City of Sherwood Oregon

Home of the Tualatin River National Wildlife Refuge

ORDINANCE 2012-010

AN ORDINANCE APPROVING A PLAN MAP AMENDMENT (PA) FROM INSTITUTIONAL PUBLIC (IP) TO MEDIUM DENSITY RESIDENTIAL LOW (MRDL) ON TAX LOT 2S130CA0100 AND APPROVING A CONCURRENT TWENTY-SIX LOT SUBDIVISION TO BE KNOWN AS RENAISSANCE AT RYCHLICK FARMS

WHEREAS, The applicant, Renaissance Development, requested a plan map amendment and subdivision and approval with the ultimate goal of developing an twenty-six lot residential development in the southeast area of Sherwood; and

WHEREAS, the subdivision would dedicate right of way and three tracts (two open space area and a vegetated corridor); and

WHEREAS, the plan map amendment approval would allow the applicant to change the zoning of a portion of the lot from Institutional Public (IP) to Medium Density Residential Low (MDRL); and

WHEREAS, the decision is a quasi-judicial land use decision subject to the following criteria: Zoning and Community Development Code Sections 16.12 (MDRL), 16.36 (Institutional and Public), 16.58 (Clear Vision), Division III Administrative Procedures, 16.80 (Plan Amendments) Division V (Community Design), Division VI - 16.104 -16.118 (Public Infrastructure), Division VII - 16.120 Subdivisions, 16.128 Land Division Design Standards, and Division VIII (Environmental Resources – 16.144 – 16.15616.40 (PUD), 16.96 (on-site circulation), Division VI (public improvements), 16.122 (Subdivision preliminary plat), 16.126 (subdivision design standards), 16.142 (Parks and Open Space); and

WHEREAS, the Planning Commission held a public hearing on June 26, 2012 to take testimony and consider the proposed plan map amendment and subdivision and made a recommendation of approval with conditions; and

WHEREAS, the Sherwood City Council has received the proposal materials, the Planning Commission recommendation including all exhibits entered into the record (PA 12-02/ SUB 12-01), and after considering the applicable criteria, the Planning Commission recommendation, applicant testimony, public testimony and all documents in the land use record, the City Council determined that the Plan Amendment as conditioned meets the applicable criteria.

NOW, THEREFORE, THE CITY OF SHERWOOD ORDAINS AS FOLLOWS:

Section 1. Commission Review & Public Hearings. The application for a plan text amendment and subdivision of one parcel specifically identified as Tax Map 2S130CA Tax Lot 100 was subject to full and proper review and public hearings were held before the Planning Commission on June 26, 2012 and the City Council on July 17, 2012.

Section 2. Findings. After full and due consideration of the proposal, the Planning Commission recommendation, applicant testimony, public testimony, applicant rebuttal and all documents included in the land use record, the City Council finds that the proposed Plan Amendment as conditioned meets the applicable criteria including all local, regional and state requirements. The findings of fact and evidence relied upon by the City are attached to this Ordinance as Exhibit 1.

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Section 3. Approval. The Plan Amendment and subdivision is approved as described and conditioned in the Planning Commission Recommendation attached as Exhibit 1.

Section 4. Manager Authorized. The Planning Manager is hereby directed to take such action as may be necessary to document and implement this ordinance.

Section 5. Effective Date. This ordinance shall become effective the 30th day after its final adoption by the City Council and signature of the Mayor.

Duly approved by the City Council and signed by the Mayor this 17th day of July 2012.

Keith S. Mays, Mayor

Attest:

Sylvia Murphy, CMC, City Recorder

	AYE	NAY
Clark	✓	
Langer	✓	
Butterfield	✓	
Folsom	✓	
Henderson	✓	
Grant	Absent	
Mays	✓	

CITY OF SHERWOOD
Date: July 19, 2012
NOTICE OF DECISION
Renaissance at Rychlick Farm (SUB 12-01/ PA 12-02)

Pre-App. Meeting:	December 12, 2011
App. Submitted:	March 30, 2012
App. Withdrawn	May 31, 2012
App. Resubmitted	May 31, 2012
App. Complete:	June 1, 2012
120-Day Deadline:	September 29, 2012
Hearing Date:	July 17, 2012

Proposal: The applicant has requested subdivision approval in order to divide a 6.57 acre site into 26 lots and four tracts. The proposed lots range in size from 5,000 square feet up to 12,013 square feet. Tract A is set aside for water quality and detention. Tract B is set aside for the protection of the vegetated corridor. Tracts C and D are intended to be common open space. The applicant is also requesting a zone change in order to make the whole site Medium Density Residential Low (MDRL). The site is currently zoned Medium Density Residential Low (MDRL) and Institutional Public (IP). The applicant's submittal packet is attached as Exhibit A and the applicant's tree materials are attached as Exhibit B.

I. BACKGROUND

A.

Applicant:	Owner:	Applicant's Representative:
Renaissance Development 16771 Boones Ferry Road Lake Oswego, OR 97035	Frank J. Rychlick Revocable Trust 17806 SW Edy Road Sherwood, OR 97140	AKS Engineering & Forestry 13910 SW Galbreath Drive Suite 100 Sherwood, OR 97140

B. Location: The property is located on the south side of SW Edy Road. The property address is 17806 SW Edy Road and the property is identified as tax lot 100 on Washington County Assessor Map 2S130CA.

C. Parcel Size: The subject property is approximately 286,189 square feet or about 6.57acres.

D. Existing Development and Site Characteristics:

The site has an existing home and it is heavily treed, and gained the Metro designations of Class A Upland Habitat and Riparian Class 1 Habitat because it is located within the Chicken Creek sub basin. The topography of the site is relatively flat on the southern portion of the site and bisected by a creek and deep ravine along the north and west portion of the site. The tree survey indicates that there are 397 existing trees, over 5-inches at diameter breast height (DBH) on the site.

E. Site History: The site has been owned by the Rychlich – Rupprecht family since 1941. The existing house was built on the property in 1952.This site was brought into the Urban Growth Boundary by Metro in 2002. The City prepared the Area 59 concept plan which was adopted in 2007. The Area 59 Concept Plan included maps that designated

portions of this site as Open Space and/or Natural Area. The implementing codes were adopted at the same time as the Concept Plan. The adopted ordinance zoned the majority of the property MDRL however the southern portion of the lot was given the IP zoning. It was thought at that time that the IP portion of the site would be a part of the anticipated school project adjacent to the south side of the lot.

F. Zoning Classification and Comprehensive Plan Designation: The existing zone for the majority of the site is Medium Density Residential Low (MDRL). Per section 16.12, the purpose of the MDRL zone is to provide for single-family and two-family housing, manufactured housing and other related uses with a density of 5.6 to 8 dwelling units per acre. About a fourth of the site is currently zoned Institutional Public. Per section 16.36 the zone provides for major institutional and governmental activities such as schools, public parks, churches, government offices, utility structures, hospitals, correctional facilities and other similar public and quasi-public uses.

G. Adjacent Zoning and Land Use: The subject site is located on the south side of SW Edy Road which is located on the northwest portion of the City. Surrounding uses include Edy Ridge Elementary School and Laurel Ridge Middle School which are both zoned Institutional Public (IP) and located to the south of the subject site. There is an existing subdivision zoned Low Density Residential (LDR) that is part of a planned unit development to the east. The lots that are adjacent to this site are between 4,000 and 6,000 Square feet in size. There is a 5.08 acre lot to the west of the subject property, with one house, which is zoned Medium Density residential Low (MDRL) and currently in agricultural uses. SW Edy Road is located north of the site. The north side of SW Edy Road include properties located within unincorporated Washington County.

H. Review Type: The subdivision requires a Type III review; however the plan map amendment requires a Type V review with a public hearing and decision made by the City Council after review by the Sherwood Planning Commission and consideration of public comments therefore both will be processed concurrently as a Type V. An appeal would be heard by the Land Use Board of Appeals (LUBA).

I. Public Notice and Hearing: Notice of the application was mailed to property owners within 1,000 feet of the site, posted on the property and in five locations throughout the City on June 5, 2012. The notice was published in The Times on June 14, 2012 and the June edition of the Gazette in accordance with Section 16.72.020 of the SZCDC.

J. Review Criteria: Review of the application will be based on the following chapters and applicable sections of the Sherwood Zoning and Community Development Code, 16.12(Medium Density Residential Low - MDRL), 16.58.010 (Clear Vision), 16.58.030 (Fences, Walls and Hedges), 16.80 (Plan Amendments), 16.94 (Off-Street Parking), 16.96 (On-Site Circulation), 16.98 (On-Site Storage), Division VI - 16.104-16.118 (Public Improvements), 16.120 (Subdivisions), 16.128 (Land Division Design Standards), 16.142 (Parks and Open Space),16.144 (Wetland, Habitat and Natural Areas),16.148 (Vibrations), 16.150 (Air Quality), 16.52 (Odors), 16.154 (Heat and Glare) and 16.156 (Energy Conservation).

II. PUBLIC COMMENTS

Public notice was mailed, posted on the property and in five locations throughout the City on June 5, 2012. Notice was published in The Times on June 14, 2012. Staff has received no written comments as of the date of this report.

III. AGENCY COMMENTS

Staff sent e-notice to affected agencies on April 30, 2012. The following is a summary of the comments received. Copies of full comments are included in the record unless otherwise noted.

Sherwood Engineering Department: The Sherwood Engineering Department have provided comments that have been summarized below, are incorporated by reference into the record of this report, and are discussed throughout the report. The applicant will be responsible for satisfying all construction and design standards in the final construction design of the application.

Grading and Erosion Control:
Retaining walls within public easements or the public right-of-way shall require engineering approval. Retaining walls with a height of 4 feet or higher located on private property will require a permit from the building department.

City policy requires that prior to grading, a permit is obtained from the Building Department for all grading on the private portion of the site.

The Engineering Department requires a grading permit for all areas graded as part of the public improvements. The Engineering permit for grading of the public improvements is reviewed, approved and released as part of the public improvement plans.

Other Engineering Issues:
Public easements are required over all public utilities outside the public right-of-way. Easements dedicated to the City of Sherwood are exclusive easements unless otherwise authorized by the City Engineer.

An eight-foot wide public utility easement is required adjacent to the right-of-way of all street frontage. (Reference code 16.118.020.B).

All existing and proposed utilities shall be placed underground.

Obtain a right-of-way permit for any work required in the public right-of-way, (reference City Ordinance 2006-20).

All public easements must be in submitted to the City for review, signed by the City and Applicant, recorded by the Applicant with the original recorded easements on file at the City prior to the release of public improvement plans.

Washington County: Washington County provided comments related to the development that basically requires dedication and half-street improvements along SW Edy Road. The County is also requesting that site distance certification for the intersection with the new public road be provided, along with a motor vehicle access restriction along the site's frontage with SW Edy

Road. Their comments are incorporated into the record for the proposed subdivision and recommended conditions of approval are incorporated into this staff report.

Clean Water Services: Clean Water Services did not provide comments on the proposal, but the applicant is required to satisfy their requirements for plat approval.

Tualatin Valley Fire and Rescue: Tualatin Valley Fire and Rescue provided comments listing the minimum requirements for fire protection. Their comments have been incorporated into the record, and the applicant will be required to satisfy their minimum standards for fire protection in designing and constructing the subdivision.

Kinder Morgan Energy, ODOT, Pride Disposal, Tualatin Valley Water District, NW Natural Gas, and Portland General Electric were all provided with an opportunity to comment, but provided no comments as of the date of this staff report.

IV. PRELIMINARY PLAT– REQUIRED FINDINGS (SECTION 16.120)

A. Streets and roads conform to plats approved for adjoining properties as to widths, alignments, grades, and other standards, unless the City determines that the public interest is served by modifying streets or road patterns.

FINDING: As proposed, the applicant will be constructing SW Nursery Way and Rychlick Court to comply with widths, alignments, grades and other standards. The applicant did not request a modification to the streets or road patterns with this application. This standard is met.

B. Streets and roads held for private use are clearly indicated on the plat and all reservations or restrictions relating to such private roads and streets are set forth thereon.

FINDING: This criterion is not applicable as the applicant has not proposed any private roads or streets.

C. The plat complies with applicable zoning district standards and design standards in Division II, and all provisions of Divisions IV, VI, VIII and IX. The subdivision complies with Chapter 16.128 (Land Division Design Standards).

FINDING: This standard is met as discussed in Divisions IV (Planning Procedures), VI (Public Infrastructure) and VII (Environmental Resources) of this report. Section IX (Historic Resources) is not addressed as it is not applicable.

D. Adequate water, sanitary sewer, and other public facilities exist to support the use of land proposed in the plat.

FINDING: As discussed in sections 16.110 – 16.118 of this report there are adequate services to support the proposed subdivision. This standard is met.

E. Development of additional, contiguous property under the same ownership can be accomplished in accordance with this Code.

The property owner only owns the property which is under review. The subdivision will result in the creation of 26 new lots which may be sold to different property owners. Although, the property owner does not own the undeveloped piece of property to the west, the proposed alignment of SW Nursery Way is consistent with the alignment of the street that would be extended past the school development which is on the other side of the western adjacent property. The properties to the east and south are already developed.

FINDING: This standard is met as described above.

F. Adjoining land can either be developed independently or is provided access that will allow development in accordance with this Code.

FINDING: The undeveloped property to the west will have the opportunity to develop independently with access from SW Edy Road or the extension of SW Nursery Way. This standard is met.

G. Tree and woodland inventories have been submitted and approved as per Section 16.142.060.

FINDING: A woodland inventory has been submitted and complies with the street tree requirement as well as the trees on private property standard as discussed in section 16.142 of this report. This standard is met.

H. The plat clearly shows the proposed lot numbers, setbacks, dedications and easements.

FINDING: This standard is met since the plat clearly shows the proposed lot numbers, street names, easements, and dedications. The applicant has provided a preliminary setback plan as well as the lot sizes for each lot which will be discussed in further detail in this report. As conditioned, the plat can feasibly satisfy the requirements for the MDRL zoning district.

I. A minimum of five percent (5%) open space has been provided per § 16.44.B.8 (Townhome- Standards) or §16.142.020 (Parks, Open Spaces and Trees-Single-Family Residential Subdivisions), if applicable.

FINDING: The applicant is required to provide a minimum of approximately 9,640 square feet (5%) of open space. There is a discrepancy on sheet 3 of 15 of the plan set; however, the applicant has proposed a minimum of 10,088 square feet in tracts C and D. The preliminary plat, Sheet 3 of 15, of the project plan set also suggests that Tract C is 12,313 square feet. Regardless, the 10,088 square feet does exceed the minimum requirement; therefore, this standard is met.

V. APPLICABLE CODE PROVISIONS

The applicable zoning district standards are identified in Chapter 16.12 below.

A. <u>Division II– Land Use and Development</u>

The applicable provisions of Division II include: 16.12 (Medium Density Residential Low) and 16.58 (Visual Clearance). Compliance with the standards in these sections is discussed below:

16.12.010 Purpose

Zoning district description

The MDRL zoning district provides for single-family and two-family housing, manufactured housing and other related uses with a density of 5.6 to 8 dwelling units per acre. Minor land partitions shall be exempt from the minimum density requirements.

FINDING: This site is 286,084 square feet of area which would yield a minimum density of 24 units and a maximum density of 35 units if all the property is zoned MDRL. As discussed further, they have demonstrated that they meet the criteria for a zone change from IP to MDRL and approval is recommended, therefore the analysis assumes this. As proposed, the proposed density is 26 units which is within the acceptable density range for this site if the zone change is approved. This standard is met if the zone change is approved .

16.12.020 Allowed Residential Land Use

Single Family Attached or Detached Dwellings

FINDING: The applicant is proposing a 26-lot subdivision for single family dwellings which is a permitted use in the medium density residential low zone. This standard is met.

16.12.030.C. Dimensional Standards

No lot area, setback, yard, landscaped area, open space, off-street parking or loading area, or other site dimension or requirement, existing on, or after, the effective date of this Code shall be reduced below the minimum required by this Code. Nor shall the conveyance of any portion of a lot, for other than a public use or right-of-way, leave a lot or structure on the remainder of said lot with less than minimum Code dimensions, area, setbacks or other requirements, except as permitted by Chapter 16.84.

Lot Dimensions

Except as otherwise provided, required minimum lot areas and dimensions shall be:

1.	**Lot area:**	**5,000 sq. ft.**
2.	**Lot width at front property line:**	**25 feet**
3.	**Lot width at building line:**	**50 feet**
4.	**Lot Depth**	**80 feet**

The lots meet the lot area requirements. The smallest lot, Lot 7, is 5, 000 square feet while the largest lot, Lot 11, is 12,013 square feet. As proposed, all 26 lots can achieve a lot width at building line at 50 feet, a building width at front property line of 25 feet and an average lot depth of 80 feet.

FINDING: This standard is met as discussed above.

16.12.030.C. Setbacks

Except as otherwise provided, required minimum setbacks shall be:

1.	**Front yard:**	**Twenty (20) feet**
2.	**Side yard:**	**Five (5) feet**
3.	**Rear yard:**	**Twenty (20) feet**
4.	**Corner side yard:**	**Fifteen (15) feet**

FINDING: As proposed, it appears that the setbacks can be achieved. The actual building envelopes will be reviewed when the lots are individually reviewed prior to issuance of building permits. However, the lots are large enough for the structures to meet the setbacks.

16.12.030.C. Height

Except as otherwise provided, the maximum height shall be 30 feet or 2 stories.

FINDING: At this time it is unclear how tall the homes will be. The actual height of the homes will be reviewed when the lots are individually reviewed prior to issuance of building permits.

16.58.010 Clear Vision Areas

A. A clear vision area shall be maintained on the corners of all property at the intersection of two (2) streets, intersection of a street with a railroad, or intersection of a street with an alley or private driveway.

B. A clear vision area shall consist of a triangular area, two (2) sides of which are lot lines measured from the corner intersection of the street lot lines for a distance specified in this regulation; or, where the lot lines have rounded corners, the lot lines extended in a straight line to a point of intersection, and so measured, and the third side of which is a line across the corner of the lot joining the non-intersecting ends of the other two (2) sides.

C. A clear vision area shall contain no planting, sight obscuring fence, wall, structure, or temporary or permanent obstruction exceeding two and one-half (2 1/2) 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 the height of seven (7) feet above the ground on the sidewalk side and ten (10) feet on the street side.

The following requirements shall govern clear vision areas:

1. **In all zones, the minimum distance shall be twenty (20) feet.**

2. **In all zones, the minimum distance from corner curb to any driveway shall be twenty-five (25) feet.**

3. **Where no setbacks are required, buildings may be constructed within the clear vision area.**

FINDING: The applicant is not proposing any new improvements that would interfere with the Clear Vision area, and has proposed grading that will improve the sites intersection with SW Edy Road. Washington County provided comments that are provided as Exhibit F to this report. The comments include a condition of approval that requires that the applicant certify site distance along SW Edy Road for the intersection. Clear Vision areas do not appear to be problematic in this development, and it is feasible for the development to comply with this standard.

B. Division IV – Planning Procedures

16.80.030.B. Map Amendment

An amendment to the City Zoning Map may be granted, provided that the proposal satisfies all applicable requirements of the adopted Sherwood Comprehensive Plan, the Transportation System Plan and this Code, and that:

1. **The proposed amendment is consistent with the goals and policies of the Comprehensive Plan and the Transportation System Plan.**

   The Sherwood Comprehensive Plan identified two goals and associated policy objectives for the Area 59 concept plan. The focus of the goals is to encourage development, provide contiguous development, and preserve natural areas and other similar policies. By changing the zone from IP to MDRL the site will continue to meet the goals and policies of the Comprehensive Plan and the intent of the Area 59 concept plan. The extension of SW Nursery Way will be feasible as shown on the proposed development plan and it will be consistent with the Transportation System Plan.

FINDING: This proposal complies with the intent of the concept plan by developing in a manner that preserves the drainage way, slopes, and accompanying buffer, and meeting the dimensional and use requirements of the MDRL Zone.

2. **There is an existing and demonstrable need for the particular uses and zoning proposed, taking into account the importance of such uses to the economy of the City, the existing market demand for any goods or services which such uses will provide, the presence or absence and location of other such uses or similar uses in the area, and the general public good.**

Within the City of Sherwood, there are approximately 22 lots available for single family construction at this time. This clearly demonstrates that there is a need for this use. In addition, as will be discussed below, there is not a need for the IP zone to remain on the subject property.

This site is located within an area, identified as Area 59, which was brought into the urban growth boundary in 2002. The City started concept planning the area in 2004. During that process it was clear that there was a need for land to be identified for a new elementary and middle school to accommodate an increase in school enrollment. After reviewing traffic analysis and citizen advisory review it was determined that a 29 acre site was adequate to support the two facilities and recreational fields. There were parties that believed that more land was needed for a school while others thought that less land was needed for the school.

The 29 acre site was identified as Institutional Public (IP) prior to establishing the zoning of the remaining buildable land. Residential, open space and mixed use areas were also identified on the adopted plan in February 2007. It is not uncommon to adopt a concept plan with zoning that does not follow property lines. In this case, a small portion of the Rychlick property, which is located to the north of the school property, was designated IP in order to provide 29 acres for the school district's development. Shortly after the adoption of the concept plan the school district moved forward with the development of the new schools and associated recreational areas. Through that review it was clarified that the boundry line between the IP and MDRL zone was the new street, "Nursery Way". This clarification (see Exhibit G) excerpt from Area 59 schools decision established the remainder of the IP zoning, a small portion of which was on the subject parcel. The IP portion of the Rychlick property was not developed as a part of that project.

As the intent to provide school land has been achieved, the demand for a school on this land has ended. Additionally, there are limited buildable residential lots left in Sherwood while there is still a demand for families to live in the City. As the rest of this site is zoned residential and it is adjacent to residentially zoned land changing the IP piece of the Rychlick property to MDRL would make it consistent with neighboring land to the north, east and west.

FINDING: This standard is met as discussed above.

3. **The proposed amendment is timely, considering the pattern of development in the area, surrounding land uses, any changes which may have occurred in the neighborhood or community to warrant the proposed amendment, and the availability of utilities and services to serve all potential uses in the proposed zoning district.**

Sherwood has not seen a lot of residential subdivision development over the past five years which is attributed to the slow economy and decreasing number of buildable residential lots in the City. Since there is still demand to live in Sherwood and live close to schools the proposed map amendment would allow the whole Rychlick site to develop with single family homes, as

proposed, and provides additional housing opportunities to current and future residents. The site is adjacent to residentially zoned land. The land to the east is already developed with a Low Density Residential Planned Unit Development subdivision. The land to the west is zoned MDRL with an existing home. Finally, to the south, the school district site is developed in the IP zone consistent with their development plan. The school district in their development, identified room for expansion of their site when needed and it does not include utilizing any portion of the Rychlick property. There are services available which will be extended to the proposed lots as a part of this development. This is discussed further the public improvement section of this report. The proposed amendment is timely.

FINDING: This criterion is met as discussed above.

4. Other lands in the City already zoned for the proposed uses are either unavailable or unsuitable for immediate development due to location, size or other factors.

As previously mentioned, the City does not have many undeveloped residential lots left. When Area 59 was concept planned it was clear that the school and residential zones would be the overwhelming majority of this area. Since three – fourths of this site is ready to develop and is zoned residential (with some open space) it provides additional housing opportunities to the Sherwood community.

There is additional residentially zoned land within Area 59 although it is unclear when the land owners will be interested in development. There are also some larger parcels on the southeast side of the city which could be developed into residential lots although these sites are zoned lower density and have additional constraints due to the topography and some contamination. This is a small piece of land attached to an already existing lot that is zoned MDRL. This proposed amendment is timely and justifiable given the circumstances for its current designation as land for a school that has already been constructed.

FINDING: This standard is met as discussed above.

C. Transportation Planning Rule Consistency

1. Review of plan and text amendment applications for effect on transportation facilities. Proposals shall be reviewed to determine whether it significantly affects a transportation facility, in accordance with OAR 660-12-0060 (the TPR). Review is required when a development application includes a proposed amendment to the Comprehensive Plan or changes to land use regulations.

The change in zoning will not affect transportation facilities. The rest of the property is zoned residential as well as the neighboring properties to the east and west. As this application is concurrent with a subdivision review it is clear that the land will be developed into single family residences. The extension of SW Nursery Way, a local street, is also included with application which will increase the transportation facilities in this area. The proposed development

and subsequent amendment do not change the classification of any of the existing streets as a result of the development or plan map amendment. In addition, the zone change only provides 1 additional lot. If the IP zoning were to remain it would be developable with a church or other public use which would almost certainly generate more trips than the 10 attributed to single family residences.

FINDING: The standard is met as discussed above.

2. "Significant" means that the transportation facility would change the functional classification of an existing or planned transportation facility, change the standards implementing a functional classification, allow types of land use, allow types or levels of land use that would result in levels of travel or access that are inconsistent with the functional classification of a transportation facility, or would reduce the level of service of the facility below the minimum level identified on the Transportation System Plan.

The applicant is proposing to change the zoning from IP to MDRL. It appears that the zone change will allow for the creation of one additional lot and it will allow the applicant to increase the size of 2-3 lots. One additional residential lot, as a result of the zone change, will not impact the functional classification of any existing or planned transportation facilities or impact the level of service of SW Edy Road or SW Nursery Way.

FINDING: This standard is met as discussed above.

3. Per OAR 660-12-0060, Amendments to the Comprehensive Plan or changes to land use regulations which significantly affect a transportation facility shall assure that allowed land uses are consistent with the function, capacity, and level of service of the facility identified in the Transportation System Plan. This shall be accomplished by one of the following:

a. Limiting allowed uses to be consistent with the planned function of the transportation facility.

b. Amending the Transportation System Plan to ensure that existing, improved, or new transportation facilities are adequate to support the proposed land uses.

c. Altering land use designations, densities or design requirements to reduce demand for automobile travel and meet travel needs through other modes.

FINDING: As discussed in section 16.80.030.C.1 and 16.80.030.C.2 above, this map amendment will not significantly affect transportation facilities, therefore this standard is met.

C. Division V – Community Design

16.96.020 - Minimum Residential Standards

Minimum standards for private, on-site circulation improvements in residential developments:

16.96.020.A. Driveways

1. Single-Family: One (1) driveway improved with hard surface pavement with a minimum width of ten (10) feet, not to exceed a grade of 14%. Permeable surfaces and planting strips between driveway ramps are encouraged in order to reduce stormwater runoff.

FINDING: It appears that each lot will be able to meet this standard when each lot is reviewed for building permits. This standard applies citywide and can be verified prior to issuance of building permits.

D. <u>Division VI - Public Improvements</u>

16.106 – Transportation Facilities

16.106.120.A. Generally

Except as otherwise provided, all developments containing or abutting an existing or proposed street, that is either unimproved or substandard in right-of-way width or improvement, shall dedicate the necessary right-of-way prior to the issuance of building permits and/or complete acceptable improvements prior to issuance of occupancy permits. The following figure provides the depiction of the functional classification of the street network as found in the Transportation System Plan, Figure 8-1.

The applicant is proposing to dedicate 52-feet of right of way for the creation of SW Nursery Way and SW Rychlick Court. These streets were proposed by the applicant in order to serve the new lots created by this subdivision. These streets will be improved prior to issuance of building permits.

The site abuts SW Edy Road, a collector street. The applicant is proposing to dedicate seven feet of right of way along the frontage of Tract C consistent with Washington County standards. The applicant will also dedicate seven feet of frontage along the intersection of SW Nursery Way and Lot 1. This will bring the total right of way on each end of the site to 37 feet. Although 50 feet of right of way is generally required for collector streets, the County and City Engineering staff prefers to match the existing improvements, and have accepted the proposed 37-foot right of way.

FINDING: As discussed above this standard is met.

16.106.020.B. Street Connectivity and Future Street Systems

1. **Future Street Systems. The arrangement of public streets shall provide for the continuation and establishment of future street systems as shown on the Local Street Connectivity Map contained in the adopted Transportation System Plan (Figure 8-8).**
2. **Connectivity Map Required. New residential, commercial, and mixed**

use development involving the construction of new streets shall be submitted with a site plan that implements, responds to and expands on the Local Street Connectivity map contained in the TSP.

a. A project is deemed to be consistent with the Local Street Connectivity map when it provides a street connection in the general vicinity of the connection(s) shown on the map, or where such connection is not practicable due to topography or other physical constraints; it shall provide an alternate connection approved by the decision-maker.

b. Where a developer does not control all of the land that is necessary to complete a planned street connection, the development shall provide for as much of the designated connection as practicable and not prevent the street from continuing in the future.

c. Where a development is disproportionately impacted by a required street connection, or it provides more than its proportionate share of street improvements along property line (i.e., by building more than 3/4 width street), the developer shall be entitled to System Development charge credits, as determined by the City Engineer.

3. Block Length. For new streets except arterials, block length shall not exceed 530 feet. The length of blocks adjacent to arterials shall not exceed 1,800 feet.

4. Where streets must cross water features identified in Title 3 of the Urban Growth Management Functional Plan (UGMFP), provide crossings at an average spacing of 800 to 1,200 feet, unless habitat quality or length of crossing prevents a full street connection.

5. Where full street connections over water features identified in Title 3 of the UGMFP cannot be constructed in centers, main streets and station communities (including direct connections from adjacent neighborhoods), or spacing of full street crossings exceeds 1,200 feet, provide bicycle and pedestrian crossings at an average spacing of 530 feet, unless exceptional habitat quality or length of crossing prevents a connection.

6. Pedestrian and Bicycle Connectivity. Paved bike and pedestrian accessways consistent with cross section standards in Figure 8-6 of the TSP shall be provided on public easements or right- of-way when full street connections are not possible, with spacing between connections of no more than 300 feet. Multi-use paths shall be built according to the Pedestrian and Bike Master Plans in the adopted TSP.

7. Exceptions. Streets, bike, and pedestrian connections need not be constructed when any of the following conditions exists:

a. Physical or topographic conditions make a street or accessway connection impracticable. Such conditions include but are not limited to freeways, railroads, steep slopes, wetlands or other bodies of water where a connection could not reasonably be provided.

b. Buildings or other existing development on adjacent lands physically preclude a connection now or in the future considering the potential for redevelopment; or

c. Where streets or accessways would violate provisions of leases, easements, covenants, restrictions or other agreements existing as of May 1, 1995, which preclude a required street or accessway

connection.

FINDING: As discussed in the previous standard, the applicant has provided the necessary right of way. The applicant is proposing a six foot sidewalk along SW Nursery way, SW Rychlick Court and SW Edy Road to provide pedestrian access to the site. The applicant is also proposing a pedestrian access from Tract D to the school property. The proposal has designed the most efficient transportation connections, and cannot form a typical block because of existing topography, surrounding development patterns, and the presence of the on-site resource area dedicated to the preservation of the Chicken Creek drainage. This standard is met.

16.106.020.C. Underground Utilities

All public and private underground utilities, including sanitary sewers and storm water drains, shall be constructed prior to the surfacing of streets. Stubs for service connections shall be long enough to avoid disturbing the street improvements when service connections are made.

The applicant is proposing underground water, sanitary and sewer facilities. These will be stubbed to the individual lots prior to issuance of building permits. The proposed plans show overhead power lines along the frontage of Edy Road.

FINDING: There is a portion of existing overhead utilities that will need to be undergrounded with future improvements. PGE, the service provider did not provide any comments on the development to suggest that the line couldn't be placed underground, therefore, the following condition is warranted.

RECOMMENDED CONDITION: Prior to issuance of building permits, all public and private utilities shall be underground unless the utility provider has determined that the lines are too large to place underground.

16.106.020. D. Additional Setbacks

Generally additional setbacks apply when the width of a street right-of-way abutting a development is less than the standard width under the functional classifications in Section VI of the Community Development Plan. Additional setbacks are intended to provide unobstructed area for future street right-of-way dedication and improvements, in conformance with Section VI. Additional setbacks shall be measured at right angles from the centerline of the street.

	Classification	Additional Setback
1.	Principle Arterial (99W)	61 feet
2.	Arterial	37 feet
3.	Collector	32 feet
4.	Neighborhood Route	32 feet
5.	Local	26 feet

FINDING: SW Edy Road is a collector and therefore, the lots fronting on to this right-of-way could be subject to this standard. Lot one is the only lot that would be

subject to this provision, and the County and City staff have indicated that the additional setback is not warranted since the prescribed amount of right-of-way is proposed to be dedicated. This criterion is not applicable to the proposed development.

16.106.040 Design

Standard cross sections showing street design and pavement dimensions are located in the City of Sherwood Transportation System Plan, and City of Sherwood's Engineering Design Manual.

FINDING: The applicant shows the proposed street cross sections. The applicant shall provide street design and pavement dimension to the Engineering Department prior to public improvement plan approval as conditioned below.

RECOMMENDED CONDITION: Prior to public improvement plan approval, submit standard cross sections showing street design and pavement dimensions to the Engineering Department per the City of Sherwood Transportation System Plan, and City of Sherwood's Engineering Design Manual

16.106.040.A. Reserve Strips

Reserve strips or street plugs controlling access or extensions to streets are not allowed unless necessary for the protection of the public welfare or of substantial property rights. All reserve strips shall be dedicated to the appropriate jurisdiction that maintains the street.

FINDING: Washington County has requested that a reserve strip be provided along SW Edy Road to manage access onto SW Edy Road. Compliance with the proposed conditions of approval will satisfy this criteria.

16.106.040.B. Alignment

All proposed streets shall, as far as practicable, be in alignment with existing streets. In no case shall the staggering of streets create a "T" intersection or a dangerous condition. Street offsets of less than one hundred (100) feet are not allowed.

FINDING: The proposed street access is located over 150 from the nearest street intersection. Street offsets of less than 100 feet are not proposed; therefore, this standard is met.

16.106.040.C. Future Extension

Where necessary to access or permit future subdivision or development of adjoining land, streets shall extend to the boundary of the proposed development and provide the required roadway width. Dead-end streets less than 100' in length shall comply with the Engineering Design Manual.

A durable sign shall be installed at the applicant's expense. The sign shall notify the public of the intent to construct future streets. The sign shall read as follows: "This road will be extended with future development. For more information contact the City of Sherwood at 503-625-4202."

Nursery Way connects to SW Edy Road. The street will dead end at the southwest corner of the site, south of lot 18. The site to the west (tax lot 100) has not been developed although there is another connection of SW Nursery Way to the west of the adjacent parcel (tax lot 100). It is intended that SW Nursery Way will provide a full connection between local and collector streets when tax lot 100 develops in the future. The applicant has acknowledged the need for a sign although a sign has not been installed notifying the public that the road could extend in the future.

FINDING: As discussed above the standard has not been met but it can be as conditioned below.

RECOMMENDED CONDITION: Prior to Public Improvement Plans approval, show that the sign will be installed.

RECOMMENDED CONDITION: Prior to issuance of building permits, install a sign (at the applicant's expense), notifying the public of the intent to construct the future street extension of SW Nursery Way. The sign shall read as follows: "This road will be extended with future development. For more information contact the City of Sherwood at 503-625-4202."

16.106.040.D. Intersection Angles

Streets shall intersect as near to ninety (90) degree angles as practical, except where topography requires a lesser angle. In all cases, the applicant shall comply with the Engineering Design Manual.

FINDING: The proposed streets intersect as near to ninety (90) degree angles as practical given the topography. This standard is met.

16.106.040.E. Cul-de-sacs

1. **All cul-de-sacs shall be used only when exceptional topographical constraints, existing development patterns, or compliance with other standards in this code preclude a street extension and circulation. A cul-de-sac shall not be more than two hundred (200) feet in length and shall not provide access to more than 25 dwelling units.**
2. **All cul-de-sacs shall terminate with a turnaround in accordance with the specifications in the Engineering Design Manual. The radius of circular turnarounds may be larger when they contain a landscaped island, parking bay in their center, Tualatin Valley Fire and Rescue submits a written request, or an industrial use requires a larger turnaround for truck access.**
3. **Public easements, tracts, or right-of-way shall provide paved pedestrian and bicycle access ways at least 6 feet wide where a cul-de-sac or dead-end street is planned, to connect the ends of the streets together, connect to other streets, or connect to other existing or planned developments in accordance with the standards of this Chapter, the TSP, the Engineering Design Manual or other provisions identified in this Code for the preservation of trees.**

The site is surrounded by an existing residential development to the east and schools to the south which precludes the ability of the development to extend SW Rychlick Court to the east or south. Additionally, there is not an ability to develop a street extension to the northwest due to environmental constraints.

SW Rychlick Court is approximately 195 feet from centerline within SW Nursery Way. The cul-de-sac will serve seven lots and will provide a secondary access to two additional lots with frontage along Nursery Way. The applicant has provided a six foot pedestrian sidewalk along the perimeter of the cul-de-sac which connects to the proposed sidewalk along Nursery Way. Access to the school site from the cul-de-sac is not needed since there is already an existing access to the school from SW Copper Terrace. Additionally, the portion of the school site to the south is used as sports fields and there is not a street for this subdivision to connect to.

FINDING: This standard is met as discussed above.

16.106.040.F. Grades and Curves

Grades shall be evaluated by the City Engineer and comply with the Engineering Design Manual.

FINDING: The proposed street grades comply with the Engineering Design Manual. This standard is met.

16.106.040.G.Streets Adjacent to Railroads

Streets adjacent to railroads shall run approximately parallel to the railroad and be separated by a distance suitable to allow landscaping and buffering between the street and railroad. Due consideration shall be given at cross streets for the minimum distance required for future grade separations and to provide sufficient depth to allow screening of the railroad.

FINDING: The proposed development is not located adjacent to a railroad; therefore, this standard is not applicable.

16.106.040.H. Buffering of Major Streets

Where a development abuts Highway 99W, or an existing or proposed principal arterial, arterial or collector street, or neighborhood route, adequate protection for residential properties shall be provided and through and local traffic shall be separated and traffic conflicts minimized. In addition, visual corridors pursuant to Section 16.142.030, and all applicable access provisions of Chapter 16.96, shall be met. Buffering may be achieved by: parallel access streets, lots of extra depth abutting the major street with frontage along another street, or other treatment suitable to meet the objectives of this Code.

The applicant has provided a ten foot visual corridor along SW Edy Road. Additionally, the applicant has provided open space in Tract C and a vegetated

corridor in Tract B which provide an additional buffer to the residential lots created by this development.

FINDING: This standard is met as discussed above.

16.106.040 .J. Transit Facilities
Development along an existing or proposed transit route, as illustrated in Figure 7-2 in the TSP, is required to provide areas and facilities for bus turnouts, shelters, and other transit-related facilities to Tri-Met specifications. Transit facilities shall also meet the following requirements:

1. **Locate buildings within 20 feet of or provide a pedestrian plaza at major transit stops.**
2. **Provide reasonably direct pedestrian connections between the transit stop and building entrances on the site.**
3. **Provide a transit passenger landing pad accessible to disabled persons (if not already existing to transit agency standards).**
4. **Provide an easement or dedication for a passenger shelter and underground utility connection from the new development to the transit amenity if requested by the public transit provider.**
5. **Provide lighting at a transit stop (if not already existing to transit agency standards).**

FINDING: The proposed development is not along an existing or proposed transit facility; therefore, this standard is not applicable.

16.106.040.K. Traffic Controls

1. **An application for a proposed residential development that will generate more than an estimated 200 average daily vehicle trips (ADT) must include a traffic impact analysis to determine the number and types of traffic controls necessary to accommodate anticipated traffic flow.**

2. **For all other proposed developments including commercial, industrial or institutional uses with over an estimated 400 ADT, or as otherwise required by the City Engineer, the application must include a traffic impact analysis to determine the number and types of traffic controls necessary to accommodate anticipated traffic flow.**

The applicant has provided a traffic impact analysis from a qualified professional, Todd Mobley, PE, at Lancaster Engineering. The proposed development is expected to generate approximately 312 additional weekday trips. Therefore, the analysis was justified. The report did not indicate that the proposed development would trigger the need for any additional mitigation beyond what was being proposed.

FINDING: Since a traffic study was provided, this criterion is satisfied by the applicant.

16.106.040 .M.2. Roadway Access

No use will be permitted to have direct access to a street or road except as specified below. Access spacing shall be measured from existing or approved accesses on either side of a street or road. The lowest functional classification street available to the legal lot, including alleys within a public easement, shall take precedence for new access points.

a. Local Streets:

Minimum right-of-way radius is fifteen (15) feet. Access will not be permitted within ten (10) feet of Point "B," if no radius exists, access will not be permitted within twenty-five (25) feet of Point "A." Access points near an intersection with a Neighborhood Route, Collector or Arterial shall be located beyond the influence of standing queues of the intersection in accordance with AASHTO standards. This requirement may result in access spacing greater than ten (10) feet.

c. Collectors:

All commercial, industrial and institutional uses with one-hundred-fifty (150) feet or more of frontage will be permitted direct access to a Collector. Uses with less than one-hundred-fifty (150) feet of frontage shall not be permitted direct access to Collectors unless no other alternative exists.

Where joint access is available it shall be used, provided that such use is consistent with Section 16.96.040, Joint Access. No use will be permitted direct access to a Collector within one- hundred (100) feet of any present Point "A." Minimum spacing between driveways (Point "C" to Point "C") shall be one-hundred (100) feet. In all instances, access points near an intersection with a Collector or Arterial shall be located beyond the influence of standing queues of the intersection in accordance with AASHTO standards. This requirement may result in access spacing greater than one hundred (100) feet.

Access spacing is illustrated on the proposed plans, and has been discussed and justified in the Traffic Impact Analysis from Lancaster Engineering. Both the City and County Engineering Divisions have reviewed the report, the proposed development, and the proposed dedications and frontage improvements, and concur that the development does comply with the above standards.

FINDING: The proposed development complies with these standards.

16.110 - Sanitary Sewers

Sanitary sewers shall be installed to serve all new developments and shall connect to existing sanitary sewer mains. Sanitary Sewers shall be constructed, located, sized and installed at standards consistent 16.110.

The applicant is proposing to tie into an existing 15-inch sanitary sewer line that is located in SW Edy Road, and extend it to the proposed termination of SW Nursery Way. The applicant can feasibly comply with this standard as proposed.

FINDING: This criterion is satisfied.

16.112– Water Supply

Water lines and fire hydrants conforming to City and Fire District standards shall be installed to serve all building sites in a proposed development in compliance with 16.112.

The applicant is proposing to tie into an existing 15-inch water line that is located in SW Edy Road, and extend it to the proposed termination of SW Nursery Way. The applicant can feasibly comply with this standard as proposed.

FINDING: This criterion is satisfied.

16.114 - Storm Water

Storm water facilities, including appropriate source control and conveyance facilities, shall be installed in new developments and shall connect to the existing downstream drainage system consistent with the Comprehensive Plan, the requirements of the Clean Water Services water quality regulations and section 16.114.

The applicant is proposing to capture the stormwater in a series of pipes and convey the water to a treatment facility located in Tract A, and discharge the water into the existing drainageway. Clean Water Services (CWS) and the City of Sherwood Engineering division have indicated that this is acceptable provided the final design satisfies the design and construction standards of CWS.

FINDING: The applicant must comply with the CWS service provider letter 12-000392 and design and construct the facilities in compliance with CWS design and construction standards. Since CWS will not sign off on the plat unless the engineering and construction comply with these standards, an additional condition is not warranted. The application can feasibly comply with this standard.

16.116.010 - Fire Protection

When land is developed so that any commercial or industrial structure is further than 250 feet or any residential structure is further than 500 feet from an adequate water supply for fire protection, as determined by the Fire District, the developer shall provide fire protection facilities necessary to provide adequate water supply and fire safety. In addition capacity, fire flow, access to facilities and number of hydrants shall be consistent with 16.116.020 and fire district standards.

16.116.020 Standards

A. Capacity

All fire protection facilities shall be approved by and meet the specifications of the Fire District, and shall be sized, constructed, located, and installed consistent with this Code, Chapter 7 of the Community Development Plan, and other applicable City standards, in order to adequately protect life and property in the proposed development.

B. Fire Flow

Standards published by the Insurance Services Office, entitled "Guide for Determination of Required Fire Flows" shall determine the capacity of

facilities required to furnish an adequate fire flow. Fire protection facilities shall be adequate to convey quantities of water, as determined by ISO standards, to any outlet in the system, at no less than twenty (20) pounds per square inch residual pressure. Water supply for fire protection purposes shall be restricted to that available from the City water system. The location of hydrants shall be taken into account in determining whether an adequate water supply exists.

C. Access to Facilities
Whenever any hydrant or other appurtenance for use by the Fire District is required by this Chapter, adequate ingress and egress shall be provided. Access shall be in the form of an improved, permanently maintained roadway or open paved area, or any combination thereof, designed, constructed, and at all times maintained, to be clear and unobstructed. Widths, height clearances, ingress and egress shall be adequate for District firefighting equipment. The Fire District, may further prohibit vehicular parking along private accessways in order to keep them clear and unobstructed, and cause notice to that effect to be posted.

D. Hydrants
Hydrants located along private, accessways shall either have curbs painted yellow or otherwise marked prohibiting parking for a distance of at least fifteen (15) feet in either direction, or where curbs do not exist, markings shall be painted on the pavement, or signs erected, or both, given notice that parking is prohibited for at least fifteen (15) feet in either direction.

TVFR has reviewed this application for compliance with their standards, and provided written comments to ensure that the development complies with the applicable standards of the Fire Code. The applicant must satisfy these standards in order to obtain final plat approval. Upon review, it doesn't appear compliance will result in changes to the plat and the proposal is feasible.

FINDING: The districts comments do not point out any deficiencies with the proposed development. The applicant will be required to satisfy the districts standards for final plat approval.

RECOMMENDED CONDITION: Prior to final plat approval, the applicant shall provide the City a set of engineered construction plans that demonstrate compliance with the TVFR district standards for fire protection.

16.118.020 – Public and Private Utilities Standard

A. Installation of utilities shall be provided in public utility easements and shall be sized, constructed, located and installed consistent with this Code, Chapter 7 of the Community Development Code, and applicable utility company and City standards.
B. Public utility easements shall be a minimum of eight feet in width unless a reduced width is specifically exempted by the City Engineer.
C. Where necessary, in the judgment of the City Manager or his designee, to provide for orderly development of adjacent properties, public and

franchise utilities shall be extended through the site to the edge of adjacent property (ies).

D. Franchise utility conduits shall be installed per the utility design and specification standards of the utility agency.

E. Public Telecommunication conduits and appurtenances shall be installed per the City of Sherwood telecommunication design standards.

F. Exceptions: Installation shall not be required if the development does not require any other street improvements. In those instances, the developer shall pay a fee in lieu that will finance installation when street or utility improvements in that location occur.

The applicants preliminary development plans provide the utility easements as required. It is feasible for the proposed development to satisfy the above criteria provided the development constructs according to plan.

FINDING: As proposed, the application complies with the above standards.

16.128.010 - Blocks

A. Connectivity

1. Block Size

The length, width, and shape of blocks shall be designed to provide adequate building sites for the uses proposed, and for convenient access, circulation, traffic control and safety.

This preliminary subdivision request includes two new streets. SW Nursery Way will connect to SW Edy Road to the north and dead end at the southwest corner. When the adjacent property to the west develops, SW Nursery Way will extend from east to west. SW Rychlick Court is a cul-de-sac which will connect to SW Nursery Way. The two roads are adequate to serve this subdivision.

FINDING: This standard is met as discussed above.

2. Block Length

Block length standards shall be in accordance with Section 16.108.040. Generally, blocks shall not exceed five-hundred thirty (530) feet in length, except blocks adjacent to principal arterial, which shall not exceed one thousand eight hundred (1,800) feet. The extension of streets and the formation of blocks shall conform to the Local Street Network map contained in the Transportation System Plan.

The block length of SW Rychlick Court is 200 feet while the block length of SW Nursery Way is about 710 feet. This development is constrained by an existing residential development to the east, an existing school development to the south and a vegetated corridor to the northeast. The location of SW Nursery Way was established when the Area 59 schools were developed. The proposed extension of SW Nursery Way will allow for a full connection of SW Nursery Way to SW Copper Terrace in the future.

FINDING: As discussed above, due to the constraints of this site, there is not an ability to continue SW Nursery Way extension from the east and create a block length less than 530 feet. This standard is satisfied.

4. Pedestrian and Bicycle Connectivity. Paved bike and pedestrian accessways shall be provided on public easements or right-of-way consistent with Figure 7.401.

FINDING: Paved sidewalks will be provided along SW Nursery Way and SW Rychlick Court. In addition, the proposed plans show multi-use path connections within Tract D which will provide a connection to the school property to the south. This standard is met.

B. Utilities Easements for sewers, drainage, water mains, electric lines, or other utilities shall be dedicated or provided for by deed. Easements shall be a minimum of ten (10) feet in width and centered on rear or side lot lines; except for tie-back easements, which shall be six (6) feet wide by twenty (20) feet long on side lot lines at the change of direction.

FINDING: The applicant has provided all required utilities, easements and dedications needed in order to serve the site and meet this standard. This standard is met.

C. Drainages
Where a subdivision is traversed by a watercourse, drainage way, channel or street, drainage easements or rights-of-way shall be provided conforming substantially to the alignment and size of the drainage.

FINDING: The applicant has proposed a vegetated corridor (Tract B) and open space (Tract C) which will allow for drainage. It will be dedicated to the City or an easement will be provided. The applicant has met this standard.

16.128.020 - Pedestrian and Bicycle Ways

Pedestrian or bicycle ways may be required to connect cul-de-sacs, divide through an unusually long or oddly shaped block, or to otherwise provide adequate circulation.

The applicant has proposed sidewalks throughout the subdivision along the proposed streets. The applicant has also proposed a multi-use path connection from the subdivision to the school property to south of the development. There is adequate circulation around the subdivision. The applicant has provided an e-mail indicating that the School District will allow the connection as proposed.

FINDING: This standard is met as discussed above.

16.128.030 - Lots

A. Size and Shape

Lot size, width, shape, and orientation shall be appropriate for the location and topography of the subdivision or partition, and shall comply with applicable zoning district requirements, with the following exception:

1. **Lots in areas not served by public sewer or water supply shall conform to any special County Health Department standards.**

   The lots appear to be appropriate for their location. As discussed in the zoning section of this report the dimensions standards have been met. The orientation and shape are acceptable. As proposed, there will be sewer, sanitary and water services available to each new lot created by this subdivision.

FINDING: This standard is met as discussed above.

B. Access

All lots in a subdivision shall abut a public street, except as allowed for infill development under Chapter 16.68.

FINDING: All 26 lots abut one of the two proposed public streets. This criterion is met.

C. Double Frontage

Double frontage and reversed frontage lots are prohibited except where essential to provide separation of residential development from railroads, traffic arteries, adjacent nonresidential uses, or to overcome specific topographical or orientation problems. A five (5) foot wide or greater easement for planting and screening may be required.

FINDING: Double frontage lots are not being proposed therefore this criterion is not applicable.

D. Side lot lines shall, as far as practicable, run at right angles to the street upon which the lots face, except that on curved streets side lot lines shall be radial to the curve of the street.

FINDING: Given the slope and topography of the site and accommodating the density requirement of the medium density residential zone the lot lines are acceptable. This criterion is met.

E. Grading

Grading of building sites shall conform to the following standards, except when topography of physical conditions warrants special exceptions:

1. Cut slopes shall not exceed one (1) and one-half (1 1/2) feet horizontally to one (1) foot vertically.
2. Fill slopes shall not exceed two (2) feet horizontally to one (1) foot vertically.

As proposed, it appears that the lots will conform to these standards. The northwestern lots adjacent to Tract B slope to the west. There appears to be plenty of space to

construct future homes on these lots. Lot 25 in particular would be allowed approximately 19 feet of vertical change if needed due to the width of the lot.

FINDING: This standard is met as discussed above.

E. <u>Division VIII – Environmental Resources</u>

16.142 – Parks and Open Space

16.142.030 Single-Family or Duplex Residential Subdivisions

A. A minimum of five percent (5%) of the net buildable site (after exclusion of public right-of-way and environmentally constrained areas) shall be maintained as "open space". Open space must include usable areas such as public parks, swimming and wading pools, grass areas for picnics and recreational play, walking paths, and other like space. The following may not be used to calculate open space:
  1. Required yards or setbacks.
  2. Required visual corridors.
  3. Required sensitive areas and buffers.
  4. Any area required to meet a standard found elsewhere in this code.

B. Enhanced streetscapes such as "boulevard treatments" in excess of the minimum public street requirements may count toward a maximum of 10,000 square feet of the open space requirement.
  1. Example: if a 52-foot-wide right-of-way [ROW] is required for a 1,000 foot-long street and a 62-foot wide ROW with 5-foot additional plantings/meandering pathway is provided on each side of the street, the additional 10-foot-wide area x 1,000 linear feet, or 10,000 square feet, counts toward the open space requirement.

C. The open space shall be conveyed in accordance with one of the following methods:
  1. By dedication to the City as public open space (if acceptable to the City). Open space proposed for dedication to the City must be acceptable to the City Manager or the Manager's designee with regard to the size, shape, location, improvement, environmental condition, and budgetary and maintenance abilities;
  2. By leasing or conveying title (including beneficial ownership) to a corporation, homeowners' association or other legal entity, with the City retaining the development rights to the open space. The terms of such lease or other instrument of conveyance must include provisions (e.g., maintenance, property tax payment, etc.) suitable to the City.

D. The density of a single-family residential subdivision shall be calculated based on the net buildable site prior to exclusion of open space per this Section.
  1. Example: a 40,000 square foot net buildable site would be required to maintain 2,000 square feet (5%) of open space but

would calculate density based on 40,000 square feet.

E. If a proposed residential subdivision contains or is adjacent to a site identified as "parks" on the Acquisition Map of the Parks Master Plan (2006) or has been identified for acquisition by the Sherwood Parks and Recreation Board, establishment of open space shall occur in the designated areas if the subdivision contains the park site, or immediately adjacent to the parks site if the subdivision is adjacent to it.

F. If the proposed residential subdivision does not contain or is not adjacent to a site identified on the Parks Master Plan map or otherwise identified for acquisition by the Parks and Recreation Board, the applicant may elect to convey off-site park/open space.

G. This standard does not apply to a residential partition provided that a development may not use phasing or series partitions to avoid the minimum open space requirement. A partition of land that was part of an approved partition within the previous five (5) years shall be required to provide the minimum five percent (5%) open space in accordance with subsection (A) above.

H. The value of the open space conveyed under Subsection (A) above may be eligible for Parks System Development Charges (SDCs) credits based on the methodology identified in the most current *Parks and Recreation System Development Charges Methodology Report.*

The site was brought into the city limits as a part of the Area 59 concept plan area. This plan established that there should be a fair amount of open space on this site by showing an undefined parks and open space zone. The applicant has honored the intent of the parks and open space zone by proposing Tract C and Tract D. Together these two tracts are about 10,088 square feet which is a little over 5%. The applicant is proposing to dedicate this land to the City of Sherwood.

FINDING: As discussed above, this standard can be met as conditioned below.

RECOMMENDED CONDITION: Prior to final plat approval, provide documentation, to be recorded with the plat, dedicating Tract C and D to the Homeowner's Association.

16.142.030.A Visual Corridors

A. Corridors Required

New developments with frontage on Highway 99W, or arterial or collector streets designated on the Transportation Plan Map, attached as Appendix C, or in Section 5 of the Community Development Plan Part 2, shall be required to establish a landscaped visual corridor according to the following standards:

	Category	Width
1.	Highway 99W	25 feet
2.	Arterial	15 feet

3.	**Collector**	**10 feet**

In residential developments where fences are typically desired adjoining the above described major street the corridor may be placed in the road right-of-way between the property line and the sidewalk. (Ord. 2006-021)

B. Landscape Materials

The required visual corridor areas shall be planted as specified by the review authority to provide a continuous visual and/or acoustical buffer between major streets and developed uses. Except as provided for above, fences and walls shall not be substituted for landscaping within the visual corridor. Uniformly planted, drought resistant street trees and ground cover, as specified in Section 16.142.050, shall be planted in the corridor by the developer. The improvements shall be included in the subdivision compliance agreement. (Ord. 2006-021)

C. Establishment and Maintenance

Designated visual corridors shall be established as a portion of landscaping requirements pursuant to Chapter 16.92. To assure continuous maintenance of the visual corridors, the review authority may require that the development rights to the corridor areas be dedicated to the City or that restrictive covenants be recorded prior to the issuance of a building permit. (Ord. 2006-021)

D. Required Yard

Visual corridors may be established in required yards, except that where the required visual corridor width exceeds the required yard width, the visual corridor requirement shall take precedence. In no case shall buildings be sited or trees be removed from within the required visual corridor, with the exception of front porches on townhomes, as permitted in Section 16.44.010(E)(4)(c). (Ord. 2006-021)

The applicant has proposed a ten foot visual corridor along Edy road which provides a visual and acoustic buffer. In addition to the meandering sidewalk, the applicant has proposed Red Sunset Maple street trees and Kinnikinnick groundcover.

FINDING: This standard can be met as conditioned below.

RECOMMENDED CONDITION: Prior to issuance of building permits, consistent with the preliminary landscape plan, plant the visual corridor landscape materials to be maintained by the Homeowner's Association.

16.142.060. Street Trees

A. Installation of Street Trees on New or Redeveloped Property.

Trees are required to be planted to the following specifications along public streets abutting or within any new development or re-development. Planting of such trees shall be a condition of development approval. The City shall be subject to the same standards for any developments involving City-owned property, or when constructing or reconstructing City streets. After installing street trees, the property owner shall be responsible for maintaining the street trees on the owner's property or within the right-of-way adjacent to the owner's property.

1. Location: Trees shall be planted within the planter strip along a newly

created or improved streets. In the event that a planter strip is not required or available, the trees shall be planted on private property within the front yard setback area or within public street right-of-way between front property lines and street curb lines or as required by the City.

2. **Size: Trees shall have a minimum trunk diameter of two (2) caliper inches which is measured six inches above the soil line and a minimum of six feet tall when planted.**
3. **Types: Developments shall include a variety of street trees. The trees planted shall be chosen from those listed in 16.142.080 of this Code.**
4. **Required Street Trees and Spacing:**
   a. **The minimum spacing is based on the maximum canopy spread identified in the recommended street tree list in section 16.142.080 with the intent of providing a continuous canopy without openings between the trees. For example, if a tree has a canopy of forty (40) feet, the spacing between trees is forty (40) feet. If the tree is not on the list, the mature canopy width must be provided to the planning department by a certified arborist.**
   b. **All new developments shall provide adequate tree planting along all public streets. The number and spacing of trees shall be determined based on the type of tree and the spacing standards described in a. above and considering driveways, street light locations and utility connections. Unless exempt per c. below, trees shall not be spaced more than forty (40) feet apart in any development.**
   c. **A new development may exceed the forty-foot spacing requirement under section b. above, under the following circumstances:**
      (1) Installing the tree would interfere with existing utility lines and no substitute tree is appropriate for the site; or
      (2) There is not adequate space in which to plant a street tree due to driveway or street light locations, vision clearance or utility connections, provided the driveways, street light or utilities could not be reasonably located elsewhere so as to accommodate adequate room for street trees; and
      (3) The street trees are spaced as close as possible given the site limitations in (1) and (2) above.
      (4) The location of street trees in an ODOT or Washington County right-of-way may require approval, respectively, by ODOT or Washington County and are subject to the relevant state or county standards.
      (5) For arterial and collector streets, the City may require planted medians in lieu of paved twelve-foot wide center turning lanes, planted with trees to the specifications of this subsection.

The proposed tree plan shows eleven Red Sunset Maple trees along SW Edy Road and ten Little Leaf Linden trees along SW Rychlich Court. The SZCDC requires that root barriers be installed around Red Sunset Maple trees which are planted as street trees. These trees have an anticipated mature canopy of 40 feet and the applicant has demonstrated how the trees can be spaced per their expected mature canopy. The applicant has also shown forty Cleveland Norway

Maple trees with along SW Nursery Way. These trees have a mature canopy spread of 30 feet. The applicant has demonstrated that the trees can be spaced appropriately based on the expected mature canopy spread.

The code allows for the spacing of street trees to exceed the expected mature canopy of the street trees to accommodate driveways, street lights and other utilities when there are no other reasonable locations. As these lots develop, the street tree spacing may change. The final street tree spacing can be evaluated by the planning department prior to occupancy of each lot.

FINDING: The applicant has shown that the spacing requirement can be achieved. It is not clear if the spacing will be possible once driveways are installed during construction of the lots. This standard can be met as conditioned below.

RECOMMENDED CONDITION: Prior to occupancy, provide an updated street tree plan showing all of the street trees meeting the spacing requirement after determining the location of the driveways in the subdivision.

RECOMMENDED CONDITION: Prior to occupancy, plant the approved street trees with a minimum trunk diameter of two (2) caliper inches which is measured six inches above the soil line and a minimum of six feet tall.

RECOMMENDED CONDITION: Prior to occupancy, install a root barrier around all Red Sunset Maple trees which are planted as street trees.

16.142.070.D.2. - Trees on Property Subject to Certain Land Use Applications Required Tree Canopy - Residential Developments (Single Family Attached, Single Family Detached and Two – Family)

Each net development site shall provide a variety of trees to achieve a minimum total tree canopy of 40 percent. The canopy percentage is based on the expected mature canopy of each tree by using the equation πr^2 to calculate the expected square footage of canopy for each tree. The expected mature canopy is counted for each tree regardless of an overlap of multiple tree canopies.

The canopy requirement can be achieved by retaining existing trees or planting new trees. Required street trees can be used toward the total on site canopy required to meet this standard. The expected mature canopy spread of the new trees will be counted toward the needed canopy cover. A certified arborist or other qualified professional shall provide the estimated tree canopy of the proposed trees to the planning department for review.

The applicant is proposing to remove 278 trees, 163 of which are healthy, in order to accommodate the development and associated infrastructure. The applicant submitted a preliminary tree which shows a variety of trees to achieve a 40 percent tree canopy. The applicant has proposed 61 street trees including eleven Red Sunset Maple trees (40 foot canopy), ten Little Leaf Linden trees (40 foot canopy) and forty Cleveland Norway Maple trees (30 foot canopy).

The applicant is also proposing to retain a mix of coniferous and deciduous trees as outlined in the arborist's report which is a part of Exhibit A. The retained trees each count for double the expected mature canopy per tree. The total site area is 286,084 square feet. The net developable area is approximately 178,655 square feet; therefore, the proposal must provide a minimum of 71,462 square feet of canopy. The total expected tree canopy for the retained and proposed trees is 99,559 square feet. The mix of trees achieves a 56 percent canopy, which exceeds the 40 percent minimum canopy requirement.

FINDING: As discussed above, this standard is met.

16.156.020 – Energy Conservation

A. Building Orientation - The maximum number of buildings feasible shall receive sunlight sufficient for using solar energy systems for space, water or industrial process heating or cooling. Buildings and vegetation shall be sited with respect to each other and the topography of the site so that unobstructed sunlight reaches the south wall of the greatest possible number of buildings between the hours of 9:00 AM and 3:00 PM, Pacific Standard Time on December 21st.

B. Wind - The cooling effects of prevailing summer breezes and shading vegetation shall be accounted for in site design. The extent solar access to adjacent sites is not impaired vegetation shall be used to moderate prevailing winter wind on the site.
(Ord. 91-922 § 3)

FINDING: The proposed lots are all over 5,000 square feet. It appears that the orientation of the buildings and future vegetation will allow for energy conservation to the extent practical. This standard is met.

Decision

Based upon review of the applicant's submittal information, review of the code, agency comments and consideration of the applicant's revised submittal, the City Council finds that the proposed subdivision does not fully comply with the standards but can be conditioned, as follows, to comply. The City Council has approved the application subject to the following conditions.

VI. CONDITIONS OF APPROVAL

A. General Conditions

1. Compliance with the Conditions of Approval is the responsibility of the developer or its successor in interest.

2. Development and construction on the site shall conform substantially to the preliminary plat development plans submitted by AKS Engineering and dated 03/02/2012 except as modified in the conditions below, (and shall conform specifically to final construction plans reviewed and approved by the City Engineer, the Building Official, Clean Water Services, Tualatin Valley Fire and Rescue, Tualatin Valley Water District and Washington County). All plans shall comply with the applicable building, planning, engineering and fire protection codes of the City of Sherwood.

3. The developer is responsible for all costs associated with any remaining public facility improvements and shall assure the construction of all public streets and utilities within and adjacent to the plat as required by these conditions of approval, to the plans, standards, and specifications of the City of Sherwood. The developer shall also provide to the City financial guarantees for construction of all public streets and utilities within and adjacent to the plat, as required by the engineering compliance agreement.

4. **This approval is valid for a period of two (2) years from the date of the decision notice.** Extensions may be granted by the City as afforded by the Sherwood Zoning and Community Development Code.

6. Placement of construction trailers on the subject property shall require a Temporary Use Permit per Section 16.86 of the SZCDC.

7. This approval does not negate the need to obtain permits, as appropriate from other local, state or federal agencies, even if not specifically required by this decision.

8. Retaining walls within public easements or the public right-of-way shall require engineering approval. Retaining walls with a height of 4 feet or higher located on private property will require a permit from the building department.

9. Retaining walls great than four (4) feet in height shall have a geotechnical engineer provide stamped design calculations and details drawings required for retaining wall construction. The retaining wall details shall include at a minimum; wall profile, wall cross section at highest point of wall, wall reinforcing geotextile requirements, wall drainage system, and wall backfill requirements. Retaining wall drainage systems shall either discharge to a public storm drainage system, or discharge on-site in such a manner as to not negatively impact adjacent downslope properties.

B. <u>Prior to issuance of grading or erosion control permits from the Building Department</u>:

1. Obtain Building Department permits and approval for erosion control and grading on private property and Engineering Department permits and approval for all grading in the public right of way.

2. Obtain a 1200C Erosion Control Permit through the Building Department for all the disturbed ground, both on and off site that is in excess of one acre in addition to meeting all CWS Design and Construction Standards. The applicant shall follow the latest requirements from DEQ and CWS for NPDES 1200-C Permit submittals. A copy of the approved and signed

permit shall be provided to the City prior to holding a pre-construction meeting or commencing any construction activity.

3. Submit a tree protection plan showing how the trees to be retained will be protected throughout the construction of the site.

4. Install tree protection fencing around trees to be retained on site. The tree protection fencing shall be inspected and deemed appropriate by the arborist to be reviewed by the Planning Department.

5. Any existing wells, septic systems and underground storage tanks shall be abandoned in accordance with Oregon state law, inspected by the City Plumbing Inspector and provide verification of such to the City Engineer.

6. A demolition permit shall be obtained from the Sherwood Building Department prior to demolishing or moving any structures.

7. Submit a geotechnical report to the Building Department if required by the Building Official.

C. Prior to approval of the public improvement plans:

1. Submit engineering plans for all public improvements and/or connections to public utilities (water, sewer, storm water, and streets) **to the Sherwood Engineering Department.** The engineering plans shall conform to the design standards of the City of Sherwood's Engineering Department, Clean Water Services, Tualatin Valley Water District, Tualatin Valley Fire & Rescue and other applicable requirements and standards. The plans shall be in substantial conformance with the utility plans dated 03/02/2012 and prepared by AKS Engineering.

2. Submit to the Engineering Department for review and approval a final stormwater report meeting design standards of both the City of Sherwood and Clean Water Services.

3. Prior to public improvement plan approval, submit standard cross sections showing street design and pavement dimensions to the Engineering Department per the City of Sherwood Transportation System Plan, and City of Sherwood's Engineering Design Manual

4. Submit public improvement plans that demonstrate the placement of all existing and proposed utilities underground

5. All public easement dedication documents must be submitted to the City for review, signed by the City and the applicant, and recorded by the applicant with the original or a certified copy of the recorded easements on file at the City prior to release of the public improvement plans.

6. Submit the final plat for review to the Planning Department.

D. Prior to Approval of the Final Plat:

1. The submittal by the applicant for final plat review and approval shall include but not be limited to the following: a final plat application; final plat review fee; narrative identifying how the required conditions of approval have or will be met; three copies of the final plat; and any other materials required to demonstrate compliance with the conditions of approval.

2. The final plat shall show the following:
   a. The Community Development Director as the City's approving authority within the signature block of the final plat.
   b. A 15-foot wide public utility easement for any areas where a single public utility line is located outside a public right-of-way with an increase of five (5) feet for each additional utility line.
   c. Private access easements, utility easements and/or special use easements as required for the development of the site. A plat note shall reference an easement and maintenance agreement or similar document, to be recorded with the plat, for the joint maintenance of any common private utility lines, common driveway improvements, or other common amenity or perimeter fencing. The language of such plat note and associated document shall be reviewed and approved by the Planning Department.

3. Prior to final plat approval, the applicant shall provide the City a set of engineered construction plans that demonstrate compliance with the TVFR district standards for fire protection.

4. Prior to final plat approval, provide documentation, to be recorded with the plat, dedicating Tract C and D to the City of Sherwood.
5. Submit verification of perpetual maintenance of the landscaped visual corridor.
6. Submit revised plans that provide adequate turning radius, hydrant location, fire flow, and adherance in compliance with TVF&R standards as verified by an acceptance letter from TVF&R.

7. The public improvement plans must be approved and bonded for prior to the City's approval of the final plat.
8. Satisfy the conditions of the comments submitted by Washington County dated May 29, 2012.

E. Prior to Issuance of a Building Permit:

1. Prior to issuance of any building permits, the public improvements must be complete and accepted by the City Engineer, and the final plat(s) must be recorded. An approval letter from the Engineering Department, accepting all public improvements, shall be issued prior to issuance of building permits.

2. Prior to issuance of building permits, all public and private utilities shall be underground unless the utility provider has determined that the lines are too large to place underground.

3. Prior to issuance of building permits, install a sign (at the applicant's expense), notifying the public of the intent to construct the future street extension of SW Nursery Way. The sign shall read as follows: "This road will be extended with future development. For more information contact the City of Sherwood at 503-625-4202."

4. Prior to issuance of building permits, consistent with the preliminary landscape plan, plant the visual corridor landscape materials.

F. Prior to Final Occupancy of the Subdivision:

1. All public improvements shall be competed, inspected and approved, as applicable, by the City, CWS, TVF & R, TVWD and other applicable agencies.
2. Prior to occupancy, provide an updated street tree plan showing all of the street trees meeting the spacing requirement after determining the location of the driveways in the subdivision.

3. Prior to occupancy, plant the approved street trees with a minimum trunk diameter of two (2) caliper inches which is measured six inches above the soil line and a minimum of six feet tall.

4. Prior to occupancy, install a root barrier around all Red Sunset Maple trees which are planted as street trees.

G. On-going Conditions

1. Joint mailbox facilities shall be installed prior to the City signing the Letter of Acceptance for the development. Joint mailbox facilities must be installed per U.S. Postal Service's "*Developers' Guide to Centralized Box Units*". The Developer shall provide a signed copy of the U.S. Postal Services "*Mode of Delivery Agreement*". Submittal of this agreement shall be required prior to a pre-construction meeting taking place.

2. The developer shall coordinate location of garbage and recycling receptacles with Pride Disposal.

3. The continual operation of the property shall comply with the applicable requirements of the Sherwood Zoning and Community Development Code.

4. Comply with the Clean Water Services Service Provider Letter throughout the development of the site.

5. Dust shall be controlled within the development during construction and shall not be permitted to drift onto adjacent properties.

6. Noise shall be kept at the minimum level possible during construction. The developer shall agree to aggressively ensure that all vehicles working in the development shall have adequate and fully functioning sound suppression devices installed and maintained at all times.

7. All construction sites shall be maintained in a clean and sanitary condition at all times. Construction debris, including food and drink waste, shall be restricted from leaving the construction site through proper disposal containers or construction fencing enclosures. Failure to comply with this condition may result in a "Stop Work" order until deficiencies have been corrected to the satisfaction of the Community Development.

8. City of Sherwood Ordinance 2012-003 amended SZCDC 16.142.070 regarding tree mitigation. This application applied SZCDC 16.142.070 as amended by Ordinance 2012-003. The ordinance is on appeal to the Oregon Land Use Board of Appeals at the time of this decision. If Ordinance 2012-003 is reversed or remanded, the applicant shall comply with the tree mitigation standards in effect prior to the adoption of Ordinance 2012-003.

VII. Exhibits

A. Applicant's submittal with narrative and supporting documents dated
B. Applicant revisions dated May 31, 2012
C. Letter from TVF&R dated May 8, 2012
D. Letter from CWS dated June 15, 2012
E. Engineering comments dated June 15, 2012 regarding a revised traffic study.
F. Comments from Washington County DLUT dated May 29, 2012.
G. Area 59 Elementary and Middle School discussion regarding IP zone interpretation
H. Letter from Erica Van Ess dated June 17, 2012
I. Letter from Mike and Kim Fletcher dated June 22, 2012
J. Letter from Phillip and Heather Riggs dated June 25, 2012

The subdivision approval is valid for a period of two (2) years from the date of the decision, per Section 16.120.050.

APPEAL

This decision is final and becomes effective 30 days from July 17, 2012. Appeals of this decision must be made to the Oregon Land Use Board of appeals within 21 days of the date of the decision.

End

A Land Use Application for a Zoning Map Amendment and 'Renaissance at Rychlick Farm' Subdivision

Proposal:	**Zoning Map Amendment and 26 Lot Subdivision**
Submitted to:	City of Sherwood Planning Department 22560 SW Pine Street Sherwood, OR 97140
Applicant:	Renaissance Development 16771 Boones Ferry Road Lake Oswego, OR 97035
Owner:	Frank J. Rychlick Revocable Trust 17806 SW Edy Road Sherwood, OR 97140
Applicant's Representative:	AKS Engineering & Forestry, LLC 13910 SW Galbreath Drive, Suite 100 Sherwood, OR 97140 Contact(s): Monty Hurley (monty@aks-eng.com) Phone: (503) 925-8799 Fax: (503) 925-8969 Web: www.aks-eng.com
Site Location:	South side of SW Edy Road, approximately 100 feet west of SW Bedstraw Terrace
Assessor's Information:	Washington County 2S1 29D 300
Site Size:	+/- 6.57/ Acres
Zoning Map Designation:	Split Zoning (MDRL / IP)

I. Executive Summary

The Rychlick property is located on the west side of Sherwood, south of SW Edy Road, and north of Laurel Ridge Middle School. The property was brought into the Urban Growth Boundary by Metro in 2002, as part of a +/- 85 acre expansion, known as Area 59. Concept planning commenced in 2004 and was completed in 2007 with the adoption of Ordinance 2006-018, which included a Concept Plan for the area.

Renaissance Development is seeking approval to establish a new high quality single-family residential community on the +/- 6.57 acre Rychlick property. This application has been prepared and submitted in order to obtain approvals from the City that are necessary for the project to move forward from concept to reality. This application includes documentation establishing that all applicable City review criteria are met. Therefore, the City can and should approve the application. Approval of this application benefits the City of Sherwood in multiple ways, including but not limited to the following:

- The project will provide needed housing opportunities to the City of Sherwood. As a result of the recent economic recession, the City lacks a sufficient reserve of residential building lots for new home construction. This project will meet this existing market demand of potential homebuyers looking to locate and become residents of the City of Sherwood and seeking a new home.
- The average lot size for the project will be +/- 6,871 square feet, which easily exceeds the minimum lot size requirement while still being compact enough to satisfy minimum densities.
- The project will provide a significant amount of open space (over 10,000 square feet) and visual corridor landscaping along SW Edy Road. A portion of the open space will be enhanced to protect and preserve natural resources while another portion is proposed to be dedicated to the City for open space. Together these areas will provide separation and buffering of the future homes from the roadway.
- The project includes a new public street that will, upon completion, provide an additional means of convenient access for pedestrians, bicyclists, and automobile drivers to the adjacent school sites.
- The project is responsive to neighborhood desires and includes proposed screening, in the form of new landscaping to complement existing trees being preserved along the property's eastern boundary adjoining the existing Miller's Landing Subdivision.
- The proposed Zoning Map Amendment corrects the undesirable split zoning that the property currently has by designating the entire property Medium Density Residential (MDRL). This is consistent with the Concept Plan adopted for the area in 2007 and the fact that the Sherwood School District did not purchase this land. The MDRL zone provides for residential uses and densities that are similar to (single family detached homes) and compatible with existing surrounding development.

II. Property History / Project Description

The Rychlick property, at 17806 SW Edy Road, has been in the Rychlick-Rupprecht family for over 70 years. In 1941, August and Alma Rupprecht , purchased the approximately 54 acre farm from the Pacific Coast Joint Stock Land Bank of Portland. In 1952, Frank and Edith (Rupprecht) Rychlick, purchased 2 aces in the NE corner of the Rupprecht farm and began building the home that is currently located on the site. In 1960, Frank and Edith purchased an additional 13 acres from August and Alma in the NW corner of the farm, adjacent to the initial 2 acres they had purchased. The remainder of the Rupprecht farm was sold to Charles Handley, which is now part of the present day Wyndham Ridge development.

Frank and Edith Rychlick were lifelong residents of the Sherwood - Tualatin area. Frank Rychlick, was born in 1922 in a house that still stands across from the present day Tualatin High School. Edith Rupprecht (Rychlick), was born in 1928 in the (Sterns) house that is located next to the Sherwood Police Department. The property that the police station was built on was owned in the 1920's by George and Clara Rupprecht. Frank and Edith Rychlick graduated from Sherwood High School, and were married in Sherwood, at St. Paul Lutheran Church in 1951. As described above, they began building their house on the property in 1952 and went on to raise a family and make a home there for nearly 55 years.

The Rychlick property currently is comprised of a single +/- 6.57 acre legal lot that is designated with split Medium Density Residential (MDRL) and IP City of Sherwood Zoning. The property was part of a +/- 85 acre urban growth boundary expansion that was approved in 2002. The split zoning is a result of zoning designations being applied to the property that were not consistent with the adopted 2007 Concept Plan. Approval of this application eliminates the split zoning by designating the entire property MDRL, which provides for residential uses and densities that are similar to and compatible with existing surrounding development on adjacent properties to the east, and is consistent with the general mapping provided in the 2007 Concept Plan.

Approval of this application also results in the creation of 26 lots with an average of +/- 6,871 square feet for future single family homes, two large open space tracts, and a new public street, that when connected to the west, will provide another means of local vehicular and pedestrian access to the adjacent Laurel Ridge Middle School and Edy Ridge Elementary School. All lots will be provided with public sanitary sewer, water, and storm sewer services in addition to power, natural gas, cable, and telecommunication utilities (including the infrastructure necessary to support Sherwood Broadband).

One of the open space tracts will preserve and protect an existing drainage that traverses the northwest corner of the site. Buffers (vegetated corridors) adjacent to the drainageway will be enhanced by the removal of noxious species (i.e. Himalayan blackberries) and replanting with native landscape species. Together with the proposed stormwater facility (vegetated swale), these enhancement activities assure that water quality in the basin will be improved by the project. The other open space tract is proposed to be dedicated to the City of Sherwood. This area could potentially be used for future park use or to remain as natural open space. Together, these open space areas, along with the proposed visual corridor improvements provide a significant vegetated buffer between the future homes and SW Edy Road.

Right-of-way dedication is proposed along SW Edy Road to accommodate public improvements that are proposed to accompany the project. The proposed improvements include street widening with a curb and gutter section, together with a concrete sidewalk along the property's frontage on SW Edy Road.

These improvements will allow for improved vehicular, pedestrian, and bicycle access to offset related project impacts.

Finally, a neighborhood meeting was held on January 5th, 2012 at the Sherwood Senior Center. At the meeting, a conceptual layout for the project was shown, and the project proposal was discussed. Many topics were covered at the meeting but a strong desire for a screen and buffer was indicated by several neighbors to the east. In response to these concerns, the proposal has been modified to include trees to be planted along the eastern property line to complement existing trees located in this area that will be preserved.

II. Site and Surrounding Area

Subject Property

The Rychlick property is comprised of a single +/- 6.57 acre legal lot that is designated with split Medium Density Residential (MDRL) and IP City of Sherwood Zoning. It is located on the south side of SW Edy Road, approximately 100 feet west of SW Bedstraw Terrace. The property varies topographically from a relatively flat bench in the southern portion of the site, to a ravine that slopes to an existing drainageway. Currently, the property supports an existing home and several outbuildings.

Surrounding Area

North. SW Edy Road is located to the north. This is a collector street within the permitting and maintenance jurisdiction of Washington County.

South. The Laurel Ridge Middle School is located to the south. The property directly abuts tennis courts and ballfields. This property is zoned IP.

East. The existing Miller's Landing Subdivision is located to the east. This residential area is zoned PUD-LDR.

West. A +/- 5.08 acre property that is improved with a house is located to the west. This property is zoned MDRL.

III. Project Details

The Rychlick property is comprised of a single legal lot, approximately 6.57 acres in area that is designated with split Medium Density Residential MDRL and IP City of Sherwood Zoning. The property was part of a +/- 85 acre urban growth boundary expansion that occurred in 2002. The split zoning is a result of zoning designations being applied to the property that were not consistent with the adopted 2007 Concept Plan. Approval of this application eliminates the split zoning by designating the entire property MDRL, which is the same zone as exists on adjacent properties to the east, and is consistent with the general mapping provided in the 2007 Concept Plan.

Approval of this application also results in the creation of 26 lots with an average of +/- 6,871 square feet for future single family homes, two large open space tracts, and a new public street, that when connected to the west, will provide another means of vehicular and pedestrian access to the adjacent Laurel Ridge Middle School and Edy Ridge Elementary School. All lots will be provided with public sanitary sewer, water, and storm sewer services in addition to power, natural gas, and telecommunications (including the infrastructure necessary to support Sherwood Broadband).

One of the open space tracts will preserve and protect an existing drainage that traverses the northwest corner of the site. Buffers (vegetated corridors) adjacent to the drainageway will be enhanced by the removal of noxious species (i.e. Himalayan blackberries) and replanting with native landscape species. Together with the proposed stormwater facility (vegetated swale), these enhancement activities assure that water quality in the basin will be improved by the project. The other open space tract is proposed to be dedicated to the City of Sherwood. This area could potentially be used for future park use or to remain as natural open space. Together, these open space areas, along with the proposed visual corridor improvements provide a buffer between the future homes and SW Edy Road.

Right-of-way dedication is proposed along SW Edy Road to accommodate public improvements that are proposed to accompany the project. The proposed improvements include street widening with a curb and gutter section, together with a concrete sidewalk along the property's frontage on SW Edy Road. These improvements will allow for improved vehicular, pedestrian, and bicycle access to offset related project impacts.

Finally, a neighborhood meeting was held on January 5th, 2012 at the Sherwood Senior Center. At the meeting, a conceptual layout for the project was shown and project proposal was discussed. Many topics were covered at the meeting but a strong desire for a buffer was indicated by several neighbors to the east. In response to these concerns, the proposal has been modified to include trees to be planted along the eastern property line to complement existing trees located in this area that will be preserved.

III. Applicable Review Criteria

Division II – Land Use and Development

Chapter 16.12 – Residential Land Use Districts

16.12.010 – Purpose and Density Requirements

Medium Density Residential (MDRL)

C. The MDRL zoning district provides for single-family and two-family housing, manufactured housing and other related uses with a density of 5.6 to 8 dwelling units per acre. Minor land partitions shall be exempt from the minimum density requirements.

RESPONSE: The subject property is currently split zoned with the majority of the property being designated MDRL and a portion of the property zoned IP. As described later in this written statement, a Zoning Map Amendment is sought to fix the split zone designation and designate the entire 6.57 acre property MDRL. The proposed subdivision encompasses the entire acre property. As shown on the preliminary plans, the net buildable acreage for the property after right-of-way / public area dedication

and deduction of the drainageway and vegetated corridor is 4.33 acres. The resultant density for the project is 6 units per acre. This is within the minimum and maximum density parameters for the property.

16.12.020. - Allowed Residential Land Uses

A. Residential Land Uses

The table below identifies the land uses that are allowed in the Residential Districts. The specific land use categories are described and defined in Chapter 16.10.

RESPONSE: The application proposes a 26 lot subdivision for the siting of future individual single-family detached dwelling units. This is a permitted use in the MDRL Zoning District.

16.12.030 - Residential Land Use Development Standards

RESPONSE: As shown on the preliminary plat, each lots has at least 25 feet of width at the front property line, 50 feet of width at the building line, and 80 feet of lot depth. Future dwelling units will comply with all required setbacks and height limitations included within this section.

Chapter 16.36 – Institutional and Public (IP)

RESPONSE: The subject property is currently split zoned with the majority of the property being designated MDRL and a portion of the property zoned IP. As described later in this written statement, a Zoning Map Amendment is sought to fix the split zone designation and designate the entire 6.57 acre property MDRL.

16.58.010 - Clear Vision Areas

A. A clear vision area shall be maintained on the corners of all property at the intersection of two (2) streets, intersection of a street with a railroad, or intersection of a street with an alley or private driveway.

B. A clear vision area shall consist of a triangular area, two (2) sides of which are lot lines measured from the corner intersection of the street lot lines for a distance specified in this regulation; or, where the lot lines have rounded corners, the lot lines extended in a straight line to a point of intersection, and so measured, and the third side of which is a line across the corner of the lot joining the non-intersecting ends of the other two (2) sides. (Ord. 86851 § 3)

C. A clear vision area shall contain no planting, sight obscuring fence, wall, structure, or temporary or permanent obstruction exceeding two and one-half (2-1/2) 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 the height of seven (7) feet above the ground.

The following requirements shall govern clear vision areas:

1. In all zones, the minimum distance shall be twenty (20) feet.

2. In all zones, the minimum distance from corner curb to any driveway shall be twenty-five(25) feet.

3. Where no setbacks are required, buildings may be constructed within the clear vision area.

RESPONSE: As shown on the preliminary plans, there are no existing (to remain) or proposed structural or screening impediments to clear vision.

Division III. – Administrative Procedures

Chapter 16.70 – General Provisions

16.70.010 - Pre-Application Conference

Pre-application conferences are encouraged and shall be scheduled to provide applicants with the informational and procedural requirements of this Code; to exchange information regarding applicable policies, goals and standards of the Comprehensive Plan; to provide technical and design assistance; and to identify opportunities and constraints for a proposed land use action. An applicant may apply at one time for all permits or zone changes needed for a development project as determined in the pre-application conference.

RESPONSE: A pre-application conference was held at City Hall on December 12, 2011.

16.70.20- Neighborhood Meeting

The purpose of the neighborhood meeting is to solicit input and exchange information about the proposed development.

B. Applicants of Type III, IV and V applications are required to hold a meeting, at a public location for with adjacent property owners and recognized neighborhood organizations that are within 1,000 feet of the subject application, prior to submitting their application to the City. Affidavits of mailing, sign-in sheets and a summary of the meeting notes shall be included with the application when submitted. Applicants for Type II land use action are encouraged, but not required to hold a neighborhood meeting.

RESPONSE: A duly noticed neighborhood meeting was held at the Sherwood Senior Center on January 5, 2012.

16.70.030 - Application Requirements

RESPONSE: All items listed in this section, as required on the City checklist, and as summarized in the City's pre-application conference notes are included in the application materials.

Division IV. – Planning Procedures

Chapter 16.80 – Plan Amendments

16.80.010 - Initiation of Amendments

An amendment to the City Zoning Map or text of the Comprehensive Plan may be initiated by the Council, Commission, or an owner of property within the City.

RESPONSE: This amendment to the City Zoning Map is being initiated by the owner of the property.

16.80.020 - Amendment Procedures

Zoning Map or Text Amendment

A. Application - An application for a Zoning Map or text amendment shall be on forms provided by the City and

shall be accompanied by a fee pursuant to Section 16.74.010

RESPONSE: A completed and signed City Land Use Application form and appropriate fee are included in the submittal materials.

B. Public Notice - Public notice shall be given pursuant to Chapter 16.72

RESPONSE: The City will provide public notice as is required by the City of Sherwood Zoning and Community Development Code and by Statute.

C. Commission Review - The Commission shall conduct a public hearing on the proposed amendment and provide a report and recommendation to the Council. The decision of the Commission shall include findings as required in Section 16.80.030

D. Council Review - Upon receipt of a report and recommendation from the Commission, the Council shall conduct a public hearing. The Council's decision shall include findings as required in Section 16.80.030. Approval of the request shall be in the form of an ordinance.

RESPONSE: All appropriate public hearings will be held.

16.80.030 - Review Criteria

A. Map Amendment

An amendment to the City Zoning Map may be granted, provided that the proposal satisfies all applicable requirements of the adopted Sherwood Comprehensive Plan, the Transportation System Plan and this Code, and that:

1. *The proposed amendment is consistent with the goals and policies of the Comprehensive Plan and the Transportation System Plan.*

2. *There is an existing and demonstrable need for the particular uses and zoning proposed, taking into account the importance of such uses to the economy of the City, the existing market demand for any goods or services which such uses will provide, the presence or absence and location of other such uses or similar uses in the area, and the general public good.*

3. *The proposed amendment is timely, considering the pattern of development in the area, surrounding land uses, any changes which may have occurred in the neighborhood or community to warrant the proposed amendment, and the availability of utilities and services to serve all potential uses in the proposed zoning district.*

4. *Other lands in the City already zoned for the proposed uses are either unavailable or unsuitable for immediate development due to location, size or other factors.*

RESPONSE: The Rychlick property was brought into the Urban Growth Boundary by Metro in 2002, as part of a +/- 85 acre expansion, known as Area 59. Concept planning commenced in 2004 and was completed in 2007 with the adoption of Ordinance 2006-018, which included a Concept Plan for the area. A copy of the adopted concept plan with the current property lines (outlined in purple) is shown on the following map.

INSERT CONCEPT PLAN HERE

The adopted concept plan showed the majority of the property being MDRL and "open space". Smaller portions of the site are shown with the IP designation or "park". The City does not have an "open space" zone rather, properties with environmental resources, such as the subject property, are subject to the standards listed in Division VIII – Environmental Resources. These requirements are addressed later in this written statement and more specifically, by the Natural Resources Report, prepared by SWCA Environmental Consultants, included with the submittal materials. The City also does not have a "park" zone. Open space is required for certain types of applications, such as subdivisions, and these standards are also included in Division VIII – Environmental Resources.

The zoning map for the property depicts a split zone with the northerly +/- ¾ of the property zoned MDRL and "open space" and the southerly +/- ¼ of the property zoned IP. Based on meetings with City Staff, it is our understanding that a mapping error has occurred and that zoning has been applied to the property in a manner that is inconsistent with the adopted Concept Plan and the City of Sherwood Zoning and Community Development Code. These types of mapping errors are typically corrected by the City, when discovered. However, in this case, as was discussed at the pre-application conference, the applicant is submitting the application to correct and remedy the mapping discrepancies by designating the entire property MDRL.

Because the mapping is consistent with the adopted concept plan, the proposed zoning map amendment is consistent with the findings adopted in 2007 with the adoption of Ordinance 2006-018. Those findings are included herein by reference.

C. Transportation Planning Rule Consistency

1. *Review of plan and text amendment applications for effect on transportation facilities. Proposals shall be reviewed to determine whether it significantly affects a transportation facility, in accordance with OAR 660-12-0060 (the TPR). Review is required when a development application includes a proposed amendment to the Comprehensive Plan or changes to land use regulations.*

2. *"Significant" means that the transportation facility would change the functional classification of an existing or planned transportation facility, change the standards implementing a functional classification, allow types of land use, allow types or levels of land use that would result in levels of travel or access that are inconsistent with the functional classification of a transportation facility, or would reduce the level of service of the facility below the minimum level identified on the Transportation System Plan.*

3. *Per OAR 660-12-0060, Amendments to the Comprehensive Plan or changes to land use regulations which significantly affect a transportation facility shall assure that allowed land uses are consistent with the function, capacity, and level of service of the facility identified in the Transportation System Plan. This shall be accomplished by one of the following:*

    a. *Limiting allowed uses to be consistent with the planned function of the transportation facility.*

    b. *Amending the Transportation System Plan to ensure that existing, improved, or new transportation facilities are adequate to support the proposed land uses.*

    c. *Altering land use designations, densities or design requirements to reduce demand for automobile travel and meet travel needs through other modes.*

RESPONSE: In addition to being a zoning map correction, the proposal complies with the requirements of this section and the TPR. Please refer to the TPR Analysis provided with the application materials for

information regarding compliance with the State Transportation Planning Rule and the listed Zoning Code standards.

Division V – Community Design

Chapter 16.94 - Off-Street Parking and Loading

RESPONSE: Section 16.94.020 requires one off-street parking space per each future dwelling unit. This requirement will be met through a combination of future driveways and garages that will be provided for each new home. This standard is met.

Division VI – Public Infrastructure

Chapter 16.106 - Transportation Facilities

16.106.020 - Required Improvements

A. Generally

Except as otherwise provided, all developments containing or abutting an existing or proposed street, that is either unimproved or substandard in right-of-way width or improvement, shall dedicate the necessary right-of-way prior to the issuance of building permits and/or complete acceptable improvements prior to issuance of occupancy permits. The following figure provides the depiction of the functional classification of the street network as found in the Transportation System Plan, Figure 8-1.

RESPONSE: Appropriate amounts of right-of-way are proposed to be dedicated along SW Edy Road, SW Nursery Way, and SW Rychlick Court as shown on the preliminary plat. This standard is met.

B. Existing Streets

Except as otherwise provided, when a development abuts an existing street, the improvements requirement shall apply to that portion of the street right-of-way located between the centerline of the right-of-way and the property line of the lot proposed for development. In no event shall a required street improvement for an existing street exceed a pavement width of thirty (30) feet.

RESPONSE: The property fronts on one existing street, SW Edy Road. As shown on the preliminary plans, improvements are proposed along the property's frontage on SW Edy Road. This standard is met.

C. Proposed Streets

1. Except as otherwise provided, when a development includes or abuts a proposed street, in no event shall the required street improvement exceed a pavement width of forty (40) feet.

RESPONSE: SW Nursery Way is proposed with a paved width of 28 feet, consistent with the local street section prescribed in Section 16.106.010.A. This standard is met.

2. *Half Streets: When a half street is created, a minimum of 22 feet of driving surface shall be provided by the developer.*

RESPONSE: An appropriate half-street improvement, as discussed with City and Washington County staff is proposed to be provided along the property's frontage of SW Edy Road. These improvements are shown on the preliminary plans. This standard is met.

D. Extent of Improvements

1. *Streets required pursuant to this Chapter shall be dedicated and improved consistent with Chapter 6 of the Community Development Plan, the TSP and applicable City specifications included in the City of Sherwood Construction Standards. Streets shall include curbs, sidewalks, catch basins, street lights, and street trees. Improvements shall also include any bikeways designated on the Transportation System Plan map. Applicant may be required to dedicate land for required public improvements only when the exaction is directly related to and roughly proportional to the impact of the development.*

2. *If the applicant is required to provide street improvements, the City Engineer may accept a future improvements guarantee in lieu of street improvements if one or more of the following conditions exist, as determined by the City:*

RESPONSE: Appropriate street improvements, as required by this and other sections of the City of Sherwood Zoning and Community Development Code are proposed as shown in the preliminary plans. This standard is met.

B. Street Connectivity and Future Street Systems

1. *Future Street Systems. The arrangement of public streets shall provide for the continuation and establishment of future street systems as shown on the Local Street Connectivity Map contained in the adopted Transportation System Plan (Figure 8-8).*

RESPONSE: A local street connection is proposed through the site as shown on the preliminary plans. It is consistent with the adopted concept plan and is therefore consistent with the Local Street Connectivity Map contained in the adopted City Transportation System Plan.

2. *Connectivity Map Required. New residential, commercial, and mixed use development involving the construction of new streets shall be submitted with a site plan that implements, responds to and expands on the Local Street Connectivity map contained in the TSP.*

RESPONSE: A preliminary circulation analysis, showing local street connectivity, is included in the preliminary plans. This submittal requirement is met.

a. *A project is deemed to be consistent with the Local Street Connectivity map when it provides a street connection in the general vicinity of the connection(s) shown on the map, or where such connection is not practicable due to topography or other physical constraints; it shall provide an alternate connection approved by the decision-maker.*

b. *Where a developer does not control all of the land that is necessary to complete a planned street connection, the development shall provide for as much of the designated connection as practicable and not prevent the street from continuing in the future.*

c. *Where a development is disproportionately impacted by a required street connection, or it provides more than its proportionate share of street improvements along property line (i.e., by building more than 3/4 width street), the developer shall be entitled to System Development charge credits, as determined by the City Engineer.*

RESPONSE: A local street connection is proposed through the site as shown on the preliminary plans. It is consistent with the adopted concept plan and is therefore consistent with the Local Street Connectivity Map contained in the adopted City Transportation System Plan. Therefore, this standard is met.

3. *Block Length. For new streets except arterials, block length shall not exceed 530 feet. The length of blocks adjacent to arterials shall not exceed 1,800 feet.*

RESPONSE: As shown on the preliminary plans, no block length is proposed that exceeds 530 feet. Therefore, this standard is met.

4. *Where streets must cross water features identified in Title 3 of the Urban Growth Management Functional Plan (UGMFP), provide crossings at an average spacing of 800 to 1,200 feet, unless habitat quality or length of crossing prevents a full street connection.*

RESPONSE: As shown on the preliminary plans, care has been taken to provide street alignments that do not cross any Title 3 protected water features. Therefore, this standard is met.

5. *Where full street connections over water features identified in Title 3 of the UGMFP cannot be constructed in centers, main streets and station communities (including direct connections from adjacent neighborhoods), or spacing of full street crossings exceeds 1,200 feet, provide bicycle and pedestrian crossings at an average spacing of 530 feet, unless exceptional habitat quality or length of crossing prevents a connection.*

RESPONSE: Pedestrian / bicycle facilities are not required to cross any Title 3 protected water features because the block length created by the proposed public street does not exceed 1,200 feet. Therefore, this standard does not apply.

6. *Pedestrian and Bicycle Connectivity. Paved bike and pedestrian accessways consistent with cross section standards in Figure 8-6 of the TSP shall be provided on public easements or right- of-way when full street connections are not possible, with spacing between connections of no more than 300 feet. Multi-use paths shall be built according to the Pedestrian and Bike Master Plans in the adopted TSP.*

RESPONSE: No trails or pathways are shown as being required by the City TSP. However, as discussed with City staff at the pre-application conference, a pedestrian path is proposed in the southwestern portion of the property adjacent to the school property. Consistent with the adopted concept plan for the area, this pathway could be extended through the school site (east of the tennis courts and north of the ball fields and track) if deemed desirable by the school. A conceptual circulation plan is included in the preliminary plans that illustrate this potential future connection. This standard is met.

C. Underground Utilities

All public and private underground utilities, including sanitary sewers and storm water drains, shall be

constructed prior to the surfacing of streets. Stubs for service connections shall be long enough to avoid disturbing the street improvements when service connections are made.

RESPONSE: New utilities will be underground as required by this section.

D. Additional Setbacks

Generally additional setbacks apply when the width of a street right-of-way abutting a development is less than the standard width under the functional classifications in Section VI of the Community Development Plan. Additional setbacks are intended to provide unobstructed area for future street right-of-way dedication and improvements, in conformance with Section VI. Additional setbacks shall be measured at right angles from the centerline of the street.

RESPONSE: As shown on the preliminary plans, all necessary right-of-way dedication is proposed to be dedicated. Therefore, this standard does not apply.

16.106.040 - Design

Standard cross sections showing street design and pavement dimensions are located in the City of Sherwood Transportation System Plan, and City of Sherwood's Engineering Design Manual.

A. Reserve Strips

Reserve strips or street plugs controlling access or extensions to streets are not allowed unless necessary for the protection of the public welfare or of substantial property rights. All reserve strips shall be dedicated to the appropriate jurisdiction that maintains the street.

RESPONSE: A reserve strip can be provided at the temporary street stub terminus, if desired by the City. This standard is met.

B. Alignment

All proposed streets shall, as far as practicable, be in alignment with existing streets. In no case shall the staggering of streets create a "T" intersection or a dangerous condition. Street offsets of less than one hundred (100) feet are not allowed.

RESPONSE: As shown on the preliminary plans, staggering of streets is not proposed. As shown on the preliminary plans, the proposed street access is located in excess of 150 feet from the nearest existing street intersection. Street offsets less than 100 feet are not proposed. Therefore, this standard is met.

C. Future Extension

Where necessary to access or permit future subdivision or development of adjoining land, streets shall extend to the boundary of the proposed development and provide the required roadway width. Dead-end streets less than 100' in length shall comply with the Engineering Design Manual.

A durable sign shall be installed at the applicant's expense. The sign shall notify the public of the intent to construct future streets. The sign shall read as follows: "This road will be extended with future development. For more information contact the City of Sherwood at 503-625-4202."

RESPONSE: As shown on the preliminary plans, the public street is proposed to be extended to the site's western boundary. If and when the abutting property develops, the street connection can be established at that time. As shown on the preliminary plans, the proposed street complies with the Engineering Design Manual and will include a sign, as required above, at its temporary terminus. This standard is met.

D. Intersection Angles

Streets shall intersect as near to ninety (90) degree angles as practical, except where topography requires a lesser angle. In all cases, the applicant shall comply with the Engineering Design Manual.

RESPONSE: As shown on the preliminary plans, all street intersections intersect at or as near to 90 degree angles as is practical. This standard is met.

E. Cul-de-sacs

1. *All cul-de-sacs shall be used only when exceptional topographical constraints, existing development patterns, or compliance with other standards in this code preclude a street extension and circulation. A cul-de-sac shall not be more than two hundred (200) feet in length and shall not provide access to more than 25 dwelling units.*

2. *All cul-de-sacs shall terminate with a turnaround in accordance with the specifications in the Engineering Design Manual. The radius of circular turnarounds may be larger when they contain a landscaped island, parking bay in their center, Tualatin Valley Fire and Rescue submits a written request, or an industrial use requires a larger turnaround for truck access.*

3. *Public easements, tracts, or right-of-way shall provide paved pedestrian and bicycle access ways at least 6 feet wide where a cul-de-sac or dead-end street is planned, to connect the ends of the streets together, connect to other streets, or connect to other existing or planned developments in accordance with the standards of this Chapter, the TSP, the Engineering Design Manual or other provisions identified in this Code for the preservation of trees.*

RESPONSE: As shown on the preliminary plans, the development pattern created by the existing school site to the south precludes a street extension to the south. The cul-de-sac is less than 200 feet in length and serves less than 25 dwelling units and is designed in accordance with the Engineering Design Manual. Consistent with the adopted Concept Plan, a separate, more appropriate location for a pedestrian connection to the school site is shown on the preliminary plans. These standards are met.

F. Grades and Curves

Grades shall be evaluated by the City Engineer and comply with the Engineering Design Manual.

RESPONSE: As shown on the preliminary plans, the grades of the proposed streets complies with the requirements of the engineering design manual. This standard is met.

G. Streets Adjacent to Railroads

Streets adjacent to railroads shall run approximately parallel to the railroad and be separated by a distance suitable to allow landscaping and buffering between the street and railroad. Due consideration shall be given at cross streets for the minimum distance required for future grade separations and to provide sufficient depth

to allow screening of the railroad.

RESPONSE: The property does not propose streets adjacent to any railroad. Therefore, this standard does not apply.

H. Buffering of Major Streets

Where a development abuts Highway 99W, or an existing or proposed principal arterial, arterial or collector street, or neighborhood route, adequate protection for residential properties shall be provided and through and local traffic shall be separated and traffic conflicts minimized. In addition, visual corridors pursuant to Section 16.142.030, and all applicable access provisions of Chapter 16.96, shall be met. Buffering may be achieved by: parallel access streets, lots of extra depth abutting the major street with frontage along another street, or other treatment suitable to meet the objectives of this Code.

RESPONSE: The property abuts SW Edy Road, a Washington County collector street. As required by this section, buffering is proposed along the site's frontage of SW Edy Road through a combination of open space, a vegetated corridor, and/or a visual corridor. This standard is met.

I. Median Islands

As illustrated in the adopted Transportation System Plan, Chapter 8, median islands may be required on arterial or collector streets for the purpose of controlling access, providing pedestrian safety or for aesthetic purposes.

RESPONSE: Median islands are neither necessary nor proposed along the site's frontage of SW Edy Road. Therefore, this standard does not apply.

J. Transit Facilities

Development along an existing or proposed transit route, as illustrated in Figure 7-2 in the TSP, is required to provide areas and facilities for bus turnouts, shelters, and other transit-related facilities to Tri-Met specifications. Transit facilities shall also meet the following requirements:

RESPONSE: The property is not located along an existing or proposed transit route. Therefore, this standard does not apply.

K. Traffic Controls

1. *An application for a proposed residential development that will generate more than an estimated 200 average daily vehicle trips (ADT) must include a traffic impact analysis to determine the number and types of traffic controls necessary to accommodate anticipated traffic flow.*

RESPONSE: A traffic impact analysis is included in the application materials. The analysis determined that no traffic controls were necessary.

L. Traffic Calming

RESPONSE: The preliminary plans show that the same City standard local street section that currently exists to the west for SW Nursery Way (completed with recent school construction) is proposed to be extended through this property. Consistent with this existing street, traffic calming measures are not

warranted or proposed. Therefore, these standards do not apply.

M. Vehicular Access Management

All developments shall have legal access to a public road. Access onto public streets shall be permitted upon demonstration of compliance with the provisions of adopted street standards in the Engineering Design Manual.

1. Measurement: See the following access diagram where R/W = Right-of-Way; and P.I. = Point-of-Intersection where P.I. shall be located based upon a 90 degree angle of intersection between ultimate right-of-way lines.

a. Minimum right-of-way radius at intersections shall conform to city standards.

b. All minimum distances stated in the following sections shall be governed by sight distance requirements according to the Engineering Design Manual.

c. All minimum distances stated in the following sections shall be measured to the nearest easement line of the access or edge of travel lane of the access on both sides of the road.

d. All minimum distances between accesses shall be measured from existing or approved accesses on both sides of the road.

e. Minimum spacing between driveways shall be measured from Point "C" to Point "C" as shown below:

2. Roadway Access

No use will be permitted to have direct access to a street or road except as specified below. Access spacing shall be measured from existing or approved accesses on either side of a street or road. The lowest functional classification street available to the legal lot, including alleys within a public easement, shall take precedence for new access points.

c. Collectors:

All commercial, industrial and institutional uses with one-hundred-fifty (150) feet or more of frontage will be permitted direct access to a Collector. Uses with less than one-hundred-fifty (150) feet of frontage shall not be permitted direct access to Collectors unless no other alternative exists.

Where joint access is available it shall be used, provided that such use is consistent with Section 16.96.040, Joint Access. No use will be permitted direct access to a Collector within one- hundred (100) feet of any present Point "A." Minimum spacing between driveways (Point "C" to Point "C") shall be one-hundred (100) feet. In all instances, access points near an intersection with a Collector or Arterial shall be located beyond the influence of standing queues of the intersection in accordance with AASHTO standards. This requirement may result in access spacing greater than one hundred (100) feet.

RESPONSE: This property abuts SW Edy Road, a Washington County collector street. The above listed City standards are the same as the County access spacing criteria. The proposed public street access complies with the 100 foot spacing standard for collector streets as shown on the preliminary plans. This standard is met.

16.106.060 - Sidewalks

A. Required Improvements

1. *Except as otherwise provided, sidewalks shall be installed on both sides of a public street and in any special pedestrian way within new development.*

2. *For Highway 99W, arterials, or in special industrial districts, the City Manager or designee may approve a development without sidewalks if alternative pedestrian routes are available.*

3. *In the case of approved cul-de-sacs serving less than fifteen (15) dwelling units, sidewalks on one side only may be approved by the City Manager or designee.*

RESPONSE: As shown on the preliminary plans, public sidewalks are proposed to be included on both sides of the public streets within the subdivision. Therefore, this standard is met.

B. Design Standards

1. *Arterial and Collector Streets*

   Arterial and collector streets shall have minimum eight (8) foot wide sidewalks/multi- use path, located as required by this Code.

RESPONSE: The project site does not front on any City arterial or collector streets. As shown on the preliminary plans, the property fronts on SW Edy Road. SW Edy Road is a Washington County maintained facility that is within the County's permitting jurisdiction. That said, based upon direction provided by the City of Sherwood Engineer, with coordination from Washington County DLUT staff, a curb tight sidewalk matching the location and grade of the existing sidewalk to the east is proposed to be continued along the site's frontage (from the eastern property boundary, past the drainage ravine). From that point (west of the drainageway, this sidewalk is proposed to transition to a modified County standard sidewalk separated from the roadway with a planter strip. These improvements are shown on the preliminary plans. This standard is met.

2. *Local Streets*

   Local streets shall have minimum five (5) foot wide sidewalks, located as required by this Code.

RESPONSE: As shown on the preliminary plans, 5 foot wide sidewalks are proposed along the local streets within the subdivision. This standard is met.

3. *Handicapped Ramps*

   Sidewalk handicapped ramps shall be provided at all intersections.

RESPONSE: As shown on the preliminary plans, ADA accessible curb ramps are proposed to be located at all intersections to provide for safe and convenient pedestrian crossings. This standard is met.

16.106.070 - Hwy. 99W Capacity Allocation Program (CAP)

RESPONSE: The CAP and the requirements of this section do not apply to single-family residential subdivisions. Therefore, these standards are not addressed in this written statement.

Chapter 16.110 - Sanitary Sewers

16.110.010 - Required Improvements

Sanitary sewers shall be installed to serve all new developments and shall connect to existing sanitary sewer mains. Provided, however, that when impractical to immediately connect to a trunk sewer system, the use of septic tanks may be approved, if sealed sewer laterals are installed for future connection and the temporary system meets all other applicable City, Clean Water Services, Washington County and State sewage disposal standards.

RESPONSE: Sanitary sewer service is available within SW Edy Road. As shown on the preliminary plans, a new sanitary sewer line is proposed to be located in the new public street to serve the new lots in the subdivision.

16.110.020 - Design Standards

A. Capacity

Sanitary sewers shall be constructed, located, sized, and installed at standards consistent with this Code, the Sanitary Sewer Service Plan Map in the Sanitary Sewer Master Plan, and other applicable Clean Water Services and City standards, in order to adequately serve the proposed development and allow for future extensions.

16.110.030 - Service Availability

Approval of construction plans for new facilities pursuant to Chapter 16.106, and the issuance of building permits for new development to be served by existing sewer systems shall include certification by the City that existing or proposed sewer facilities are adequate to serve the development.

RESPONSE: City staff confirmed in their pre-application notes that sanitary sewer service is available within SW Edy Road that can serve this site. Prior to the approval of construction plans and issuance of building permits, certification that the proposed sanitary sewer system is adequate to serve the project will be provided. Therefore, this standard is met.

Chapter 16.112 - Water Supply

16.112.010 - Required Improvements

Water lines and fire hydrants conforming to City and Fire District standards shall be installed to serve all building sites in a proposed development. All waterlines shall be connected to existing water mains or shall construct new mains appropriately sized and located in accordance with the Water System Master Plan.

16.112.020 - Design Standards

A. Capacity

Water lines providing potable water supply shall be sized, constructed, located and installed at standards

consistent with this Code, the Water System Master Plan, the City's Design and Construction Manual, and with other applicable City standards and specifications, in order to adequately serve the proposed development and allow for future extensions.

RESPONSE: Water service is available within SW Edy Road. As shown on the preliminary plans, a new water line is proposed to be located in the new public street to serve the new lots in the subdivision.

B. Fire Protection

All new development shall comply with the fire protection requirements of Chapter 16.116, the applicable portions of Chapter 7 of the Community Development Plan, and the Fire District.

RESPONSE: Please refer to the findings provided in Chapter 16.116 for this information.

C. Over-Sizing

16.112.030 - Service Availability

Approval of construction plans for new water facilities pursuant to Chapter 16.106, and the issuance of building permits for new development to be served by existing water systems shall include certification by the City that existing or proposed water systems are adequate to serve the development.

RESPONSE: As shown on the preliminary plans, a water line exists in SW Edy Road. The proposal involves connecting to this line and installing a new line in the new public street. This will be looped to the west upon that property's future redevelopment. Prior to the approval of construction plans and issuance of building permits, certification that the proposed water system is adequate to serve the project will be provided. Therefore, this standard is met.

Chapter 16.114 - Storm Water

16.114.010 - Required Improvements

Storm water facilities, including appropriate source control and conveyance facilities, shall be installed in new developments and shall connect to the existing downstream drainage systems consistent with the Comprehensive Plan and the requirements of the Clean Water Services water quality regulations contained in their Design and Construction Standards R&O 04-9, or its replacement.

RESPONSE: As shown on the preliminary plans, a new stormwater facility is proposed to ensure that water quality requirements are satisfied. Therefore, this standard is met.

16.114.020 - Design Standards

A. Capacity

Storm water drainage systems shall be sized, constructed, located, and installed at standards consistent with this Code, the Storm Drainage Master Plan Map, attached as Exhibit E, Chapter 7 of the Community Development Plan, other applicable City standards, the Clean Water Services Design and Construction standards R&O 04-9 or its replacement, and hydrologic data and improvement plans submitted by the developer.

RESPONSE: Please refer to the preliminary stormwater report, included with the application materials for hydraulic calculations and other related information.

B. On-Site Source Control

Storm water detention and groundwater recharge improvements, including but not limited to such facilities as dry wells, detention ponds, and roof top ponds shall be constructed according to Clean Water Services Design and Construction Standards.

RESPONSE: None of these measures are proposed or required. Therefore, this standard does not apply.

C. Conveyance System

The size, capacity and location of storm water sewers and other storm water conveyance improvements shall be adequate to serve the development and accommodate upstream and downstream flow. If an upstream area discharges through the property proposed for development, the drainage system shall provide capacity to the receive storm water discharge from the upstream area. If downstream drainage systems are not sufficient to receive an increase in storm water caused by new development, provisions shall be made by the developer to increase the downstream capacity or to provide detention such that the new development will not increase the storm water caused by the new development.

RESPONSE: As shown on the preliminary plans, a new stormwater facility is proposed to ensure that water quality requirements are satisfied. Please refer to the preliminary stormwater report, included with the application materials for hydraulic calculations and other related information.

16.114.030 - Service Availability

Approval of construction plans for new storm water drainage facilities pursuant to Chapter 16.106, and the issuance of building permits for new development to be served by existing storm water drainage systems shall include certification by the City that existing or proposed drainage facilities are adequate to serve the development.

RESPONSE: Please refer to the Service Provider Letter from Clean Water Services. Prior to the approval of construction plans and issuance of building permits, certification that the proposed stormwater system is adequate to serve the project will be provided. Therefore, this standard is met.

Chapter 16.116 - Fire Protection

16.116.010 - Required Improvements

When land is developed so that any commercial or industrial structure is further than two hundred and fifty (250) feet or any residential structure is further than five hundred (500) feet from an adequate water supply for fire protection, as determined by the Fire District, the developer shall provide fire protection facilities necessary to provide adequate water supply and fire safety.

RESPONSE: Water service is available within SW Edy Road by way of a public water line. As shown on the preliminary plans, a new water line is proposed to connect to the existing main line and brought into the site in the new public street. This new line is one component of the fire protection facilities, which are further described below.

16.116.020 - Standards

A. Capacity

All fire protection facilities shall be approved by and meet the specifications of the Fire District, and shall be sized, constructed, located, and installed consistent with this Code, Chapter 7 of the Community Development Plan, and other applicable City standards, in order to adequately protect life and property in the proposed development.

RESPONSE: The preliminary plans show that an adequately sized water line is proposed to be located within the right-of-way proposed to be dedicated for the new public streets. This standard is met.

B. Fire Flow

Standards published by the Insurance Services Office, entitled "Guide for Determination of Required Fire Flows" shall determine the capacity of facilities required to furnish an adequate fire flow. Fire protection facilities shall be adequate to convey quantities of water, as determined by ISO standards, to any outlet in the system, at no less than twenty (20) pounds per square inch residual pressure. Water supply for fire protection purposes shall be restricted to that available from the City water system. The location of hydrants shall be taken into account in determining whether an adequate water supply exists.

RESPONSE: City staff provided the applicant with evidence, in the form of hydrant flow data demonstrating that flows in the area provide 84 pounds per square inch (static) and 64 pounds per square inch (residual) flow pressure. This exceeds the above listed requirements. A hydrant is proposed to be provided on-site that will also comply with this requirement. This standard is met.

C. Access to Facilities

Whenever any hydrant or other appurtenance for use by the Fire District is required by this Chapter, adequate ingress and egress shall be provided. Access shall be in the form of an improved, permanently maintained roadway or open paved area, or any combination thereof, designed, constructed, and at all times maintained, to be clear and unobstructed. Widths, height clearances, ingress and egress shall be adequate for District firefighting equipment. The Fire District, may further prohibit vehicular parking along private accessways in order to keep them clear and unobstructed, and cause notice to that effect to be posted.

RESPONSE: As shown on the preliminary plans, full public street access is proposed to be provided to all components of the firefighting water supply system including the water lines, hydrant, and emergency vehicle turn-around. This standard is met.

D. Hydrants

Hydrants located along private, accessways shall either have curbs painted yellow or otherwise marked prohibiting parking for a distance of at least fifteen (15) feet in either direction, or where curbs do not exist, markings shall be painted on the pavement, or signs erected, or both, given notice that parking is prohibited for at least fifteen (15) feet in either direction.

RESPONSE: New fire hydrants are proposed to be provided as indicated on the preliminary plans. Visual markings or aids will be provided to ensure fire department access, as necessary. Therefore, this standard is met.

16.116.030 - Miscellaneous Requirements

A. Timing of Installation

When fire protection facilities are required, such facilities shall be installed and made serviceable prior to or at the time any combustible construction begins on the land unless, in the opinion of the Fire District, the nature or circumstances of said construction makes immediate installation impractical.

RESPONSE: Firefighting water supply and access will be available prior to the commencement of combustible construction. Therefore, this standard is met.

Chapter 16.118 - Public and Private Utilities

16.118.020 - Standard

A. Installation of utilities shall be provided in public utility easements and shall be sized, constructed, located and installed consistent with this Code, Chapter 7 of the Community Development Code, and applicable utility company and City standards.

RESPONSE: As shown on the preliminary plans, all utilities are proposed to be sized, located, and installed consistent with City and franchise utility provider standards. Therefore, this standard is met.

B. Public utility easements shall be a minimum of eight (8) feet in width unless a reduced width is specifically exempted by the City Engineer. An eight-foot wide public utility easement (PUE) shall be provided on private property along all public street frontages. This standard does not apply to developments within the Old Town Overlay.

RESPONSE: As shown on the preliminary plans, all necessary public utility easements are proposed to be provided. Therefore, this standard is met.

C. Where necessary, in the judgment of the City Manager or his designee, to provide for orderly development of adjacent properties, public and franchise utilities shall be extended through the site to the edge of adjacent property(ies).

RESPONSE: As shown on the preliminary plans, all necessary public utilities (as appropriate) are proposed to be extended to the property boundaries. This standard is met.

D. Franchise utility conduits shall be installed per the utility design and specification standards of the utility agency.

RESPONSE: Franchise utility provider conduits are proposed to be provided per the utility design and specification standards of the specific utility agency. This standard is met.

E. Public Telecommunication conduits and appurtenances shall be installed per the City of Sherwood telecommunication design standards.

RESPONSE: Public telecommunication conduits and appurtenances are proposed to be provided per the City of Sherwood telecommunication design standards. This standard is met.

16.118.030 - Underground Facilities

Except as otherwise provided, all utility facilities, including but not limited to, electric power, telephone, natural gas, lighting, cable television, and telecommunication cable, shall be placed underground, unless specifically authorized for above ground installation, because the points of connection to existing utilities make underground installation impractical, or for other reasons deemed acceptable by the City.

RESPONSE: All interior site utilities will be provided underground as is required. SW Edy Road is a Washington County public facility, where undergrounding is not required. Therefore, undergrounding of utility lines along the site's frontage on SW Edy Road are not proposed.

16.118.040 - Exceptions

Surface-mounted transformers, surface-mounted connection boxes and meter cabinets, temporary utility service facilities during construction, high capacity electric and communication feeder lines, and utility transmission lines operating at fifty thousand (50,000) volts or more may be located above ground. The City reserves the right to approve location of all surface-mounted transformers.

RESPONSE: Exception noted.

16.118.050 - Private Streets

RESPONSE: Private streets are not proposed or necessary for this application. Therefore, these standards do not apply to this application.

Chapter 16.120 - Subdivisions

16.120.020 - General Subdivision Provisions

A. Approval of a subdivision occurs through a two-step process: the preliminary plat and the final plat.

1. The preliminary plat shall be approved by the Approval Authority before the final plat can be submitted for approval consideration; and

RESPONSE: This application has been submitted for preliminary plat approval.

2. The final plat shall reflect all conditions of approval of the preliminary plat.

RESPONSE: It is understood that final plat approval is subject to compliance with conditions of approval applied in the Notice of Decision for the preliminary plat approval.

B. All subdivision proposals shall conform to all state regulations set forth in ORS Chapter 92, Subdivisions and Partitions.

RESPONSE: The final plat will comply with ORS 92.

C. Future re-division

When subdividing tracts into large lots, the Approval Authority shall require that the lots be of such size and

shape as to facilitate future re-division in accordance with the requirements of the zoning district and this Division.

RESPONSE: Future re-division of any lot is not anticipated. Each of the lots in the preliminary plat are sized appropriately and are intended for the future construction of one single-family residence.

D. Future Partitioning

When subdividing tracts into large lots which may be resubdivided, the City shall require that the lots be of a size and shape, and apply additional building site restrictions, to allow for the subsequent division of any parcel into lots of smaller size and the creation and extension of future streets.

RESPONSE: Future re-division of any lot is not anticipated. Each of the lots in the preliminary plat are sized appropriately and are intended for the future construction of one single-family residence.

E. Lot averaging

Lot size may be averaged to allow lots less than the minimum lot size allowed in the underlying zoning district subject to the following regulations:

RESPONSE: Lot averaging is not proposed in this application. The preliminary plat shows that each lot complies with all dimensional requirements including minimum lot size.

F. Required Setbacks

All required building setback lines as established by this Code, shall be shown in the preliminary subdivision plat.

RESPONSE: The preliminary plat shows the required building setbacks for the MDRL Zone.

G. Property Sales

No property shall be disposed of, transferred, or sold until required subdivision approvals are obtained, pursuant to this Code.

RESPONSE: This is understood.

16.120.030 - Approval Procedure-Preliminary Plat

A. Approval Authority

1. *The approving authority for preliminary and final plats of subdivisions shall be in accordance with Section 16.72.010 of this Code.*

    a. *A subdivision application for 11-50 lots will follow a Type III review process.*

RESPONSE: Although the proposed subdivision may be reviewed through a Type III process, a concurrent application for a Zoning Map amendment is also submitted, requiring a Type IV process.

2. *Approval of subdivisions is required in accordance with this Code before a plat for any such subdivision*

may be filed or recorded with County. Appeals to a decision may be filed pursuant to Chapter 16.76

RESPONSE: This application has been submitted for preliminary plat approval. In the future, an application for final plat approval will be submitted. Both of these will occur prior to recordation of the final plat with Washington County.

B. Phased Development

RESPONSE: Phasing is not proposed. Therefore, these standards are not addressed.

16.120.040 - Approval Criteria: Preliminary Plat

No preliminary plat shall be approved unless:

A. Streets and roads conform to plats approved for adjoining properties as to widths, alignments, grades, and other standards, unless the City determines that the public interest is served by modifying streets or road patterns.

RESPONSE: As shown on the preliminary plans and described in this written statements, all streets proposed in this subdivision conform to City standards and are consistent with other existing streets (i.e. SW Nursery Way) that ultimately may connect with this site. Frontage improvements on SW Edy Road will be consistent with the abutting street improvements to the east, transitioning to a modified County street section, as previously described. This criteria is satisfied.

B. Streets and roads held for private use are clearly indicated on the plat and all reservations or restrictions relating to such private roads and streets are set forth thereon.

RESPONSE: Private streets are not proposed. Therefore, this standard does not apply.

C. The plat complies with applicable zoning district standards and design standards in Division II, and all provisions of Divisions IV, VI, VIII and IX. The subdivision complies with Chapter 16.128 (Land Division Design Standards).

RESPONSE: As documented throughout this written statement and as demonstrated on the preliminary plans and other information included in the application submittal package, the proposed preliminary plat complies with the applicable zoning district standards and the applicable standards in Division II and all applicable provisions of Divisions IV, VI, and VIII. This criteria is satisfied.

D. Adequate water, sanitary sewer, and other public facilities exist to support the use of land proposed in the plat.

RESPONSE: As described in the written findings provided in response to the applicable requirements of Division VI, adequate water, sanitary sewer, and other public facilities exist to support the use of land proposed in the plat. This criteria is satisfied.

E. Development of additional, contiguous property under the same ownership can be accomplished in accordance with this Code.

RESPONSE: There is no additional contiguous property under the same ownership. Therefore, this

standard does not apply.

F. Adjoining land can either be developed independently or is provided access that will allow development in accordance with this Code.

RESPONSE: Adjoining land capable of being developed is provided access and is capable of developing independent of this site. This criteria is satisfied.

G. Tree and woodland inventories have been submitted and approved as per Section 16.142.060

RESPONSE: Tree and woodland inventories have been submitted for approval per Section 16.142.060. This criteria is satisfied.

H. The plat clearly shows the proposed lot numbers, setbacks, dedications and easements.

RESPONSE: The preliminary plat clearly shows the proposed lot numbers, setbacks, dedications, and easements. This criteria is satisfied.

I. A minimum of five percent (5%) open space has been provided per § 16.44.B.8 (Townhome- Standards) or §16.142.020 (Parks, Open Spaces and Trees-Single-Family Residential Subdivisions), if applicable.

RESPONSE: As shown on the preliminary plans, in excess of five percent open space is proposed to be provided, as is required. This criteria is satisfied.

16.120.050 – Final Subdivision Plat

RESPONSE: A final subdivision plat shall be filed with the City and County, and all City / County requirements will be satisfied prior to recordation.

Chapter 16.128 - Land Division Design Standards

16.128.010 - Blocks

A. Connectivity

1. Block Size

The length, width, and shape of blocks shall be designed to provide adequate building sites for the uses proposed, and for convenient access, circulation, traffic control and safety.

RESPONSE: As shown on the preliminary plans, the proposed subdivision includes two new streets. SW Nursery Way is proposed to access SW Edy Road in the northern portion of the property, head uphill into the site to the south, eventually bending westward, where it will stub to the site's property boundary. When / if the property to the west develops, a through street connection may be provided. In addition, a small cul-de-sac street is proposed to access SW Nursery Way. This cul-de-sac (SW Rychlick Court) will be shorter than 200 feet in length and serve 9 lots. The blocks formed by these two streets provide adequate building sites for the uses proposed, and for convenient access, circulation, traffic control and safety. This standard is met.

2. *Block Length*

Block length standards shall be in accordance with Section 16.108.040. Generally, blocks shall not exceed five-hundred thirty (530) feet in length, except blocks adjacent to principal arterial, which shall not exceed one thousand eight hundred (1,800) feet. The extension of streets and the formation of blocks shall conform to the Local Street Network map contained in the Transportation System Plan.

RESPONSE: As shown on the preliminary plans, no block length is proposed that exceeds 530 feet. The proposed street pattern is consistent with the adopted concept plan for the area and therefore complies with the Local Street Network Map contained in the City Transportation System Plan. This standard is met.

3. *Pedestrian and Bicycle Connectivity. Paved bike and pedestrian accessways shall be provided on public easements or right-of-way consistent with Figure 7.401.*

RESPONSE: No trails or pathways are shown as being required by the City TSP. However, as discussed with City staff at the pre-application conference, a pedestrian path is proposed in the southwestern portion of the property adjacent to the school property. Consistent with the adopted concept plan for the area, this pathway could be extended through the school site (east of the tennis courts and north of the ball fields and track) if deemed desirable by the school. A conceptual level circulation plan is included in the preliminary plans that illustrate this potential future connection. This standard is met.

B. *Utilities Easements for sewers, drainage, water mains, electric lines, or other utilities shall be dedicated or provided for by deed. Easements shall be a minimum of ten (10) feet in width and centered on rear or side lot lines; except for tie-back easements, which shall be six (6) feet wide by twenty (20) feet long on side lot lines at the change of direction.*

RESPONSE: All necessary easements for service, utilities, etc. are shown on the preliminary plat. This standard is met.

C. *Drainages*

Where a subdivision is traversed by a watercourse, drainage way, channel or street, drainage easements or rights-of-way shall be provided conforming substantially to the alignment and size of the drainage.

RESPONSE: As illustrated in this the preliminary plans, Tract "B" and Tract "C" represent a vegetative corridor and stormwater facility that are to be either dedicated to the public or provided with appropriate easements as required above. This standard is met.

16.128.020 - Pedestrian and Bicycle Ways

Pedestrian or bicycle ways may be required to connect cul-de-sacs, divide through an unusually long or oddly shaped block, or to otherwise provide adequate circulation.

RESPONSE: Consistent with the adopted Concept Plan, a pedestrian connection to the school site is shown on the preliminary plans. This standard is met.

16.128.030 - Lots

A. Size and Shape

Lot size, width, shape, and orientation shall be appropriate for the location and topography of the subdivision or partition, and shall comply with applicable zoning district requirements, with the following exception:

RESPONSE: As demonstrated in the preliminary plans, the lot size, width, shape and orientation are appropriate to provide suitable building sites for future homes. Each lot complies with all requirements for the MDRL zone. This standard is met.

1. Lots in areas not served by public sewer or water supply shall conform to any special County Health Department standards.

RESPONSE: This does not apply as all lots are proposed to be served with public sewer service.

B. Access

All lots in a subdivision shall abut a public street, except as allowed for infill development under Chapter 16.68.

RESPONSE: Each proposed lot abuts a public street, and the infill development standards found in Chapter 16.88 do not apply to this site. Therefore, this standard is met.

C. Double Frontage

Double frontage and reversed frontage lots are prohibited except where essential to provide separation of residential development from railroads, traffic arteries, adjacent nonresidential uses, or to overcome specific topographical or orientation problems. A five (5) foot wide or greater easement for planting and screening may be required.

RESPONSE: No double frontage lots are proposed with this application. This standard is met.

D. Side Lot Lines Side lot lines shall, as far as practicable, run at right angles to the street upon which the lots face, except that on curved streets side lot lines shall be radial to the curve of the street.

RESPONSE: As demonstrated in the preliminary plans, side lot lines run as close as practicable to right angles to the street upon which the lots face except where fronting on a curve or cul-de-sac, where these side lot lines are radial to the curve of the street. This standard is met.

E. Grading

Grading of building sites shall conform to the following standards, except when topography of physical conditions warrants special exceptions:

1. Cut slopes shall not exceed one (1) and one-half (1 1/2) feet horizontally to one (1) foot vertically.

2. Fill slopes shall not exceed two (2) feet horizontally to one (1) foot vertically.

RESPONSE: As shown on the preliminary plans, grading that creates cut slopes that exceed one (1) and one-half (1 1/2) feet horizontally to one (1) foot vertically and fill slopes shall not exceed two (2) feet

horizontally to one (1) foot vertically except when existing topography warrants an exception or a wall is proposed.

Division VIII – Environmental Resources

Chapter 16.142 - Parks and Open Spaces

16.142.030 - Single-Family or Duplex Residential Subdivisions

A. A minimum of five percent (5%) of the net buildable site (after exclusion of public right-of-way and environmentally constrained areas) shall be maintained as "open space". Open space must include usable areas such as public parks, swimming and wading pools, grass areas for picnics and recreational play, walking paths, and other like space. The following may not be used to calculate open space:

1. Required yards or setbacks.

2. Required visual corridors.

3. Required sensitive areas and buffers.

4. Any area required to meet a standard found elsewhere in this code.

RESPONSE: Calculations are provided on the preliminary plat, demonstrating that in excess of 5% of the net buildable site (after exclusion of public right-of-way and environmentally constrained areas) is proposed to be maintained as "open space". This is in the form of Tract "C" and Tract "D". These areas include a walking path and passive open space. This standard is met.

C. The open space shall be conveyed in accordance with one of the following methods:

2. By dedication to the City as public open space (if acceptable to the City). Open space proposed for dedication to the City must be acceptable to the City Manager or the Manager's designee with regard to the size, shape, location, improvement, environmental condition, and budgetary and maintenance abilities;

3. By leasing or conveying title (including beneficial ownership) to a corporation, homeowners' association or other legal entity, with the City retaining the development rights to the open space. The terms of such lease or other instrument of conveyance must include provisions (e.g., maintenance, property tax payment, etc.) suitable to the City.

RESPONSE: The applicant proposes to dedicate Tract "C" and Tract "D" to the City for open space purposes. This standard is met.

D. The density of a single-family residential subdivision shall be calculated based on the net buildable site prior to exclusion of open space per this Section.

1. Example: a 40,000 square foot net buildable site would be required to maintain 2,000 square feet (5%) of open space but would calculate density based on 40,000 square feet.

RESPONSE: Density calculations are provided on the preliminary plat. These calculations are based on

the net buildable site area prior to dedication of the above required open space. This standard is met.

E. If a proposed residential subdivision contains or is adjacent to a site identified as "parks" on the Acquisition Map of the Parks Master Plan (2006) or has been identified for acquisition by the Sherwood Parks and Recreation Board, establishment of open space shall occur in the designated areas if the subdivision contains the park site, or immediately adjacent to the parks site if the subdivision is adjacent to it.

RESPONSE: Consistent with the adopted Concept Plan for the area, a significant amount of open space (over 10,000 square feet) is proposed to be created in the subdivision. This open space includes natural open space which includes, protects, and preserves the on-site drainageway with a wide vegetated buffer. This also includes open space as required by this section, which is proposed to be dedicated to the City. Together with the required visual corridors, these open spaces combine to provide an attractive and substantial buffer from SW Edy Road for the proposed subdivision, the school site, and other existing development. Not only are these open spaces consistent with the adopted Concept Plan, but they are appropriate for the area considering the existing school and park amenities that are already in place immediately to the south. This standard is met.

H. This standard does not apply to a residential partition provided that a development may not use phasing or series partitions to avoid the minimum open space requirement. A partition of land that was part of an approved partition within the previous five (5) years shall be required to provide the minimum five percent (5%) open space in accordance with subsection (A) above.

RESPONSE: A partition is not proposed and has not occurred on the property within the past 5 years. Therefore, this language is not relevant to the application.

I. The value of the open space conveyed under Subsection (A) above may be eligible for Parks System Development Charges (SDCs) credits based on the methodology identified in the most current Parks and Recreation System Development Charges Methodology Report.

RESPONSE: If eligible, the applicant will apply for Parks System Development Charge credits.

16.142.040 - Visual Corridors

A. Corridors Required

New developments located outside of the Old Town Overlay with frontage on Highway 99W, or arterial or collector streets designated on Figure 8-1 of the Transportation System Plan shall be required to establish a landscaped visual corridor according to the following standards:

	Category	***Width***
3.	*Collector*	*10 feet*

In residential developments where fences are typically desired adjoining the above described major street the corridor may be placed in the road right-of-way between the property line and the sidewalk. In all other developments, the visual corridor shall be on private property adjacent to the right-of-way.

RESPONSE: As required by this Section, a 10 foot wide Visual Corridor (as described above) is being provided along the property's frontage (in the right-of-way and on-site) on SW Edy Road. This standard is met.

16.142.060 - Street Trees

RESPONSE: As shown on the preliminary plans, street trees are proposed to be planted along streets. These trees will be a minimum of 2 inches DBH, spaced appropriately given the anticipated mature canopy spread, and selected from the City's recommended street tree list. This requirement is met.

16.142.070 - Trees on Property Subject to Certain Land Use Applications

RESPONSE: Based upon the adoption of Ordinance 2012 – 003, the following standards are applicable to the application.

C. Inventory

1. *To assist the City in making its determinations on the retention of trees and woodlands, land use applications including Type II – IV development shall include a tree and woodland inventory and report. The report shall be prepared by a qualified professional and must contain the following information:*

    a. *Tree size (in DBH and canopy area)*
    b. *Tree species*
    c. *The condition of the tree with notes as applicable explaining the assessment*
    d. *The location of the tree on the site*
    e. *The location of the tree relative to the planned improvements*
    f. *Assessment of whether the tree must be removed to accommodate the development*
    g. *Recommendations on measures that must be taken to preserve trees during the construction that are not proposed to be removed.*

2. *Trees removed on the property within one year prior to the submittal of the development application shall also be included in the inventory. In the event that adequate data is not available to address the specific inventory requirements below, an aerial photo may be utilized to determine the approximate number, canopy size and type of trees on the property.*

3. *Definitions for the inventory purposes of this Section*

    a. *A tree is a living woody plant having a trunk diameter as specified below at Diameter at Breast Height (DBH). Trees planted for commercial agricultural purposes, and/or those subject to farm forest deferral, such as nut and fruit orchards and Christmas tree farms, are excluded from this definition and from regulation under this Section, as are any living woody plants under six (6) inches at DBH. All trees six (6) inches or greater shall be inventoried.*

    b. *A woodland is a biological community dominated by trees covering a land area of 20,000 square feet or greater at a density of at least fifty (50) trees per every 20,000 square feet with at least fifty percent (50%) of those trees of any species having a six (6) inches or greater at DBH. Woodlands planted for commercial agricultural purposes and/or subject to farm forest deferral, such as nut and fruit orchards and Christmas tree farms, are excluded from this definition, and from regulation under this Section.*

c. *A large stature tree is over 20 feet tall and wide with a minimum trunk diameter of 30 inches at DBH.*

RESPONSE: A tree and woodland inventory (preliminary tree preservation and removal plan) including the above listed information has been prepared by a certified arborist and is included with the application materials.

D. Retention requirements

1. *Trees may be considered for removal to accommodate the development including buildings, parking, walkways, grading etc., provided the development satisfies of D.2 or D.3, below.*

RESPONSE: The preliminary tree preservation and removal plan shows the number, size, species, condition, and location of trees and woodlands proposed to be preserved and those proposed to be removed. The trees are proposed to be removed to accommodate future streets and other necessary public infrastructure, earthwork / grading that is necessary to install this infrastructure to City standards, due to hazardous (existing or future) tree conditions, and/or necessary to provide suitable cleared areas to build future homes. The proposed subdivision is permitted and therefore the tree removal is necessary and acceptable to accompany it. That said, the preliminary tree preservation and removal plan shows that a significant number of trees are being preserved. This submittal requirement is met.

2. *Required Tree Canopy - Residential Developments (Single Family Attached, Single Family Detached and Two – Family)*

   Each net development site shall provide a variety of trees to achieve a minimum total tree canopy of 40 percent. The canopy percentage is based on the expected mature canopy of each tree by using the equation πr^2 to calculate the expected square footage of canopy for each tree. The expected mature canopy is counted for each tree regardless of an overlap of multiple tree canopies.

   The canopy requirement can be achieved by retaining existing trees or planting new trees. Required street trees can be used toward the total on site canopy required to meet this standard. The expected mature canopy spread of the new trees will be counted toward the needed canopy cover. A certified arborist or other qualified professional shall provide the estimated tree canopy of the proposed trees to the planning department for review.

RESPONSE: As shown on the preliminary street tree and tree canopy plan (prepared by a professional landscape architect, *56 percent of the net developable site will be covered with by tree canopy (based on mature canopy spread). This exceeds the required minimum standard by 16 percent. This is achieved through a combination of preservation of existing trees and trees to be planted.

*It is worth noting that the calculation provided is a conservative number because it does not include the substantial number of trees proposed to be preserved in open space Tract C. If this area is not dedicated to the City, and those trees to be preserved were include in the calculation, the percentage of canopy preserved would be substantially higher.

4. *The City may determine that, regardless of D.1 through D.3, that certain trees or woodlands may be required to be retained. The basis for such a decision shall include; specific findings that retention of said trees or woodlands furthers the purposes and goals of this Section, is feasible and practical both within the*

context of the proposed land use plan and relative to other policies and standards of the City Comprehensive Plan, and are:

a. Within a Significant Natural Area, 100-year floodplain, City greenway, jurisdictional wetland or other existing or future public park or natural area designated by the City Comprehensive Plan, or

RESPONSE: As shown on the preliminary tree preservation and removal plan, trees within the on-site vegetated corridor and adjacent to the drainageway are proposed to be preserved.

b. A landscape or natural feature as per applicable policies of the City Comprehensive Plan, or are necessary to keep other identified trees or woodlands on or near the site from being damaged or destroyed due to windfall, erosion, disease or other natural processes, or

RESPONSE: There are no identified landscape or natural features on site that are affected by tree removal. There are no identified trees or woodlands near the site that will be damaged or destroyed due to windfall, erosion, or disease as a result of the proposed tree removal.

c. Necessary for soil stability and the control of erosion, for managing and preserving surface or groundwater quantities or quality, or for the maintenance of a natural drainageway, as per Clean Water Services stormwater management plans and standards of the City Comprehensive Plan, or

RESPONSE: The preliminary tree preservation and removal plan shows that trees adjacent to the drainageway ravine, which is the steepest portion of the site, are proposed to be preserved.

d. Necessary in required buffers between otherwise incompatible land uses, or from natural areas, wetlands and greenways, or

RESPONSE: No incompatible land uses are proposed in this application. Surrounding properties are either developed as a school or existing detached homes, the same as proposed in this application. That said, trees are proposed to be preserved in the open space areas along SW Edy Road and adjacent to the site's property boundary, where feasible and practical.

e. Otherwise merit retention because of unusual size, size of the tree stand, historic association or species type, habitat or wildlife preservation considerations, or some combination thereof, as determined by the City.

RESPONSE: As shown on the preliminary tree preservation and removal plan, existing trees are proposed to be preserved where proximal to the drainage, within the CWS vegetated corridor, and within the proposed open space tract. There are no tree stands of unusual size or historic association, etc. that are proposed to be removed. As shown on the preliminary plans, the proposed tree preservation plan will help buffer the future neighborhood from vehicular traffic on SW Edy Road.

7. All trees, woodlands, and vegetation located on any private property accepted for dedication to the City for public parks and open space, greenways, Significant Natural Areas, wetlands, floodplains, or for storm water management or for other purposes, as a condition of a land use approval, shall be retained outright, irrespective of size, species, condition or other factors. Removal of any such trees, woodlands, and vegetation prior to actual dedication of the property to the City shall be cause for reconsideration of the land use plan approval.

RESPONSE: As shown on the preliminary tree preservation and removal plan, existing trees are proposed to be preserved where proximal to the drainage, within the CWS vegetated corridor, and within the proposed open space tract.

E. Tree Preservation Incentive. Retention of existing native trees on site which are in good health can be used to achieve the required mature canopy requirement of the development. The expected mature canopy can be calculated twice for existing trees. For example, if one existing tree with an expected mature canopy of 10 feet (78.5 square feet) is retained it will count as twice the existing canopy (157 square feet).

RESPONSE: Consistent with this incentive, existing native trees are being preserved.

F. Tree Protection During Development

The applicant shall prepare and submit a final Tree and Woodland Plan prior to issuance of any construction permits, illustrating how identified trees and woodlands will be retained, removed or protected as per the Notice of Decision. Such plan shall specify how trees and woodlands will be protected from damage or destruction by construction activities, including protective fencing, selective pruning and root treatments, excavation techniques, temporary drainage systems, and like methods. At a minimum, trees to be protected shall have the area within the drip line of the tree protected from grading, stockpiling, and all other construction related activity unless specifically reviewed and recommended by a certified arborist or other qualified professional. Any work within the dripline of the tree shall be supervised by the project arborist or other qualified professional onsite during construction.

RESPONSE: A final tree preservation and removal plan will be prepared and submitted to the City prior to the issuance of construction permits, as required above.

Chapter 16.144 - Wetland, Habitat and Natural Areas

16.144.020 - Standards

A. The applicant shall identify and describe the significance and functional value of wetlands on the site and protect those wetlands from adverse effects of the development. A facility complies with this standard if it complies with the criteria of subsections A.1.a and A.1.b, below:

1. The facility will not reduce the area of wetlands on the site, and development will be separated from such wetlands by an area determined by the Clean Water Services Design and Construction Standards R&O 00-7 or its replacement provided Section 16.140.090 does not require more than the requested setback.

a. A natural condition such as topography, soil, vegetation or other feature isolates the area of development from the wetland.

b. Impact mitigation measures will be designed, implemented, and monitored to provide effective protection against harm to the wetland from sedimentation, erosion, loss of surface or ground water supply, or physical trespass.

c. A lesser setback complies with federal and state permits, or standards that will apply to state and federal permits, if required.

RESPONSE: A wetland and water areas delineation and natural resource assessment has prepared by SWCA Environmental Consultants (SWCA) and was submitted to Clean Water Services (CWS), the regional authority with jurisdiction over buffers (vegetated corridors) to wetlands and water areas. A service provider letter has been obtained from CWS. Copies of the water areas delineation and natural resource assessment and service provider letter are included in the application materials. As shown on these materials (and the preliminary plans), a vegetated corridor is proposed to buffer the protected water feature. As demonstrated by the approved service provider letter, the vegetated corridor width requirements are satisfied. This standard is met.

2. *If existing wetlands are proposed to be eliminated by the facility, the applicant shall demonstrate that the project can, and will develop or enhance an area of wetland on the site or in the same drainage basin that is at least equal to the area and functional value of wetlands eliminated.*

RESPONSE: As demonstrated by the application materials, no impacts to wetlands are proposed. Therefore, this standard does not apply.

B. *The applicant shall provide appropriate plans and text that identify and describe the significance and functional value of natural features on the site (if identified in the Community Development Plan, Part 2) and protect those features from impacts of the development or mitigate adverse effects that will occur. A facility complies with this standard if:*

RESPONSE: A complete description of the significance and functional value of the on-site resource is provided in the wetland and water areas delineation and natural resource assessment prepared by SWCA. This information is in the application materials.

1. *The site does not contain an endangered or threatened plant or animal species or a critical habitat for such species identified by Federal or State government (and does not contain significant natural features identified in the Community Development Plan, Part 2, Natural Resources and Recreation Plan).*

RESPONSE: The site is not identified as containing an endangered or threatened plant or animal species or containing significant natural features identified in the Community Development Plan, Part 2, Natural Resources and Recreation Plan.

2. *The facility will comply with applicable requirements of the zone.*

RESPONSE: The proposal complies with the requirements of the zone.

3. *The applicant will excavate and store topsoil separate from subsurface soil, and shall replace the topsoil over disturbed areas of the site not covered by buildings or pavement or provide other appropriate medium for re-vegetation of those areas, such as yard debris compost.*

RESPONSE: Disturbance of the water area and wetlands or vegetated corridor is not proposed in the application.

4. *The applicant will retain significant vegetation in areas that will not be covered by buildings or pavement or disturbed by excavation for the facility; will replant areas disturbed by the development and not covered by buildings or pavement with native species vegetation unless other vegetation is needed to buffer the facility; will protect disturbed areas and adjoining habitat from potential erosion until replanted*

vegetation is established; and will provide a plan or plans identifying each area and its proposed use.

RESPONSE: Disturbance of vegetation within the water area and wetlands or vegetated corridor is not proposed in the application.

5. *Development associated with the facility will be set back from the edge of a significant natural area by an area determined by the Clean Water Services Design and Construction standards R&O 00-7 or its replacement, provided Section 16.140.090A does not require more than the requested setback. Lack of adverse effect can be demonstrated by showing the same sort of evidence as in subsection A.1 above.*

RESPONSE: An appropriate setback (vegetated corridor) is proposed and has been approved by Clean Water Services. Please refer to the service provider letter from CWS and wetland and water areas delineation and natural resource assessment prepared by SWCA.

Chapter 16.154 – Heat and Glare

16.154.010 - Generally

Except for exterior lighting, all otherwise permitted commercial, industrial, and institutional uses shall conduct any operations producing excessive heat or glare entirely within enclosed buildings. Exterior lighting shall be directed away from adjoining properties, and the use shall not cause such glare or lights to shine off site in excess of one-half (0.5) foot candle when adjoining properties are zoned for residential uses.

RESPONSE: As shown on the preliminary lighting plan, the only exterior lighting proposed is required City street lighting. As shown, this lighting will not cause glare or lights to shine off site in excess of 0.5 foot candles. This standard is met.

IV. Conclusion

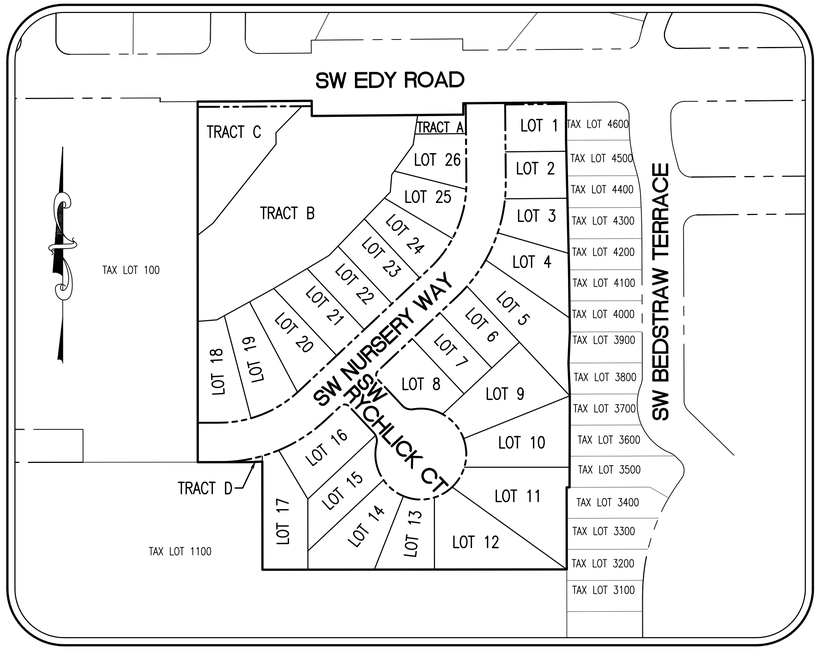
The required findings have been made and the written narrative and accompanying documentation demonstrate that the proposal is consistent with the applicable provisions of the City of Sherwood Municipal Code. The evidence in the record is substantial and supports approval of the application. Therefore, the applicant respectfully requests approval of the proposed Zoning Map Amendment and Subdivision for the Renaissance at Rychlick Farm application.

RENAISSANCE AT RYCHLICK FARM

ZONING MAP AMENDMENT AND PRELIMINARY SUBDIVISION PLANS



VICINITY MAP
NOT TO SCALE



SITE MAP

SCALE: 1"=100'

LEGEND

	EXISTING	PROPOSED
DECIDUOUS TREE	○	○
CONIFEROUS TREE	✶	✶
FIRE HYDRANT	♀	♀
WATER BLOWOFF	⚲	⚲
WATER METER	▭	▬
WATER VALVE	⋈	⋈
DOUBLE CHECK VALVE	⊠	▣
AIR RELEASE VALVE	⚲	⚲
SANITARY SEWER CLEAN OUT	○	●
SANITARY SEWER MANHOLE	◯	●
SIGN	⊸	⊸
STREET LIGHT	☼	☼
MAILBOX	MB	MB

	EXISTING	PROPOSED
STORM SEWER CLEAN OUT	○	●
STORM SEWER CATCH BASIN	□	■
STORM SEWER MANHOLE	◎	●
GAS METER	⊠	◘
GAS VALVE	⧈	◨
GUY WIRE ANCHOR	⟵	⟵
POWER POLE	⊸	⊸
POWER VAULT	P	P
POWER JUNCTION BOX	△	△
POWER PEDESTAL	▫	▪
COMMUNICATIONS VAULT	C	C
COMMUNICATIONS JUNCTION BOX	△	▲
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

SHEET INDEX

1 – COVER SHEET WITH VICINITY MAP, SITE MAP, AND LEGEND
2 – EXISTING CONDITIONS PLAN
3 – PRELIMINARY SUBDIVISION PLAT
4 – PRELIMINARY TREE PRESERVATION AND REMOVAL PLAN
5 – PRELIMINARY TREE PRESERVATION AND REMOVAL PLAN DETAIL
6 – PRELIMINARY GRADING AND EROSION CONTROL
7 – PRELIMINARY COMPOSITE UTILITY PLAN
8 – PRELIMINARY STREET AND PATH PLAN
9 – PRELIMINARY STREET PROFILES AND CROSS-SECTIONS
10 – PRELIMINARY STREET PROFILES AND CROSS-SECTIONS
11 – PRELIMINARY BUILDING SETBACKS PLAN
12 – PRELIMINARY STREET TREE, TREE MITIGATION, LANDSCAPING, VISUAL CORRIDOR, STREETLIGHT, AND FENCING PLAN
13 – PRELIMINARY LANDSCAPING AND FENCING DETAILS
14 – PRELIMINARY TREE CANOPY PLAN
15 – CONCEPTUAL GENERAL CIRCULATION, ZONING, AND SURROUNDING LAND USES WITH AERIAL PHOTOGRAPH PLAN

APPLICANT
RENAISSANCE DEVELOPMENT
16771 SW BOONES FERRY ROAD
LAKE OSWEGO, OR 97035

OWNER
FRANK J. RYCHLICK REVOCABLE TRUST DATED SEPTEMBER 21, 2010
17806 SW EDY ROAD
SHERWOOD, OR 97140

PLANNING / ENGINEERING / SURVEYING FIRM
AKS ENGINEERING & FORESTRY, LLC.
CONTACT: MONTY HURLEY
13910 SW GALBREATH DRIVE, SUITE 100
SHERWOOD, OR 97140
PH: 503-925-8799
FAX: 503-925-8969

PROJECT LOCATION ±100' WEST OF THE INTERSECTION OF EDY ROAD AND BEDSTRAW TERRACE
17806 SW EDY ROAD
SHERWOOD, OR 97140

PROPERTY DESCRIPTION: TAX LOT 100 WASHINGTON COUNTY MAP NUMBER 2S 1 30CA LOCATED IN THE SOUTHWEST ONE-QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF SHERWOOD, WASHINGTON COUNTY, OREGON.

SITE SIZE: 6.568 ACRES±

EXISTING LAND USE: EXISTING HOME AND OUT-BUILDINGS WITH TREES / BRUSH

PROJECT PURPOSE: SINGLE-FAMILY DETACHED RESIDENTIAL 26 LOT SUBDIVISION IN THE MDRL ZONE

PERMIT APPROVALS REQUESTED: ZONING MAP AMENDMENT AND PRELIMINARY SUBDIVISION PLAT

HORIZONTAL DATUM: OREGON STATE PLANE, NORTH ZONE 3601 (NAD83), AS DERIVED FROM STATIC OBSERVATIONS FROM CORS STATIONS JIME AND NWBG USING TRIMBLE BUSINESS OFFICE.

VERTICAL DATUM: ELEVATIONS ARE BASED ON WASHINGTON COUNTY BENCHMARK 101, BEING A BRASS DISK IN CONCRETE AT THE SOUTHEAST CORNER OF THE INTERSECTION OF ELWERT ROAD AND EDY ROAD, WITH A NGVD 29 ELEVATION OF 158.238 FEET.

FLOOD ELEVATION: SITE IS IN ZONE C: AREAS OF MINIMAL FLOODING PER FIRM MAP PANEL 4102380551B WITH AN EFFECTIVE DATE OF SEPTEMBER 30, 1982. NO FLOOD ELEVATION IS GIVEN.

COVER SHEET WITH VICINITY MAP, SITE MAP, AND LEGEND

RENAISSANCE AT RYCHLICK FARM
SHERWOOD OREGON
TAX LOT 100 WASHINGTON COUNTY TAX MAP 2S 1 30CA

AKS ENGINEERING & FORESTRY
ENGINEERING · PLANNING
SURVEYING · FORESTRY
13910 SW GALBREATH DR., SUITE 100
SHERWOOD, OR 97140
PHONE: (503) 925-8799
FAX: (503) 925-8969

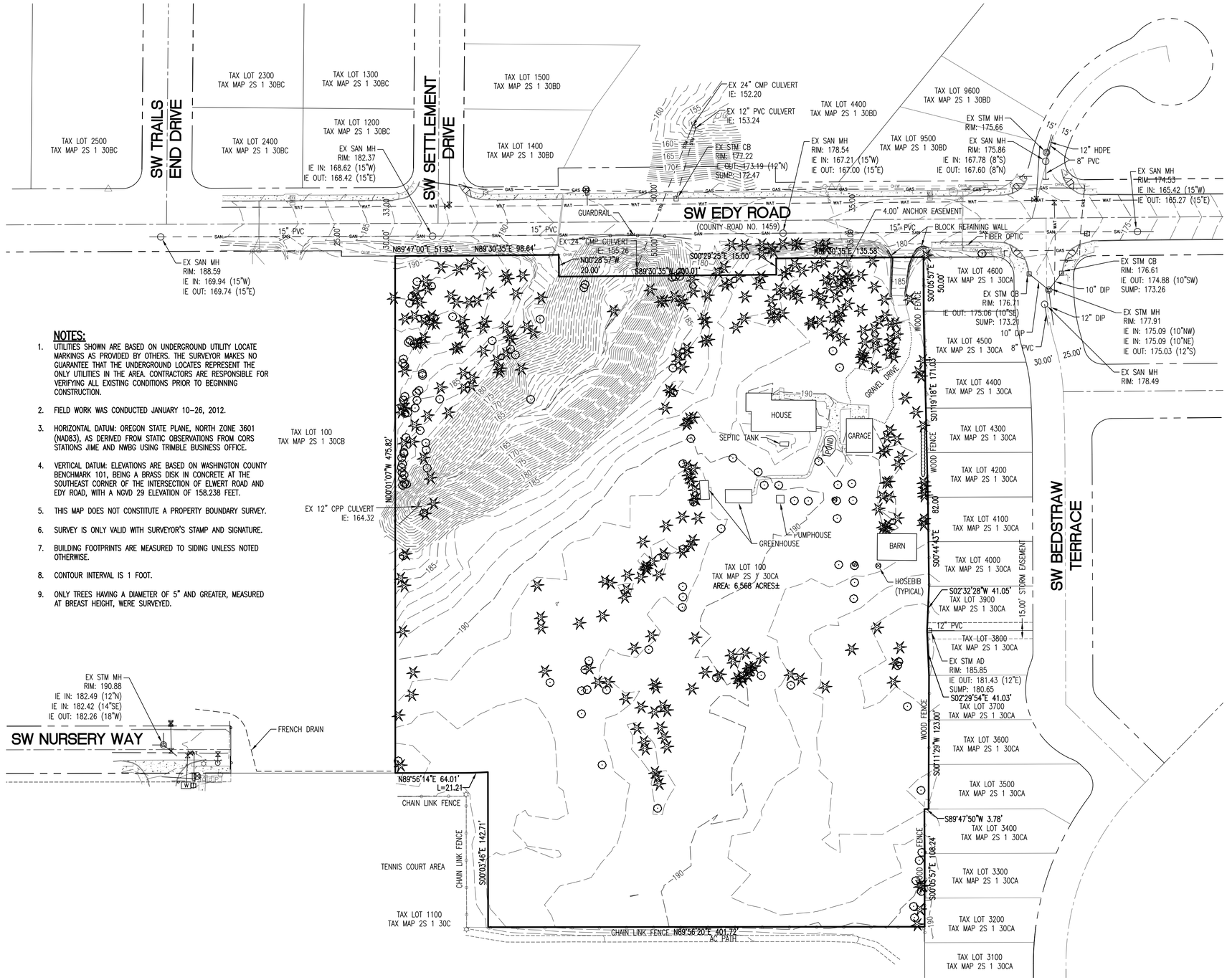
DESIGNED BY:
DRAWN BY: JOH
CHECKED BY: MBH
DRAWING NO.: P1-01
SCALE: AS NOTED

PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

DATE: 03/02/2012
REGISTERED PROFESSIONAL ENGINEER OREGON MAY 9, 2003 MONTGOMERY B. HURLEY
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/13

JOB NUMBER 2997

SHEET 1 OF 15



NOTES:

1. UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS AS PROVIDED BY OTHERS. 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 JANUARY 10–26, 2012.
3. HORIZONTAL DATUM: OREGON STATE PLANE, NORTH ZONE 3601 (NAD83), AS DERIVED FROM STATIC OBSERVATIONS FROM CORS STATIONS JIME AND NWBG USING TRIMBLE BUSINESS OFFICE.
4. VERTICAL DATUM: ELEVATIONS ARE BASED ON WASHINGTON COUNTY BENCHMARK 101, BEING A BRASS DISK IN CONCRETE AT THE SOUTHEAST CORNER OF THE INTERSECTION OF ELWERT ROAD AND EDY ROAD, WITH A NGVD 29 ELEVATION OF 158.238 FEET.
5. THIS MAP DOES NOT CONSTITUTE A PROPERTY BOUNDARY SURVEY.
6. SURVEY IS ONLY VALID WITH SURVEYOR'S STAMP AND SIGNATURE.
7. BUILDING FOOTPRINTS ARE MEASURED TO SIDING UNLESS NOTED OTHERWISE.
8. CONTOUR INTERVAL IS 1 FOOT.
9. ONLY TREES HAVING A DIAMETER OF 5" AND GREATER, MEASURED AT BREAST HEIGHT, WERE SURVEYED.

SCALE 1" = 50 FEET

EXISTING CONDITIONS PLAN

RENAISSANCE AT RYCHLICK FARM

SHERWOOD, OREGON
WASHINGTON COUNTY TAX MAP 2S 1 30CA
TAX LOT 100

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13910 SW GALBREATH DR., SUITE 100
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PHONE: (503) 925-8799
FAX: (503) 925-8969

DESIGNED BY:	
DRAWN BY:	JOH
CHECKED BY:	MBH
DRAWING NO.:	P1-02
SCALE:	AS NOTED

PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

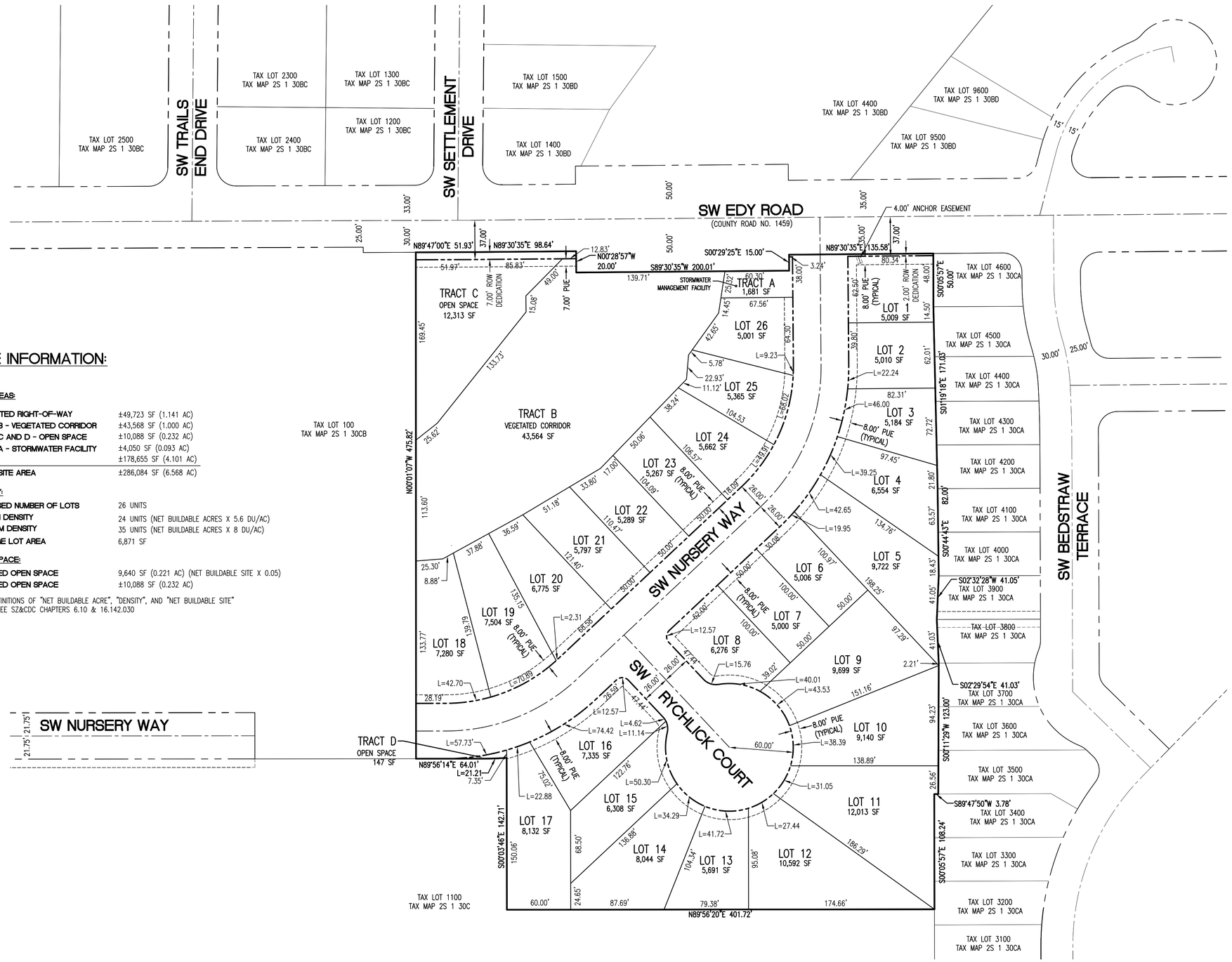
DATE: 03/02/2012

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JULY 15, 2003
MONTGOMERY B. HURLEY
58542LS
RENEWS: 6/30/13

~~PRELIMINARY~~ NOT FOR ~~CONSTRUCTION~~

JOB NUMBER
2997

SHEET
2 OF 15



SITE INFORMATION:

SITE AREAS:

DEDICATED RIGHT-OF-WAY	±49,723 SF (1.141 AC)
TRACT B - VEGETATED CORRIDOR	±43,568 SF (1.000 AC)
TRACT C AND D - OPEN SPACE	±10,088 SF (0.232 AC)
TRACT A - STORMWATER FACILITY	±4,050 SF (0.093 AC)
LOTS	±178,655 SF (4.101 AC)
TOTAL SITE AREA	±286,084 SF (6.568 AC)

DENSITY:

PROPOSED NUMBER OF LOTS	26 UNITS
MINIMUM DENSITY	24 UNITS (NET BUILDABLE ACRES X 5.6 DU/AC)
MAXIMUM DENSITY	35 UNITS (NET BUILDABLE ACRES X 8 DU/AC)
AVERAGE LOT AREA	6,871 SF

OPEN SPACE:

REQUIRED OPEN SPACE	9,640 SF (0.221 AC) (NET BUILDABLE SITE X 0.05)
PROVIDED OPEN SPACE	±10,088 SF (0.232 AC)

*FOR DEFINITIONS OF "NET BUILDABLE ACRE", "DENSITY", AND "NET BUILDABLE SITE" PLEASE SEE SZ&CDC CHAPTERS 6.10 & 16.142.030

PRELIMINARY SUBDIVISION PLAT

RENAISSANCE AT RYCHLICK FARM

SHERWOOD, OREGON

WASHINGTON COUNTY TAX MAP 2S 1 30CA

TAX LOT 100

AKS ENGINEERING & FORESTRY

ENGINEERING · PLANNING
SURVEYING · FORESTRY

13910 SW GALBREATH DR.,
SUITE 100
SHERWOOD, OR 97140
PHONE: (503) 925-8799
FAX: (503) 925-8969

DESIGNED BY:
DRAWN BY: JOH
CHECKED BY: MBH
DRAWING NO.: P1-03
SCALE: AS NOTED

PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

DATE: 03/02/2012

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 9, 2002
MONTGOMERY B. HURLEY
RENEWAL DATE: 6/30/13

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER
2997

SHEET
3 OF 15

TREES–PRESERVE

TREE NO.	SPECIES	DBH
10629	CEDAR	19
10632	CEDAR	26
10633	UNKNOWN DECID.	9
10642	FIR	42
10658	FIR	34
10659	CEDAR	17
10661	MAPLE	8
10662	MAPLE	9
10663	MAPLE	12
10664	MAPLE	10
10794	FIR	18
10797	MAPLE	6
10799	MAPLE	10
10807	MAPLE	13
10810	MAPLE	18
10922	CEDAR	9
10924	CEDAR	22
10980	CEDAR	36
10981	UNKNOWN DECID.	10
10982	UNKNOWN DECID.	18
10983	CEDAR	39
10986	CEDAR	22
10987	UNKNOWN DECID.	7
10988	UNKNOWN DECID.	15
11013	PINE	12
11015	PINE	8
11018	PINE	10
11019	PINE	8
11110	FIR	15
11139	CEDAR	20
11140	FIR	26
11141	FIR	12
11142	FIR	17
11143	FIR	19
11144	MAPLE	13
11145	FIR	28
11146	CEDAR	10
11147	FIR	22
11149	CEDAR	19
11156	CEDAR	16
11161	MAPLE	13
11162	CEDAR	8
11163	CEDAR	8
11164	MADRONA	21
11165	FIR	46
11166	MADRONA	6
11167	FIR	37
11168	CEDAR	8
11169	CEDAR	15
11170	FIR	12
11171	CEDAR	16
11172	FIR	28
11173	FIR	19
11174	CEDAR	17
11175	CEDAR	23
11176	FIR	19
11177	FIR	25
11178	UNKNOWN DECID.	9
11179	FIR	20
11180	FIR	13
11181	MAPLE	6
11182	FIR	18
11183	MAPLE	11
11184	FIR	21
11185	FIR	26
11186	FIR	16
11187	UNKNOWN DECID.	5
11188	FIR	26
11189	FIR	37
11190	FIR	28
11191	FIR	21
11192	CEDAR	18
11193	MAPLE	9
11194	MAPLE	13
11195	MAPLE	14
11196	MAPLE	9,10,13,13
11197	MAPLE	11,12
11198	MAPLE	7,12,12
11199	CEDAR	7
11200	MAPLE	5
11201	MAPLE	7,8
11202	CEDAR	13
11203	FIR	29
11204	CEDAR	29
11205	CEDAR	17
11206	FIR	14
11207	CEDAR	16
11208	CEDAR	25
11209	MAPLE	8
11210	CEDAR	24
11211	CEDAR	23
11212	MAPLE	10
11213	MAPLE	10
11214	MAPLE	12
11215	MAPLE	6
11216	MAPLE	10,13
11217	MAPLE	8
11218	CEDAR	8
11219	CEDAR	9
11220	MAPLE	13
11221	MAPLE	10
11222	CEDAR	5
11223	CEDAR	22
11224	MAPLE	6
11225	CEDAR	12
11226	MAPLE	7
11244	FIR	16
11245	MAPLE	13
11246	MAPLE	7
11247	MAPLE	8
11287	MAPLE	20
11288	HOLLY	6

TREES–PRESERVE

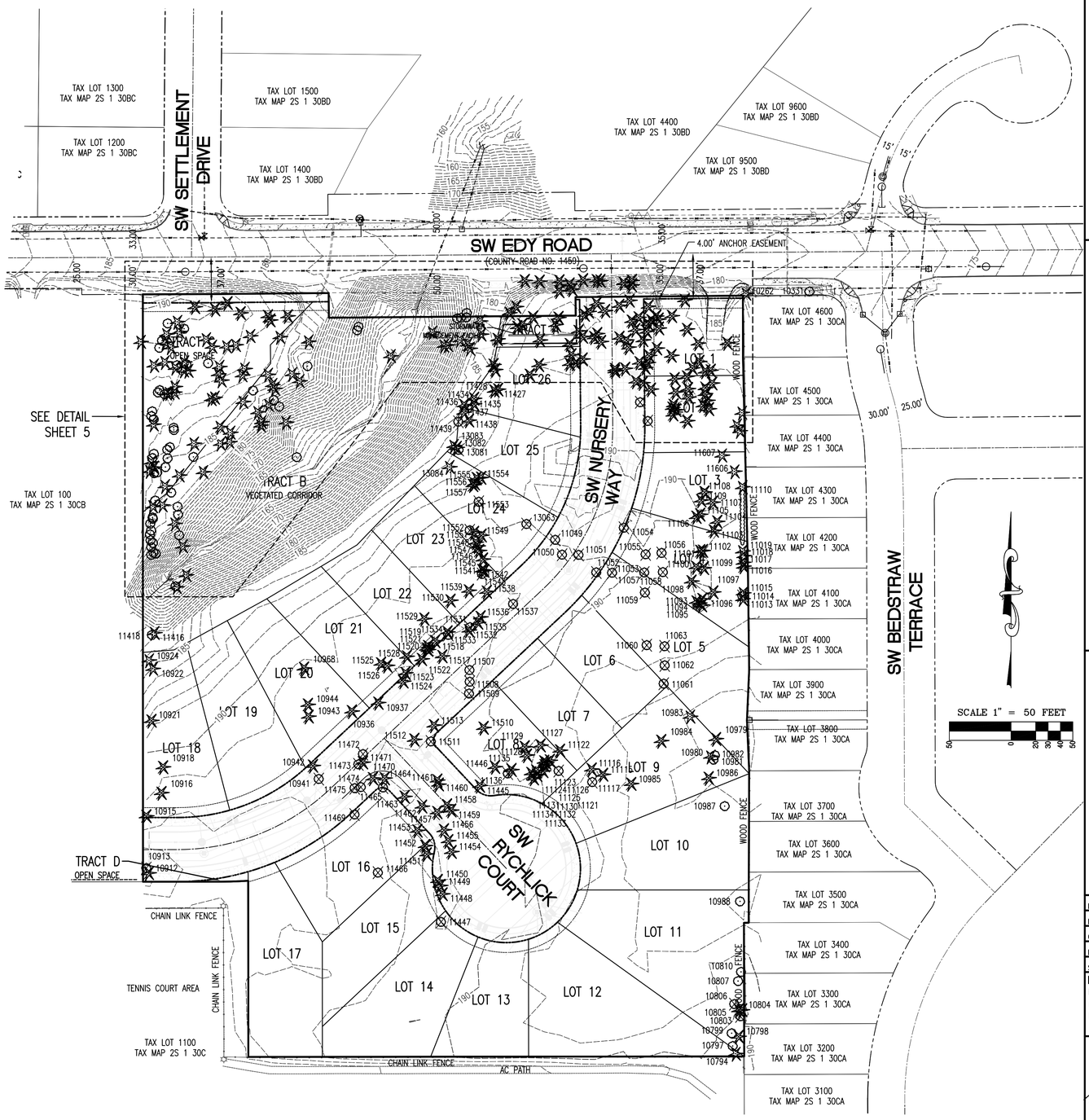
11288	HOLLY	6
11311	CEDAR	11
11332	CEDAR	16
11333	CEDAR	24
11334	FIR	15
11335	CEDAR	9
11386	CEDAR	24
11388	ALDER	22
11389	CEDAR	12
11390	CEDAR	13
11391	MAPLE	18,33
11392	FIR	29,10
11393	MAPLE	6
11394	MAPLE	14
11395	CEDAR	25
11396	MAPLE	15
11397	MAPLE	12
11399	MAPLE	9
11400	MAPLE	11
11401	MAPLE	13
11402	MAPLE	13
11404	MAPLE	9,11
11405	MAPLE	10
11406	MAPLE	16
11408	MAPLE	8
11409	MAPLE	9
11416	CEDAR	18
11418	ALDER	12,14
11601	CEDAR	24
11602	FIR	39
11603	CEDAR	5
11606	CEDAR	31,22
11607	CEDAR	24
13082	FIR	28
13083	CEDAR	21
13084	CEDAR	25

TREES–REMOVE (INFRASTRUCTURE)

TREE NO.	SPECIES	DBH
10262	FIR	14 16
10280	FIR	10
10281	FIR	6
10282	FIR	5
10283	FIR	50
10284	CEDAR	16
10285	FIR	27
10286	FIR	9
10287	CEDAR	17
10288	FIR	18
10289	CEDAR	14
10290	CEDAR	10
10291	CEDAR	8
10292	FIR	32
10298	CEDAR	14
10322	FIR	11
10323	CEDAR	16
10324	CEDAR	7
10325	CEDAR	14
10326	CEDAR	7
10327	CEDAR	9
10328	FIR	6
10329	CEDAR	8
10330	FIR	8
10331	UNKNOWN DECID.	5
10656	CEDAR	7
10657	CEDAR	11
10660	FIR	10
10912	CEDAR	32
10913	MAPLE	8
10915	FIR	16
10936	CEDAR	
10937	FIR	27
10941	MAPLE	7
10942	UNKNOWN CONIF.	8
11049	UNKNOWN DECID.	4,5,5,6
11050	APPLE	6
11051	UNKNOWN DECID.	4
11052	APPLE	7,6
11053	CHERRY	12,16
11054	UNKNOWN DECID.	5,6,6
11150	CEDAR	37
11151	CEDAR	15
11152	CEDAR	7
11157	CEDAR	30
11158	FIR	38
11159	CEDAR	34
11160	FIR	16
11422	CEDAR	8
11423	FIR	29
11425	FIR	32
11426	CEDAR	25
11427	CEDAR	7,14
11428	PINE	26
11434	CEDAR	13
11435	FIR	42
11436	CEDAR	12
11437	FIR	19
11438	FIR	33
11439	MAPLE	8
11442	CEDAR	9
11443	FIR	37
11444	CEDAR	27
11445	CEDAR	29

TREES–REMOVE (INFRASTRUCTURE)

11447	MAPLE	8
11448	SPRUCE	19
11449	SPRUCE	14
11450	SPRUCE	11
11451	SPRUCE	30
11452	SPRUCE	27
11453	SPRUCE	21
11454	FIR	7
11455	FIR	6
11456	FIR	9
11457	FIR	5
11458	FIR	6
11459	FIR	8
11460	FIR	9
11461	FIR	8
11462	CEDAR	36
11463	SPRUCE	26
11464	CEDAR	22
11465	MAPLE	8,8
11469	MAPLE	7
11470	FIR	14
11471	CEDAR	35
11472	MAPLE	5
11473	MAPLE	8
11474	MAPLE	6
11475	MAPLE	7
11507	OAK	13
11508	CHESTNUT	7
11509	CHESTNUT	6,6,8
11511	OAK	12
11512	FIR	26
11513	CEDAR	25
11517	FIR	39
11518	FIR	15
11519	FIR	10
11520	FIR	11
11521	CEDAR	5
11522	FIR	15
11523	CEDAR	35
11524	FIR	20
11528	CEDAR	5
11531	MAPLE	13
11532	FIR	10
11533	MAPLE	9
11534	FIR	28
11535	FIR	27
11536	FIR	14
11537	CHERRY	13,13,17
11538	CEDAR	32
11640	CEDAR	18
11641	FIR	8
11642	CEDAR	8
11643	FIR	11
11644	FIR	14
11645	CEDAR	15
11646	UNKNOWN DECID.	9
11647	CHERRY	10 11 6
11648	FIR	27
11649	FIR	15
11650	FIR	26
11651	FIR	18
11652	CEDAR	29
11653	FIR	22
11654	CEDAR	14
11655	CEDAR	8
11656	FIR	14
11657	FIR	25
11658	CEDAR	14
11660	CEDAR	7
11661	FIR	13
11662	CEDAR	14
11663	CEDAR	10
11664	FIR	21
11665	CEDAR	12
11666	FIR	26
11667	CEDAR	14
11669	FIR	35
11670	FIR	27
11672	CEDAR	14
11673	CEDAR	13
11674	FIR	9
11675	FIR	15
11676	FIR	14
11677	FIR	24
11678	FIR	21
11679	FIR	18



LEGEND

EXISTING TREE TO BE REMOVED

EXISTING TREE TO REMAIN

PRELIMINARY
TREE PRESERVATION
AND REMOVAL PLAN

RENAISSANCE AT RYCHLICK FARM

SHERWOOD
TAX LOT 100

OREGON
WASHINGTON COUNTY, TAX MAP 2S 1 30CA

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DESIGNED BY:	
DRAWN BY:	JOH
CHECKED BY:	MBH
DRAWING NO.:	P1-04 05
SCALE:	AS NOTED

PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

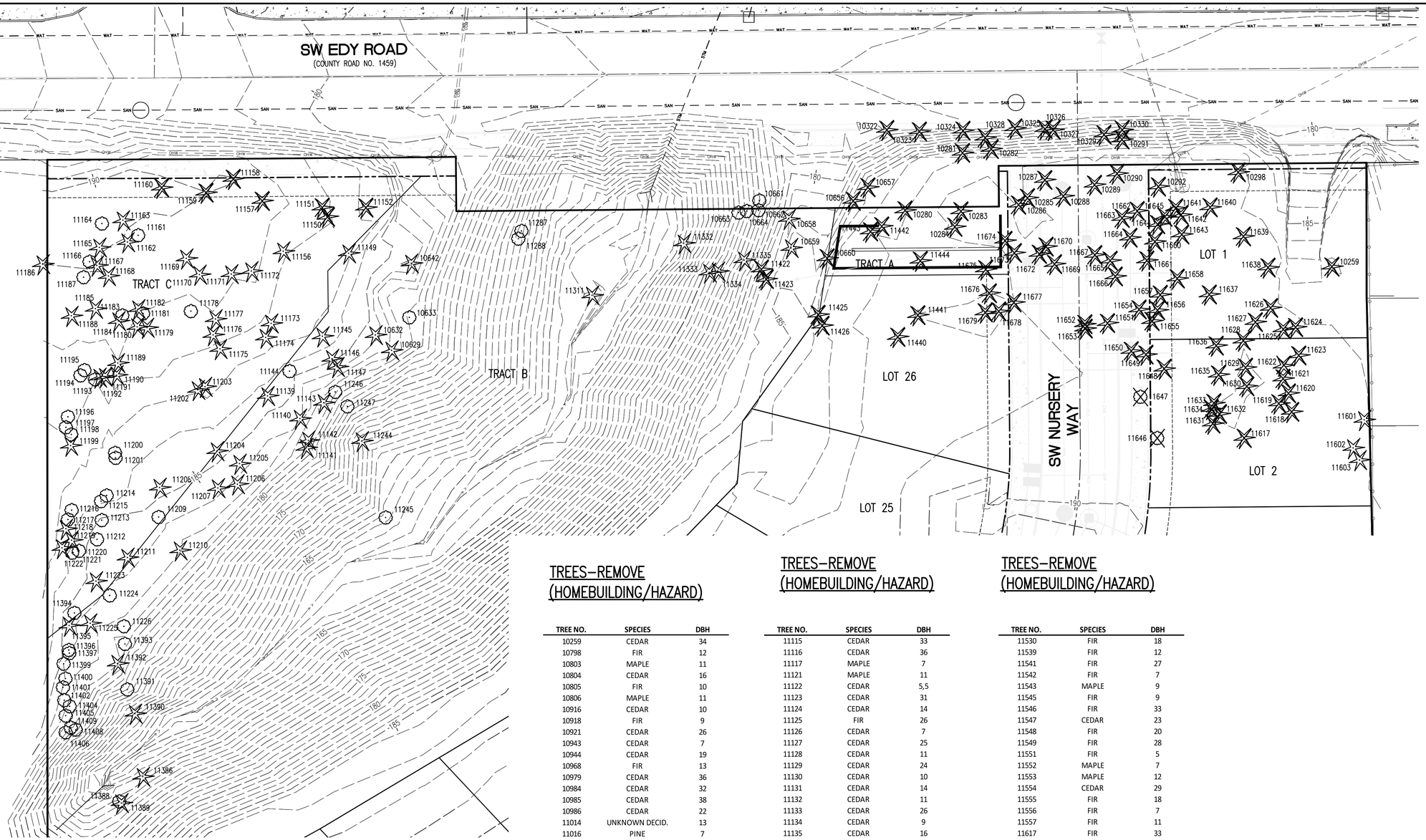
DATE: 03/02/2012

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 9, 2002
MONTGOMERY B. NURSE
RENEWAL DATE: 6/30/13

PRELIMINARY
NOT FOR CONSTRUCTION

JOB NUMBER
2997

SHEET
4 OF 15



SCALE 1" = 20 FEET

TREES–REMOVE (HOMEBUILDING/HAZARD)

TREE NO.	SPECIES	DBH
10259	CEDAR	34
10798	FIR	12
10803	MAPLE	11
10804	CEDAR	16
10805	FIR	10
10806	MAPLE	11
10916	CEDAR	10
10918	FIR	9
10921	CEDAR	26
10943	CEDAR	7
10944	CEDAR	19
10968	FIR	13
10979	CEDAR	36
10984	CEDAR	32
10985	CEDAR	38
10986	CEDAR	22
11014	UNKNOWN DECID.	13
11016	PINE	7
11017	PINE	4
11056	UNKNOWN DECID.	7
11057	CHERRY	4,6,8
11058	UNKNOWN DECID.	8
11059	APPLE	6,6
11060	APPLE	7,5
11061	APPLE	6,6,6
11062	APPLE	5,6,7
11063	APPLE	9
11093	FIR	28
11094	CEDAR	14
11095	FIR	27
11096	CEDAR	15,11
11097	FIR	34
11098	CEDAR	29
11099	FIR	24,39
11100	FIR	23
11101	CEDAR	22
11102	CEDAR	24
11103	FIR	46
11104	CEDAR	6
11105	FIR	34
11106	FIR	26
11107	CEDAR	26
11108	FIR	30
11109	CEDAR	27

TREES–REMOVE (HOMEBUILDING/HAZARD)

TREE NO.	SPECIES	DBH
11115	CEDAR	33
11116	CEDAR	36
11117	MAPLE	7
11121	MAPLE	11
11122	CEDAR	5,5
11123	CEDAR	31
11124	CEDAR	14
11125	FIR	26
11126	CEDAR	7
11127	CEDAR	25
11128	CEDAR	11
11129	CEDAR	24
11130	CEDAR	10
11131	CEDAR	14
11132	CEDAR	11
11133	CEDAR	26
11134	CEDAR	9
11135	CEDAR	16
11136	MAPLE	12
11422	CEDAR	8
11423	FIR	29
11425	FIR	32
11426	CEDAR	25
11427	CEDAR	7,14
11428	PINE	26
11434	CEDAR	13
11435	FIR	42
11436	CEDAR	12
11437	FIR	19
11438	FIR	33
11439	MAPLE	8
11440	CEDAR	35
11441	FIR	40
11442	CEDAR	9
11443	FIR	37
11444	CEDAR	27
11445	CEDAR	29
11446	CEDAR	29
11466	MAPLE	6
11510	FIR	9
11525	FIR	12
11526	FIR	15
11528	CEDAR	5
11529	CEDAR	11

TREES–REMOVE (HOMEBUILDING/HAZARD)

TREE NO.	SPECIES	DBH
11530	FIR	18
11539	FIR	12
11541	FIR	27
11542	FIR	7
11543	MAPLE	9
11545	FIR	9
11546	FIR	33
11547	CEDAR	23
11548	FIR	20
11549	FIR	28
11551	FIR	5
11552	MAPLE	7
11553	MAPLE	12
11554	CEDAR	29
11555	FIR	18
11556	FIR	7
11557	FIR	11
11617	FIR	33
11618	FIR	29
11619	FIR	26
11620	FIR	28
11621	FIR	16
11622	FIR	12
11623	FIR	27
11624	FIR	33
11625	CEDAR	8
11626	FIR	25
11627	CEDAR	14
11628	CEDAR	11
11629	FIR	10
11630	FIR	10
11631	FIR	39
11632	FIR	9
11633	CEDAR	24
11634	FIR	23
11635	FIR	17
11636	FIR	24
11637	FIR	23
11638	FIR	26
11639	FIR	38
13063	CHERRY	10 11 14
13081	MADRONA	10

LEGEND

EXISTING TREE TO BE REMOVED

EXISTING TREE TO REMAIN

PRELIMINARY TREE PRESERVATION AND REMOVAL PLAN DETAIL

RENAISSANCE AT RYCHLICK FARM

SHERWOOD OREGON

TAX LOT 100 WASHINGTON COUNTY TAX MAP 2S 1 30CA

AKS ENGINEERING & FORESTRY
ENGINEERING · PLANNING
SURVEYING · FORESTRY
13910 SW GALBREATH DR., SUITE 100
SHERWOOD, OR 97140
PHONE: (503) 925-8799
FAX: (503) 925-8969

DESIGNED BY:
DRAWN BY: JOH
CHECKED BY: MBH
DRAWING NO.: P1-04 05
SCALE: AS NOTED

PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

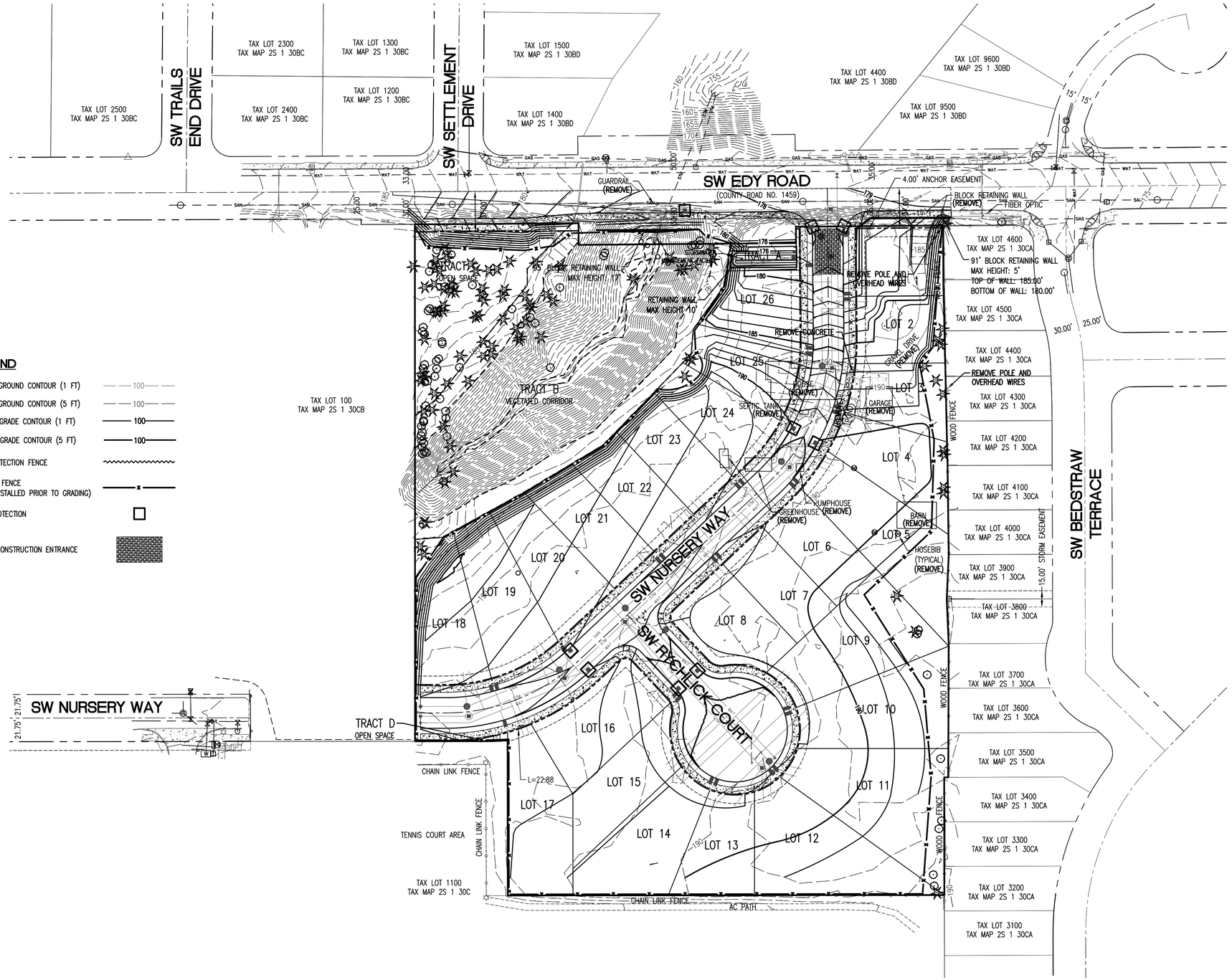
DATE: 03/02/2012

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 9, 2002
MONTGOMERY B. HURLEY
RENEWAL DATE: 6/30/13

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER
2997

SHEET
5 OF 15



LEGEND

- EXISTING GROUND CONTOUR (1 FT) — 100 —
- EXISTING GROUND CONTOUR (5 FT) — 100 —
- FINISHED GRADE CONTOUR (1 FT) — 100 —
- FINISHED GRADE CONTOUR (5 FT) — 100 —
- TREE PROTECTION FENCE
- SEDIMENT FENCE (TO BE INSTALLED PRIOR TO GRADING)
- INLET PROTECTION
- GRAVEL CONSTRUCTION ENTRANCE

PRELIMINARY GRADING AND EROSION CONTROL PLAN

RENAISSANCE AT RYCHLICK FARM

SHERWOOD, OREGON
WASHINGTON COUNTY TAX MAP 2S 1 30CA
TAX LOT 100

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AKS ENGINEERING & FORESTRY
13910 SW GALBREATH DR., SUITE 100
SHERWOOD, OR 97140
PHONE: (503) 925-8799
FAX: (503) 925-8969

DESIGNED BY:	
DRAWN BY:	JOH
CHECKED BY:	MBH
DRAWING NO.:	P1-06
SCALE:	AS NOTED

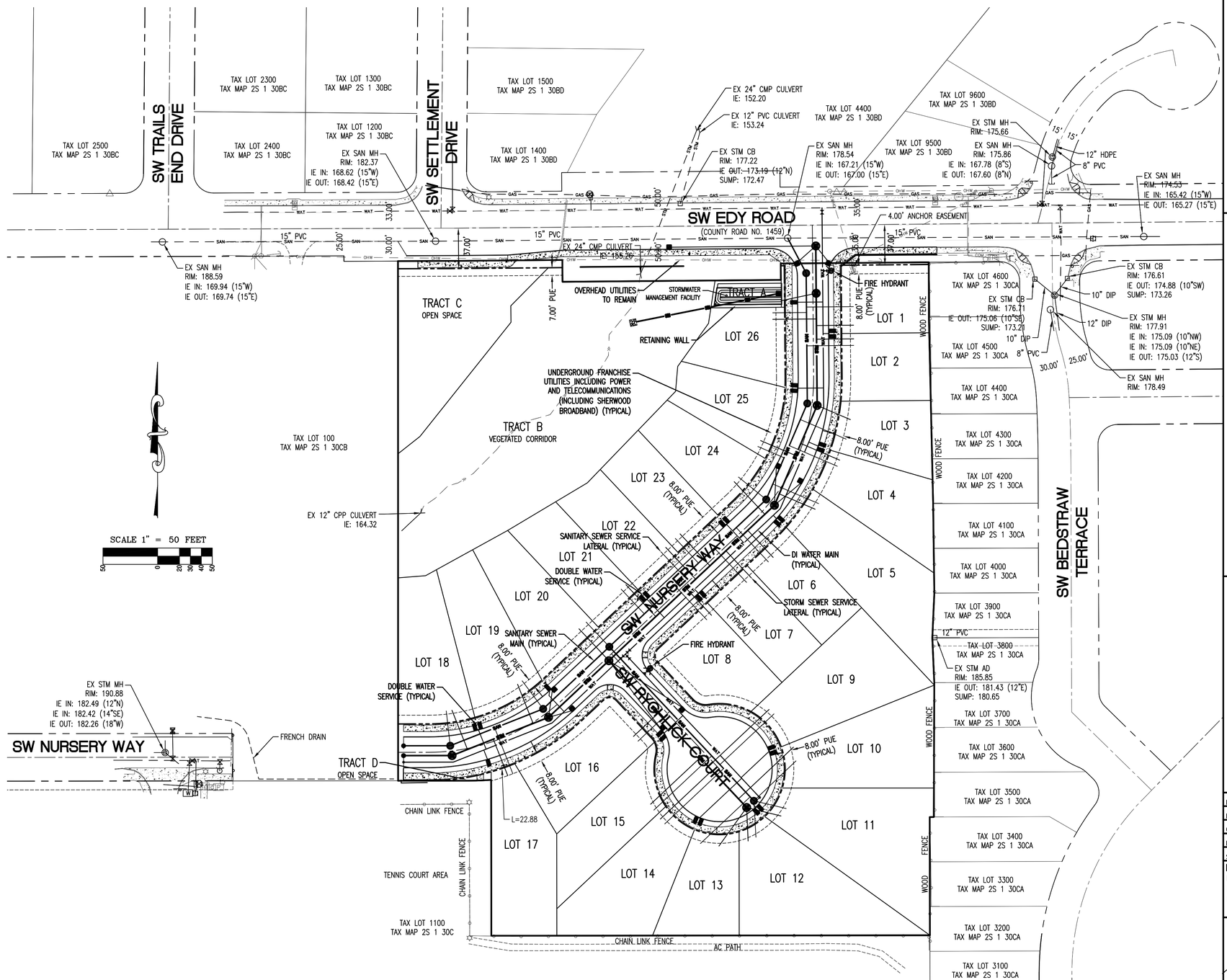
PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

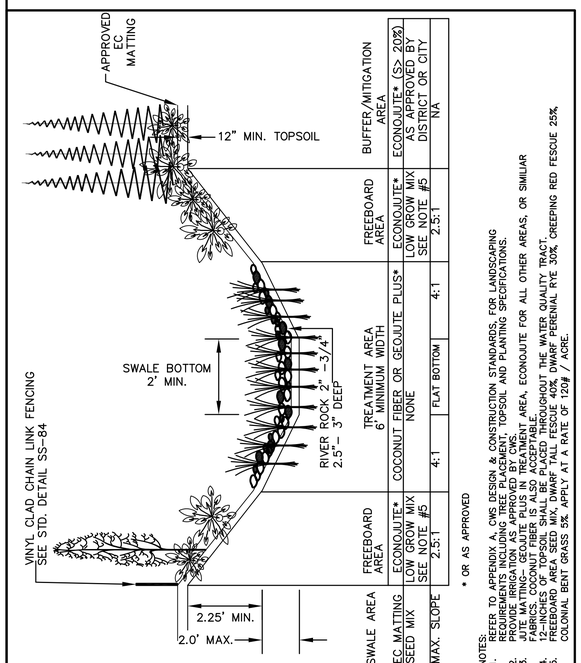
DATE: 03/02/2012

REGISTERED PROFESSIONAL ENGINEER — OREGON — MAY 9, 2003 — MONTGOMERY B. HURLEY
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/13

JOB NUMBER
2997

SHEET
6 OF 15





* OR AS APPROVED

NOTES:
1. REFER TO APPENDIX A, CWS DESIGN & CONSTRUCTION STANDARDS, FOR LANDSCAPING REQUIREMENTS INCLUDING TREE PLACEMENT, TOPSOIL AND PLANTING SPECIFICATIONS.
2. PROVIDE IRRIGATION AS APPROVED BY CWS.
3. ALL MITIGATION SWALE PLUS INFILTRATION AREA, ECONOLITE FOR ALL OTHER AREAS, OR SIMILAR FABRICS. COCONUT FIBER IS ALSO ACCEPTABLE.
4. 12-INCHES OF TOPSOIL SHALL BE PLACED THROUGHOUT THE WATER QUALITY TRACT.
5. FREEBOARD AREA SEED MIX, DWARF TALL FESCUE 40% DWARF PERENIAL RYE 30% CREEPING RED FESCUE 25%, COLONIAL BENT GRASS 5% APPLY AT A RATE OF 120# / ACRE.

	STANDARD DRAWING TITLE	DRAWING NUMBER
City of Sherwood Oregon	WATER QUALITY SWALE	SS-80
Any alteration of this drawing may not be associated in any way with the City of Sherwood Standard Drawings.	SCALE: N.T.S.	DATE: JUL' 09

PRELIMINARY COMPOSITE UTILITY PLAN

RENAISSANCE AT RYCHLICK FARM

OREGON
WASHINGTON COUNTY TAX MAP 2S 1 30CA

SHERWOOD
TAX LOT 100

ENGINEERING · PLANNING
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13910 SW GALBREATH DR., SUITE 100
SHERWOOD, OR 97140
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FAX: (503) 925-8969

DESIGNED BY:	
DRAWN BY:	JOH
CHECKED BY:	MBH
DRAWING NO.:	P1-07
SCALE:	AS NOTED

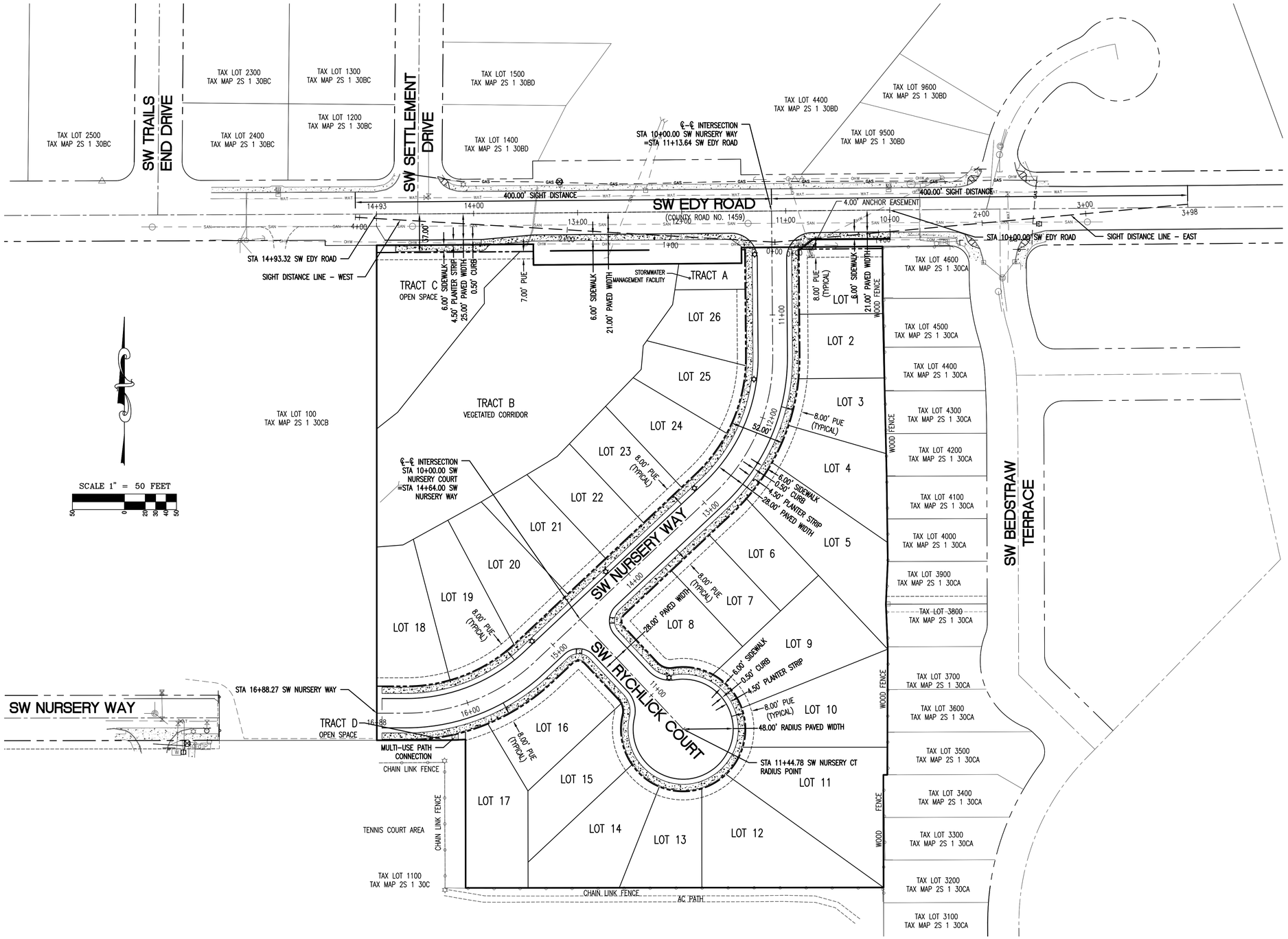
PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

DATE: 03/02/2012

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 9, 2002
MONTGOMERY B. HURLBURT
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/13

JOB NUMBER
2997

SHEET
7 OF 15



PRELIMINARY STREET AND PATH PLAN

RENAISSANCE AT RYCHLICK FARM

SHERWOOD, OREGON

WASHINGTON COUNTY TAX MAP 2S 1 30CA

TAX LOT 100

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AKS ENGINEERING & FORESTRY
13910 SW GALBREATH DR., SUITE 100
SHERWOOD, OR 97140
PHONE: (503) 925-8799
FAX: (503) 925-8969

DESIGNED BY:	
DRAWN BY:	JOH
CHECKED BY:	MBH
DRAWING NO.:	P1-08
SCALE:	AS NOTED

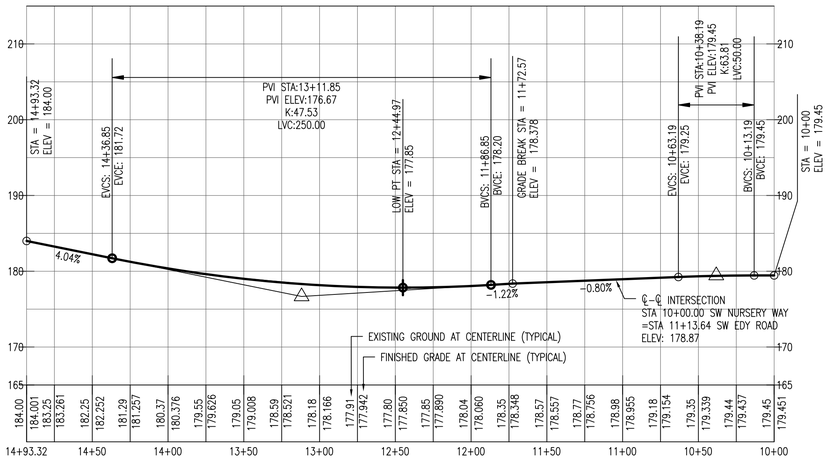
PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

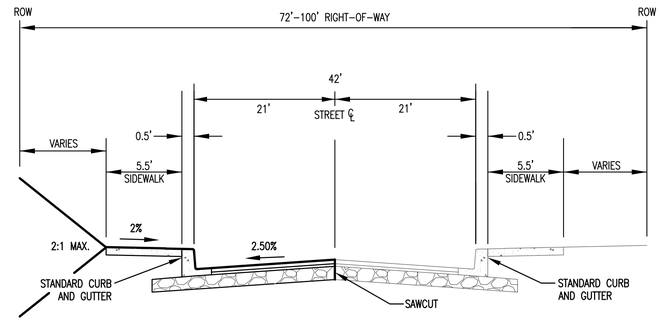
DATE: 03/02/2012

REGISTERED PROFESSIONAL ENGINEER
OREGON
MAY 9, 2003
MONTGOMERY B. HURLEY
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/13

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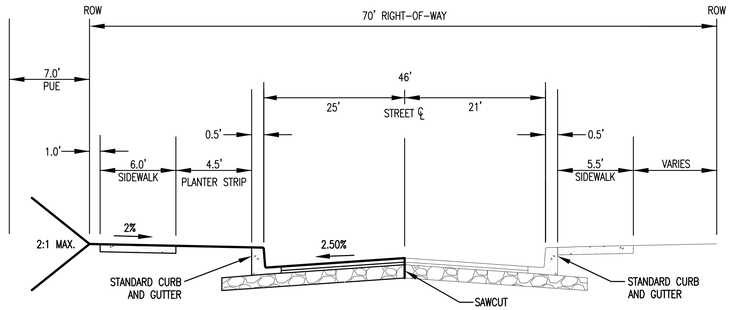
SHEET
8 OF 15



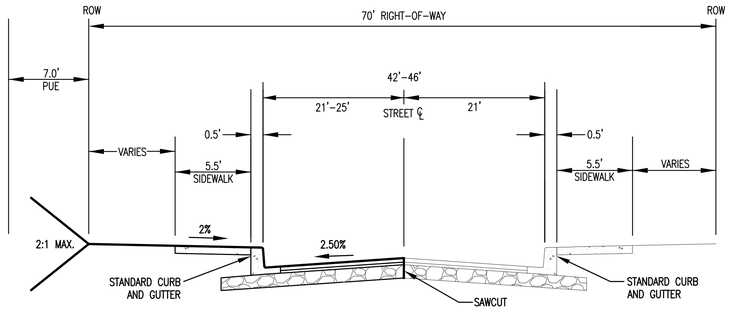


SW EDY ROAD STA 10+00–13+42.88
CROSS–SECTION
NOT TO SCALE

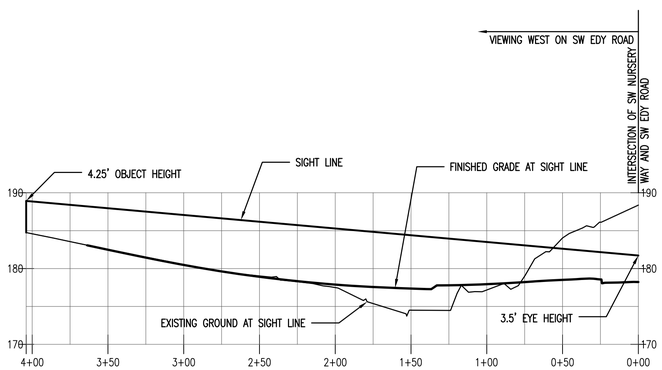
SW EDY ROAD
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Vert. Scale: 1"= 10'



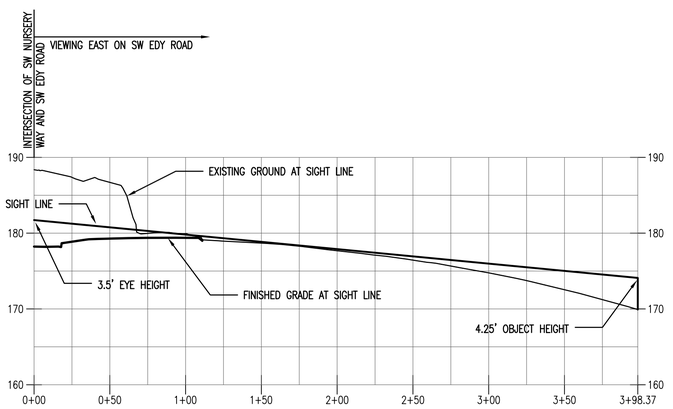
SW EDY ROAD STA 13+92.88–14+85.30
CROSS–SECTION
NOT TO SCALE



SW EDY ROAD STA 13+42.88–13+92.88
CROSS–SECTION
NOT TO SCALE



SIGHT DISTANCE LINE – WEST
Hor. Scale: 1"= 50'
Vert. Scale: 1"= 10'



SIGHT DISTANCE LINE – EAST
Hor. Scale: 1"= 50'
Vert. Scale: 1"= 10'

PRELIMINARY STREET PROFILES AND CROSS-SECTIONS

RENAISSANCE AT RYCHLICK FARM

OREGON
WASHINGTON COUNTY TAX MAP 2S 1 30CA
SHERWOOD
TAX LOT 100

AKS ENGINEERING & FORESTRY
ENGINEERING · PLANNING
SURVEYING · FORESTRY
13910 SW GALBREATH DR., SUITE 100
SHERWOOD, OR 97140
PHONE: (503) 925-8799
FAX: (503) 925-8969

DESIGNED BY:
DRAWN BY: JOH
CHECKED BY: MBH
DRAWING NO.: P1-09
SCALE: AS NOTED

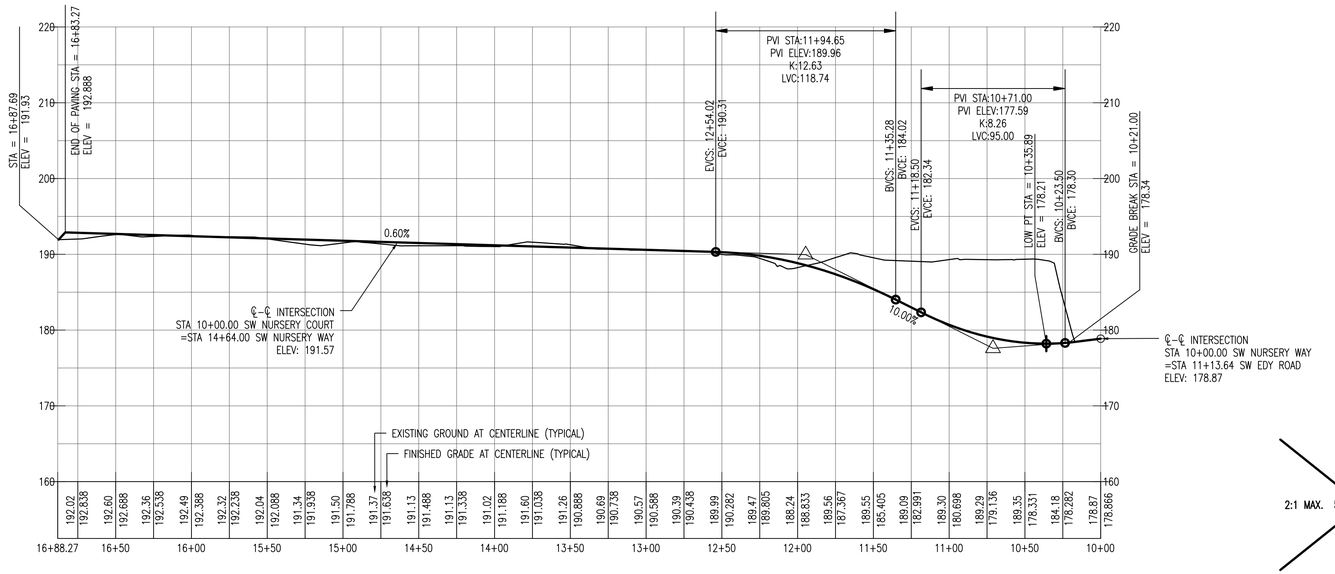
PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

DATE: 03/02/2012

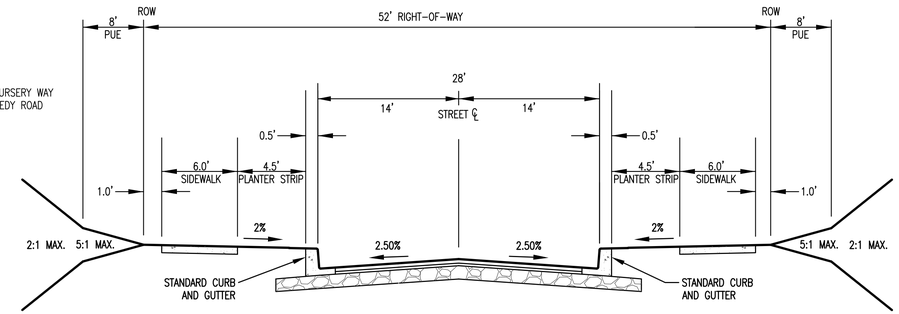
REGISTERED PROFESSIONAL ENGINEER
OREGON
MAY 9, 2003
MONTGOMERY B. HURLEY
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/13

JOB NUMBER
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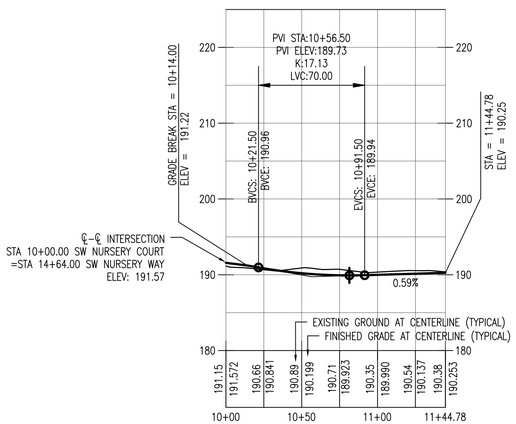
SHEET
9 OF 15



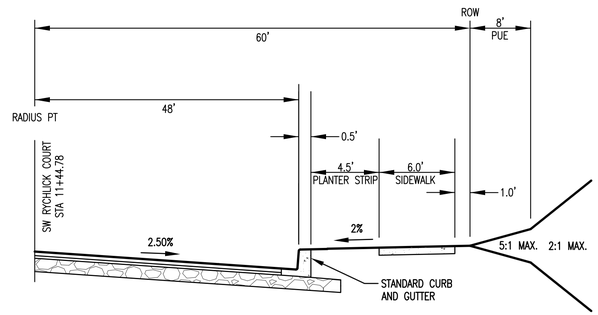
SW NURSERY WAY
Hor. Scale: 1"= 50'
Vert. Scale: 1"= 10'



SW NURSERY WAY STA 10+46.00 – STA 16+83.27
AND SW RYCHLICK COURT STA 10+34.00 – 10+81.44
CROSS–SECTION
NOT TO SCALE



SW RYCHLICK COURT
Hor. Scale: 1"= 50'
Vert. Scale: 1"= 10'



SW RYCHLICK COURT CUL–DE–SAC
CROSS–SECTION
NOT TO SCALE

PRELIMINARY STREET PROFILES AND CROSS-SECTIONS

RENAISSANCE AT RYCHLICK FARM

OREGON
WASHINGTON COUNTY TAX MAP 2S 1 30CA
SHERWOOD
TAX LOT 100

AKS ENGINEERING & FORESTRY
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13910 SW GALBREATH DR.,
SUITE 100
SHERWOOD, OR 97140
PHONE: (503) 925-8799
FAX: (503) 925-8969

DESIGNED BY:	
DRAWN BY:	JOH
CHECKED BY:	MBH
DRAWING NO.:	P1-10
SCALE:	AS NOTED

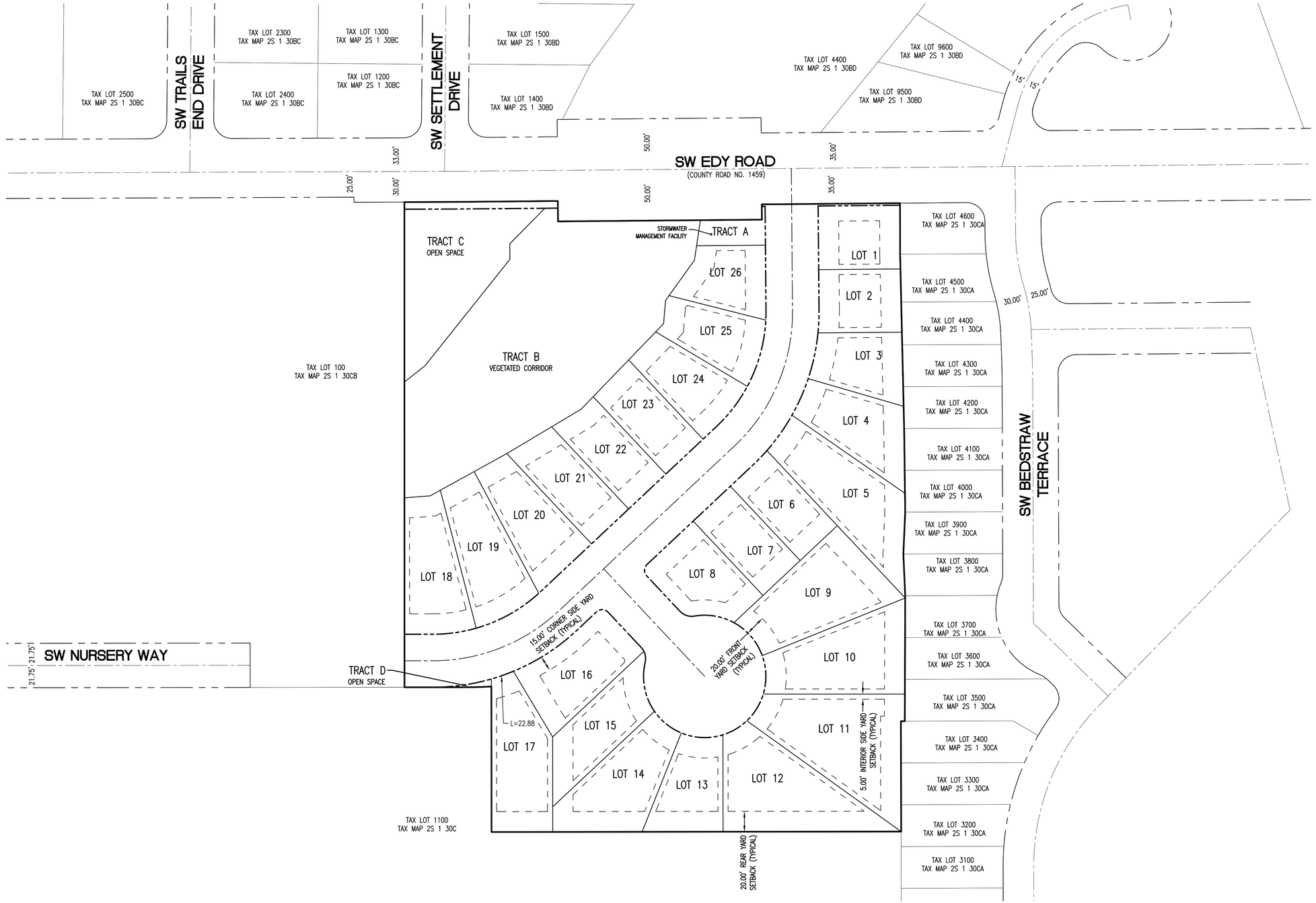
PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

DATE: 03/02/2012

REGISTERED PROFESSIONAL ENGINEER
OREGON
MAY 9, 2003
MONTGOMERY B. HURLEY
PRELIMINARY
NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/13

JOB NUMBER
2997

SHEET
10 OF 15



PRELIMINARY SETBACK PLAN

RENAISSANCE AT RYCHLICK FARM

SHERWOOD OREGON

WASHINGTON COUNTY TAX MAP 2S 1 30CA

TAX LOT 100

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SURVEYING · FORESTRY

13910 SW GALBREATH DR., SUITE 100
SHERWOOD, OR 97140
PHONE: (503) 925-8799
FAX: (503) 925-8969

DESIGNED BY:	
DRAWN BY:	JOH
CHECKED BY:	MBH
DRAWING NO.:	P1-11
SCALE:	AS NOTED

PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

DATE: 03/02/2012

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 9, 2002
MONTGOMERY B. HURLEY
PRELIMINARY NOT FOR CONSTRUCTION
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2997

SHEET
11 OF 15

PLANT LEGEND

STREET TREES AND GROUNDCOVER

SYMBOL	QTIES.	BOTANICAL NAME	COMMON NAME	CONDITION	SIZE	SPACING	CANOPY SPREAD/AREA
	40	ACER PLATANOIDES 'CLEVELAND'	CLEVELAND NORWAY MAPLE	B&B	2" CAL.	30' O.C. OR AS SHOWN	30' DIA./707 SF
	10	ACER RUBRUM 'FRANKSRED'	RED SUNSET MAPLE	B&B	2" CAL.	40' O.C. OR AS SHOWN	40' DIA./1,257 SF
	10	TILIA CORDATA	LITTLE LEAF LINDEN	B&B	2" CAL.	40' O.C. OR AS SHOWN	40' DIA./1,257 SF
		EXISTING CONIFEROUS TREE TO BE PRESERVED (TREE CANOPY VARIES, REFER TO SHEET 14 AND ARBORIST REPORT)					
		EXISTING DECIDUOUS TREE TO BE PRESERVED (TREE CANOPY VARIES, REFER TO SHEET 14 AND ARBORIST REPORT)					
		ARCTOSTAPHYLOS UVA-URSI	KINNIKINNICK	CONTAINER	1 GAL.	24" O.C.	

TOTAL NUMBER OF STREET TREES: 60

SITE TREES

SYMBOL	QTIES.	BOTANICAL NAME	COMMON NAME	CONDITION	SIZE	SPACING	CANOPY SPREAD/AREA
	9	THUJA PLICATA 'FASTIGATA'	HOGAN CEDAR	B&B	6'-8' H.	20' O.C. OR AS SHOWN	25' DIA./491 SF

TOTAL NUMBER OF SITE TREES: 9

VEGETATED COORIDOR (TRACT 'B')

SYMBOL	QTIES.	BOTANICAL NAME	COMMON NAME	CONDITION	SIZE	SPACING
	180	ALNUS RUBRA	RED ALDER	CONTAINER	1 GAL.	10' O.C.
	180	THUJA PLICATA	WESTERN RED CEDAR	CONTAINER	2 GAL.	10' O.C.
	451	ACER CIRCINATUM	VINE MAPLE	CONTAINER	1 GAL.	4'-5' O.C.
	451	OEMLERIS CERASIFORMIS	INDIAN PLUM	CONTAINER	2 GAL.	4'-5' O.C.
	451	RUBUS SPECTABILIS	SALMONBERRY	CONTAINER	1 GAL.	4'-5' O.C.
	451	SYMPHORICARPOS ALBUS	SNOWBERRY	CONTAINER	1 GAL.	4'-5' O.C.

SEED MIX (APPLY AT RATE LISTED AS NEEDED FOR BARE SOIL AREAS > 25 SF FOLLOWING INVASIVE SPECIES REMOVAL)

BROMUS CARINATUS (NATIVE CALIFORNIA BROME) APPLY AT A RATE OF 10 LBS PLS/ACRE

ELYMUS GLAUCUS (BLUE WILDRYE) APPLY AT A RATE OF 10 LBS PLS/ACRE

FESTUCA RUBRA VAR. RUBRA (NATIVE RED FESCUE) APPLY AT A RATE OF 5 LBS PLS/ACRE

LUPINUS POLYPHLLUS (LARGE-LEAFED LUPINE) APPLY AT A RATE OF 8 LBS PLS/ACRE

TOTAL NUMBER OF TREES: 360

TOTAL SHRUBS: 1,804

NOTE: SHRUB PLACEMENT SHALL BE CONSISTENT WITH NATURALLY OCCURRING PLANT COMMUNITIES. PLANT IN NATURAL APPEARING GROUPINGS. AREAS SHOWN ARE INTENDED TO DEMONSTRATE RELATIVE AREAS OF PLANTINGS. AVOID CONFLICTS WITH EXISTING NATIVE PLANTS, TREE ROOT ZONES, ETC. AND PLANT TO MINIMIZE DISTURBANCE TO EXISTING NATIVE VEGETATION TO THE MAXIMUM EXTENT PRACTICABLE. REFER TO NOTES BELOW FOR FURTHER SPECIFICATIONS.

STORMWATER FACILITY (TRACT 'A')

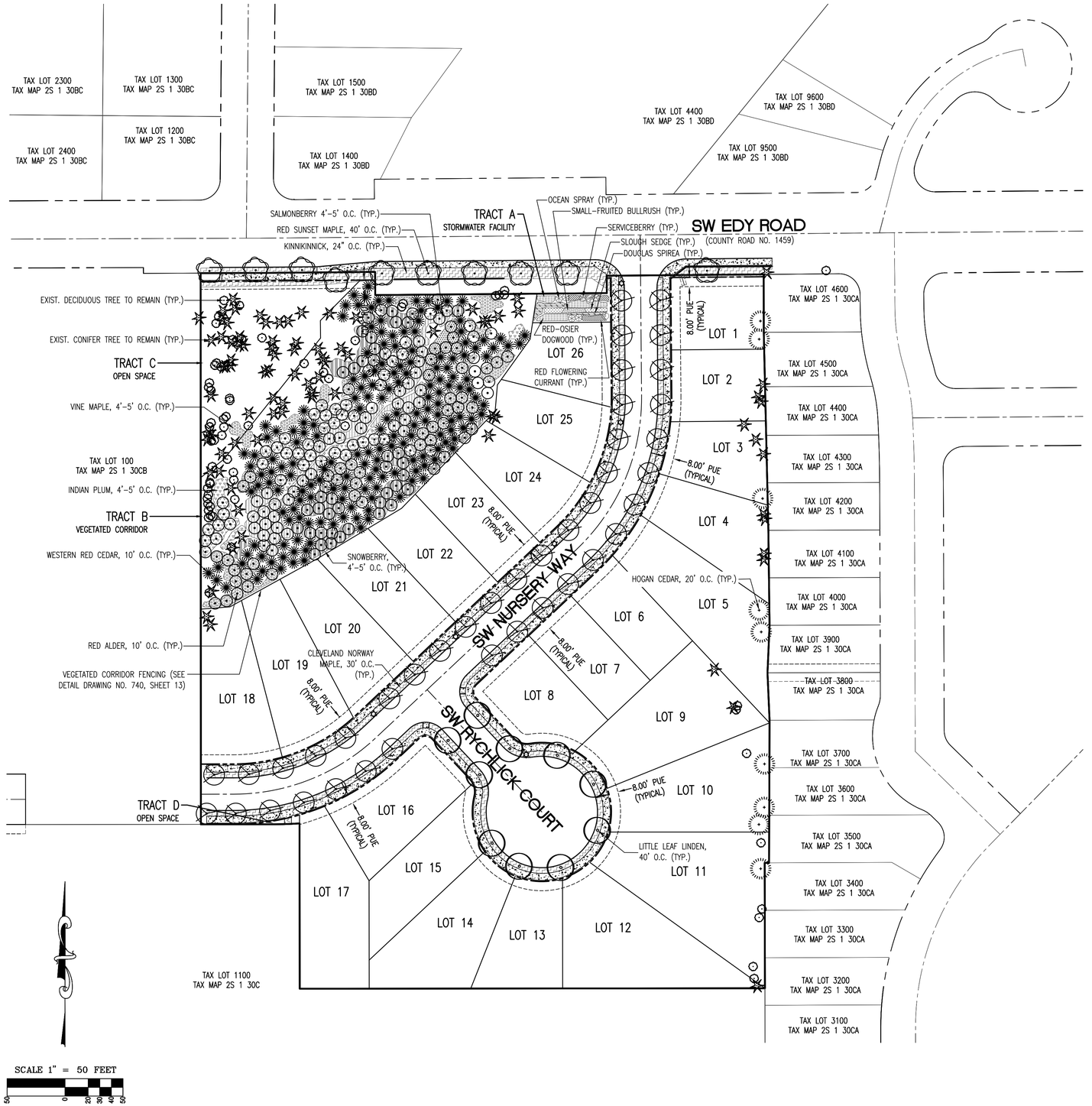
SYMBOL	QTIES.	BOTANICAL NAME	COMMON NAME	CONDITION	SIZE	SPACING
	4	ALMELANCHIER ALNIFOLIA	SERVICEBERRY	CONTAINER	1 GAL.	AS SHOWN
	40	CAREX OBNUPTA	SLOUGH SEDGE	PLUGS	6" H.	MASS; EA. PLANT 24" O.C.
	25	CORNUS SERICEA	RED-OSIER DOGWOOD	CONTAINER	1 GAL.	CLUSTER; GROUPS OF 3-4 PLANTS, EA. PLANT 24" O.C.
	4	HOLODISCUS DISCOLOR	OCEANSPRAY	CONTAINER	1 GAL.	AS SHOWN
	17	RIBES SANGUINEUM	RED FLOWERING CURRANT	CONTAINER	1 GAL.	CLUSTER; GROUPS OF 3-4 PLANTS, EA. PLANT 24" O.C.
	25	SCIRPUS MICROCARPUS	SMALL-FRUITED BULLRUSH	PLUGS	6" H.	MASS; EA. PLANT 24" O.C.
	25	SPIRAEA DOUGLASII	DOUGLAS SPIREA	CONTAINER	1 GAL.	CLUSTER; GROUPS OF 3-4 PLANTS, EA. PLANT 24" O.C.
	10	SYMPHORICARPUS ALBUS	SNOWBERRY	CONTAINER	1 GAL.	CLUSTER; GROUPS OF 3-4 PLANTS, EA. PLANT 24" O.C.
		AGROSTIS OREGONESIS	OREGON BENTGRASS	SEED		SPREAD UNDER AND AROUND ALL PLANTINGS IN ALL DRY AREAS AT A RATE RECOMMENDED BY MANUFACTURER

TOTAL SHRUBS: 85

NOTE: SHRUB PLACEMENT SHALL BE CONSISTENT WITH NATURALLY OCCURRING PLANT COMMUNITIES. PLANT IN NATURAL APPEARING GROUPINGS. AREAS SHOWN ARE INTENDED TO DEMONSTRATE RELATIVE AREAS OF PLANTINGS. REFER TO CWS DETAIL DRAWING NO. 700, SHEET 13.

LANDSCAPING NOTES:

1. PLANTS AND PLANTINGS SHALL CONFORM TO CITY OF SHERWOOD'S DESIGN STANDARDS AND AMERICAN NURSERY STANDARDS ASN 1260.1. PLANT IN ACCORDANCE WITH STANDARDS ADOPTED BY THE OREGON LANDSCAPE CONTRACTORS BOARD (OLCB).
2. SOIL MIX FOR STREET TREES: MIX 1 PART ORGANICS WITH 2 PARTS TOPSOIL
3. DOUBLE STAKE ALL STREET TREES. REFER TO DETAILS 1 AND 2 SHEET 13.
4. PLANT SPECIES, SIZES, SPACING, ETC. ARE SHOWN TO CONVEY DESIGN INTENT AND MAY BE CHANGED BY THE LANDSCAPE ARCHITECT PRIOR TO FINAL SUBMITTAL.
5. PLANTS AND PLANTING IN VEGETATED CORRIDOR AND STORMWATER FACILITY SHALL CONFORM TO CLEAN WATER SERVICES (CWS) STANDARDS REGARDING INVASIVE PLANT REMOVAL, SOIL PREPARATION, MAINTENANCE, MONITORING, ETC. REFER ALSO TO SWCA ENVIRONMENTAL CONSULTANT'S NATURAL RESOURCE ASSESSMENT DATED MARCH 1, 2012.
6. PLACE KINNIKINNICK GROUNDCOVER 24" O.C. TRIANGULARLY SPACED BETWEEN CURB AND SIDEWALK ON EVERY STREET. KEEP A MINIMUM 3' O.C. AWAY FROM TREE TRUNKS.
7. REFER TO SHEET 14 FOR TREE CANOPY AREAS AND CALCULATIONS.



SCALE 1" = 50 FEET

50 0 25 50 100

PRELIMINARY STREET TREE, LANDSCAPING, VISUAL CORRIDOR, STREETLIGHT, AND FENCING PLAN

RENAISSANCE AT RYCHLICK FARM

SHERWOOD OREGON

WASHINGTON COUNTY, TAX MAP 2S 1 30CA

TAX LOT 100

AKS ENGINEERING & FORESTRY
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13910 SW GALBREATH DR., SUITE 100
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PHONE: (503) 925-8799
FAX: (503) 925-8969

DESIGNED BY:	JHII
DRAWN BY:	KAH
CHECKED BY:	JHII
DRAWING NO.:	P1-12
SCALE:	AS NOTED

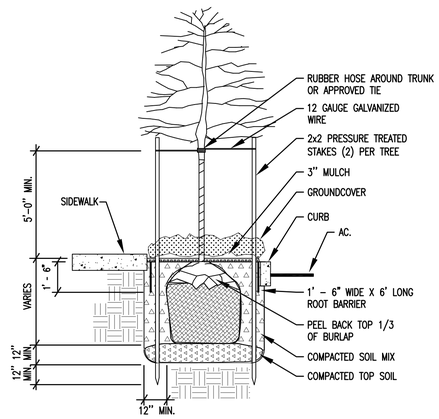
PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

DATE: 03/02/2012

REGISTERED LANDSCAPE ARCHITECT
OREGON
JAMES H. HENSLEY II
EXPIRES: 6/30/2013
PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER
2997

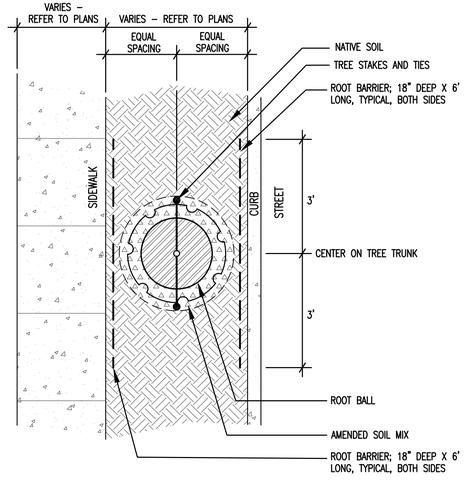
SHEET
12 OF 15



1 TYPICAL STREET TREE PLANTING DETAIL

NTS

NOTES:
1. DRIVE STAKES OUTSIDE OF ROOTBALL PARALLEL TO STREET AND SIDEWALK. SINGLE STAKE TREES LESS THAN 6' TALL.
2. SET TREE 2" ABOVE FINISH GRADE TO ALLOW FOR SETTLING OF SOIL.
3. PROVIDE A 6' LONG ROOT BARRIER NEXT TO SIDEWALK AND CURB. CENTER BARRIER ON TREE TRUNK
4. SOIL MIX FOR TREE PLANTING TO BE 1/3 ORGANIC MATERIALS, 1/3 TOPSOIL, AND 1/3 SANDY LOAM.



2 TYPICAL STREET TREE DETAIL PLAN

NTS

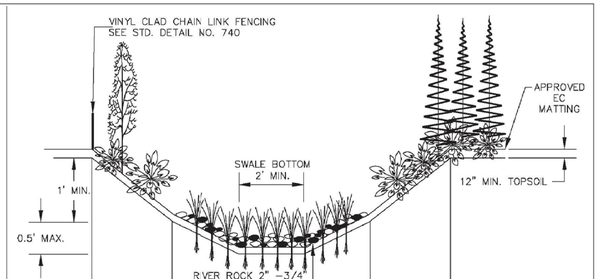
NOTES:
1. DRIVE STAKES OUTSIDE OF ROOTBALL, PARALLEL TO STREET AND SIDEWALK. SINGLE STAKE TREES LESS THAN 6' TALL.
2. SET TREE 2" ABOVE FINISH GRADE TO ALLOW FOR SETTLING OF SOIL.
3. PROVIDE A 6' LONG ROOT BARRIER NEXT TO SIDEWALK AND CURB. CENTER BARRIER ON TREE TRUNK
4. SOIL MIX FOR TREE PLANTING TO BE 1/3 ORGANIC MATERIALS, 1/3 TOPSOIL, AND 1/3 SANDY LOAM.

DRAWING NO. 700

WATER QUALITY SWALE

REVISED 12-06

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SWALE AREA	FREEBOARD AREA	TREATMENT AREA 6' MINIMUM WIDTH			FREEBOARD AREA	BUFFER/MITIGATION AREA
EC MATTING	ECONOJUTE*	COCONUT FIBER OR GEOJUTE PLUS*			ECONOJUTE*	ECONOJUTE* (S> 20%)
SEED MIX	LOW GROW MIX SEE NOTE #5	NONE			LOW GROW MIX SEE NOTE #5	AS APPROVED BY DISTRICT OR CITY
MAX. SLOPE	2.5:1	4:1	FLAT BOTTOM	4:1	2.5:1	NA

* OR AS APPROVED

NOTES:
1. REFER TO APPENDIX A, CWS DESIGN & CONSTRUCTION STANDARDS, FOR LANDSCAPING REQUIREMENTS INCLUDING TREE PLACEMENT, TOPSOIL AND PLANTING SPECIFICATIONS.
2. PROVIDE IRRIGATION AS APPROVED BY CWS.
3. JUTE MATTING- GEOJUTE PLUS IN TREATMENT AREA, ECONOJUTE FOR ALL OTHER AREAS, OR SIMILIAR FABRICS. COCONUT FIBER IS ALSO ACCEPTABLE.
4. 12–INCHES OF TOPSOIL SHALL BE PLACED THROUGHOUT THE WATER QUALITY TRACT.
5. FREEBOARD AREA SEED MIX, DWARF TALL FESCUE 40%, DWARF PERENIAL RYE 30% CREEPING RED FESCUE 25%, COLONIAL BENT GRASS 5%. APPLY AT A RATE OF 120# / ACRE.

DRAWING NO. 740

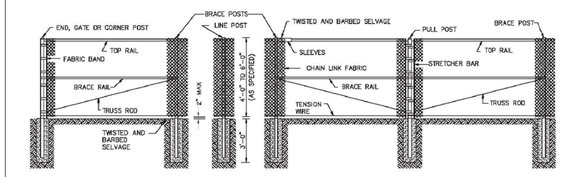
CHAIN LINK FENCE AND GATE

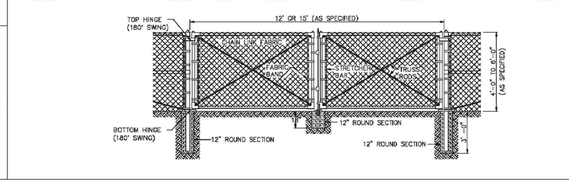
REVISED 12-06

CleanWater Services
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MEMBER	NOMINAL DIA (IN)	MATERIAL
BRACE RAIL	1.660	GALV TUBULAR STL
GATE FRAME	2.00	GALV TUBULAR STL
LINE POSTS	2.375	GALV TUBULAR STL
END & CORNER POST	2.875	GALV TUBULAR STL
CHAIN LINK FABRIC		9 GA W/GREEN OR BLACK PVC COATING
	GATE OPENING (S)	NOMINAL DIA (IN)	MATERIAL
GATE POST	12' OR 15'	4	GALV TUBULAR STL

NOTES:
1. ALL FITTINGS, FASTENERS, & AND FABRIC TIES SHALL BE HOT DIP GALV.
2. CONC SHALL BE MIN 2500 PSI @ 28 DAYS.
3. PROVIDE BRACE RAIL BETWEEN END POSTS AND LINE POSTS. LENGTHS AS REQ'D.
4. PROVIDE GATE STOPS AND DROP RECEIVERS SET IN CONCRETE, EACH GATE.
5. PROVIDE EXTENSION ARMS ON LINE, END AND CORNER POSTS & GATE POSTS AS REQ'D.
6. PROVIDE SIGHT OBSCURING SLATS WITH ALL WASTEWATER PUMP STATIONS.
7. CENTER BRACE RAIL NOT REQUIRED WITH FENCE HEIGHT OF 5' OR LESS.
8. ALL POSTS AND RAILS TO MATCH FENCE COLOR.





CONSTRUCTION

1. Water Quality Swale shall be over-excavated and filled to final grade with 12-inch amended topsoil. Topsoil amendments shall be garden compost, not conventional fertilizer amendments.
2. A biodegradable Erosion Control Matting shall be placed over the topsoil throughout the swale cross section, fabric shall be held in place in accordance with the manufacturer's installation requirements. Anchor spacing shall be based on 3 fps flow over the fabric.
   a. Treatment area - high-density jute matting (Geojute Plus or other approved equal)
   b. All other areas - low-density jute matting (Econojute or other approved equal)
3. 2.5-3 inches of 2"-¾" river run rock shall be placed over the matting evenly throughout the length and width of the swale.
4. Plant materials shall be placed in accordance with the plan and plant table as shown on approved plans.
5. The water quality swale treatment area plantings can be deemed "substantially complete" once active green growth has occurred to an average growth of 3" and plant density is an average of approx. 6 plants (minimum 1-inch plugs or equivalent) per square foot.
6. The facility shall be deemed acceptable to begin the maintenance period when plant growth and density matches the engineer's design as shown on the approved plans and all other requirements have been met. The engineer must certify the facility to be functional, in accordance with the approved plan design to begin the two-year maintenance period.

MAINTENANCE

1. The permittee is responsible for the maintenance of this facility for a minimum of two years following construction and acceptance of this facility per Chapter 2.
2. Irrigation is to be provided per separate irrigation plan as approved.
   Note: Irrigation needs are to be met using a temporary irrigation system with a timer during the dry season. Systems should be winterized during the wet season to assure longevity and guard against damage from freezing temperatures. Water source shall be as shown on the approved plans.
3. Engineer or Owners Representative is to visit and evaluate the site a minimum of twice annually (Spring and Fall). The landscaping shall be evaluated and replanted as necessary to ensure a minimum of 80% survival rate of the required vegetation and 90% aerial coverage. Non-native, invasive plant species shall be removed when occupying more than 20% of the site.
4. The facility shall be re-excavated and planted if siltation greater than 3 inches in depth occurs within the two-year maintenance period.

WATER QUALITY SWALE CONSTRUCTION & MAINTENANCE NOTES

DETAIL NO. 710

REVISED 12-06

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PRELIMINARY
LANDSCAPING AND FENCING DETAILS

RENAISSANCE AT RYCHLICK FARM

SHERWOOD OREGON
WASHINGTON COUNTY TAX MAP 2S 1 30CA
TAX LOT 100

AKS ENGINEERING & FORESTRY
ENGINEERING · PLANNING
SURVEYING · FORESTRY
13910 SW GALBREATH DR., SUITE 100
SHERWOOD, OR 97140
PHONE: (503) 925-8799
FAX: (503) 925-8969

DESIGNED BY:	JHII
DRAWN BY:	KAH
CHECKED BY:	JHII
DRAWING NO.:	P1-13
SCALE:	AS NOTED

PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

DATE: 03/02/2012

REGISTERED LANDSCAPE ARCHITECT
OREGON
JAMES H. HENSLEY II
EXPIRES: 6/30/13
PRELIMINARY
NOT FOR CONSTRUCTION

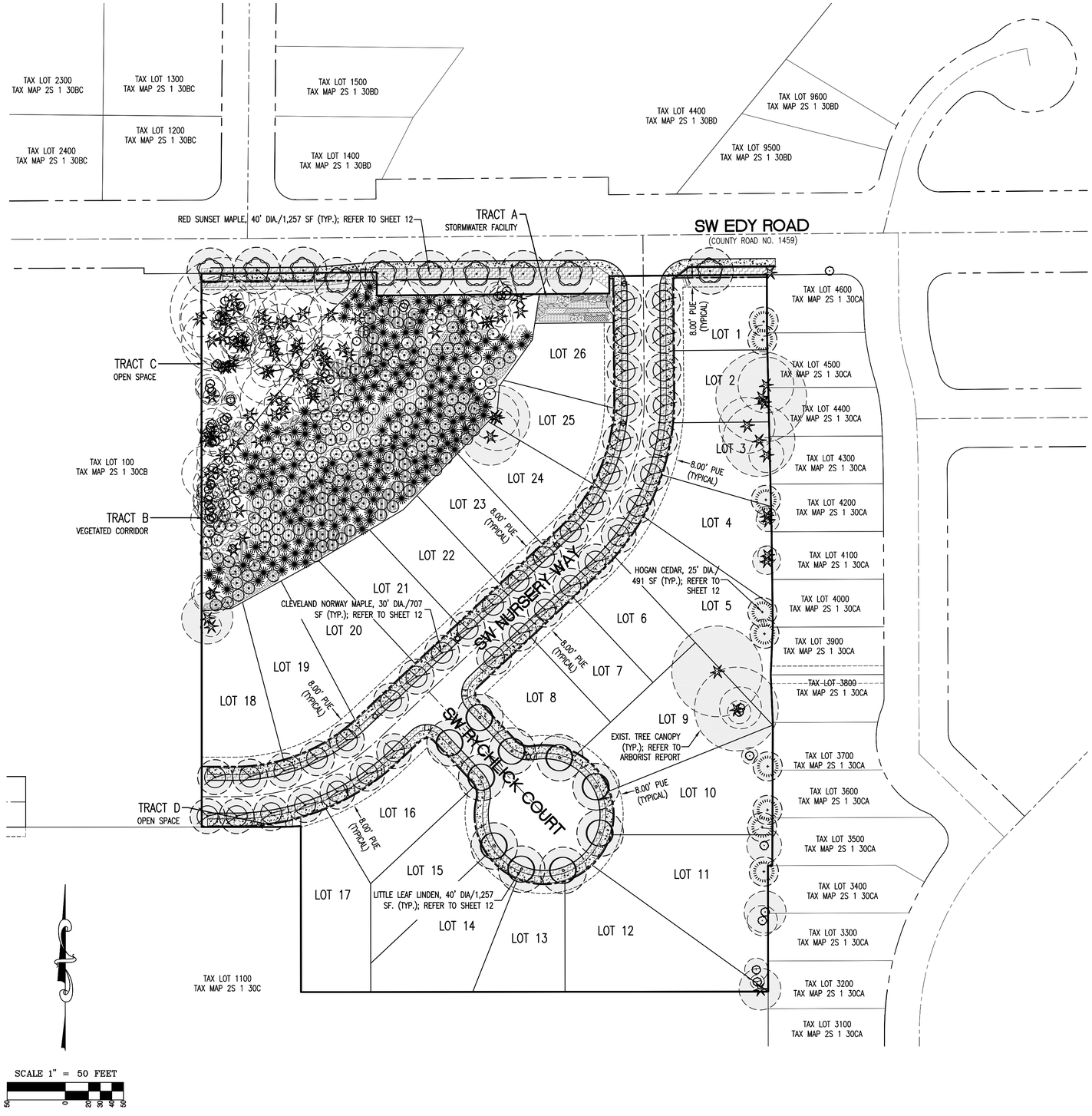
JOB NUMBER
2997

SHEET
13 OF 15

CANOPY OUTLINE

QUALIFYING CANOPY AREA

NET DEVELOPABLE AREA: 178,655 SF
TOTAL TREE CANOPY OF EXISTING TREES, STREET TREES AND TREES WITHIN NET DEVELOPABLE AREA: 78,699 SF
PERCENTAGE OF TREE CANOPY COVERAGE: 44%



PRELIMINARY
TREE CANOPY PLAN

RENAISSANCE AT RYCHLICK FARM

SHERWOOD
TAX LOT 100

OREGON
WASHINGTON COUNTY TAX MAP 2S 1 30CA

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DESIGNED BY:	JHII
DRAWN BY:	KAH
CHECKED BY:	JHII
DRAWING NO.:	P1-12
SCALE:	AS NOTED

PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

DATE: 03/02/2012

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JAMES H. HENSLEY II
EXPIRES: 6/30/2013
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JOB NUMBER
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SHEET
14 OF 15

CITY BOUNDARY

ZONE: PUD LDR

TAX LOT 2500
TAX MAP 2S 1 30BC

SW TAILS END DRIVE

ZONE: PUD LDR

TAX LOT 2300
TAX MAP 2S 1 30BC

TAX LOT 1300
TAX MAP 2S 1 30BC

TAX LOT 1200
TAX MAP 2S 1 30BC

TAX LOT 2400
TAX MAP 2S 1 30BC

SWEETTLEMENT DRIVE

ZONE: PUD LDR

TAX LOT 1500
TAX MAP 2S 1 30BD

TAX LOT 1400
TAX MAP 2S 1 30BD

TAX LOT 4100
TAX MAP 2S 1 30BD

TAX LOT 9600
TAX MAP 2S 1 30BD

TAX LOT 9500
TAX MAP 2S 1 30BD

SW EDY ROAD
(COUNTY ROAD NO. 1459)

ZONE: MDRH

SW COPPER TERRACE

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

TAX LOT 100
TAX MAP 2S 1 30CB

ZONE: MDRL

TRACT C
OPEN SPACE

STORMWATER MANAGEMENT FACILITY

TRACT A

LOT 26

LOT 25

LOT 24

LOT 23

LOT 22

LOT 21

LOT 20

LOT 19

LOT 18

TRACT B
VEGETATED CORRIDOR

LOT 1

LOT 2

LOT 3

LOT 4

LOT 5

LOT 6

LOT 7

LOT 8

LOT 9

LOT 10

LOT 11

LOT 12

LOT 13

LOT 14

LOT 15

LOT 16

LOT 17

TAX LOT 4600
TAX MAP 2S 1 30CA

TAX LOT 4500
TAX MAP 2S 1 30CA

TAX LOT 4400
TAX MAP 2S 1 30CA

TAX LOT 4300
TAX MAP 2S 1 30CA

TAX LOT 4200
TAX MAP 2S 1 30CA

TAX LOT 4100
TAX MAP 2S 1 30CA

TAX LOT 4000
TAX MAP 2S 1 30CA

TAX LOT 3900
TAX MAP 2S 1 30CA

TAX LOT 3800
TAX MAP 2S 1 30CA

TAX LOT 3700
TAX MAP 2S 1 30CA

TAX LOT 3600
TAX MAP 2S 1 30CA

TAX LOT 3500
TAX MAP 2S 1 30CA

TAX LOT 3400
TAX MAP 2S 1 30CA

TAX LOT 3300
TAX MAP 2S 1 30CA

TAX LOT 3200
TAX MAP 2S 1 30CA

TAX LOT 3100
TAX MAP 2S 1 30CA

ZONE: PUD LDR

SW BEDSTRAW TERRACE

ZONE: PUD LDR

ZONE: PUD LDR

SW NURSERY WAY

TRACT D
OPEN SPACE

ZONE: IP

TAX LOT 1100
TAX MAP 2S 1 30C

ZONE BOUNDARY: ———

CIRCULATION ROUTE: + + + + +
(EXISTING AND CONCEPTUAL FUTURE)

CONCEPTUAL GENERAL CIRCULATION, ZONING, AND SURROUNDING LAND USES WITH AERIAL PHOTOGRAPH PLAN

RENAISSANCE AT RYCHLICK FARM

OREGON
WASHINGTON COUNTY TAX MAP 2S 1 30CA
SHERWOOD
TAX LOT 100

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FAX: (503) 925-8969

DESIGNED BY:	
DRAWN BY:	JOH
CHECKED BY:	MBH
DRAWING NO.:	P1-14
SCALE:	AS NOTED

PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

DATE: 03/02/2012

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 9, 2007
MONTGOMERY B. HURLOW
RENEWAL DATE: 6/30/13

EXHIBIT
NOT FOR CONSTRUCTION

JOB NUMBER
2997

SHEET
15 OF 15

GeoPacific Engineering, Inc.

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

February 3, 2012
Project No. 11-2487

Randy Sebastian
Renaissance Homes
16771 Boones Ferry Road
Lake Oswego, Oregon 97035

CC: Monty Hurley, AKS Engineering & Forestry via email: monty@aks-eng.com

SUBJECT: GEOTECHNICAL ENGINEERING REPORT
RENAISSANCE AT RYCHLICK SUBDIVISION
17806 SW EDY ROAD
SHERWOOD, OREGON

This report presents the results of a geotechnical engineering study conducted by GeoPacific Engineering, Inc. (GeoPacific) for the above-referenced project. The purpose of our investigation was to evaluate subsurface conditions at the site and to provide geotechnical recommendations for site development. This geotechnical study was performed in accordance with GeoPacific Proposal No. P-4092, dated December 14, 2011, and your subsequent authorization of our proposal and *General Conditions for Geotechnical Services*.

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The subject site is approximately 6.6 acres in size and located on the south side of SW Edy Road in the City of Sherwood, Washington County, Oregon. The headwater of a tributary to Cedar Creek is present in the northwestern portion of the site. Topography is gently sloping towards the creek at grades of approximately 5 percent or less. Grades steepen to 75 percent adjacent to the drainage. The site is currently occupied by one home, two outbuildings and vegetation consists primarily of short grasses, brambles, and dense to sparse trees.

A site plan indicates the proposed development includes 27 lots for single family homes, approximately 900 lineal feet of new public streets, a storm water facility, and associated underground utilities. Retaining walls may be incorporated into the storm water facility. A grading plan has not been provided for our review; however, it is our understanding a deep cut will be required to connect Nursery Way to SW Edy Road. Grading for the lots will be on the order of a few feet.

REGIONAL AND LOCAL 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 is underlain by the Quaternary age (last 1.6 million years) Willamette Formation, a catastrophic flood deposit associated with repeated glacial outburst flooding of the Willamette Valley (Madin, 1990). The last of these outburst floods occurred about 10,000 years ago. In the Tualatin basin, these deposits consist of horizontally layered, micaceous, silt to coarse sand forming poorly-defined to distinct beds less than 3 feet thick. Locally, the flood deposits are mantled by a thin layer of loess (windblown silt) that is difficult to distinguish from the water deposited silt.

Underlying the Willamette Formation is an unnamed sequence of non-marine, fine-grained strata that consists of moderately to poorly lithified siltstone, sandstone, mudstone, and claystone with common wood fragments and minor volcanic ash and pumice (Yeats et al., 1996). These rocks are tentatively correlated with the Sandy River Mudstone, and the Troutdale and Helvetia Formations. The unnamed strata rest on Miocene (about 14.5 to 16.5 million years ago) Columbia River Basalt, a thick sequence of lava flows which forms the crystalline basement of the basin.

REGIONAL SEISMIC SETTING

At least three major fault zones capable of generating damaging earthquakes are thought to exist in the vicinity of the subject site. These include the Portland Hills Fault Zone, the Gales Creek-Newberg-Mt. Angel Structural Zone, and the Cascadia Subduction Zone.

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 12 miles northeast of the site. The Oatfield Fault occurs along the western side of the Portland Hills, and is about 10 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 8.5 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 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 Fault or Newberg Fault; 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 approximately 50 miles west of the Portland Basin at depths of between 20 and 40 kilometers below the surface.

FIELD EXPLORATION

Our site-specific exploration for this report was conducted on January 10th, 2012. One exploratory boring was drilled to a depth of 26.5 feet and a total of 9 exploratory test pits were excavated with a medium sized trackhoe to depths ranging between 8 and 10 feet at the approximate locations shown on Figure 2. It should be noted that test pit 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 borehole was drilled using a trailer-mounted drill rig and solid stem auger methods. 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 test pits and boring. Soils observed in the explorations were classified in general accordance with the Unified Soil Classification System. During exploration, our geologist also noted geotechnical conditions such as soil consistency, moisture and groundwater conditions. Logs of test pits and boring are attached to this report. The following report sections are based on the exploration program and summarize subsurface conditions encountered at the site.

Existing Fill: Undocumented fill was encountered in test pit TP-5 and generally consisted of about 2.5 feet of medium stiff SILT (ML-OL) with organics and woody debris throughout. This material may have been associated with the logging that occurred at the property within the last few years. Other areas of fill may be present in the vicinity of SW Edy Road and the existing structures.

Topsoil Horizon: With the exception of test pit TP-5, the ground surface in explorations was a topsoil horizon consisting of brown, moderately to highly organic SILT (OL-ML). The topsoil horizon contained many fine roots, was generally loose, and characterized by a medium stiff consistency. In explorations, the topsoil horizon was approximately 9 to 12 inches in thickness.

Native Soil Horizon: Underlying the topsoil horizon in explorations was SILT (ML) formed by in place decomposition of the underlying Willamette Formation. The light brown silt was generally characterized by a medium stiff to very stiff consistency and displayed strong orange and gray mottling. Field pocket penetrometer measurements indicate an approximate unconfined compressive strength of 0.5 to 4.5 tons/ft^2. In explorations, the native soil horizon extended to a depth of approximately 5 to 6 feet below the ground surface.

Willamette Formation: Underlying the native soil horizon in boring B-1 and test pits TP-1 through TP-9 was SILT (ML) with trace fine grained sand belonging to the Willamette Formation. The silt was generally characterized by a stiff to very stiff consistency and generally exhibited subtle orange and gray mottling. In boring B-1, material from the Willamette Formation extended beyond the maximum depth of exploration (26.5 feet).

Soil Moisture and Groundwater

On January 10, 2012, soils encountered in explorations were moist. Minor groundwater seepage was encountered in test pit TP-1 at a depth of 9 feet. Discharge was visually estimated at one gallon per minute or less. 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.

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. Along the drainage in the northwestern portion of the site, slope stability can be maintained with a 15-foot setback from the break in the slope. This 15-foot setback line coincides with the edge of the vegetated corridor.

Site Preparation

Areas of proposed buildings, streets, and areas to receive fill should be cleared of vegetation and any organic and inorganic debris. Existing buried structures (such as septic tanks) should be demolished and any cavities structurally backfilled, if encountered. Inorganic debris and organic materials from clearing should be removed from the site.

Organic-rich topsoil should then be stripped from construction areas of the site or where engineered fill is to be placed. The estimated average necessary depth of removal in undisturbed

areas for moderately organic soils is about 9 to 12 inches. Deeper removal depths may be required in highly treed 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. We anticipate that areas of undocumented fill likely exist in the vicinity of the existing structures, driveway, and near SW Edy Road.

Once topsoil has been stripped, a proof roll should be performed directly on exposed soils in order to verify subgrade strength. We recommend proof-rolling directly on subgrade soils with a loaded dump truck during dry weather. Soils in soft areas that pump, rut, or weave should be removed and replaced as engineered fill (see section below) prior to pouring foundations or paving.

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.

Engineered Fill

All grading for the proposed construction 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. 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.

Excavating Conditions and Utility Trenches

We anticipate that on-site soils can be excavated using conventional heavy equipment such as trackhoes to a depth of 12 feet. All temporary cuts in excess of 4 feet in height should be sloped in accordance with U.S. Occupational Safety and Heath Administration (OSHA) regulations (29 CFR Part 1926), or be shored. The existing native soil is classified 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 Standard Proctor ASTM D698 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.

Erosion Control Considerations

During our field exploration program, we did not observe soil types that would be considered highly susceptible to erosion. 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.

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
- Bales of straw and/or geotextile silt fences 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.

Pavement Design

For design purposes, we used an estimated resilient modulus of 6,000 for a compacted soil subgrade. Table 1 presents our recommended minimum pavement section for dry weather construction.

Table 1 - Recommended Minimum Dry-Weather Pavement Section

Material Layer	Private Streets and Driveways	Public Street SW Nursery Way	Compaction Standard upper/lower lifts
Asphaltic Concrete (AC)	3 in.	5.5 in.	91%/ 92% of Rice Density AASHTO T-209
Crushed Aggregate Base ¾"-0 (leveling course)	2 in.	2 in.	95% of Modified Proctor AASHTO T-180
Crushed Aggregate Base 1½"-0	10 in.	14 in.	95% of Modified Proctor AASHTO T-180
Subgrade	12 in.	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.

Foundations

The proposed 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 12 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 two No. 4 bars at the tops of stem walls, and two No. 4 bars at the bottom of footings. Concrete slab-on-grade reinforcement should consist of No. 4 bars placed on 24-inch centers in a grid pattern.

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 column load of 100 kips is assumed. 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 0.40, 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. GeoPacific should review the foundation excavation prior to placement. 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 construction incorporating raised wood floors and conventional spread footing foundations. If 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.

Concrete Slabs-on-Grade

The proposed buildings may incorporate concrete slabs-on-grade. At a minimum, designers of interior slab-on-grade floors at any site should provide an adequate moisture break and vapor retarder; geotechnical consultants are not experts in the field of vapor transmission. The following discussion is intended to aid the designer similar to discussions in found in publications from ACI, ASTM, PTI or the IRC.

The site is located on relatively impermeable soils such that shallow, perched storm water is expected during much of the year in the near-surface soils surrounding the buildings. In addition, compacted fill consisting of on-site soils will similarly impede surface runoff from passing vertically downward through the soil. Unexpected poor surface drainage within and around the building could allow water to conduct and/or concentrate beneath a slab-on-grade. Though generally not required, as a precaution in the event water gets beneath the slab-on-grade, underslab drains can be incorporated beneath every living unit or confined foundation cell. These drains can tie into the perimeter footing drains provided they have positive drainage and should be similarly constructed. Due to these soil and groundwater conditions, we recommend that a qualified firm be engaged to evaluate vapor transmission paths and potential adverse impacts on various components of the structure.

The outside edge of all perimeter footings and the interior of portion of every unit or foundation cell should be provided with a perimeter footing and underslab drainage system consisting of 3-inch diameter, perforated, rigid plastic pipe embedded in a minimum of 1 ft^3 per lineal foot of clean, free-draining gravel or ¾-0" rock. The use of thin-walled, collapsible plastic pipe should be avoided. Water collected from the footing drains should be directed into the local storm drain system or other suitable outlet. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet

A capillary moisture break material should consist of free-draining, crushed rock such as consisting of 19mm-6.3mm from Section 02680.20 of the 1998 ODOT Supplemental Standard Specifications

for Highway Construction. For dry-weather construction, the minimum recommended thickness of capillary break materials on re-compacted soil subgrade is 12 inches. The actual thickness of crushed aggregate will also be dependent on the subgrade and drainage conditions at the time of construction. Under-slab aggregate should be compacted to at least 95 percent of its maximum dry density as determined by ASTM D698 (Standard Proctor) or equivalent.

In areas where moisture will be detrimental to floor coverings or equipment inside the proposed structures, a minimum 10-mil polyethylene vapor retarder should be placed directly over the capillary break and beneath the slab. Consideration may be given to providing additional or alternate protection to reduce the potential for damp floors and damage to flooring, including the following:

- Utilize flooring and building materials that are not moisture sensitive.
- Raise the building grade and thicken the rock moisture break (often at odds with ADA requirements).
- Utilize hardscaping as much as feasible keeping irrigated landscape areas farther away from the building.
- Apply a moisture intrusion retarder on the slab (Preseal, Creteseal or approved equivalent) to the surface of the concrete.
- Maintain a slab water cement ratio of 0.42 or less utilizing mid-range plasticizers.
- Utility trenches should slope away from the building.

Vapor retarder products should be installed in accordance with manufacturer recommendations. The building should be complete and the HVAC system operating for a period of time during wet weather before moisture-sensitive flooring is applied. This time period should be long enough to allow the vapor gradient within and below the building to stabilize and obtain acceptable slab moisture content.

Seismic Design

Structures should be designed to resist earthquake loading in accordance with the methodology described in the 2006 International Residential Code (IRC) for One- and Two-Family Dwellings, with applicable Oregon Structural Specialty Code (OSSC) revisions. We recommend Site Class D be used for design per the OSSC, Table 1613.5.2. Design values determined for the site using the USGS (United States Geological Survey) *Earthquake Ground Motion Parameters* utility are summarized below.

February 3, 2012
Project No. 11-2487

Table 2. Recommended Earthquake Ground Motion Parameters (2006 IBC / 2007 OSSC)

Parameter	Value
Location (Lat, Long), degrees	45.367, -122.861
Mapped Spectral Acceleration Values (MCE):	
Short Period, S_s	0.88 g
1.0 Sec Period, S_1	0.33 g
Soil Factors for Site Class D:	
F_a	1.15
F_v	1.74
Residential Site Value = 2/3 x F_a x S_s	0.67 g
Residential Seismic Design Category	D_1

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. Following development, on-site soils will consist predominantly of stiff native fine-grained soils, which are not considered susceptible to liquefaction. Therefore, it is our opinion that special design or construction measures are not required to mitigate the effects of liquefaction.

Drainage

The outside edge of perimeter footings should be provided with a drainage system consisting of 3-inch diameter, slotted, flexible plastic pipe embedded in a minimum of 1 ft^3 per lineal foot of clean, free-draining gravel or 1 1/2" - 3/4" 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. Water collected from the footing drains should be directed into the local storm drain system or other suitable outlet. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. Down spouts and roof drains should not be connected to the foundation drains in order to reduce the potential for clogging. The footing drains should include clean-outs to allow periodic maintenance and inspection. Grades around the proposed structure should be sloped such that surface water drains away from the building. Perimeter footing drains are recommended to prevent detrimental effects of groundwater on foundations, and should not be expected to eliminate all potential sources of water entering a crawlspace or beneath a slab-on-grade. An adequate grade to a low point outlet drain in the crawlspace is required by code. Underslab drains are sometimes added beneath the slab when placed over soils of low permeability and shallow, perched groundwater.

February 3, 2012
Project No. 11-2487

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.

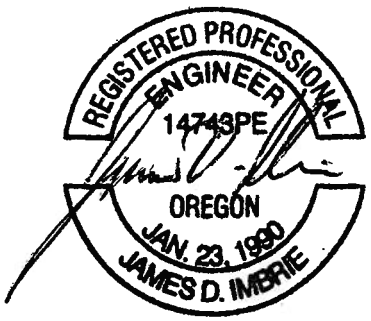
Sufficient geotechnical monitoring, testing and consultation should be provided during construction to confirm that the conditions encountered are consistent with those indicated by explorations. The checklist attached to this report outlines recommended geotechnical observations and testing for the 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 attempted to execute these services in accordance with generally accepted professional principles and practices in the fields of geotechnical engineering and engineering geology 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.



EXPIRES: 06/30/2013

Beth K. Rapp, G.I.T.
Project Geologist

James D. Imbrie, G.E., C.E.G.
Principal Geotechnical Engineer

Attachments: References
Checklist of Recommended Geotechnical Testing and Observation
Figure 1 – Vicinity Map
Figure 2 – Site and Exploration Plan
Boring Log (B-1)
Test Pit Logs (TP-1 – TP-9)

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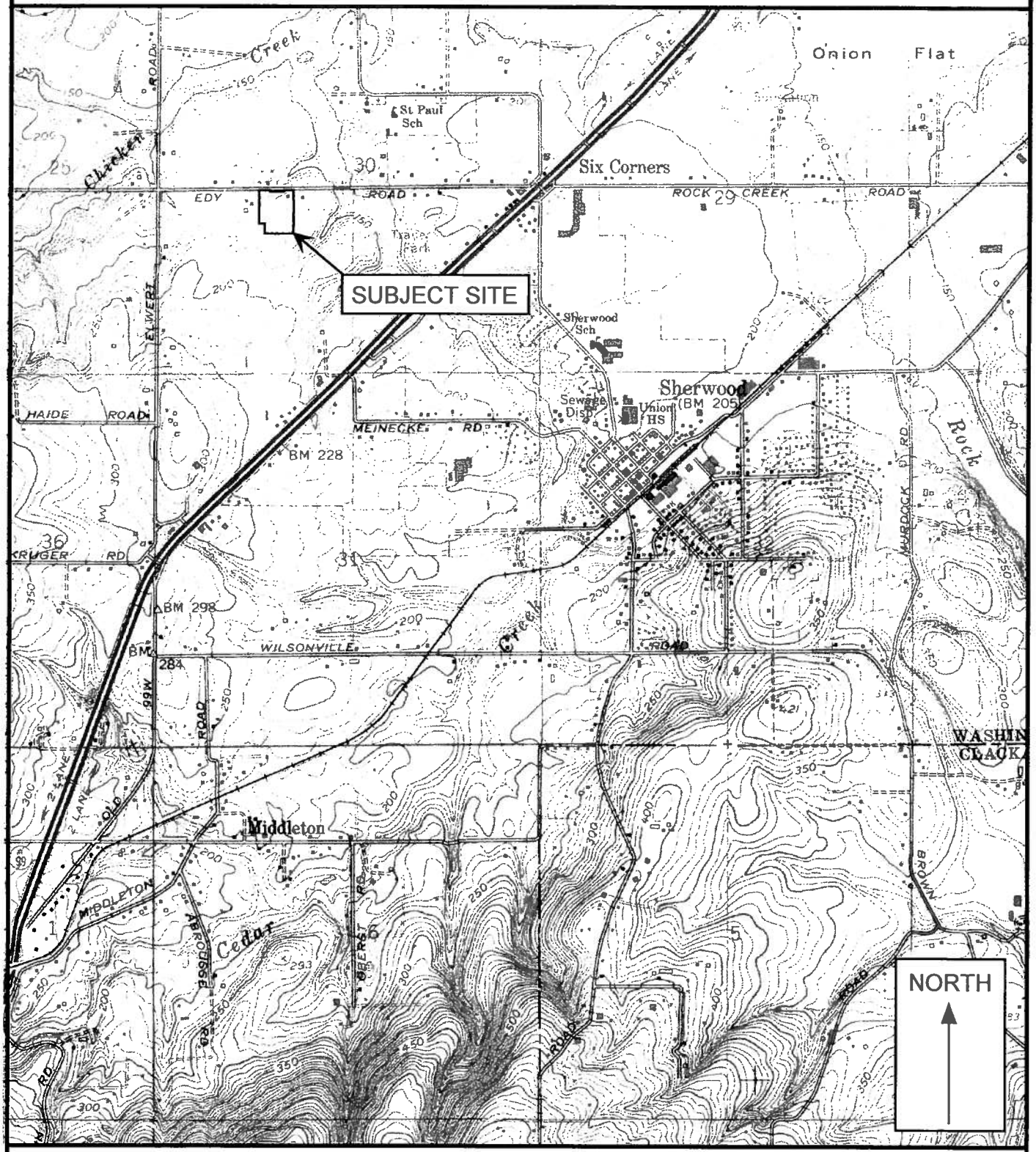
February 3, 2012
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CHECKLIST OF RECOMMENDED GEOTECHNICAL TESTING AND OBSERVATION

Item No.	Procedure	Timing	By Whom	Done
1	Preconstruction meeting	Prior to beginning site work	Contractor, Developer, Civil and Geotechnical Engineers	
2	Fill removal from site or sorting and stockpiling	Prior to mass stripping	Soil Technician/ Geotechnical Engineer	
3	Stripping, aeration, and root-picking operations	During stripping	Soil Technician	
4	Compaction testing of engineered fill (95% of Standard Proctor)	During filling, tested every 2 vertical feet	Soil Technician	
5	Compaction testing of trench backfill (95% of Standard Proctor)	During backfilling, tested every 4 vertical feet for every 200 lineal feet	Soil Technician	
6	Street Subgrade Compaction (95% of Standard Proctor)	Prior to placing base course	Soil Technician	
7	Base course compaction (95% of Modified Proctor)	Prior to paving, tested every 200 lineal feet	Soil Technician	
8	AC Compaction (91% (bottom lift) / 92% (top lift) of Rice)	During paving, tested every 200 lineal feet	Soil Technician	
9	Final Geotechnical Engineer's Report	Completion of project	Geotechnical Engineer	

GeoPacific Engineering, Inc.
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Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

VICINITY MAP



Legend

Approximate Scale 1 in = 2,000 ft

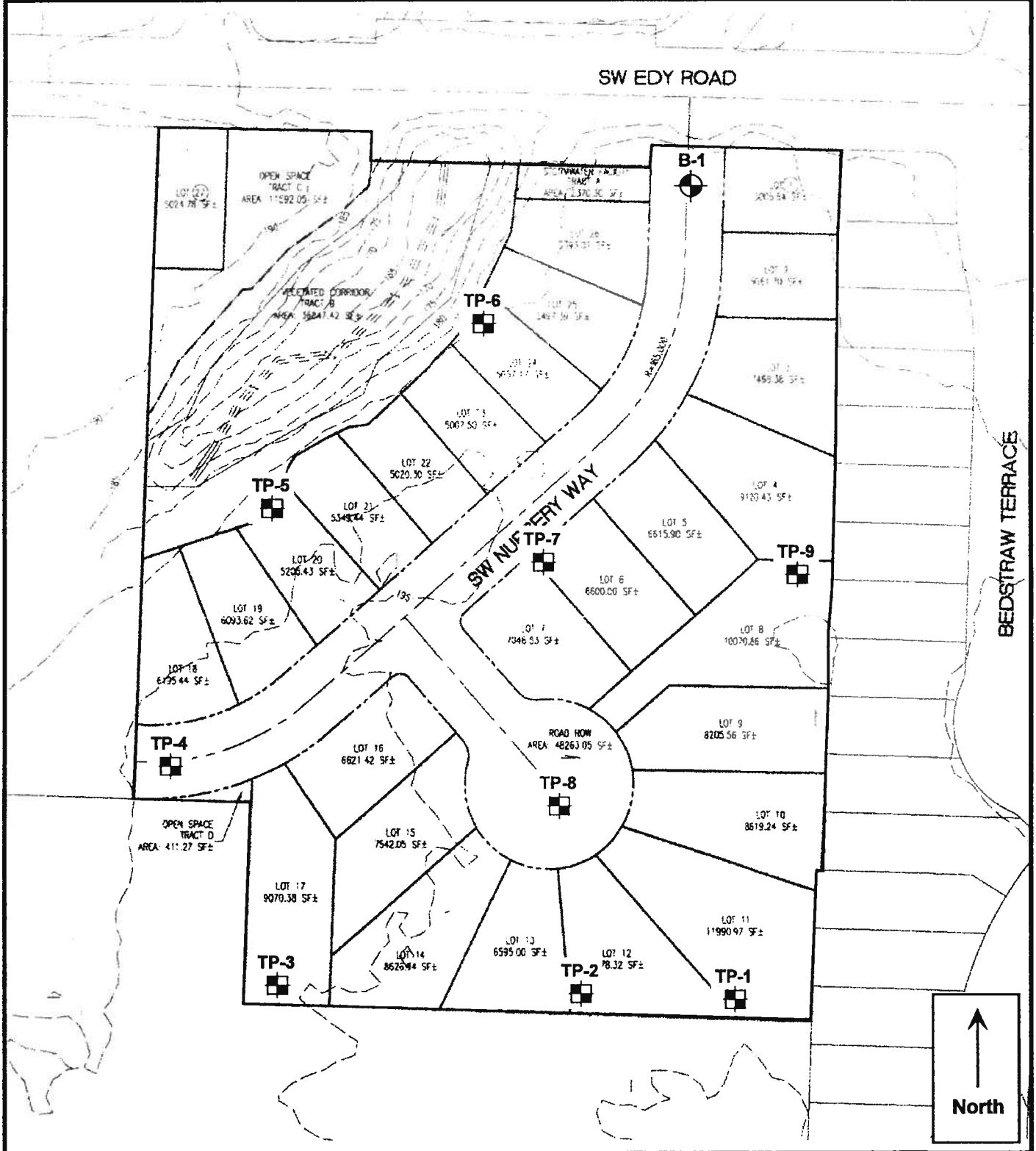
Date: 01/25/12
Drawn by: EKR

Base map: U.S. Geological Survey 7.5 minute Topographic Map Series, Sherwood, Oregon Quadrangle, 1961 (Photorevised 1985).

Project: Renaissance at Rychlick Farm Subdivision Sherwood, Oregon	Project No. 11-2487	FIGURE 1

GeoPacific Engineering, Inc.
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SITE PLAN AND EXPLORATION LOCATIONS



Legend

B-1 Boring Designation and Approximate Location

TP-1 Test Pit Designation and Approximate Location

0 100'

APPROXIMATE SCALE 1"=100'

Date: 01/25/12
Drawn by: EKR

Project: Renaissance at Rychlick Farm Subdivision Sherwood, Oregon	Project No. 11-2487	FIGURE 2

GeoPacific Engineering, Inc.
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BORING LOG

Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

Boring No. **B-1**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing Zone	Material Description
						Highly organic SILT (OL-ML), dark brown, roots throughout, loose, moist (Topsoil)
5		14				Stiff to very stiff, SILT (ML), light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Native Soil Horizon)
		19				
		17				
10		15				
						Stiff to very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
15		12				
20		9				
25		11				
30						Boring Terminated at 26.5 Feet. No Groundwater or Seepage encountered.
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 Drilled: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
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TEST PIT LOG

Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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	0.5					Highly organic SILT (OL-ML), dark brown, roots throughout, loose, moist (Topsoil)
2	0.5					Medium stiff to very stiff, SILT (ML), light brown, subtle orange and gray mottling, micaceous, many roots down to 3.5 feet, trace black staining, moist (Native Soil Horizon)
3	1.0					
	2.0					
4	4.5					
5						
6						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
7						
8						
9						
10						Test Pit Terminated at 10 Feet.
11						
12						Note: Groundwater seepage encountered at 9 feet. Discharge visually estimated at less than 1 gallon per minute.
13						
14						
15						
16						
17						

LEGEND



Bag Sample



Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

TEST PIT LOG

Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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	2.0					Highly organic SILT (OL-ML), brown, roots throughout, moist (Topsoil)
2	0.5					Medium stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace black staining, moist (Native Soil Horizon)
	1.5					
3	2.0					
4	2.5					
5						
6						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
7						
8						
9						
10						Test Pit Terminated at 9.5 Feet.
11						
12						Note: No seepage or groundwater encountered.
13						
14						
15						
16						
17						

LEGEND



Bag Sample



Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

TEST PIT LOG

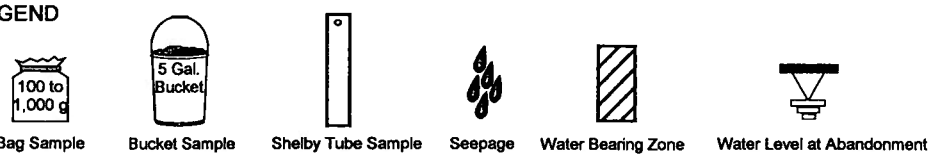
Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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	1.0					Moderately organic SILT (OL-ML), brown, roots throughout, moist (Topsoil)
2	1.5					Stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace black staining, moist (Native Soil Horizon)
3	2.0					
4	4.5					
5						
6						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
7						
8						
9						Test Pit Terminated at 9 Feet.
10						
11						Note: No seepage or groundwater encountered.
12						
13						
14						
15						
16						
17						

LEGEND



Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

TEST PIT LOG

Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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	0.5					Highly organic SILT (OL-ML), brown, 3 inch thick root mat, fine roots throughout, moist (Topsoil)
2	1.0					Medium stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace black staining, moist (Native Soil Horizon)
3	2.0					
4	2.0					
5						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
6						
7						
8						
9						Test Pit Terminated at 8.5 Feet.
10						
11						Note: No seepage or groundwater encountered.
12						
13						
14						
15						
16						
17						

LEGEND



Bag Sample



Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

TEST PIT LOG

Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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	0.5					Medium stiff, SILT (OL-ML), brown, with organics and woody debris throughout, moist (Fill)
2	0.5					
	1.0					
3	2.0					Stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace black staining, moist (Native Soil Horizon)
4	4.0					
5						
6						
7						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
8						
9						
10						Test Pit Terminated at 9 Feet.
11						
12						Note: No seepage or groundwater encountered.
13						
14						
15						
16						
17						

LEGEND



Bag Sample



Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
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Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

TEST PIT LOG

Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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	0.5					Highly organic SILT (OL-ML), dark brown, roots throughout, loose, moist (Topsoil)
2	2.5					Medium stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace black staining, moist (Native Soil Horizon)
3	1.5					
4	1.5					
5						
6						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
7						
8						Test Pit Terminated at 8 Feet.
9						
10						Note: No seepage or groundwater encountered.
11						
12						
13						
14						
15						
16						
17						

LEGEND



Bag Sample



Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

TEST PIT LOG

Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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	0.5					Moderately organic SILT (OL-ML), brown, roots throughout, moist (Topsoil)
2	1.0					Medium stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace charcoal fragments, moist (Native Soil Horizon)
3	1.5					
4	3.0					
5						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
6						
7						
8						Test Pit Terminated at 8 Feet.
9						
10						Note: No seepage or groundwater encountered.
11						
12						
13						
14						
15						
16						
17						

LEGEND



Bag Sample



Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

TEST PIT LOG

Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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
1	1.0					Highly organic SILT (OL-ML), dark brown, roots throughout, moist (Topsoil)
2	2.0					Stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace black staining, moist (Native Soil Horizon)
3	2.0					
4	3.5					
5						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
6						
7						
8						Test Pit Terminated at 8 Feet.
9						
10						Note: No seepage or groundwater encountered.
11						
12						
13						
14						
15						
16						
17						

LEGEND



Bag Sample



Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

TEST PIT LOG

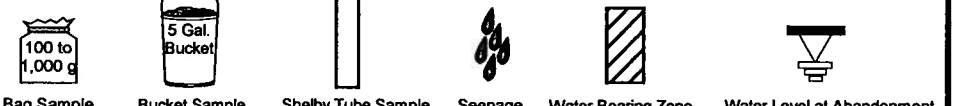
Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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
1	3.0					Highly organic SILT (OL-ML), brown, roots throughout, loose, moist (Topsoil)
2	2.0					Stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace black staining, moist (Native Soil Horizon)
3	2.0					
4	2.0					
5						
6						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
7						
8						
9						
10						Test Pit Terminated at 9 Feet.
11						
12						Note: No seepage or groundwater encountered.
13						
14						
15						
16						
17						

LEGEND



Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

RENAISSANCE AT RYCHLICK FARM
PRELIMINARY STORMWATER REPORT

Date:	March, 2012
Client:	Renaissance Development 16771 Boones Ferry Road Lake Oswego, OR 97035
Engineering Contact:	Monty Hurley, PE, PLS
Engineering Firm:	AKS Engineering & Forestry, LLC.

3-7-12

REGISTERED PROFESSIONAL ENGINEER
OREGON

6-30-13

AKS ENGINEERING & FORESTRY

13910 SW Galbreath Drive, Suite 100
Sherwood, OR 97140
Phone: (503) 925-8799

RENAISSANCE AT RYCHLICK FARM
PRELIMINARY STORMWATER REPORT

Date:	March, 2012
Client:	Renaissance Development 16771 Boones Ferry Road Lake Oswego, OR 97035
Engineering Contact:	Monty Hurley, PE, PLS
Engineering Firm:	AKS Engineering & Forestry, LLC.

13910 SW Galbreath Drive, Suite 100
Sherwood, OR 97140
Phone: (503) 925-8799

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PRELIMINARY STORMWATER REPORT

PROJECT: RENAISSANCE AT RYCHLICK FARM

1.0 PURPOSE OF REPORT

The purpose of this report is to document the criteria for which the storm water system for this site was designed to meet, the sources of information on which the analysis is based, the design methodology, and the results of the analysis.

2.0 PROJECT LOCATION/DESCRIPTION

The proposed development is on a parcel of land (approximately 6.57 acres) in Section 30, Township 2 South, Range 1 West, Willamette Meridian, Washington County, Oregon (Tax Lot 100, Tax Map 2S-1-30CA). The project site is located south of SW Edy Road and west of SW Bedstraw Terrace.

3.0 REGULATORY DESIGN CRITERIA

3.1 STORM WATER QUANTITY MANAGEMENT CRITERIA

The storm water for the site is conveyed to a water quality vegetated swale in the northwest corner of the site. A downstream analysis has been performed, please see attached Hydrocad calculations that show stormwater detention is not necessary in accordance with *Clean Water Services Design and Construction Standards for Sanitary Sewer and Surface Water Management (R&O 07-20).* This analysis shows that the additional flows created by the development of this property constitute less than 5% of the total tributary drainage flow shortly downstream from this site at the confluence of the tributary adjacent to the subject site and Cedar Creek, which is approximately 880 feet northeast of the swale discharge point into the tributary. At this point, the additional stormwater flows from this development constitute less than 5% of the total tributary drainage area. The downstream drainage has been visually investigated for ¼ mile downstream, and there does not appear to be any potential downstream impacts to structures.

3.2 STORMWATER QUALITY MANAGEMENT CRITERIA

Stormwater quality management criteria is addressed with a vegetated swale designed to meet the requirements of *Clean Water Services Design and Construction Standards for Sanitary Sewer and Surface Water Management (R&O 07-20).*

The storm water facility is designed for the public improvements and future homes to be created with this development.

4.0 DESIGN METHODOLOGY

The vegetated swale was designed by using Manning's equation based on the water quality flow and peak flow for the 25-year event. FlowMaster computer software aided in the analysis.

The Santa Barbara Urban Hydrograph (SBUH) Method was utilized on the downstream analysis. This method utilizes the SCS Type 1A 24-hour storm. Hydrocad computer software aided in the analysis.

5.0 DESIGN PERAMETERS

5.1 DESIGN STORM

5.1.1 ON-SITE INLET AND CONDUIT SIZING

Stormwater inlets for the site are placed at locations that will adequately control the stormwater for the site. The stormwater pipes are adequately sized for flows from the 25-year event.

5.2 PRE-DEVELOPED SITE TOPOGRAPHY AND LAND USE

5.2.1 SITE TOPOGRAPHY

The site is primarily flat and wooded with a natural drainage area on the west side that is heavily overgrown with brush and blackberry.

5.2.2 LAND USE

The site has an existing residential building and accessory buildings.

5.3 SOIL TYPE

The soils for the site are classified as Hillsboro loam (hydrologic group “B”), Huberly Silt Loam (hydrologic group “A”), Woodburn Silt Loam (hydrologic group “C”), Xerochrepts and Haploxerolls (hydrologic group “C”), and Quatama loam (hydrologic group “C”), according to the USDA Soil Survey for Washington County. Information for these soil types is included in this report.

5.4 POST DEVELOPED SITE TOPOGRAPHY AND LAND USE

5.4.1 SITE TOPOGRAPHY

The post-developed site topography will consist of residential single-family-detached home lots, public streets, and a stormwater quality facility.

5.4.2 LAND USE

The site land use will be residential.

5.4.3 POST-DEVELOPED INPUT PARAMETERS

See FlowMaster Analysis (Appendix 3-1)

5.5 DESCRIPTION OF OFF-SITE CONTRIBUTORY BASINS

The property to the east is a developed residential subdivision and does not contribute stormwater to the site. The property to the west is an undeveloped residential and agricultural site, which drains directly into the drainageway. North of the site is the SW Edy Road right-of-way, which does not drain onto the site. South and southwest of the site is a public school, which does not drain onto this site.

6.0 CALCULATION METHODOLOGY

6.1 PROPOSED STORMWATER CONDUIT SIZING AND INLET SPACING

The stormwater pipes are adequately sized for flows from the 25-year event.

6.2 PROPOSED STORMWATER QUALITY CONTROL FACILITY DESIGN

The stormwater runoff from the associated public improvements created with this development and future homes will be routed to the vegetated swale for treatment. The swale is sized to meet Clean Water Services (CWS) requirements.

6.3 PROPOSED STORMWATER QUANTITY CONTROL FACILTY DESIGN

A downstream analysis has been performed, see attached Hydrocad calculations, that shows storm water detention is not necessary in accordance with *Clean Water Services Design and Construction Standards for Sanitary Sewer and Surface Water Management (R&O 07-20).* This analysis shows that the additional flows created by the development of this property constitute less than 5% of the total tributary drainage at the confluence of the tributary (that flows through the subject site) and Cedar Creek, which is less than ¼ mile downstream of the site.

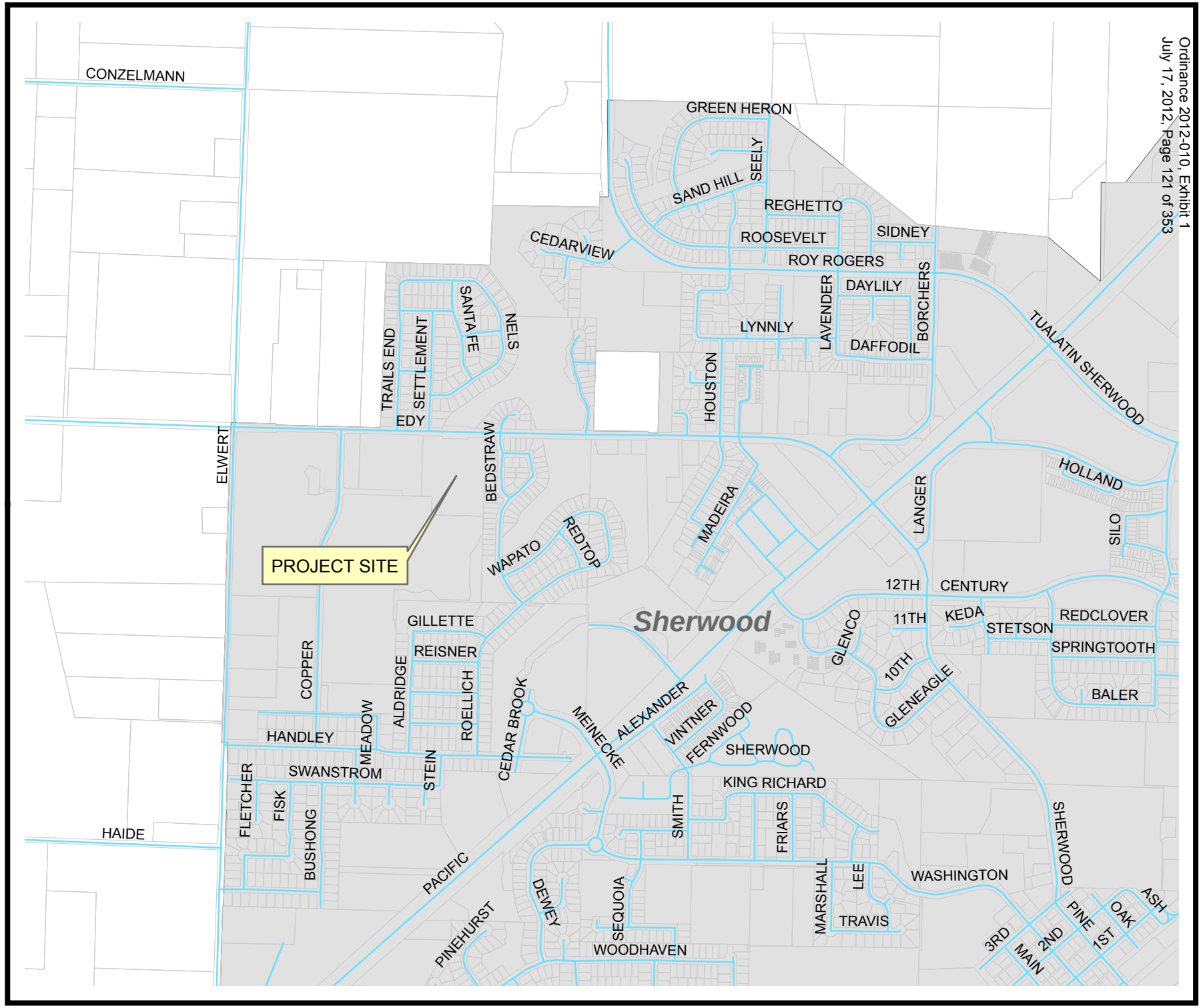
6.4 ENERGY DISSIPATER CALCULATIONS

A rip-rap energy dissipater will be placed at the outfall of the storm system into the drainageway.

6.5 DOWNSTREAM ANALYSIS

A downstream analysis has been performed, please see attached Hydrocad calculations that show stormwater detention is not necessary in accordance with *Clean Water Services Design and Construction Standards for Sanitary Sewer and Surface Water Management (R&O 07-20).* This analysis shows that the additional flows created by the development of this property constitute less than 5% of the total tributary drainage flow shortly downstream from this site at the confluence of the tributary adjacent to the subject site and Cedar Creek, which is approximately 880 feet northeast of the swale discharge point into the tributary. At this point, the additional stormwater flows from this development constitute less than 5% of the total tributary drainage area. The downstream drainage has been visually investigated for ¼ mile downstream, and there does not appear to be any potential downstream impacts to structures.

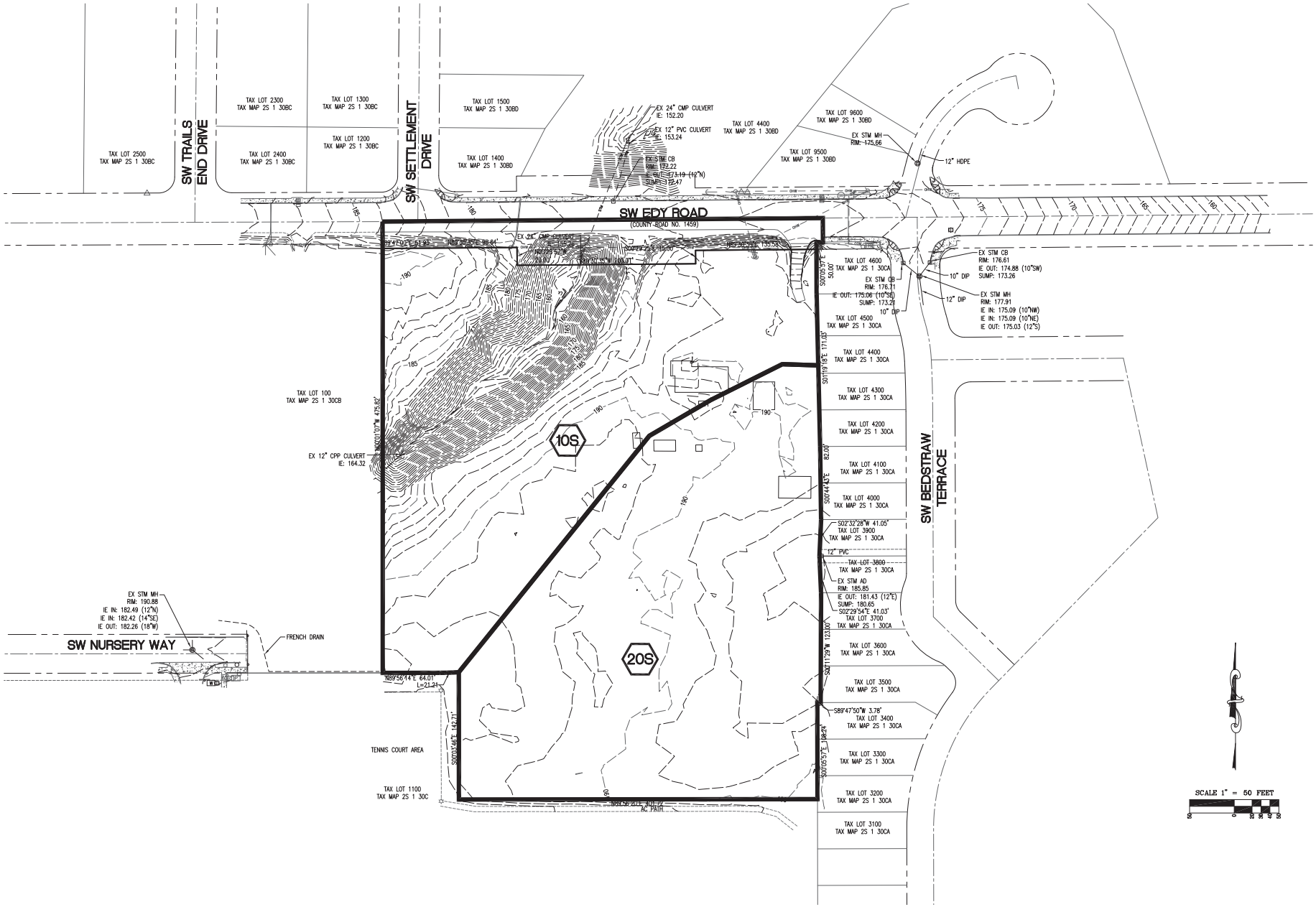
APPENDIX 1-1
VICINITY MAP



N

1 INCH EQUALS 1,000 FEET

APPENDIX 1-2
CATCHMENT MAPS



PRE-DEVELOPED CATCHMENT MAP

RENAISSANCE AT RYCHLICK FARM
SHERWOOD OREGON
WASHINGTON COUNTY TAX MAP 2S 1 30CA
TAX LOT 100

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ENGINEERING · PLANNING
SURVEYING · FORESTRY
13910 SW GALBRAITH DR., SUITE 100
SHERWOOD, OR 97140
PHONE: (503) 925-8799
FAX: (503) 925-8969

DESIGNED BY:	MBH
DRAWN BY:	RSW
CHECKED BY:	MBH
DRAWING NO.:	2997 CATCHMENT MAP
SCALE:	AS NOTED

PREPARED FOR:
RENAISSANCE HOMES
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

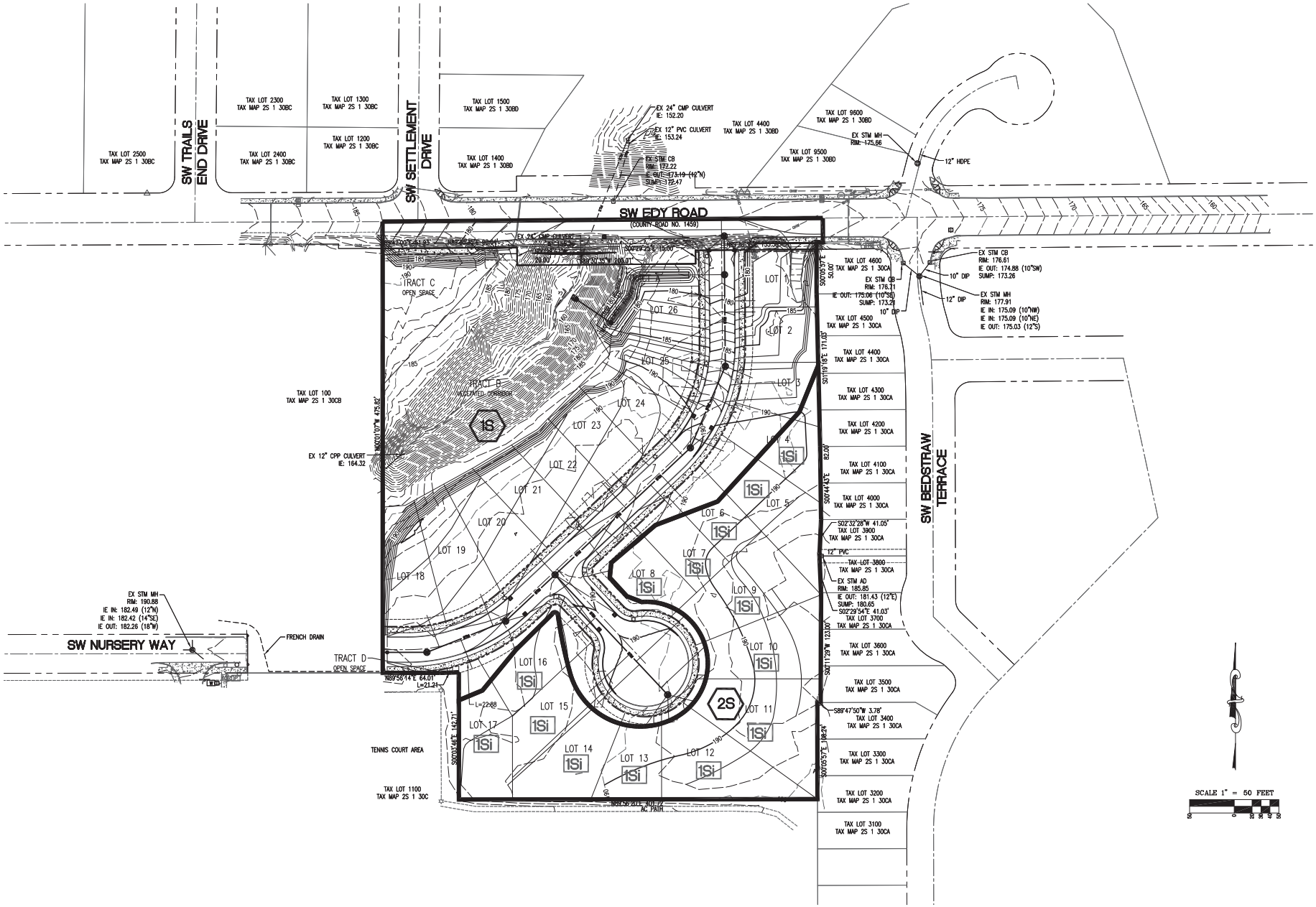
DATE: 03/02/2012

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 9, 2002
MONTGOMERY B. HURD
RENEWAL DATE: 6/30/13

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER
2997

SHEET
1



POST-DEVELOPED
CATCHMENT MAP

RENAISSANCE AT RYCHLICK FARM

SHERWOOD OREGON
TAX LOT 100 WASHINGTON COUNTY, TAX MAP 2S 1 30CA

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CHECKED BY:	MBH
DRAWING NO.:	2997 CATCHMENT MAP
SCALE:	AS NOTED

PREPARED FOR:
RENAISSANCE HOMES
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

DATE: 03/02/2012

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OREGON
JULY 9, 2002
MONTGOMERY B. HURD
RENEWAL DATE: 6/30/13

PRELIMINARY
NOT FOR CONSTRUCTION

JOB NUMBER
2997

SHEET
2

BASIN MAP

RENAISSANCE AT RYCHLICK FARM
SHERWOOD OREGON
TAX LOT 100
WASHINGTON COUNTY TAX MAP 2S 1 33CA

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SHERWOOD, OR 97140
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DESIGNED BY:	MBH
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RENAISSANCE HOMES
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

DATE: 03/02/2012

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 9, 2002
MONTGOMERY B. HURD
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/13

JOB NUMBER
2997

SHEET
3

BASIN MAP

RENAISSANCE AT RYCHLICK FARM
SHERWOOD OREGON
WASHINGTON COUNTY TAX MAP 2S 1 33CA
TAX LOT 100

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DESIGNED BY:	MBH
DRAWN BY:	RSW
CHECKED BY:	MBH
DRAWING NO.:	2997 BASIN MAP
SCALE:	AS NOTED

PREPARED FOR:
RENAISSANCE HOMES
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

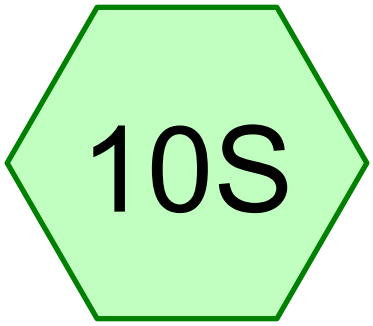
DATE: 03/02/2012

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OREGON
JULY 9, 2002
MONTGOMERY B. HURD
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/13

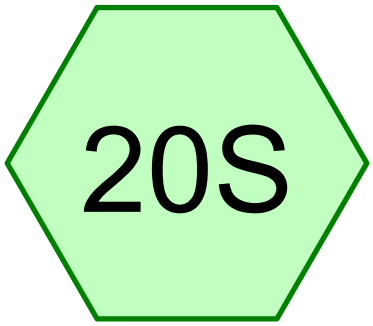
JOB NUMBER
2997

SHEET
3

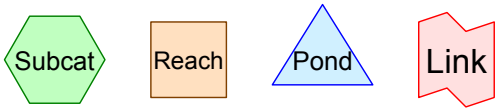
APPENDIX 2-1
25-YEAR STORM EVENT (3.90”)



North Pre-Developed



South Pre-Developed



Drainage Diagram for 2997 PRE DEV
Prepared by {enter your company name here}, Printed 3/7/2012
HydroCAD® 8.50 s/n 005096 © 2007 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
294,069	86	PERVIOUS (10S,20S)
11,513	98	IMPERVIOUS (10S,20S)
305,582		**TOTAL AREA**

Summary for Subcatchment 10S: North Pre-Developed

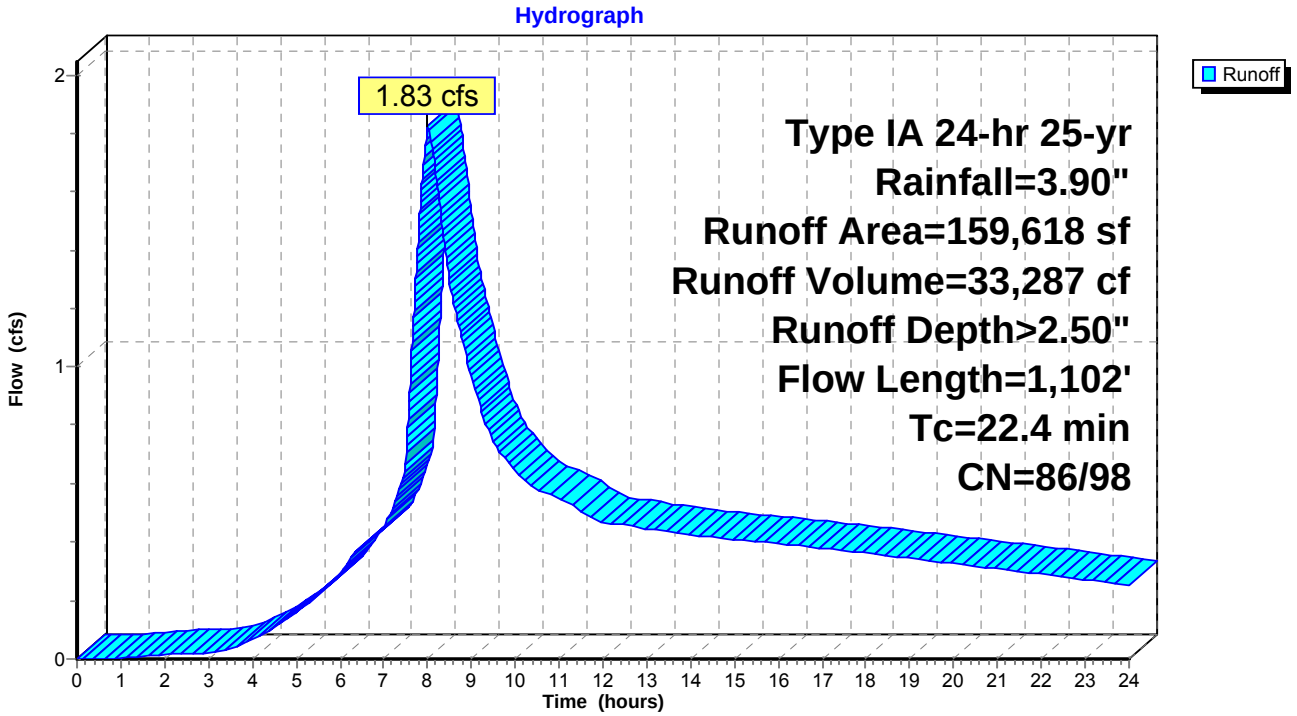
Runoff = 1.83 cfs @ 8.01 hrs, Volume= 33,287 cf, Depth> 2.50"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

	Area (sf)	CN	Description
*	9,520	98	IMPERVIOUS
*	150,098	86	PERVIOUS
	159,618	87	Weighted Average
	150,098	86	Pervious Area
	9,520	98	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	213	0.0460	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
1.7	45	0.4200	0.43		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
1.8	304	0.0340	2.77		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	540	0.0185	2.04		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
22.4	1,102	Total			

Subcatchment 10S: North Pre-Developed



Summary for Subcatchment 20S: South Pre-Developed

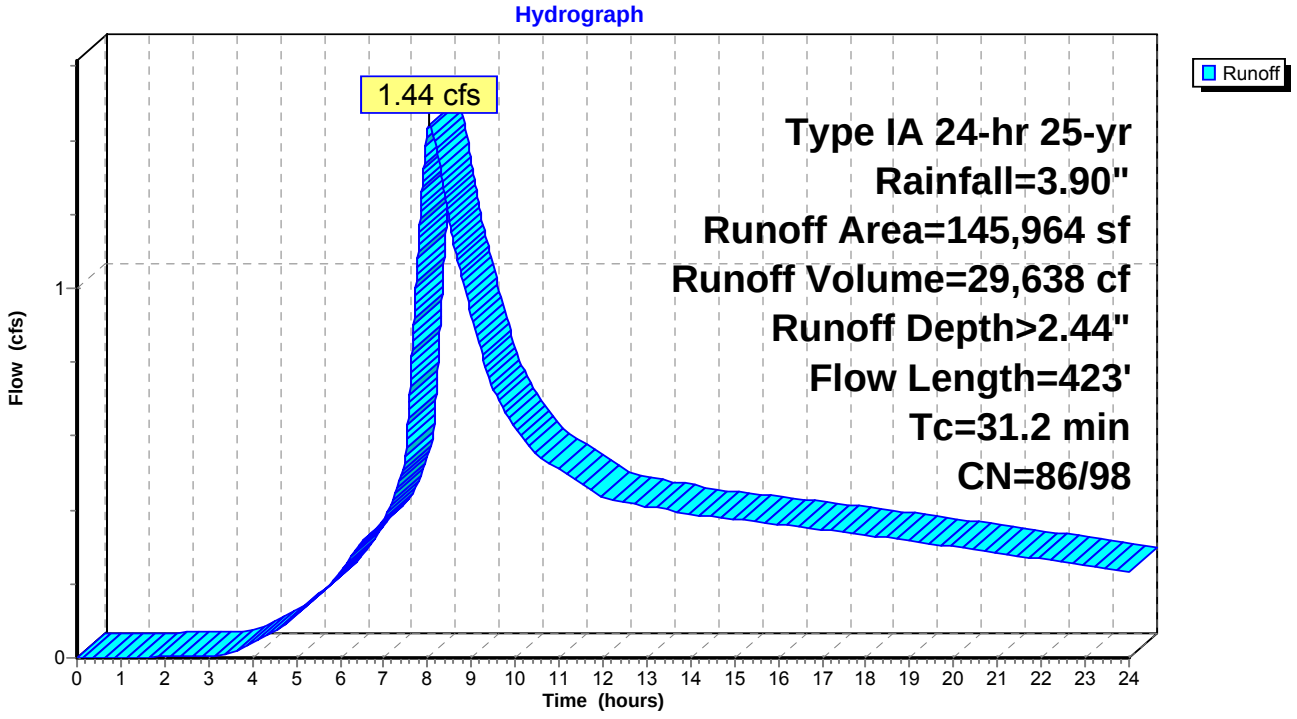
Runoff = 1.44 cfs @ 8.01 hrs, Volume= 29,638 cf, Depth> 2.44"

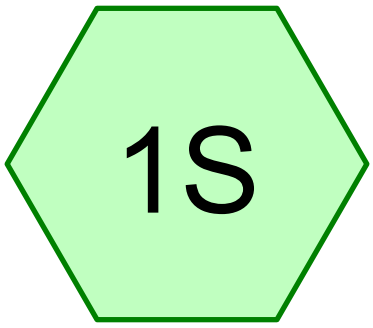
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

	Area (sf)	CN	Description
*	143,971	86	PERVIOUS
*	1,993	98	IMPERVIOUS
	145,964	86	Weighted Average
	143,971	86	Pervious Area
	1,993	98	Impervious Area

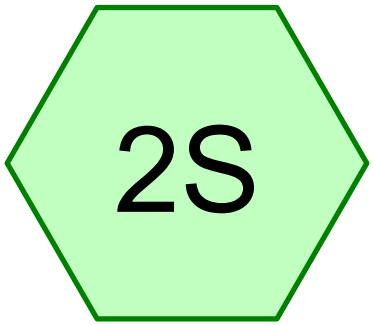
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.2	300	0.0160	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
2.0	123	0.0210	1.01		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
31.2	423	Total			

Subcatchment 20S: South Pre-Developed

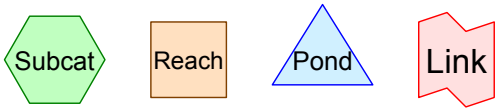




North Post-Developed



South Post-Developed



Drainage Diagram for 2997 POST DEV
Prepared by {enter your company name here}, Printed 3/7/2012
HydroCAD® 8.50 s/n 005096 © 2007 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
184,364	86	PERVIOUS (1S,2S)
120,718	98	IMPERVIOUS (1S)
305,082		**TOTAL AREA**

Summary for Subcatchment 1S: North Post-Developed

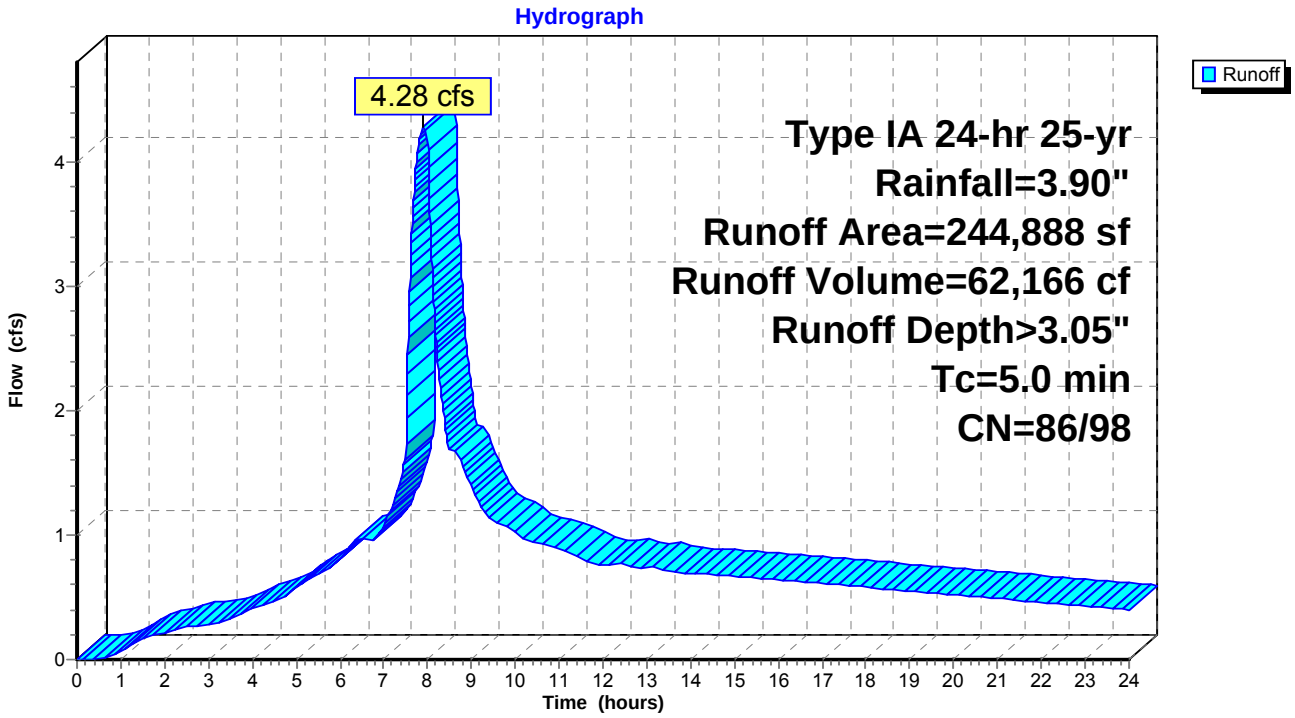
Runoff = 4.28 cfs @ 7.90 hrs, Volume= 62,166 cf, Depth> 3.05"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

	Area (sf)	CN	Description
*	120,718	98	IMPERVIOUS
*	124,170	86	PERVIOUS
	244,888	92	Weighted Average
	124,170	86	Pervious Area
	120,718	98	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 1S: North Post-Developed



Summary for Subcatchment 2S: South Post-Developed

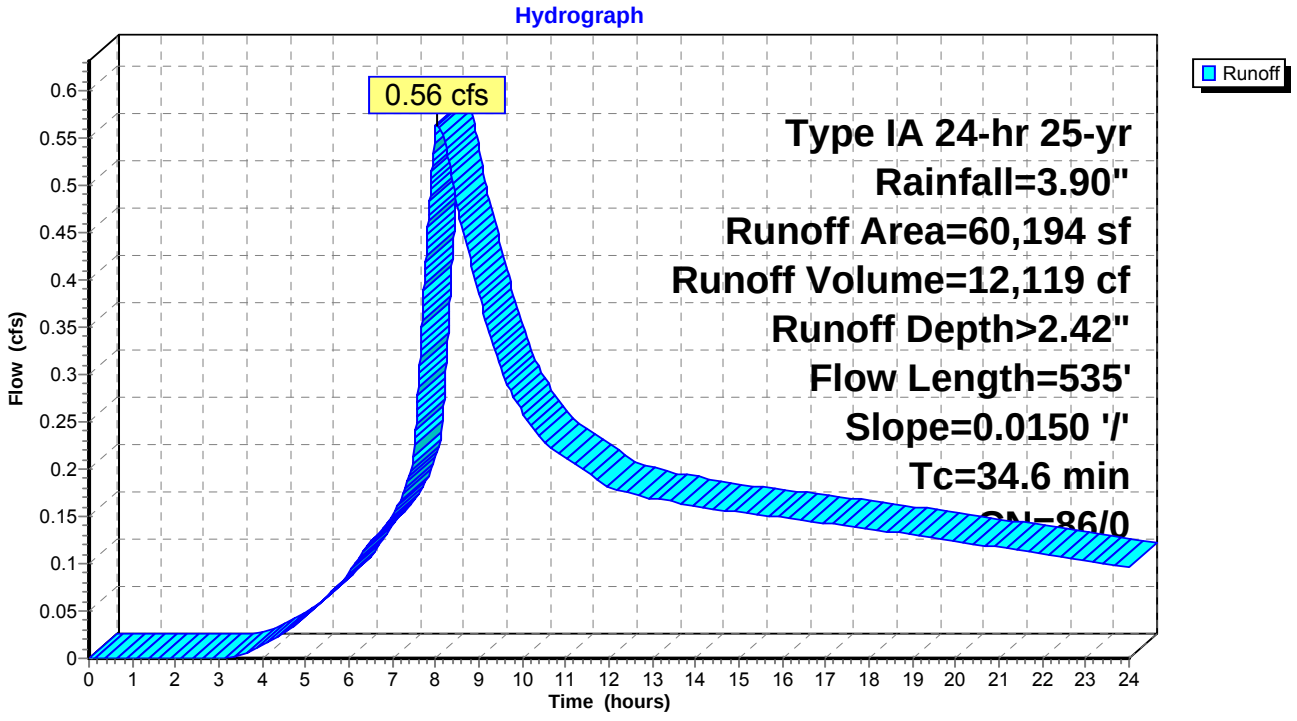
Runoff = 0.56 cfs @ 8.03 hrs, Volume= 12,119 cf, Depth> 2.42"

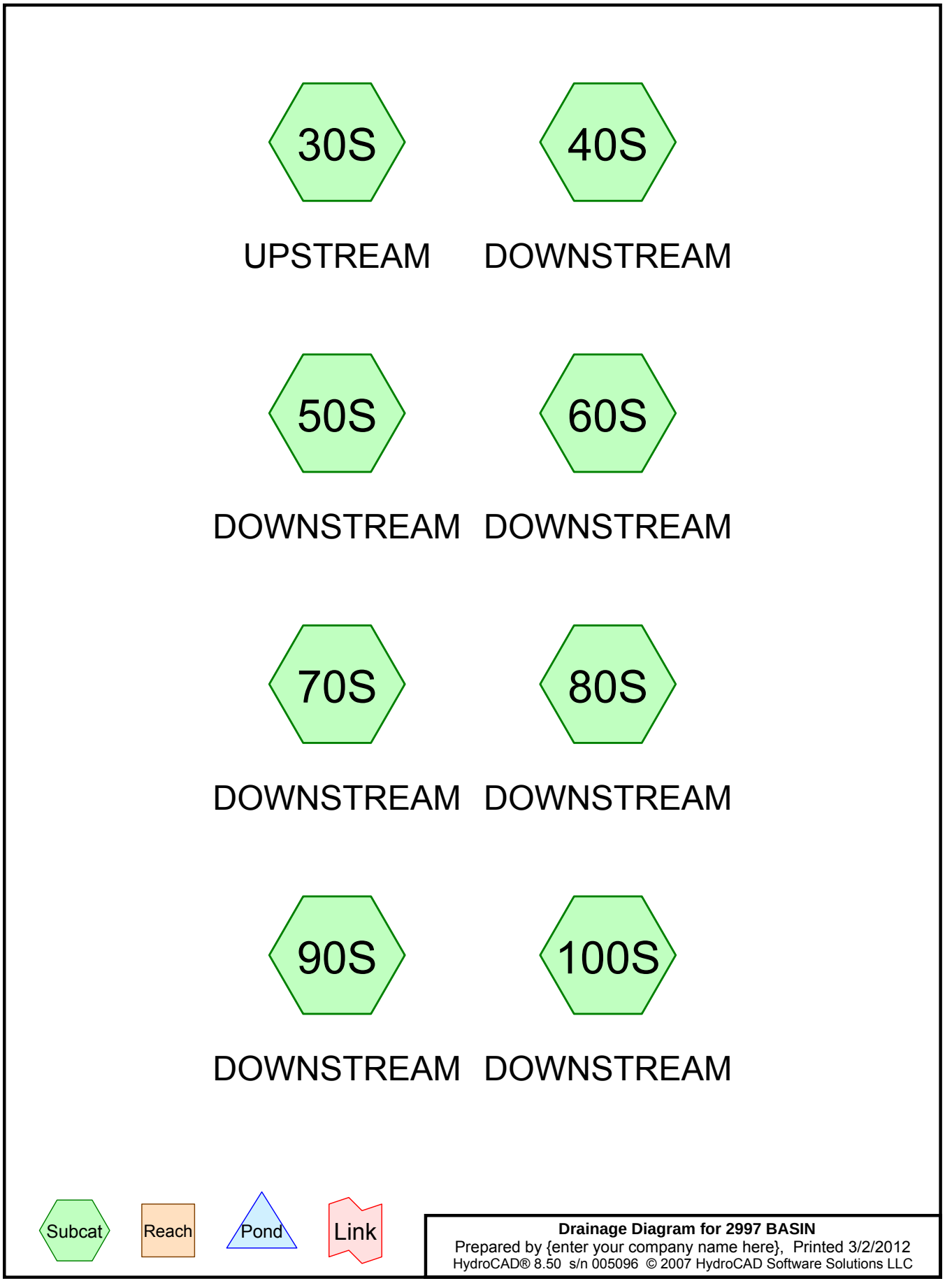
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

	Area (sf)	CN	Description
*	60,194	86	PERVIOUS
	60,194	86	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.0	300	0.0150	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
4.6	235	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
34.6	535	Total			

Subcatchment 2S: South Post-Developed





Drainage Diagram for 2997 BASIN
Prepared by {enter your company name here}, Printed 3/2/2012
HydroCAD® 8.50 s/n 005096 © 2007 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
2,210,331	86	PERVIOUS (30S,40S,50S,60S,70S,80S,90S,100S)
1,140,325	98	IMPERVIOUS (30S,50S,60S,80S,90S,100S)
3,350,656		**TOTAL AREA**

Summary for Subcatchment 30S: UPSTREAM

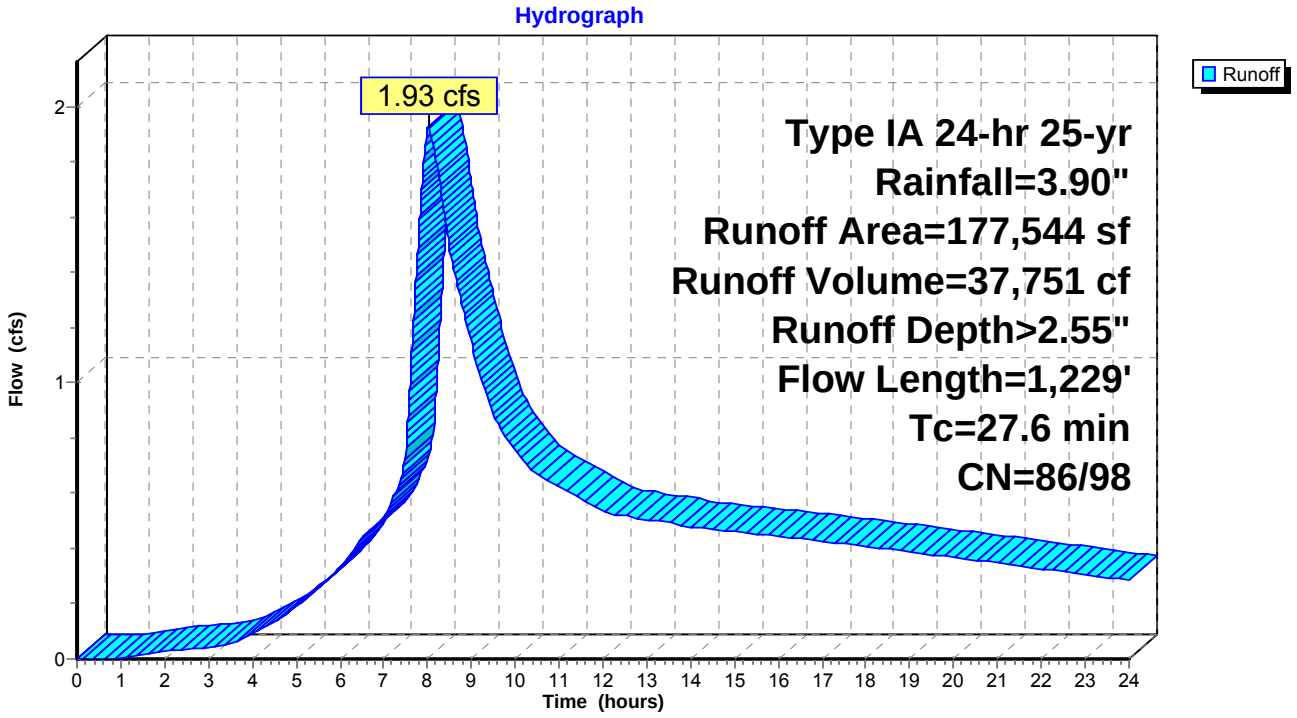
Runoff = 1.93 cfs @ 8.01 hrs, Volume= 37,751 cf, Depth> 2.55"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

	Area (sf)	CN	Description
*	18,720	98	IMPERVIOUS
*	158,824	86	PERVIOUS
	177,544	87	Weighted Average
	158,824	86	Pervious Area
	18,720	98	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.7	300	0.0376	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
0.7	85	0.0165	1.93		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.8	304	0.0340	2.77		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	540	0.0185	2.04		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
27.6	1,229	Total			

Subcatchment 30S: UPSTREAM



Summary for Subcatchment 40S: DOWNSTREAM

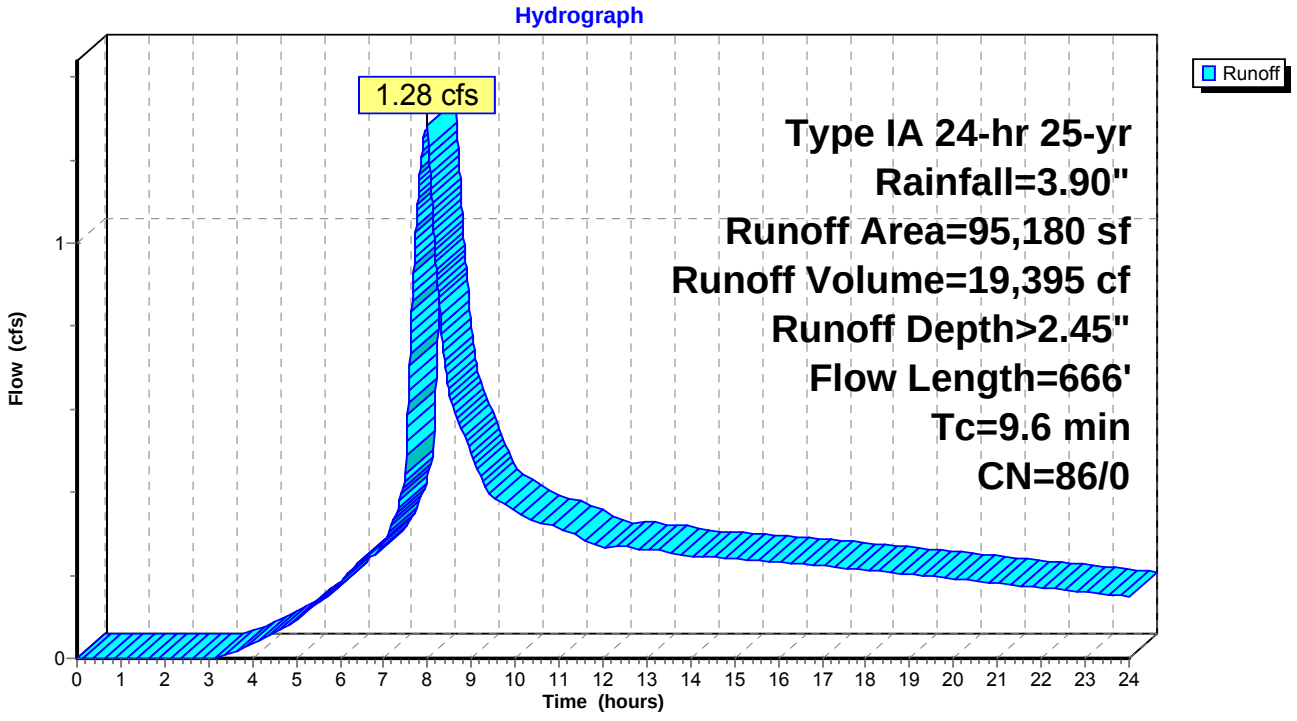
Runoff = 1.28 cfs @ 8.00 hrs, Volume= 19,395 cf, Depth> 2.45"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

	Area (sf)	CN	Description
*	95,180	86	PERVIOUS
	95,180	86	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	126	0.2060	0.40		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
4.4	540	0.0185	2.04		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.6	666	Total			

Subcatchment 40S: DOWNSTREAM



Summary for Subcatchment 50S: DOWNSTREAM

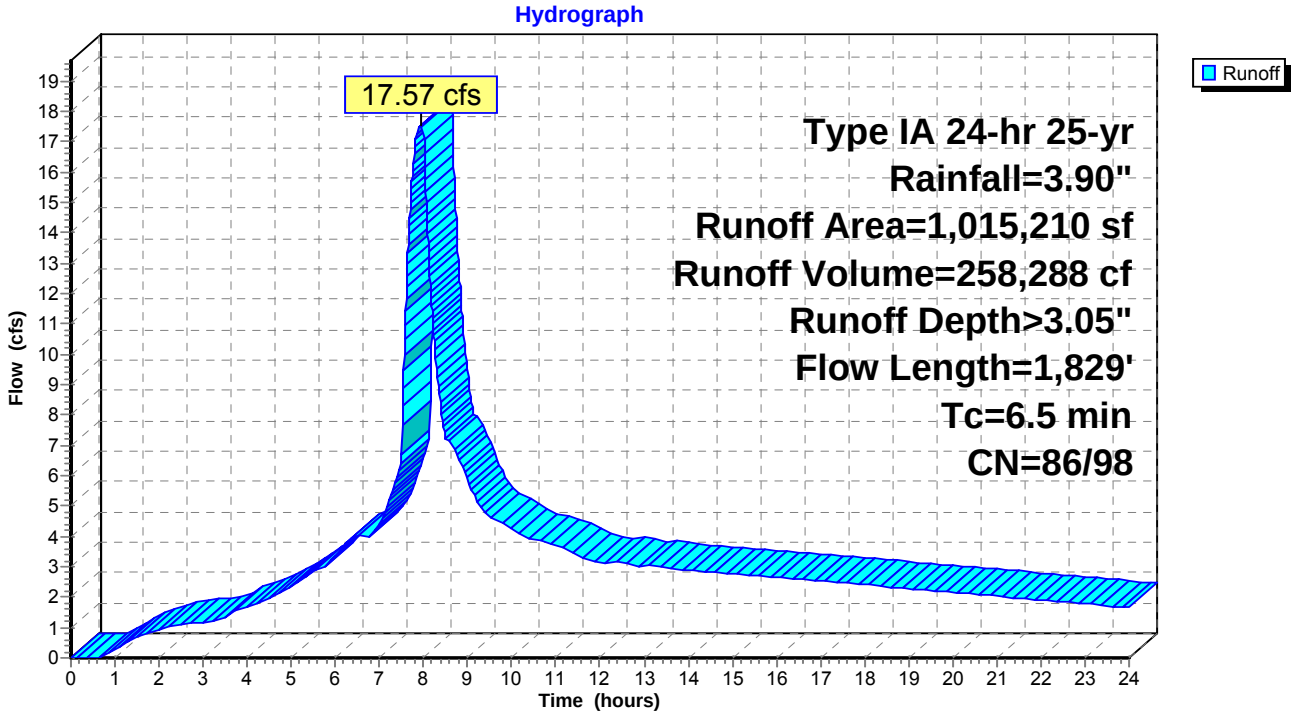
Runoff = 17.57 cfs @ 7.93 hrs, Volume= 258,288 cf, Depth> 3.05"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

	Area (sf)	CN	Description
*	507,605	86	PERVIOUS
*	507,605	98	IMPERVIOUS
	1,015,210	92	Weighted Average
	507,605	86	Pervious Area
	507,605	98	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	162	0.0307	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.3	1,667	0.0150	6.45	7.91	**Circular Channel (pipe),** Diam= 15.0" Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
6.5	1,829	Total			

Subcatchment 50S: DOWNSTREAM



Summary for Subcatchment 60S: DOWNSTREAM

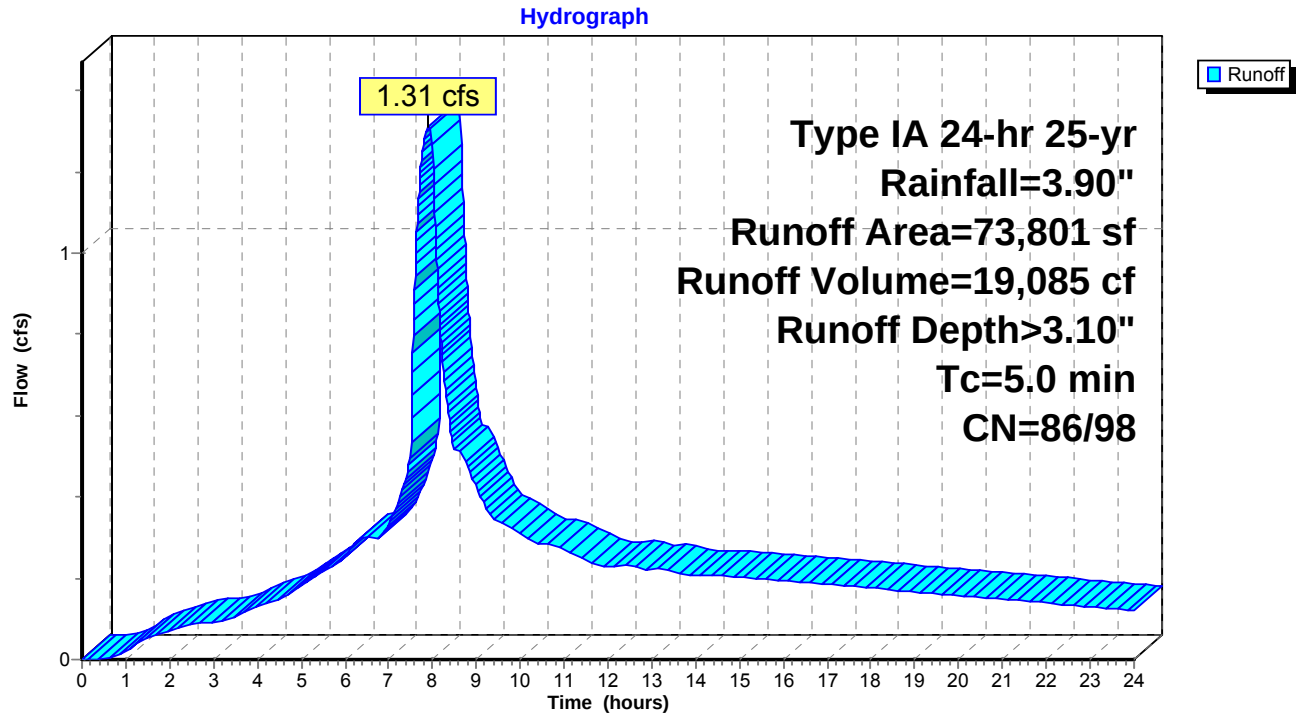
Runoff = 1.31 cfs @ 7.90 hrs, Volume= 19,085 cf, Depth> 3.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

	Area (sf)	CN	Description
*	33,948	86	PERVIOUS
*	39,853	98	IMPERVIOUS
	73,801	92	Weighted Average
	33,948	86	Pervious Area
	39,853	98	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 60S: DOWNSTREAM



Summary for Subcatchment 70S: DOWNSTREAM

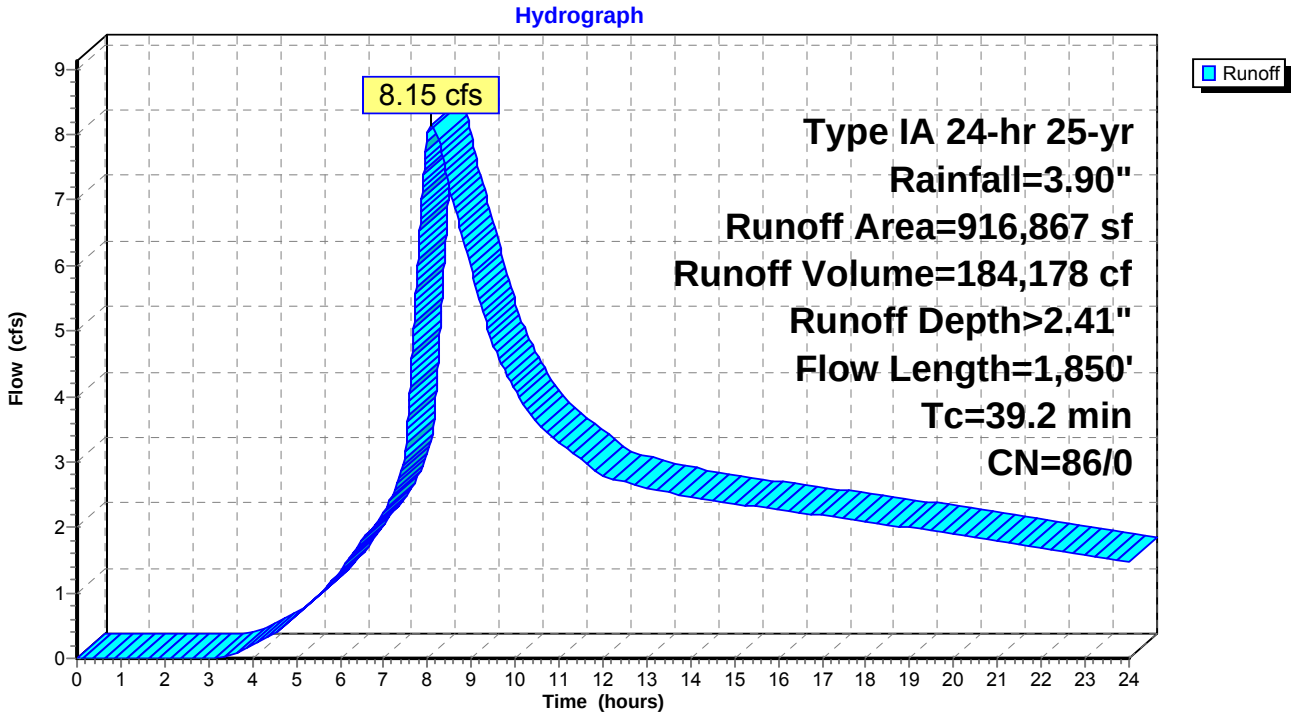
Runoff = 8.15 cfs @ 8.07 hrs, Volume= 184,178 cf, Depth> 2.41"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

	Area (sf)	CN	Description
*	916,867	86	PERVIOUS
	916,867	86	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.0	300	0.0830	0.23		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.50"
17.2	1,550	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
39.2	1,850	Total			

Subcatchment 70S: DOWNSTREAM



Summary for Subcatchment 80S: DOWNSTREAM

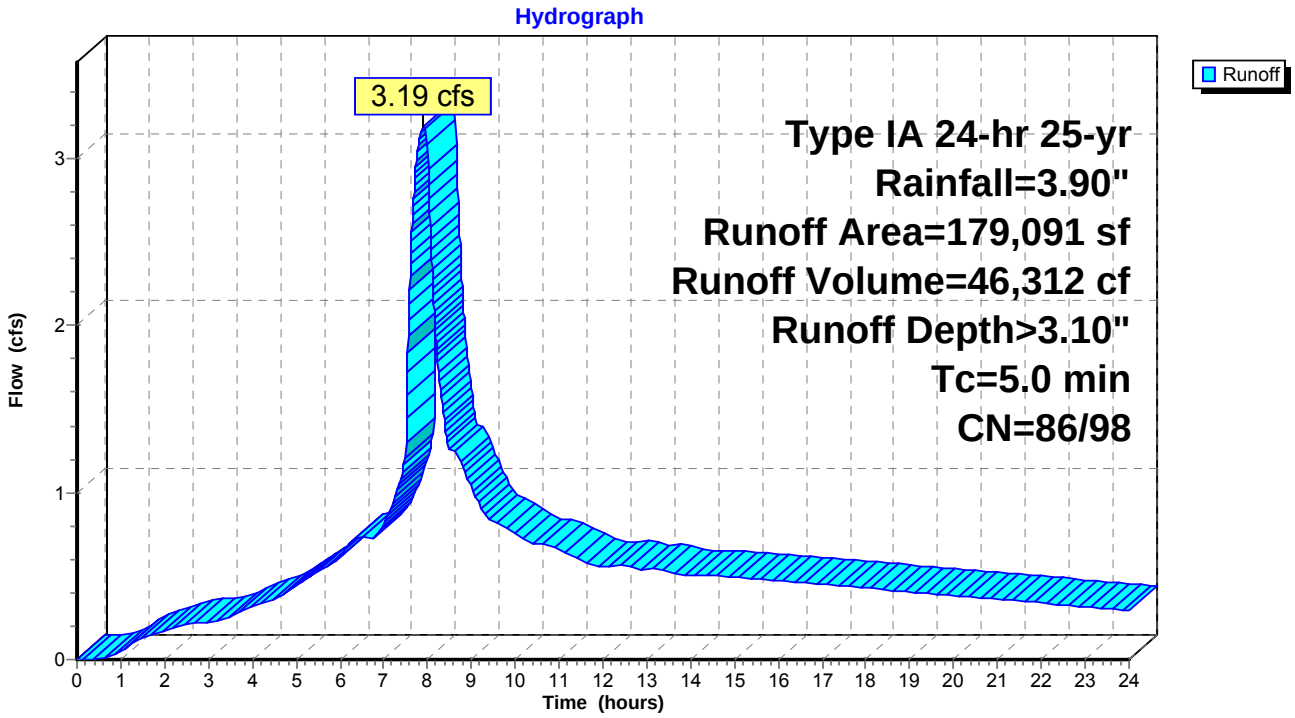
Runoff = 3.19 cfs @ 7.90 hrs, Volume= 46,312 cf, Depth> 3.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

	Area (sf)	CN	Description
*	82,382	86	PERVIOUS
*	96,709	98	IMPERVIOUS
	179,091	92	Weighted Average
	82,382	86	Pervious Area
	96,709	98	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 80S: DOWNSTREAM



Summary for Subcatchment 90S: DOWNSTREAM

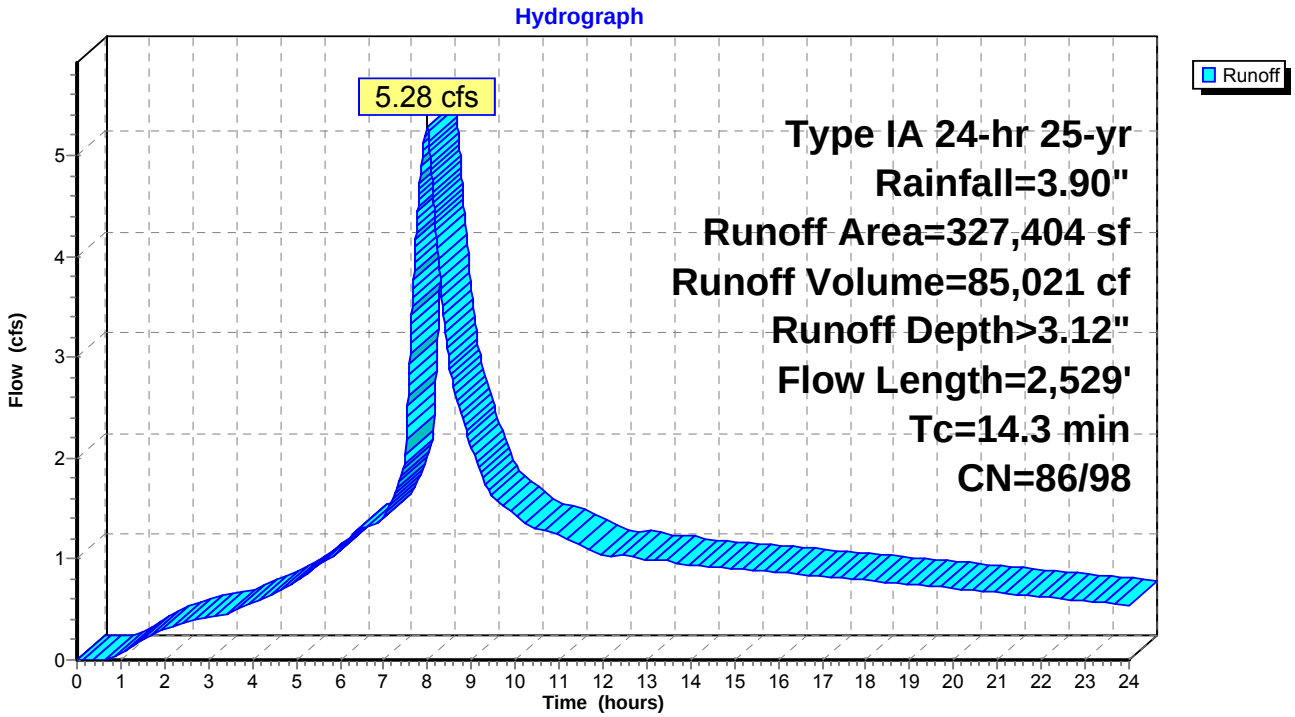
Runoff = 5.28 cfs @ 8.00 hrs, Volume= 85,021 cf, Depth> 3.12"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

	Area (sf)	CN	Description
*	144,057	86	PERVIOUS
*	183,347	98	IMPERVIOUS
	327,404	93	Weighted Average
	144,057	86	Pervious Area
	183,347	98	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	162	0.0307	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.3	1,667	0.0150	6.45	7.91	**Circular Channel (pipe),** Diam= 15.0" Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
7.8	700	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.3	2,529	Total			

Subcatchment 90S: DOWNSTREAM



Summary for Subcatchment 100S: DOWNSTREAM

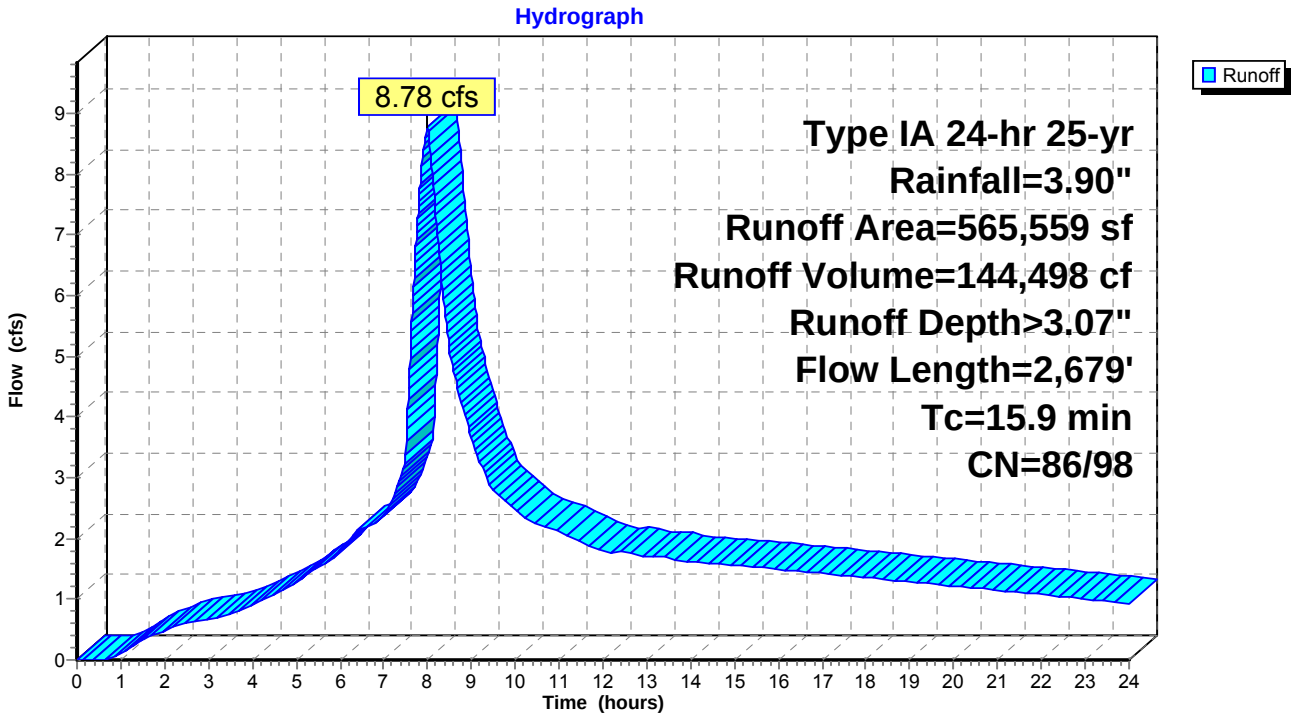
Runoff = 8.78 cfs @ 8.00 hrs, Volume= 144,498 cf, Depth> 3.07"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

	Area (sf)	CN	Description
*	271,468	86	PERVIOUS
*	294,091	98	IMPERVIOUS
	565,559	92	Weighted Average
	271,468	86	Pervious Area
	294,091	98	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	162	0.0307	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.3	1,667	0.0150	6.45	7.91	**Circular Channel (pipe),** Diam= 15.0" Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
9.4	850	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
15.9	2,679	Total			

Subcatchment 100S: DOWNSTREAM



APPENDIX 3-1
WATER QUALITY AND VEGETATED SWALE CALCULATIONS

RENAISSANCE AT RYCHLICK FARM

Post-Developed Stormwater Swale Calculations

Total Site Area = 305,582 sf

Impervious Area = 120,178 sf

Water Quality Volume = $\frac{0.36''\left(120{,}178\,ft^2\right)}{12''}$ = 3,605 cf

Water Quality Flow = $\frac{3{,}605\,ft^3}{14{,}400\,\text{sec}}$ = 0.2503 cfs

Hydraulic Analysis (See FlowMaster Analysis Appendix 3-2)

Water Quality Storm Event:

Hydraulic Residence Time (*Req. 9 min*) = $\frac{Length = 117\,ft}{Velocity = 0.18\,ft/\text{sec}} = 650\,\text{sec} = 10.8\,\text{min}$

Water Depth (*Max 0.50 ft*) = 0.39 ft

Freeboard (*Min 1 ft*) = 2.36 ft

25-Year Storm Event:

Velocity (*Max 2.0 fps*) = 0.38 fps

Freeboard (*Min 1 ft*) = 1.30 ft

APPENDIX 3-2
FLOWMASTER ANALYSIS OF VEGETATED SWALE

WATER QUALITY EVENT

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.240	
Channel Slope	0.00500	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	4.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	0.25	ft^3/s

Results

Normal Depth	0.39	ft
Flow Area	1.38	ft^2
Wetted Perimeter	5.21	ft
Hydraulic Radius	0.27	ft
Top Width	5.11	ft
Critical Depth	0.07	ft
Critical Slope	2.09650	ft/ft
Velocity	0.18	ft/s
Velocity Head	0.00	ft
Specific Energy	0.39	ft
Froude Number	0.06	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.39	ft
Critical Depth	0.07	ft
Channel Slope	0.00500	ft/ft

WATER QUALITY EVENT

GVF Output Data

Critical Slope	2.09650	ft/ft

25 YEAR EVENT

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.240	
Channel Slope	0.00500	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	4.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	4.28	ft^3/s

Results

Normal Depth	1.45	ft
Flow Area	11.26	ft^2
Wetted Perimeter	13.93	ft
Hydraulic Radius	0.81	ft
Top Width	13.57	ft
Critical Depth	0.40	ft
Critical Slope	1.32123	ft/ft
Velocity	0.38	ft/s
Velocity Head	0.00	ft
Specific Energy	1.45	ft
Froude Number	0.07	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.45	ft
Critical Depth	0.40	ft
Channel Slope	0.00500	ft/ft

25 YEAR EVENT

GVF Output Data

Critical Slope	1.32123	ft/ft

APPENDIX 4-1
DOWNSTREAM ANALYSIS AND CALCULATIONS

RENAISSANCE AT RYCHLICK FARM

Downstream Analysis Calculations

25-Year Storm Flow Rates

Catchments	Flow Rate (CFS)
Catchment 10S =	1.83
Catchment 20S =	1.44
Catchment 30S =	1.93
Catchment 40S =	1.28
Catchment 50S =	17.57
Catchment 60S =	1.31
Catchment 70S =	8.15
Catchment 80S =	3.19
Catchment 90S =	5.28
Catchment 100S =	8.78

Total Pre-Developed Flows = **50.76 CFS**

On-Site Pre-Developed Flows (10S and 20S) = 3.27 CFS

On-Site Post-Developed Flows (10S and 20S) = 4.84 CFS

Additional flow created from this project = (4.84-3.27) = **1.57 CFS**

Percent of additional flow from development = $\left[\frac{1.57}{50.76}\right]$ = 0.0309 = **3.09%**

3.09% < 5.00% => Visually investigate for ¼ mile.

=> Visual investigation does not show any downstream impacts to structures.

APPENDIX 5-1
RELEVANT INFORMATION FROM THE KING COUNTY SURFACE WATER MANAGEMENT MANUAL

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)	Separate curve number shall be selected for pervious and impervious portion of the site or basin			
1.0 DU/GA	15				
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.

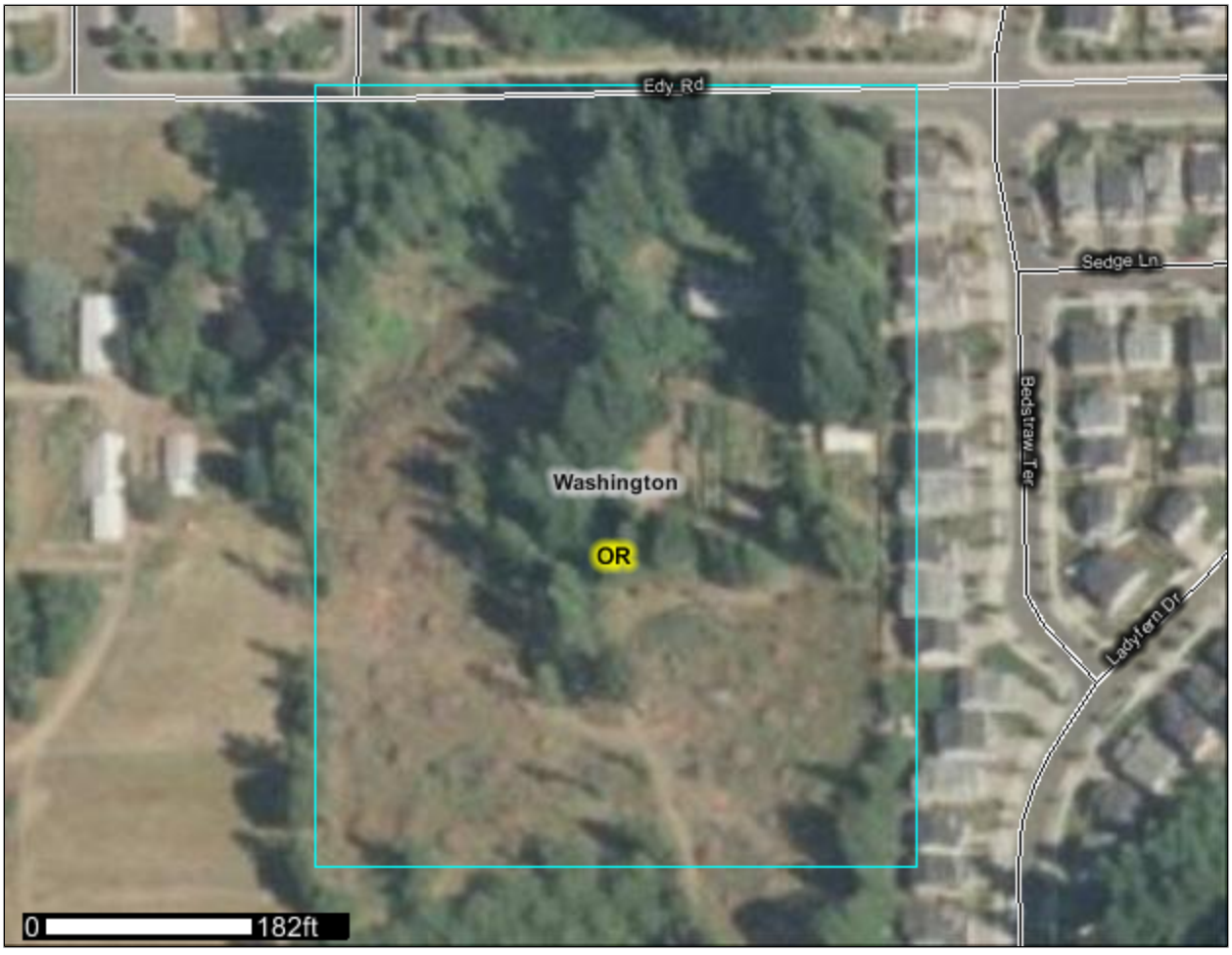
APPENDIX 6-1
USDA SOIL SURVEY OF WASHINGTON COUNTY

United States Department of Agriculture

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 Washington County, Oregon



March 1, 2012

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Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

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
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:1,230 if printed on A size (8.5" × 11") sheet.

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 accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washington County, Oregon
Survey Area Data: Version 9, Jul 15, 2010

Date(s) aerial images were photographed: 8/4/2005

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

Washington County, Oregon (OR067)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
21A	Hillsboro loam, 0 to 3 percent slopes	2.4	29.1%
22	Huberly silt loam	0.5	6.1%
37A	Quatama loam, 0 to 3 percent slopes	2.4	29.7%
37B	Quatama loam, 3 to 7 percent slopes	0.0	0.3%
45A	Woodburn silt loam, 0 to 3 percent slopes	0.6	7.7%
46F	Xerochrepts and Haploxerolls, very steep	2.2	27.1%
Totals for Area of Interest		**8.2**	**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.

Washington County, Oregon

21A—Hillsboro loam, 0 to 3 percent slopes

Map Unit Setting

Elevation: 160 to 240 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days

Map Unit Composition

Hillsboro and similar soils: 90 percent

Description of Hillsboro

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and loamy old alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability (nonirrigated): 1

Typical profile

0 to 15 inches: Loam
15 to 48 inches: Loam
48 to 57 inches: Fine sandy loam
57 to 81 inches: Fine sand

22—Huberly silt loam

Map Unit Setting

Elevation: 150 to 300 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days

Map Unit Composition

Huberly and similar soils: 90 percent
Minor components: 3 percent

Description of Huberly

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 20 to 30 inches to fragipan
Drainage class: Poorly 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 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability (nonirrigated): 3w

Typical profile

0 to 8 inches: Silt loam
8 to 25 inches: Silt loam
25 to 60 inches: Silt loam

Minor Components

Verboort

Percent of map unit: 3 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

37A—Quatama loam, 0 to 3 percent slopes

Map Unit Setting

Elevation: 140 to 250 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days

Map Unit Composition

Quatama and similar soils: 85 percent
Minor components: 4 percent

Description of Quatama

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately 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 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability (nonirrigated): 2w

Typical profile

0 to 15 inches: Loam
15 to 30 inches: Clay loam
30 to 62 inches: Loam

Minor Components

Huberly

Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

37B—Quatama loam, 3 to 7 percent slopes

Map Unit Setting

Elevation: 140 to 250 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days

Map Unit Composition

Quatama and similar soils: 85 percent
Minor components: 4 percent

Description of Quatama

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately 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 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability (nonirrigated): 2e

Typical profile

0 to 15 inches: Loam
15 to 30 inches: Clay loam
30 to 62 inches: Loam

Minor Components

Huberly

Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

45A—Woodburn silt loam, 0 to 3 percent slopes

Map Unit Setting

Elevation: 150 to 400 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days

Map Unit Composition

Woodburn and similar soils: 85 percent
Minor components: 1 percent

Description of Woodburn

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Old alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
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 25 to 32 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability (nonirrigated): 2w

Typical profile

0 to 16 inches: Silt loam
16 to 31 inches: Silty clay loam
31 to 60 inches: Silt loam

Minor Components

Dayton

Percent of map unit: 1 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

46F—Xerochrepts and Haploxerolls, very steep

Map Unit Setting

Elevation: 50 to 450 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days

Map Unit Composition

Xerochrepts and similar soils: 45 percent
Haploxerolls and similar soils: 40 percent
Minor components: 1 percent

Description of Xerochrepts

Setting

Landform: Terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy lacustrine deposits

Properties and qualities

Slope: 20 to 60 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 8.0 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 8 inches: Silt loam
8 to 48 inches: Gravelly loam
48 to 60 inches: Very cobbly clay loam

Description of Haploxerolls

Setting

Landform: Terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy lacustrine deposits

Properties and qualities

Slope: 30 to 60 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 12.0 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 12 inches: Silt loam
12 to 60 inches: Silty clay loam

Minor Components

Aquepts, seeps and springs

Percent of map unit: 1 percent
Landform: Escarpments

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.

Custom Soil Resource Report
Map—Hydrologic Soil Group



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:1,230 if printed on A size (8.5" × 11") sheet.

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 accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washington County, Oregon
Survey Area Data: Version 9, Jul 15, 2010

Date(s) aerial images were photographed: 8/4/2005

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 — Washington County, Oregon (OR067)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
21A	Hillsboro loam, 0 to 3 percent slopes	B	2.4	29.1%
22	Huberly silt loam	D	0.5	6.1%
37A	Quatama loam, 0 to 3 percent slopes	C	2.4	29.7%
37B	Quatama loam, 3 to 7 percent slopes	C	0.0	0.3%
45A	Woodburn silt loam, 0 to 3 percent slopes	C	0.6	7.7%
46F	Xerochrepts and Haploxerolls, very steep	C	2.2	27.1%
Totals for Area of Interest			**8.2**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

TECHNICAL MEMORANDUM

LANCASTER
ENGINEERING

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TO: Randy Sebastian
Renaissance Homes
16771 Boones Ferry Road
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COPY: Monty Hurley, AKS Engineering & Forestry

FROM: Todd E. Mobley, PE, PTOE TEM

DATE: March 9, 2012

SUBJECT: 17806 SW Edy Road - Sherwood (Renaissance at Rychlick Farm)
Transportation Impact Study

Lancaster Engineering has evaluated the impact of the proposed comprehensive plan amendment, zone change, and 26-lot subdivision for the property located at 17806 SW Edy Road in Sherwood, Oregon. This memorandum serves as the transportation impact study for both the proposed zone change and the subdivision. The scope of work for this analysis has been prescribed by the City of Sherwood.

The site is currently occupied by one single-family dwelling. The 6.57 acre site is split zoned, with 1.35 acres of the site zoned Institutional Public (IP) and 5.22 acres of the site zoned Medium Density Residential (MDRL). The proposal involves retaining the existing MDRL and changing the existing IP zoning to MDRL.

The City zoning map indicates that a portion of the property is zoned "Open Space". City staff have confirmed that an "Open Space" zone does not exist. The area indicated as "Open Space" is, in fact, zoned MDRL.

The zone change involves only a very small portion of the property, with only approximately 58,791 square feet, or 1.35 acres affected by the proposed zone change. The MDRL zone would permit up to ten (10) single-family detached dwelling units to be constructed on that portion of the property.

The proposed subdivision would construct 26 detached single-family dwellings on the entire 6.57-acre property. Access for the subdivision would be via an extension of Nursery Way from Edy Road. Future development not a part of this application would further extend Nursery Way to connect with the existing Nursery Way to the west.

The purpose of this of this letter is twofold. The first is to analyze the transportation impacts of converting the 1.35 acre portion of property to a MDRL zone, specifically in relation to compliance with the Transportation Planning Rule (TPR). The second is to analyze the impacts of the proposed 26-lot subdivision, including addressing sight distance requirements at the new intersection of Edy Road & Nursery Way. Both the zone change and subdivision portions of this letter address the City

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of Sherwood Zoning and Community Development Code and applicable Washington County Development Code as they relate to sight distance and access.

COMPREHENSIVE PLAN AMENDMENT & ZONE CHANGE

Because a change in zoning is proposed, it is necessary to compare the reasonable worst-case development scenario under the existing zoning to the reasonable worst-case development scenario under the proposed zoning. The net decrease in trips associated with these two scenarios determines that the proposed change does not significantly affect transportation facilities.

EXISTING ZONING & PROPOSED ZONING

Within the IP zone, the Sherwood Zoning and Community Development Code establishes several allowed and conditional uses including:

- *Wireless communication facilities on City-owned property.*
- *Wireless communication antennas mounted on an existing building or structure not exceeding the height of the roof of the structure provided the applicant can demonstrate to the satisfaction of the City that the location of the antennas on City-owned property would be unfeasible.*
- *Government offices, including but not limited to postal stations, administrative offices, police and fire stations.*
- *Public use buildings, including but not limited to libraries, museums, community centers, and senior centers.*
- *Churches and parsonages.*
- *Cemeteries and crematory mausoleums.*
- *Public recreational facilities, including but not limited to parks, playfields, golf courses, and sport and racquet courts.*
- *Public and private schools providing education at the preschool level or higher, excluding commercial trade schools.*
- *Public and private utilities, including but not limited to telephone exchanges, electric substations, gas regulator stations, treatment plants, water wells and public works yards.*
- *Radio, television and similar communication stations, including transmitters and wireless communication towers.*

The existing IP zoning designation allows a library to be constructed on the subject portion of the property, which is a relatively traffic-intensive use. The proposed MDRL zoning allows up to ten single-family detached dwelling units to be constructed. A demonstrated below, the proposed zone has a far lower trip generation rate than does the existing zoning and therefore, the proposed change cannot significantly affect transportation facilities.

TRIP GENERATION COMPARISON

To estimate and compare the number of trips that will be generated by the reasonable worst-case uses in the existing zoning and the reasonable worst case uses allowed in the proposed zoning, trip rates from the manual *TRIP GENERATION,* Eighth Edition, published by the Institute of

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Transportation Engineers (ITE), were used. It was determined that the reasonable worst-case trip generator within the IP zone is a library. Likewise, it was determined that the reasonable worst-case trip generator in the MDRL zone is single-family detached housing. The trip rates used were for land-use codes 210, *Single-Family Detached Housing* and 590, *Library.* The trip generation rates are based on the number of dwelling units for housing and square footage for a library. The existing zoning would permit an approximate 14,700 square foot library based on 25% lot coverage. The proposed zoning would allow up to ten single-family detached dwelling units on the 1.35 acre portion of the property.

The following table shows the results of the trip generation analysis and quantifies the net decrease in trips that would result from the proposed zone change. In the weekday AM peak hour, the proposed zoning would result in six less trips than the existing zoning. In the weekday PM peak hour, the proposed zoning would result in 91 less trips than the existing zoning.

			Weekday AM Peak Hour			*Weekday PM Peak Hour*		
Land Use	*Units*	*ITE Code*	*In*	*Out*	*Total*	*In*	*Out*	*Total*
Library	14,700 GFA	590	10	4	14	50	54	104
Single-Family Detached Housing	10 Dwellings	210	2	6	8	8	5	13
	Net New Trips				-6			-91

The proposed comprehensive plan amendment and zone change requires the analysis of and compliance with the Transportation Planning Rule (TPR) OAR 660-012-0060. Modifications to the TPR were adopted on January 1, 2012 and are provided below.

TRANSPORTATION PLANNING RULE

The Transportation Planning Rule (TPR) is a statewide regulation that 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. The applicable elements of the TPR are each quoted directly below, with a response directly following.

660-012-0060

(1) If an amendment to a functional plan, an acknowledged 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 this 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

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(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 adopted 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 the performance standards identified in the TSP or comprehensive plan.

In this case, subsections (a) and (b) are not triggered, since the proposed zone change and subsequent development is not expected to impact nor alter the functional classification of any existing or planned facility and the proposal does not include a change to any functional classification standards.

To compare the reasonable worst-case development of the subject property under both the existing and proposed zoning designations, development of the site with the proposed allowable residential density has been compared to development with the existing allowable and conditional uses.

As established in the trip generation comparison above, **the proposed comprehensive plan amendment and zone change will result in a lower reasonable worst-case trip generation than the current zone**. The proposed modification cannot degrade the performance of an existing or planned transportation facility such that it would not meet the performance standards identified in the City's TSP or comprehensive plan due to this lower trip generation. Likewise, the proposed modification cannot degrade the performance of an existing or planned facility that is otherwise projected to not meet the performance standards identified in the TSP or comprehensive plan due to this lower trip generation.

As such, subsection (c) is also not triggered and transportation facilities are not significantly affected as defined by the TPR. No mitigations or limitations on development are proposed or necessary.

APPROVAL CRITERIA

Section 16.80.030 of the Sherwood Zoning and Community Development Code contains applicable transportation-related approval criteria for comprehensive plan amendment and zone change applications. The code section requires that adequate transportation facilities are available to support the proposed rezone. The section is quoted below:

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1. *Review of plan and text amendment applications for effect on transportation facilities. Proposals shall be reviewed to determine whether it significantly affects a transportation facility, in accordance with OAR 660-12-0060 (the TPR). Review is required when a development application includes a proposed amendment to the Comprehensive Plan or changes to land use regulations.*
2. *"Significant" means that the transportation facility would change the functional classification of an existing or planned transportation facility, change the standards implementing a functional classification, allow types of land use, allow types or levels of land use that would result in levels of travel or access that are inconsistent with the functional classification of a transportation facility, or would reduce the level of service of the facility below the minimum level identified on the Transportation System Plan.*
3. *Per OAR 660-12-0060, Amendments to the Comprehensive Plan or changes to land use regulations which significantly affect a transportation facility shall assure that allowed land uses are consistent with the function, capacity, and level of service of the facility identified in the Transportation System Plan. This shall be accomplished by one of the following:*
   a. *Limiting allowed uses to be consistent with the planned function of the transportation facility.*
   b. *Amending the Transportation System Plan to ensure that existing, improved, or new transportation facilities are adequate to support the proposed land uses.*
   c. *Altering land use designations, densities or design requirements to reduce demand for automobile travel and meet travel needs through other modes.*

As demonstrated previously in this report, the proposal results in a net decrease in trips, and therefore, the proposal will not significantly affect the functionality of the existing transportation system.

SUBDIVISION

In addition to the zone change and comprehensive plan amendment proposal, a 26-lot subdivision is proposed on the 6.57 acre parcel. As required by Section 16.106.040 of the City of Sherwood Zoning and Community Development Code, a traffic impact analysis is required for residential developments generating 200 average daily trips or more. The proposed subdivision will generate greater than 200 average daily trips, so a traffic impact analysis is required to support the proposed subdivision.

Two study intersections have been identified by City of Sherwood for analysis:

1. SW Edy Road/SW Nursery Way
2. SW Edy Road/SW Borchers Drive

Development of the subdivision will occur in a single phase. It is anticipated that full buildout will occur by the end of 2014. Based upon regional traffic trends, a growth rate of 2% is assumed per year.

Access will be provided via an extension of Nursery Way to the south from Edy Road. With future development, Nursery Way will likely be further extended to the west from the project site to connect with the existing terminus of Nursery Way.

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Edy Road is classified as a collector roadway by the City of Sherwood Transportation System Plan and Washington County Transportation System Plan while Nursery Way will be developed as a local residential street. Edy Road is under the jurisdiction of Washington County, while Nursery Way will be under the jurisdiction of the City of Sherwood.

EXISTING & FUTURE TRAFFIC VOLUMES

To determine the existing traffic volumes at the study area intersections, manual turning movement counts were conducted. The counts were completed during the periods of 7:00 to 9:00 AM and from 4:00 to 6:00 PM in order to capture both the morning and evening peak hours. Figure 1 in Appendix B shows the existing peak hour traffic volumes.

Detailed traffic count data is included in the Appendix A of this report.

For this analysis, it was conservatively assumed that volumes would increase at a rate of two percent (2%) per year from the 2012 existing traffic volumes to the 2014 buildout conditions.

Figure 2 in Appendix B shows the 2014 traffic background volumes for both the morning and evening peak hours.

TRIP GENERATION AND DISTRIBUTION

Trip Generation

To estimate the number of trips that will be generated by the proposed subdivision, trip rates from the manual *TRIP GENERATION,* Eighth Edition, published by the Institute of Transportation Engineers (ITE), were used. The trip rates used were for land-use codes 210, *Single-Family Detached Housing.* The trip generation rates are based on the number of dwelling units.

The following table shows the results of the trip generation analysis.

		ITE	AM Peak Hour			PM Peak Hour			Wkdy
Land Use	*Units*	*Code*	*In*	*Out*	*Total*	*In*	*Out*	*Total*	*Total*
Single-Family Detached Housing	26 Dwellings	210	5	15	20	20	12	32	312

Trip Distribution

The estimated new trips of the proposed subdivision were assigned to the project study area based primarily on the existing distribution of peak hour traffic volumes and the location of surrounding trip destinations.

Figure 3 of Appendix B shows the distribution and assignment of the net increase in trips.

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INTERSECTION CAPACITY & LEVEL OF SERVICE

To determine the capacity and level of service at the study intersections, a capacity analysis was conducted. The analysis was conducted using the unsignalized intersection analysis methodology in the 2000 *HIGHWAY CAPACITY MANUAL* (HCM) published by the Transportation Research Board. Level of service can range from A, which indicates little or no delay, to F, which indicates a significant amount of congestion and delay. City of Sherwood operational standards per the City's Transportation System Plan are level of service D or better at unsignalized intersections. However, no particular level of service has been adopted as approval criteria within the City of Sherwood Zoning and Community Development Code.

In order to gauge the amount of capacity remaining at the intersection, the volume-to-capacity ratio, or v/c ratio, is also calculated and reported. A v/c ratio of less than 1.0 indicates that the intersection is operating within capacity. At unsignalized intersections, the v/c ratio is not dependent on the delay that a driver experiences while waiting for a suitable gap in traffic, but rather, the number of available gaps and the demand on the side street.

The following table presents the intersection capacity analysis results at the two study intersections.

Capacity & Level of Service Summary

	AM Peak Hour			*PM Peak Hour*		
	Delay	*LOS*	*v/c*	*Delay*	*LOS*	*v/c*
SW Edy Road/SW Nursery Way						
2013 Total	13.7	B	0.04	11.4	B	0.03
SW Edy Road/SW Borchers Drive						
Existing Conditions	30.0	D	0.50	35.5	E	0.74
2014 Background	34.1	D	0.55	42.6	E	0.80
2014 Total	34.5	D	0.55	45.1	E	0.82

For both level of service and v/c ratio, the reported results apply to the stop-controlled movements from the side streets. These movements generally experience the longest delays.

During both the weekday AM and weekday PM peak hour, the intersection of SW Edy Road/SW Nursery Way will operate acceptably.

During the weekday AM peak hour in the existing, background and total traffic conditions, the intersection of SW Edy Road/SW Borchers Drive will operate acceptably.

During the weekday PM peak hour in the existing, background and total traffic conditions, the intersection of SW Edy Road/SW Borchers Drive will operate at LOS E. With the proposed subdivision, the intersection will operate minimally worse than the 2014 background conditions, but

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will continue to operate at LOS E. However, again, the City of Sherwood has not adopted any particular standard as part of their Zoning and Community Development Code.

The City's TSP considers either a future traffic signal or roundabout at the intersection of SW Edy Road and SW Borchers Drive. As demonstrated in this analysis, the intersection is still operating within capacity and queuing is acceptable. The subject subdivision has an insignificant impact to the intersection and does not add any traffic to the critical southbound left turn from Borchers Drive onto Edy Road. This intersection should continue to be monitored as properties in the area develop and as growth occurs in Sherwood, but there is no nexus to require improvements at this intersection as part of the subject application.

Detailed level of service and capacity analysis calculations are included in Appendix C.

LEFT TURN LANE WARRANTS

As required by the City of Sherwood, the need for a westbound left turn lane at the intersection of Edy Road/Nursery Way was evaluated based upon the left turn lane warrant curves developed by M.D. Harmelink. Based upon these curves, a westbound left turn lane is not required.

The left turn lane warrant analysis is provided in Appendix D.

QUEUING AT EDY ROAD/BORCHERS DRIVE

As required by the City of Sherwood, the eastbound left turn lane queue storage was evaluated at the intersection of Edy Road/Borchers Drive. The table below presents the results of that analysis.

	AM Peak Hour 95% Queue (feet)	*PM Peak Hour 95% Queue (feet)*	*Available Queue Storage (feet)*	*Queue Storage Exceeded?*
SW Edy Road/SW Borchers Drive				
Existing Conditions	25	25	50	No
2014 Background	25	25	50	No
2014 Total	25	25	50	No

Detailed calculations are included in Appendix C.

SIGHT DISTANCE

Intersection sight distance at the new intersection of Edy Road and Nursery Way is addressed by AKS Engineering and Forestry in other application materials. For line of sight information and demonstration of compliance with Washington County standards, please refer to the civil plan set.

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ACCESS SPACING

Access to Edy Road will be provided via an extension of Nursery Way to the south from Edy Road. With future land development not under the control of the applicant and not part of this application, Nursery Way may be extended to the west to connect to the existing terminus of Nursery Way. Nursery Way is planned to be a City maintained local street.

Edy Road is classified as a collector roadway by the City of Sherwood Transportation System Plan and Washington County's Transportation System Plan while Nursery Way will be developed as a local residential street.

The proposed extension of Nursery Way will intersect Edy Road approximately 230 feet to the west of Bedstraw Terrace and approximately 340 feet to the east of Settlement Drive.

Edy Road is under the jurisdiction of Washington County. Section 501-8.5 of the County's Community Development Code includes standards for control of access. However, this section does not address any particular standard for a new public roadway to access an existing public roadway. A search of the County's TSP also revealed no particular standard for this situation. However, this section requires that no access occur within 100 feet of another access location. In the case of Nursery Way, there is sufficient distance between any adjacent roadways and accesses to meet this standard.

PEDESTRIAN SAFETY

The proposed subdivision will provide a sidewalk along the subdivision's Edy Road south side site frontage and along both sides of the proposed Nursery Way extension from Edy Road.

Based upon weekday PM peak hour (5 PM to 6:30 PM) site observations on February 21, 2012, there is very little existing pedestrian activity in the area. During this period, there was one pedestrian observed on Edy Road in the vicinity of the site. No pedestrians were observed to cross Edy Road at or near Edy Road/Bedstraw Terrace or Edy Road/Settlement Drive.

Sight distance at the intersection of Edy Road/Nursery Way will be adequate. Sight distance at the intersections of Edy Road/Bedstraw Terrace and Edy Road/Settlement Drive is also adequate.

A review of the crash history in the area indicates that there are no reported pedestrian or bicycle related crashes on Edy Road in the vicinity of the site from the period of 2007 to July 2011.

Based upon this information, it is not recommended that marked pedestrian crosswalks be provided across Edy Road as few pedestrians are anticipated and existing safety is adequate.

Crash history of Edy Road is provided in Appendix E.

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CONCLUSIONS & RECOMMENDATIONS

Based on the reasonable worst-case development assumptions for the site under the existing IP zone and the proposed MDRL zone, transportation facilities are not significantly affected, as the proposal results in less trips on the transportation system. Therefore, the requirements of the TPR and City of Sherwood are met. The zone change and comprehensive plan amendment can be approved without mitigation or restrictions.

The subdivision analysis has established the sight distance at the proposed new intersection of Edy Road and Nursery Way can be made adequate and will meet the standards of Washington County. The intersection of Edy Road/Borchers Drive currently operates at LOS E and will continue to operate at LOS E with the approval of the subdivision. The City of Sherwood has not adopted criteria relevant to a subdivision application that necessitates improvements to that intersection, nor is there currently a need for mitigation at the intersection. The subdivision application can be approved without further mitigation or improvements.

REGISTERED PROFESSIONAL ENGINEER
54853
OREGON
JULY 9, 2001
TODD E. MOBLEY

3/9/12

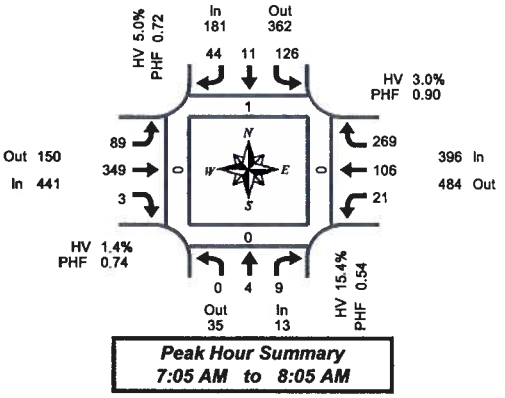
EXPIRES: 12/31/2012

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APPENDIX A

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:05 AM to 8:05 AM

SW Borchers Dr & SW Edy Rd

Thursday, March 01, 2012
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy 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	0	0	0	0	10	0	1	0	5	25	0	0	0	5	16	0	62	0	0	0	0
7:05 AM	0	0	1	0	9	0	3	0	3	19	0	0	0	6	29	0	70	0	0	0	0
7:10 AM	0	0	0	0	7	0	1	0	3	23	0	0	2	11	22	0	69	1	0	0	0
7:15 AM	0	0	0	0	16	2	3	0	7	13	1	0	2	16	22	0	82	0	0	0	0
7:20 AM	0	2	0	0	10	0	3	0	6	14	0	0	3	9	10	0	57	0	0	0	0
7:25 AM	0	0	1	0	16	3	5	0	3	32	0	0	3	6	18	0	87	0	0	0	0
7:30 AM	0	1	0	0	13	0	6	0	4	30	0	0	1	10	24	0	89	0	0	0	0
7:35 AM	0	0	1	0	15	2	3	0	8	36	0	0	2	7	22	0	96	0	0	0	0
7:40 AM	0	1	1	0	9	1	4	0	6	37	1	0	2	13	18	0	93	0	0	0	0
7:45 AM	0	0	2	0	8	2	10	0	8	37	0	0	2	8	23	1	100	0	0	0	0
7:50 AM	0	0	2	0	10	1	3	0	13	33	1	0	1	7	26	0	97	0	0	0	0
7:55 AM	0	0	0	0	5	0	3	0	14	36	0	0	1	3	31	0	93	0	0	0	0
8:00 AM	0	0	1	0	8	0	0	0	14	39	0	0	2	10	24	0	98	0	0	0	0
8:05 AM	0	0	0	0	12	0	0	0	6	13	0	0	1	6	15	0	53	0	0	0	0
8:10 AM	0	1	0	0	16	1	2	0	7	17	0	0	3	5	14	0	66	0	0	0	0
8:15 AM	0	0	1	0	10	0	4	0	1	10	0	0	2	3	27	0	58	0	0	0	0
8:20 AM	0	0	0	0	15	0	4	0	6	18	0	0	4	2	15	0	64	0	0	0	0
8:25 AM	0	0	1	0	8	0	3	0	1	8	0	0	4	4	18	0	47	0	0	0	0
8:30 AM	0	0	0	0	8	0	1	0	2	13	0	0	1	1	13	0	39	0	0	0	0
8:35 AM	0	0	2	0	8	0	3	0	3	13	0	0	2	6	16	0	53	0	0	0	0
8:40 AM	0	0	0	0	9	0	3	0	4	14	0	0	1	6	13	1	50	0	0	0	1
8:45 AM	0	1	1	0	9	0	1	0	6	15	0	0	3	5	13	0	54	0	0	0	0
8:50 AM	0	0	2	0	11	0	2	0	1	6	0	1	5	4	16	0	47	0	0	0	0
8:55 AM	0	0	0	0	8	0	2	0	4	6	0	0	2	3	13	0	38	0	0	0	0
Total Survey	0	6	16	0	250	12	70	0	135	507	3	1	49	156	458	2	1,662	1	0	0	1

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy 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	0	0	1	0	26	0	5	0	11	67	0	0	2	22	67	0	201	1	0	0	0
7:15 AM	0	2	1	0	42	5	11	0	16	59	1	0	8	31	50	0	226	0	0	0	0
7:30 AM	0	2	2	0	37	3	13	0	18	103	1	0	5	30	64	0	278	0	0	0	0
7:45 AM	0	0	4	0	23	3	16	0	35	106	1	0	4	18	80	1	290	0	0	0	0
8:00 AM	0	1	1	0	36	1	2	0	27	69	0	0	6	21	53	0	217	0	0	0	0
8:15 AM	0	0	2	0	33	0	11	0	8	36	0	0	10	9	60	0	169	0	0	0	0
8:30 AM	0	0	2	0	25	0	7	0	9	40	0	0	4	13	42	1	142	0	0	0	1
8:45 AM	0	1	3	0	28	0	5	0	11	27	0	1	10	12	42	0	139	0	0	0	0
Total Survey	0	6	16	0	250	12	70	0	135	507	3	1	49	156	458	2	1,662	1	0	0	1

Peak Hour Summary
7:05 AM to 8:05 AM

By Approach	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy 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	13	35	48	0	181	362	543	0	441	150	591	0	396	484	880	1	1,031	1	0	0	0
%HV	15.4%				5.0%				1.4%				3.0%				2.8%				
PHF	0.54				0.72				0.74				0.90				0.89				

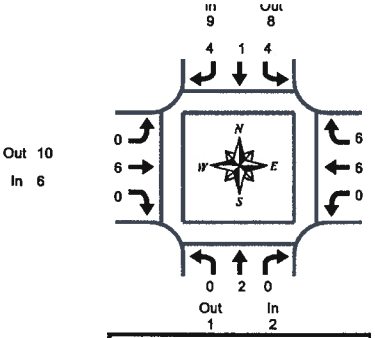
By Movement	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	4	9	13	126	11	44	181	89	349	3	441	21	106	269	396	1,031
%HV	0.0%	50.0%	0.0%	15.4%	3.2%	9.1%	9.1%	5.0%	0.0%	1.7%	0.0%	1.4%	0.0%	5.7%	2.2%	3.0%	2.8%
PHF	0.00	0.33	0.45	0.54	0.72	0.55	0.65	0.72	0.54	0.79	0.38	0.74	0.66	0.74	0.83	0.90	0.89

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy 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	0	4	8	0	128	11	45	0	80	335	3	0	19	101	261	1	995	1	0	0	0
7:15 AM	0	5	8	0	138	12	42	0	96	337	3	0	23	100	247	1	1,011	0	0	0	0
7:30 AM	0	3	9	0	129	7	42	0	88	314	2	0	25	78	257	1	954	0	0	0	0
7:45 AM	0	1	9	0	117	4	36	0	79	251	1	0	24	61	235	2	818	0	0	0	1
8:00 AM	0	2	8	0	122	1	25	0	55	172	0	1	30	55	197	1	667	0	0	0	1

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:05 AM to 8:05 AM

SW Borchers Dr & SW Edy Rd

Thursday, March 01, 2012
7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy 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	1	0	1	0	1	0	1	2
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	1	1	0	0	0	0	0	1	0	1	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
7:20 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	2	0	2	4
7:25 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	2
7:30 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	2	3
7:35 AM	0	0	0	0	1	0	1	2	0	0	0	0	0	1	0	1	3
7:40 AM	0	0	0	0	1	0	0	1	0	2	0	2	0	1	1	2	5
7:45 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
7:50 AM	0	0	0	0	1	0	1	2	0	1	0	1	0	0	1	1	4
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	1	0	0	1	0	0	0	0	0	0	0	0	1
8:05 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
8:10 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:20 AM	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	1	3
8:25 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	1	2
8:50 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	2	1	3	9	1	4	14	1	8	0	9	0	7	8	15	41

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy 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	1	1	0	1	0	1	0	2	0	2	4
7:15 AM	0	2	0	2	0	1	0	1	0	0	0	0	0	2	3	5	8
7:30 AM	0	0	0	0	2	0	2	4	0	2	0	2	0	3	2	5	11
7:45 AM	0	0	0	0	1	0	1	2	0	4	0	4	0	0	1	1	7
8:00 AM	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	3
8:15 AM	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	1	4
8:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
8:45 AM	0	0	1	1	0	0	0	0	0	1	0	1	0	0	1	1	3
Total Survey	0	2	1	3	9	1	4	14	1	8	0	9	0	7	8	15	41

Heavy Vehicle Peak Hour Summary
7:05 AM to 8:05 AM

By Approach	Northbound SW Borchers Dr			Southbound SW Borchers Dr			Eastbound SW Edy Rd			Westbound SW Edy Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	1	3	9	8	17	6	10	16	12	10	22	29
PHF	0.25			0.56			0.25			0.60			0.60

By Movement	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	2	0	2	4	1	4	9	0	6	0	6	0	6	6	12	29
PHF	0.00	0.25	0.00	0.25	0.50	0.25	0.50	0.56	0.00	0.25	0.00	0.25	0.00	0.50	0.50	0.60	0.60

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

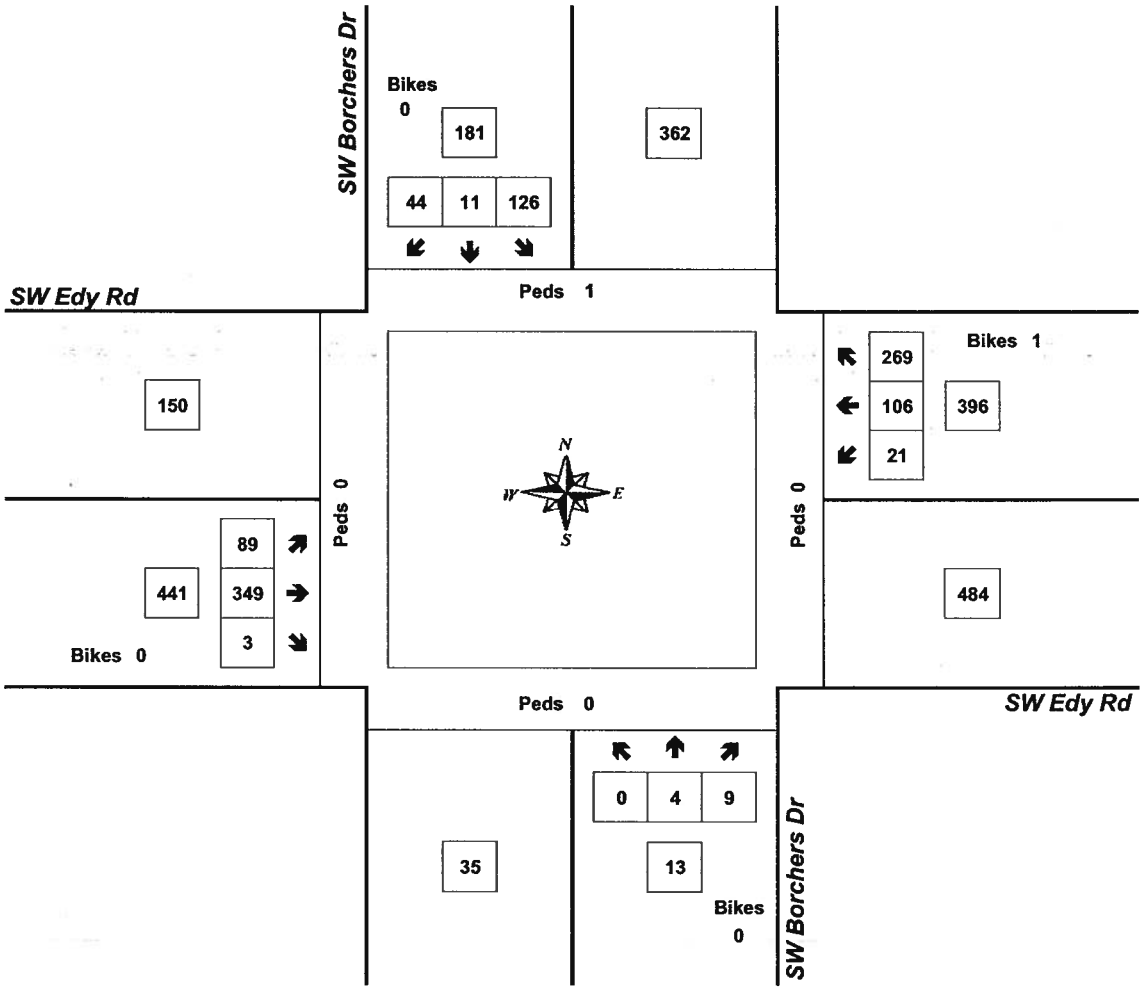
Interval Start Time	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	2	0	2	3	1	4	8	0	7	0	7	0	7	6	13	30
7:15 AM	0	2	0	2	6	1	3	10	0	6	0	6	0	5	6	11	29
7:30 AM	0	0	0	0	9	0	3	12	0	6	0	6	0	3	4	7	25
7:45 AM	0	0	0	0	7	0	1	8	1	4	0	5	0	0	2	2	15
8:00 AM	0	0	1	1	6	0	0	6	1	1	0	2	0	0	2	2	11

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SW Borchers Dr & SW Edy Rd

7:05 AM to 8:05 AM
Thursday, March 01, 2012

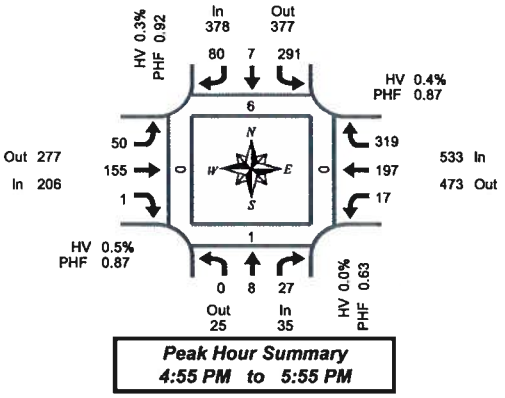


Approach	PHF	HV%	Volume
EB	0.74	1.4%	441
WB	0.90	3.0%	396
NB	0.54	15.4%	13
SB	0.72	5.0%	181
Intersection	0.89	2.8%	1,031

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



SW Borchers Dr & SW Edy Rd

Wednesday, February 29, 2012
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy Rd				Interval	Pedestrians Crosswalk			
Time	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	Total	North	South	East	West
4:00 PM	1	4	3	0	18	1	5	0	6	16	0	0	1	8	22	0	85	0	0	0	0
4:05 PM	0	0	2	0	19	0	4	0	3	7	0	0	2	12	21	0	70	0	0	0	0
4:10 PM	0	1	2	0	25	0	5	0	3	9	0	0	0	5	11	0	61	0	0	0	0
4:15 PM	0	1	1	0	17	1	2	0	3	9	0	0	1	17	27	0	79	1	0	0	0
4:20 PM	0	1	3	0	31	0	2	0	4	10	0	0	1	6	22	0	80	1	0	0	0
4:25 PM	0	0	2	0	23	0	5	0	5	13	0	0	3	13	17	0	81	0	0	0	0
4:30 PM	0	0	1	0	21	0	3	0	0	15	0	1	4	13	15	1	72	0	0	0	1
4:35 PM	0	0	2	0	17	0	5	0	6	10	0	0	0	17	22	0	79	0	0	0	0
4:40 PM	0	0	2	0	19	0	4	0	5	10	1	0	2	14	25	0	82	0	0	0	0
4:45 PM	0	0	1	0	28	0	3	0	3	9	1	0	4	14	28	0	91	0	0	0	0
4:50 PM	0	0	2	0	24	0	5	0	1	10	0	0	1	16	18	0	77	1	0	0	0
4:55 PM	0	0	1	0	31	0	6	0	5	12	0	0	0	13	23	0	91	2	0	0	0
5:00 PM	0	0	7	0	30	0	5	0	2	18	0	0	2	11	23	0	98	0	1	0	0
5:05 PM	0	0	5	0	14	1	8	0	6	16	0	0	1	16	25	0	92	1	0	0	0
5:10 PM	0	0	2	0	28	0	3	0	5	12	0	0	0	16	24	0	90	0	0	0	0
5:15 PM	0	0	0	0	28	0	8	0	1	10	0	0	1	15	29	0	92	0	0	0	0
5:20 PM	0	1	0	0	24	0	7	0	7	12	0	0	4	18	24	0	97	0	0	0	0
5:25 PM	0	0	5	0	29	0	7	0	3	15	0	0	1	16	34	0	110	0	0	0	0
5:30 PM	0	2	1	0	22	0	7	0	4	7	0	1	1	20	28	0	92	1	0	0	0
5:35 PM	0	2	1	0	13	3	8	0	6	16	0	0	1	14	32	0	96	2	0	0	0
5:40 PM	0	1	1	0	22	1	6	0	2	12	1	0	2	18	23	0	89	0	0	0	0
5:45 PM	0	2	2	0	18	2	7	0	8	14	0	0	3	26	34	0	116	0	0	0	0
5:50 PM	0	0	2	0	32	0	8	0	1	11	0	0	1	14	20	0	89	0	0	0	0
5:55 PM	0	0	2	0	20	0	5	0	6	8	0	0	4	19	26	0	90	0	0	0	0
Total Survey	1	15	50	0	553	9	128	0	95	281	3	2	40	351	573	1	2,099	9	1	0	1

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy Rd				Interval	Pedestrians Crosswalk			
Time	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	Total	North	South	East	West
4:00 PM	1	5	7	0	62	1	14	0	12	32	0	0	3	25	54	0	216	0	0	0	0
4:15 PM	0	2	6	0	71	1	9	0	12	32	0	0	5	36	66	0	240	2	0	0	0
4:30 PM	0	0	5	0	57	0	12	0	11	35	1	1	6	44	62	1	233	0	0	0	1
4:45 PM	0	0	4	0	83	0	14	0	9	31	1	0	5	43	69	0	259	3	0	0	0
5:00 PM	0	0	14	0	72	1	16	0	13	46	0	0	3	43	72	0	280	1	1	0	0
5:15 PM	0	1	5	0	81	0	22	0	11	37	0	0	6	49	87	0	299	0	0	0	0
5:30 PM	0	5	3	0	57	4	21	0	12	35	1	1	4	52	83	0	277	3	0	0	0
5:45 PM	0	2	6	0	70	2	20	0	15	33	0	0	8	59	80	0	295	0	0	0	0
Total Survey	1	15	50	0	553	9	128	0	95	281	3	2	40	351	573	1	2,099	9	1	0	1

Peak Hour Summary
4:55 PM to 5:55 PM

By Approach	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy 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	35	25	60	0	378	377	755	0	206	277	483	1	533	473	1,006	0	1,152	6	1	0	0
%HV	0.0%				0.3%				0.5%				0.4%				0.3%				
PHF	0.63				0.92				0.87				0.87				0.96				

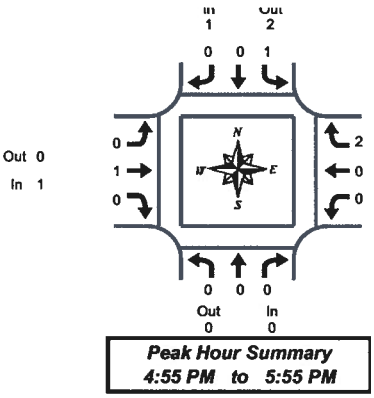
By Movement	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	8	27	35	291	7	80	378	50	155	1	206	17	197	319	533	1,152
%HV	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.3%	0.0%	0.6%	0.0%	0.5%	0.0%	0.0%	0.6%	0.4%	0.3%
PHF	0.00	0.40	0.48	0.63	0.90	0.29	0.91	0.92	0.78	0.84	0.25	0.87	0.71	0.85	0.85	0.87	0.96

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy Rd				Interval	Pedestrians Crosswalk			
Time	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	Total	North	South	East	West
4:00 PM	1	7	22	0	273	2	49	0	44	130	2	1	19	148	251	1	948	5	0	0	1
4:15 PM	0	2	29	0	283	2	51	0	45	144	2	1	19	166	269	1	1,012	6	1	0	1
4:30 PM	0	1	28	0	293	1	64	0	44	149	2	1	20	179	290	1	1,071	4	1	0	1
4:45 PM	0	6	26	0	293	5	73	0	45	149	2	1	18	187	311	0	1,115	7	1	0	0
5:00 PM	0	8	28	0	280	7	79	0	51	151	1	1	21	203	322	0	1,151	4	1	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:55 PM to 5:55 PM

SW Borchers Dr & SW Edy Rd

Wednesday, February 29, 2012
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy 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	0	0	0	0	0	1	1	1
4:05 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	1	0	1	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	0	0	0	1	0	0	1	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	1	1	1
5:05 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	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	0	0	0	0	0	0	0	0	0	0	0	0
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	2	0	0	2	0	3	0	3	0	1	3	4	9

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy 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	1	0	0	1	0	0	0	0	0	0	1	1	2
4:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
4:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	1	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
5:30 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
Total Survey	0	0	0	0	2	0	0	2	0	3	0	3	0	1	3	4	9

Heavy Vehicle Peak Hour Summary
4:55 PM to 5:55 PM

By Approach	Northbound SW Borchers Dr			Southbound SW Borchers Dr			Eastbound SW Edy Rd			Westbound SW Edy Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	1	2	3	1	0	1	2	2	4	4
PHF	0.00			0.25			0.25			0.50			0.33

By Movement	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	1	0	0	1	0	1	0	1	0	0	2	2	4
PHF	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.25	0.00	0.25	0.00	0.25	0.00	0.00	0.50	0.50	0.33

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

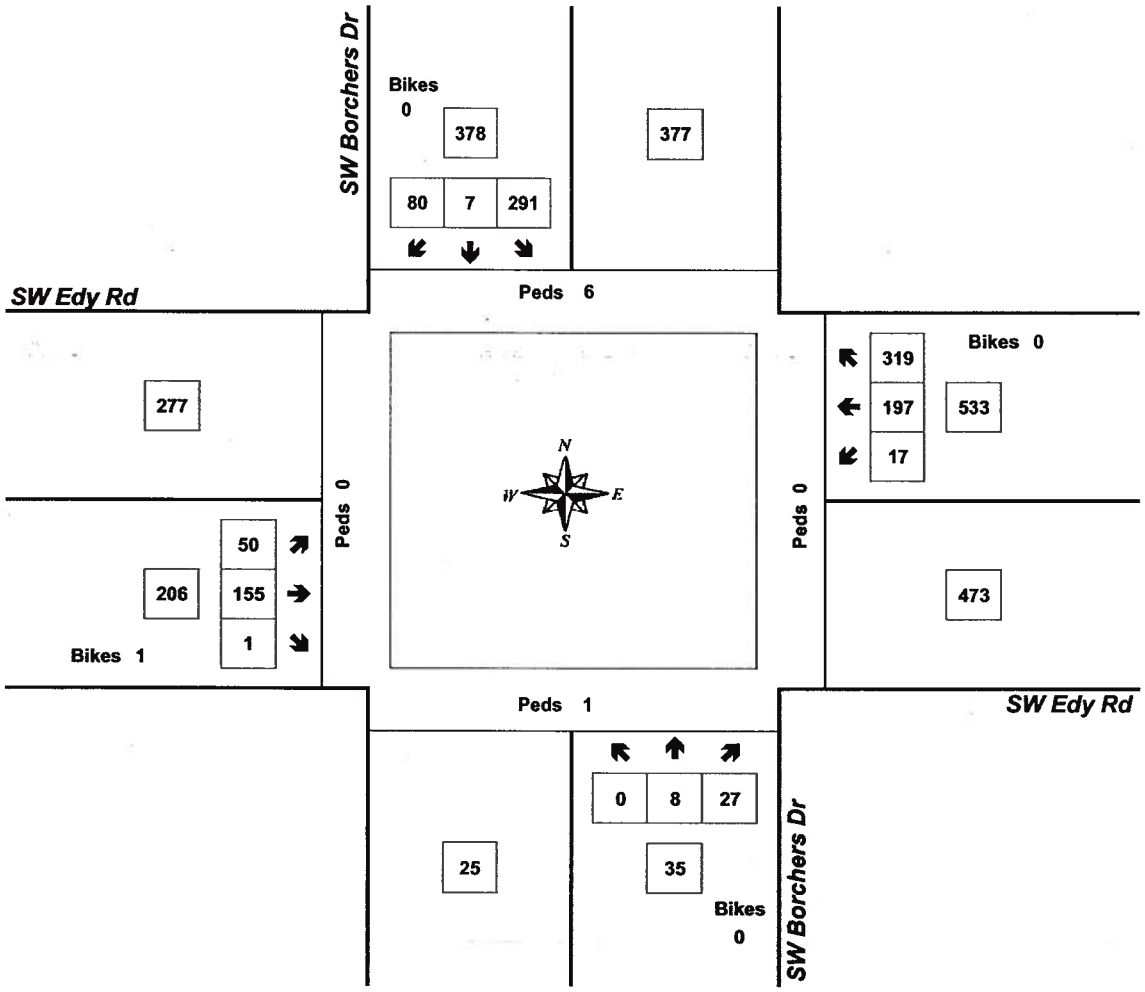
Interval Start Time	Northbound SW Borchers Dr				Southbound SW Borchers Dr				Eastbound SW Edy Rd				Westbound SW Edy Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	2	0	0	2	0	2	0	2	0	1	1	2	6
4:15 PM	0	0	0	0	1	0	0	1	0	3	0	3	0	1	1	2	6
4:30 PM	0	0	0	0	1	0	0	1	0	1	0	1	0	1	2	3	5
4:45 PM	0	0	0	0	1	0	0	1	0	1	0	1	0	0	2	2	4
5:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2	2	3

Peak Hour Summary

All Traffic Data Services Inc
Clay Carney
(503) 833-2740

SW Borchers Dr & SW Edy Rd

4:55 PM to 5:55 PM
Wednesday, February 29, 2012

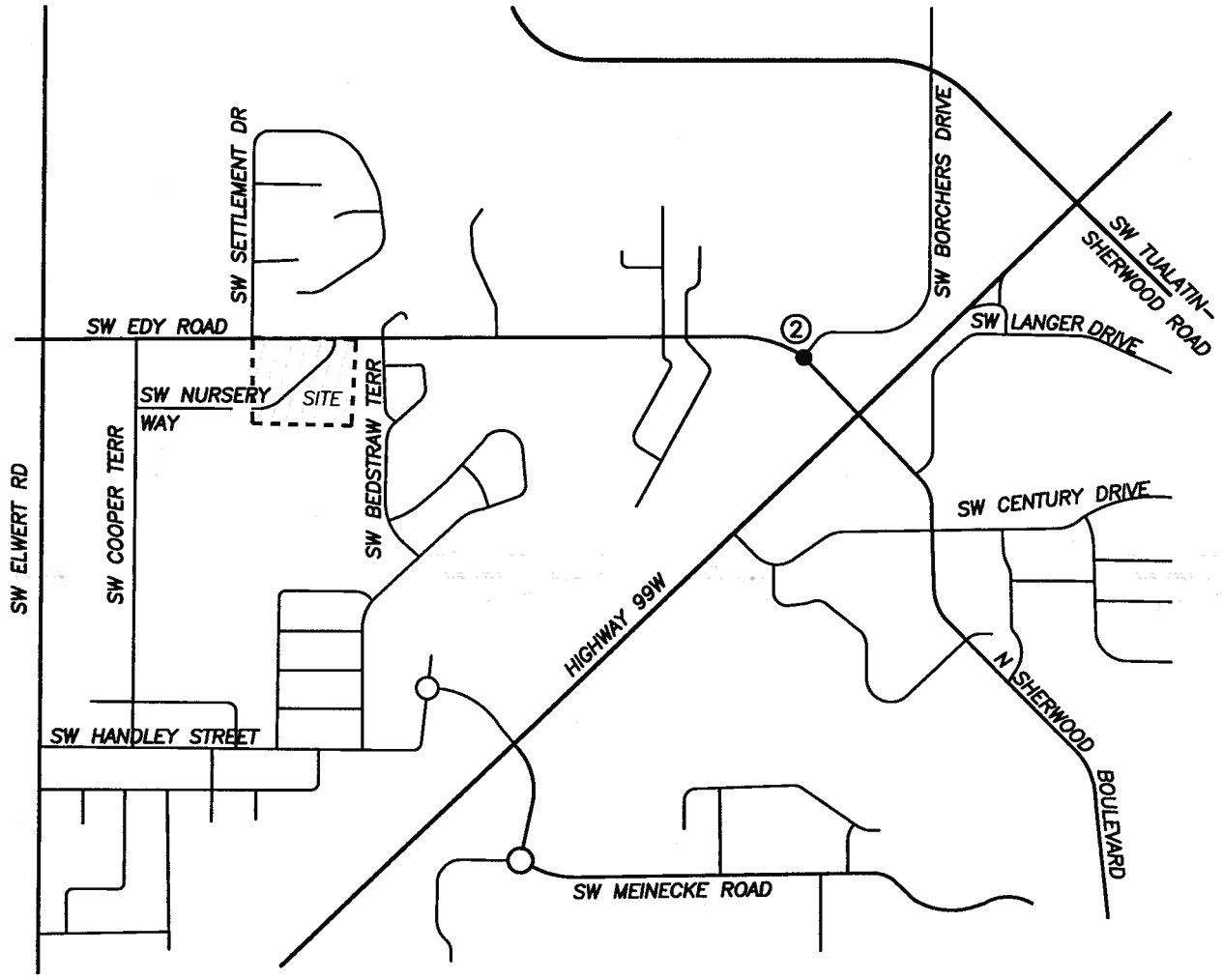


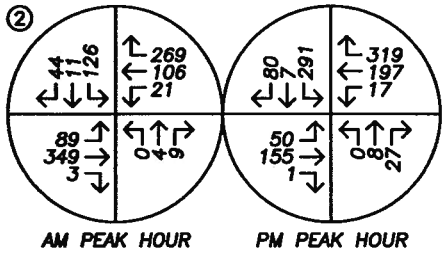
Approach	PHF	HV%	Volume
EB	0.87	0.5%	206
WB	0.87	0.4%	533
NB	0.63	0.0%	35
SB	0.92	0.3%	378
Intersection	0.96	0.3%	1,152

Count Period: 4:00 PM to 6:00 PM

1e

APPENDIX B



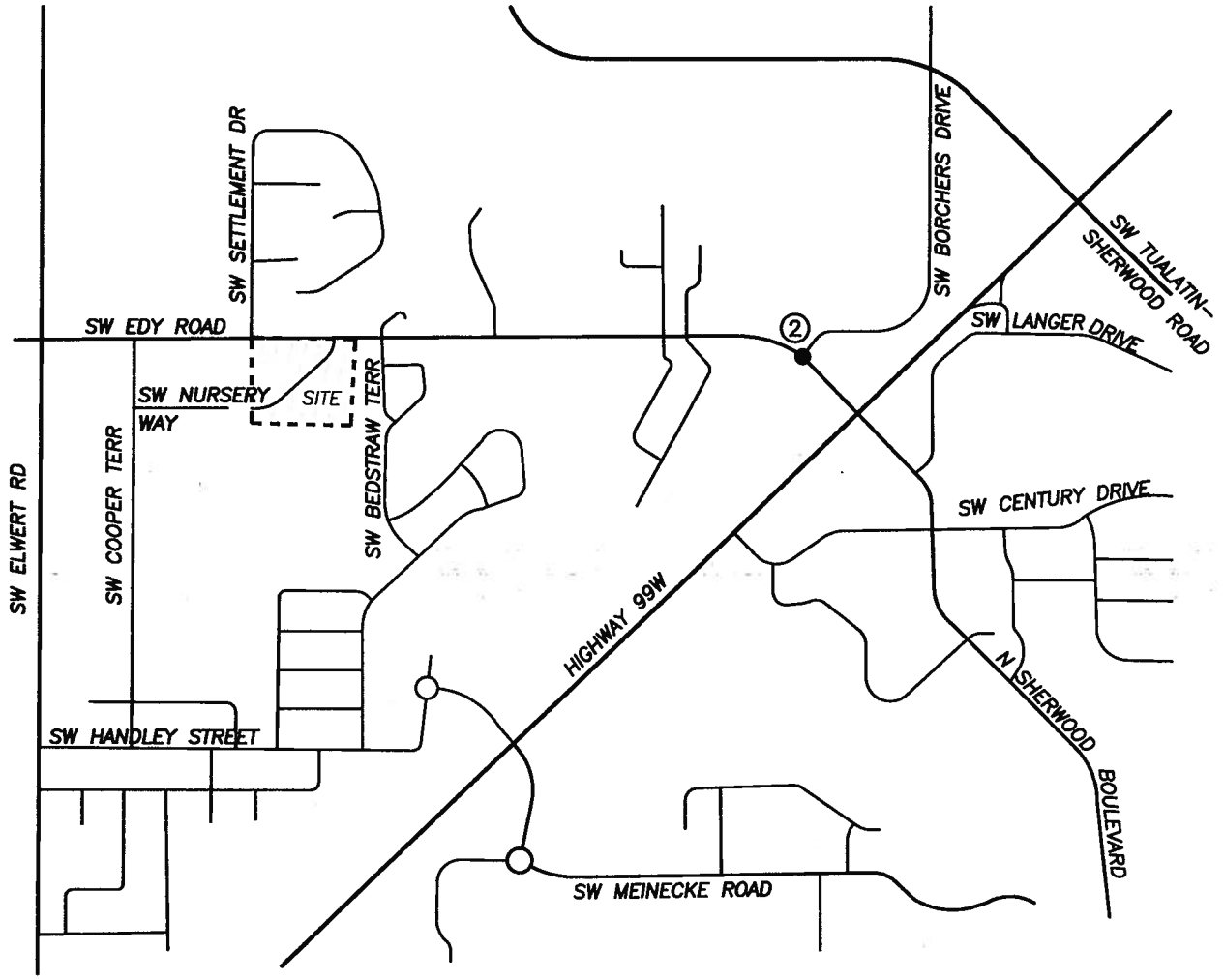


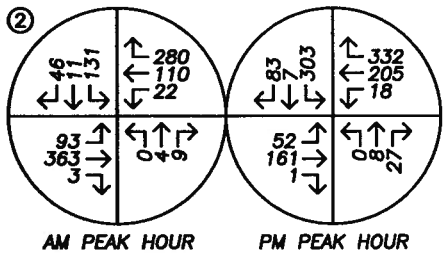
TRAFFIC VOLUMES
Existing Traffic Volumes
AM & PM Peak Hours

no scale

FIGURE 1

PAGE –



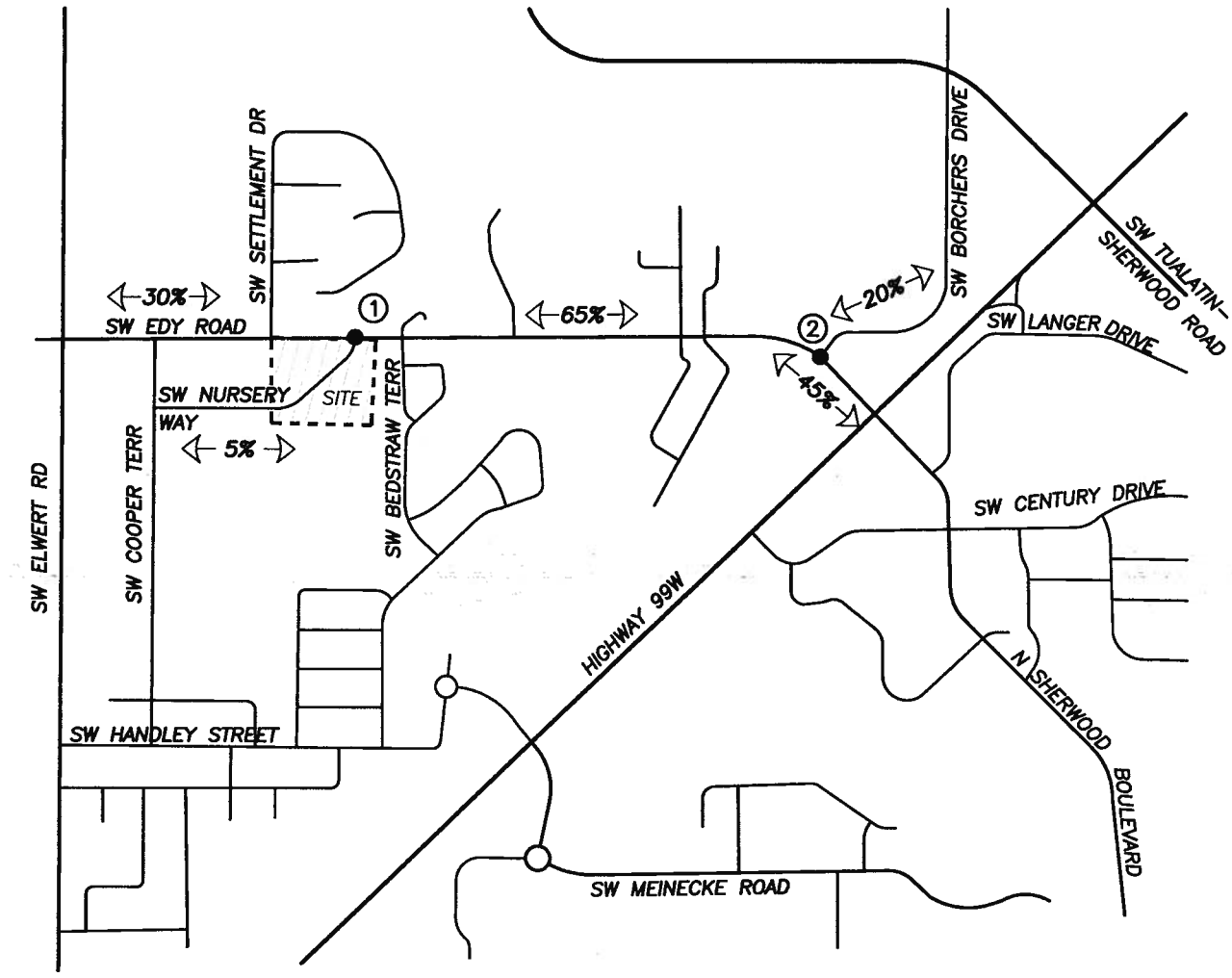


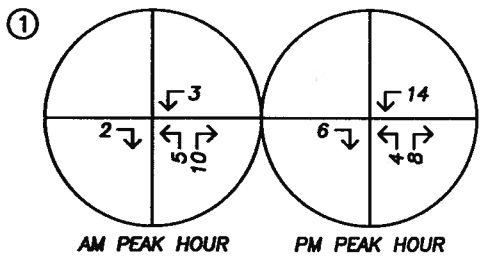
TRAFFIC VOLUMES
Year 2014 Background Traffic
AM & PM Peak Hours

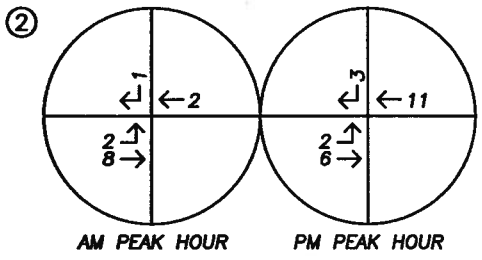
no scale

FIGURE 2

PAGE –





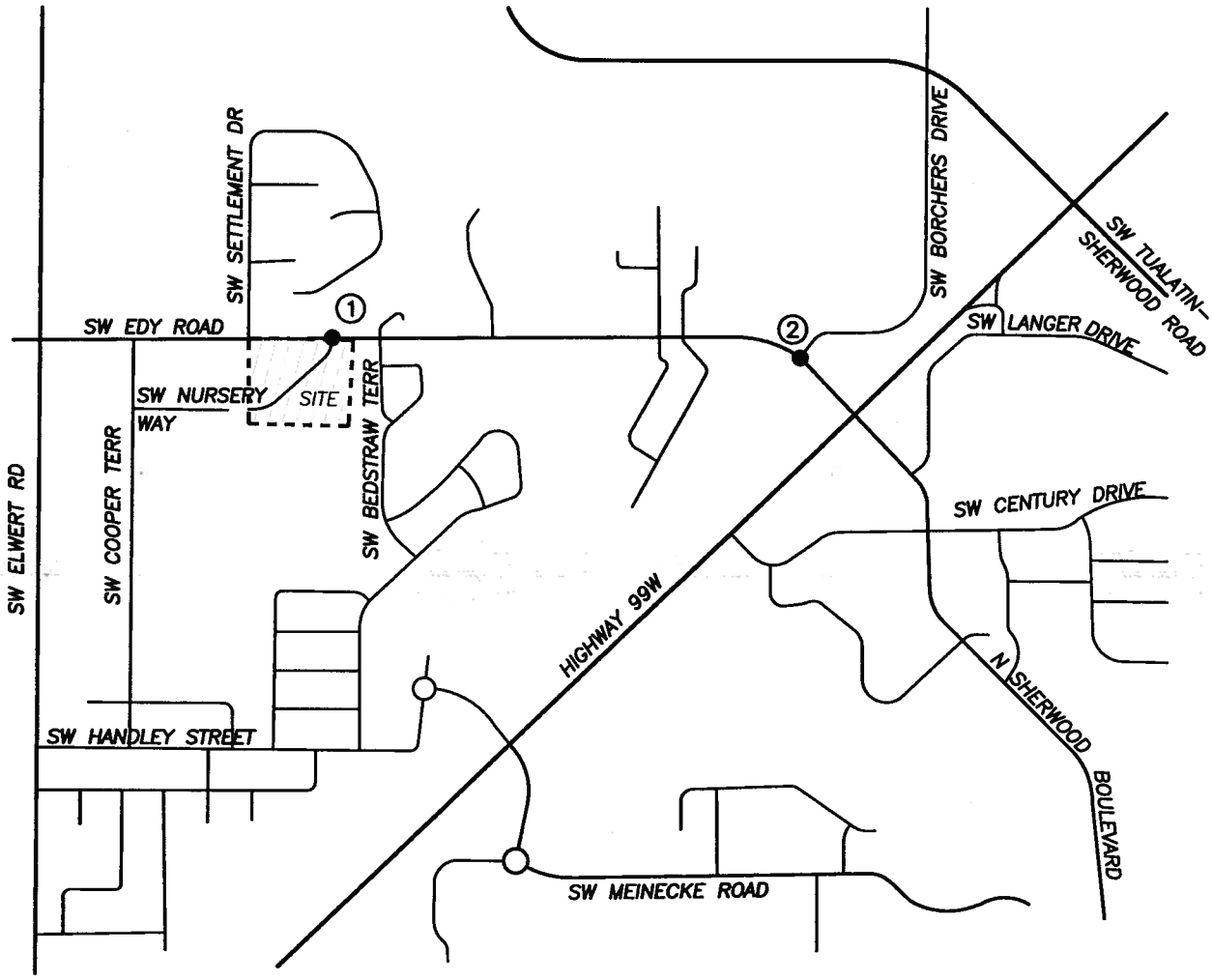


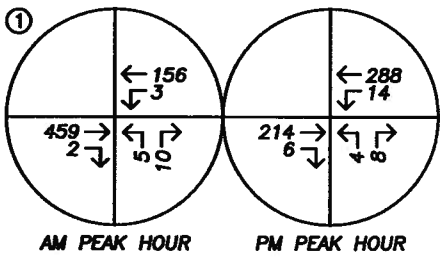
SITE-GENERATED TRAFFIC (26 Single Family DU)
Trip Distribution & Assignment
Weekday AM & PM Peak Hours

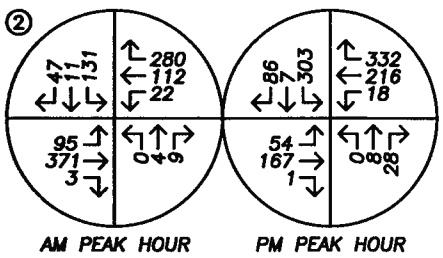
no scale

FIGURE 3

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TRAFFIC VOLUMES
Total 2014 Total Traffic Volumes (Background+26 SFR Homes)
AM & PM Peak Hours

no scale

FIGURE 4

PAGE –

1e

APPENDIX C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RN*	Intersection	*SW Edy Road & SW Borchers Dr*
Agency/Co.	*Lancaster Engineering*	Jurisdiction	*City of Sherwood*
Date Performed	*3/2/2012*	Analysis Year	*2012 Existing*
Analysis Time Period	*Weekday AM Peak Hour*		

Project Description	*Rychlick Farm - Renaissance Homes*
East/West Street: *SW Edy Road*	North/South Street: *Borchers Drive*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*89*	*349*	*3*	*21*	*106*	*269*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*100*	*392*	*3*	*23*	*119*	*302*
Percent Heavy Vehicles	*1*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*1*
Configuration	*L*		*TR*	*L*	*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*4*	*9*	*126*	*11*	*44*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*0*	*4*	*10*	*141*	*12*	*49*
Percent Heavy Vehicles	*0*	*15*	*15*	*5*	*5*	*5*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*L*		*TR*	*L*		*TR*
v (veh/h)	*100*	*23*	*0*		*14*	*141*		*61*
C (m) (veh/h)	*1142*	*1158*	*207*		*377*	*281*		*652*
v/c	*0.09*	*0.02*	*0.00*		*0.04*	*0.50*		*0.09*
95% queue length	*0.29*	*0.06*	*0.00*		*0.12*	*2.63*		*0.31*
Control Delay (s/veh)	*8.5*	*8.2*	*22.4*		*14.9*	*30.0*		*11.1*
LOS	*A*	*A*	*C*		*B*	*D*		*B*
Approach Delay (s/veh)	--	--	*14.9*			*24.3*		
Approach LOS	--	--	*B*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RN*	Intersection	*SW Edy Road & SW Borchers Dr*
Agency/Co.	*Lancaster Engineering*	Jurisdiction	*City of Sherwood*
Date Performed	*3/2/2012*	Analysis Year	*2012 Existing*
Analysis Time Period	*Weekday PM Peak Hour*		

Project Description	*Rychlick Farm - Renaissance Homes*
East/West Street: *SW Edy Road*	North/South Street: *Borchers Drive*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*50*	*155*	*1*	*17*	*197*	*319*
Peak-Hour Factor, PHF	*0.96*	*0.96*	*0.96*	*0.96*	*0.96*	*0.96*
Hourly Flow Rate, HFR (veh/h)	*52*	*161*	*1*	*17*	*205*	*332*
Percent Heavy Vehicles	*1*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*1*
Configuration	*L*		*TR*	*L*	*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*8*	*27*	*291*	*7*	*80*
Peak-Hour Factor, PHF	*0.96*	*0.96*	*0.96*	*0.96*	*0.96*	*0.96*
Hourly Flow Rate, HFR (veh/h)	*0*	*8*	*28*	*303*	*7*	*83*
Percent Heavy Vehicles	*0*	*15*	*15*	*5*	*5*	*5*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*L*		*TR*	*L*		*TR*
v (veh/h)	*52*	*17*	*0*		*36*	*303*		*90*
C (m) (veh/h)	*1026*	*1427*	*293*		*572*	*407*		*764*
v/c	*0.05*	*0.01*	*0.00*		*0.06*	*0.74*		*0.12*
95% queue length	*0.16*	*0.04*	*0.00*		*0.20*	*5.98*		*0.40*
Control Delay (s/veh)	*8.7*	*7.6*	*17.3*		*11.7*	*35.5*		*10.3*
LOS	*A*	*A*	*C*		*B*	*E*		*B*
Approach Delay (s/veh)	--	--	*11.7*			*29.8*		
Approach LOS	--	--	*B*			*D*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RN*	Intersection	*SW Edy Road & SW Borchers Dr*
Agency/Co.	*Lancaster Engineering*	Jurisdiction	*City of Sherwood*
Date Performed	*3/2/2012*	Analysis Year	*2014 Background*
Analysis Time Period	*Weekday AM Peak Hour*		

Project Description	*Rychlick Farm - Renaissance Homes*
East/West Street:	*SW Edy Road*
North/South Street:	*Borchers Drive*
Intersection Orientation:	*East-West*
Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*93*	*363*	*3*	*22*	*110*	*280*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*104*	*407*	*3*	*24*	*123*	*314*
Percent Heavy Vehicles	*1*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*1*
Configuration	*L*		*TR*	*L*	*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*4*	*9*	*131*	*11*	*46*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*0*	*4*	*10*	*147*	*12*	*51*
Percent Heavy Vehicles	*0*	*15*	*15*	*5*	*5*	*5*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*L*		*TR*	*L*		*TR*
v (veh/h)	*104*	*24*	*0*		*14*	*147*		*63*
C (m) (veh/h)	*1126*	*1143*	*194*		*362*	*266*		*643*
v/c	*0.09*	*0.02*	*0.00*		*0.04*	*0.55*		*0.10*
95% queue length	*0.30*	*0.06*	*0.00*		*0.12*	*3.07*		*0.32*
Control Delay (s/veh)	*8.5*	*8.2*	*23.6*		*15.3*	*34.1*		*11.2*
LOS	*A*	*A*	*C*		*C*	*D*		*B*
Approach Delay (s/veh)	--	--	*15.3*			*27.2*		
Approach LOS	--	--	*C*			*D*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RN*	Intersection	*SW Edy Road & SW Borchers Dr*
Agency/Co.	*Lancaster Engineering*	Jurisdiction	*City of Sherwood*
Date Performed	*3/2/2012*	Analysis Year	*2014 Background*
Analysis Time Period	*Weekday PM Peak Hour*		

Project Description	*Rychlick Farm - Renaissance Homes*
East/West Street: *SW Edy Road*	North/South Street: *Borchers Drive*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*52*	*161*	*1*	*18*	*205*	*332*
Peak-Hour Factor, PHF	*0.96*	*0.96*	*0.96*	*0.96*	*0.96*	*0.96*
Hourly Flow Rate, HFR (veh/h)	*54*	*167*	*1*	*18*	*213*	*345*
Percent Heavy Vehicles	*1*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*1*
Configuration	*L*		*TR*	*L*	*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*8*	*28*	*303*	*7*	*83*
Peak-Hour Factor, PHF	*0.96*	*0.96*	*0.96*	*0.96*	*0.96*	*0.96*
Hourly Flow Rate, HFR (veh/h)	*0*	*8*	*29*	*315*	*7*	*86*
Percent Heavy Vehicles	*0*	*15*	*15*	*5*	*5*	*5*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*L*		*TR*	*L*		*TR*
v (veh/h)	*54*	*18*	*0*		*37*	*315*		*93*
C (m) (veh/h)	*1008*	*1420*	*278*		*562*	*392*		*756*
v/c	*0.05*	*0.01*	*0.00*		*0.07*	*0.80*		*0.12*
95% queue length	*0.17*	*0.04*	*0.00*		*0.21*	*7.07*		*0.42*
Control Delay (s/veh)	*8.8*	*7.6*	*17.9*		*11.9*	*42.6*		*10.4*
LOS	*A*	*A*	*C*		*B*	*E*		*B*
Approach Delay (s/veh)	--	--	*11.9*			*35.3*		
Approach LOS	--	--	*B*			*E*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RN*	Intersection	*SW Edy Road & SW Borchers Dr*
Agency/Co.	*Lancaster Engineering*	Jurisdiction	*City of Sherwood*
Date Performed	*3/2/2012*	Analysis Year	*2014 Total*
Analysis Time Period	*Weekday AM Peak Hour*		

Project Description *Rychlick Farm - Renaissance Homes*

East/West Street: *SW Edy Road* | North/South Street: *Borchers Drive*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*95*	*371*	*3*	*21*	*112*	*274*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*106*	*416*	*3*	*23*	*125*	*307*
Percent Heavy Vehicles	*1*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*1*
Configuration	*L*		*TR*	*L*	*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*4*	*9*	*129*	*11*	*47*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*0*	*4*	*10*	*144*	*12*	*52*
Percent Heavy Vehicles	*0*	*15*	*15*	*5*	*5*	*5*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*L*		*TR*	*L*		*TR*
v (veh/h)	*106*	*23*	*0*		*14*	*144*		*64*
C (m) (veh/h)	*1131*	*1135*	*191*		*359*	*261*		*640*
v/c	*0.09*	*0.02*	*0.00*		*0.04*	*0.55*		*0.10*
95% queue length	*0.31*	*0.06*	*0.00*		*0.12*	*3.05*		*0.33*
Control Delay (s/veh)	*8.5*	*8.2*	*23.8*		*15.4*	*34.5*		*11.2*
LOS	*A*	*A*	*C*		*C*	*D*		*B*
Approach Delay (s/veh)	--	--	*15.4*			*27.4*		
Approach LOS	--	--	*C*			*D*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RN*	Intersection	*SW Edy Road & SW Borchers Dr*
Agency/Co.	*Lancaster Engineering*	Jurisdiction	*City of Sherwood*
Date Performed	*3/2/2012*	Analysis Year	*2014 Total*
Analysis Time Period	*Weekday PM Peak Hour*		

Project Description *Rychlick Farm - Renaissance Homes*

East/West Street: *SW Edy Road* | North/South Street: *Borchers Drive*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*54*	*167*	*1*	*17*	*216*	*325*
Peak-Hour Factor, PHF	*0.96*	*0.96*	*0.96*	*0.96*	*0.96*	*0.96*
Hourly Flow Rate, HFR (veh/h)	*56*	*173*	*1*	*17*	*225*	*338*
Percent Heavy Vehicles	*1*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*1*
Configuration	*L*		*TR*	*L*	*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*8*	*28*	*297*	*7*	*86*
Peak-Hour Factor, PHF	*0.96*	*0.96*	*0.96*	*0.96*	*0.96*	*0.96*
Hourly Flow Rate, HFR (veh/h)	*0*	*8*	*29*	*309*	*7*	*89*
Percent Heavy Vehicles	*0*	*15*	*15*	*5*	*5*	*5*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*L*		*TR*	*L*		*TR*
v (veh/h)	*56*	*17*	*0*		*37*	*309*		*96*
C (m) (veh/h)	*1003*	*1413*	*268*		*554*	*379*		*744*
v/c	*0.06*	*0.01*	*0.00*		*0.07*	*0.82*		*0.13*
95% queue length	*0.18*	*0.04*	*0.00*		*0.21*	*7.24*		*0.44*
Control Delay (s/veh)	*8.8*	*7.6*	*18.4*		*12.0*	*45.1*		*10.6*
LOS	*A*	*A*	*C*		*B*	*E*		*B*
Approach Delay (s/veh)	--	--	*12.0*			*36.9*		
Approach LOS	--	--	*B*			*E*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RN*	Intersection	*SW Edy Road & SW Nursery Dr*
Agency/Co.	*Lancaster Engineering*	Jurisdiction	*City of Sherwood*
Date Performed	*3/2/2012*	Analysis Year	*2014 Total*
Analysis Time Period	*Weekday AM Peak Hour*		

Project Description *Rychlick Farm - Renaissance Homes*

East/West Street: *SW Edy Road* | North/South Street: *SW Nursery Drive*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*459*	*2*	*3*	*156*	
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*0*	*612*	*2*	*4*	*208*	*0*
Percent Heavy Vehicles	*1*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*5*		*10*			
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*6*	*0*	*13*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*5*	*5*	*5*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (veh/h)		*4*		*19*				
C (m) (veh/h)		*961*		*434*				
v/c		*0.00*		*0.04*				
95% queue length		*0.01*		*0.14*				
Control Delay (s/veh)		*8.8*		*13.7*				
LOS		*A*		*B*				
Approach Delay (s/veh)	--	--	*13.7*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RN*	Intersection	*SW Edy Road & SW Nursery Dr*
Agency/Co.	*Lancaster Engineering*	Jurisdiction	*City of Sherwood*
Date Performed	*3/2/2012*	Analysis Year	*2014 Total*
Analysis Time Period	*Weekday PM Peak Hour*		

Project Description	*Rychlick Farm - Renaissance Homes*
East/West Street: *SW Edy Road*	North/South Street: *SW Nursery Drive*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*214*	*6*	*14*	*288*	
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*0*	*285*	*8*	*18*	*384*	*0*
Percent Heavy Vehicles	*1*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*4*		*8*			
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*5*	*0*	*10*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*5*	*5*	*5*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (veh/h)		*18*		*15*				
C (m) (veh/h)		*1280*		*581*				
v/c		*0.01*		*0.03*				
95% queue length		*0.04*		*0.08*				
Control Delay (s/veh)		*7.9*		*11.4*				
LOS		*A*		*B*				
Approach Delay (s/veh)	--	--	*11.4*					
Approach LOS	--	--	*B*					

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1e

APPENDIX D

WB LT @ Edy Road / Nursery Way
Total Traffic Conditions
(2014)

Unsignalized Left Turn Queue Storage Requirements

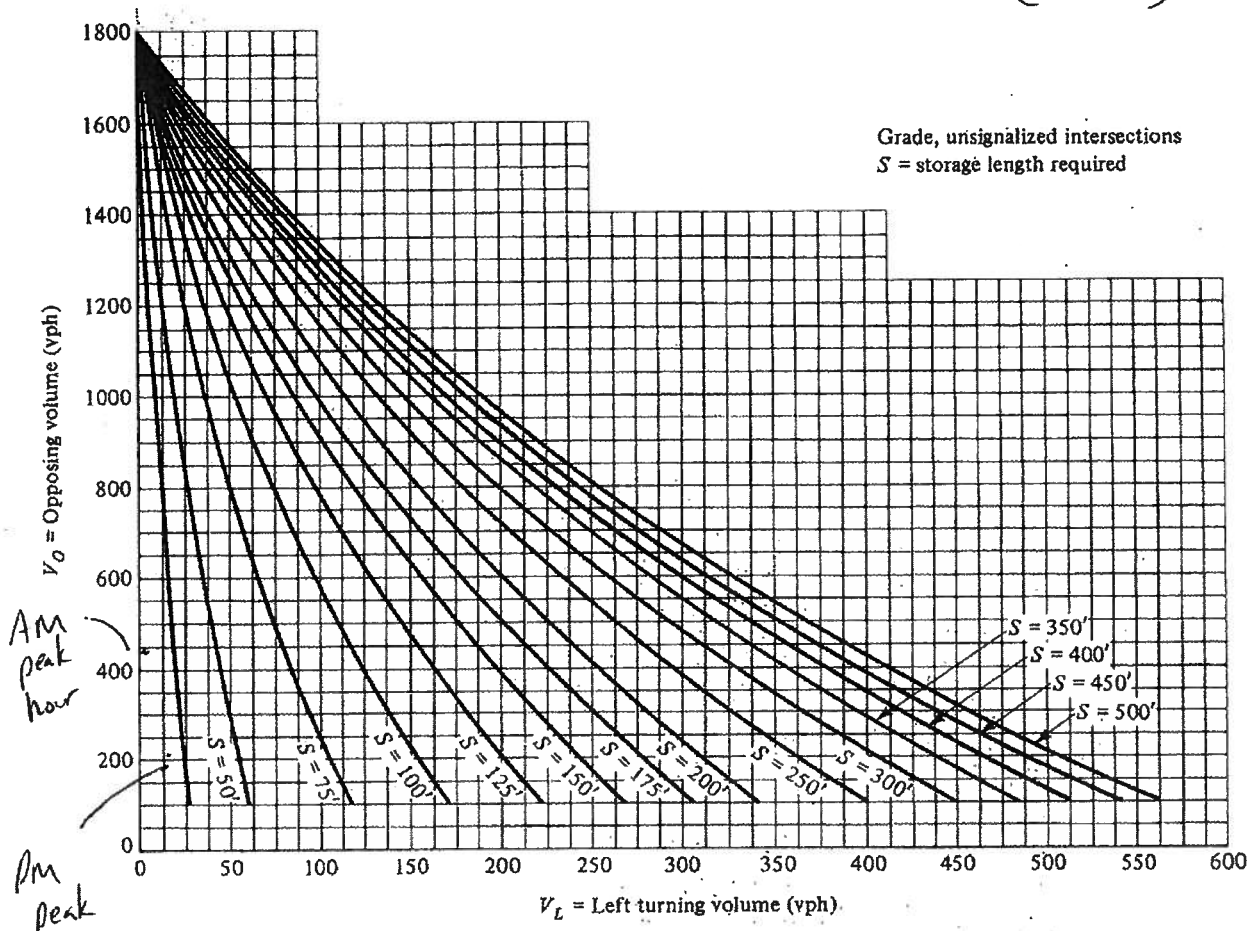


Figure 5-15 Nomograph for left-turn storage at nonsignalized intersections. The nomograph is used by reading horizontally from the opposing traffic volume, V_O, on the vertical axis and reading vertically from the left-turn volume, V_L, on the horizontal axis and locating the minimum storage length, S, at the point where the horizontal and vertical lines cross. For example, 100 left-turning vehicles per hour, V_L, with an opposing through volume, V_O, of 950 vph, will require a minimum storage length of about 150 feet. SOURCE: M. D. Hamelink [12].

Source: Transportation and Land Development, Institute of Tranportation Engineers

1e

APPENDIX E

CD8380
03/05/2012

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

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EDY RD and Intersectional Crashes at EDY RD, City of Sherwood, Washington County, 01/01/2007 to 07/31/2011

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04821	N	N	N	N	N	09/15/2010	17	SW EDY RD	ALLEY		N	N	CLR	S-1STOP	01	NONE 0	STRGHT											32,07,06
CITY						WE	200	SW TRAILBLAZER PL	E	(NONE)	NONE	N	DRY	REAR		PRVTE	E -W									007		00
						8A			08	0		N	DAY	INJ		PSNGR CAR			01 DRVR	NONE	50	F	OR-Y		052,043,037	000		32,07,06
										(02)													OR<25					
															02	NONE 0	STOP											
																PRVTE	E -W									012		00
																PSNGR CAR			01 DRVR	INJC	36	F	OR-Y		000	000		00
																							OR<25					
															03	NONE 0	STRGHT											
																PRVTE	W -E									022		00
																PSNGR CAR			01 DRVR	NONE	29	F	OR-Y		000	000		00
																							OR<25					
02743	N	N	N	N	N	05/26/2011	17	SW BORCHERS DR	INTER	3-LEG	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											07
CITY						TH	0	SW EDY RD	NE		STOP SIGN	N	WET	REAR		PRVTE	NE-SW									000		00
						10A			06	0		N	DAY	PDO		MOTRHOME			01 DRVR	NONE	88	F	OR-Y		043,026	000		07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	NE-SW									011		00
																PSNGR CAR			01 DRVR	NONE	39	F	OR-Y		000	000		00
																							OR<25					
00496	N	N	N	N	N	01/23/2007	17	SW BORCHERS DR	INTER	3-LEG	N	N	CLR	BIKE	01	NONE	TURN-R											02
CITY						TU	0	SW EDY RD	NW		UNKNOWN	N	DRY	TURN		PRVTE	NW-SW									000		00
						3P			06	0		N	DAY	INJ		PSNGR CAR			01 DRVR	NONE	16	F	OR-Y		027	000		02
																							OR<25					
																	-											
																	STRGHT		01 BIKE	INJC	21	M			000	000		00
																	NW SE											
07908	N	N	N	N	N	12/22/2007	17	SW BORCHERS DR	INTER	3-LEG	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT											02
CITY						SA	0	SW EDY RD	CN		STOP SIGN	N	WET	ANGL		PRVTE	NE-SW									015		00
						10A			01	0		Y	DAY	INJ		PSNGR CAR			01 DRVR	NONE	42	F	OR-Y		028	000		02
																							OR<25					
															02	NONE 0	STRGHT											
																PRVTE	NW-SE									000		00
																PSNGR CAR			01 DRVR	INJC	31	F	OR-Y		000	000		00
																							OR<25					
06381	N	N	N	N	N	11/20/2008	17	SW BORCHERS DR	INTER	3-LEG	N	N	CLD	ANGL-OTH	01	NONE 0	TURN-L										040	02,10
CITY						TH	0	SW EDY RD	CN		STOP SIGN	N	WET	TURN		PRVTE	NE-SE									015		00
						5P			01	0		N	DLIT	PDO		PSNGR CAR			01 DRVR	NONE	70	F	OR-Y		028	000		02
																							OR>25					
															02	NONE 0	STRGHT											
																PRVTE	SE-NW									000	040	00
																PSNGR CAR			01 DRVR	NONE	22	M	OR-Y		015	000		10
																							OR<25					
04524	N	N	N	N	N	09/02/2010	17	SW BORCHERS DR	INTER	3-LEG	N	N	CLR	O-1TURN	01	NONE 0	TURN-L											32,02
NO RPT						TH	0	SW EDY RD	CN		STOP SIGN	N	DRY	TURN		PRVTE	NW-NE									000		00
						7P			02	0		N	DUSK	INJ		PSNGR CAR			01 DRVR	INJB	18	M	OR-Y		052,004,028	000		32,02
																							OR<25					
															02	NONE 0	STRGHT											
																PRVTE	SE-NW									000		00
																PSNGR CAR			01 DRVR	INJC	35	M	OR-Y		000	000		00

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CDS380
03/05/2012

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
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																		02	NONE 0 PRVTE PSNGR CAR	STRGHT SE-NW	02	PSNG	INJC	12	M	OR<25		000	000 000		00 00
																		02	NONE 0 PRVTE PSNGR CAR	STRGHT SE-NW	03	PSNG	INJC	12	M			000	000 000		00 00
03185	N	N	N				06/16/2008	16	SW EDY RD	INTER	CROSS	N	N	CLR	ANGL-OTH		01	NONE 0	STRGHT										02
NONE							MO	0	SW ELWERT RD	CN		STOP SIGN	N	DRY	ANGL			PRVTE	W -E									015		00
							12P			03	0		N	DAY	PDO			PSNGR CAR		01	DRVR	NONE	48	F	OR-Y OR<25		000	000		00
																		02	NONE 0 PRVTE PSNGR CAR	STRGHT N -S	01	DRVR	NONE	30	F	OR-Y OR<25		028	015 000		00 02
																		02	NONE 0 PRVTE PSNGR CAR	STRGHT N -S	02	PSNG	NO<5	01	M			000	015 000		00 00
																		02	NONE 0 PRVTE PSNGR CAR	STRGHT N -S	03	PSNG	NO<5	03	M			000	015 000		00 00
01452	N	N	N				03/18/2011	17	SW EDY RD	INTER	CROSS	N	N	RAIN	ANGL-OTH		01	NONE 0	TURN-L										02
NONE							FR	0	SW HOUSTON DR	CN		STOP SIGN	N	WET	TURN			PRVTE	N -E									015		00
							7A			02	0		N	DAY	PDO			PSNGR CAR		01	DRVR	NONE	16	M	OR-Y OR<25		028	000		02
																		02	NONE 0 PRVTE PSNGR CAR	TURN-L W -N	01	DRVR	NONE	40	F	OR-Y OR<25		000	000 000		00 00
02719	N	N	N				05/15/2007	14	SW EDY RD	INTER	CROSS	N	N	CLR	S-1STOP		01	NONE 0	STRGHT										092	07,26
NO RPT							TU		SW PACIFIC HY 99W	NE		TRF SIGNAL	N	DRY	REAR			PRVTE	NE-SW									000		00
							4P			06	0		N	DAY	INJ			PSNGR CAR		01	DRVR	NONE	60	M	OR-Y OR<25		026	000		07
																		02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	01	DRVR	INJC	65	M	OTH-Y N-RES		000	011 000	092	26 00
05294	N	N	N				10/22/2009	14	SW EDY RD	INTER	CROSS	N	N	CLR	S-1STOP		01	NONE 0	STRGHT										07
NONE							TH		SW PACIFIC HY 99W	NE		TRF SIGNAL	N	DRY	REAR			PRVTE	NE-SW									000		00
							5P			06	0		N	DUSK	PDO			PSNGR CAR		01	DRVR	NONE	00	M	OR-Y OR<25		026	000		07
																		02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW .	01	DRVR	NONE	20	M	OR-Y OR<25		000	011 000		00 00
04958	N	N	N				09/20/2010	14	SW EDY RD	INTER	CROSS	N	N	CLD	S-1STOP		01	NONE 0	STRGHT										32
CITY							MO		SW PACIFIC HY 99W	NE		TRF SIGNAL	N	DRY	REAR			PRVTE	NE-SW									000		00

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							4P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	42	M	OR-Y OR<25		052,026	000		32
																02	NONE 0	STOP											
																	PRVTE	NE-SW									011		00
																	PSNGR CAR		01	DRVR	NONE	37	M	OR-Y OR>25		000	000		00
03926 NO RPT	N	N	N				08/11/2009 TU	14	SW EDY RD SW PACIFIC HY 99W	INTER NW	CROSS 0	N R-GRN-SIG	N N	CLR DRY	S-1TURN TURN	01	NONE 0 PRVTE	STRGHT NW-SE									000		07 00
							3P			06			N	DAY	PDO		PSNGR CAR	.	01	DRVR	NONE	28	F	OR-Y OR<25		026	000		07
																01	NONE 0	STRGHT											
																	PRVTE	NW-SE									000		00
																	PSNGR CAR		02	PSNG	NO<5	03	M			000	000		00
																02	NONE 0	TURN-R											
																	PRVTE	NW-SW									013		00
																	PSNGR CAR		01	DRVR	NONE	45	F	OR-Y OR<25		000	000		00
07453 CITY	N	N	N	N	N	N	12/05/2010 SU	14	SW EDY RD SW PACIFIC HY 99W	INTER NW	CROSS 0	N TRF SIGNAL	N N	CLR DRY	S-1STOP REAR	01	NONE 0 PRVTE	STRGHT NW-SE									000		07 00
							4P			06			N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	25	F	OR-Y OR<25		043	000		07
																02	NONE 0	STOP											
																	PRVTE	NW-SE									011		00
																	PSNGR CAR		01	DRVR	NONE	52	F	OR-Y OR<25		000	000		00
01405 CITY	N	N	N	N	N	N	03/13/2008 TH 5P	17 0	SW EDY RD SW PACIFIC HY 99W	INTER NW 06	CROSS 0	N TRF SIGNAL	N N	CLD DRY	PED PED	01	NONE 0 PRVTE	TURN-R NW-SW									016		02 00
													N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	53	M	OR-Y OR>25		029	000		02
																		- STRGHT SW NE	01	PED	INJB	28	F		I XWLK	000	035		00
																		- STRGHT SW NE	02	PED	INJB	10	M		I XWLK	000	035		00
05958 CITY	N	N	N	N	N	N	11/21/2009 SA 5P	14 0	SW EDY RD SW PACIFIC HY 99W	INTER NW 06	CROSS 0	N TRF SIGNAL	N N	CLD DRY	S-1STOP REAR	01	NONE 0 PRVTE	STRGHT NW-SE									000	013	32,07 00
													N	DARK	INJ		PSNGR CAR		01	DRVR	INJC	34	F	OR-Y OR<25		052,026	000		32,07
																02	NONE 0	STOP											
																	PRVTE	NW-SE									011	013	00
																	PSNGR CAR		01	DRVR	INJC	24	M	OR-Y OR<25		000	000		00
																03	NONE 0	STOP											
																	PRVTE	NW-SE									011	013	00
																	PSNGR CAR		01	DRVR	NONE	26	F	OR-Y OR<25		000	000		00
																04	NONE 0	STOP											

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July 17, 2012, Page 213 of 353

CDS380
03/05/2012

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
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													PRVTE PSNGR CAR	NW-SE	01	DRVR	NONE	46	F	OR-Y OR<25		000	011 000		00 00
02747 NONE	N N N		05/26/2011 TH 8A	17 0	SW EDY RD SW PACIFIC HY 99W	INTER NW 06	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	UNKN 0 UNKN PSNGR CAR	STRGHT NW-SE	01	DRVR	NONE	00	F	OR-Y UNK		026	000 000		07 00 07
												02	NONE 0 PRVTE PSNGR CAR	STOP NW-SE	01	DRVR	NONE	48	F	OR-Y OR<25		000	011 000		00 00
03898 NO RPT	N N N		07/21/2008 MO 3P	14	SW EDY RD SW PACIFIC HY 99W	INTER CN 03	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	S-OTHER TURN PDO	01	UNKN 9 PRVTE PSNGR CAR	TURN-L NW-NE	01	DRVR	NONE	46	F	OR-Y OR<25		026	000 000		07 00 07
												02	NONE 0 PRVTE PSNGR CAR	TURN-L NW-NE	01	DRVR	NONE	24	F	OR-Y OR<25		000	013 000		00 00
00566 NONE	N N N		02/05/2009 TH 3P	14	SW EDY RD SW PACIFIC HY 99W	INTER CN 03	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	S-OTHER TURN INJ	01	NONE 0 PRVTE PSNGR CAR	TURN-R NW-SW	01	DRVR	NONE	46	M	OR-Y OR<25		026	000 000		07 00 07
												02	NONE 0 PRVTE PSNGR CAR	TURN-R NW-SW	01	DRVR	NONE	36	M	OR-Y OR<25		000	013 000		00 00
												02	NONE 0 PRVTE PSNGR CAR	TURN-R NW-SW	02	PSNG	INJC	10	M			000	013 000		00 00
06438 CITY	N N N N N N		12/15/2009 TU 5P	17 200	SW EDY RD SW PACIFIC HY 99W	STRGHT NW 08	(NONE) (03)	N L-TURN REF	N N N	RAIN WET DLIT	PED PED INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT NW-SE	01	DRVR	NONE	29	M	OR-Y OR<25		000	000 000		18 00 00
														STRGHT SW NE	01	PED	INJB	50	F		ROAD	057	037		18
01023 CITY	N N N N N N		03/03/2009 TU 5P	17 0	SW EDY RD SW WAGONTRAIN PL	INTER CN 02	CROSS 0	N STOP SIGN	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT E -W	01	DRVR	NONE	17	M	OR-Y OR<25		043,026	000 000		07 00 07
												02	NONE 0 PRVTE PSNGR CAR	STOP E -W	01	DRVR	NONE	42	M	OR-Y OR<25		000	012 000		00 00
01914 CITY	N N N N N N		04/14/2011 TH 7A	17 0	SW EDY RD SW WAGONTRAIN PL	INTER CN 01	CROSS 0	N STOP SIGN	N N N	RAIN WET DAY	ANGL-OTH ANGL INJ	01	NONE 0 PUBLC SCHL BUS	STRGHT E -W	01	DRVR	NONE	73	M	OR-Y OR<25		000	000 000	013	02 00 00

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CDS380
03/05/2012

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF SHERWOOD, WASHINGTON COUNTY

EDY RD and Intersectional Crashes at EDY RD, City of Sherwood, Washington County, 01/01/2007 to 07/31/2011

Total crash records: 21

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 / TYPE / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
															02	NONE 0	STRGHT											
																PRVTE	N -S									015	013	00
																PSNGR CAR		01	DRVR	INJC	17	F	OR-Y OR<25		028	000		02
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																PSNGR CAR		02	PSNG	INJC	15	F			000	000		00
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																PRVTE	N -S									015	013	00
																PSNGR CAR		03	PSNG	INJC	17	F			000	000		00
															03	NONE 0	STOP											
																PRVTE	S -N									022		00
																PSNGR CAR		01	DRVR	NONE	55	F	OR-Y OR<25		000	000		00

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.

Lawyers Title

Lawyers Title
Development Services
1120 NW Couch St., Suite 500
Portland, OR 97209
503-220-8374 FAX 503-228-7817

PUBLIC RECORDS REPORT FOR PARTITION / SUBDIVISION / CONDOMINIUM

THIS REPORT IS FOR THE EXCLUSIVE USE OF:
Renaissance Custom Homes, LLC
16771 Boones Ferry Road
Lake Oswego, OR 97035

Date Prepared: December 20, 2011
Order No.: 15F0002494
Customer Ref:
File Reference: Renaissanc Custom Homes, LLC - Report

CONDITIONS, STIPULATIONS AND DEFINITIONS

(I) Definitions:

(a) "Customer": The person or persons named or shown on this cover sheet.
(b) "Effective date": The title plant date of December 08, 2011.
(c) "Land": The land described, specifically as by reference, in this public record report and improvements affixed thereto which by law constitute real property.
(d) "Liens and encumbrances": Include taxes, mortgages, and deeds of trust, contracts, assignments, rights of way, easements, covenants, and other restrictions on title.
(e) "Public records": Those records which by the laws of the State of Oregon impart constructive notice of matters relating to said land.

(II) Liability of Lawyers Title:

(a) THIS IS NOT A COMMITMENT TO ISSUE TITLE INSURANCE AND DOES NOT CONSTITUTE A POLICY OF TITLE INSURANCE.
(b) The liability of Lawyers Title for errors or omissions in this public record report is limited to the amount of the fee paid by the customer, provided, however, that Lawyers Title has no liability in the event of no actual loss to the customer.
(c) No costs of defense, or prosecution of any action, is afforded to the customer.
(d) In any event, Lawyers Title assumes no liability for loss or damage by reason of the following:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
2. Any facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the land or by making inquiry of persons in possession thereof.
3. Easements, liens or encumbrances, or claims thereof, which are not shown by the public records.
4. Discrepancies, encroachments, shortage in area, conflicts in boundary lines or any other facts which a survey would disclose.
5. (i) Unpatented mining claims; (ii) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (iii) water rights or claims or title to water.
6. Any right, title, interest, estate or easement in land beyond the lines of the area specifically described or referred to in this report, or in abutting streets, roads, avenues, alleys, lanes, ways or waterways.

7. Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use or enjoyment of the land; (ii) the character, dimensions or location of an improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at the effective date hereof.
8. Any governmental police power not excluded by (II)(d)(7) above, except to the extent that notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at the effective date hereof.
9. Defects, liens, encumbrances, adverse claims or other matters created, suffered, assumed, agreed to or actually known by the customer.

(III) Report Entire Contract:

Any rights or actions or rights of action that the customer may have or may bring against Lawyers Title arising out of the subject matter of this report must be based on the provisions of this report. No provision or condition of this report can be waived or changed except by a writing signed by an authorized officer of Lawyers Title. By accepting this form report, the customer acknowledges and agrees that the customer has been afforded the opportunity to purchase a title insurance policy but has elected to utilize this form of public record report and accepts the limitation of liability of Lawyers Title as set forth herein.

(IV) Fee:

The fee charged for this Report does not include supplemental reports, updates or other additional services of Lawyers Title.

REPORT

Order No. : 15F0002494
Effective Date : 5:00 P.M. on December 08, 2011
Customer Ref:

A. The land referred to in this public record report is located in the County of Washington, State of Oregon, and is described as follows:

SEE ATTACHED EXHIBIT "A"

B. As of the effective date and according to the public records, we find title to the land apparently vested in:

Unknown trustee of the Frank J. Rychlick Revocable Trust dated September 21, 2010

C. And as of the effective date and according to the public records. The land is subject to the following liens and encumbrances, which are not necessarily shown in the order of priority:

1. NOTE: 2011-12 TAXES ARE PAID IN FULL and are being shown for informational purposes only. This exception will not be shown on a title insurance policy.
   Original Amount : $4,763.95
   Account No. : R548615; Levy Code: 088.10; Map 2S130CA-00100

   Prior to close of escrow, please contact the Tax Collector's Office to confirm all amounts owing, including current fiscal year taxes, supplemental taxes, escaped assessments and any delinquencies.

2. The Land has been classified as forestland, as disclosed by the tax roll. If the Land becomes disqualified, said Land may be subject to additional taxes and/or penalties.

3. Municipal Liens, if any imposed by the City of Sherwood.

4. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:
   Granted to : Portland General Electric Company
   Purpose : Anchor
   Recording Date : February 9, 2010
   Recording No. : 2010011208

5. Any invalidity or defect in the title of the vestees in the event that the trust referred to herein is invalid or fails to grant sufficient powers to the trustee(s) or in the event there is a lack of compliance with the terms and provisions of the trust instrument.

   If title is to be insured in the trustee(s) of a trust (or if their act is to be insured), this Company will require a copy of said Trust Agreement or a Trust Certification pursuant to ORS Chapter 130.860.

   The Company reserves the right to make additional requirements or add additional items or exceptions after review of the requested documentation.

Note: We find of record Probate No. C11-0043PE involving Frank J. Rychlick, deceased as disclosed by Notice of Pendency of an Action
Recording date : September 16, 2011
Recording No. : 2011064067

6. Please be advised that our search did not disclose any open Deeds of Trust of record. If you should have knowledge of any outstanding obligation, please contact the Title Department immediately for further review prior to closing.

End of Reported Information

There will be additional charges for additional information or copies. For questions or additional requests, contact:

Escrow Officer: Frank Lambert, 503-220-8374 Fax: 503-228-7817
E-Mail: flambert@ltic.com

Exhibit "A"

A portion of the Southwest one-quarter of Section 30, Township 2 South, Range 1 West, Willamette Meridian, in the City of Sherwood, County of Washington and State of Oregon, being more particularly described as follows:

Beginning at the 5/8" iron rod with yellow plastic cap inscribed "LDC Design Group" marking the intersection of the Southerly Right of Way line of S.W. Edy Road with the West line of the D.R. Horton, Inc. Tract of Land as described in deed, recorded in Document Number 99-054686, Washington County Deed Records; thence along said West line, South 00°04'36" East, 50.00 feet; thence leaving said line, South 01°17'57" East, 171.03 feet; thence South 00°43'22" East, 82.00 feet; thence South 02°33' 49" West, 41.05 feet; thence South 02°28'33" East, 41.03 feet; thence South 00°12'50" West, 123.00 feet; thence South 89°49'11" West, 3.75 feet to said West line; thence along said line South 00°04'36' East, 774.21 feet to the Southwest Corner thereof; thence along the South line of the Rychlick Tract of Land as described in deed, recorded in Book 428, Page 83, said Deed Records South 89°52'46" West, 489.72 feet to the Southwest Corner thereof; thence along the West line of said Tract of Land North 00°04'33" East, 1284.40 feet to the Southerly Right of Way line of S.W. Edy Road; thence along said Right of Way line the following courses; thence North 89°47'28" East, 62.06 feet; thence North 89°31'03" East, 96.02 feet; thence South 00°25'57" East, 20.00 feet; thence North 89°31'03" East, 200.00; thence North 00°28'57" West, 15.00 feet; thence North 89°31'03" East, 135.60 feet to the point of beginning.

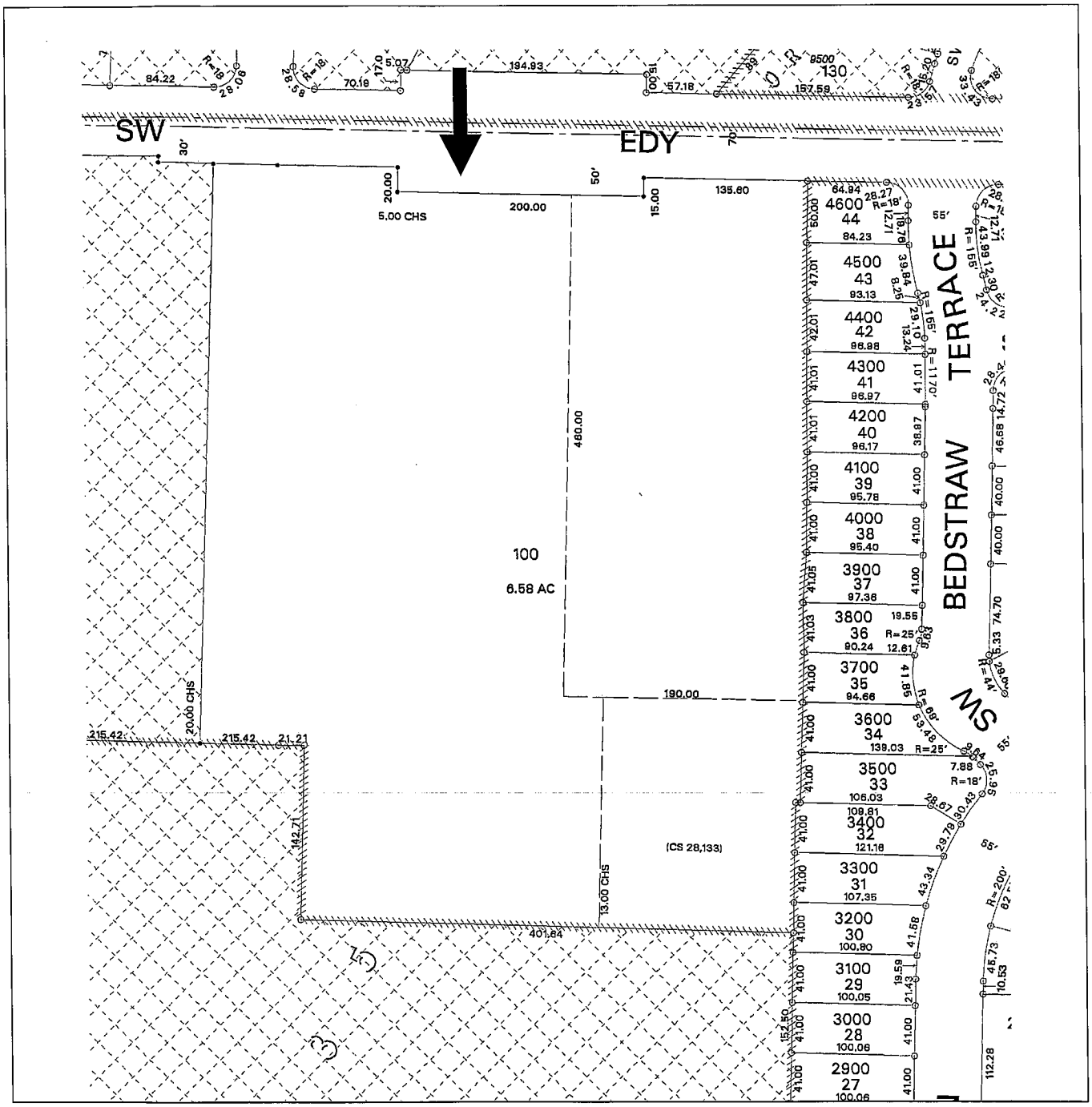
EXCEPTING THEREFROM a tract of land located in the Southwest one-quarter of Section 30, Township 2 South, Range 1 West, Willamette Meridian, in the City of Sherwood, County of Washington and State of Oregon; being a portion of that property conveyed by Document No. 2000-032499, and being more particularly described as follows:

Beginning at the Southeast corner of said property, being a point on the North line of "WYNDHAM RIDGE NO. 2", which bears North 56°08'48" East, 2,374.44 feet from the Southwest corner of said Section 30, and being at the intersection of said North line and the West line of MILLER'S LANDING NO. 2, thence, along said North line, South 89°47'57" West, 487.62 feet to a point on the East line of that property conveyed by Document No. 2004-089401, which bears North 48°19'54" East, 1,986.97 feet from the Southwest corner of said Section 30; thence, along said East line, North 00°01'53" West 810.23 feet, to a point which bears North 34°50'50" East, 2596.88 feet from the Southwest corner of said Section 30; thence North 89°55'30" East, 64.00 feet to the beginning of a 326-foot radius curve to the left; thence along the arc of said curve, through an angle of 03°43'41", the chord of which bears North 88°03'39" East, 21.21 feet, an arc length of 21.21 feet; thence, non-tangent, South 00°04'30" East 142.71 feet; thence North 89°55'36" East, 401.64 feet to the West line of MILLER'S LANDING NO. 2; thence, along said West line and said West line of MILLER'S LANDING NO. 2, South 00°05'21" East 667.12 feet to the Point of Beginning.

FURTHER EXCEPTING THEREFROM a tract of land located in the Southwest one-quarter of Section 30, Township 2 South, Range 1 West, Willamette Meridian, in the City of Sherwood, County of Washington and State of Oregon; being all of that property conveyed by Document No. 96-110901; being "Tract 1, WYNDHAM RIDGE NO. 2", and being more particularly described as follows:

Beginning at the Northeast corner of said property; thence along the East line of said "Tract

1", South 00°12'03" East 6.40 feet to the South line thereof; thence along said South line, South 89°54'58" West, 489.72 feet, to the Southeast corner of "Tract H, WYNDHAM RIDGE NO. 2"; thence, along the East line of said "Tract H, North 00°12'03" West, 5.40 feet to the Northeast corner thereof; thence along the North line of said "Tract 1", North 89°47'57" East, 489.72 feet to the Point of Beginning.



THIS MAP IS MADE SOLELY FOR THE PURPOSE OF ASSISTING IN LOCATING SAID PREMESIS, AND THE COMPANY ASSUMES NO LIBILITY FOR VARIATIONS. IF ANY, IN DIMENSIONS, AREAS, AND LOCATIONS ASCERTAINED BY ACTUAL SURVEY.

SHERWOOD · VANCOUVER · SALEM
13910 SW GALBREATH DR., SUITE 100 · SHERWOOD, OR 97140
AKS ENGINEERING & FORESTRY
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March 13, 2012

Amy Schnell
Project Manager
Renaissance Development Corporation
16771 Boones Ferry Road
Lake Oswego, OR 97035

E-mail: ASchnell@Renaissance-Homes.com

Renaissance at Rychlick Farm Subdivision Tree Inventory and Arborist Report

Dear Ms. Schnell:

The purpose of this letter and the attached Renaissance at Rychlick Farm Subdivision Tree Report is to satisfy the requirements of the City of Sherwood Zoning and Development Code section 16.142.070 (PA 11-06 adoption pending). The report deals specifically with trees and proposed site improvements located at 17806 SW Edy Road (2S130CA TL 100), City of Sherwood, Washington County, Oregon.

The trees located at 17806 SW Edy Road were examined by me on February 28, 2012. Approximately 3.5 acres of the+/- 6.57 acre site are being developed, resulting in 26 residential lots, 700 feet of new public streets, a cul-de-sac, Edy Right of Way improvements, and a storm water facility.

I am a forester with a Bachelor's Degree from Oregon State University in Forest Engineering. I have worked in consulting forestry for over 24 years in the Pacific Northwest. I am also a Certified Arborist per the International Society of Arboriculture (Certificate number: PN-1908), a Certified Tree Risk Assessor per the Pacific Northwest Chapter of the International Society of Arboriculture (Certificate number: 197), and a Member of the American Society of Consulting Arborists. My resume is attached.

Please let me know if you have any questions.

Very Truly Yours,
AKS Engineering & Forestry, LLC



AMERICAN SOCIETY of CONSULTING ARBORISTS

CERTIFIED ARBORIST

KEITH JEHNKE
CERTIFICATE NUMBER PN-1908
EXPIRATION DATE: 6/30/2013

Keith Jehnke, PE, PLS, Principal;
Certified Arborist #PN-1908, Certified Tree Risk Assessor #192
Member, American Society of Consulting Arborists

Enclosures

RENAISSANCE AT RYCHLICK FARM SUBDIVISION SITE- TREE REPORT

The purpose of this Tree Report is to meet the intent of the City of Sherwood's Zoning and Development Code section 16.142.070 (PA 11-06 adoption pending). This report deals specifically with the proposed site improvements located on 2S130CA TL 100, City of Sherwood, Washington County, Oregon. This report covers tree preservation and tree removal for the project.

Location:
The site is located in a portion of the northeast ¼ of the southwest ¼ of Section 30, Township 2 South, Range 1 West, Willamette Meridian, City of Sherwood, Washington County, Oregon, being south of SW Edy Road. The trees in the area of the proposed improvements were evaluated and shown in the calculations in this report and in the attached tree inventory.

This Tree Report consists of this written report and the Preliminary Tree Preservation and Removal Plan that is included with the preliminary plans.

1. **The number, species, size and location of trees to be cut;** This project consists of a rural residential home site with yard, garden and orchard area, cutover timber areas, and residual timber areas. There are also areas of ornamental trees. The timber type consists of a light to dense stocking of second growth Douglas-fir, Western red cedar, and big leaf maple, with a few scattered ornamentals and orchard trees and previously cut areas. The project site varies from basically flat (0-7% slopes) to a steep incised stream channel. There is exposure to the south and southwesterly storm winds. There are 397 trees 6 inches and greater in diameter breast height (dbh) on the site. Of these 397 trees, 115 are defective in such a manner as to be considered a hazard and therefore are proposed to be removed. Of the remaining 282 trees, 95 will be removed in order to construct utilities, streets, and their associated grading and 68 will be removed for home construction, leaving 119 trees to be retained. Trees to be removed include: Douglas fir, Western red cedar, Big leaf maple, Bitter cherry and various ornamental and orchard trees. The trees vary from a 42 inch dbh Douglas fir (Pseudotsuga menziesii) to a 6 " dbh Western red cedar (Thuja plicata). See the attached Detailed Tree Inventory spreadsheet for more detailed information. The locations of all of the trees are shown on the Preliminary Tree Preservation and Removal Plan.

2. **The time and method of cutting or removal;-**The trees will be removed 1-4 weeks prior to the beginning of grading. The trees will be either felled with a chainsaw and the merchantable boles removed as logs, or they will be removed with excavators. Limbs and other non-merchantable materials will either be chipped and left on site for erosion control, or removed from the site. Stumps will either have the roots cut and then be pulled or they will be removed using a grinding machine.

3. **A site plan or sketch depicting where each individual tree to be removed and each tree to be preserved is located;-**The Preliminary Tree Preservation and Removal Plan, outlines each tree location, including those proposed to be preserved and those to be removed. Some trees proposed to be preserved will be near construction areas and will need to be evaluated by the Arborist after the project is completed to re-evaluate the tree for possible construction damage or latent conditions that are apparent in the future.

4. **A statement of the reason for cutting or removal;-**The project involves a permitted use of residentially zoned land (MDRL). This includes a residential subdivision and detached dwelling units and the infrastructure required to support the project. Tree removal is necessary to accommodate the required public streets, services, utilities, and the earthwork necessary to build this supporting infrastructure. In addition, the end product of the

subdivision is homes. Therefore, trees will be removed where necessary to allow for future home construction. In addition, some trees are also proposed to be removed due to various defects that can threaten the stability of the tree. The reasons for the removal of each tree is outlined in the Detailed Tree Inventory Spreadsheet attached, under the "Reason for Removal" heading.

5. **Soils Information;-**The site contains Hillsboro loam, 0 to 3 percent slopes, Huberly silt loam, Quatama loam, 0 to 3 percent slopes, Woodburn silt loam, 0 to 3 percent slopes and Xerochrepts and Haploxerolls, very steep. These soils have an effective rooting depth ranging from 20 inches in the Huberly silt loam up to 60 inches in the rest of the soils and due to the deep rooting depth will be somewhat windthrow resistant. A copy of the NRCS Custom Soil Resource report for the site is attached.

General Notes:
The total site contains 6.58+/- acres. The proposal is for the construction of approximately 700 feet of new road and a cul-de-sac, 260 feet of frontage improvements on Edy Road, the construction of 26 single family residential lots, construction of associated utilities, and a stormwater facility.

There are a total of 397 trees in the project area. Of the 397 existing trees, 115 are considered Hazard trees, leaving 282 healthy trees. Of these 282 healthy trees, 95 will be removed due to necessary public infrastructure construction and 68 will be removed to allow for future home construction.

Project		All Trees	Total Canopy (sq. ft)	Healthy Trees
	Preserve	119	151,965	119
	Cut	278	334,780	163
	Total	397	486,745	278

WINDTHROW:

Windthrow is a natural phenomenon affecting trees. All trees can be susceptible to windthrow. Windthrow is the action of a tree being blown down. There are several different ways that windthrow occurs including:

1. "Stem" break, where the bole of the tree snaps well above the ground.
2. "Stock" break, where the bole snaps at ground level.
3. "Root" break, where the tree is uprooted by pivoting on broken roots close to the bole.
4. "Hinge" fall, where the tree is uprooted pivoting on the outer edge of the root plate.

Wind- Windthrow can be broken into two categories, catastrophic and endemic. Catastrophic windthrow occurs infrequently, on a large scale, when there are extraordinarily strong winds (see table below). During catastrophic storm events, trees are most often blown over in the general direction of the prevailing winds. Stem break failures are more common, especially on deep well drained soils. Endemic windthrow occurs more regularly, and on a smaller scale, being caused by numerous lower velocity windstorms that effect individual or small groups of trees that generally have some windthrow prone characteristics.

Catastrophic Wind Storm Events in the Portland Area over the Last 50 Years:

DATE:	MAXIMUM WIND SPEED IN THE PORTLAND AREA
October 12, 1962	112 mph
March 27, 1963	57 mph
October 2, 1967	70 mph
March 25-26, 1971	78 mph
November 13, 1981	71 mph
November 15, 1981	57 mph (gust)
December 12, 1995	75 mph
December 14-15, 2006	62 mph (gust)
November 12, 2007	46 mph

The majority of the destructive surface winds in Oregon come from the southwest. Very strong east winds may occur, but these are usually limited to small areas in the Columbia River Gorge. The much more frequent and widespread endemic winds are also from the southwest and are associated with storms moving onto the coast from the Pacific Ocean. If the winds are from the west, they are often stronger on the coast than in the interior valleys due to the north-south orientation of the Coast Range and Cascades. These mountain ranges obstruct and slow down the westerly surface winds.

The most destructive winds are those which blow from the south, parallel to the major mountain ranges. The Columbus Day Storm of 1962 was a classic example of a south wind storm.

Individual Tree Traits Affecting Windthrow-The individual tree traits affecting windthrow include height, crown size, diameter, shape of bole, and tree health. Taller trees are subject to larger wind forces due to both the larger turning moment and the greater wind velocities higher above the ground. Trees with large dense crowns catch more wind than trees with smaller less dense crowns. As the wind speed increases, the force on the tree stem increases by the square of the wind speed, meaning that if the wind speed doubles, the force on the stem increases by four times . The height to diameter at breast height (4.5 feet above the uphill side of the tree) ratio is also an indicator as a conical trunk is stronger than a cylindrical trunk. A height to diameter ratio of 60 or less (a more conical shaped bole) is considered more wind firm, and a height to diameter ratio of 100 or more (a tall, skinny, "telephone pole" shaped bole) is less wind firm. Individual tree defects, including bole rot and root rot, also increase the chances of windthrow. Dominant and co-dominant trees (the larger trees in an even aged stand) are less susceptible to windthrow than the smaller suppressed trees. Trees less than 60 feet tall are also generally more wind firm. The strength and elasticity of the boles of different species of trees can vary, with those with stronger more elastic boles being more windthrow resistant. The greater the rooting depth, the greater the rooting area, and the larger the size and greater the number of roots, all increases the windthrow resistance. Other items being equal, older trees also have a greater chance of windthrow. Individual trees within a stand can have widely differing windthrow resistance due to the variations in the above characteristics.

The proximity of adjacent trees and the growth pattern and history of those trees also greatly affects the chances of windthrow. Trees are generally windthrow resistant if they are open grown from a young age. Well stocked even-aged stands of second growth (generally Douglas-fir) on a good growing site rely on the group of trees to work

together to withstand winds. This is provided by interlocking root systems, inter-tree crown damping during swaying, and dense crowns to reduce wind penetration. Younger stands are typically more wind firm than older stands.

The soils characteristics that affect windthrow are depth, drainage, soil structure, and the resulting shear strength. Deep soils allowing root penetration of greater than 3 feet to a restricting layer are more windthrow resistant as they allow a greater root soil mass. Shallow soils allowing root penetration of 1 foot or less are less wind firm. Dry soils generally have greater shear strength than wet soils. Well drained soils are drier more often and therefore more windthrow resistant. Poorly drained soils also restrict root growth and are more windthrow prone.

The characteristic of the root systems also greatly affects resistance to windthrow. Large lateral roots (greater than 0.2 inches) predominantly determine the resistance to overturning provided by the root system. The overall strength of a root is proportional to the fourth power of its diameter, hence when a root splits evenly into two branches; its overall strength is cut in half. Trees with a root mass of larger roots provide more resistance to overturning than those with smaller roots. Increased anchoring strength also results from the intermingling of the trees root systems with the root systems of adjacent trees. As the tree grows and catches more wind, the root system responds by adding more root mass.

Topography-The topography aspects that affect windthrow include the wind exposure and the wind direction, speed, and turbulence. Certain types of topography can "compress" wind streamlines (causing higher winds) including flowing through narrow valleys, over hills and ridges, and around shoulders. In the lee side of large ridges and even small hills, a turbulent wake develops eddies that can have strong vertical velocities that can lead to wind damage.

Weather Conditions-Both the overturning stress placed on the tree and the likelihood of windthrow is greatly affected by the wind speed, the number and strength of gusts, and the overall windstorm duration. Longer duration storms allow more time for swaying boles to break roots, increasing the chance of overturning with every weakened root. Saturation of the soil by rain also increases the likelihood of windthrow due to the reduction in root to soil adhesion and soil shear strength.

Windthrow Hazard Evaluation-A completely quantitative method to evaluate the windthrow hazard for a particular tree is not possible because there is not enough information available about the response of different species, crown classes, tree heights, bole shape, etc. to high winds. While you cannot make a quantitative prediction, you can make an evaluation based on qualitative traits of the specific tree and its growing site. Each tree has factors affecting its resistance to overturning. It also has factors effecting the total wind force acting on the tree. The interplay between these factors determines the overall windthrow hazard.

Field Evaluation-When evaluating trees and groups of trees for their windthrow "risk", various elements of the individual tree, surrounding trees, soils, topography, and predominant storm wind direction are qualitatively evaluated based upon observations, experience, and the physical principles of the windthrow process in order to determine a general hazard classification for the likelihood of windthrow.

Other items evaluated during the site visit are evidence of recent windthrown trees, evidence of root or butt rots, and the presence of "pit and mound" micro-topography. Pit and mound micro-topography is caused by root break and hinge fall windthrown trees creating a "pit" where the tree pulled out of the ground, and a "mound" adjacent, where the dirt settles off the root wad over time. Evidence of past windthrow events can be a good predictor of future windthrow events.

Wind Force Factors:

Element Evaluated:	Ratings: High Hazard	Moderate Hazard	Lower Hazard
Location:	Topographically exposed locations, crests, saddles, upper slopes, lee of ridges		Topographically protected locations (valley bottoms, mid-slope trees)
Tree Group Edge Boundaries:	Tree edge faces the prevailing storm winds	Tree edge is parallel to the prevailing storm winds	Tree edge is on lee side of the prevailing storm winds
Height:	Taller	Intermediate	Shorter
Crown Size/Density:	Large/Dense		Small/Open

Resistance to Overturning Factors:

Element Evaluated:	Ratings: High Hazard	Moderate Hazard	Lower Hazard
Taper/Butt Flare:	Low Taper/No Butt Flare		High Taper/Large Butt Flare
Rooting/Soil Depth:	16 Inches or Less	Greater Than 16 inches & Less Than 32.5 inches	32.5 Inches or More
Root Rot Present:	Evidence of Root Rot		No Evidence of Root Rot
Soil Drainage:	Poorly Drained Soils		Well Drained Soils
Structural Integrity of Tree	Tree has a Structural Defect Compromising Its Ability to Resist Overturning		Tree has no Structural Defects

HIGH RISK TREES-Have a high wind force and low resistance to overturning.

MODERATE RISK TREES-Have a low wind force and low resistance to overturning, a high wind force and a high resistance to overturning, and moderate wind force and a moderate resistance to overturning.

LOW RISK TREES-Have a low wind force and a high resistance to overturning.

In addition to the above, other indicators can be used to refine the individual tree windthrow rating.

Other Indicators:

Element Evaluated:	Ratings: High Hazard	Moderate Hazard	Lower Hazard
Existing Windthrow on Site:	Moderate to Extensive Windthrow	Minor Windthrow	No Windthrow
Windthrow In Neighboring Recently Exposed Trees:	Moderate to Extensive Windthrow	Minor Windthrow	No Windthrow
Pit & Mound Micro-topography:	Evidence of Pit & Mound topography		No Evidence of Pit & Mound Topography

THIS SITE'S WINDTHROW POTENTIAL:

The tree stocking on this site varies from scattered individual trees to well stocked even-aged trees. The medium to well stocked even-aged trees are the result of a second growth forest. The medium to well stocked area has led to dominant trees becoming increasingly taller due to competition for light. This in turn is leading to an increase in the total height to diameter at breast height (dbh) ratio, with the ratio of some trees approaching 100.

This site's soils are classified as Hillsboro loam, Huberly silt loam, Quatama loam, Woodburn silt loam and Xerochrepts and Haploxerolls. These soils have an effective rooting depth ranging from 20 inches in the Huberly silt loam up to 60 inches in the rest of the soils. The deep soils lead to a lower windthrow potential due to the deep rooting depth giving additional stability.

Generally, the trees on site have moderate to poor taper and moderate to poor butt flare. The majority of the High Windthrow Risk trees have structural defects.

Careful consideration has been given to each of the trees shown to be preserved. Each tree has been visually examined for its individual structural defects and windthrow characteristics, and this information is summarized in the "Detailed Tree Inventory" spreadsheet which is attached.

TREE PROTECTION NOTES

Methods that will maximize tree survival during and after construction-
The following items are included in addition to items on the tree plan drawings.

Designing for Tree Preservation:
Designing for tree preservation means that trees are considered an important project feature. The goal of tree preservation is to have trees remain safe assets to the site for years to come. Trees that are preserved must be carefully selected to make sure that they will survive the construction impacts, adapt to the new environment, and perform well in the new landscape. An assessment of suitability for preservation evaluates tree health, structure, age, and species factors. The consultant gathers information on the individual trees, and makes recommendations as to which trees are suitable for preservation, and how much undisturbed space they will require. The consultant also provides specific guidelines regarding grading, drainage, trenching, protected areas, root pruning, etc.

Tree Characteristics and Their Suitability for Preservation:
Trees vary in their suitability for preservation both on the basis of their inherent characteristics, and their future response to construction impacts. Trees that are structurally unstable, in poor health, or are unlikely to survive construction impacts could be a dangerous liability to future neighborhoods. A good tree preservation plan will call for the pre-construction removal of trees likely to die or to become a tree with a higher than acceptable risk of failure after construction. The factors to be evaluated are:

Tree Health-Healthy, vigorous trees are better able than non-vigorous trees to tolerate construction related stresses such as root removal, changes in grade, changes in soil moisture, and soil compaction. These healthy trees are also better able to adapt to the changed site conditions that occur after development.

Tree Structure-Trees with defects such as decayed wood, poor crown structure from past manual "topping" or natural broken tops, and co-dominant trunks with poor attachments are not suitable for preservation in areas where people or property could be injured or damaged. Such defects cannot be treated and may lead to failure.

Species-Although trees require protection to avoid injury, species vary widely in their ability to withstand damage and changes in their environment.

Tree Age-As a tree age, its capacity to overcome injury, adapt to changes in its site environment, and to resist pests declines. For these reasons, mature and over-mature trees are less able to tolerate construction impacts and remain healthy than are young and semi-mature trees. Young vigorous trees are better able to generate new tissue and adapt to a new environment than old trees.

Tree Size/Height-Larger, taller trees are capable of hitting targets a greater distance away from the tree, and causing greater damage. Taller trees also provide a larger wind "sail", catching more wind and being more prone to being blown down in a large storm. Coupling this "sail" effect with the structural weakening of root removal/disturbance can lead to a higher than acceptable blow down risk.

Tree Location-The best candidates for preservation are single trees that developed as individual specimens, as they typically have uniform canopies and well tapered trunks. Trees that grow in groups do not function well as individuals. They often have tall, poorly shaped trunks, irregularly shaped crowns, and are prone to failure and decline when their neighbors are removed.

The arboricultural consultant weighs each of the above factors, and makes recommendations as to which trees are likely to thrive and be a long term asset to the new development, as well as recommendations to remove those trees that will likely have an unacceptable risk of failure and become a liability in the new development.

Guidelines for the Area Required to Preserve a Tree:
In order to preserve a tree, an area around that tree must be protected to ensure that the tree is not physically damaged, and that the roots are protected. A method to calculate this area, utilizes the diameter at breast height (dbh), species, and age. The dbh is multiplied by a factor (the factor is based on the tree age and the species tolerance for disturbance) from 0.5 feet radius to 1.5 feet radius (from the trunk-often 1 foot radius per inch dbh is used for an average), and this area is called the "Optimal Tree Protection Zone". The general guidelines for preservation are that you do not want to disturb more than 1/3 of this area, but that with healthy vigorous trees, up to 50% of the area could be disturbed.

How to Preserve Trees During Construction:
The portion of the "Optimal Tree Protection Zone" that is being protected must be fenced off (with a "substantial" fence). Within this area, no soil disturbance, including stripping is permitted. The natural grade is to be maintained, and no storage or dumping of materials, parking, etc. will be allowed within this zone without the approval of the arboricultural consultant. This tree protection fence should remain in place through the construction of the dwellings.

Excavation Within the "Optimal Tree Protection Zone":
Where there is excavation proposed within an "Optimal Tree Protection Zone" (outside of the protected zone fenced off above), it will be important for the contractor to prune the roots along the excavation lines. These roots should be pruned in the following manner:

- Excavation in the top 24" of the soil in the critical root zone area should begin at the excavation line that is closest to the tree.
- The excavation should be done by hand/shovel or with a back-hoe and a man with a shovel, pruning shears and a pruning saw.

- If done by hand, all roots 1" or larger should be pruned at the excavation line.
- If done with a backhoe (most likely scenario), then the operator needs to start the cut at the excavation line and carefully "feel" for roots/resistance. When there is resistance, the man with the shovel hand digs around the roots and prunes the roots larger that 1" diameter.
- The backhoe is to remain off of the tree roots to be saved at all times.
- The work will be done under the supervision of the Project Consulting Arborist.

The above system works well and can be done fairly quickly. The key is to avoid pulling on the roots larger than 1" diameter, potentially resulting in damage to roots between the excavation line and the tree.

How Trees Die:
Natural tree death is frequently a slow and complex process generally with a gradual decline involving a number of factors. Most trees die from one of three causes: (1) structural failure, (2) environmental degradation, or (3) pest infestation. Generally, trees die from a combination of factors. Trees weakened by changes in their environment (such as construction impacts) become more susceptible to infestation by disease and insects. Most individual trees survive for only a fraction of the potential lifespan of the species. Soil compaction, changes in grade, mechanical injury, changes in the environment around the tree, and changes in drainage may not kill the tree of themselves, but they may so weaken the tree that death by another cause occurs. Prevention of stress and the maintenance of health are the key elements of tree longevity.

What is "Tree Topping", and How Does It Damage a Tree?
Tree topping is a pruning technique to reduce the height by cutting the central leader. This method of pruning is very detrimental to trees and not considered a good practice. Trees are generally topped by unknowledgeable pruners in order to lower the height of the tree and minimize the chance of windthrow by reducing the tree's wind profile. The large stub of a topped tree has a difficult time forming callus over the wound. The terminal location of these cuts, as well as their large diameter, prevents the tree's chemically based natural defense system from doing its job. The stubs are highly vulnerable to both insect invasion and the spores of decay fungi. If decay is already present, topping will speed the spread of the disease. The tree reacts to the topping cut by producing multiple shoots below the cut. These shoots develop from buds near the surface of the topping cut. Unlike normal branches that develop in a socket of overlapping wood tissues, these new shoots are anchored only in the outermost layers of the bole. These new shoots grow quickly, and are prone to breaking, especially during windy conditions. For all of these reasons, trees that have been topped pose a danger to life and safety and are recommended for removal.

Development Impacts Affecting Preserved Trees:
Construction of the site improvements generally consists of cut and fill (grading), construction of retaining walls, trenching for the wet and dry utilities, coring of roads, and placement of aggregate and pavement. During this work, adjacent soil areas outside of the grading can be compacted by heavy equipment driving over it. The grading and placement of utility trenches (and subsequent pipe bedding), and retaining walls can also affect the local water table.

Construction of the buildings and landscaping requires foundation placement, pruning of trees near the buildings under construction, and the installation of landscape irrigation systems. During this work, adjacent soil areas outside of the work area can be compacted by equipment driving over it.

Future Condition of Trees on the Site:
The characteristics of the individual tree are a guide to how well that tree will respond to site disturbance. Larger trees have correspondingly larger root zones. Older trees are less resilient to disturbance than younger trees. Unhealthy trees are less resilient to disturbance than healthy trees. Douglas-fir trees are tolerant of a small amount of fill, but intolerant of poor drainage. Western red cedar trees are intolerant of fill and changes in the water table/soil moisture conditions. Western hemlock trees are prone to windthrow and decay, and intolerant of cuts or fills. This site is composed of predominantly Douglas-fir, Western red cedar and big leaf maple with some scattered minor species (bitter cherry, Pacific madrone) and assorted orchard and ornamental trees.

Development of this site will result in a significant area of disturbance. The grading required for the street improvements, utilities, and home construction will require significant stripping and grading across the site. This stripping/grading results in the initial tree disturbance by cutting (removing the roots) or filling (killing the roots by removing water and oxygen). Additional disturbance to the trees will occur during the construction of the dwellings themselves. This will include root disturbance, pruning, trenching, and soil compaction. All of these factors will add to the stress of each preserved tree.

Tree Inventory:

Vegetation Types/Trees per acre-The site consists of a rural residential home site with yard, garden and orchard area, cutover timber areas, and residual timber areas.

The vegetation on the property consists of: trees, shrubs, small trees, and forbs including:

Common Name	**Scientific Name**
misc. grasses	
Douglas fir	Pseudotsuga menziesii
Western red cedar	Thuja plicata
Big leaf maple	Acer macrophyllum
Incense Cedar	Alnus rubra
Red alder	Amelanchier alnifolia
Pacific madrone	Arbutus menziesii
Bitter Cherry	Prunus emarginata
misc. ornamental trees, shrubs & forbs	

Potential for Tree Preservation- The trees are being removed for new streets, street improvements, utilities, site grading, and home construction. Care will need to be taken when working adjacent to trees to be preserved to disturb as few roots as possible during the excavation. Given the dense nature of some of the existing trees and the proposed removals, there may be incidences of post construction windthrow within the Preserved trees. After the construction is complete the Project Arborist shall reevaluate the trees to be preserved for construction damage and latent defects that have become apparent after construction.

Methods that will ensure the survival during and after construction-

The following items are included in addition to items on the tree plan drawings.

GENERAL

1. Install tree protection fence as directed by the Project Consulting Arborist prior to the clearing phase. Fence location is to be verified by the Project Consulting Arborist. Fence must remain in place throughout the duration of construction or any activity potentially injurious to trees to be retained. Any necessary intrusion into the tree protection area must be approved and directed by the Project Consulting Arborist. Erect prior to commencement of clearing and demolition work and remove only after all work potentially injurious to trees and other plants is complete. Fence shall be placed as far from trees as is practical, but in no instance closer than one foot behind required construction limits. Fence shall be 4' visibility plastic on steel posts placed no further than 6' apart extending no less than 4-1/2' above the ground, kept taut at all times.

2. Stumps of trees removed within twenty feet of those designated to be retained must be ground below grade, not grubbed. Root pruning prior to stump removal may be an acceptable alternative as approved and directed by the Project Consulting Forester.

3. All retained trees located within fifty feet of construction limits must be pruned to ANSI A-300 Crown Cleaning standards for deadwood removal (safety pruning) and interior crown thinning on evergreen specie for wind throw reduction. Thinning must not exceed fifteen percent live tissue (branch) removal. Individual trees with extreme windthrow characteristics may be removed for safety reasons after consultation with the City.

4. Site clearing and construction activities in close proximity to tree protection areas must be monitored by the Project Consulting Arborist.

5. Additional site specific or therapeutic care requirements may be recommended based on site monitoring visits by the Project Consulting Arborist.

6. Protect all trees form stockpiling, material storage, vehicle parking and driving within the tree drip line or tree protection fence area.

7. Protect all plant growth including root systems of trees and plants from:

A. Dumping of refuse.
B. Chemically injurious materials and liquids.
C. Noxious materials in solution caused by run-off and spillage during mixing and placement of construction materials and drainage from stored materials.
D. Continual puddling of running water.

8. Restrict vehicular and foot traffic to prevent compaction of soil over root systems.

EXCAVATION AROUND TREES

1. Excavate within root zone of trees to be preserved only where indicated and acceptable to the Consulting Forester.

2. Excavate around tree roots of trees to be preserved within tree root zone only under the direction of a Consulting Forester retained by the Contractor.

3. Where trenching for utilities is required within root zones of trees to be preserved, do not cut main lateral support roots. Cut smaller roots which interfere with installation of new work; use sharp pruning tools.

4. Where excavating for new construction is required within root zones of trees to be preserved, hand excavate to minimize damage to root systems. Use narrow tine spading forks and comb soil to expose roots. Relocate roots in backfill areas whenever possible. If large, main lateral roots are encountered, expose beyond excavation limits as required to bend and relocate without breaking.

5. If encountered immediately adjacent to location of new construction and relocation is not practical, cut roots of trees to be preserved approximately 6 inches back from new construction.

6. Do not allow exposed roots of trees to be preserved to dry out before permanent backfill is placed; provide temporary earth cover, pack with wet peat moss or 4 layers of wet untreated burlap and temporarily support and protect from damage until permanently relocated and covered with backfill.

GRADING AND FILLING AROUND TREES

1. Maintain existing grade within root zones of trees to be preserved unless otherwise indicated or acceptable to the Consulting Arborist.

2. Lowering Grades: Where existing grade is above new finish grade shown around trees to be preserved, under direction of Consulting Arborist, carefully hand excavate within root zones to new grade. Cut roots exposed by excavation to approximately 3 inches below elevation of new finish grade.

3. Raising Grades: Permitted only as acceptable to the Consulting Arborist.

Required Tree Canopy:

The City of Sherwood Zoning and Development Code section 16.142.070 (PA 11-06 adoption pending) requires 40% tree canopy coverage of the net developable area. This project's net developable area is 178,655 square feet. Forty percent of this area is 71,462 square feet. The trees preserved within the net developable area of the site is 20,860 square feet, meaning that to reach the City canopy requirements an additional 50,602 square feet of tree canopy needs to be planted.

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.

KEITH R. JEHNKE, Certified Arborist, Certified Tree Risk Assessor, PE**,** PLS, Principal

EDUCATION:
BS Forest Engineering
Oregon State University 1986
High Honors

BS Civil Engineering
Oregon State University 1986
High Honors

LICENSES:
International Society of Arboriculture
Certified Arborist (PN-1908)

Certified Tree Risk Assessor, Pacific Northwest Chapter ISA (#197)

Professional Land Surveyor
- Oregon (#2619)
- Washington (#32582)
- Idaho (#14842)

Professional Civil & Environmental Engineer
- Oregon (#14971)
- Washington (#32582)
- Alaska (#CE-9452)

Certified Water Right Examiner
- Oregon (#302)

AFFILIATIONS
- Pacific Northwest Chapter of the International Society of Arboriculture
- American Society of Consulting Arborists
- Society of American Foresters
- City of Durham Planning Commission (2007-2010)
- City of Durham City Council (2010-Present)
- Tigard Intergovernmental Water Board (2010-Present)
- Professional Engineers of Oregon
- Professional Land Surveyors of Oregon
- National Society of Professional Engineers

Keith Jehnke has worked in the arborist and forestry profession for more than 23 years working extensively in Oregon, Washington and Alaska. Mr. Jehnke is a licensed Certified Arborist, Engineer and Land Surveyor. As an owner of AKS, Mr. Jehnke works with the clients and AKS staff to maintain communication and project planning. Mr. Jehnke has been Project Manager on numerous forest engineering, tree plan, civil engineering and forestry projects. His experience includes tree protection plans, evaluation of hazard trees, field inspection of excavation in tree root zones during construction, logging road layout and design, timber cruising (in Oregon, Washington, Idaho and Alaska), appraisals, harvest unit layout, fish passage culvert design, small bridge design, and hydrology analysis. Some of his relevant project experience includes:

St. Cecilia Campus Improvements, Beaverton, Oregon: Mr. Jehnke provided the Certified Arborist services for this project from the initial tree evaluations, to the civil design process, through construction monitoring for the recent building additions.

Housing Authority of Portland. Demar Downs Apartments Landscape and Site Improvements, Portland, Oregon: Mr. Jehnke provided/is providing the Certified Arborist services for this project from the initial tree evaluations, to the civil design process, through construction monitoring on the 3 acre Demar Downs site.

O.N.S., Pokarney Place Planned Development, Lake Oswego, Oregon: Mr. Jehnke provided the Certified Arborist services for this project from the initial tree evaluations, to the civil design process, through construction monitoring for this 11-lot planned development.

Various Clients, Tree Plans and Expert Witness Testimony, Oregon, Washington: Mr. Jehnke has performed numerous tree plans for various public, site plan, and residential development projects for various jurisdictions including Vancouver, Beaverton, Durham, Lake Oswego, Portland, Happy Valley, and Sherwood.

City of Lake Oswego, Wastewater Line Extension, Lake Oswego, Oregon: Mr. Jehnke provided the Certified Arborists services for this project from the initial tree evaluations, to the civil design process, through construction monitoring for this 4,500 lineal foot sanitary sewer construction project.

Brown & Caldwell, City of Wilsonville Wastewater Treatment Plant Improvements, Wilsonville, Oregon: Mr. Jehnke provided Certified Arborist services for the evaluation of over 700 tree on the Wilsonville Wastewater Treatment Plant Site in preparation for a plant expansion.

Oregon Department of Forestry, Lyons Unit Layout, Various Units, Lyons, Oregon: Keith was project manager for the unit layout, road location and design, road R.O.W. posting and staking, cable profile analysis, construction cost estimates, logging appraisals, drainage rehabilitation, fish culvert passage design, timber cruising and project administration. Keith also was the lead forester and timber cruiser on these projects. This project included four timber sales with a total of 1864 acres and 6.6 miles of new road construction.

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Detailed Tree Inventory for 17806 SW Edy Road											
	Total Preserved Existing Tree Canopy Coverage as a Percentage of Net Development Site Area=					**11.7%**					
NO. 2997											
AKS Survey Reference #	**Total DBH** (In)	**Total Canopy Area^^** (sf)	**Tree Species**	**Total Canopy Preserved**	**Condition/Comments**	**Hazard Rating 1-4***	**Reason for Removal**	Total Canopy in Developable Area Preserved	**Wind-throw Rating****	***Save/ Remove**
10259	34	3,356	Western red cedar (Thuja plicata)	0	Some lean, vines, OK	2	Homebuilding	0	B	0
10262	21	1,359	Douglas fir (Pseudotsuga menziesii)	0	14" bole and 16" bole	2	Utilities, Streets and Site Grading	0	B	0
10280	10	362	Douglas fir (Pseudotsuga menziesii)	0	OK, In Vegetated Corridor	2	Utilities, Streets and Site Grading	0	B	0
10281	6	157	Douglas fir (Pseudotsuga menziesii)	0	In Edy ROW-Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
10283	50	7,034	Douglas fir (Pseudotsuga menziesii)	0	OK, Large, In Vegetated Corridor	2	Utilities, Streets and Site Grading	0	B	0
10284	16	827	Western red cedar (Thuja plicata)	0	OK, In Vegetated Corridor	2	Utilities, Streets and Site Grading	0	B	0
10285	27	2,170	Douglas fir (Pseudotsuga menziesii)	0	Some lean, OK	2	Utilities, Streets and Site Grading	0	B	0
10286	9	303	Douglas fir (Pseudotsuga menziesii)	0	Suppressed, don't leave	2	Utilities, Streets and Site Grading	0	B	0
10287	17	923	Western red cedar (Thuja plicata)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
10288	18	1,024	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
10289	14	651	Western red cedar (Thuja plicata)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
10290	10	362	Western red cedar (Thuja plicata)	0	Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
10291	8	249	Western red cedar (Thuja plicata)	0	In Edy ROW-Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
10292	32	2,991	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
10298	14	651	Western red cedar (Thuja plicata)	0	Topped, decay, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
10322	11	426	Douglas fir (Pseudotsuga menziesii)	0	In Edy ROW-Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
10323	16	827	Western red cedar (Thuja plicata)	0	In Edy ROW-Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
10324	7	201	Western red cedar (Thuja plicata)	0	In Edy ROW-Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
10325	14	651	Western red cedar (Thuja plicata)	0	In Edy ROW-Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
10326	7	201	Western red cedar (Thuja plicata)	0	In Edy ROW-Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
10327	9	303	Western red cedar (Thuja plicata)	0	In Edy ROW-Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
10328	6	157	Douglas fir (Pseudotsuga menziesii)	0	In Edy ROW-Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
10329	8	249	Western red cedar (Thuja plicata)	0	In Edy ROW-Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
10330	8	249	Douglas fir (Pseudotsuga menziesii)	0	In Edy ROW-Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
10629	19	1,130	Western red cedar (Thuja plicata)	1,130	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
10632	26	2,022	Western red cedar (Thuja plicata)	2,022	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
10633	9	303	UNKNOWN DECIDUOUS.	303	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
10642	42	5,027	Douglas fir (Pseudotsuga menziesii)	5,027	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
10656	7	201	Western red cedar (Thuja plicata)	0	In Edy ROW-OK	2	Utilities, Streets and Site Grading	0	B	0
10657	11	426	Western red cedar (Thuja plicata)	0	In Edy ROW	2	Utilities, Streets and Site Grading	0	B	0
10658	34	3,356	Douglas fir (Pseudotsuga menziesii)	3,356	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
10659	17	923	Western red cedar (Thuja plicata)	923	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
10660	10	362	Douglas fir (Pseudotsuga menziesii)	362	Suppressed, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
10661	8	249	Big Leaf Maple (Acer macrophyllum)	0	In Edy ROW-Topped, Hazard	3	Hazard	0	A	0
10662	9	303	Big Leaf Maple (Acer macrophyllum)	0	Topped, Hazard, In Vegetated Corridor	3	Hazard	0	A	0
10663	12	496	Big Leaf Maple (Acer macrophyllum)	0	Topped, Hazard, In Vegetated Corridor	3	Hazard	0	A	0
10664	10	362	Big Leaf Maple (Acer macrophyllum)	0	Topped, Hazard, In Vegetated Corridor	3	Hazard	0	A	0
10794	18	1,024	Douglas fir (Pseudotsuga menziesii)	1,024	Sweep, OK	2	Preserve-In Lot	1,024	B	1

AKS Survey Reference #	Total DBH (In)	Total Canopy Area^^ (sf)	Tree Species	Total Canopy Preserved	Condition/Comments	Hazard Rating 1-4*	Reason for Removal	Total Canopy in Developable Area Preserved	Wind-throw Rating**	***Save/ Remove
10797	6	157	Big Leaf Maple (Acer macrophyllum)	0	Lean, Hazard	3	Hazard	0	A	0
10798	12	496	Douglas fir (Pseudotsuga menziesii)	0	Lean, Topped, Hazard	3	Hazard	0	A	0
10799	10	362	Big Leaf Maple (Acer macrophyllum)	362	Lean, OK	2	Preserve-In-Lot	362	B	1
10803	11	426	Big Leaf Maple (Acer macrophyllum)	0	Lean, Scar, Hazard	3	Hazard	0	A	0
10804	16	827	Western red cedar (Thuja plicata)	0	Topped at 10', decay, Hazard	4	Hazard	0	A	0
10805	10	362	Douglas fir (Pseudotsuga menziesii)	0	Dead	4	Hazard	0	A	0
10806	11	426	Big Leaf Maple (Acer macrophyllum)	0	Lean, Scars, Hazard	3	Hazard	0	A	0
10807	13	571	Big Leaf Maple (Acer macrophyllum)	571	Lean, OK, Watch	2	Preserve-In Lot	571	B	1
10810	18	1,024	Big Leaf Maple (Acer macrophyllum)	1,024	Lean, OK, Watch	2	Preserve-In Lot	1,024	B	1
10912	32	2,991	Western red cedar (Thuja plicata)	0	Decay, Hazard	4	Hazard, Utilities, Streets and Site Grading	0	A	0
10913	8	249	Big Leaf Maple (Acer macrophyllum)	0	Severe Lean, Hazard	4	Hazard, Utilities, Streets and Site Grading	0	A	0
10915	16	827	Douglas fir (Pseudotsuga menziesii)	0	Lean, Sap, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
10916	10	362	Western red cedar (Thuja plicata)	0	OK	2	Homebuilding	0	B	0
10918	9	303	Douglas fir (Pseudotsuga menziesii)	0	Suppressed, Don't Leave	2	Homebuilding	0	B	0
10921	26	2,022	Western red cedar (Thuja plicata)	0	Decay, Hazard	3	Homebuilding	0	B	0
10922	9	303	Western red cedar (Thuja plicata)	0	Scar, OK	2	Utilities, Streets and Site Grading	0	B	0
10924	22	1,481	Western red cedar (Thuja plicata)	0	Lean, Scar, OK	2	Utilities, Streets and Site Grading	0	B	0
10936	12	496	Western red cedar (Thuja plicata)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
10937	27	2,170	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
10941	7	201	Big Leaf Maple (Acer macrophyllum)	0	Lean, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
10942	8	249	Dawn Redwood (Metasequoia glyptostroboides)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
10943	9	303	Western red cedar (Thuja plicata)	0	OK	2	Homebuilding	0	B	0
10944	19	1,130	Western red cedar (Thuja plicata)	0	Dead, topped at 10', Hazard	4	Hazard, Homebuilding	0	A	0
10968	13	571	Douglas fir (Pseudotsuga menziesii)	0	Broken Top, Lean, Hazard	3	Hazard, Homebuilding	0	A	0
10979	36	3,742	Western red cedar (Thuja plicata)	0	Decay, Hazard	4	Hazard	0	A	0
10980	36	3,742	Western red cedar (Thuja plicata)	3,742	OK	2	Preserve-on Lot	3,742	B	1
10981	10	362	UNKNOWN DECIDUOUS.	362	Lean, OK	2	Preserve-on Lot	362	B	1
10982	18	1,024	UNKNOWN DECIDUOUS.	1,024	Lean, OK, Watch	2	Preserve-on Lot	1,024	B	1
10983	39	4,361	Western red cedar (Thuja plicata)	4,361	OK	2	Preserve-on Lot	4,361	B	1
10984	32	2,991	Western red cedar (Thuja plicata)	0	Decay, Hazard	4	Hazard, Homebuilding	0	A	0
10985	38	4,149	Western red cedar (Thuja plicata)	0	Sap, Decay, Hazard	4	Hazard, Utilities, Streets and Site Grading	0	A	0
10986	22	1,481	Western red cedar (Thuja plicata)	0	Lean, Topped, Hazard	3	Hazard	0	A	0
10987	7	201	UNKNOWN DECIDUOUS.	0	Lean, OK	2	Utilities, Streets and Site Grading	0	B	0
10988	15	736	UNKNOWN DECIDUOUS.	736	Lean, OK, Watch	2	Preserve-In-Lot	736	B	1
11013	12	496	Pine (Pinus spp.)	496	Lean, OK	2	Preserve-in Lot	496	B	1
11014	13	571	UNKNOWN DECIDUOUS.	0	Lean, Hazard	3	Hazard	0	A	0
11015	8	249	Pine (Pinus spp.)	249	Lean, Sap, Scar, OK, Watch	2	Preserve-in Lot	249	A	1
11016	7	201	Pine (Pinus spp.)	0	Lean, Topped, Hazard	3	Hazard	0	A	0
11018	10	362	Pine (Pinus spp.)	362	Lean, OK, Watch	2	Preserve-in Lot	362	B	1
11019	8	249	Pine (Pinus spp.)	249	Lean, Topped, Watch	2	Preserve-in Lot	249	B	1
11049	10	362	Cherry (Prunus spp.)	0	4" bole, 5" bole, 5" bole, 6" bole, included bark, decay, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0

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11050	6	157	Apple (Malus spp.)	0	Lean, Decay, Hazard	4	Hazard, Utilities, Streets and Site Grading	0	A	0
11052	9	303	Apple (Malus spp.)	0	7" bole, 6" bole, Decay, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11053	20	1,242	Cherry (Prunus spp.)	0	12" bole, 16" bole, Decay, Hazard	3	Hazard, Homebuilding	0	A	0
11054	10	362	Beech (Fagus spp.)	0	5" bole, 6" bole, 6" bole, included bark, OK	2	Utilities, Streets and Site Grading	0	B	0
11055	14	651	UNKNOWN DECIDUOUS.	0	6" bole, 10" bole, 7" bole, vines, included bark, OK	2	Homebuilding	0	B	0
11056	7	201	Apple (Malus spp.)	0	Nearly Dead, Hazard	3	Hazard, Homebuilding	0	A	0
11057	11	426	Cherry (Prunus spp.)	0	4" bole, 6" bole, 8" bole, Included Bark, Cankers, Decay, Hazard	3	Hazard, Homebuilding	0	A	0
11058	8	249	Apple (Malus spp.)	0	OK	1	Homebuilding	0	C	0
11059	8	249	Apple (Malus spp.)	0	6" bole, 6" bole, Included Bark, Decay, Hazard	3	Hazard, Homebuilding	0	A	0
11060	9	303	Apple (Malus spp.)	0	7" bole, 5" bole, Included Bark, OK	2	Homebuilding	0	B	0
11061	10	362	Apple (Malus spp.)	0	6" bole, 6" bole, 6" bole, Included Bark, OK	2	Homebuilding	0	B	0
11062	10	362	Apple (Malus spp.)	0	5" bole, 6" bole, 7" bole, Decay, Hazard	3	Hazard, Homebuilding	0		0
11063	9	303	Apple (Malus spp.)	0	OK	2	Homebuilding	0	B	0
11093	28	2,324	Douglas fir (Pseudotsuga menziesii)	0	Sweep, OK	2	Homebuilding	0	B	0
11094	14	651	Western red cedar (Thuja plicata)	0	OK	2	Homebuilding	0	B	0
11095	27	2,170	Douglas fir (Pseudotsuga menziesii)	0	Sap, Sweep, OK	2	Homebuilding	0	B	0
11096	19	1,130	Western red cedar (Thuja plicata)	0	15" bole, 11" bole, Included Bark, Sweep, OK	2	Homebuilding	0	B	0
11097	34	3,356	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Homebuilding	0	B	0
11098	29	2,483	Western red cedar (Thuja plicata)	0	Scar, OK	2	Homebuilding	0	B	0
11099	46	5,988	Douglas fir (Pseudotsuga menziesii)	0	24" bole, 39" bole, some Cankers, OK	2	Homebuilding	0	B	0
11100	23	1,608	Douglas fir (Pseudotsuga menziesii)	0	Sap, OK	2	Homebuilding	0	B	0
11101	22	1,481	Western red cedar (Thuja plicata)	0	Topped, OK	2	Homebuilding	0	B	0
11102	24	1,741	Western red cedar (Thuja plicata)	0	OK	2	Homebuilding	0	B	0
11103	46	5,988	Douglas fir (Pseudotsuga menziesii)	0	Sweep, OK	2	Homebuilding	0	B	0
11104	6	157	Western red cedar (Thuja plicata)	0	Sweep, OK	2	Homebuilding	0	B	0
11105	34	3,356	Douglas fir (Pseudotsuga menziesii)	0	Some Butt Swell, Sweep, OK	2	Homebuilding	0	B	0
11106	26	2,022	Douglas fir (Pseudotsuga menziesii)	0	Sap, Sweep, OK	2	Homebuilding	0	B	0
11107	26	2,022	Western red cedar (Thuja plicata)	0	OK	2	Homebuilding	0	B	0
11108	30	2,647	Douglas fir (Pseudotsuga menziesii)	0	Sweep, OK	2	Homebuilding	0	B	0
11109	27	2,170	Western red cedar (Thuja plicata)	0	OK	2	Homebuilding	0	B	0
11110	15	736	Douglas fir (Pseudotsuga menziesii)	736	Vines, Lean, OK, Watch	2	Preserve-in Lot	736	B	1
11115	33	3,171	Western red cedar (Thuja plicata)	0	OK	2	Homebuilding	0	B	0
11116	36	3,742	Western red cedar (Thuja plicata)	0	Some Lean, OK	2	Homebuilding	0	B	0
11117	7	201	Big Leaf Maple (Acer macrophyllum)	0	Lean, Topped, Hazard	3	Hazard, Homebuilding	0	A	0
11121	11	426	Big Leaf Maple (Acer macrophyllum)	0	Lean, Topped, Hazard	3	Hazard, Homebuilding	0	A	0
11122	7	201	Western red cedar (Thuja plicata)	0	5" bole, 5" bole, sweep, OK	2	Homebuilding	0	B	0
11123	31	2,816	Western red cedar (Thuja plicata)	0	OK	2	Homebuilding	0	B	0
11124	14	651	Western red cedar (Thuja plicata)	0	Lean, OK	2	Homebuilding	0	B	0
11125	26	2,022	Douglas fir (Pseudotsuga menziesii)	0	Conks, Decay, Hazard	4	Hazard, Homebuilding	0	A	0
11126	7	201	Western red cedar (Thuja plicata)	0	Dead, Lean	4	Hazard, Utilities, Streets and Site Grading	0	A	0
11127	25	1,879	Western red cedar (Thuja plicata)	0	Lean, OK	2	Homebuilding	0	B	0

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11128	11	426	Western red cedar (Thuja plicata)	0	Sweep, OK	2	Homebuilding	0	B	0
11129	24	1,741	Western red cedar (Thuja plicata)	0	Decay, Hazard	4	Hazard, Homebuilding	0	A	0
11130	10	362	Western red cedar (Thuja plicata)	0	Lean, OK	2	Homebuilding	0	B	0
11131	14	651	Western red cedar (Thuja plicata)	0	Lean, OK	2	Homebuilding	0	B	0
11132	11	426	Western red cedar (Thuja plicata)	0	Scars, OK	2	Homebuilding	0	B	0
11133	26	2,022	Western red cedar (Thuja plicata)	0	Multiple Boles, OK	2	Homebuilding	0	B	0
11134	9	303	Western red cedar (Thuja plicata)	0	Sparse Foliage, OK	2	Homebuilding	0	B	0
11135	16	827	Western red cedar (Thuja plicata)	0	Decay, Hazard	4	Hazard, Homebuilding	0	A	0
11136	12	496	Big Leaf Maple (Acer macrophyllum)	0	Lean, OK	2	Homebuilding	0	B	0
11139	20	1,242	Western red cedar (Thuja plicata)	1,242	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11140	26	2,022	Douglas fir (Pseudotsuga menziesii)	2,022	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11141	12	496	Douglas fir (Pseudotsuga menziesii)	496	Broken top, Development Hazard, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11142	17	923	Douglas fir (Pseudotsuga menziesii)	923	Broken top, Development Hazard, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11143	19	1,130	Douglas fir (Pseudotsuga menziesii)	1,130	Broken top, Development Hazard, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11144	13	571	Big Leaf Maple (Acer macrophyllum)	571	Lean, Scar, Development Hazard, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11145	28	2,324	Douglas fir (Pseudotsuga menziesii)	2,324	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11146	10	362	Western red cedar (Thuja plicata)	362	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11147	22	1,481	Douglas fir (Pseudotsuga menziesii)	1,481	Lean, Development Hazard, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11149	19	1,130	Western red cedar (Thuja plicata)	1,130	In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11150	37	3,943	Western red cedar (Thuja plicata)	3,943	Included Bark, OK, Watch, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11151	15	736	Western red cedar (Thuja plicata)	736	, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11152	7	201	Western red cedar (Thuja plicata)	201	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11156	16	827	Western red cedar (Thuja plicata)	827	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11157	30	2,647	Western red cedar (Thuja plicata)	2,647	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11158	38	4,149	Douglas fir (Pseudotsuga menziesii)	4,149	Scar, OK, Watch, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11159	34	3,356	Western red cedar (Thuja plicata)	3,356	Scar, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11160	16	827	Douglas fir (Pseudotsuga menziesii)	827	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11161	13	571	Big Leaf Maple (Acer macrophyllum)	571	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11162	8	249	Western red cedar (Thuja plicata)	249	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11163	8	249	Western red cedar (Thuja plicata)	0	Decay, Hazard, In Vegetated Corridor	4	Hazard	0	A	0
11164	21	1,359	Pacific Madrone (Arbutus menziesii)	0	Lean, Hazard, In Vegetated Corridor	3	Hazard	0	A	0
11165	46	5,988	Douglas fir (Pseudotsuga menziesii)	5,988	Sap, OK, Watch, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11166	6	157	Pacific Madrone (Arbutus menziesii)	157	In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11167	37	3,943	Douglas fir (Pseudotsuga menziesii)	3,943	OK, Watch, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11168	8	249	Western red cedar (Thuja plicata)	0	Decay, Hazard, In Vegetated Corridor	4	Hazard	0	A	0
11169	15	736	Western red cedar (Thuja plicata)	736	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11170	12	496	Douglas fir (Pseudotsuga menziesii)	496	Suppressed, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1

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11171	16	827	Western red cedar (Thuja plicata)	827	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11172	28	2,324	Douglas fir (Pseudotsuga menziesii)	0	Conk, Decay, Hazard, In Vegetated Corridor	4	Hazard	0	A	0
11173	19	1,130	Douglas fir (Pseudotsuga menziesii)	1,130	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11174	17	923	Western red cedar (Thuja plicata)	923	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11175	23	1,608	Western red cedar (Thuja plicata)	1,608	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11176	19	1,130	Douglas fir (Pseudotsuga menziesii)	1,130	Scars, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11177	25	1,879	Douglas fir (Pseudotsuga menziesii)	1,879	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11178	9	303	Red alder (Alnus rubra)	303	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11179	20	1,242	Douglas fir (Pseudotsuga menziesii)	1,242	Lean, OK, Watch, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11180	13	571	Douglas fir (Pseudotsuga menziesii)	0	Sap, Conks, Dead, In Vegetated Corridor	4	Hazard	0	A	0
11181	6	157	Big Leaf Maple (Acer macrophyllum)	0	Lean, Hazard, In Vegetated Corridor	3	Hazard	0	A	0
11182	18	1,024	Douglas fir (Pseudotsuga menziesii)	0	Conks, Decay, Hazard, In Vegetated Corridor	4	Hazard	0	A	0
11183	11	426	Big Leaf Maple (Acer macrophyllum)	0	Lean, Hazard, In Vegetated Corridor	3	Hazard	0	A	0
11184	21	1,359	Douglas fir (Pseudotsuga menziesii)	1,359	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11185	26	2,022	Douglas fir (Pseudotsuga menziesii)	0	Conks, Decay, Hazard, In Vegetated Corridor	4	Hazard	0	A	0
11188	26	2,022	Douglas fir (Pseudotsuga menziesii)	2,022	OK, Watch, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11189	37	3,943	Douglas fir (Pseudotsuga menziesii)	3,943	In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11190	28	2,324	Douglas fir (Pseudotsuga menziesii)	2,324	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11191	21	1,359	Douglas fir (Pseudotsuga menziesii)	1,359	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11192	18	1,024	Western red cedar (Thuja plicata)	1,024	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11193	9	303	Big Leaf Maple (Acer macrophyllum)	303	Sweep, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11194	13	571	Big Leaf Maple (Acer macrophyllum)	571	Lean, OK, Watch, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11195	14	651	Big Leaf Maple (Acer macrophyllum)	651	Lean, OK, Watch, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11196	23	1,608	Big Leaf Maple (Acer macrophyllum)	1,608	9" bole, 10" bole, 13" bole, 13" bole, Included Bark, Lean, Watch, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11197	16	827	Big Leaf Maple (Acer macrophyllum)	827	11" bole, 12" bole, Included Bark, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11198	18	1,024	Big Leaf Maple (Acer macrophyllum)	1,024	7" bole, 12" bole, 12" bole, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11199	7	201	Western red cedar (Thuja plicata)	201	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11201	11	426	Big Leaf Maple (Acer macrophyllum)	426	7" bole, 8" bole, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11202	13	571	Western red cedar (Thuja plicata)	0	Sweep, Decay, Hazard	4	Hazard	0	A	0
11203	29	2,483	Douglas fir (Pseudotsuga menziesii)	2,483	Butt Swell, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11204	29	2,483	Western red cedar (Thuja plicata)	2,483	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11205	17	923	Western red cedar (Thuja plicata)	923	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11206	14	651	Douglas fir (Pseudotsuga menziesii)	0	Lean, Hazard, Remove, In Vegetated Corridor	3	Hazard	0	A	0
11207	16	827	Western red cedar (Thuja plicata)	827	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11208	25	1,879	Western red cedar (Thuja plicata)	1,879	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11209	8	249	Big Leaf Maple (Acer macrophyllum)	249	Sweep, Development Hazard, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11210	24	1,741	Western red cedar (Thuja plicata)	1,741	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11211	23	1,608	Western red cedar (Thuja plicata)	1,608	Sweep, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11212	10	362	Big Leaf Maple (Acer macrophyllum)	362	Sweep, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1

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11213	10	362	Big Leaf Maple (Acer macrophyllum)	362	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11214	12	496	Big Leaf Maple (Acer macrophyllum)	496	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11215	6	157	Big Leaf Maple (Acer macrophyllum)	0	Decay, Lean, Hazard, In Vegetated Corridor	4	Hazard	0	A	0
11216	16	827	Big Leaf Maple (Acer macrophyllum)	827	10" bole, 13" bole, Lean, Watch, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11217	8	249	Big Leaf Maple (Acer macrophyllum)	249	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11218	8	249	Western red cedar (Thuja plicata)	249	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11219	9	303	Western red cedar (Thuja plicata)	303	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11220	13	571	Big Leaf Maple (Acer macrophyllum)	571	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11221	10	362	Big Leaf Maple (Acer macrophyllum)	362	Lean, Development Hazard, In Vegetated Corridor	3	Preserve-In Vegetated Corridor	0	A	1
11222	5	119	Western red cedar (Thuja plicata)	119	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11223	22	1,481	Western red cedar (Thuja plicata)	0	Snag, Decay, Hazard, In Vegetated Corridor	4	Hazard	0	A	0
11224	6	157	Big Leaf Maple (Acer macrophyllum)	157	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11225	12	496	Western red cedar (Thuja plicata)	0	Decay, Hazard, In Vegetated Corridor	4	Hazard	0	A	0
11226	7	201	Big Leaf Maple (Acer macrophyllum)	201	Lean, Development Hazard, In Vegetated Corridor	3	Preserve-In Vegetated Corridor	0	A	1
11244	16	827	Douglas fir (Pseudotsuga menziesii)	0	OK, In Vegetated Corridor	2	Utilities, Streets and Site Grading	0	A	0
11245	13	571	Big Leaf Maple (Acer macrophyllum)	571	OK, In Vegetated Corridor	2	Preserve	0	B	1
11246	7	201	Big Leaf Maple (Acer macrophyllum)	0	Lean, Development Hazard, In Vegetated Corridor Area	3	Utilities, Streets and Site Grading	0	A	0
11247	8	249	Big Leaf Maple (Acer macrophyllum)	0	Lean, OK, In Vegetated Corridor	2	Utilities, Streets and Site Grading	0	B	0
11287	20	1,242	Big Leaf Maple (Acer macrophyllum)	1,242	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11288	6	157	Holly (Ilex spp.)	157	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11311	11	426	Western red cedar (Thuja plicata)	426	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11332	16	827	Western red cedar (Thuja plicata)	827	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11333	24	1,741	Western red cedar (Thuja plicata)	1,741	Topped, OK, Watch, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11334	15	736	Douglas fir (Pseudotsuga menziesii)	0	Dead, Conks, Hazard, In Vegetated Corridor	4	Hazard	0	A	0
11335	9	303	Western red cedar (Thuja plicata)	0	Lean, Hazard, In Vegetated Corridor	3	Hazard	0	A	0
11386	24	1,741	Western red cedar (Thuja plicata)	1,741	Vines, Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11388	22	1,481	Red alder (Alnus rubra)	0	Snag, Hazard, In Vegetated Corridor	4	Hazard	0	A	0
11389	12	496	Western red cedar (Thuja plicata)	496	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11390	13	571	Western red cedar (Thuja plicata)	571	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11391	38	4,149	Big Leaf Maple (Acer macrophyllum)	4,149	18" bole, 33" bole, Included Bark, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11392	31	2,816	Douglas fir (Pseudotsuga menziesii)	2,816	29" bole, 10" bole, Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11393	6	157	Big Leaf Maple (Acer macrophyllum)	157	Lean, Development Hazard, In Vegetated Corridor	3	Preserve-In Vegetated Corridor	0	A	1
11394	14	651	Big Leaf Maple (Acer macrophyllum)	651	Lean, OK, Watch, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11395	25	1,879	Western red cedar (Thuja plicata)	1,879	OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11396	15	736	Big Leaf Maple (Acer macrophyllum)	736	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11397	12	496	Big Leaf Maple (Acer macrophyllum)	496	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1

AKS Survey Reference #	Total DBH (In)	Total Canopy Area^^ (sf)	Tree Species	Total Canopy Preserved	Condition/Comments	Hazard Rating 1-4*	Reason for Removal	Total Canopy in Developable Area Preserved	Wind-throw Rating**	***Save/ Remove
11399	9	303	Big Leaf Maple (Acer macrophyllum)	303	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11400	11	426	Big Leaf Maple (Acer macrophyllum)	426	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11401	13	571	Big Leaf Maple (Acer macrophyllum)	571	Lean, OK, , In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11402	13	571	Big Leaf Maple (Acer macrophyllum)	0	Decay, Hazard, , In Vegetated Corridor	4	Hazard	0	A	0
11404	14	651	Big Leaf Maple (Acer macrophyllum)	651	9" bole, 11" bole, Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11405	10	362	Big Leaf Maple (Acer macrophyllum)	362	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11406	16	827	Big Leaf Maple (Acer macrophyllum)	827	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11408	8	249	Big Leaf Maple (Acer macrophyllum)	249	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11409	9	303	Big Leaf Maple (Acer macrophyllum)	303	Lean, OK, In Vegetated Corridor	2	Preserve-In Vegetated Corridor	0	B	1
11416	18	1,024	Western red cedar (Thuja plicata)	0	Topped, Hazard	3	Hazard	0	A	0
11418	18	1,024	Red alder (Alnus rubra)	0	12" bole, 14" bole, Decay, Hazard	3	Hazard	0	A	0
11422	8	249	Western red cedar (Thuja plicata)	0	Scar, Lean, Hazard, In Vegetated Corridor	3	Hazard	0	A	0
11423	29	2,483	Douglas fir (Pseudotsuga menziesii)	0	Lean, Hazard, In Vegetated Corridor	3	Hazard	0	A	0
11425	32	2,991	Douglas fir (Pseudotsuga menziesii)	0	Sap, OK-In Lot	2	Utilities, Streets and Site Grading	0	B	0
11426	25	1,879	Western red cedar (Thuja plicata)	0	Multiple Boles, Included Bark, OK-In Lot	2	Utilities, Streets and Site Grading	0	B	0
11427	16	827	Western red cedar (Thuja plicata)	0	7" bole, 14" bole, Included Bark, OK	2	Utilities, Streets and Site Grading	0	B	0
11428	26	2,022	Ponderosa Pine (Pinus Ponderosa)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11434	13	571	Western red cedar (Thuja plicata)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11435	42	5,027	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11436	12	496	Western red cedar (Thuja plicata)	0	Lean, OK, Watch	2	Utilities, Streets and Site Grading	0	B	0
11437	19	1,130	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11438	33	3,171	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11439	8	249	Big Leaf Maple (Acer macrophyllum)	0	Scar, Decay, Lean, Hazard	4	Hazard, Utilities, Streets and Site Grading	0	A	0
11440	35	3,547	Western red cedar (Thuja plicata)	0	Lean, OK	2	Utilities, Streets and Site Grading	0	B	0
11441	40	4,577	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11442	9	303	Western red cedar (Thuja plicata)	0	OK, In Vegetated Corridor	2	Utilities, Streets and Site Grading	0	B	0
11443	37	3,943	Douglas fir (Pseudotsuga menziesii)	0	OK, In Vegetated Corridor	2	Utilities, Streets and Site Grading	0	B	0
11444	27	2,170	Western red cedar (Thuja plicata)	0	Sweep, OK, In Vegetated Corridor	2	Utilities, Streets and Site Grading	0	B	0
11445	29	2,483	Western red cedar (Thuja plicata)	0	Sparse Foliage, OK	2	Utilities, Streets and Site Grading	0	B	0
11446	29	2,483	Western red cedar (Thuja plicata)	0	Swelled Bole, OK	2	Homebuilding	0	B	0
11447	8	249	Big Leaf Maple (Acer macrophyllum)	0	Lean, Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11448	19	1,130	Incense Cedar (Calocedrus decurrens)	0	Topped, OK, Watch	2	Utilities, Streets and Site Grading	0	B	0
11449	14	651	Incense Cedar (Calocedrus decurrens)	0	Topped, OK, Watch	2	Utilities, Streets and Site Grading	0	B	0
11450	11	426	Incense Cedar (Calocedrus decurrens)	0	Laminar Failure, Hazard	4	Hazard, Utilities, Streets and Site Grading	0	A	0
11451	30	2,647	Incense Cedar (Calocedrus decurrens)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11452	27	2,170	Incense Cedar (Calocedrus decurrens)	0	Sweep, OK	2	Utilities, Streets and Site Grading	0	B	0
11453	21	1,359	Incense Cedar (Calocedrus decurrens)	0	Scar, Lean, OK	2	Utilities, Streets and Site Grading	0	B	0
11454	7	201	Spruce (Picea spp.)	0	Scar, Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11455	6	157	Spruce (Picea spp.)	0	Topped, OK	2	Utilities, Streets and Site Grading	0	B	0
11456	9	303	Spruce (Picea spp.)	0	Topped, OK	2	Utilities, Streets and Site Grading	0	B	0
11458	6	157	Spruce (Picea spp.)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11459	8	249	Spruce (Picea spp.)	0	Scar, Sap, Broken Top, OK	2	Utilities, Streets and Site Grading	0	B	0

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11460	9	303	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11461	8	249	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11462	36	3,742	Western red cedar (Thuja plicata)	0	Included Bark, OK	2	Utilities, Streets and Site Grading	0	B	0
11463	26	2,022	Incense Cedar (Calocedrus decurrens)	0	Broken Top, Scar, OK	2	Utilities, Streets and Site Grading	0	B	0
11464	22	1,481	Western red cedar (Thuja plicata)	0	Included Bark, OK	2	Utilities, Streets and Site Grading	0	B	0
11465	11	426	Big Leaf Maple (Acer macrophyllum)	0	8" bole, 8" bole, Broken Top, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11466	6	157	Big Leaf Maple (Acer macrophyllum)	0	Topped, Lean, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11469	7	201	Big Leaf Maple (Acer macrophyllum)	0	Lean, Decay, Hazard	4	Hazard, Utilities, Streets and Site Grading	0	A	0
11470	14	651	Douglas fir (Pseudotsuga menziesii)	0	Sweep, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11471	35	3,547	Western red cedar (Thuja plicata)	0	Included Bark, OK	2	Utilities, Streets and Site Grading	0	B	0
11473	8	249	Big Leaf Maple (Acer macrophyllum)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11474	6	157	Big Leaf Maple (Acer macrophyllum)	0	Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11475	7	201	Big Leaf Maple (Acer macrophyllum)	0	Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11507	13	571	Oregon White Oak (Quercus garryana)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11508	7	201	Chestnut (Castaneda spp.)	0	Decay, Hazard	4	Hazard, Utilities, Streets and Site Grading	0	A	0
11509	12	496	Chestnut (Castaneda spp.)	0	6" bole, 6" bole, 8" bole, Included Bark, OK	2	Utilities, Streets and Site Grading	0	B	0
11510	9	303	Douglas fir (Pseudotsuga menziesii)	0	Scar, Sap, OK	2	Homebuilding	0	B	0
11511	12	496	Scarlet Oak (Quercus coccinea)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11512	26	2,022	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11513	25	1,879	Western red cedar (Thuja plicata)	0	Included Bark, OK	2	Utilities, Streets and Site Grading	0	B	0
11517	39	4,361	Douglas fir (Pseudotsuga menziesii)	0	Lean, Sweep, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11518	15	736	Douglas fir (Pseudotsuga menziesii)	0	Sweep, OK	2	Utilities, Streets and Site Grading	0	B	0
11519	10	362	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11520	11	426	Douglas fir (Pseudotsuga menziesii)	0	Lean, OK	2	Utilities, Streets and Site Grading	0	B	0
11522	15	736	Douglas fir (Pseudotsuga menziesii)	0	Sweep, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11523	35	3,547	Western red cedar (Thuja plicata)	0	Included Bark, Vines, OK	2	Utilities, Streets and Site Grading	0	B	0
11524	20	1,242	Douglas fir (Pseudotsuga menziesii)	0	Lean, OK	2	Utilities, Streets and Site Grading	0	B	0
11525	12	496	Douglas fir (Pseudotsuga menziesii)	0	Lean, Hazard	3	Hazard, Homebuilding	0	A	0
11526	15	736	Douglas fir (Pseudotsuga menziesii)	0	Lean, Hazard	3	Hazard, Utilities, Homebuilding	0	A	0
11529	11	426	Western red cedar (Thuja plicata)	0	OK	2	Homebuilding	0	B	0
11530	18	1,024	Douglas fir (Pseudotsuga menziesii)	0	Scars, Lean, OK	2	Homebuilding	0	B	0
11531	13	571	Big Leaf Maple (Acer macrophyllum)	0	Decay, Scars, Hazard	4	Hazard, Utilities, Streets and Site Grading	0	A	0
11532	10	362	Douglas fir (Pseudotsuga menziesii)	0	Suppressed, Don't Leave	2	Utilities, Streets and Site Grading	0	B	0
11533	9	303	Big Leaf Maple (Acer macrophyllum)	0	Suppressed, Included Bark, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11534	28	2,324	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11535	27	2,170	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11536	14	651	Douglas fir (Pseudotsuga menziesii)	0	Lean, Topped, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11537	25	1,879	Bitter Cherry (Prunus emarginata)	0	13" bole, 13" bole, 17" bole, Decay, Hazard	4	Hazard, Utilities, Streets and Site Grading	0	A	0
11538	32	2,991	Western red cedar (Thuja plicata)	0	Some decay, included bark, OK, Watch	2	Utilities, Streets and Site Grading	0	A	0
11539	12	496	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Homebuilding	0	B	0
11541	27	2,170	Douglas fir (Pseudotsuga menziesii)	0	Sweep, OK	2	Homebuilding	0	B	0
11542	7	201	Douglas fir (Pseudotsuga menziesii)	0	Sap, OK	2	Homebuilding	0	B	0
11543	9	303	Big Leaf Maple (Acer macrophyllum)	0	Lean, OK	2	Homebuilding	0	B	0

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11545	9	303	Douglas fir (Pseudotsuga menziesii)	0	Suppressed, Hazard	3	Hazard, Homebuilding	0	A	0
11546	33	3,171	Douglas fir (Pseudotsuga menziesii)	0	Conks, Sap, Hazard	3	Hazard, Homebuilding	0	A	0
11547	23	1,608	Western red cedar (Thuja plicata)	0	Pitch, Included Bark, OK	2	Homebuilding	0	B	0
11548	20	1,242	Douglas fir (Pseudotsuga menziesii)	0	Scars, OK	2	Homebuilding	0	B	0
11549	28	2,324	Douglas fir (Pseudotsuga menziesii)	0	Lean, Hazard	3	Hazard, Homebuilding	0	A	0
11552	7	201	Big Leaf Maple (Acer macrophyllum)	0	Lean, Hazard	3	Hazard, Homebuilding	0	A	0
11553	12	496	Big Leaf Maple (Acer macrophyllum)	0	Lean, Decay, Hazard	4	Hazard, Homebuilding	0	A	0
11554	29	2,483	Western red cedar (Thuja plicata)	0	Lean, Included Bark, OK	2	Homebuilding	0	B	0
11555	18	1,024	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Homebuilding	0	B	0
11556	7	201	Douglas fir (Pseudotsuga menziesii)	0	Dead	4	Hazard, Homebuilding	0	A	0
11557	11	426	Douglas fir (Pseudotsuga menziesii)	0	Sweep, Lean, Hazard	3	Hazard, Homebuilding	0	A	0
11601	24	1,741	Western red cedar (Thuja plicata)	1,741	Lean, OK	2	Preserve-in Lot	0	B	1
11602	39	4,361	Douglas fir (Pseudotsuga menziesii)	4,361	Vines, OK	2	Preserve-in Lot	0	B	1
11606	38	4,149	Western red cedar (Thuja plicata)	4,149	31" bole, 22" bole, Included Bark, OK	2	Preserve-in Lot	0	B	1
11607	24	1,741	Western red cedar (Thuja plicata)	1,741	Vines, OK	2	Preserve-in Lot	0	B	1
11617	33	3,171	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Homebuilding	0	B	0
11618	29	2,483	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Homebuilding	0	B	0
11619	26	2,022	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Homebuilding	0	B	0
11620	28	2,324	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Homebuilding	0	B	0
11621	16	827	Douglas fir (Pseudotsuga menziesii)	0	Sap, OK	2	Homebuilding	0	B	0
11622	12	496	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Homebuilding	0	B	0
11623	27	2,170	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Homebuilding	0	B	0
11624	33	3,171	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Homebuilding	0	B	0
11625	8	249	Western red cedar (Thuja plicata)	0	OK	1	Homebuilding	0	C	0
11626	25	1,879	Douglas fir (Pseudotsuga menziesii)	0	Lean, OK	2	Homebuilding	0	B	0
11627	14	651	Western red cedar (Thuja plicata)	0	Gall at 7', Hazard	3	Hazard, Homebuilding	0	A	0
11628	11	426	Western red cedar (Thuja plicata)	0	Gall at 7', Hazard	3	Hazard, Homebuilding	0	A	0
11629	10	362	Douglas fir (Pseudotsuga menziesii)	0	Suppressed, Hazard	3	Hazard, Homebuilding	0	A	0
11630	10	362	Douglas fir (Pseudotsuga menziesii)	0	Suppressed, Hazard	3	Hazard, Homebuilding	0	A	0
11631	39	4,361	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Homebuilding	0	B	0
11632	9	303	Douglas fir (Pseudotsuga menziesii)	0	Conks, Decay, Hazard	4	Hazard, Homebuilding	0	A	0
11633	24	1,741	Western red cedar (Thuja plicata)	0	Decay, Hazard	4	Hazard, Homebuilding	0	A	0
11634	23	1,608	Douglas fir (Pseudotsuga menziesii)	0	Sweep, OK	2	Homebuilding	0	A	0
11635	17	923	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Homebuilding	0	B	0
11636	24	1,741	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Homebuilding	0	B	0
11637	23	1,608	Douglas fir (Pseudotsuga menziesii)	0	Sweep, OK	2	Homebuilding	0	B	0
11638	26	2,022	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Homebuilding	0	B	0
11639	38	4,149	Douglas fir (Pseudotsuga menziesii)	0	Some Butt Swell, OK	2	Homebuilding	0	B	0
11640	18	1,024	Western red cedar (Thuja plicata)	0	Some Lean, OK	2	Utilities, Streets and Site Grading	0	B	0
11641	8	249	Douglas fir (Pseudotsuga menziesii)	0	Suppressed, Almost Dead, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11642	8	249	Western red cedar (Thuja plicata)	0	Suppressed, OK	2	Utilities, Streets and Site Grading	0	B	0
11643	11	426	Douglas fir (Pseudotsuga menziesii)	0	Suppressed, OK	2	Utilities, Streets and Site Grading	0	B	0
11644	14	651	Douglas fir (Pseudotsuga menziesii)	0	Suppressed, OK	2	Utilities, Streets and Site Grading	0	B	0

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11645	15	736	Western red cedar (Thuja plicata)	0	Lean, OK	2	Utilities, Streets and Site Grading	0	B	0
11646	9	303	Magnolia (Magnolia spp.)	0	Lean, OK	2	Utilities, Streets and Site Grading	0	B	0
11647	16	827	Bitter Cherry (Prunus emarginata)	0	10" bole, 11" bole, 6" bole, Decay, Hazard	4	Hazard, Utilities, Streets and Site Grading	0	A	0
11648	27	2,170	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11649	15	736	Douglas fir (Pseudotsuga menziesii)	0	Swelled Bole, Suppressed, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11650	26	2,022	Douglas fir (Pseudotsuga menziesii)	0	Sweep, OK	2	Utilities, Streets and Site Grading	0	B	0
11651	18	1,024	Douglas fir (Pseudotsuga menziesii)	0	Suppressed, Don't Leave	2	Utilities, Streets and Site Grading	0	B	0
11652	29	2,483	Western red cedar (Thuja plicata)	0	Lean, OK	2	Utilities, Streets and Site Grading	0	B	0
11653	22	1,481	Douglas fir (Pseudotsuga menziesii)	0	Lean, OK	2	Utilities, Streets and Site Grading	0	B	0
11654	14	651	Western red cedar (Thuja plicata)	0	Scar, OK	2	Utilities, Streets and Site Grading	0	B	0
11655	8	249	Western red cedar (Thuja plicata)	0	Dead	4	Hazard, Utilities, Streets and Site Grading	0	A	0
11656	14	651	Douglas fir (Pseudotsuga menziesii)	0	Scar, Sap, Suppressed, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11657	25	1,879	Douglas fir (Pseudotsuga menziesii)	0	Galls, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11658	14	651	Western red cedar (Thuja plicata)	0	Sweep, OK	2	Utilities, Streets and Site Grading	0	B	0
11660	7	201	Western red cedar (Thuja plicata)	0	Suppressed, OK	2	Utilities, Streets and Site Grading	0	B	0
11661	13	571	Douglas fir (Pseudotsuga menziesii)	0	Suppressed, OK	2	Utilities, Streets and Site Grading	0	B	0
11662	14	651	Western red cedar (Thuja plicata)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11663	10	362	Western red cedar (Thuja plicata)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11664	21	1,359	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11665	12	496	Western red cedar (Thuja plicata)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11666	26	2,022	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11667	14	651	Western red cedar (Thuja plicata)	0	Scar at Roots, OK	2	Utilities, Streets and Site Grading	0	B	0
11669	35	3,547	Douglas fir (Pseudotsuga menziesii)	0	Some Butt Swell and Pitch, OK, Watch	2	Utilities, Streets and Site Grading	0	B	0
11670	27	2,170	Douglas fir (Pseudotsuga menziesii)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11672	14	651	Western red cedar (Thuja plicata)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11673	13	571	Western red cedar (Thuja plicata)	0	OK	2	Utilities, Streets and Site Grading	0	B	0
11674	9	303	Douglas fir (Pseudotsuga menziesii)	0	Dead, In Vegetated Corridor	4	Hazard, Utilities, Streets and Site Grading	0	A	0
11675	15	736	Douglas fir (Pseudotsuga menziesii)	0	OK, In Vegetated Corridor	2	Utilities, Streets and Site Grading	0	B	0
11676	14	651	Douglas fir (Pseudotsuga menziesii)	0	Nearly Dead, Sap, Hazard	3	Hazard, Utilities, Streets and Site Grading	0	A	0
11677	24	1,741	Douglas fir (Pseudotsuga menziesii)	0	Some Lean, Slight Decay, OK	2	Utilities, Streets and Site Grading	0	B	0
11678	21	1,359	Douglas fir (Pseudotsuga menziesii)	0	Broken top, OK, Watch	2	Utilities, Streets and Site Grading	0	B	0
11679	18	1,024	Douglas fir (Pseudotsuga menziesii)	0	Conks, Decay, Hazard	4	Hazard, Utilities, Streets and Site Grading	0	A	0
13063	20	1,242	Bitter Cherry (Prunus emarginata)	0	10" bole, 11" bole, 14" bole, Included Bark, Lean, Hazard	3	Hazard, Homebuilding	0	A	0
13081	10	362	Pacific Madrone (Arbutus menziesii)	0	Severe Lean, Hazard	3	Hazard	0	A	0

AKS Survey Reference #	Total DBH (In)	Total Canopy Area^^ (sf)	Tree Species	Total Canopy Preserved	Condition/Comments	Hazard Rating 1-4*	Reason for Removal	Total Canopy in Developable Area Preserved	Wind-throw Rating**	***Save/ Remove
13082	28	2,324	Douglas fir (Pseudotsuga menziesii)	2,324	Scar, OK	2	Preserve-in Lot	2,324	B	1
13083	21	1,359	Western red cedar (Thuja plicata)	1,359	Scar, OK	2	Preserve-in Lot	1,359	B	1
13084	25	1,879	Western red cedar (Thuja plicata)	1,879	OK	2	Preserve-in Lot	1,879	B	1
Totals	7,006	486,745		151,965				20,860		119

Total # of Existing Trees=	**397**	**Total # of Trees to be Removed=**	**278**
Total # of Hazard Trees=	**115**	**Total # of Non-hazard Trees to be Removed=**	**163**
Total Existing Basal Area (Sq Ft)=	**870.9**	**Total Basal Area (Sq Ft) to be Removed=**	**599**
Total Non-Hazard Basal Area=	**718**	**Total Tree Canopy Coverage (including tracts A, B, & C) Preserved (sf)=**	**151,965**
Total # of Trees To Be Retained=	**119**	**Total Tree Canopy Coverage in Developable Area Preserved (sf)=**	**20,860**
Total Non-Hazard Inches=	**5432**	**Total Area (Developable and Tracts A, B, & C) (sf)=**	**236,214**
Total Basal Area (Sq Ft) Retained=	**272**	**Net Developable Area (sf)=**	**178,655**
Total Inches of Trees to Be Retained=	**2,167**	**Percent Canopy Coverage of Total Area=**	**85.1%**
% of Non-Hazard Total Inches to Be Retained=	**40%**	**Percent Canopy Coverage of Developable Area=**	**11.7%**
		40% of the Total Developable Area (sf)=	**71,462**
		Canopy Area to be Planted to Meet 40% (sf)=	**50,602**

***HAZARD RATING**	****Windthrow Rating:**	***** SAVE/REMOVE:**
1=LOW RISK	A=Least Windthrow Resistant	1= SAVE
2=MODERATE RISK	B=Moderate Windthrow Resistance	0=REMOVE
3=HIGH RISK	C=Most Windthrow Resistant	
4=EXTREME RISK		

^^The canopy area is calculated by the formula: maximum crown width (feet) = 3.183+1.829*DBH (inches)

This formula is from: [1] Krajicek, J. E., K. E. Brinkman, S. F. Gingrich 1961. Crown 7:35-42. Competition - A Measure of Density. Forest Science

This formula gives a roughly 1 foot of canopy radius per 1 inch of dbh. Slightly more for 6-17" and slightly less for 19"+.

****Hazard-These trees either pose an immediate danger to life and safety, are diseased or defective in a manner that threatens their continued viability, or will become a danger to life and safety due to disease or defects after the project is "built out".

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.

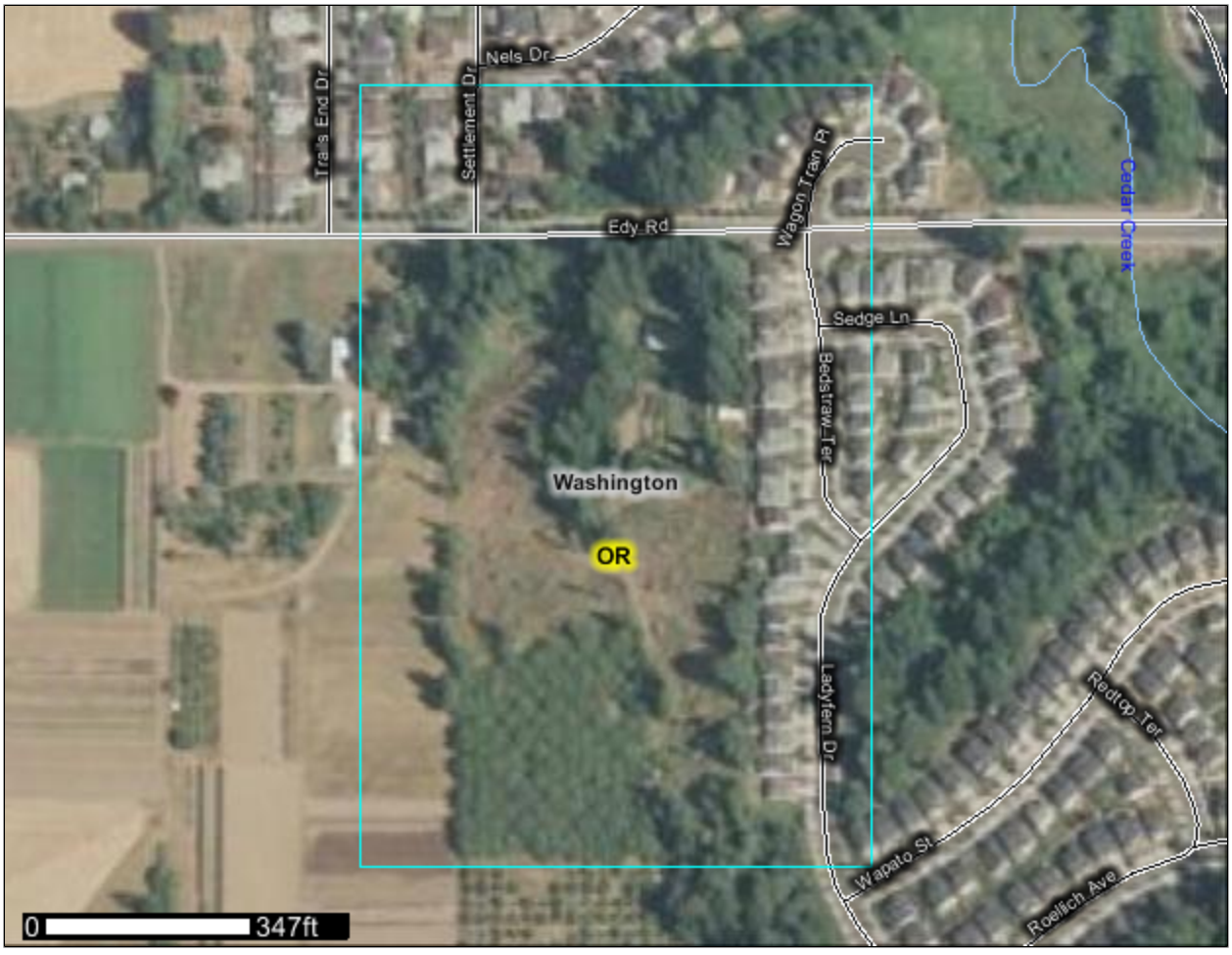
At the completion of construction, all trees must once again be reviewed to evaluate their hazard rating. Land clearing and removal of adjacent trees can expose previously unseen defects and otherwise healthy trees can be damaged during construction

United States Department of Agriculture

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 Washington County, Oregon



March 7, 2012

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

17806 SW Edy Road Project Site



Map Unit Legend

Washington County, Oregon (OR067)			
Map Unit Symbol	Map Unit Name	[redacted]	[redacted]
1	Aloha silt loam	[redacted]	[redacted]
21A	Hillsboro loam, 0 to 3 percent slopes	[redacted]	[redacted]
22	Huberly silt loam	[redacted]	[redacted]
37A	Quatama loam, 0 to 3 percent slopes	[redacted]	[redacted]
37B	Quatama loam, 3 to 7 percent slopes	[redacted]	[redacted]
45A	Woodburn silt loam, 0 to 3 percent slopes	[redacted]	[redacted]
45B	Woodburn silt loam, 3 to 7 percent slopes	[redacted]	[redacted]
46F	Xerochrepts and Haploxerolls, very steep	[redacted]	[redacted]
Totals for Area of Interest		[redacted]	[redacted]

Washington County, Oregon

21A—Hillsboro loam, 0 to 3 percent slopes

Map Unit Setting

Elevation: 160 to 240 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days

Map Unit Composition

Hillsboro and similar soils: 90 percent

Description of Hillsboro

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and loamy old alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability (nonirrigated): 1

Typical profile

0 to 15 inches: Loam
15 to 48 inches: Loam
48 to 57 inches: Fine sandy loam
57 to 81 inches: Fine sand

Data Source Information

Soil Survey Area: Washington County, Oregon
Survey Area Data: Version 9, Jul 15, 2010

Washington County, Oregon

22—Huberly silt loam

Map Unit Setting

Elevation: 150 to 300 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days

Map Unit Composition

Huberly and similar soils: 90 percent
Minor components: 3 percent

Description of Huberly

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 20 to 30 inches to fragipan
Drainage class: Poorly 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 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability (nonirrigated): 3w

Typical profile

0 to 8 inches: Silt loam
8 to 25 inches: Silt loam
25 to 60 inches: Silt loam

Minor Components

Verboort

Percent of map unit: 3 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear

Washington County, Oregon

37A—Quatama loam, 0 to 3 percent slopes

Map Unit Setting

Elevation: 140 to 250 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days

Map Unit Composition

Quatama and similar soils: 85 percent
Minor components: 4 percent

Description of Quatama

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately 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 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability (nonirrigated): 2w

Typical profile

0 to 15 inches: Loam
15 to 30 inches: Clay loam
30 to 62 inches: Loam

Minor Components

Huberly

Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear

Washington County, Oregon

45A—Woodburn silt loam, 0 to 3 percent slopes

Map Unit Setting

Elevation: 150 to 400 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days

Map Unit Composition

Woodburn and similar soils: 85 percent
Minor components: 1 percent

Description of Woodburn

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Old alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
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 25 to 32 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability (nonirrigated): 2w

Typical profile

0 to 16 inches: Silt loam
16 to 31 inches: Silty clay loam
31 to 60 inches: Silt loam

Minor Components

Dayton

Percent of map unit: 1 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear

Washington County, Oregon

46F—Xerochrepts and Haploxerolls, very steep

Map Unit Setting

Elevation: 50 to 450 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days

Map Unit Composition

Xerochrepts and similar soils: 45 percent
Haploxerolls and similar soils: 40 percent
Minor components: 1 percent

Description of Xerochrepts

Setting

Landform: Terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy lacustrine deposits

Properties and qualities

Slope: 20 to 60 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 8.0 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 8 inches: Silt loam
8 to 48 inches: Gravelly loam
48 to 60 inches: Very cobbly clay loam

Description of Haploxerolls

Setting

Landform: Terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy lacustrine deposits

Properties and qualities

Slope: 30 to 60 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 12.0 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 12 inches: Silt loam
12 to 60 inches: Silty clay loam

Minor Components

Aquepts, seeps and springs

Percent of map unit: 1 percent
Landform: Escarpments

Data Source Information

Soil Survey Area: Washington County, Oregon
Survey Area Data: Version 9, Jul 15, 2010

SWCA
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.

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Technical Memorandum

To: Amber Wierck
Cc: Amy Schnell, Renaissance Homes
From: Stacey Reed, Wetland Scientist
Date: March 1, 2012
Subject: Request for Service Provider Letter
Rychlick Farm Residential Development Project
17806 SW Edy Road, Sherwood, Washington County, Oregon
Tax lot 100 of tax map 2S 1 30CA

INTRODUCTION AND BACKGROUND

SWCA Environmental Consultants (SWCA) was contracted by Renaissance Homes to conduct a wetland and waters delineation and natural resource assessment for a residential development project located at 17806 SW Edy Road, Sherwood, Washington County, Oregon (Figure 1). The project site includes tax lot 100 of tax map 2S 1W 30CA (Figure 2). The applicant is proposing a lot partition for a 27-lot single-family residential subdivision including an approximately half-acre open space area; the subdivision is referred to as the Rychlick Subdivision.

According to the Washington County Natural Resources Conservation Service (NRCS) Soil Survey, hydric Huberly silt loam is mapped extending into the southwest corner of the site (Figure 3). The property is not included on the City of Sherwood local wetland inventory (LWI) map; however, an intermittent tributary to Cedar Creek and associated wetlands is mapped immediately off-site to the north (Figure 4). SWCA delineated the on-site boundary of a perennial tributary to Cedar Creek and two small emergent fringe wetlands located at the bottom of a steep ravine in the western portion of the site. The slopes adjacent to the on-site resources are greater than 25 percent, requiring the vegetated corridor to extend past the break in slope.

This memo has been prepared to meet Clean Water Service's (CWS') natural resource assessment requirements listed under Chapter 3 of the June 2007 (amended August 2008) R&O Design and Construction Standards.

EXISTING CONDITIONS AND TOPOGRAPHY

Topography on the majority of the site is generally flat, with a steep-sided ravine sloping down toward the tributary in the northwestern portion of the site. The site is mostly undeveloped with the exception of a single-family residence and detached barn and garage area in the northeastern portion of the site. The southern portion contains planted pine and Douglas-fir trees. A review of

historical aerials obtained from PortlandMaps.com indicates that the site was logged sometime during 2004. The adjacent land use consists of residential use to the north, east, and west, with a school immediately south of the site.

WATER QUALITY SENSITIVE RESOURCES

Mirth Walker and Stacey Reed conducted an initial site reconnaissance on October 26, 2011, and a follow-up site visit was conducted to delineate wetlands and waters on January 12, 2012. The methodology used for determining the presence of wetlands and delineating wetland boundaries followed the routine approach of the U.S. Army Corps of Engineers' (USACE's) *Wetlands Delineation Manual*[1] and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the Western Mountains, Valleys, and Coast Region Version 2.0*[2] used by both the USACE and the Oregon Department of State Lands (DSL).

A perennial drainage flows northeasterly at the bottom of the ravine in the northwest corner of the site. Hydrology for the drainage originates from groundwater seeps and from a 12-inch diameter culvert located on-site. The culvert is connected to a storm drain from SW Nursery Way. The drainage exits the site to the north through a 24-inch diameter culvert located under SW Edy Road and is a tributary to Cedar Creek. On-site, the channel bed averages approximately 5 feet wide and is generally unvegetated with silt loam as the dominant substrate. The banks on-site vary from 2 feet tall in the north with approximately 3-foot-tall banks near the inlet due to incision and scouring. The middle portions of the on-site channel are less defined and are overgrown with Himalayan blackberry. Approximately 0.5-inch deep flow was observed in the downstream portions of the channel during the January 12, 2012, site visit. The upstream portions of the tributary lacked continuous flow and had scattered, approximately 0.25-inch deep ponding. The ordinary high water mark (OHWM) was delineated at the top of the defined stream banks. A transition to a non-hydrophytic vegetation community (generally Himalayan blackberry and/or English ivy) was present immediately above the top of the streambank. Approximately 1,882 square feet of perennial waters was delineated on the site.

Two small emergent wetland benches were delineated adjacent to the tributary in the northern portion of the site, just downstream of the culvert under SW Edy Road. Plot 4 documents the conditions of Wetland A located adjacent to the left bank (west bank) of the tributary (approximately 302 square feet in size). Wetland A was dominated by common horsetail and lady fern with a few Oregon ash trees rooted just upslope of the wetland. The wetland boundary was well defined by a distinct topographic rise to the adjacent convex hillslope along with a change in the vegetation community from hydrophytic in the wetland (common horsetail and lady fern) to non-hydrophytic in upland (Himalayan blackberry and English ivy). The adjacent upland was documented at Plot 5. Plot 5 also lacked hydric soil indicators and wetland hydrology during the January 12, 2012, site visit.

Plot 2 documents the conditions of Wetland B located adjacent to the right bank (east bank) of the tributary (approximately 233 square feet in size). Little herbaceous vegetation was present in

1 Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Online edition. Vicksburg, Mississippi: U.S. Army Engineer Waterways Experiment Station.

2 Wakeley, J.S., R.W. Lichvar, and C.V. Noble, eds. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). Vicksburg, Mississippi: U.S. Army Engineer Research and Development Center.

the wetland during the January 12, 2012, site visit with a western redcedar canopy from mature trees rooted immediately upslope of the wetland boundary. Salmonberry was present in the wetland near Plot 2. The wetland boundary was well defined by a distinct topographic increase to the adjacent upland along with a change in the vegetation community to Himalayan blackberry and English ivy in the adjacent upland. The upland conditions were documented at paired Plot 3. Soils at Plot 3 lacked hydric indicators and wetland hydrology. A total of approximately 535 square feet of fringe floodplain wetlands adjacent to the tributary were delineated on the site.

The wetland determination data sheets for Plots 1 to 5 and representative site photos are attached. Plots 1 to 5 and the wetland and waters boundaries were flagged in the field by SWCA and professionally land surveyed by AKS Engineering and Forestry, as shown on the attached Figure 5, Existing Conditions.

EXTENT OF ON-SITE VEGETATED CORRIDOR

The slopes adjacent to the tributary and wetlands are greater than 25 percent, requiring the vegetated corridor to extent 35 feet past the break in slope. The applicant had a geotech survey completed by GeoPacific. The stamped geotech report states that the slopes adjacent to the tributary are stable and would remain stable with a reduced vegetated corridor width beyond the break in slope. Therefore, the vegetated corridor was reduced to 15 feet past the break in slope, which still maintains a minimum 50-foot-wide vegetated corridor extending from the outermost boundary of on-site wetlands and waters. The topography and slope measurements adjacent to the resources and the extent of the on-site vegetated corridor (41,277 square feet) are shown on Figure 5. The February 3, 2012, geotech report for the Rychlick Subdivision prepared by GeoPacific is attached for reference.

EXISTING CONDITION OF THE ON-SITE VEGETATED CORRIDOR

The existing condition of the on-site vegetated corridor was determined according to CWS vegetated corridor standards, which are based upon the presence of tree canopy and percent cover of native trees, shrubs, and ground covers. The condition of the on-site corridor was documented at VECO Plots A, B, C, and D. Approximately 3,000 square feet of *good* condition and approximately 38,277 square feet of *degraded* and *marginal* condition vegetated corridor were documented on the site (total vegetated corridor = 41,277 square feet).

VECO Plot A documents the corridor in the northern portion of the site adjacent to Wetlands A and B and the tributary. This community had a mature western redcedar overstory, but the understory was dominated by Himalayan blackberry and English ivy. This community was determined to be in *marginal* condition due to the presence of 50 percent canopy cover by native western redcedar.

VECO Plot B documents the *degraded* condition and comprises the majority of the on-site vegetated corridor adjacent to the tributary. This community lacks a tree canopy and is dominated by dense Himalayan blackberry thickets. A few scattered young cherry and Oregon ash trees are present in the blackberry thickets, but are not dominant; therefore, this community was determined to be in *degraded* condition.

VECO Plot C/Wetland Determination Plot 1 documents the conditions of a small bench upslope

of the left bank of the tributary. This area was dominated by Himalayan blackberry, Queen Anne's lace, Canadian and bull thistle, tall fescue, spotted cat's-ear, and other weedy forb species. The community lacked tree canopy cover and was dominated by 55 percent aerial cover by non-native invasive vegetation species; it was thus determined to be in *degraded* condition.

VECO Plot D documents a forested community located at the break in slope along the western side of the tributary. This area is dominated by mature Douglas-fir trees with an understory dominated by dull Oregon grape and English ivy. This community extends along the entire break in slope on the western side and was determined to be in *good* condition due to having 80 percent cover by native Douglas-fir trees.

The vegetated corridor plot locations and associated conditions are shown on Figure 5.

PROPOSED VEGETATED CORRIDOR IMPACTS

The proposed site plan is included as Figure 6. No vegetated corridor impacts are proposed for the residential lots; however, the surface stormwater quality facility extends approximately 25 feet into the outer portion of *marginal* condition vegetated corridor upslope of Wetland B, requiring a Tier 1 Alternatives Analysis. The proposed stormwater infrastructure would result in approximately 2,369 square feet of permanent encroachment into vegetated corridor. The stormwater quality facility will be planted with native vegetation species in accordance with the City of Sherwood and CWS's water quality facility standards. The placement of a buried 12-inch stormwater discharge pipe would temporarily disturb approximately 150 square feet of *marginal* condition vegetated corridor (for a trench approximately 50 feet long by 3 feet wide). Temporarily disturbed vegetated corridor would be enhanced to good condition after pipe placement. The location of the outfall pipe was selected to avoid disturbance to western red cedar trees and would not result in the removal of any native trees with greater than 6-inch diameter breast height (DBH). A riprap discharge pad would be constructed in vegetated corridor upslope of Wetland B. The stormwater discharge pad would permanently impact approximately 30 square feet of *marginal* condition vegetated corridor.

TIER 1 ALTERNATIVES ANALYSIS

The proposed surface water quality facility swale will extend within 30% of the depth of the vegetated corridor adjacent to the perennial tributary. The location and size of the stormwater facility is necessary based on site topography and to meet the City of Sherwood and CWS requirements (3.07.3.c.4). There is no practical alternative that does not disturb the vegetated corridor (3.07.3.c.5).

VEGETATED CORRIDOR MITIGATION AND ENHANCEMENT

To compensate for the 2,369 square feet of permanent vegetated corridor encroachment by the stormwater quality facility, approximately 2,372 square feet of replacement mitigation would occur adjacent and continuous to the existing vegetated corridor on the northwestern side of the tributary. The existing condition of this community was determined to be *good* (as documented at VECO Plot D). However, some English hawthorn and English ivy are present in the understory. These and any other non-native invasive vegetation species are required to be removed by hand, and cleared areas are to be replanted with native shrubs and ground covers.

Approximately 36,072 square feet (0.82 acre) of remaining on-site *degraded* and *marginal* condition vegetated corridor will be enhanced to *good* condition. The attached Vegetated Corridor Enhancement Specification Table, March 1, 2012, provides a list of recommended species, size, spacing, and quantities that can be used within the on-site vegetated corridor to establish *good* condition corridor. The proposed planting specifications are in accordance with Appendix A, Planting Requirements, of CWS' updated Design and Construction Standards (R&O 07-20). Non-native invasive vegetation species including Himalayan blackberry, English ivy, English holly, and Canadian and bull thistle were observed within the on-site vegetated corridor and are required to be removed before installing the native enhancement plants.

Please do not hesitate to contact me with any questions concerning the proposed project.

Stacey Reed

Stacey Reed
Wetland Scientist

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Figure 2. Tax lot map
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VECO Data Sheets (Plots A–D)
Representative On-Site Photographs
Geotech Report, February 3, 2012, prepared by GeoPacific
Vegetated Corridor Enhancement Planting Specification Table
Sensitive Areas Certification Form

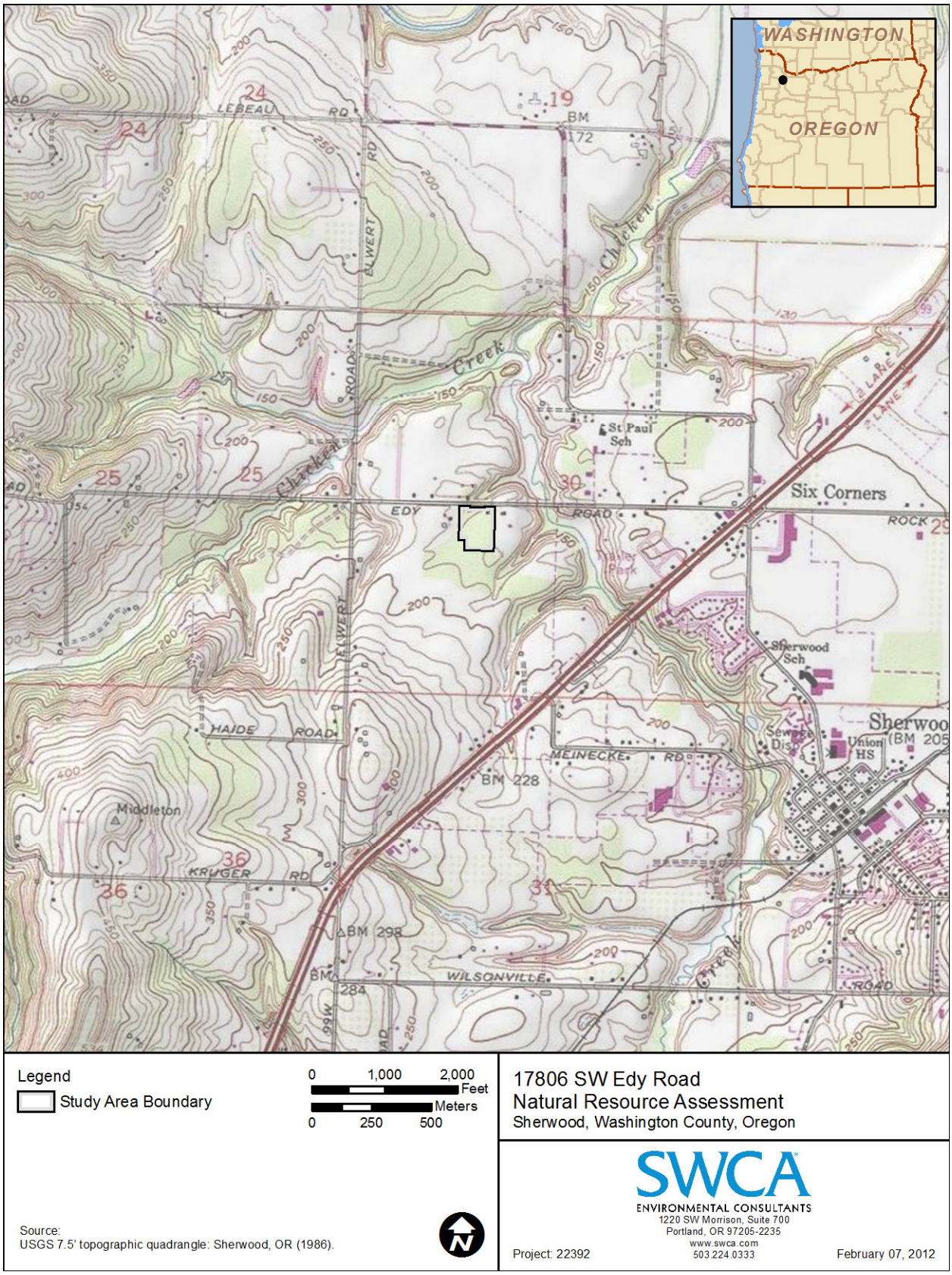


Figure 1. Site location map.

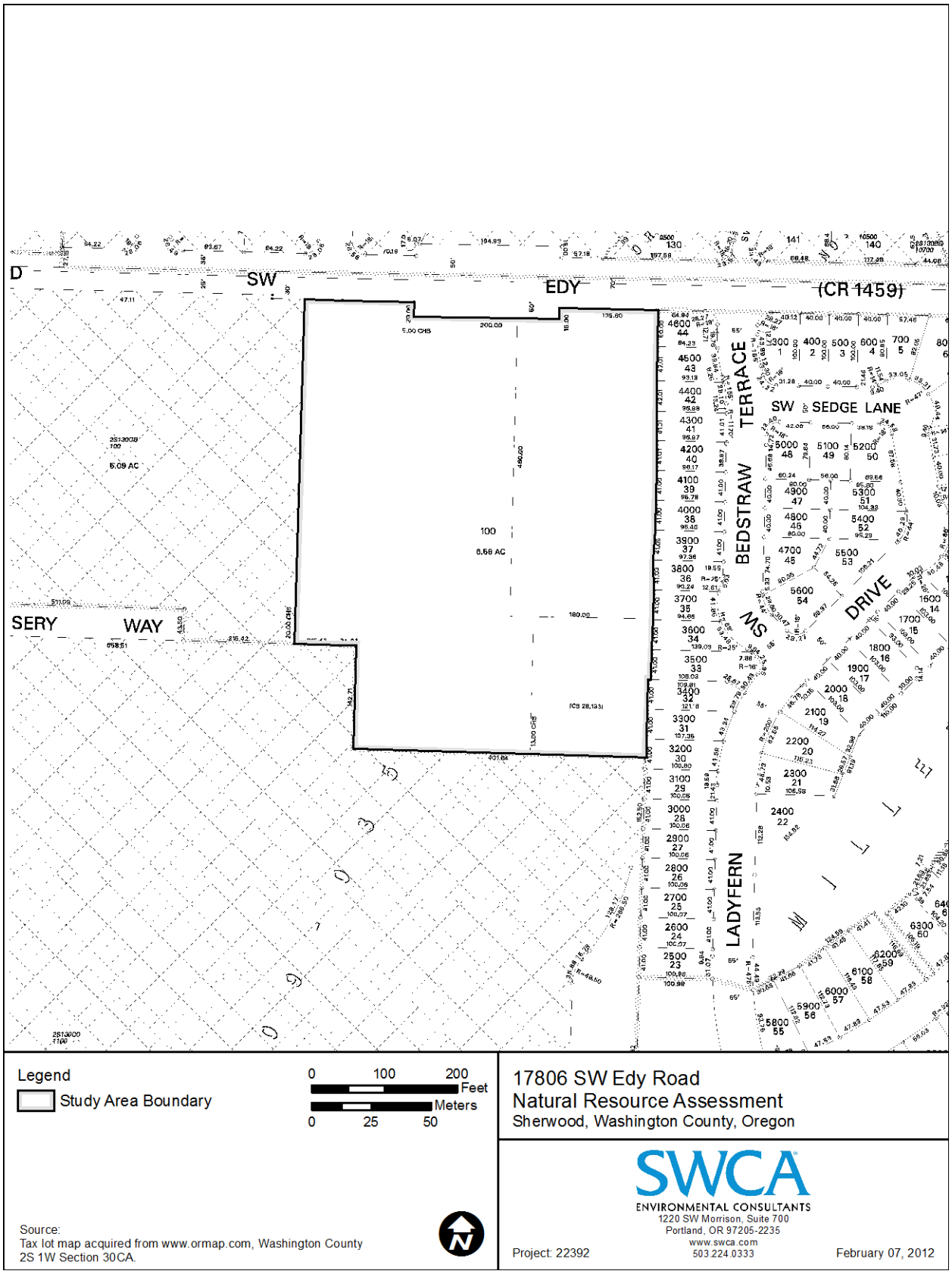


Figure 2. Tax lot map.



Figure 3. Soil survey map.

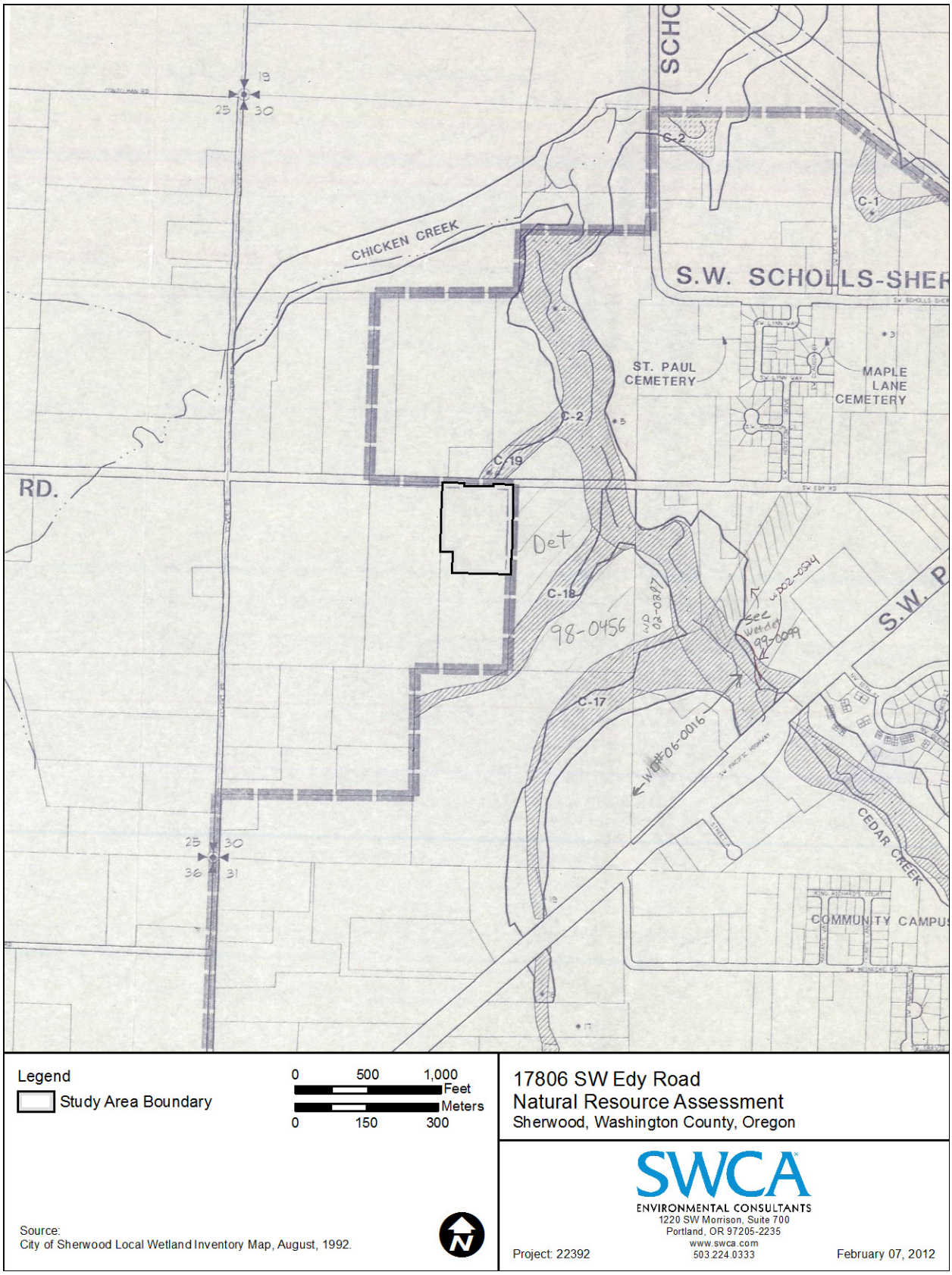


Figure 4. City of Sherwood local wetland inventory map.

150 SF temporary marginal condition corridor impacts to be restored to good condition

Existing condition of vegetated corridor above break in slope and 2,372SF mitigation area= good; remove invasive non-native plant species by hand and re-plant cleared areas using low impact methods with native shrubs listed on the attached Planting Specification Table

Remaining 36,072 SF of degraded and marginal condition corridor will be enhanced to good condition per Planting Specification Table

VEGETATED CORRIDOR MITIGATION AREA (AREA: 2,372 SF)

TAX LOT 100
TAX MAP 2S 1 30CB

TRACT C
OPEN SPACE
4,911 SF

TRACT A
4,050 SF

TRACT B
VEGETATED CORRIDOR
43,568 SF

TRACT D
OPEN SPACE
147 SF

BURIED STORM DRAIN PIPE L=40 LF±

OUTFALL RIPRAP PROTECTION (PERMANENT) ENCROACHMENT = 30 SF±

STORMWATER SWALE ENCROACHMENT AREA (AREA: 2,389 SF)

LOT 2 5,010 SF
LOT 3 5,184 SF
LOT 4 6,554 SF
LOT 5 9,722 SF
LOT 6 5,006 SF
LOT 7 5,090 SF
LOT 8 6,276 SF
LOT 9 9,699 SF
LOT 10 9,140 SF
LOT 11 12,013 SF
LOT 12 10,592 SF
LOT 13 5,691 SF
LOT 14 8,044 SF
LOT 15 6,308 SF
LOT 16 7,335 SF
LOT 17 8,132 SF
LOT 18 7,280 SF
LOT 19 7,504 SF
LOT 20 6,775 SF
LOT 21 5,797 SF
LOT 22 5,289 SF
LOT 23 5,267 SF
LOT 24 5,602 SF
LOT 25 5,365 SF
LOT 26 5,001 SF

TAX LOT 4600 TAX MAP 2S 1 30CA
TAX LOT 4500 TAX MAP 2S 1 30CA
TAX LOT 4400 TAX MAP 2S 1 30CA
TAX LOT 4300 TAX MAP 2S 1 30CA
TAX LOT 4200 TAX MAP 2S 1 30CA
TAX LOT 4100 TAX MAP 2S 1 30CA
TAX LOT 4000 TAX MAP 2S 1 30CA
TAX LOT 3900 TAX MAP 2S 1 30CA
TAX LOT 3800 TAX MAP 2S 1 30CA
TAX LOT 3700 TAX MAP 2S 1 30CA
TAX LOT 3600 TAX MAP 2S 1 30CA
TAX LOT 3500 TAX MAP 2S 1 30CA
TAX LOT 3400 TAX MAP 2S 1 30CA
TAX LOT 3300 TAX MAP 2S 1 30CA
TAX LOT 3200 TAX MAP 2S 1 30CA
TAX LOT 1100 TAX MAP 2S 1 30C

SW BEDSTRAW TERRACE

CHAIN LINK FENCE
WOOD FENCE
TENNIS COURT AREA
8" PVC

SCALE 1" = 60 FEET
60 0 24 36 48 60

Printed at 11 x 17

Figure 6 Site Plan
March 1, 2012

VEGETATED CORRIDOR PLAN w/ EX. CONDITIONS

17806 SW EDY RD
SHERWOOD OREGON

AKS ENGINEERING & FORESTRY
ENGINEERING · PLANNING
SURVEYING · FORESTRY
13910 SW GALBREATH DR., SUITE 100
SHERWOOD, OR 97140
PHONE: (503) 925-8799
FAX: (503) 925-8969

DESIGNED BY:
DRAWN BY: JMM
CHECKED BY:
DRAWING NO.: 2997MPL
SCALE: AS NOTED
PREPARED FOR:

DATE: DRAFT

JOB NUMBER 2997
SHEET 2 OF 2

17806 SW Edy Road / Rychlick Farm Residential Development
Natural Resource Assessment
March 1, 2012

Vegetated Corridor Enhancement within on-site *degraded* and *marginal* condition vegetated corridor
Total Area = 36,072 square feet

Scientific Name	Common Name	Size*	Spacing/Seeding Rate	Quantity
Trees (total 360)				
Alnus rubra	red alder	1 gallon	10 feet on center	180
Thuja plicata	western red cedar	2 gallon	10 feet on center	180
Shrubs (total1,804)				
Acer circinatum	vine maple	1 gallon	4-5 feet on center	451
Oemerlis cerasiformis	Indian plum	2 gallon	4-5 feet on center	451
Rubus spectabilis	salmonberry	1 gallon	4-5 feet on center	451
Symphoricarpos albus	snowberry	1 gallon	4-5 feet on center	451
Seed Mix				
Bromus carinatus	native California brome	seed	10 lbs pls/acre	As needed for bare soil areas >25 sq. ft. following invasive species removal
Elymus glaucus	blue wildrye	seed	10 lbs pls/acre	
Festuca rubra var. *rubra*	native red fescue	seed	5 lbs pls/acre	
Lupinus polyphyllus	large-leafed lupine	seed	8 lbs pls/acre	

* Bare root plants may be substituted for container plants based on availability. If bare root plants are used, they must be planted during the late winter/early spring dormancy period.

Planting Notes (per CWS Design & Construction Standards, Appendix A Planting Requirements, June 2007):

1) Non-native invasive species are present in the on-site vegetated corridor. Due to their proximity to the tributary to Cedar Creek mechanical control by hand consistent with Clean Water Services' *Integrated Vegetation and Animal Management Guide* (March 2003) is recommended to control its spread prior to installing plantings.

2) Plantings should preferably be installed between February 1 and May 1 for bare roots and seeds and between October 1 and November 15 for containers. Plants may be installed at other times of the year; however, additional measures may be necessary to ensure plant survival. Irrigation or other water practices (i.e. polymer, plus watering) shall be used during the two-year maintenance period. Watering shall be provided at a rate of at least one inch per week between June 15 and October 15.

3) Plantings shall be mulched a minimum of three inches in depth and 18 inches in diameter to retain moisture and discourage weed growth around newly installed plant material.

4) Tree plantings shall be protected from wildlife damage (beaver, nutria) by installing tree-protector tubes or wire mesh cylinders around newly installed plantings.

Maintenance Plan:

1) Clean Water Services requires a two-year maintenance period for vegetated corridor mitigation. The enhanced vegetated corridor is to be inspected annually, a minimum of two times during the growing season, by June 1 and September 30.

2) Plant survival: Clean Water Services' success criterion for vegetated corridor enhancement is 80% survival of tree and shrub plantings during the two years following planting. If any mortality is noted on the site, the factor likely to have caused mortality of plantings is to be determined and corrected if possible. If survival falls below 80% at any time during the two-year maintenance period, the plantings shall be replaced, and other corrective

measures, such as mulching or irrigation, may need to be implemented. If replanting is necessary, the maintenance period will be extended for two years from the date of replanting.

3) Invasive species control is to be conducted as needed based upon the site inspections. Invasive species include: Himalayan and evergreen blackberry (*Rubus discolor* and *R. laciniatus*), reed canarygrass (*Phalaris arundinacea*), teasel (*Dipsacus fullonum*), Canada and bull thistle (*Cirsium arvense* and *C. vulgare*), Scotch broom (*Cytisus scoparius*), purple loosestrife (*Lythrum salicaria*), Japanese knotweed (*Polygonium cuspidatum*), morning glory (*Convolvulus* species), giant hogweed (*Heracleum mantegazzianum*), English ivy (*Hedera helix*), nightshade (*Solanum* species), and clematis (*Clematis ligusticifolia* and *C. vitalba*).

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: 17806 SW Edy Road / Rychlick Farm Development City/County: Sherwood/Washington Sampling Date: 10/26/2011

Applicant/Owner: Renaissance Homes State: OR Sampling Point: 1

Investigator(s): Coral Mirth Walker and Stacey Reed Section, Township, Range: Section 30, T02S, R01W

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Convex Slope (%): <3

Subregion (LRR): A, Northwest Forests and Coast Lat: Long: Datum:

Soil Map Unit Name: 46F - Xerochrepts and Haploxerolls, very steep NWI classification: None

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	Is the Sampled Area within a Wetland?	Yes No X
Hydric Soil Present?	Yes	No X		
Wetland Hydrology Present?	Yes	No X		

Remarks: NA means Not Applicable (used on plowed and planted agricultural crop sites in reference to the vegetation).
Precipitation prior to fieldwork: Trace amounts of rainfall received on the day of field work and 0.13 inches two weeks prior in Hillsboro.
Upslope of left bank of tributary (west of tributary) on bench.

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. *Rubus armeniacus*	5%	Yes	FACU
2.			
3.			
4.			
5.			
	5% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Poa species*	30%	Yes	FAC ?
2. *Hypochaeris radicata*	20%	Yes	FACU*
3. *Daucus carota*	10%	Yes	NOL
4. *Schedonorus phoenix*	10%	Yes	FAC
5. *Trifolium repens*	10%	Yes	FAC*
6. *Holcus lanatus*	5%	No	FAC
7. *Cirsium arvense*	5%	No	FACU
8. *Cirsium vulgare*	5%	No	FACU
9. *Elymus repens*	5%	No	FAC
10.			
11.			
	100% = 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: 3 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	60	x 3 =	180
FACU species	35	x 4 =	140
UPL species	10	x 5 =	50
Column Totals:	105 (A)		370 (B)
Prevalence Index = B/A =			3.52

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: *identifies indicator status is tentative

Entered by: JCW QC by: CMW

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
0-6	10YR 3/2	100	None				sil	
6-13	10YR 3/3	100	None				l	

[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: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
dry and compacted

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): >13	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): >13	Yes _____	No **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: JCW QC by: CMW

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: 17806 SW Edy Road / Rychlick Farm Development City/County: Sherwood/Washington Sampling Date: 1/12/2011

Applicant/Owner: Renaissance Homes State: OR Sampling Point: 2

Investigator(s): Coral Mirth Walker and Stacey Reed Section, Township, Range: Section 30, T02S, R01W

Landform (hillslope, terrace, etc.): Floodplain terrace Local relief (concave, convex, none): None Slope (%): <3

Subregion (LRR): A, Northwest Forests and Coast Lat: Long: Datum:

Soil Map Unit Name: 46F - Xerochrepts and Haploxerolls, very steep NWI classification: None

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 X	No	Is the Sampled Area within a Wetland? Yes X No
Wetland Hydrology Present?	Yes X	No	

Remarks: NA means Not Applicable (used on plowed and planted agricultural crop sites in reference to the vegetation).
Precipitation prior to fieldwork: No rainfall received on the day of field work and 1.34 inches two weeks prior in Hillsboro.
Wetland B

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Thuja plicata*	50%	Yes	FAC
2.			
3.			
4.			
	50% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. *Thuja plicata*	5%	Yes	FAC
2. *Rubus armeniacus*	5%	Yes	FACU
3.			
4.			
5.			
	10% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Hedera helix*	10%	Yes	NOL
2. *Athyrium filix-femina*	5%	Yes	FAC
3. *Equisetum arvense*	5%	Yes	FAC
4. *Polystichum munitum*	1%	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	21% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 79%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 6 (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 65	x 3 =	195
FACU species 6	x 4 =	24
UPL species 10	x 5 =	50
Column Totals: 81 (A)		269 (B)
Prevalence Index = B/A =		3.32

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: *identifies indicator status is tentative
English ivy and Himalayan blackberry cover increase immediately upslope of wetland boundary.

Entered by: JCW QC by: CMW

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
0-16	10YR 3/1	98	10YR 3/4	2	C	M	sicl	Charcoal

[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)
- X 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)
- X 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 **X** No _____

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
No ORC.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X 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 X	No	Depth (inches):	13*	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes X	No	Depth (inches):	Surface	Yes **X** No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
*Seeps to 8".

Entered by: JCW QC by: CMW

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: 17806 SW Edy Road / Rychlick Farm Development City/County: Sherwood/Washington Sampling Date: 1/12/2011

Applicant/Owner: Renaissance Homes State: OR Sampling Point: 3

Investigator(s): Coral Mirth Walker and Stacey Reed Section, Township, Range: Section 30, T02S, R01W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 10

Subregion (LRR): A, Northwest Forests and Coast Lat: Long: Datum:

Soil Map Unit Name: 46F - Xerochrepts and Haploxerolls, very steep NWI classification: None

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	Is the Sampled Area within a Wetland?	Yes No X
Hydric Soil Present?	Yes	No X		
Wetland Hydrology Present?	Yes	No X		

Remarks: NA means Not Applicable (used on plowed and planted agricultural crop sites in reference to the vegetation).
Precipitation prior to fieldwork: No rainfall received on the day of field work and 1.34 inches two weeks prior in Hillsboro.
Plot approximately 2 feet higher in elevation than plot 2.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Thuja plicata*	50%	Yes	FAC
2.			
3.			
4.			
	50% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. *Rubus armeniacus*	90%	Yes	FACU
2.			
3.			
4.			
5.			
	90% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Hedera helix*	10%	Yes	NOL
2. *Polystichum munitum*	5%	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	15% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 85%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 0	x 1 =	0
FACW species 0	x 2 =	0
FAC species 50	x 3 =	150
FACU species 95	x 4 =	380
UPL species 10	x 5 =	50
Column Totals: 155 (A)		580 (B)
Prevalence Index = B/A =		3.74

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: *identifies indicator status is tentative

Entered by: JCW QC by: CMW

SOIL Sampling Point: **3**

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 3/3	100	None				sicl	

[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: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

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:
Moist throughout.

Entered by: JCW QC by: CMW

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: 17806 SW Edy Road / Rychlick Farm Development City/County: Sherwood/Washington Sampling Date: 1/12/2011

Applicant/Owner: Renaissance Homes State: OR Sampling Point: 4

Investigator(s): Coral Mirth Walker and Stacey Reed Section, Township, Range: Section 30, T02S, R01W

Landform (hillslope, terrace, etc.): Floodplain terrace Local relief (concave, convex, none): None Slope (%): <3

Subregion (LRR): A, Northwest Forests and Coast Lat: Long: Datum:

Soil Map Unit Name: 46F - Xerochrepts and Haploxerolls, very steep NWI classification: None

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	Is the Sampled Area within a Wetland?	Yes X No
Hydric Soil Present?	Yes X	No		
Wetland Hydrology Present?	Yes X	No		

Remarks: NA means Not Applicable (used on plowed and planted agricultural crop sites in reference to the vegetation).
Precipitation prior to fieldwork: No rainfall received on the day of field work and 1.34 inches two weeks prior in Hillsboro.
Wetland A

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus latifolia*	10%	Yes	FACW
2.			
3.			
4.			
	10% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. *Rubus armeniacus*	50%	Yes	FACU
2. *Rubus spectabilis*	20%	Yes	FAC
3. *Thuja plicata*	5%	No	FAC
4.			
5.			
	75% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Equisetum arvense*	20%	Yes	FAC
2. *Athyrium filix-femina*	10%	Yes	FAC
3. *Hedera helix*	10%	Yes	NOL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 60%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 6 (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	10	x 2 =	20
FAC species	55	x 3 =	165
FACU species	50	x 4 =	200
UPL species	10	x 5 =	50
Column Totals:	125 (A)		435 (B)
Prevalence Index = B/A =			3.48

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: *Identifies indicator status is tentative
Oregon ash was rooted upslope of wetland boundary.

Entered by: JCW QC by: CMW

SOIL

Sampling Point: 4

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 3/1	98	10YR 3/4	2	C	M	sicl	

[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)
- X 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)
- X 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 X No ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X 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 X	No ___	Depth (inches):	0.25"
Water Table Present?	Yes X	No ___	Depth (inches):	Surface
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	Surface

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Seeps to surface. Scattered shallow ponding near plot.

Entered by: JCW QC by: CMW

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: 17806 SW Edy Road / Rychlick Farm Development City/County: Sherwood/Washington Sampling Date: 1/12/2011

Applicant/Owner: Renaissance Homes State: OR Sampling Point: 5

Investigator(s): Coral Mirth Walker and Stacey Reed Section, Township, Range: Section 30, T02S, R01W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): <5

Subregion (LRR): A, Northwest Forests and Coast Lat: Long: Datum:

Soil Map Unit Name: 46F - Xerochrepts and Haploxerolls, very steep NWI classification: None

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	Is the Sampled Area within a Wetland?	Yes No X
Hydric Soil Present?	Yes	No X		
Wetland Hydrology Present?	Yes	No X		

Remarks: NA means Not Applicable (used on plowed and planted agricultural crop sites in reference to the vegetation).
Precipitation prior to fieldwork: No rainfall received on the day of field work and 1.34 inches two weeks prior in Hillsboro.
Approximately 18" higher in elevation than plot 4.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus latifolia*	10%	Yes	FACW
2.			
3.			
4.			
	10% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. *Rubus armeniacus*	80%	Yes	FACU
2. *Thuja plicata*	5%	No	FAC
3.			
4.			
5.			
	85% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Hedera helix*	90%	Yes	NOL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 10%

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	10	x 2 =	20
FAC species	5	x 3 =	15
FACU species	80	x 4 =	320
UPL species	90	x 5 =	450
Column Totals:	185 (A)		805 (B)
Prevalence Index = B/A =			4.35

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: *identifies indicator status is tentative

Entered by: JCW QC by: CMW

SOIL

Sampling Point: 5

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
0-14	10YR 4/3	100	None				sicl	Trace sand
14-17	10YR 4/3	70	7.5YR 4/6	10	C	M	sicl	Mixed matrix
	10YR 5/1	20					sic	

[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: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

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):	>17
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):	>17

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Moist throughout.

Entered by: JCW QC by: CMW

Vegetated Corridor (VECO) Condition Assessment for CWS Natural Resource Assessment

Site:	SW Edy Road
Investigators:	Mirth Walker and Stacey Reed
Date:	January 12, 2012
Community:	Western red cedar
Location:	Adjacent to Wetlands A and B
Plot ID:	VECO A

Tree species, % Cover, Native, Invasive - 30 foot radius, >5% cover:			50%
* western red cedar	*Thuja plicata*	native	50%
Shrub species, % Cover, Native, Invasive - 30 foot radius, >5% cover:			90%
* Himalayan blackberry	*Rubus armeniacus*	invasive	90%
Herb Species, % Cover, Native, Invasive - 10 foot radius, >5% cover:			15%
* English ivy	*Hedera helix*	invasive	10%
* sword fern	*Polystichum munitum*	native	5%

* Dominant

Total Cover 155%

	Absolute areal cover
% Tree canopy:	**50%**
% Cover by natives:	55%
% Invasive:	100%
% Noxious:	0%
% Non-native:	0%
	155%

Corridor Condition: Marginal

Vegetated Corridor (VECO) Condition Assessment for CWS Natural Resource Assessment

Site:	SW Edy Road
Investigators:	Mirth Walker and Stacey Reed
Date:	January 12, 2012
Community:	Himalayan blackberry
Location:	Adjacent to tributary
Plot ID:	VECO B

Tree species, % Cover, Native, Invasive - 30 foot radius, >5% cover: 0%

Shrub species, % Cover, Native, Invasive - 30 foot radius, >5% cover: 100%

* Himalayan blackberry	*Rubus armeniacus*	invasive	90%
cherry	*Prunus species*	-	10%

Herb Species, % Cover, Native, Invasive - 10 foot radius, >5% cover: 0%

* Dominant

Total Cover 100%

	Absolute areal cover
% Tree canopy:	**0%**
% Cover by natives:	0%
% Invasive:	90%
% Noxious:	0%
% Non-native:	0%
	90%

Corridor Condition: Degraded

Vegetated Corridor (VECO) Condition Assessment for CWS Natural Resource Assessment

Site:	SW Edy Road
Investigators:	Mirth Walker and Stacey Reed
Date:	January 12, 2012
Community:	Himalayan blackberry / grass bench
Location:	Upslope left bank tributary
Plot ID:	VECO C

Tree species, % Cover, Native, Invasive - 30 foot radius, >5% cover: 0%

Shrub species, % Cover, Native, Invasive - 30 foot radius, >5% cover: 5%

* Himalayan blackberry	*Rubus armeniacus*	invasive	5%

Herb Species, % Cover, Native, Invasive - 10 foot radius, >5% cover: 95%

* bluegrass	*Poa species*	non-native	30%
* spotted cats-ear	*Hypochaeris radicata*	introduced	20%
Queen Anne's lace	*Daucus carota*	introduced	10%
tall fescue	*Schedonorus phoenix*	introduced	10%
white clover	*Trifolium repens*	introduced	10%
common velvetgrass	*Holcus lanatus*	introduced	5%
Canada thistle	*Cirsium arvense*	invasive	5%
bull thistle	*Cirsium vulgare*	invasive	5%
* Dominant			
		Total Cover	100%

	Absolute areal cover
% Tree canopy:	**0%**
% Cover by natives:	0%
% Invasive:	15%
% Noxious:	0%
% Non-native:	55%
	70%

Corridor Condition: Degraded

Vegetated Corridor (VECO) Condition Assessment for CWS Natural Resource Assessment

Site:	SW Edy Road
Investigators:	Mirth Walker and Stacey Reed
Date:	January 12, 2012
Community:	Douglas-fir forest
Location:	Top of break in slope west of tributary
Plot ID:	VECO D

Tree species, % Cover, Native, Invasive - 30 foot radius, >5% cover:			85%
* Douglas fir	*Pseudotsuga menziesii*	native	80%
* western red cedar	*Thuja plicata*	native	5%

Shrub species, % Cover, Native, Invasive - 30 foot radius, >5% cover:			16%
* beaked hazelnut	*Corylus cornuta*	native	10%
* Himalayan blackberry	*Rubus armeniacus*	invasive	5%
Pacific yew	*Taxus brevifolia*	native	1%

Herb Species, % Cover, Native, Invasive - 10 foot radius, >5% cover:			75%
* dull Oregon grape	*Mahonia nervosa*	native	60%
sword fern	*Polystichum munitum*	native	10%
English ivy	*Hedera helix*	invasive	5%

* Dominant

Total Cover 176%

	Absolute areal cover
% Tree canopy:	**85%**
% Cover by natives:	166%
% Invasive:	10%
% Noxious:	0%
% Non-native:	0%
	176%

Corridor Condition: Good

17806 SW Edy Road / Rychlick Residential Project
Natural Resource Assessment



Photo 1. View west of wetland plot 2 (yellow flag) and tributary (red flags).



Photo 2. View west of western side of tributary. Degraded vegetated corridor in foreground transitioning into good condition forest at the break in slope in the background.

17806 SW Edy Road / Rychlick Residential Project
Natural Resource Assessment



Photo 3. View southwest of tributary and adjacent degraded condition vegetated corridor.



Photo 4. View east of degraded condition vegetated corridor.

GeoPacific Engineering, Inc.

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

February 3, 2012
Project No. 11-2487

Randy Sebastian
Renaissance Homes
16771 Boones Ferry Road
Lake Oswego, Oregon 97035

CC: Monty Hurley, AKS Engineering & Forestry via email: monty@aks-eng.com

SUBJECT: GEOTECHNICAL ENGINEERING REPORT
RENAISSANCE AT RYCHLICK SUBDIVISION
17806 SW EDY ROAD
SHERWOOD, OREGON

This report presents the results of a geotechnical engineering study conducted by GeoPacific Engineering, Inc. (GeoPacific) for the above-referenced project. The purpose of our investigation was to evaluate subsurface conditions at the site and to provide geotechnical recommendations for site development. This geotechnical study was performed in accordance with GeoPacific Proposal No. P-4092, dated December 14, 2011, and your subsequent authorization of our proposal and *General Conditions for Geotechnical Services.*

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The subject site is approximately 6.6 acres in size and located on the south side of SW Edy Road in the City of Sherwood, Washington County, Oregon. The headwater of a tributary to Cedar Creek is present in the northwestern portion of the site. Topography is gently sloping towards the creek at grades of approximately 5 percent or less. Grades steepen to 75 percent adjacent to the drainage. The site is currently occupied by one home, two outbuildings and vegetation consists primarily of short grasses, brambles, and dense to sparse trees.

A site plan indicates the proposed development includes 27 lots for single family homes, approximately 900 lineal feet of new public streets, a storm water facility, and associated underground utilities. Retaining walls may be incorporated into the storm water facility. A grading plan has not been provided for our review; however, it is our understanding a deep cut will be required to connect Nursery Way to SW Edy Road. Grading for the lots will be on the order of a few feet.

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REGIONAL AND LOCAL 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 is underlain by the Quaternary age (last 1.6 million years) Willamette Formation, a catastrophic flood deposit associated with repeated glacial outburst flooding of the Willamette Valley (Madin, 1990). The last of these outburst floods occurred about 10,000 years ago. In the Tualatin basin, these deposits consist of horizontally layered, micaceous, silt to coarse sand forming poorly-defined to distinct beds less than 3 feet thick. Locally, the flood deposits are mantled by a thin layer of loess (windblown silt) that is difficult to distinguish from the water deposited silt.

Underlying the Willamette Formation is an unnamed sequence of non-marine, fine-grained strata that consists of moderately to poorly lithified siltstone, sandstone, mudstone, and claystone with common wood fragments and minor volcanic ash and pumice (Yeats et al., 1996). These rocks are tentatively correlated with the Sandy River Mudstone, and the Troutdale and Helvetia Formations. The unnamed strata rest on Miocene (about 14.5 to 16.5 million years ago) Columbia River Basalt, a thick sequence of lava flows which forms the crystalline basement of the basin.

REGIONAL SEISMIC SETTING

At least three major fault zones capable of generating damaging earthquakes are thought to exist in the vicinity of the subject site. These include the Portland Hills Fault Zone, the Gales Creek-Newberg-Mt. Angel Structural Zone, and the Cascadia Subduction Zone.

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 12 miles northeast of the site. The Oatfield Fault occurs along the western side of the Portland Hills, and is about 10 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 8.5 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 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 Fault or Newberg Fault; 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 approximately 50 miles west of the Portland Basin at depths of between 20 and 40 kilometers below the surface.

FIELD EXPLORATION

Our site-specific exploration for this report was conducted on January 10th, 2012. One exploratory boring was drilled to a depth of 26.5 feet and a total of 9 exploratory test pits were excavated with a medium sized trackhoe to depths ranging between 8 and 10 feet at the approximate locations shown on Figure 2. It should be noted that test pit 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 borehole was drilled using a trailer-mounted drill rig and solid stem auger methods. 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 test pits and boring. Soils observed in the explorations were classified in general accordance with the Unified Soil Classification System. During exploration, our geologist also noted geotechnical conditions such as soil consistency, moisture and groundwater conditions. Logs of test pits and boring are attached to this report. The following report sections are based on the exploration program and summarize subsurface conditions encountered at the site.

Existing Fill: Undocumented fill was encountered in test pit TP-5 and generally consisted of about 2.5 feet of medium stiff SILT (ML-OL) with organics and woody debris throughout. This material may have been associated with the logging that occurred at the property within the last few years. Other areas of fill may be present in the vicinity of SW Edy Road and the existing structures.

Topsoil Horizon: With the exception of test pit TP-5, the ground surface in explorations was a topsoil horizon consisting of brown, moderately to highly organic SILT (OL-ML). The topsoil horizon contained many fine roots, was generally loose, and characterized by a medium stiff consistency. In explorations, the topsoil horizon was approximately 9 to 12 inches in thickness.

Native Soil Horizon: Underlying the topsoil horizon in explorations was SILT (ML) formed by in place decomposition of the underlying Willamette Formation. The light brown silt was generally characterized by a medium stiff to very stiff consistency and displayed strong orange and gray mottling. Field pocket penetrometer measurements indicate an approximate unconfined compressive strength of 0.5 to 4.5 tons/ft^2. In explorations, the native soil horizon extended to a depth of approximately 5 to 6 feet below the ground surface.

Willamette Formation: Underlying the native soil horizon in boring B-1 and test pits TP-1 through TP-9 was SILT (ML) with trace fine grained sand belonging to the Willamette Formation. The silt was generally characterized by a stiff to very stiff consistency and generally exhibited subtle orange and gray mottling. In boring B-1, material from the Willamette Formation extended beyond the maximum depth of exploration (26.5 feet).

Soil Moisture and Groundwater

On January 10, 2012, soils encountered in explorations were moist. Minor groundwater seepage was encountered in test pit TP-1 at a depth of 9 feet. Discharge was visually estimated at one gallon per minute or less. 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.

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. Along the drainage in the northwestern portion of the site, slope stability can be maintained with a 15-foot setback from the break in the slope. This 15-foot setback line coincides with the edge of the vegetated corridor.

Site Preparation

Areas of proposed buildings, streets, and areas to receive fill should be cleared of vegetation and any organic and inorganic debris. Existing buried structures (such as septic tanks) should be demolished and any cavities structurally backfilled, if encountered. Inorganic debris and organic materials from clearing should be removed from the site.

Organic-rich topsoil should then be stripped from construction areas of the site or where engineered fill is to be placed. The estimated average necessary depth of removal in undisturbed

areas for moderately organic soils is about 9 to 12 inches. Deeper removal depths may be required in highly treed 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. We anticipate that areas of undocumented fill likely exist in the vicinity of the existing structures, driveway, and near SW Edy Road.

Once topsoil has been stripped, a proof roll should be performed directly on exposed soils in order to verify subgrade strength. We recommend proof-rolling directly on subgrade soils with a loaded dump truck during dry weather. Soils in soft areas that pump, rut, or weave should be removed and replaced as engineered fill (see section below) prior to pouring foundations or paving.

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.

Engineered Fill

All grading for the proposed construction 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. 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.

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Excavating Conditions and Utility Trenches

We anticipate that on-site soils can be excavated using conventional heavy equipment such as trackhoes to a depth of 12 feet. All temporary cuts in excess of 4 feet in height should be sloped in accordance with U.S. Occupational Safety and Heath Administration (OSHA) regulations (29 CFR Part 1926), or be shored. The existing native soil is classified 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 Standard Proctor ASTM D698 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.

Erosion Control Considerations

During our field exploration program, we did not observe soil types that would be considered highly susceptible to erosion. 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.

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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
- Bales of straw and/or geotextile silt fences 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.

Pavement Design

For design purposes, we used an estimated resilient modulus of 6,000 for a compacted soil subgrade. Table 1 presents our recommended minimum pavement section for dry weather construction.

Table 1 - Recommended Minimum Dry-Weather Pavement Section

Material Layer	Private Streets and Driveways	Public Street SW Nursery Way	Compaction Standard upper/lower lifts
Asphaltic Concrete (AC)	3 in.	5.5 in.	91%/ 92% of Rice Density AASHTO T-209
Crushed Aggregate Base ¾"-0 (leveling course)	2 in.	2 in.	95% of Modified Proctor AASHTO T-180
Crushed Aggregate Base 1½"-0	10 in.	14 in.	95% of Modified Proctor AASHTO T-180
Subgrade	12 in.	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.

Foundations

The proposed 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 12 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 two No. 4 bars at the tops of stem walls, and two No. 4 bars at the bottom of footings. Concrete slab-on-grade reinforcement should consist of No. 4 bars placed on 24-inch centers in a grid pattern.

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 column load of 100 kips is assumed. 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 0.40, 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. GeoPacific should review the foundation excavation prior to placement. 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 construction incorporating raised wood floors and conventional spread footing foundations. If 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.

Concrete Slabs-on-Grade

The proposed buildings may incorporate concrete slabs-on-grade. At a minimum, designers of interior slab-on-grade floors at any site should provide an adequate moisture break and vapor retarder; geotechnical consultants are not experts in the field of vapor transmission. The following discussion is intended to aid the designer similar to discussions in found in publications from ACI, ASTM, PTI or the IRC.

The site is located on relatively impermeable soils such that shallow, perched storm water is expected during much of the year in the near-surface soils surrounding the buildings. In addition, compacted fill consisting of on-site soils will similarly impede surface runoff from passing vertically downward through the soil. Unexpected poor surface drainage within and around the building could allow water to conduct and/or concentrate beneath a slab-on-grade. Though generally not required, as a precaution in the event water gets beneath the slab-on-grade, underslab drains can be incorporated beneath every living unit or confined foundation cell. These drains can tie into the perimeter footing drains provided they have positive drainage and should be similarly constructed. Due to these soil and groundwater conditions, we recommend that a qualified firm be engaged to evaluate vapor transmission paths and potential adverse impacts on various components of the structure.

The outside edge of all perimeter footings and the interior of portion of every unit or foundation cell should be provided with a perimeter footing and underslab drainage system consisting of 3-inch diameter, perforated, rigid plastic pipe embedded in a minimum of 1 ft^3 per lineal foot of clean, free-draining gravel or ¾-0" rock. The use of thin-walled, collapsible plastic pipe should be avoided. Water collected from the footing drains should be directed into the local storm drain system or other suitable outlet. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet

A capillary moisture break material should consist of free-draining, crushed rock such as consisting of 19mm-6.3mm from Section 02680.20 of the 1998 ODOT Supplemental Standard Specifications

for Highway Construction. For dry-weather construction, the minimum recommended thickness of capillary break materials on re-compacted soil subgrade is 12 inches. The actual thickness of crushed aggregate will also be dependent on the subgrade and drainage conditions at the time of construction. Under-slab aggregate should be compacted to at least 95 percent of its maximum dry density as determined by ASTM D698 (Standard Proctor) or equivalent.

In areas where moisture will be detrimental to floor coverings or equipment inside the proposed structures, a minimum 10-mil polyethylene vapor retarder should be placed directly over the capillary break and beneath the slab. Consideration may be given to providing additional or alternate protection to reduce the potential for damp floors and damage to flooring, including the following:

- Utilize flooring and building materials that are not moisture sensitive.
- Raise the building grade and thicken the rock moisture break (often at odds with ADA requirements).
- Utilize hardscaping as much as feasible keeping irrigated landscape areas farther away from the building.
- Apply a moisture intrusion retarder on the slab (Preseal, Creteseal or approved equivalent) to the surface of the concrete.
- Maintain a slab water cement ratio of 0.42 or less utilizing mid-range plasticizers.
- Utility trenches should slope away from the building.

Vapor retarder products should be installed in accordance with manufacturer recommendations. The building should be complete and the HVAC system operating for a period of time during wet weather before moisture-sensitive flooring is applied. This time period should be long enough to allow the vapor gradient within and below the building to stabilize and obtain acceptable slab moisture content.

Seismic Design

Structures should be designed to resist earthquake loading in accordance with the methodology described in the 2006 International Residential Code (IRC) for One- and Two-Family Dwellings, with applicable Oregon Structural Specialty Code (OSSC) revisions. We recommend Site Class D be used for design per the OSSC, Table 1613.5.2. Design values determined for the site using the USGS (United States Geological Survey) *Earthquake Ground Motion Parameters* utility are summarized below.

Table 2. Recommended Earthquake Ground Motion Parameters (2006 IBC / 2007 OSSC)

Parameter	Value
Location (Lat, Long), degrees	45.367, -122.861
Mapped Spectral Acceleration Values (MCE):	
Short Period, S_s	0.88 g
1.0 Sec Period, S_1	0.33 g
Soil Factors for Site Class D:	
F_a	1.15
F_v	1.74
Residential Site Value = 2/3 x F_a x S_s	0.67 g
Residential Seismic Design Category	D_1

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. Following development, on-site soils will consist predominantly of stiff native fine-grained soils, which are not considered susceptible to liquefaction. Therefore, it is our opinion that special design or construction measures are not required to mitigate the effects of liquefaction.

Drainage

The outside edge of perimeter footings should be provided with a drainage system consisting of 3-inch diameter, slotted, flexible plastic pipe embedded in a minimum of 1 ft^3 per lineal foot of clean, free-draining gravel or 1 1/2" - 3/4" 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. Water collected from the footing drains should be directed into the local storm drain system or other suitable outlet. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. Down spouts and roof drains should not be connected to the foundation drains in order to reduce the potential for clogging. The footing drains should include clean-outs to allow periodic maintenance and inspection. Grades around the proposed structure should be sloped such that surface water drains away from the building. Perimeter footing drains are recommended to prevent detrimental effects of groundwater on foundations, and should not be expected to eliminate all potential sources of water entering a crawlspace or beneath a slab-on-grade. An adequate grade to a low point outlet drain in the crawlspace is required by code. Underslab drains are sometimes added beneath the slab when placed over soils of low permeability and shallow, perched groundwater.

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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 attempted to execute these services in accordance with generally accepted professional principles and practices in the fields of geotechnical engineering and engineering geology 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.



EXPIRES: 06/30/2013

Beth K. Rapp, G.I.T.
Project Geologist

James D. Imbrie, G.E., C.E.G.
Principal Geotechnical Engineer

Attachments: References
Checklist of Recommended Geotechnical Testing and Observation
Figure 1 – Vicinity Map
Figure 2 – Site and Exploration Plan
Boring Log (B-1)
Test Pit Logs (TP-1 – TP-9)

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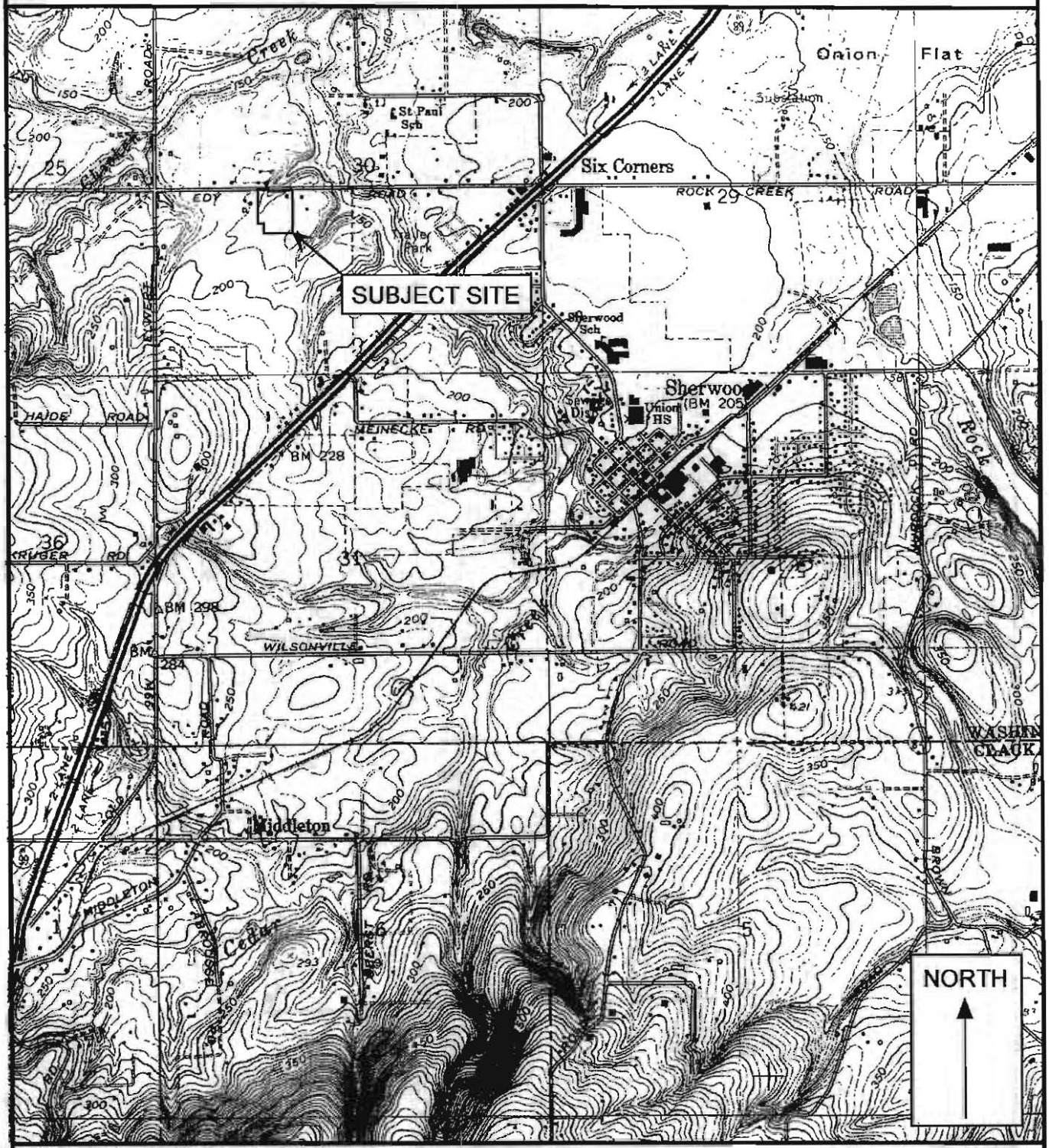
February 3, 2012
Project No. 11-2487

CHECKLIST OF RECOMMENDED GEOTECHNICAL TESTING AND OBSERVATION

Item No.	Procedure	Timing	By Whom	Done
1	Preconstruction meeting	Prior to beginning site work	Contractor, Developer, Civil and Geotechnical Engineers	
2	Fill removal from site or sorting and stockpiling	Prior to mass stripping	Soil Technician/ Geotechnical Engineer	
3	Stripping, aeration, and root-picking operations	During stripping	Soil Technician	
4	Compaction testing of engineered fill (95% of Standard Proctor)	During filling, tested every 2 vertical feet	Soil Technician	
5	Compaction testing of trench backfill (95% of Standard Proctor)	During backfilling, tested every 4 vertical feet for every 200 lineal feet	Soil Technician	
6	Street Subgrade Compaction (95% of Standard Proctor)	Prior to placing base course	Soil Technician	
7	Base course compaction (95% of Modified Proctor)	Prior to paving, tested every 200 lineal feet	Soil Technician	
8	AC Compaction (91% (bottom lift) / 92% (top lift) of Rice)	During paving, tested every 200 lineal feet	Soil Technician	
9	Final Geotechnical Engineer's Report	Completion of project	Geotechnical Engineer	

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Tel: (503) 625-4455 Fax: (503) 625-4405

VICINITY MAP



Legend

Approximate Scale 1 in = 2,000 ft

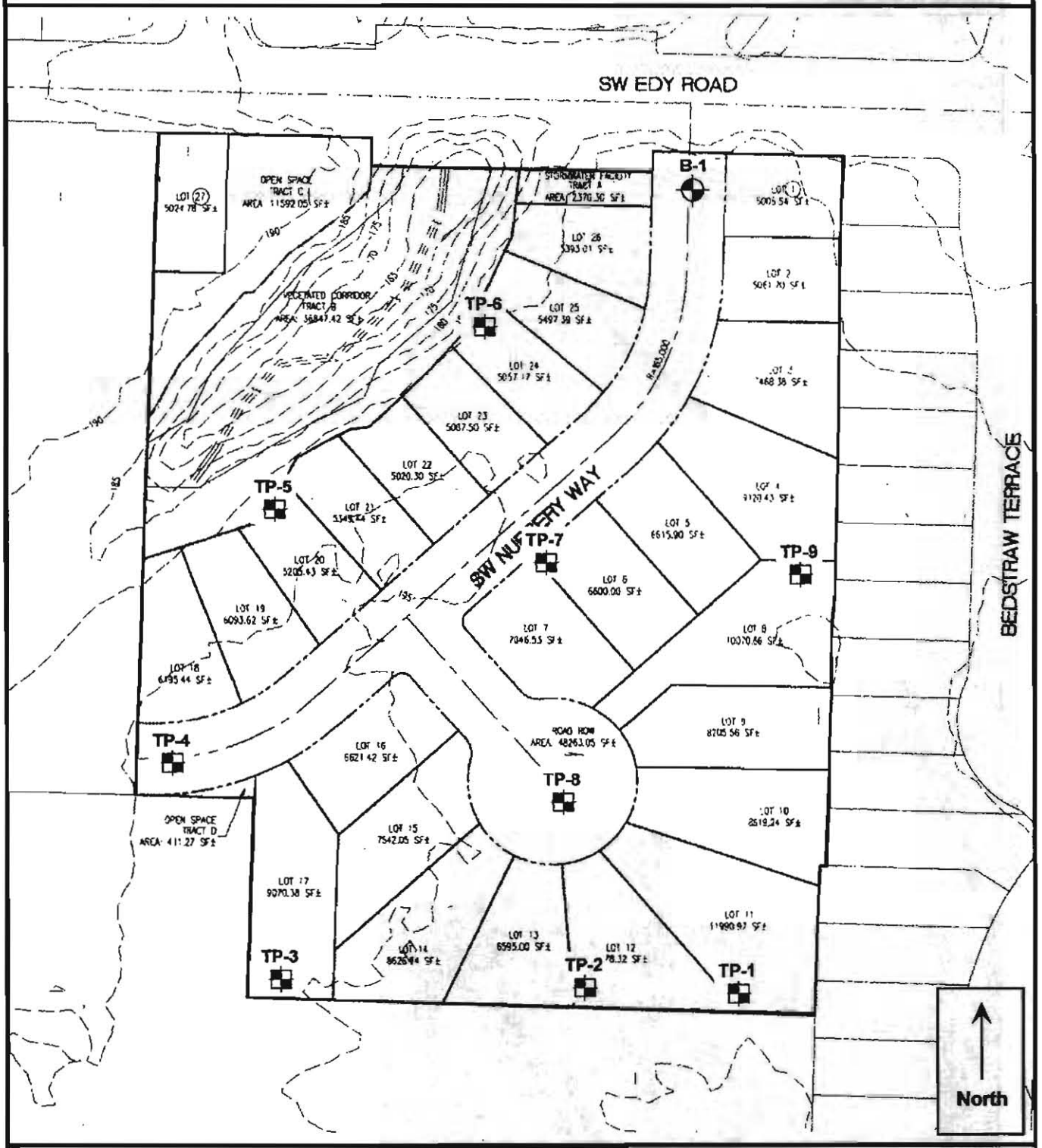
Date: 01/25/12
Drawn by: EKR

Base map: U.S. Geological Survey 7.5 minute Topographic Map Series, Sherwood, Oregon Quadrangle, 1961 (Photorevised 1985).

Project: Renaissance at Rychlick Farm Subdivision Sherwood, Oregon	Project No. 11-2487	FIGURE 1

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SITE PLAN AND EXPLORATION LOCATIONS



Legend

B-1 Boring Designation and Approximate Location

TP-1 Test Pit Designation and Approximate Location

Date: 01/25/12
Drawn by: EKR

0 100'

APPROXIMATE SCALE 1"=100'

Project: Renaissance at Rychlick Farm Subdivision Sherwood, Oregon	Project No. 11-2487	FIGURE 2

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BORING LOG

Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

Boring No. B-1

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing Zone	Material Description
						Highly organic SILT (OL-ML), dark brown, roots throughout, loose, moist (Topsoil)
5		14				Stiff to very stiff, SILT (ML), light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Native Soil Horizon)
		19				
		17				
10		15				
						Stiff to very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
15		12				
20		9				
25		11				
30						Boring Terminated at 26.5 Feet. No Groundwater or Seepage encountered.
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 Drilled: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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	2.0					Highly organic SILT (OL-ML), brown, roots throughout, moist (Topsoil)
2	0.5					Medium stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace black staining, moist (Native Soil Horizon)
	1.5					
3	2.0					
4	2.5					
5						
6						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
7						
8						
9						
10						Test Pit Terminated at 9.5 Feet.
11						
12						Note: No seepage or groundwater encountered.
13						
14						
15						
16						
17						

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: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

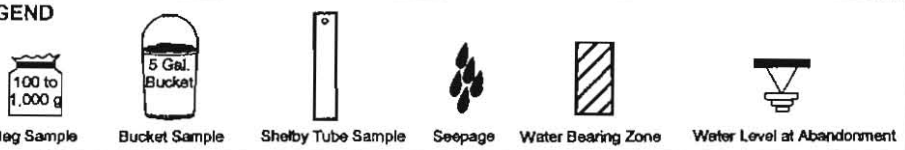
Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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	0.5					Highly organic SILT (OL-ML), dark brown, roots throughout, loose, moist (Topsoil)
2	0.5					Medium stiff to very stiff, SILT (ML), light brown, subtle orange and gray mottling, micaceous, many roots down to 3.5 feet, trace black staining, moist (Native Soil Horizon)
3	1.0					
	2.0					
4	4.5					
5						
6						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
7						
8						
9					💧	
10						Test Pit Terminated at 10 Feet.
11						
12						Note: Groundwater seepage encountered at 9 feet. Discharge visually estimated at less than 1 gallon per minute.
13						
14						
15						
16						
17						

LEGEND



Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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	1.0					Moderately organic SILT (OL-ML), brown, roots throughout, moist (Topsoil)
2	1.5					Stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace black staining, moist (Native Soil Horizon)
3	2.0					
4	4.5					
5						
6						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
7						
8						
9						
10						Test Pit Terminated at 9 Feet.
11						Note: No seepage or groundwater encountered.
12						
13						
14						
15						
16						
17						

LEGEND



Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Renaissance at Rychlick Farm Subdivision Sherwood, Oregon	Project No. 11-2487	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	0.5					Highly organic SILT (OL-ML), brown, 3 inch thick root mat, fine roots throughout, moist (Topsoil)
2	1.0					Medium stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace black staining, moist (Native Soil Horizon)
3	2.0					
4	2.0					
5						
6						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
7						
8						
9						Test Pit Terminated at 8.5 Feet.
10						
11						Note: No seepage or groundwater encountered.
12						
13						
14						
15						
16						
17						

LEGEND



Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Renaissance at Rychlick Farm Subdivision Sherwood, Oregon	Project No. 11-2487	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	0.5					Medium stiff, SILT (OL-ML), brown, with organics and woody debris throughout, moist (Fill)
2	0.5					
	1.0					
3	2.0					Stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace black staining, moist (Native Soil Horizon)
4	4.0					
5						
6						
7						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
8						
9						Test Pit Terminated at 9 Feet.
10						
11						Note: No seepage or groundwater encountered.
12						
13						
14						
15						
16						
17						

LEGEND



Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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	0.5					Highly organic SILT (OL-ML), dark brown, roots throughout, loose, moist (Topsoil)
2	2.5					Medium stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace black staining, moist (Native Soil Horizon)
3	1.5					
4	1.5					
5						
6						
7						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
8						Test Pit Terminated at 8 Feet.
9						
10						Note: No seepage or groundwater encountered.
11						
12						
13						
14						
15						
16						
17						

LEGEND



Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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	0.5					Moderately organic SILT (OL-ML), brown, roots throughout, moist (Topsoil)
2	1.0					Medium stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace charcoal fragments, moist (Native Soil Horizon)
3	1.5					
4	3.0					
5						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
6						
7						
8						Test Pit Terminated at 8 Feet.
9						
10						Note: No seepage or groundwater encountered.
11						
12						
13						
14						
15						
16						
17						

LEGEND



Bag Sample



Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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
1	1.0					Highly organic SILT (OL-ML), dark brown, roots throughout, moist (Topsoil)
2	2.0					Stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace black staining, moist (Native Soil Horizon)
3	2.0					
4	3.5					
5						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
6						
7						
8						Test Pit Terminated at 8 Feet.
9						
10						Note: No seepage or groundwater encountered.
11						
12						
13						
14						
15						
16						
17						

LEGEND



Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

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Tel: (503) 625-4455 Fax: (503) 625-4405

TEST PIT LOG

Project: Renaissance at Rychlick Farm Subdivision
Sherwood, Oregon

Project No. 11-2487

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
1	3.0					Highly organic SILT (OL-ML), brown, roots throughout, loose, moist (Topsoil)
2	2.0					Stiff to very stiff, SILT (ML), light brown, trace fine roots throughout, subtle orange and gray mottling, trace black staining, moist (Native Soil Horizon)
3	2.0					
4	2.0					
5						
6						Very stiff, SILT (ML), trace fine grained sand, light brown, subtle orange and gray mottling, micaceous, trace black staining, moist (Willamette Formation)
7						
8						
9						
10						Test Pit Terminated at 9 Feet.
11						Note: No seepage or groundwater encountered.
12						
13						
14						
15						
16						
17						

LEGEND



Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 1/10/2012
Logged By: B. Rapp
Surface Elevation:

Clean Water Services

Clean Water Services File Number

Sensitive Areas Certification Form

1. Property Information *(example 1S234AB01400)*
Tax lot ID(s): Tax lot 100 of tax map 2S 1 30CA

Site Address: 17806 SW Edy Road
City, State, Zip: Sherwood, OR 97140
Nearest Cross Street: SW Edy Road and SW Settlement

2. Owner Information
Name: Amy Schnell
Company: Renaissance Homes
Address: 16771 Boones Ferry Road
City, State, Zip: Lake Oswego, OR 97035
Phone/Fax: 503-636-5600
E-Mail: aschnell@renaissance-homes.com

3. Development Activity *(check all that apply)*

- ☐ Addition to Single Family Residence (rooms, deck, garage)
- ☐ Lot Line Adjustment
- ☐ Minor Land Partition
- ☐ Residential Condominium
- ☐ Commercial Condominium
- ☒ Residential Subdivision
- ☐ Commercial Subdivision
- ☐ Single Lot Commercial
- ☐ Multi Lot Commercial

Other

4. Applicant Information
Name: Same as owner
Company:
Address:
City, State, Zip:
Phone/Fax:
E-Mail:

5. Check any of the following that apply to this project.

- ☐ Adds less than 500 square feet of impervious surface.
- ☐ Does not encroach closer to the Sensitive Area than existing development on the property.
- ☐ Is not located on a slope greater than 25%.

6. Applicant Information
Name:
Company:
Address:
City, State, Zip:
Phone/Fax:
E-Mail:

7. Will the project involve any off-site work? ☐ Yes ☒ No ☐ Unknown *(check appropriate box)*
If yes, location and description of off-site work

8. Additional comments or information that may be needed to understand your project

Clean Water Services File Number

Sensitive Areas Certification Form *(continued)*

9. **An on-site, water quality sensitive area reconnaissance was completed on:**

Date	By	Title	Company
January 12, 2012	Stacey Reed	Wetland Scientist	SWCA Env Consultants

10. **Existence of Water Quality Sensitive Areas** *(check all appropriate boxes)*

As defined in the Districts Design and Construction Standards:

A. Water-quality-sensitive areas ☒ do ☐ do not exist on the tax lot.

B. Water-quality-sensitive areas ☒ do ☐ do not exist within 200' on adjacent properties, or ☐ unable to evaluate adjacent property.

C. Vegetated corridors ☒ do (14,277 SF) ☐ do not exist on the tax lot.

D. Vegetated corridors ☒ do ☐ do not exist within 200' on adjacent properties, or ☐ unable to evaluate adjacent property.

E. Impacts to sensitive areas and/or vegetated corridors will occur ☒ On-site ☐ Off-site ☒ None proposed at this time.

F. If impacts, mitigation is ☒ On-site ☐ Off-site ☐ Other _____

11. **Simplified Site Assessment containing the following information:** *(check only items submitted).*

Please refer to Design and Construction Standards 07-20 section 3.02.2 for application requirements.

☐ Complete Certification Form *(2 pages)*
☐ Written description of the site and proposed activity.
☐ Site plan of the entire property.
☐ Photographs of the site labeled and keyed to the site plan.

12. **Standard Site Assessment containing the following information:** *(check only items submitted).*

Please refer to Design and Construction Standards 07-20 section 3.02.2 for application requirements.

☒ Complete Certification Form (2 pages)
☒ Written description per Design and Construction Standards 07-20 section 3.13.3 b. 1
☒ Wetland Data sheets
☒ Vegetated Corridor Data sheets
☒ Existing Site Condition Figures
☒ Proposed Development Figures

By signing this form the Owner, or Owner's authorized agent or representative, acknowledges and agrees that employees of Clean Water Services have authority to enter the project site at all reasonable times for the purpose of inspecting project site conditions and gathering information related to the project site.

I certify that I am familiar with the information contained in this document, and to the best of my knowledge and belief, this information is true, complete, and accurate.

Applicant:

Amy Schnell	Director of Administration - Project Manager
Print/Type Name	Print/Type Title
Signature	2/10/12 Date

Clean Water Services
Our commitment is clear.

CWS File Number
12-000392

Service Provider Letter

This form and the attached conditions will serve as your Service Provider Letter in accordance with Clean Water Services Design and Construction Standards (R&O 07-20).

Jurisdiction:	Sherwood	**Review Type:**	Allowed Use
Site Address / Location:	17806 SW Edy RD Sherwood, OR 97140	**SPL Issue Date:** **SPL Expiration Date:**	March 29, 2012 March 29, 2014

Applicant Information:		**Owner Information:**	
Name		Name	
Company	RENAISSANCE CUSTOM HOMES	Company	RENAISSANCE CUSTOM HOMES
Address	16771 BOONES FERRY RD LAKE OSWEGO OR 97035	Address	16771 BOONES FERRY RD LAKE OSWEGO OR 97035
Phone/Fax	(503) 636-5600	Phone/Fax	(503) 636-5600
E-mail:		E-mail:	

Tax lot ID	**Development Activity**
2S130CA00100	Residential Subdivision

Pre-Development Site Conditions:		**Post Development Site Conditions:**	
Sensitive Area Present:	[X] On-Site [X] Off-Site	Sensitive Area Present:	[X] On-Site [X] Off-Site
Vegetated Corridor Width:	Variable: 60-80	Vegetated Corridor Width:	Variable: 6-80
Vegetated Corridor Condition:	Good/Marginal/Degraded		

Enhancement of Remaining Vegetated Corridor Required: [X]

Square Footage to be enhanced: 38,277

Encroachments into Pre-Development Vegetated Corridor:

Type and location of Encroachment:	Square Footage:
Stormwater Outfall (Temporary Encroachment; Mitigation/Planting in-place)	150

Mitigation Requirements:

Type/Location	Sq. Ft./Ratio/Cost
No Mitigation Required	0

[X] Conditions Attached [X] Development Figures Attached (4) [ ] Planting Plan Attached [ ] Geotech Report Required

This Service Provider Letter does NOT eliminate the need to evaluate and protect water quality sensitive areas if they are subsequently discovered on your property.

CWS File Number 12-000392

In order to comply with Clean Water Services water quality protection requirements the project must comply with the following conditions:

1. No structures, development, construction activities, gardens, lawns, application of chemicals, uncontained areas of hazardous materials as defined by Oregon Department of Environmental Quality, pet wastes, dumping of materials of any kind, or other activities shall be permitted within the sensitive area or Vegetated Corridor which may negatively impact water quality, except those allowed in R&O 07-20, Chapter 3.
2. Prior to any site clearing, grading or construction the Vegetated Corridor and water quality sensitive areas shall be surveyed, staked, and temporarily fenced per approved plan. During construction the Vegetated Corridor shall remain fenced and undisturbed except as allowed by R&O 07-20, Section 3.06.1 and per approved plans.
3. **If any activity is proposed within the sensitive area, the applicant shall gain authorization for the project from the Oregon Department of State Lands (DSL) and US Army Corps of Engineers (USACE). The applicant shall provide Clean Water Services or its designee (appropriate city) with copies of all DSL and USACE project authorization permits.**
4. An approved Oregon Department of Forestry Notification is required for one or more trees harvested for sale, trade, or barter, on any non-federal lands within the State of Oregon.
5. **Prior to ground disturbance, an Erosion Control Permit is required through the City. Appropriate Best Management Practices (BMP's) for Erosion Control, in accordance with Clean Water Services' Erosion Prevention and Sediment Control Planning and Design Manual, shall be used prior to, during, and following earth disturbing activities.**
6. Prior to construction, a Stormwater Connection Permit from Clean Water Services or its designee is required pursuant to Ordinance 27, Section 4.B.
7. Activities located within the 100-year floodplain shall comply with R&O 07-20, Section 5.10.
8. Removal of native, woody vegetation shall be limited to the greatest extent practicable.
9. The water quality facility shall be planted with Clean Water Services approved native species, and designed to blend into the natural surroundings.
10. **Should final development plans differ significantly from those submitted for review by Clean Water Services, the applicant shall provide updated drawings, and if necessary, obtain a revised Service Provider Letter.**

SPECIAL CONDITIONS

11. The Vegetated Corridor width for sensitive areas within the project site shall be a minimum of 50 feet wide, as measured horizontally from the delineated boundary of the sensitive area.
12. **For Vegetated Corridors that extend 35 feet from the break in slope, the width of Vegetated Corridors may be reduced to 15 feet wide if a stamped geotechnical report confirms that slope stability can be maintained with the reduced setback from the break in slope. Geotechnical report has been provided.**
13. The applicant shall enhance the entire Vegetated Corridor to meet or exceed good corridor condition as defined in R&O 07-20, Section 3.14.2, Table 3-3.
14. Removal of invasive non-native species by hand is required in all Vegetated Corridors rated "good." Replanting is required in any cleared areas larger than 25 square feet using low impact methods. The applicant shall calculate all cleared areas larger than 25 square feet prior to the preparation of the required Vegetated Corridor enhancement/restoration plan.
15. Prior to any site clearing, grading or construction, the applicant shall provide Clean Water Services with a Vegetated Corridor enhancement/restoration plan. Enhancement/restoration of the Vegetated Corridor shall be provided in accordance with R&O 07-20, Appendix A.
16. Prior to installation of plant materials, all invasive vegetation within the Vegetated Corridor shall be removed per methods described in Clean Water Services' Integrated Pest Management

CWS File Number 12-000392

Plan, 2009. During removal of invasive vegetation care shall be taken to minimize impacts to existing native tree and shrub species.

17. The City shall be notified 72 hours prior to the start and completion of enhancement/restoration activities. Enhancement/restoration activities shall comply with the guidelines provided in Landscape Requirements (R&0 07-20, Appendix A).
18. **Maintenance and monitoring requirements shall comply with R&O 07-20, Section 2.11.2. If at any time during the warranty period the landscaping falls below the 80% survival level, the owner shall reinstall all deficient planting at the next appropriate planting opportunity and the two year maintenance period shall begin again from the date of replanting.**
19. Performance assurances for the Vegetated Corridor shall comply with R&O 07-20, Section 2.06.2.
20. **For any developments which create multiple parcels or lots intended for separate ownership, Clean Water Services may require that the sensitive area and Vegetated Corridor be contained in a separate tract and subject to a "STORM SEWER, SURFACE WATER, DRAINAGE AND DETENTION EASEMENT OVER ITS ENTIRETY" to be granted to Clean Water Services.**

FINAL PLANS

21. **Final construction plans shall include landscape plans.** In the details section of the plans, a description of the methods for removal and control of exotic species, location, distribution, condition and size of plantings, existing plants and trees to be preserved, and installation methods for plant materials is required. Plantings shall be tagged for dormant season identification and shall remain on plant material after planting for monitoring purposes.
22. **A Maintenance Plan shall be included on final plans** including methods, responsible party contact information, and dates (minimum two times per year, by June 1 and September 30).
23. **Final construction plans shall clearly depict the location and dimensions of the sensitive area and the Vegetated Corridor** (indicating good, marginal, or degraded condition). Sensitive area boundaries shall be marked in the field.
24. **Protection of the Vegetated Corridors and associated sensitive areas shall be provided by the installation of permanent fencing and signage** between the development and the outer limits of the Vegetated Corridors. Fencing and signage details to be included on final construction plans.

This Service Provider Letter is not valid unless CWS-approved site plan is attached.

Please call (503) 681-3653 with any questions.



Amber Wierck
Environmental Plan Review

Attachments (4)

Clean Water Services
Our commitment is clear.

CWS File Number 12-000392

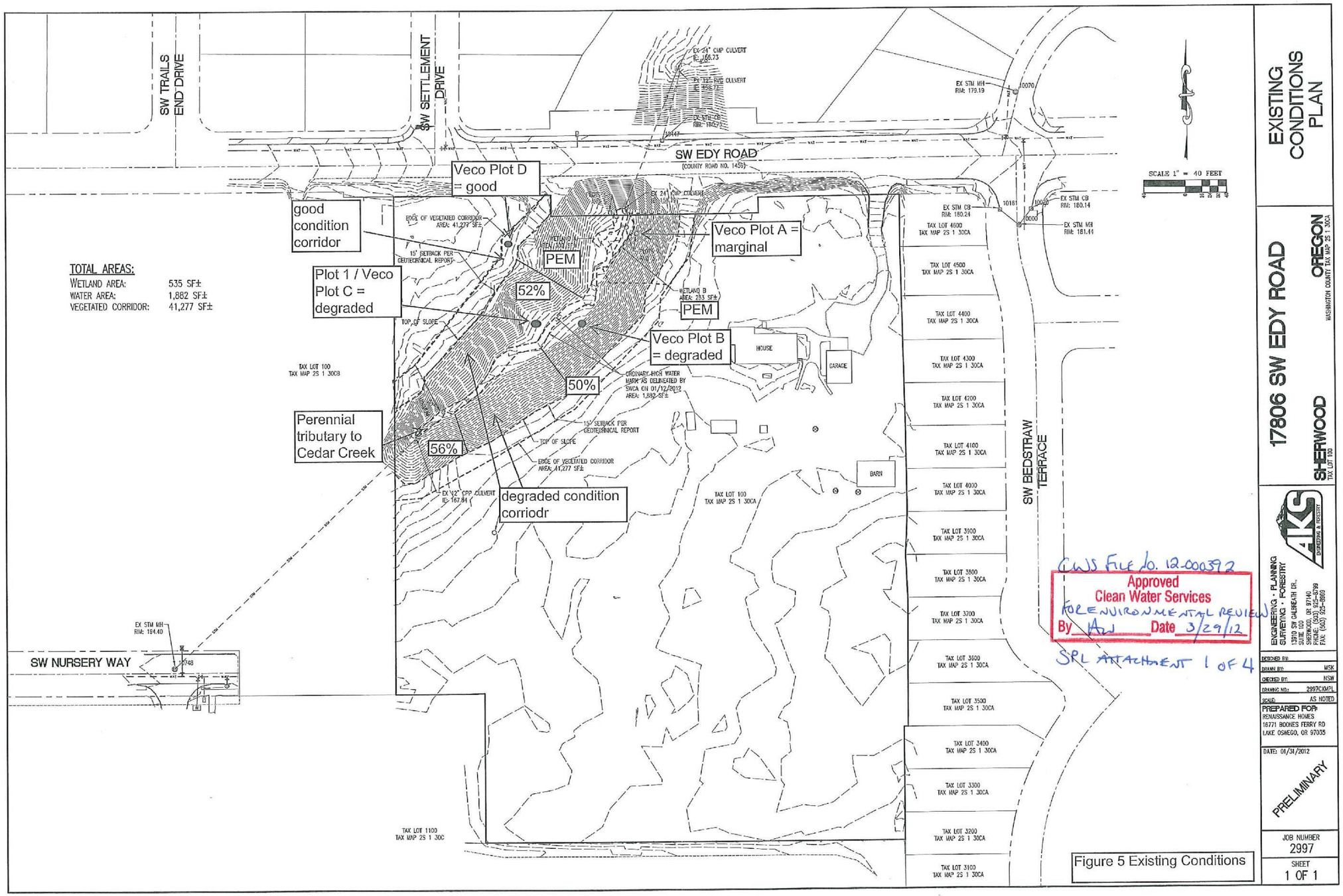
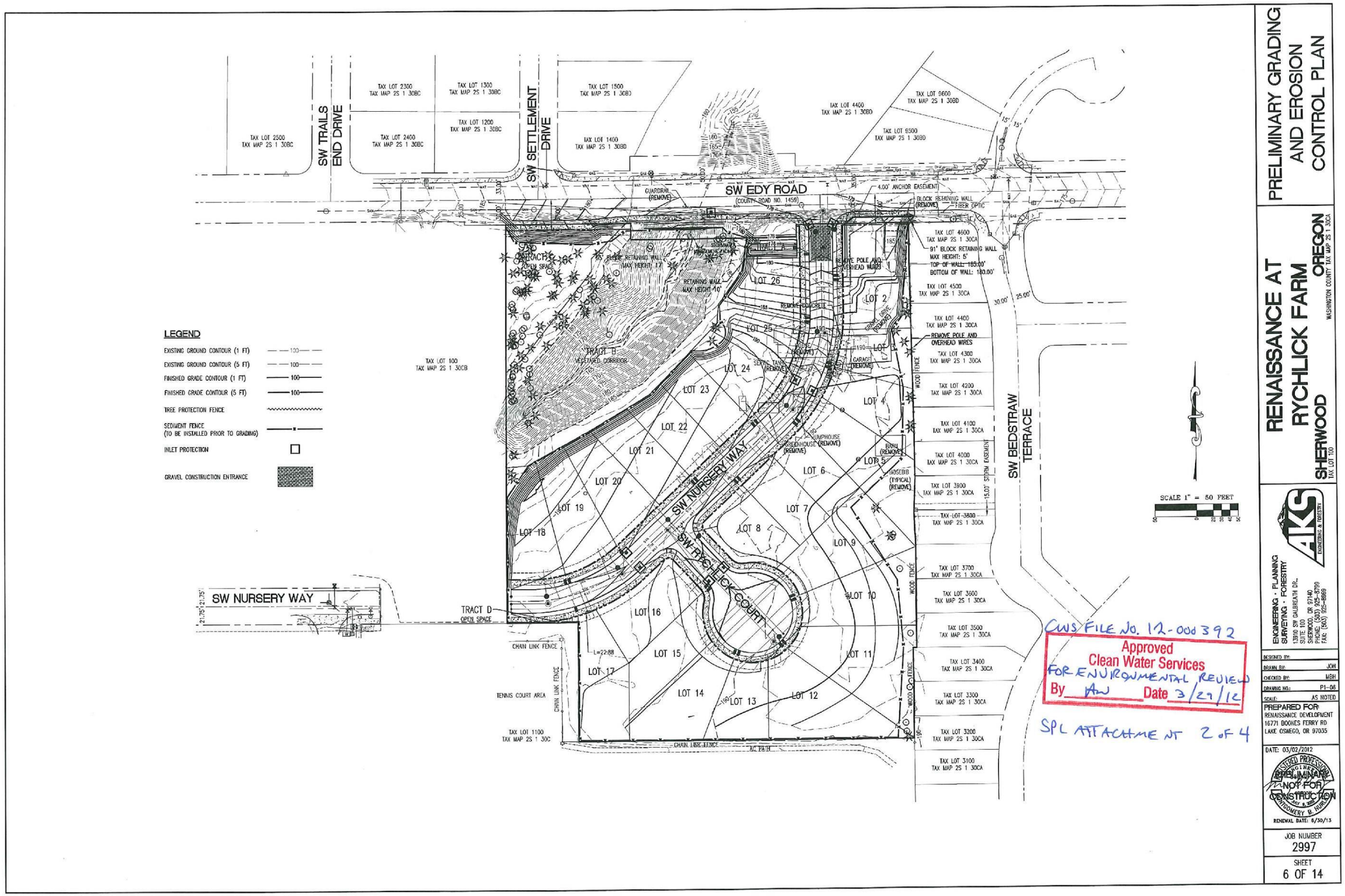


Figure 5 Existing Conditions

CWS File Number

12-000392



CWS FILE NO. 12-000392

Approved
Clean Water Services
FOR ENVIRONMENTAL REVIEW
By AN Date 3/27/12

SPL ATTACHMENT 2 OF 4

PRELIMINARY GRADING AND EROSION CONTROL PLAN

RENAISSANCE AT RYCHLICK FARM

SHERWOOD OREGON

WASHINGTON COUNTY TAX MAP 2S 1 30CA TAX LOT 100

AKS ENGINEERING & FORESTRY
ENGINEERING - PLANNING
SURVEYING - FORESTRY
13910 SW GALBREATH DR.
SUITE 100
SHERWOOD, OR 97140
PHONE: (503) 925-8799
FAX: (503) 925-8969

DESIGNED BY:	
DRAWN BY:	JOH
CHECKED BY:	MBH
DRAWING NO.:	P1-06
SCALE:	AS NOTED

PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

DATE: 03/02/2012

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 9, 2002
MONTGOMERY B. HURLEY
RENEWAL DATE: 6/30/13

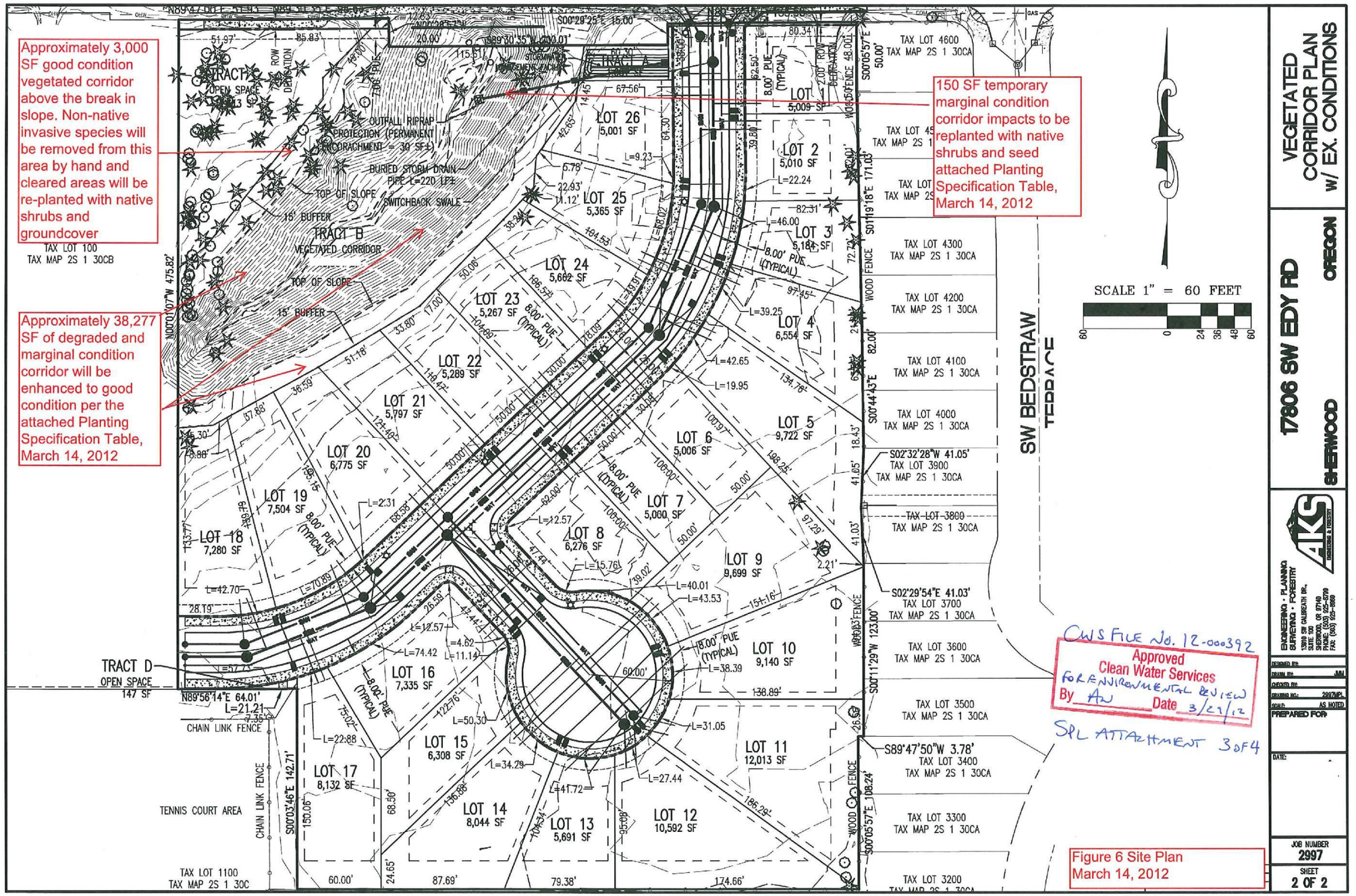
PRELIMINARY
NOT FOR CONSTRUCTION

JOB NUMBER
2997

SHEET
6 OF 14

CWS File Number

12-000392



Clean Water Services
Our commitment is clear.

CWS File Number 12-000392

CWS File No. 12-000392
Approved
Clean Water Services
For Environmental Review
By AW Date 3/29/12
SPL Attachment 4 of 4

17806 SW Edy Road / Rychlick Farm Residential Development
Natural Resource Assessment
March 14, 2012

Vegetated Corridor Enhancement within on-site *degraded* and *marginal* condition vegetated corridor
Total Area = 38,277 square feet

Scientific Name	Common Name	Size*	Spacing/Seeding Rate	Quantity
Trees (total 384)				
Alnus rubra	red alder	1 gallon	10 feet on center	192
Thuja plicata	western red cedar	2 gallon	10 feet on center	192
Shrubs (total 1913)				
Acer circinatum	vine maple	1 gallon	4-5 feet on center	478
Oemerlis cerasiformis	Indian plum	2 gallon	4-5 feet on center	478
Rubus spectabilis	salmonberry	1 gallon	4-5 feet on center	478
Symphoricarpos albus	snowberry	1 gallon	4-5 feet on center	479
Seed Mix				
Bromus carinatus	native California brome	seed	10 lbs pls/acre	As needed for bare soil areas >25 sq. ft. following invasive species removal
Elymus glaucus	blue wildrye	seed	10 lbs pls/acre	
Festuca rubra var. *rubra*	native red fescue	seed	5 lbs pls/acre	
Lupinus polyphyllus	large-leafed lupine	seed	8 lbs pls/acre	

* Bare root plants may be substituted for container plants based on availability. If bare root plants are used, they must be planted during the late winter/early spring dormancy period.

Vegetated Corridor Restoration Enhancement for 150 SF of temporary impact for stormwater outfall.

Scientific Name	Common Name	Size	Spacing/Seeding Rate	Quantity
Shrubs (total 8)				
Acer circinatum	vine maple	1 gallon	4-5 feet on center	4
Rubus spectabilis	salmonberry	1 gallon	4-5 feet on center	4
Seed Mix				
Bromus carinatus	native California brome	seed	10 lbs pls/acre	As needed for bare soil areas >25 sq. ft. following invasive species removal
Elymus glaucus	blue wildrye	seed	10 lbs pls/acre	
Festuca rubra var. *rubra*	native red fescue	seed	5 lbs pls/acre	
Lupinus polyphyllus	large-leafed lupine	seed	8 lbs pls/acre	

Planting Notes (per CWS Design & Construction Standards, Appendix A Planting Requirements, June 2007):

1) Non-native invasive species are present in the on-site vegetated corridor. Due to their proximity to the tributary to Cedar Creek mechanical control by hand consistent with Clean Water Services' *Integrated Vegetation and Animal Management Guide* (March 2003) is recommended to control its spread prior to installing plantings.

2) Plantings should preferably be installed between February 1 and May 1 for bare roots and seeds and between October 1 and November 15 for containers. Plants may be installed at other times of the year; however, additional measures may be necessary to ensure plant survival. Irrigation or other water practices (i.e. polymer, plus watering) shall be used during the two-year maintenance period. Watering shall be provided at a rate of at least one inch per week between June 15 and October 15.

3) Plantings shall be mulched a minimum of three inches in depth and 18 inches in diameter to retain moisture and discourage weed growth around newly installed plant material.

SHERWOOD · VANCOUVER · SALEM
13910 SW GALBREATH DR., SUITE 100 · SHERWOOD, OR 97140
AKS ENGINEERING & FORESTRY
WWW.AKS-ENG.COM
P: (503) 925-8799 F: (503) 925-8969

May 31, 2012

Brad Kilby, AICP - Senior Planner
City of Sherwood – Planning Department
22560 SW Pine Street
Sherwood, OR 97140

RE: Renaissance at Rychlick Farm Subdivision (SUB12-01 and PA12-02)

Dear Brad:

Based on our discussions with you, other City staff, and the applicant, the current application (SUB12-01 and PA12-02) is being withdrawn and resubmitted at this time. The new application includes the following:

1. $265 in application fees in the form of a check from the applicant. Please re-apply the fees already paid towards the new application, as discussed.

2. Previously prepared application materials.

3. Two (2) additional sets of mailing labels.

4. The following written responses to the requirements of the Section 16.142.070, effective at the time of submittal pursuant to the adoption of Ordinance 2012-003. Additionally, the Preliminary Tree Canopy Plan has been updated based on the new code and is attached. This information supersedes the language and plan provided previously.

Thank you again for your help on this application. If you have any questions, or need anything else, please let me know.

Sincerely,
AKS Engineering & Forestry, LLC

Chris Goodell, AICP, LEED^{AP}

16.142.070 - Trees on Property Subject to Certain Land Use Applications

RESPONSE: Based upon the adoption of Ordinance 2012 – 003, the following standards are applicable to the application.

C. Inventory

1. *To assist the City in making its determinations on the retention of trees and woodlands, land use applications including Type II – IV development shall include a tree and woodland inventory and report. The report shall be prepared by a qualified professional and must contain the following information:*

    a. *Tree size (in DBH and canopy area)*
    b. *Tree species*
    c. *The condition of the tree with notes as applicable explaining the assessment*
    d. *The location of the tree on the site*
    e. *The location of the tree relative to the planned improvements*
    f. *Assessment of whether the tree must be removed to accommodate the development*
    g. *Recommendations on measures that must be taken to preserve trees during the construction that are not proposed to be removed.*

2. *Trees removed on the property within one year prior to the submittal of the development application shall also be included in the inventory. In the event that adequate data is not available to address the specific inventory requirements below, an aerial photo may be utilized to determine the approximate number, canopy size and type of trees on the property.*

3. *Definitions for the inventory purposes of this Section*

    a. *A tree is a living woody plant having a trunk diameter as specified below at Diameter at Breast Height (DBH). Trees planted for commercial agricultural purposes, and/or those subject to farm forest deferral, such as nut and fruit orchards and Christmas tree farms, are excluded from this definition and from regulation under this Section, as are any living woody plants under six (6) inches at DBH. All trees six (6) inches or greater shall be inventoried.*

    b. *A woodland is a biological community dominated by trees covering a land area of 20,000 square feet or greater at a density of at least fifty (50) trees per every 20,000 square feet with at least fifty percent (50%) of those trees of any species having a six (6) inches or greater at DBH. Woodlands planted for commercial agricultural purposes and/or subject to farm forest deferral, such as nut and fruit orchards and Christmas tree farms, are excluded from this definition, and from regulation under this Section.*

    c. *A large stature tree is over 20 feet tall and wide with a minimum trunk diameter of 30 inches at DBH.*

RESPONSE: A tree and woodland inventory (preliminary tree preservation and removal plan) including the above listed information has been prepared by a certified arborist and is included with the application materials.

D. Retention requirements

1. Trees may be considered for removal to accommodate the development including buildings, parking, walkways, grading etc., provided the development satisfies of D.2 or D.3, below.

RESPONSE: The preliminary tree preservation and removal plan shows the number, size, species, condition, and location of trees and woodlands proposed to be preserved and those proposed to be removed. The trees are proposed to be removed to accommodate future streets and other necessary public infrastructure, earthwork / grading that is necessary to install this infrastructure to City standards, due to hazardous (existing or future) tree conditions, and/or necessary to provide suitable cleared areas to build future homes. The proposed subdivision is permitted and therefore the tree removal is necessary and acceptable to accompany it. That said, the preliminary tree preservation and removal plan shows that a significant number of trees are being preserved. This submittal requirement is met.

2. Required Tree Canopy - Residential Developments (Single Family Attached, Single Family Detached and Two – Family)

Each net development site shall provide a variety of trees to achieve a minimum total tree canopy of 40 percent. The canopy percentage is based on the expected mature canopy of each tree by using the equation πr^2 to calculate the expected square footage of canopy for each tree. The expected mature canopy is counted for each tree regardless of an overlap of multiple tree canopies.

The canopy requirement can be achieved by retaining existing trees or planting new trees. Required street trees can be used toward the total on site canopy required to meet this standard. The expected mature canopy spread of the new trees will be counted toward the needed canopy cover. A certified arborist or other qualified professional shall provide the estimated tree canopy of the proposed trees to the planning department for review.

RESPONSE: As shown on the preliminary street tree and tree canopy plan (prepared by a professional landscape architect, *56 percent of the net developable site will be covered with by tree canopy (based on mature canopy spread). This exceeds the required minimum standard by 16 percent. This is achieved through a combination of preservation of existing trees and trees to be planted.

*It is worth noting that the calculation provided is a conservative number because it does not include the substantial number of trees proposed to be preserved in open space Tract C. If this area is not dedicated to the City, and those trees to be preserved were include in the calculation, the percentage of canopy preserved would be substantially higher.

4. The City may determine that, regardless of D.1 through D.3, that certain trees or woodlands may be required to be retained. The basis for such a decision shall include; specific findings that retention of said trees or woodlands furthers the purposes and goals of this Section, is feasible and practical both within the context of the proposed land use plan and relative to other policies and standards of the City Comprehensive Plan, and are:

a. Within a Significant Natural Area, 100-year floodplain, City greenway, jurisdictional wetland or other existing or future public park or natural area designated by the City Comprehensive Plan, or

RESPONSE: As shown on the preliminary tree preservation and removal plan, trees within the on-site vegetated corridor and adjacent to the drainageway are proposed to be preserved.

b. A landscape or natural feature as per applicable policies of the City Comprehensive Plan, or are necessary to keep other identified trees or woodlands on or near the site from being damaged or destroyed due to windfall, erosion, disease or other natural processes, or

RESPONSE: There are no identified landscape or natural features on site that are affected by tree removal. There are no identified trees or woodlands near the site that will be damaged or destroyed due to windfall, erosion, or disease as a result of the proposed tree removal.

c. Necessary for soil stability and the control of erosion, for managing and preserving surface or groundwater quantities or quality, or for the maintenance of a natural drainageway, as per Clean Water Services stormwater management plans and standards of the City Comprehensive Plan, or

RESPONSE: The preliminary tree preservation and removal plan shows that trees adjacent to the drainageway ravine, which is the steepest portion of the site, are proposed to be preserved.

d. Necessary in required buffers between otherwise incompatible land uses, or from natural areas, wetlands and greenways, or

RESPONSE: No incompatible land uses are proposed in this application. Surrounding properties are either developed as a school or existing detached homes, the same as proposed in this application. That said, trees are proposed to be preserved in the open space areas along SW Edy Road and adjacent to the site's property boundary, where feasible and practical.

e. Otherwise merit retention because of unusual size, size of the tree stand, historic association or species type, habitat or wildlife preservation considerations, or some combination thereof, as determined by the City.

RESPONSE: As shown on the preliminary tree preservation and removal plan, existing trees are proposed to be preserved where proximal to the drainage, within the CWS vegetated corridor, and within the proposed open space tract. There are no tree stands of unusual size or historic association, etc. that are proposed to be removed. As shown on the preliminary plans, the proposed tree preservation plan will help buffer the future neighborhood from vehicular traffic on SW Edy Road.

7. All trees, woodlands, and vegetation located on any private property accepted for dedication to the City for public parks and open space, greenways, Significant Natural Areas, wetlands, floodplains, or for storm water management or for other purposes, as a condition of a land use approval, shall be retained outright, irrespective of size, species, condition or other factors. Removal of any such trees, woodlands, and vegetation prior to actual dedication of the property to the City shall be cause for reconsideration of the land use plan approval.

RESPONSE: As shown on the preliminary tree preservation and removal plan, existing trees are proposed to be preserved where proximal to the drainage, within the CWS vegetated corridor, and within the proposed open space tract.

E. Tree Preservation Incentive. Retention of existing native trees on site which are in good health can be used to achieve the required mature canopy requirement of the development. The expected mature canopy can be calculated twice for existing trees. For example, if one existing tree with an expected mature canopy of 10 feet (78.5 square feet) is retained it will count as twice the existing canopy (157 square feet).

RESPONSE: Consistent with this incentive, existing native trees are being preserved.

F. Tree Protection During Development

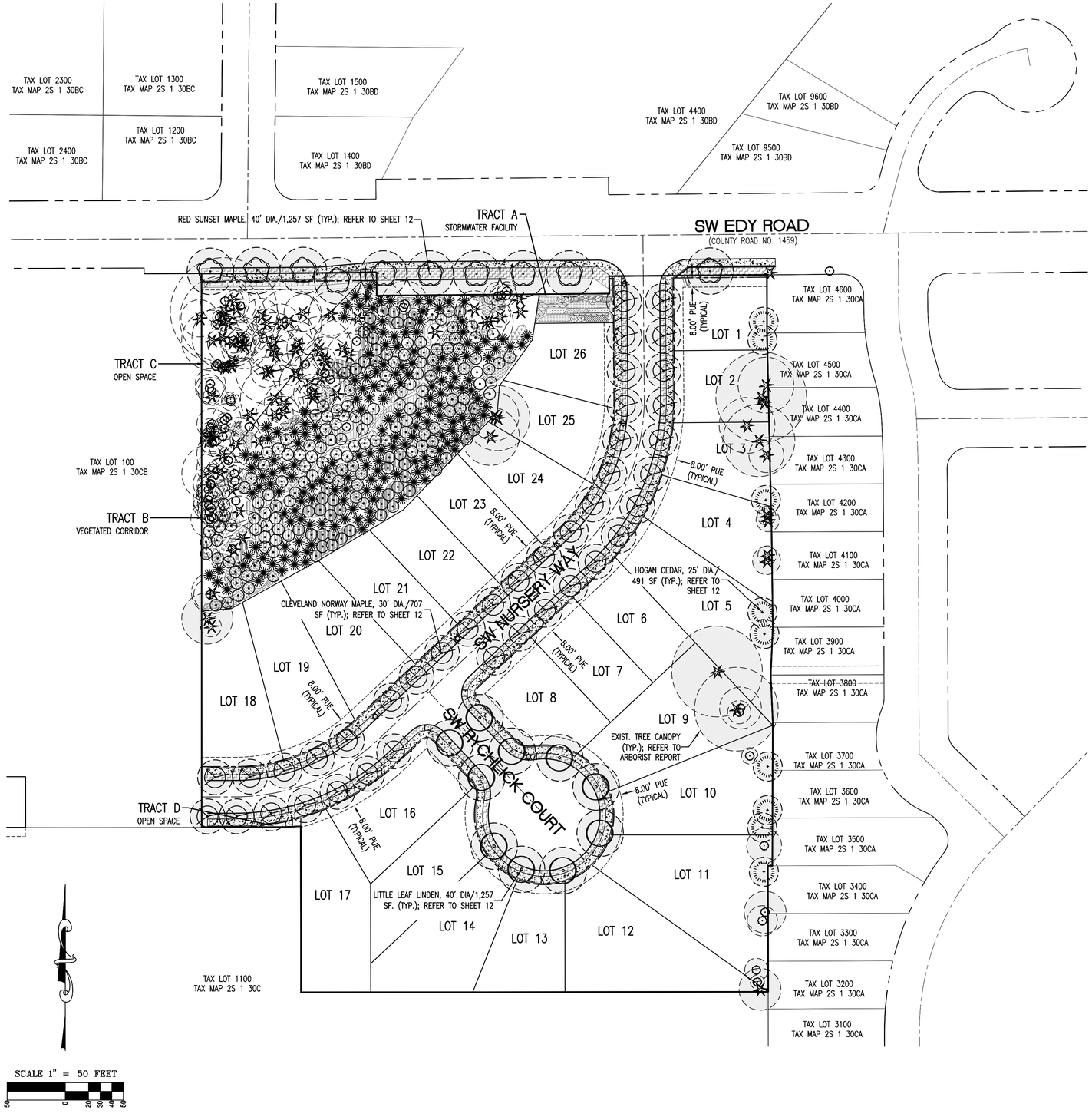
The applicant shall prepare and submit a final Tree and Woodland Plan prior to issuance of any construction permits, illustrating how identified trees and woodlands will be retained, removed or protected as per the Notice of Decision. Such plan shall specify how trees and woodlands will be protected from damage or destruction by construction activities, including protective fencing, selective pruning and root treatments, excavation techniques, temporary drainage systems, and like methods. At a minimum, trees to be protected shall have the area within the drip line of the tree protected from grading, stockpiling, and all other construction related activity unless specifically reviewed and recommended by a certified arborist or other qualified professional. Any work within the dripline of the tree shall be supervised by the project arborist or other qualified professional onsite during construction.

RESPONSE: A final tree preservation and removal plan will be prepared and submitted to the City prior to the issuance of construction permits, as required above.

CANOPY OUTLINE

QUALIFYING CANOPY AREA

NET DEVELOPABLE AREA: 178,655 SF
TOTAL QUALIFYING TREE CANOPY OF EXISTING TREES, STREET TREES AND TREES WITHIN NET DEVELOPABLE AREA: 99,559 SF
PERCENTAGE OF TREE CANOPY COVERAGE: 56%



PRELIMINARY
TREE CANOPY PLAN

RENAISSANCE AT RYCHLICK FARM

SHERWOOD OREGON
TAX LOT 100
WASHINGTON COUNTY TAX MAP 2S 1 30CA

AKS ENGINEERING & FORESTRY
ENGINEERING · PLANNING
SURVEYING · FORESTRY
13910 SW GALBREATH DR., SUITE 100
SHERWOOD, OR 97140
PHONE: (503) 925-8799
FAX: (503) 925-8969

DESIGNED BY:	JHII
DRAWN BY:	KAH
CHECKED BY:	JHII
DRAWING NO.:	P1-12
SCALE:	AS NOTED

PREPARED FOR:
RENAISSANCE DEVELOPMENT
16771 BOONES FERRY RD
LAKE OSWEGO, OR 97035

DATE: 05/31/2012

REGISTERED LANDSCAPE ARCHITECT
OREGON
JAMES H. HENSLEY II
EXPIRES: 6/30/2013
PRELIMINARY
NOT FOR CONSTRUCTION

JOB NUMBER
2997

SHEET
14 OF 15

Tualatin Valley Fire & Rescue

May 8,2012

Renaissance Development
16771 Boones Ferry Rd
Lake Oswego, OR 97035

Re: Renaissance at Rychlick Farm

Thank you for the opportunity to review the proposed site plan surrounding the above named development project. Tualatin Valley Fire & Rescue endorses this proposal predicated on the following criteria and conditions of approval:

1) **DEAD END ROADS:** Dead end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround. (OFC 503.2.5) ***The cul-de-sac shown meets the criteria for an approved turn around. Note: Parking will not be allowed with in the turn around area. Appropriate signage must be in place and the No Parking rule ensured to be enforced.***

2) **FIRE APPARATUS ACCESS ROAD EXCEPTION FOR AUTOMATIC SPRINKLER PROTECTION:** When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access may be modified as approved by the fire code official. (OFC 503.1.1) ***Note: If residential fire sprinklers are elected as an alternate means of protection and the system will be supported by a municipal water supply, please contact the local water purveyor for information surrounding water meter sizing.***

3) **ADDITIONAL ACCESS ROADS – COMMERCIAL:** Where buildings exceed 30 feet in height or three stories in height shall have at least two separate means of fire apparatus access. Buildings or facilities having a gross area of more than 62,000 square feet shall be provided with at least two separate means of fire apparatus access. Buildings up to 124,000 square feet provided with fire sprinklers may have a single access. (OFC D104) ***Building elevations are not provided at this stage in the project. The above information is provided as an advisory for future development.***

4) **ADDITIONAL ACCESS ROADS – ONE-OR TWO-FAMILY RESIDENTIAL:** Where there are more than 30 one- or two-family dwelling units, not less than two separate approved means of access shall be provided. Where there are more than 30 dwelling units and all are protected by approved residential sprinkler systems, a single access will be allowed. (OFC D107) ***26 lots are proposed. This information is provided as an advisory for future development.***

5) **AERIAL FIRE APPARATUS ACCESS:** Buildings or portions of buildings or facilities exceeding 30 feet in height above the lowest level of fire department vehicle access shall be provided with approved fire apparatus access roads capable of accommodating fire department aerial apparatus. Overhead utility and power lines shall not be located within the aerial fire apparatus access roadway. Fire apparatus access roads shall have a minimum unobstructed width of 26 feet in the immediate vicinity of any building or portion of building more than 30 feet in height. At least one of the required access routes meeting this condition shall be located within a minimum of 15 feet and a maximum of 30 feet from the building, and shall be positioned parallel to one entire side of the building. (OFC D105) ***Building elevations are not provided at this stage in the project. The above information is provided as an advisory for future development***

6) **FIRE APPARATUS ACCESS ROAD WIDTH AND VERTICAL CLEARANCE:** Fire apparatus access roads shall have an unobstructed width of not less than 20 feet (12 feet for up to two dwelling units and accessory buildings), and an unobstructed vertical clearance of not less than 13 feet 6 inches. Where fire apparatus roadways are less than 26 feet wide, "NO PARKING" signs shall be installed on both sides of the roadway and in turnarounds as needed. Where fire apparatus roadways are more than 28 feet wide but less than 32 feet wide, "NO PARKING" signs shall be installed on one side of the roadway and in turnarounds as

needed. Where fire apparatus roadways are 32 feet wide or more, parking is not restricted. (OFC 503.2.) ***The fire district does not endorse the design concept wherein twenty feet of unobstructed roadway width is not provided.***

7) **FIRE APPARATUS ACCESS ROADS WITH FIRE HYDRANTS:** Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet. (OFC D103.1)

8) **TURNOUTS:** When any fire apparatus access road exceeds 400 feet in length, turnouts 10 feet wide and 30 feet long shall be provided in addition to the required road width and shall be placed no more than 400 feet apart, unless otherwise approved by the fire code official. These distances may be adjusted based on visibility and light distances. (OFC 503.2.2) ***At the point near 400 feet from Edy Rd is near the cul-de-sac/turn around. An additional turn out will not need to be provided.***

9) **NO PARKING SIGNS:** Where fire apparatus roadways are not of sufficient width to accommodate parked vehicles and 20 feet of unobstructed driving surface, "No Parking" signs shall be installed on one or both sides of the roadway and in turnarounds as needed. Roads 26 feet wide or less shall be posted on both sides as a fire lane. Roads more than 26 feet wide to 32 feet wide shall be posted on one side as a fire lane. Signs shall read "NO PARKING - FIRE LANE" and shall be installed with a clear space above grade level of 7 feet. Signs shall be 12 inches wide by 18 inches high and shall have red letters on a white reflective background. (OFC D103.6)

10) **SURFACE AND LOAD CAPACITIES:** Fire apparatus access roads shall be of an all-weather surface that is easily distinguishable from the surrounding area and is capable of supporting not less than 12,500 pounds point load (wheel load) and 60,000 pounds live load (gross vehicle weight). You may need to provide documentation from a registered engineer that the design will be capable of supporting such loading. (OFC D102.1)

11) **TURNING RADIUS:** The inside turning radius and outside turning radius shall be not less than 28 feet and 48 feet respectively, measured from the same center point. (OFC 503.2.4 & 103.3) ***Turning radius shown meet requirements.***

12) **PAINTED CURBS:** Where required, fire apparatus access roadway curbs shall be painted red and marked "NO PARKING FIRE LANE" at approved intervals. Lettering shall have a stroke of not less than one inch wide by six inches high. Lettering shall be white on red background. (OFC 503.3)

13) **SINGLE FAMILY DWELLINGS - REQUIRED FIRE FLOW:** The minimum available fire flow for single family dwellings and duplexes served by a municipal water supply shall be 1,000 gallons per minute. If the structure(s) is (are) 3,600 square feet or larger, the required fire flow shall be determined according to IFC Appendix B. (OFC B105.2) ***Prior to issuance of a building permit, provide evidence of a current fire flow test of the nearest fire hydrant demonstrating available flow at 20 PSI residual pressure.***

14) **FIRE HYDRANTS – ONE- AND TWO-FAMILY DWELLINGS & ACCESSORY STRUCTURES:** Where a portion of a structure is more than 600 feet from a hydrant on a fire apparatus access road, as measured in an approved route around the exterior of the structure(s), on-site fire hydrants and mains shall be provided. (OFC 507.5.1) ***Fire hydrants as shown meets minimum requirements.***

15) **FIRE HYDRANT NUMBER AND DISTRIBUTION:** The minimum number and distribution of fire hydrants available to a building shall not be less than that listed in Appendix C, Table C 105.1. ***Fire hydrants as shown meet minimum requirements.***

16) **REFLECTIVE HYDRANT MARKERS:** Fire hydrant locations shall be identified by the installation of reflective markers. The markers shall be blue. They shall be located adjacent and to the side of the centerline of the access road way that the fire hydrant is located on. In case that there is no center line, then assume a centerline, and place the reflectors accordingly. (OFC 510.1)

17) **PHYSICAL PROTECTION:** Where fire hydrants are subject to impact by a motor vehicle, guard posts, bollards or other approved means of protection shall be provided. (OFC 507.5.6)

18) **CLEAR SPACE AROUND FIRE HYDRANTS:** A 3 foot clear space shall be provided around the circumference of fire hydrants. (OFC 507.5.5)

19) **ACCESS AND FIRE FIGHTING WATER SUPPLY DURING CONSTRUCTION:** Approved fire apparatus access roadways and fire fighting water supplies shall be installed and operational prior to any combustible construction or storage of combustible materials on the site. (OFC 1410.1 & 1412.1)

20) **PREMISES IDENTIFICATION:** Buildings shall have approved address numbers, building numbers or approved building identification placed in a position that is plainly legible and visible from the street or road

fronting the property. These numbers shall contrast with their background. Address numbers shall be Arabic numerals or alphabet numbers. Numbers shall be a minimum of 4 inches high with a ½ inch stroke. (OFC 505.1)

If you have questions or need further clarification, please feel free to contact me at 503-259-1500.

Sincerely,

John Wolff

John Wolff
Deputy Fire Marshal II

Copy:

Clean Water Services

MEMORANDUM

Date: June 15, 2012

To: Brad Kilby, Senior Planner, City of Sherwood

From: Jackie Sue Humphreys, Clean Water Services (the District)

Subject: Renaissance at Rychlick Farm, SUB 12-01PA, 2S130CA00100

Please include the following comments when writing your conditions of approval:

PRIOR TO ANY WORK ON THE SITE AND PLAT RECORDING

A Clean Water Services (the District) Storm Water Connection Permit Authorization must be obtained prior to plat approval and recordation. Application for the District's Permit Authorization must be in accordance with the requirements of the Design and Construction Standards, Resolution and Order No. 07-20, (or current R&O in effect at time of Engineering plan submittal), and is to include:

a. Detailed plans prepared in accordance with Chapter 2, Section 2.04.2.b-l.

b. Detailed grading and erosion control plan. An Erosion Control Permit will be required. Area of Disturbance must be clearly identified on submitted construction plans. If site area and any offsite improvements required for this development exceed one-acre of disturbance, project will require a 1200-CN Erosion Control Permit. If site area and any offsite improvements required for this development exceed five-acres of disturbance, project will require a 1200-C Erosion Control Permit.

c. Detailed plans showing each lot within the development having direct access by gravity to public storm and sanitary sewer.

d. Provisions for water quality in accordance with the requirements of the above named design standards. Water Quality is required for all new development and redevelopment areas per R&O 07-20, Section 4.05.5, Table 4-1. Access shall be provided for maintenance of facility per R&O 07-20, Section 4.02.4.

2550 SW Hillsboro Highway • Hillsboro, Oregon 97123
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e. If use of an existing offsite or regional Water Quality Facility is proposed, it must be clearly identified on plans, showing its location, condition, capacity to treat this site and, any additional improvements and/or upgrades that may be needed to utilize that facility.

f. If private lot LIDA systems proposed, must comply with the current CWS Design and Construction Standards. A private maintenance agreement, for the proposed private lot LIDA systems, needs to be provided to the City for review and acceptance.

g. Show all existing and proposed easements on plans. Any required storm sewer, sanitary sewer, and water quality related easements must be granted to the City.

h. Site contains a "Sensitive Area." Applicant shall comply with the conditions as set forth in the Service Provider Letter No. 12-000392, dated March 29, 2012.

i. Developer may be required to preserve a corridor separating the sensitive area from the impact of development. The corridor must be set aside in a separate tract, not part of any buildable lot and, shall be subject to a "Storm Sewer, Surface Water, Drainage and Detention Easement over its entirety", or its equivalent.

j. Detailed plans showing the sensitive area and corridor delineated, along with restoration and enhancement of the corridor.

k. Provide DSL and Corps of Engineers permits for any work in the wetlands or creek prior to any on site work, including grading and erosion control. Include permit number on cover sheet of plans or provide concurrence with the delineation.

l. Any proposed offsite construction activities will require an update or amendment to the current Service Provider Letter for this project.

CONCLUSION

This Land Use Review does not constitute the District's approval of storm or sanitary sewer compliance to the NPDES permit held by the District. The District, prior to issuance of any connection permits, must approve final construction plans and drainage calculations.

Engineering Department
Land Use Application
Final Review Comments

To:	Brad Kilby, Senior Planner
From:	Jason Waters, Civil Engineer
Project:	SUB 12-01 Renaissance at Rychlick Farm
Date:	June 8, 2012

Engineering staff has reviewed the information provided for the above cited project. Final construction plans will need to meet the standards established by the City of Sherwood and Clean Water Services (CWS), in addition to requirements established by other jurisdictional agencies providing land-use comments. City of Sherwood Engineering Department comments are as follows:

- SW Rychlick Court and SW Nursery Way are 28' standard residential streets per the 2005 TSP and shall match the cross sections depicted in the preliminary subdivision plans dated March 2, 2012 (sheet 10).
- An 8' Public Utility Easement (PUE) shall be established along each side of SW Rychlick Court and Nursery Way per the March 2, 2012 plans.
- SW Edy Road is within the jurisdiction of Washington County and all final design plans and construction activity shall be approved by the County Department of Land Use and Transportation (DLUT). It is the City Engineering Department's understanding that the SW Edy Road cross section shown in the March 2, 2012 plans matches the road section that the City had discuss and tentatively approved with the County, which was documented in an email from Jason Waters to Bob Galati, dated February 16, 2012 (attached).
- A Washington County facilities or right-of-way permit shall be required for any work within the SW Edy Road right-of-way. An Engineering Compliance Agreement is required for all on-site work outside of the Edy Road ROW.
- In addition to the cross section approved by the County for SW Edy Road, the City will require a 7' PUE along the front property line of Tract 'C' and a small portion of Tract 'B', which is depicted on the March 2, 2012 preliminary subdivision plans.
- Prior to submitting initial construction plans to the Engineering Department, the applicant shall provide a revised Traffic Impact Analysis that addresses comments provided by the City traffic engineer (DKS Associates) in their May 4th, 2012 memorandum (attached).
- The applicant shall be responsible for reimbursing the City for "No Parking" signs that are required on one side of the 28' neighborhood street.
- All sanitary, storm and water quality/quantity structures shall meet the standards of Clean Water Services (CWS) and the City of Sherwood.
- Sensitive lands (wetland waterways and vegetated corridors) shall meet the standards of CWS and the requirements of the Service Provider Letter (SPL).
- All water infrastructure shall meet the standards of the City of Sherwood and be reviewed and approved by the Sherwood Water Department (Public Works Department) prior to issuance of an Engineering Compliance Agreement.

- Initial construction plans submitted to the Engineering Department shall show access to the water quality facility on Tract 'A' that meets CWS requirements. Preliminary plans dated March 2, 2012 do not show how the WQF will be accessed by maintenance crews.
- All existing and proposed utilities shall be placed underground.
- City policy requires that prior to grading, a permit is obtained from the Building Department for all grading on the private portion of the site. In addition, an approved grading and erosion control plan is required in order to obtain a Storm Water Connection Permit from Clean Water Services (SWCP).
- All easement (public or private) associated with the development shall be recorded with the County prior to the release of the public improvement plans and transfer to a 2-year maintenance bond.
- Sherwood Resolution 2008-011 and SMC 13.24.100 require the property owner to pay an equitable share of sanitary improvements benefiting the site prior to development of the property.

End of Engineering Land Use Review Comments

DKS

MEMORANDUM

DATE: May 4, 2012

TO: Bob Galati, City of Sherwood
Jason Waters, City of Sherwood

FROM: Chris Maciejewski, P.E., P.T.O.E.
Garth Appanaitis, EIT

SUBJECT: **Sherwood Transportation On-Call Task 6**
Rychlick Farm Subdivision – TIS/TPR Completeness Review 11117-006

Per your request of April 28, 2012, we have reviewed the materials[1] provided for the proposed 26-lot subdivision for the property located at 17806 SW Edy Road. The property, located on the south side of Edy Road, is also within the northeast corner of Area 59. This review focused on determining if the Transportation Impact Study (TIS) and the materials provided to address the Transportation Planning Rule (TPR) are complete. Based on our review, additional materials are required and the analysis is not complete at this time.

Background

The City of Sherwood provided scoping comments for the TIS[2], and noted that a traffic impact statement may be required by Washington County. In addition, the City of Sherwood Transportation System Plan (TSP) includes general requirements for TIS.

TPR (Zone Change) Analysis

The provided analysis indicates that the proposed zone change would reduce the trip potential for the site. Land use and trip generation assumptions are provided. No additional analysis is required for TPR completeness.

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[1] Technical Memorandum: 17806 SW Edy Road – Sherwood (Renaissance at Rychlick Farm) Transportation Impact Study, prepared by Lancaster Engineering, March 9, 2012.
[2] Email from Jason Waters, City of Sherwood, February 28, 2012.

720 SW Washington Street
Suite 500
Portland, OR 97205

(503) 243-3500
(503) 243-1934 fax
www.dksassociates.com

DKS

TIS Analysis

The following additional components and/or clarifications are required before the analysis can be deemed complete:

- Page 5 - A 2% background growth rate was assumed "based on regional traffic trends". Cite the source of these trends.
- Page 6 – Edy Road/Borchers Drive was indicated as a study intersection. Provide functional class (and agency of jurisdiction) for Borchers Drive in discussion of study area facilities. Note that our understanding is that the study intersection of SW Edy Road/SW Borchers Drive is under the jurisdiction of ODOT and therefore Oregon Highway Plan mobility standards would apply.
- Page 7 – The Capacity and Level of Service Summary table indicates that the intersection of Edy Road/Nursery Way was analyzed for 2013 rather than the previously stated 2014. Confirm the year of analysis.
- Page 7 – If the addition of site traffic causes intersection operations to not meet mobility standards or further degrade in cases that would not meet mobility standards with the addition of background traffic growth, potential mitigation needs to be evaluated. The analysis of such potential improvements may also consider the proportional share of the improvement that would be the responsibility of the site.
- Page 8 – Document the methodology used to estimate vehicle queue length. For intersections under ODOT jurisdiction, an analysis methodology consistent with the Analysis Procedures Manual should be used.
- Page 8 – Sight distance measurements, as well as the required distances based on facility characteristics, should both be provided in the TIA.
- Page 9 – Note that observed pedestrian activity in the area was potentially influenced by both time of day (5PM to 6:30 PM) and season/weather. Other times/seasons may potentially have higher pedestrian activity, especially considering the proximity to local schools. Provide additional information regarding pedestrian safety, including:
    - In general, describe how pedestrians from the site will connect to surrounding pedestrian facilities and potential destinations (including transit access).
    - Describe the route used by pedestrians between the proposed site and the nearby schools. This would include identifying gaps in sidewalks or other pedestrian facilities that should be filled to provide safe walking routes to school.
    - If street crossings are required, describe the location and potential treatment (if any) required for a safe crossing.
    - The potential for increased pedestrian/bicycle activity with the development of the proposed site should be considered when considering improvements such as a marked crosswalk.
- Page 9 – Safety within the influence area (including, but not limited to crash history analysis), should be considered for all modes.

DKS

While not specifically listed in the original scoping request, the following items would be helpful in determining the safety for all modes throughout the study area:

- Study intersection queuing (95th-percentile) for all movements, as well as available storage.
- Describe bicycle safety in a similar context to the information requested above for pedestrian safety and routes.

If you have any questions, please feel free to call.

Bob Galati

From: Jason Waters
Sent: Thursday, February 16, 2012 10:33 AM
To: Bob Galati
Cc: Bradley Kilby
Subject: FW: City of Sherwood/Edy Road Subdivision by Renaissance/Pre-App Follow Up
Attachments: 1_County TSP Cross Section_Urban Collector_MODIFIED.pdf; 2_Edy Road_Existing Half Street Improvements_Millers Landing.pdf

Bob,

The County has confirmed that they will support modifying their Urban Collector cross section from a 4' wide to a 4.5' wide planter strip and a 5' wide to a 6' wide sidewalk. See attached pdf (1_County...) for the changes to their TSP exhibit. This cross section will be required only along the lot 27 frontage.

The rest of the developed frontage should match the existing Miller's Landing half street improvements. See attached pdf (2_Edy Road...) for an exhibit of that cross section.

Question: should we obtain a PUE, if so, how wide and where? **My suggestion is to NOT obtain a PUE for the Miller's Landing cross section because there will be an extra 10.5' of ROW between back of walk and the property line, and YES to obtain a 7' wide PUE in front of lot 27 because only 1' of ROW exists between back of walk and the property line.**

Let me know if you agree or disagree and your preference. Once we have a decision on the PUE, Brad can document the ½ street cross sections that will be required.

Thanks,
Jason

Jason Waters
City of Sherwood
503-925-2304
watersj@sherwoodoregon.gov

From: Naomi Vogel [mailto:Naomi_Vogel@co.washington.or.us]
Sent: Thursday, February 16, 2012 8:09 AM
To: Jason Waters
Subject: RE: City of Sherwood/Edy Road Subdivision by Renaissance/Pre-App Follow Up

Jason

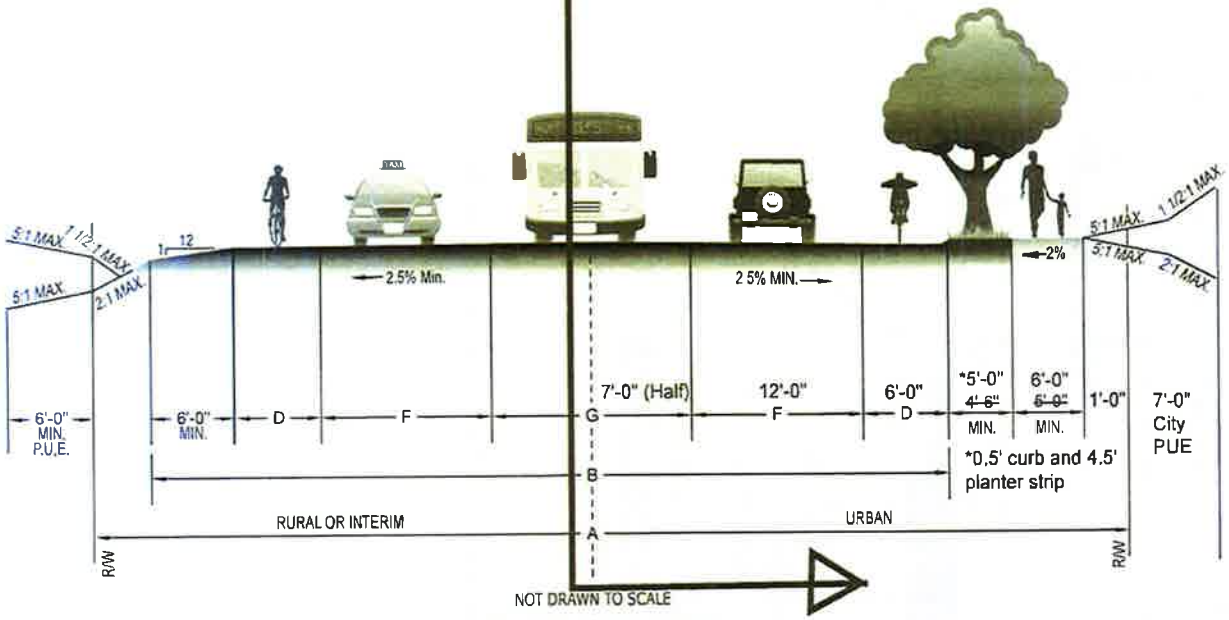
Per our discussion, the County agrees to condition the subject site as indicated below (4.5' landscape strip/6' sidewalk).

Thank you

Naomi

Edy Road Subdivision, February 2012

Collector Road Section



DESIGN SPEED 35 MILES PER HOUR

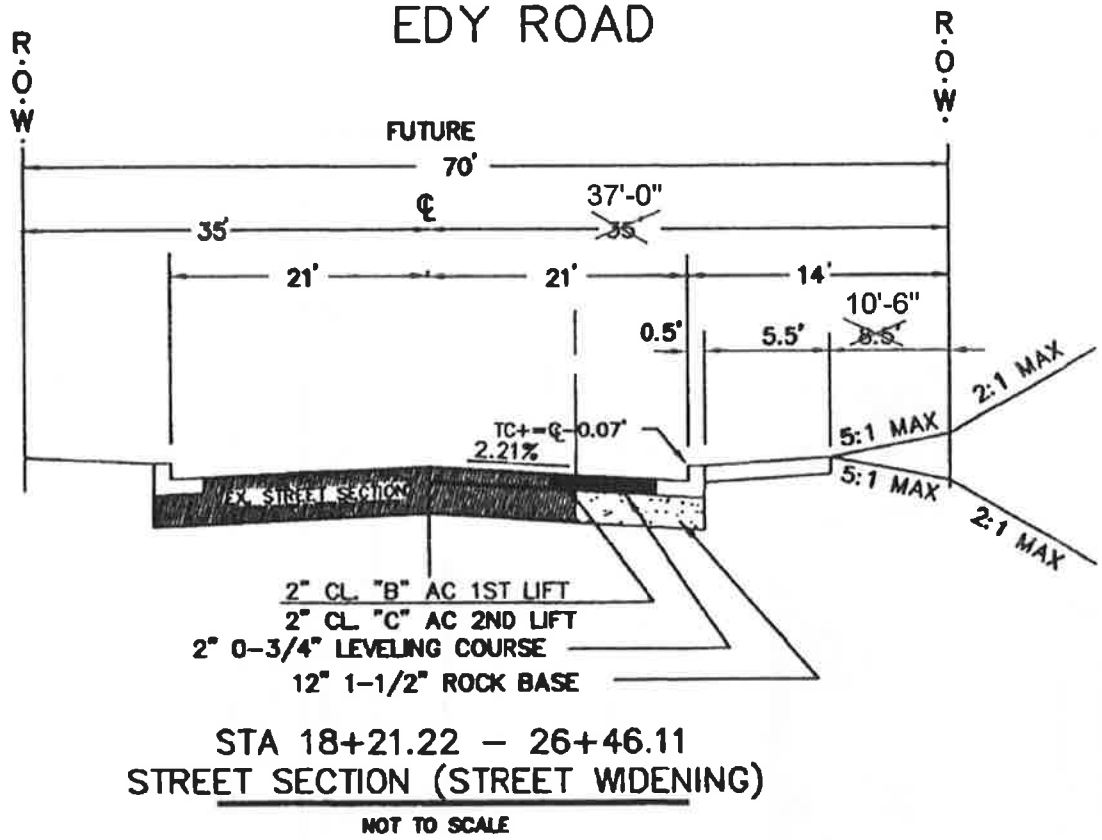
Road Classification	Washington County Designation	Right of Way (Feet)	Paved Width (Feet)	Number of Lanes	Bike Lane/ Paved Shoulder	Travel Lane	Center Turn Lane	Parking Allowed
		A	B		D	F	G	
Collectors	C-1	74	50	3	6	12	14	NONE
	C-2	**	36 *‡	2	6	12	0	NONE

*GRAVEL SHOULDERS AND DITCHES ALLOWED FOR THESE WIDTHS ONLY. STANDARD INTERIM SECTION
** USE ULTIMATE R/W FOR PAVED WIDTH IDENTIFIED IN THE TRANSPORTATION PLAN, IF NOT KNOWN USE 74 FOOT R/W, IN RURAL AREAS 60' OF RIGHT OF WAY IS REQUIRED.
‡ P.U.E.'S REQUIRED OUTSIDE OF R/W IF SHOULDERS AND DITCHES ARE USED.

The applied "Washington County Designation" is determined by the county's transportation plan and the land use decision.
See Appendices C and D for maps of County collector roads.

Collector Road Section
Washington County Exhibit#: 2
Effective Date:

Washington County
Department of Land Use
& Transporation
Engineering Section



STA 18+21.22 – 26+46.11
STREET SECTION (STREET WIDENING)

NOT TO SCALE

EXISTING MILLERS LANDING CROSS SECTION

WASHINGTON COUNTY, OREGON
Department of Land Use and Transportation, Operations & Maintenance Division
1400 SW Walnut Street, MS 51, Hillsboro, Oregon 97123-5625
(503) 846-7623 · FAX: (503) 846-7620

May 29, 2012

Brad Kilby
City of Sherwood
Planning Department
22560 SW Pine Street
Sherwood, OR 97140
No. of pages: 6

RE: **Renaissance @ Rychlick Farm Subdivision**
City File Number: **SUB 12-01/PA 12-02**
Tax Map and Lot Number: **2S1 30CA 100**
Location: **17806 SW Edy Road**



Washington County Department of Land Use and Transportation has reviewed this development application and submits the following comments and required conditions for access to SW Edy Road, a County-maintained Collector (2-3 lanes).

NOTE: A pre-existing driveway which is part of a redeveloping site is subject to County review and conditions for access approval.

BACKGROUNDS/COMMENTS

The applicant is proposing a twenty-six (26) lot subdivision with access to SW Edy Road via a new public street, SW Nursery Way.

1. The minimum access spacing standard for SW Edy Road is **100** feet, measured between access points on each side of the road as required by Resolution and Order 86-95 (R&O 86-95) and Section 501-8.5.B of the Community Development Code.

The proposed new public street connection to SW Edy Road meets the spacing standard required for access to a Collector. To implement the County's access-spacing standards, the applicant will be required to record a motor vehicle access restriction along the subject site's frontage on SW Edy Road.

2. Resolution and Order 86-95 requires a minimum sight distance (measured in feet) equal to ten times the vehicular speed of the road(s) at proposed access location(s). This requirement applies to sight distance in both directions at each access.

   Before the County will permit access to SW Edy Road, the applicant will be required to provide certification from a registered professional engineer that adequate sight distance exists in both directions (or can be obtained pursuant to specific improvements and/or easements).

3. Consistent with statewide pedestrian circulation/linkage goals of the Transportation Planning Rule and the County's R&O 86-95 (road safety requirements), the County normally requires sidewalk installation as a minimum road safety improvement along site frontage of all County-maintained roads. Sidewalks further establish future street profiles, demarcate County or City right-of-way, and address drainage issues. Sidewalk requirements are not generally waived, even when sidewalk is not currently present on neighboring properties. Rather, even non-contiguous sidewalk is considered to provide some measure of pedestrian refuge and ideally, makes possible eventual connection of sidewalks (as surrounding development takes place and is likewise conditioned to provide sidewalk). Additionally, the Washington County Road Design and Construction Standards require provision of adequate drainage along a site's frontage of a county road.

   Construction of a half-street is required along the subject site's frontage of SW Edy Road. The half-street shall be constructed as indicated in the attached email dated February 1, 2012.

   Note: *For half street improvements, an applicant shall provide street lighting consistent with County engineering standards and procedures and the requirements of the electrical utility company providing service to the area. The applicant shall ensure the construction, maintenance and power costs of street light facilities through the annexation and petition for service to an existing County service district for lighting or other funding method approved by the County Engineer.*

4. The statewide Transportation Planning Rule requires provision for adequate transportation facilities in order for development to occur. Accordingly, the County has classified roads and road segments within the County system based upon their function. The current Transportation Plan (regularly updated) contains adequate right-of-way, road width and lane provision standards based upon each roadway's classification. Subject right of way is considered deficient if half-width of the existing right of way does not meet that determined necessary within the County's current transportation plan.

   The applicant is required to dedicate additional right-of-way along the subject site's frontage of SW Edy Road. The applicant shall dedicate a minimum of 37 feet from the centerline of SW Edy Road.

Note: *All private signage and improvements are required to be located outside of the dedicated ROW.*

5. ILLUMINATION- Resolution and Order No. 86-95 requires access points on collectors and arterials to be adequately illuminated. A public street light must be installed at a proposed access to a County-maintained Collector/Arterial if adequate illumination does not currently exist (as determined by the County Engineering Division).

To meet this requirement, a public street light is required to be installed at the proposed access to SW Edy Road. Staff notes additional illumination to County standards may be required with construction of the half-street improvement along the subject site's frontage of SW Edy Road.

REQUIRED CONDITIONS OF APPROVAL

IMPORTANT:

Road improvements required along site frontage shall apply to frontage of all land within the subject site that abuts the County roadway. ***The subject site shall be considered to include:*** *any lot or parcel to be partitioned or otherwise subdivided (regardless of whether it contains existing structures or not);* ***and*** *any contiguous lots or parcels that constitute phases of the currently proposed development.*

If the applicant proposes to develop the project in phases, all County-required frontage improvements must be constructed with the first phase. In addition, off-site improvements ***warranted by*** *the first phase must also be completed with the first phase.*

Refer to the following link to access Washington County Road Design and Construction Standards:

http://www.co.washington.or.us/LUT/Divisions/Engineering/ConsultantResources/road-design-standards.cfm

I. PRIOR TO ISSUANCE OF A GRADING PERMIT/BUILDING PERMIT OR FINAL APPROVAL OF THE SUBDIVISION PLAT BY THE CITY OF SHERWOOD:

A. Submit to Operations Division, Project Planner [Naomi Vogel, 846-7639], a copy of the subdivision plat for review. The following shall be represented on the plat and recorded with the Washington County Survey Division:

1. Dedication of additional right-of-way to provide **37** feet from centerline of SW Edy Road, including any public easements (if required).

2. Provision of a non-access reservation along the subject site's frontage of SW Edy Road.

B. Submit to **Washington County** Public Assurance Staff, 503-846-3843:

1. Completed "Design Option" form.

2. **$5,000.00** Administration Deposit.

NOTE: The Administration Deposit is a cost-recovery account used to pay for County services provided to the developer, including plan review and approval, field inspections, as-built approval, and project administration. The Administration Deposit amount noted above is an estimate of what it will cost to provide these services. If, during the course of the project, the Administration Deposit account is running low, additional funds will be requested to cover the estimated time left on the project (at then-current rates per the adopted Washington County Fee Schedule). If there are any unspent funds at project close out, they will be refunded to the applicant. Any point of contact with County staff can be a chargeable cost. If project plans are not complete or do not comply with County standards and codes, costs will be higher. There is a charge to cover the cost of every field inspection. Costs for enforcement actions will also be charged to the applicant.

3. A copy of the City's Land Use Approval with Conditions, signed and dated.

4. Preliminary certification of adequate sight distance for the public street access to SW Edy Road, in accordance with County Code, prepared and stamped by a registered professional engineer, as well as:

   a. A detailed list of improvements necessary to produce adequate intersection sight distance and easements, if required.

http://www.co.washington.or.us/LUT/Divisions/CurrentPlanning/development-application-forms.cfm

5. Three (3) sets of complete engineering plans for construction of the following public improvements:

   a. Half-street improvement as indicated in the attached email dated February 1, 2012 (Option "2") along the subject site's frontage of SW Edy Road.

   b. Access to SW Edy Road to County standards.

   c. Improvements within the right-of-way as necessary to provide adequate intersection sight distance at SW Edy Road access point, if required.

   d. Closure of all existing driveways to SW Edy Road, other than at the access point approved by Washington County under the current land use application.

   e. Adequate illumination at the site's access to SW Edy Road.

      Note: Adequate illumination shall consist of at least one 200-watt high-pressure sodium cobra head luminaire mounted at a minimum mounting height of 20 feet, on existing utility poles if available. The fixture shall have a medium full-cutoff Type III distribution. The pole shall be within the area defined by the radius returns of the intersection. The fixture shall be oriented at 90 degrees to centerline of the arterial road. If no existing utility poles are available within the intersection area as defined by the radius returns, the developer shall meet the requirements of the Department of Land Use and Transportation Roadway Illumination Standards, latest revision. Illumination within the prescribed intersection area shall be a minimum of 1.5 times the required illumination level

of the roadway classification at the access. The County Traffic Engineer may require illumination in addition to the above-stated minimums.

C. **Obtain** a Washington County **Facility Permit** upon completion of the following:

1. Obtain Engineering Division approval and provide a financial assurance for the construction of the public improvements listed in conditions **I.B.5.**

NOTE: The Public Assurance staff (503-846-3843) will send the required forms to the applicant's representative **after** submittal and approval of items listed under **I.B.**

The Facility Permit *allows construction work within County rights-of-way and permits site access only after the developer first submits plans and obtains Washington County Engineering approval, obtains required grading and erosion control permits, and satisfies various other requirements of Washington County's Assurances Section including but not limited to execution of financial and contractual agreements. This process ensures that the developer accepts responsibility for construction of public improvements, and that improvements are closely monitored, inspected, and built to standard in a timely manner.* ***Access will only be permitted under the required Washington County Facility Permit, and only following submittal and County acceptance of all materials required under the facility permit process.***

II. PRIOR TO ISSUANCE OF FINAL OCCUPANCY OF ANY DWELLING UNIT:

Obtain a **Finaled** Washington County **Facility Permit**, contingent upon the following:

A. The road improvements required in condition **I.B.5.** above shall be completed and accepted by Washington County.

B. Upon completion of necessary improvements, submit **final** certification of adequate sight distance in accordance with County Code, prepared and stamped by a registered professional engineer.

Note: The property owner shall continuously maintain adequate sight distance. This may require the property owner to periodically remove obstructing vegetation from the road right-of-way (and on site).

Requirements identified within this letter are considered by the County to be minimum warranted improvements (and/or analyses) that are necessitated by the proposed development, therefore it is requested that they be conveyed to the applicant within the City's Approval document. Please send a copy of the subsequent Final City Notice of Decision and any appeal information to the County. Thank you for the opportunity to comment. Should you have any questions, please contact me at 503-846-7639.

Naomi Vogel
Associate Planner

From: Jason Waters
Sent: Wednesday, February 01, 2012 3:31 PM
To: 'Naomi Vogel'
Subject: RE: City of Sherwood/Edy Road Subdivision by Renaissance/Pre-App Follow Up

Hi Naomi,

I wanted to close out this email chain regarding ½ street improvements along Edy Road that will be conditioned as part of the proposed Renaissance development project, specifically the planter strip width and sidewalk width.

A 37' dedication (from centerline) will be conditioned. The developer will match the existing ½ street improvements that were installed with the Miller's Landing subdivision in 2000, but will still dedicate 37' along that section. There will be no direct access to Edy Road from proposed Lot 27.

The City will request that the developer transition to the County TSP section (w/ planter strip) after crossing the drainage ravine to the west. The City would like to condition a 4.5' minimum planter strip width (without curb width included). 4' does not promote healthy tree growth, although 4.5' isn't much wider but that is the minimum width the City is comfortable enforcing. City prefers 5' wide planter strips, but has required 4.5' on most projects. The City would like to condition 6' wide detached sidewalks in the TSP section versus 5' shown in the County exhibit because the existing Miller's Landing sidewalks are 6' wide (5.5' plus 0.5' curb) and the minimum per the City's TSP is 6'. **Please confirm if the City can condition a 4.5' wide planter strip (not including 6" wide curb) and a 6' wide sidewalk.**

If those two items are confirmed there are the two possible scenarios for the half-street section within the TSP zone:

1. 7' median, 12' travel lane, 5.5' bike lane, 0.5' curb, 4.5' planter strip, 6' sidewalk, 1.5' shoulder (37' total half street width), plus a 6.5' PUE. *see attached PDFs for this scenario
2. 7' median, 12' travel lane, 6' bike lane, 0.5' curb, 4.5' planter strip, 6' sidewalk, 1' shoulder (37' total half street width), plus a 6' PUE

What is the County's preference, 1 or 2? I'm guessing 2.

Please discuss with County staff for confirmation.

Thanks,
Jason

Jason Waters
City of Sherwood
503-925-2304
watersj@sherwoodoregon.gov

This proposal is the construction of a public school; therefore, this standard does not apply. However, the site has been designed to minimize conflicts with pedestrians and vehicles by providing a separate parent drop-off/pick-up area and bus loading area. Sidewalk connections have been made in multiple locations to Copper Terrance as well as to the existing neighborhood to the east and sidewalk improvements will be provided to the existing neighborhoods on the north side of Edy Road.

FINDING: As explained above, this standard is not applicable.

III. APPLICABLE CODE STANDARDS

1.102.03 Zoning District Boundaries

The Commission shall resolve any dispute over the exact location of a zoning district boundary. In interpreting the location of such boundaries on the Official Plan and Zoning Map, the Commission shall rely on the following guidelines:

A. Unless otherwise indicated, zoning district boundaries are the centerlines of streets, roads, highways, alleys, or such lines extended.

B. Where a boundary line follows or nearly coincides with a section, lot or property ownership line, the boundary shall be construed as following such line.

C. In the event that a dedicated street, road, highway, or alley is vacated by ordinance, the zoning regulations applicable to abutting property shall apply up to the centerline of such rights-of-way.

D. If a right-of-way is vacated in total to one (1) property, the zoning of that property shall apply to the total vacated right-of-way.

As shown on the attached comprehensive plan zoning map, the general location of the school is zoned IP. However, because no streets and lot development has occurred, some level of interpretation is necessary to determine the exact location of the zone boundaries. As identified in "A" above, it is recommended that the Commission determine that the IP zone line to the west shall be the centerline of Copper Terrace. To the north, the IP boundary shall be the centerline of loop road. To the east, the IP zone boundary is the property line and to the south it is the adjusted property line between the School site and Tax Lot 200 on Assessor Map 2S130CC (Fillmore property). This interpretation on the southern boundary is consistent with both the approved concept plan and the adopted Comprehensive Plan when comparing where the boundary line lines up with other streets and off-site property lines.

FINDING: The Commission has the authority to resolve disputes over the exact location of zoning district boundaries. As discussed above, the Commission can determine that the proposed school site and IP zone is consistent with the comprehensive plan zone map and the concept plan, and the zone map will be updated to reflect this clarification upon dedication of the public roads and completion of the lot line adjustments and partition.

A. Chapter 2 - Land Use and Development

The applicable zoning district standards for this site are identified in Section 2.113 (Institutional and Public), and 2.301 (Clear Vision Areas).

2.113 (Institutional and Public) Zoning District

The applicable standards in Section 2.113 include: 2.113.02, 2.113.03, 2.113.04 and 2.113.05. Compliance with these standards is discussed below:

ERICA VAN ESS
21011 BEDSTRAW TERRACE
SHERWOOD, OR 97140
503-625-4859

June 17, 2012

Sherwood Planning Department, City Hall
22560 SW Pine St,
Sherwood, OR 97140

RE: **SUB12-01/PA12-02, Renaissance at Rychlick Farm Subdivision**

To Whom It May Concern:

Please consider this my written testimony in regard to the public hearing for SUB12-01/PA12-02, Renaissance at Rychlick Farm Subdivision. I have lived at my home on Bedstraw Terrace in Sherwood for almost 10 years. I work in Portland, but relocated to Sherwood in order to live in a community that offers a family-friendly environment surrounded by farmland, forests and wildlife. Although I live in a neighborhood setting, large, established trees currently surround the back yard of my home. These trees were a strong selling point for me because they provide privacy, shade and homes for the surrounding wildlife.

Recently, I learned about the sale of the property directly behind my home. In reviewing the development plans, I am angry and saddened to learn that the majority of the large conifers will be removed and will be replaced by only a couple new trees on Lot 1 directly behind my home, as well as along the entire property line from Lots 2-11. In addition, there are also beautiful, established rhododendrons that would be removed as well. I have several concerns regarding this plan:

- If all of the evergreen foliage is removed as planned, there will be very little privacy between my home and the new house being built in Lot 1, which neither myself nor my new neighbor will enjoy
- There are owls, raccoons, birds and frogs that live in and around the area that would be disturbed once their habitat is destroyed
- The yard has become a sanctuary for my autistic sister, who enjoys sitting in the shady back yard listening to and watching the birds in the trees
- We would no longer enjoy afternoon shade, causing my back patio to heat up significantly in the summer and eliminating the ability for my sister to enjoy her back yard
- Traffic and other noise would be increased, as there would no longer be a buffer to reduce noise disturbances

Based on these concerns, I request that a revision to the development plan be considered. I request that a setback be required along the property line, ensuring that any existing evergreen foliage remain if located within 10 feet of the property line. This change would allow development to occur but reduce disturbance to existing homeowners and wildlife. In addition, I believe that like me, home buyers for these new homes will be pleased to see that established trees exist in their new neighborhood.

I fully understand that Sherwood is a growing community because it is a wonderful place to raise a family, neighbors know and care about each other and the community protects the beautiful environment we are surrounded by. Sherwood is such a great area, in part, because it can feel a world away from the city. This feeling is accentuated by the large, established, beautiful patches of wilderness throughout the town making it a special place and I hope that considerations can be made to ensure that this is considered as the community expands and grows.

Thank you for your consideration,

Erica Van Ess

Erica Van Ess
Sherwood homeowner

June 22, 2012

Planning Department
City Hall
22560 SW Pine Street
Sherwood, OR 97140

RE: Renaissance at Rychlick Farm Subdivision

To Whom It May Concern,

Our names are Mike and Kim Fletcher and we live at 21235 SW Ladyfern Dr., lot 31, of Miller's Landing, in Sherwood. We are writing you today to voice our concerns over the change in zoning as part of the proposed Renaissance at Rychlick Farm Subdivision. We have several concerns with regards to these plans that we would like to make part of the public hearing.

Our first concern with regards to the proposed subdivision and change of zoning revolves around the school and added congestion to the area. We are parents to two children, one who attends Edy Ridge Elementary and one who will be attending in two years. The proposed subdivision has plans for outlets to both Edy Rd. and SW Copper Terrace. As parents who drop off their child and frequent this area, we have seen first hand the congestion the area experiences during pickup and drop-off times at the school. Adding homes in this particular area will only add to this problem. The proposed outlet road onto Edy Rd. is especially concerning because of the placement. There is a slight rise in the road at the planned area, which makes navigating a turn into our development, Miller's Landing, tricky at times

Our second concern is with regards to our further loss of green space and potential loss of home value. We moved to Sherwood in 2001 and have grown to love and adore this community. We chose Sherwood because of the small town feel and sense of rural living tucked so close to the Portland Metro area. When we moved into our home we had an abundant green space to the rear of our property, which was one of the main factors for us in purchasing our home. We have lost a majority of this space to the development of the school and now it appears we might be losing what remains. The green space behind our home not only provides a buffer for us from the school and it's activities but it also provides shade and a sense of privacy. The homes in our development our extremely close together, so the space to the rear of our home gives us the feeling of a bigger space when in reality our lot is small. Like everyone else, we have lost value in our home over the last few years and we are extremely concerned that the loss of green space to the rear of our property would in turn cost us more value.

We recognize that the space behind our home is a prime location for development, but does it have to be additional homes? If we are to lose the green space, it could be for better uses, such as parks, recreational areas, or even school expansion. We realize Sherwood is a rapidly growing area, which is

why we need to conserve some green space in our neighborhoods. Thanks you for taking the time to consider our concerns. It is important for us as citizens of Sherwood to have a voice in matters that affect us directly.

Sincerely,

Mike + Kim Fletcher

Mike and Kim Fletcher

Phillip and Heather Riggs
21219 SW Ladyfern Drive
Sherwood, OR 97140
503-925-1351

June 25, 2012

Planning Department
City Hall
22560 SW Pine Street
Sherwood, OR 97140

Re: Case File No. SUB 12-01/PA 12-02

To whom it may concern,

We are jointly opposed to the amended zoning of tax map/lot 2S130CA Tax Lot 100.

The proposed rezoning area lies directly behind our property and would mean losing the privacy and that was a large part of the reason we purchased this home in 2007 with the current zoning. With the market the way it is, our home has already lost value, but to take away the green space and put in brand new larger homes in such close proximity will make it much more difficult for our home to recover it's value. It is our understanding that with the last expansion of the urban growth boundary we were guaranteed the green space.

Another concern with such a large development going in at this location is the traffic situation on Edy Road. Visibility to the west is already difficult when turning from SW Bedstraw onto Edy Road and adding another street in such close proximity would only make this problem worse. It also seems to pose a hazard for the kids walking to school who would need to walk past these streets where cars already have a hard time seeing over the dips in the road.

Thank you for your time and consideration in this matter.

Respectfully,

Phillip and Heather Riggs

Heather Riggs