City of West Linn
22500 Salamo Road
West Linn, OR 97068

STAFF REPORT
FOR THE PLANNING COMMISSION

FILE NUMBER:	PUD-16-01/SUB-16-01/ WAP-16-05/VAR-16-01/ VAR-16-02/WRG-16-01
HEARING DATE:	September 21, 2016
REQUEST:	50-lot Planned Unit Development (PUD), Subdivision, Water Resource Area Permit, Class II Variances (2), and Habitat Conservation Area (HCA) permit including Habitat Conservation Area Boundary Verification at 1270 Rosemont Road.
APPROVAL CRITERIA:	Community Development Code (CDC) Chapter 11, Single-Family Residential, R 10; Chapter 85, Land Division General Provisions; Chapter 32, Water Resource Area Protection; Chapter 24: PUD; Chapter 75: Class II Variances, Chapter 28: Willamette and Tualatin River Protection (WRG).
STAFF REPORT PREPARED BY:	Peter Spir, Associate Planner

Planning Manager's Initials AB Development Review Engineer's Initials KQL

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GENERAL INFORMATION

OWNER:	Terwilliger Plaza Foundation Holdings LLC 2545 SW Terwilliger Boulevard Portland, OR 97201
APPLICANT:	ICON Construction and Development LLC 1980 Willamette Falls Drive West Linn, OR 97068 Contact: Mark Handris
CONSULTANT:	Rick Givens 18680 Sunblaze Drive Oregon City, OR 97045
SITE LOCATION:	1270 Rosemont Road
LEGAL DESCRIPTION:	Clackamas County Assessor's Map 2S1E26A tax lot 1100 and 2S1E26D tax lot 300
SITE SIZE:	15.14 acres
ZONING:	R-10, Single-Family Residential, (10,000 square foot minimum lot size for single family detached homes)
COMP PLAN DESIGNATION:	Low Density Residential
120-DAY PERIOD:	This application became complete on July 1, 2016. The 120-day maximum application-processing period ends on October 28, 2016. The applicant has provided a 21-day waiver which extends the end date to November 15, 2016.
PUBLIC NOTICE:	Public notice was mailed to the all neighborhood associations and affected property owners on August 31, 2016. The property was posted with a notice sign on September 1, 2016. The notice was published in the West Linn Tidings on September 8, 2016. The notice requirements of CDC Chapter 99 have been met. In addition, the application was posted on the City's website August 31, 2016.

EXECUTIVE SUMMARY

The applicant seeks approval of an application for Subdivision Preliminary Plat for the development of 50 residential lots ("Tanner Ridge at Rosemont") on a 15.14 acre site. The zoning is R-10 (10,000 square foot minimum lot size). Because the site is constrained by the presence of Tanner Creek, wetlands, Habitat Conservation Areas (HCAs) and stands of significant trees, the applicant is proposing a Planned Unit Development (PUD) to allow those constrained areas to be set aside and protected in two tracts totaling 3.63 acres, while transferring the allowable density to other portions of the site. To facilitate the density transfer, PUD provisions allow smaller lot sizes despite the underlying R-10 zone designation. In this application, lots will range from 5,885 square feet to 19,426 square feet. The majority of lots exceed 7,300 square feet. The lots will be occupied by single family detached homes.

The properties to the west and south are zoned R-3 (3,000 square foot minimum lot size) and developed with attached and detached townhomes. An undeveloped City owned parcel lies to the south east across Parker Road. To the east, the zoning is R-7 (7,000 square foot minimum lots size) and R-10 and developed with single family residential homes. To the north, the zoning is R-10 and developed with single family residential homes.

Three streets abut the property: Rosemont Road to the north, Parker Road to the south, and Roxbury Drive to the east. The property is within the Parker Crest Neighborhood Association boundary.

From the site's highpoint along Rosemont Road, the land slopes downhill towards Parker Road. The west half of the site comprises stands of significant trees. The southern edge of the site comprises Tanner Creek and associated wetlands plus Habitat Conservation Areas (HCAs). The east half comprises a grassy 12 percent slope. The trees have been cataloged (number, type, size and condition) by an arborist and those findings have been reviewed by the City's Arborist. Trees considered significant by the City Arborist total 101. The applicant proposes to save 73 of the significant trees (72 percent of the significant trees). The largest stand of conifers, near the intersection of Salamo and Rosemont Road, is to be protected by Open Space Tract A.

The applicant's wetland specialist, Schott and Associates provided a Jurisdictional Wetland Delineation. The delineation was reviewed by Oregon Department of State Lands (DSL) and received concurrance (page 363). The applicant is proposing to use the Alternate Review Process of CDC 32.070 and 32.080 (Schott and Associates, March 2016 report (page 337)) to reduce the WRA setbacks consistent with Schott and Associates assessment of the function and value of the WRA. The applicant is also requesting a "Verification of Metro Habitat Protection Map Boundaries" per CDC 28.070 which will adjust the HCA boundary in the areas of lots 35, 23, 24 and 25. This process relies on findings also submitted by Schott and Associates (August 25, 2016 (page 358)).

The applicant provided a geotechnical engineering report by GeoPacific dated July 20, 2016 (page 159).

Lancaster Engineering provided a Traffic Impact Study (March 9, 2016 (page 240)) and made the following summary finding:

"The trip generation calculations show that the proposed 52-lot subdivision (staff note: the Traffic Study was based on 52 lots, not 50 lots as proposed) *is projected to generate up to 39 site trips during the morning peak hour, 52 site trips during the evening peak hour, and up to a total of 496 daily trips.* (50 lots yields 476 daily trips)

Based on the results of the operational analysis, all study intersections are currently operating acceptably per City of West Linn standards and are projected to continue operating acceptably through year 2018 either with or without the addition of site trips resulting from the proposed development. No operational mitigation is necessary or recommended.

A detailed examination of the most recent five years of crash reports at the study intersections shows no significant safety concerns and no trends that are indicative of design deficiencies. No safety mitigations are recommended.

Based on the detailed analysis, adequate sight distance is available for the proposed site accesses along Rosemont Road and Parker Road. No sight distance mitigation is necessary or recommended.

The intersection of Rosemont Road at Salamo Road/Santa Anita Drive is projected to operate at LOS B during the morning and evening peak hours under all analysis scenarios through year 2018."

The report was reviewed by DKS Engineering who work for the City of West Linn to provide an independant third party review. DKS agreed with the study's findings.

The applicable approval criteria include:

- Chapter 11, R-10, Single-Family Residential Detached;
- Chapter 85, Land Division General Provisions;
- Chapter 28, Willamette and Tualatin River Protection Area permit (WRG)
- Chapter 24, Planned Unit Development (PUD)
- Chapter 32, Water Resource Area permit (WRA)
- Chapter 75, Class II Variance (2)

Public comments: As of the publication date of this report, staff had received no public comments. (A neighborhood meeting was held per CDC 99.038 on March 16, 2016. Summarized public comments from that meeting are found in the applicant's submittal (page 145).)

RECOMMENDATION

Staff recommends approval of application PUD-16-01/SUB-16-01/ WAP-16-05/VAR-16-01/ VAR-16-02/WRG-16-01, based on: 1) the findings submitted by the applicant, which are incorporated by this reference, 2) supplementary staff findings included in the Addendum below, and 3) the addition of conditions of approval below. With these findings, the applicable approval criteria are met. The conditions are as follows:

1. **Site Plan. With the exception of modifications as required by these conditions and the HCA Boundary change, the project shall conform to the Tentative Plan (June 2016), the Tree Preservation Plan, the Habitat Conservation Areas, Slope Analysis, Wetlands Plan as identified in Sheets 1/1 to 1/5 respectively and the Utility Plan, Street Profiles and Concept Plan identified as Sheets 1/3 to 3/3 respectively.**

2. **Engineering Standards. All public improvements and facilities associated with public improvements including street improvements, utilities, grading, onsite storm water design, street lighting, easement and easement locations are subject to the City Engineer's review, modification, and approval. These must be designed, constructed and completed prior to final plat approval.**
   a. **Public Works may coordinate with the applicant to complete voluntary additional off-site improvements along Rosemont Road.**
   b. **The applicant shall replace the existing 8" ductile iron water pipe along Rosemont Road from Salamo Road to Wildrose Drive with a 12" ductile iron water pipe per the City Water Master Plan.**

3. **Fire Flow. Prior to approval of the final plat, the applicant shall perform a fire flow test and submit a letter from Tualatin Valley Fire and Rescue showing adequate fire flow is present.**

4. **Significant Tree Mitigation. Prior to approval of the final plat, the applicant will mitigate for the removal of significant trees by planting 402 two-inch caliper trees on the project site. Trees which are not able to be planted on site will be mitigated for either in off-site plantings in a location chosen by the City's arborist or the applicant will pay a fee in lieu to the City for trees which cannot be planted on site.**

5. **Access Restriction. Lots 1-6 and lots 40-50 shall have 10 foot wide "Access Restricted" easements established along their north lot lines adjacent to the Rosemont Road ROW which will state that these lots are prohibited from direct access to Rosemont Road.**

6. **Access Easement.** Mutual access and maintenance easements covering the joint driveways for lots 39 and 40 and the joint driveway for lots 9 and 10 shall be recorded to assure access to the closest public street for all users of the private driveway.

7. **Trail.** The trail, identified on the Tentative Plan as a "hog fuel path", shall be constructed at least 30 feet from Tanner Creek and the delineated wetland boundary except at the creek crossing.

8. **Tract A and B Dedication.** The final plat will show the dedication of Tracts A and B to the City for park. All necessary procedures for dedication to the City shall be completed prior to recording the final plat including the removal of all invasive plants in these tracts and re-vegetation with native plants, trees and shrubs.

9. **Underground Existing Utilities.** The applicant shall coordinate with PGE and associated franchised utility companies to place all existing overhead utilities along Rosemont Road and Parker Road underground for their frontage.

10. **HCA Boundary.** This approval is subject to final approval of the HCA Map boundary, which is subject to the process in CDC 28.070. The applicant shall provide a map with its areas verified outside of the HCA Map boundary.

11. **Setbacks.** Setbacks shall be five feet for the side yard, 10 feet for side street, 15 feet for front yard and rear yard, (front and rear porches may encroach forward another five feet). Setback areas contiguous to the perimeter of the project, excluding ROW, shall be the same as those required by the R-10 zone. The setbacks provisions of CDC Chapter 34 and 38 shall apply. The maximum lot coverage is 45 percent. Unless modified by these provisions, all other standards of the R-10 zone shall apply.

ADDENDUM

PLANNING COMMISSION STAFF REPORT

September 21, 2016

STAFF EVALUATION OF THE PROPOSAL'S COMPLIANCE WITH APPLICABLE CODE CRITERIA

CHAPTER 11: SINGLE-FAMILY RESIDENTIAL DETACHED, R-10

11.030 PERMITTED USES

The following are uses permitted outright in this zoning district

1. Single-family detached residential unit.
2. (....)

Staff Finding 1: The applicant's subdivision proposes to accommodate 50 single-family detached homes. Per CDC 11.030(1), single family detached homes are permitted outright in this zone. This criterion is met.

11.070 DIMENSIONAL REQUIREMENTS, USES PERMITTED OUTRIGHT AND USES PERMITTED UNDER PRESCRIBED CONDITIONS

Except as may be otherwise provided by the provisions of this code, the following are the requirements for uses within this zone:

1. The minimum lot size shall be 10,000 square feet for a single-family detached unit.
2. The minimum front lot line length or the minimum lot width at the front lot line shall be 35 feet.
3. The average minimum lot width shall be 50 feet.
4. Repealed by Ord. 1622.
5. Except as specified in CDC 25.070(C)(1) through (4) for the Willamette Historic District, the minimum yard dimensions or minimum building setback area from the lot line shall be:

a. For the front yard, 20 feet; except for steeply sloped lots where the provisions of CDC 41.010 shall apply.
b. For an interior side yard, seven and one-half feet.
c. For a side yard abutting a street, 15 feet.
d. For a rear yard, 20 feet.

6. The maximum building height shall be 35 feet, except for steeply sloped lots in which case the provisions of Chapter 41 CDC shall apply.
7. The maximum lot coverage shall be 35 percent.

8. The minimum width of an accessway to a lot which does not abut a street or a flag lot shall be 15 feet.
9. The floor area ratio shall be 0.45. (....)
10. The sidewall provisions of Chapter 43 CDC shall apply.

Staff Finding 2: Regarding 11.070(1), the minimum lot size may be modified using the PUD provisions (24.180(A)) which allow lot sizes under 10,000 square feet so long as the total number of lots does not exceed the allowable density. (The allowable density is 51.84 lots.) Lots will range from 5,885 square feet to 19,426 square feet. The majority of lots exceed 7,300 square feet. Regarding 11.070(2), all lots have front lot line dimensions and average widths greater than the required 35 feet. Regarding 11.070(3) all lots meet the average minimum lot width of 50 feet.

Regarding 11.070(5) relating to front side and rear setbacks, the provisions of 24.180(D) allow the applicant to establish his own setbacks or use default setbacks. The applicant has not proposed any alternate setbacks therefore the setbacks of 24.180(D) will apply. These setbacks are declared in Condition of Approval 11. Please note that 24.180(D) (1) requires that the (rear) setbacks all perimeter lots contiguous to homes on Roxbury Drive and Dillon Drive must meet the underlying zone setbacks.

Regarding 11.070(6) relating to the maximum building height. PUDs are limited to the allowable height of the base zone which for R-10 is 35 feet. Regarding 11.070(7), the PUD provisions of 24.180 allow 45 percent lot coverage. Regarding 11.070(8) relating to the minimum width of an accessway to a lot which does not abut a street or a flag lot, the 20-foot wide shared private access drive for Lots 13-15 exceeds the minimum accessway width of 15 feet. Regarding 11.070(9) relating to the floor area ratio, all lots are required to meet the .45 standards of the R-10 zone. Regarding 11.070(10) relating to the sidewall provisions of Chapter 43 shall be applicable to homes built in this subdivision. At such time that building permits are applied for, compliance with these provisions will be determined. These criteria are met.

Regarding 14.090, Chapters 34: "Accessory Structures" and Chapter 35: "Temporary Structures" do not apply since no accessory or temporary structures are proposed. Chapters 38: "Additional Yard Area", Chapter 40: "Building Height", Chapter 41: "Structures on Steep Lots", and Chapter 42: "Clear Vision Areas" apply to structures and would only be applicable at such time that building permits are applied for. Chapter 44: "Fences" will only apply at such time that fences are proposed to be built. Chapter 46: "Parking" requires one off street parking space per home. This criteria will be met at such time that a building permit is applied for. Chapter 48: "Access" is addressed in Staff Findings No. 41-61. Chapter 52: "Signs" does not apply since no signs are proposed. Chapter 54: "Landscaping" does not apply per Chapter 54.020(E) (1-3) which states that landscaping requirements only apply to non-residential uses and all non-single family residential uses.

CHAPTER 85: LAND DIVISION

85.200 APPROVAL CRITERIA
No tentative subdivision or partition plan shall be approved unless adequate public facilities will be available to provide service to the partition or subdivision area prior to final plat approval and the Planning Commission or Planning Director, as applicable, finds that the following standards have been satisfied, or can be satisfied by condition of approval.

Staff Finding 3: Addressing 85.200 and what constitutes "Adequate public facilities", CDC Chapter 2 provides a definition:

***"Adequate public facilities.** Public facilities that must be adequate for an application for new construction, remodeling, or replacement of an existing structure to be approved are transportation, water, sewer, and storm sewer facilities. To be adequate, on-site and adjacent facilities must meet City standards, and off-site facilities must have sufficient capacity to (1) meet all existing demands, (2) satisfy the projected demands from projects with existing land use approvals, plus the additional demand created by the application, and (3) remain compliant with all applicable standards.*

For purposes of evaluating discretionary permits in situations where the level-of-service or volume-to-capacity performance standard for an affected City or State roadway is currently failing or projected to fail to meet the standard, and an improvement project is not programmed, the approval criteria shall be that the development avoids further degradation of the affected transportation facility. Mitigation must be provided to bring the facility performance standard to existing conditions at the time of occupancy."

85.200(A) (22) below, explains how appropriate mitigation can meet the approval criteria of "Adequate Public Facilities".

"85.200 (A) (22). Based upon the determination of the City Manager or the Manager's designee, the applicant shall construct or cause to be constructed, or contribute a proportionate share of the costs, for all necessary off-site improvements identified by the transportation analysis commissioned to address CDC 85.170(B)(2) that are required to mitigate impacts from the proposed subdivision. The proportionate share of the costs shall be determined by the City Manager or Manager's designee, who shall assume that the proposed subdivision provides improvements in rough proportion to identified impacts of the subdivision. Off-site transportation improvements will include bicycle and pedestrian improvements as identified in the adopted City of West Linn TSP."

In the event that the Planning Commission can make findings to justify off-site improvements, based on accepted engineering studies, the criteria explained in the definition above and further explained in 85.200(A) (22) makes clear that mitigation must be allowed for.

Lancaster Engineering provided a Traffic Impact Study (March 9, 2016 (page 240)) and offered the following summary findings:

"The trip generation calculations show that the proposed 52-lot subdivision (staff note: the Traffic Study was based on 52 lots, not 50 lots as proposed) *is projected to generate up to 39 site trips during the morning peak hour, 52 site trips during the evening peak hour, and up to a total of 496 daily trips.* (50 lots yields 476 daily trips)

Based on the results of the operational analysis, all study intersections are currently operating acceptably per City of West Linn standards and are projected to continue operating acceptably through year 2018 either with or without the addition of site trips resulting from the proposed development. No operational mitigation is necessary or recommended.

A detailed examination of the most recent five years of crash reports at the study intersections shows no significant safety concerns and no trends that are indicative of design deficiencies. No safety mitigations are recommended.

Based on the detailed analysis, adequate sight distance is available for the proposed site accesses along Rosemont Road and Parker Road. No sight distance mitigation is necessary or recommended.

The intersection of Rosemont Road at Salamo Road/Santa Anita Drive is projected to operate at LOS B during the morning and evening peak hours under all analysis scenarios through year 2018."

The study was reviewed by DKS Engineering who work for the City of West Linn to provide an independant third party review. In the DKS review, dated August 31, 2016, (page 402) DKS found, *"Transportation facilities are sized to provide adequate capacity for the proposed development and mobility standards are met. All roadways analyzed by the proposed development would continue to meet mobility (level-of-service) standards and would not require additional mitigation."*

The City's Development Engineer agrees with these findings, both by DKS and Lancaster Engineering, regarding the adequacy of on-site street design and the capacity of neighboring streets.

Regarding other public infrastructure; specifically, water and sewer supply, the City Engineer has confirmed that with the completion of the water line improvement along Rosemont Road, as per the Condition of Approval 2(b), the water system will have sufficient water volume and pressure to serve the subdivision. The City Engineer has also confirmed the sufficient capacity of the sanitary system and sewage treatment facility. Storm water facilities are addressed by the applicant's engineered on-site storm water facility. All utilities were found to meet City of West Linn Standards.

Staff finds that adequate public facilities are in place and no off-site improvements or mitigation is required or justified. (Half street improvements in the ROW contiguous to the site are not considered off-site improvements.) The criteria is met.

(The City has had preliminary discussions with the applicant about voluntarily installing off-site improvements including sidewalk, curb, pavement, and storm drainage along the north side Rosemont Road. The voluntary aspect recognizes there is no nexus between this project and improvements and there is no approval criteria that obligates the applicant to make these improvements. If this proposal is agreeable to both parties, the applicant will construct those improvements per condition of approval 11 and the City will reimburse the off-site cost.)

A. Streets.
1. General. The location, width and grade of streets shall be considered in their relation to existing and planned streets, to the generalized or reasonable layout of streets on adjacent undeveloped parcels, to topographical conditions, to public convenience and safety, to accommodate various types of transportation (automobile, bus, pedestrian, bicycle), and to the proposed use of land to be served by the streets.
(....)

Staff Finding 4: Meadowlark Drive provides for a connecting north to south road between Rosemont Road and Parker Road. Meanwhile, Rosemont Summit 2 subdivision to the east was constructed with Roxbury Drive stubbing out with the intent that it be extended through this subdivision. This application makes that extension in the form of Heron Drive.

Meadowlark Drive provides a "north to south connector" between Rosemont Road and Parker Road, which meets the connectivity standards of 85.200(A) (1).

Heron Court's cul de sac design does not provide a connective road due to the topographic conditions and natural features of this site. Specifically, the southwest portion of the site is constrained by a WRA while a significant tree stand to the west makes a connecting street (non-cul de sac design) impossible in those directions.

Connecting Heron Court north to Rosemont Road, which is an arterial, confronts three obstacles. First, the connection would diminish that arterial's function which is best served by minimizing access onto it.

Second, staff finds that connecting Heron Court north to Rosemont Road would create a 500 foot long block in the direction of Meadowlark Drive which would not meet the TSP intersection section spacing standard of 600 feet per Table 8-4 of the TSP and thus require another variance.

Third, the existing grades between Heron Court's cul de sac and Rosemont Road do not allow a slope under 15 percent which is maximum local street grade. For those reasons, a cul de sac is appropriate. Staff also notes that TVFR supports the cul de sac design with a radius sufficient for emergency vehicles.

Internal street widths of 32 feet are consistent with local street standards (see Staff Finding 6). Six foot wide sidewalks and planter strips are also proposed to meet the dimensional requirements of this chapter. This criterion is met.

(The City has had preliminary discussions with the applicant about voluntarily installing off-site improvements along Rosemont Road. (See Condition of Approval 2(a))

2. Right-of-way and roadway widths.

Street Classification	*Right of Way (from West Linn TSP)*
(....)	
Collector	*48-72 feet*
Local Street	*48-56 feet*
(....)	

Additional rights-of-way for slopes may be required. Sidewalks shall not be located outside of the right-of-way unless to accommodate significant natural features or trees.

Staff Finding 5: The interior street is classified as a local street. Local streets require a ROW width ranging from 48-56 feet. The proposed right of way width is 56 feet. This ROW width can accommodate sidewalk and planter strips with street trees on both sides. The criteria is met.

3. Street widths. Street widths shall depend upon which classification of street is proposed. The classifications and required cross sections are established in Chapter 8 of the adopted TSP.
(...)

Staff Finding 6: The applicant proposes a curb to curb street width of 32 feet. This exceeds the minimum required width for a local street per the adopted Transportation System Plan (TSP). (Table 8-1 of the TSP requires two 12 foot wide travel lanes for local streets.) The Heron Court cul de sac exceeds the minimum cul de sac radius in order to meet the TVFR turnaround standard. Therefore, the criteria is met.

4. The decision-making body shall consider the City Engineer's recommendations on the desired right-of-way width, pavement width and street geometry of the various street types within the subdivision after consideration by the City Engineer of the following criteria:
a. The type of road as set forth in the Transportation Master Plan.
(...)

Staff Finding 7: The City's Development Engineer has reviewed the proposal finds the proposed ROW and street widths to be consistent with the City standards. The criteria is met.

5. Additionally, when determining appropriate street width, the decision-making body shall consider the following criteria:
a. When a local street is the only street serving a residential area and is expected to carry more than the normal local street traffic load, the designs with two travel and one parking lane are appropriate.
b. Streets intended to serve as signed but unstriped bike routes should have the travel lane widened by two feet.
c. Collectors should have two travel lanes and may accommodate some parking. Bike routes are appropriate.
d. Arterials should have two travel lanes. On-street parking is not allowed unless part of a Street Master Plan. Bike lanes are required as directed by the Parks Master Plan and Transportation Master Plan.

Staff Finding 8: Meadowlark Drive, Heron Court and Heron Drive are local streets. They provide local access to the 50 lots within this subdivision. Meadowlark Drive also provides connectivity between Parker and Rosemont Roads. The 32 foot width can accommodate two travel lanes and one parking lane. The remaining criteria does not apply since these streets are not collectors or arterials nor are any bike lanes required. The criteria is met.

6. Reserve strips. Reserve strips or street plugs controlling the access to streets are not permitted unless owned by the City.

Staff Finding 9: No reserve strips are proposed so this criterion does not apply.

7. Alignment. All streets other than local streets or cul-de-sacs, as far as practical, shall be in alignment with existing streets by continuations of the centerlines thereof. The staggering of street alignments resulting in "T" intersections shall, wherever practical, leave a minimum distance of 200 feet between the centerlines of streets having approximately the same direction and otherwise shall not be less than 100 feet.

Staff Finding 10: Heron Drive continues the alignment of the existing Roxbury Drive. Meadowlark Drive intersections on Parker and Rosemont Road constitute T-intersections. There is 230 feet between the centerlines of Meadowlark Drive and Dillon Lane on Parker Road. There is 650 feet between the centerlines of Meadowlark Drive and Wild Rose Drive on Rosemont Road. These distances exceed the minimum standard of 200 feet. This criterion is met.

8. Future extension of streets. Where necessary to give access to or permit a satisfactory future subdivision of adjoining land, streets shall be extended to the boundary of the subdivision and the resulting dead-end streets may be approved without turnarounds. (Temporary *turnarounds built to Fire Department standards are required when the dead-end street is over 100 feet long.)*

Staff Finding 11: There is no need to extend or stub out streets from this subdivision for the purpose of future subdivisions since all surrounding properties are fully built. This criterion is met.

9. Intersection angles. Streets shall be laid out to intersect angles as near to right angles as practical, except where topography requires lesser angles, but in no case less than 60 degrees unless a special intersection design is approved....

Staff Finding 12: All streets have right angle intersections. The criterion is met.

10. Additional right-of-way for existing streets. Wherever existing street rights-of-way adjacent to or within a tract are of inadequate widths based upon the standards of this chapter, additional right-of-way shall be provided at the time of subdivision or partition.

Staff Finding 13: Rosemont's 60 foot ROW is sufficient as is Parker's 60-80 foot ROW. No additional ROW dedication is needed. The criterion is met.

11. Cul-de-sacs.

a. New cul-de-sacs and other closed-end streets (not including stub streets intended to be connected) on sites containing less than five acres, or sites accommodating uses other than residential or mixed use development, are not allowed unless the applicant demonstrates that there is no feasible alternative due to:
1) Physical constraints (e.g., existing development, the size or shape of the site, steep topography, or a fish bearing stream or wetland protected by Chapter 32 CDC), or
(...)

Staff Finding 14: Heron Court terminates in a cul de sac. The cul de sac is appropriate since extending the street west to connect with the Rosemont-Salamo Road intersection would impact a significant tree stand as well as compromise the function of that intersection. Extending south would take the street into a wetland; also, the Parker ROW in this area has been repurposed into a well-used bike/pedestrian corridor with no motor vehicles permitted.

Extending the street north would add another intersection on Rosemont Road and compromise the function of that street plus violate the TSP's intersection separation standards of Table 8-4, would trigger the need for a variance and could not meet the 15 percent maximum street grade due to steep slopes (see Staff Finding 4).

The 600 foot long Heron Court cul de sac exceeds the maximum length of 200 feet. The cul de sac radius is designed to meet TVFR specifications to allow proper turnaround space for

emergency vehicles. A Class II Variance has been applied for. (See Staff Findings 113-117.) The criteria is met by a decision of the Planning Commission.

12. Street names. No street names shall be used which will duplicate or be confused with the names of existing streets within the City. Street names that involve difficult or unusual spellings are discouraged.

Staff Finding 15: No street names duplicate existing ones. This criterion is met.

13. Grades and curves. Grades shall not exceed 8 percent on major or secondary arterials, 10 percent on collector streets, or 15 percent on any other street unless by variance. (...)

Staff Finding 16: All streets are local streets and meet the maximum allowed grade of 15 percent. The criterion is met.

14. Access to local streets
(...)
15. Alleys
(...)

Staff Finding 17: All lots have direct access to local streets with the exception of lots 6, 9, 10, 39 and 40 which are all permitted flag lots. This criteria is met.

16. Sidewalks. Sidewalks shall be installed per CDC 92.010(H), Sidewalks. The residential sidewalk width is six feet plus planter strip...or to match existing sidewalks or right-of-way limitations.

17. Planter strip. The planter strip is between the curb and sidewalk providing space for a grassed or landscaped area and street trees. The planter strip shall be at least 6 feet wide...or in response to right-of-way limitations.

Staff Finding 18: The applicant proposes to install six-foot wide sidewalks and six-foot wide planter strips along all interior streets and frontages on Rosemont Road and Parker Road. The criterion is met.

18. Streets and roads shall be dedicated without any reservations or restrictions.

Staff Finding 19: The applicant proposes to dedicate the streets without any reservations or restrictions. The criterion is met.

19. All lots in a subdivision shall have access to a public street. Lots created by partition may have access to a public street via an access easement pursuant to the standards and limitations set forth for such accessways in Chapter 48 CDC.

Staff Finding 20: All lots have access to public streets with the exception of lots 6, 9, 10, 39 and 40 which are all permitted flag lots with access driveways per Chapter 48. The criterion is met.

20. Gated Streets
(...)
21. Entryway treatments and street isle design
(...)

Staff Finding 21: The subdivision will not be gated. The applicant is not proposing any subdivision monument/entry treatment. These criteria are met.

22. Based upon the determination of the City Manager or the Manager's designee, the applicant shall construct or cause to be constructed, or contribute a proportionate share of the costs, for all necessary off-site improvements identified by the transportation analysis commissioned to address CDC 85.170(B)(2) that are required to mitigate impacts from the proposed subdivision. The proportionate share of the costs shall be determined by the City Manager or Manager's designee, who shall assume that the proposed subdivision provides improvements in rough proportion to identified impacts of the subdivision. Off-site transportation improvements will include bicycle and pedestrian improvements as identified in the adopted City of West Linn TSP.

Staff Finding 22: The applicant's Transportation Impact Study was prepared by Lancaster Engineering (page 240) and concurred with by DKS Engineering (page 402) who provide independent third party review of traffic studies for the City. No off-site improvements or mitigation is required. The criterion is met.

B. Blocks and lots.
1. General
(...)
2. Sizes
(...)
3. Lot size and shape

Staff Finding 23: Staff incorporates the applicant's findings regarding blocks and lots. Lots in PUDs are not required to meet the minimum lot size. All lots exceed the minimum lot dimensions in terms of width and depth. All lots are sized to reasonably accommodate a detached single family home. These criteria are met.

4. Access. Access to subdivisions, partitions, and lots shall conform to the provisions of Chapter 48 CDC, Access, Egress and Circulation.

Staff Finding 24: Please see Staff Findings 43-61 for discussion of the "Access" criteria. The criterion is met.

5. Double frontage lots and parcels. Double frontage lots and parcels have frontage on a street at the front and rear property lines. Double frontage lots and parcels shall be avoided except where they are essential to provide separation of residential development from arterial streets or adjacent non-residential activities, or to overcome specific disadvantages of topography and orientation. A planting screen or impact mitigation easement at least 10 feet wide, and across which there shall be no right of access, may be required along the line of building sites abutting such a traffic artery or other incompatible use.

Staff Finding 25: Lots 1-6 and lots 40-50 are double frontage lots in that they are between Rosemont Road and Heron Drive/Court.

Staff finds that 85.200(B) (5) criteria allows double frontage lots when "*they are essential to provide separation of residential development from arterial streets...*" Rosemont Road is classified as an arterial. Staff finds that lots 1-6 and lots 40-50 provide the "*necessary separation*" between the arterial (Rosemont) and the local street (Heron Drive/Court). To ensure that the function of the arterial will not be diminished by the construction of private driveways on Rosemont Road, staff proposes condition of approval 5 that lots 1-6 and lots 40-50 shall have a 10 foot wide "no-access" easement along their north lot lines (per criteria above). The criteria is met.

(In addition to the easement, please note that lots 40-49, adjacent to Rosemont Road ROW, will be graded down below the sidewalk elevation to the extent that retaining walls up to four feet in height will be constructed along their rear or north lot lines.)

(...)
6. Lot and parcel side lines

7. Flag lots. Flag lots can be created where it can be shown that no other reasonable street access is possible to achieve the requested land division. A single flag lot shall have a minimum street frontage of 15 feet for its accessway. Where two to four flag lots share a common accessway, the minimum street frontage and accessway shall be eight feet in width per lot. Common accessways shall have mutual maintenance agreements and reciprocal access and utility easements. The following dimensional requirements shall apply to flag lots:
a. Setbacks applicable to the underlying zone shall apply to the flag lot.
(...)
e. As per CDC 48.030, the accessway shall have a minimum paved width of 12 feet.

Staff Finding 26: Lots 6, 9, 10, 39 and 40 are flag lots. No reasonable alternate means of access exists. All dimensional and access standards are met. This criteria is met.

8. Large lots or parcels.

Staff Finding 27: Staff finds that no lots are large enough to be partitioned given the underlying R-10 zoning. This criterion is met.

C. Pedestrian and bicycle trails.
(...)
Staff Finding 28: The sidewalks along all interior streets plus Rosemont Road and Parker Road will provide the necessary pedestrian facilities. In particular, the Rosemont Road and Parker Road sidewalks will fill gaps in those street's pedestrian facilities. The Open Space Tracts will have trails for walking and they will connect with the pedestrian/biking path that uses the Parker Road ROW along the south edge of the site.
This criteria is met.

D. Transit Facilities.
(...)
Staff Finding 29: There are no existing or proposed transit facilities or service in this area so this criteria does not apply.

E. Grading. Grading of building sites shall conform to the following standards unless physical conditions demonstrate the propriety of other standards:
1. All cuts and fills shall comply with the excavation and grading provisions of the Uniform Building Code and the following:
(....)

Staff Finding 30: The applicant's submittal included a stamped geotechnical report by GeoPacific, dated July 20, 2016 (page 159). The City's Development Engineer has reviewed the applicant's plans (Sheet 3/3) and geotechnical report and finds the grading and fill plans meet the criteria.

The grading plan is the minimum necessary to meet the allowable/maximum local street grade of 15 percent and provide appropriate building sites. The criteria is met.

F. Water.
1. A plan for domestic water supply lines or related water service facilities shall be prepared consistent with the adopted Comprehensive Water System Plan, plan update, March 1987, and subsequent superseding revisions or updates.
(....)

Staff Finding 31: Water is available on Rosemont Road, Parker Road and is stubbed out at the existing terminus of Roxbury Drive. These waterlines will be looped through the subdivision. The City Engineer has confirmed that with the completion of the water line improvement along Rosemont Road (upgrading from 8 to 12-inch line), as per the Condition of Approval 2(b), the water system will have sufficient water volume and pressure to serve the

subdivision. The applicant shall also submit a fire flow test for review and approval by TVFR per Condition of Approval 3. The criteria are met.

G. Sewer.
1. A plan prepared by a licensed engineer shall show how the proposal is consistent with the Sanitary Sewer Master Plan (July 1989). Agreement with that plan must demonstrate how the sanitary sewer proposal will be accomplished and how it is gravity-efficient. The sewer system must be in the correct basin and should allow for full gravity service.
(....)

Staff Finding 32: The applicant proposes to install a sanitary sewer lines to service all lots within this subdivision. The system will be built to appropriate standards and the City Engineer has confirmed the sufficient capacity of the sanitary system and sewage treatment facility. These criteria are met.

I. Utility easements.
Subdivisions and partitions shall establish utility easements to accommodate the required service providers as determined by the City Engineer. The developer of the subdivision shall make accommodation for cable television wire in all utility trenches and easements so that cable can fully serve the subdivision.

Staff Finding 33: The applicant proposes to place all utilities within the public right of way or within appropriately dimensioned utility easements and tracts to serve the subdivision. This criterion is met.

J. Supplemental provisions.
1. Wetland and natural drainageways. Wetlands and natural drainageways shall be protected as required by Chapter 32 CDC, Water Resource Area Protection. Utilities may be routed through the protected corridor as a last resort, but impact mitigation is required.

Staff Finding 34: Tanner Creek runs along part of the south edge of the property. A wetland in the same area was delineated by Schott and Associates (page 358) and is being protected with setbacks as allowed by Chapter 32. Utilities are generally routed along public right of ways with the exception of the storm water detention facility in the WRA as allowed by WRA Chapter 32.060(B). This criteria is met.

3. Willamette and Tualatin Greenways. The approval authority may require the dedication to the City or setting aside of greenways which will be open or accessible to the public. Except for trails or paths, such greenways will usually be left in a natural condition without improvements. Refer to Chapter 28 CDC for further information on the Willamette and Tualatin River Greenways.

Staff Finding 35: This section refers to public access (e.g. trails) along the Willamette and Tualatin Rivers and is therefore not applicable. The criteria is met.

3. Street trees.
Street trees are required as identified in the appropriate section of the municipal code and Chapter 54 CDC.

Staff Finding 36: Street trees shall be installed as required in the West Linn Public Works Standards. These criteria are met.

4. Lighting.
To reduce ambient light and glare, high or low pressure sodium light bulbs shall be required for all subdivision street or alley lights. The light shall be shielded so that the light is directed downwards rather than omni-directional.

Staff Finding 37: The applicant will install street lights to City Public Works standards. This criterion is met.

5. Dedications and exactions.
The City may require an applicant to dedicate land and/or construct a public improvement that provides a benefit to property or persons outside the property that is the subject of the application when the exaction is roughly proportional. No exaction shall be imposed unless supported by a determination that the exaction is roughly proportional to the impact of development.

Staff Finding 38: The applicant proposes to dedicate Open Space Tracts A and B to the City which comprise 158,994 square feet.

These dedications will allow for the preservation of a high profile stand of significant trees at the Rosemont and Salamo Road intersection as well as a WRA which will integrate with the adjacent Parker Road ROW bike/pedestrian path through the development of a hog fuel trail. The dedication is declared in Condition of Approval 4. The City Parks Director supports these dedications. There are no other dedications proposed or requested. This criterion is met.

(The "Useable Open Space" provisions of 24.170 and 55.100(F) require 15,000 square feet (50 lots X 300 square feet) and are addressed through Tracts A and B. Even after deducting the "Useable Open Space" square footage, Tracts A and B will retain in excess of 143,994 square feet.)

6. Underground utilities.
All utilities, such as electrical, telephone, and television cable, that may at times be above ground or overhead shall be buried underground in the case of new development.

Staff Finding 39: The applicant shall underground utilities to meet the West Linn Public Works Standards. This criterion is met.

(Public Works has had preliminary discussions with the applicant regarding voluntary additional off-site improvements along Rosemont Road. (See Condition of Approval 2(a).)

7. Density requirement.
Density shall occur at 70 percent or more of the maximum density allowed by the underlying zoning. These provisions would not apply when density is transferred from Type I and II lands as defined in CDC 02.030. Development of Type I or II lands are exempt from these provisions. Land divisions of three lots or less would also be exempt.

Staff Finding 40: The R-10 zone permits a maximum density of 4.356 dwelling units per net acre. Net acre is defined as "The total gross acres less the public right-of-way (ROW) and other acreage deductions, as applicable".

The gross site comprises 695,610 square feet. The ROW comprises 124,185 square feet for a Net Acreage of 571,425 square feet. Type I or II lands, WRA and Open Space areas comprise 168,668 square feet which yields 11.57 lots through density allowances ranging from 50 to 100 percent. Type III and IV lands comprise 402,757 square feet for an allowable density of 40.27 lots. This yields an allowable total of 51.84 lots (page 114, table on sheet 1/5 "Tentative Plan"). The applicant is proposing 50 lots. Seventy percent of 51.84 lots translates into a minimum density of 36.28 lots. The applicant is proposing 50 lots which meets the 70 percent density requirement. The criteria is met.

8. Mix requirement.
The "mix" rule means that developers shall have no more than 15 percent of the R-2.1 and R-3 development as single-family residential. The intent is that the majority of the site shall be developed as medium high density multi-family housing.

Staff Finding 41: The property is not zoned R-2.1 or R-3 so these provisions do not apply. This criterion is met.

9. Heritage trees/significant tree and tree cluster protection.
All heritage trees, as defined in the Municipal Code, shall be saved. Diseased heritage trees, as determined by the City Arborist, may be removed at his/her direction. All non-heritage trees and clusters of trees (three or more trees with overlapping dripline; however, native oaks need not have an overlapping dripline) that are considered significant by virtue of their size, type, location, health, or numbers shall be saved pursuant to CDC 55.100(B)(2). Trees are defined per the municipal code as having a trunk six inches in diameter or 19 inches in circumference at a point five feet above the mean ground level at the base of the trunk.

Staff Finding 42: The site comprises no heritage trees. There are 101 significant trees on the site. Of these trees, 73 will be retained for a retention rate of 72 percent. The applicant proposes mitigation for the significant trees to be removed. (See condition of approval 2.) Notable is the fact that the applicant using the PUD process, will be saving clusters of significant trees, mostly Douglas Firs, near the intersection of Salamo Road and Rosemont

Road through the proposed dedication of an Open Space Tract A. Other trees will be protected within the WRA boundary and will provide useful temperature control for waters within that area. This criterion is met.

CHAPTER 48: ACCESS CONTROL

48.025 ACCESS CONTROL
B. Access Control Standards
1. Traffic impact analysis requirements. The City or other agency with access jurisdiction may require a traffic study prepared by a qualified professional to determine access, circulation and other transportation requirements. (See also CDC 55.125, Traffic Impact Analysis.)

Staff Finding 43: A traffic impact analysis (TIA) was required since the criteria of 85.170(B) (2) are met. Lancaster Engineering provided a Traffic Impact Study (March 9, 2016 (page 240)):

"The trip generation calculations show that the proposed 52-lot subdivision **(staff note: the Traffic Study was based on 52 lots, not 50 lots as proposed)** ***is projected to generate up to 39 site trips during the morning peak hour, 52 site trips during the evening peak hour, and up to a total of 496 daily trips.*** **(50 lots yields 476 daily trips)**

Based on the results of the operational analysis, all study intersections are currently operating acceptably per City of West Linn standards and are projected to continue operating acceptably through year 2018 either with or without the addition of site trips resulting from the proposed development. No operational mitigation is necessary or recommended.

A detailed examination of the most recent five years of crash reports at the study intersections shows no significant safety concerns and no trends that are indicative of design deficiencies. No safety mitigations are recommended.

Based on the detailed analysis, adequate sight distance is available for the proposed site accesses along Rosemont Road and Parker Road. No sight distance mitigation is necessary or recommended.

The intersection of Rosemont Road at Salamo Road/Santa Anita Drive is projected to operate at LOS B during the morning and evening peak hours under all analysis scenarios through year 2018."

Given that the TIA was based on two additional lots (52, not 50 as currently proposed) and still found no need for mitigation or improvements, the reduction in trip generation can only improve the application. The report was reviewed by DKS Engineering (page 402) who work for the City of West Linn to provide an independant third party review. DKS agreed with the study's findings. The criterion is met.

2. The City or other agency with access permit jurisdiction may require the closing or consolidation of existing curb cuts or other vehicle access points, recording of reciprocal access easements (i.e., for shared driveways), development of a frontage street, installation of traffic control devices, and/or other mitigation as a condition of granting an access permit, to ensure the safe and efficient operation of the street and highway system. Access to and from off-street parking areas shall not permit backing onto a public street.

Staff Finding 44: To provide assurance that the function of the arterial will not be diminished by private driveways on Rosemont Road, staff proposes condition of approval 5 that lots 1-6 and lots 40-50 shall have a ten foot wide "no access" easement established along their north property lines per 85.200(B)(5). All access will be via the interior local streets. The criteria is met.

3. Access options. When vehicle access is required for development (i.e., for off-street parking, delivery, service, drive-through facilities, etc.), access shall be provided by one of the following methods (planned access shall be consistent with adopted public works standards and TSP). These methods are "options" to the developer/subdivider.
a) Option 1. Access is from an existing or proposed alley or mid-block lane. If a property has access to an alley or lane, direct access to a public street is not permitted.
b) Option 2. Access is from a private street or driveway connected to an adjoining property that has direct access to a public street (i.e., "shared driveway"). A public access easement covering the driveway shall be recorded in this case to assure access to the closest public street for all users of the private street/drive.
c) Option 3. Access is from a public street adjacent to the development lot or parcel. If practicable, the owner/developer may be required to close or consolidate an existing access point as a condition of approving a new access. Street accesses shall comply with the access spacing standards in subsection (B) (6) of this section.

Staff Finding 45: The applicant proposes access to the majority of lots via Option 3 (above) which is access from a public street. The exception would be the four flag lots (39, 40, 9 and 10) which will be accessed using Option 2: a shared driveway overlaying the flag lot stem. Flag lot 6 will have a private driveway so no mutual access easement is needed. The criteria are met by condition of approval 6 which requires mutual access easements covering the joint driveways for lots 39 and 40 and the joint driveway for lots 9 and 10.

4. Subdivisions fronting onto an arterial street. New residential land divisions fronting onto an arterial street shall be required to provide alleys or secondary (local or collector) streets for access to individual lots. When alleys or secondary streets cannot be constructed due to topographic or other physical constraints, access may be provided by consolidating driveways for clusters of two or more lots (e.g., includes flag lots and mid-block lanes).

Staff Finding 46: This subdivision does not "front" onto the arterials: Parker Road and Rosemont Road. Instead, the subdivision "fronts" onto local streets. Consequently no alleys or alternate access is needed and the criteria is met.

5. Double-frontage lots. When a lot or parcel has frontage onto two or more streets, access shall be provided first from the street with the lowest classification. For example, access shall be provided from a local street before a collector or arterial street. When a lot or parcel has frontage opposite that of the adjacent lots or parcels, access shall be provided from the street with the lowest classification.

Staff Finding 47: Lots 1-6 and lots 40-50 have frontage on two streets. Rosemont Road is an arterial while Heron Drive/Court is a local street. All of these lots will access exclusively via the local street. Condition of approval 5 ensures this, stating that the applicant shall establish a ten foot wide "no access" easement along the north property lines of lots 1-6 and lots 40-50. (In addition to the easement, please note that lots 40-49, adjacent to Rosemont Road ROW, will be graded down below the sidewalk elevation to the extent that retaining walls up to four feet in height will be constructed along their rear or north lot lines.) This criteria is met by Condition of Approval 5.

6. Access spacing.
a. The access spacing standards found in Chapter 8 of the adopted Transportation System Plan (TSP) shall be applicable to all newly established public street intersections and non-traversable medians.
b. Private drives and other access ways are subject to the requirements of CDC 48.060.

Staff Finding 48: Meadowlark Drive intersects with both Rosemont Road and Parker Road at locations that do not meet the intersection separation standards of the TSP. The applicant has applied for a Class II Variance for relief from this standard. TSP Table 8-3 requires a public intersection separation of 600 feet. The site has limited frontage on Parker Road to the extent that the centerline of the Meadowlark Drive intersection on Parker Road is 228 feet from the centerline of Dillon Drive to the east. Lancaster Engineering has found that the proposed intersection has sufficient lines of sight to the west and east.

TSP Table 8-3 requires a separation of 300 feet on arterials between intersections and private driveways. The intersection of Meadowlark Drive on Rosemont Road is 205 feet from the driveway to Oppenlander Field on the north side of Rosemont Road. Lancaster Engineering has found that the proposed intersection has sufficient lines of sight to the west and east.

These access spacing deficiencies will be decided by the Planning Commission's decision on the Class II Variance and the approval criteria of Chapter 75. See Staff Findings 118-121.

7. Number of access points.
8. Shared driveways.

Staff Finding 49: Staff incorporates applicant findings and references Staff Finding No. 44 and 45. These criteria are met.

C. Street connectivity and formation of blocks required.
In order to promote efficient vehicular and pedestrian circulation throughout the City, land divisions and large site developments shall produce complete blocks bounded by a connecting network of public and/or private streets, in accordance with the following standards:
1. Block length and perimeter.
The maximum block length shall not exceed 800 feet or 1,800 feet along an arterial.

Staff Finding 50: Staff finds that the distance from the intersection of Rosemont Road and Salamo to Meadowlark Drive is 1,120 feet which meets the 1,800 foot limit on an arterial. This criterion is met.

2. Street standards. Public and private streets shall also conform to Chapter 92 CDC, Required Improvements, and to any other applicable sections of the West Linn Community Development Code and approved TSP.

Staff Finding 51: All street designs and improvements shall be consistent with the provisions of CDC Chapters 92 and 85, and the West Linn Transportation System Plan. This criterion is met.

48.030 MINIMUM VEHICULAR REQUIREMENTS FOR RESIDENTIAL USES
A. Direct individual access from single-family dwellings and duplex lots to an arterial street (...)
B. When any portion of any house is less than 150 feet from the adjacent right-of-way, access to the home is as follows:
1. One single-family residence, including residences with an accessory dwelling unit as defined in CDC 02.030, shall provide 10 feet of unobstructed horizontal clearance. Dual-track or other driveway designs that minimize the total area of impervious driveway surface are encouraged.
2. Two to four single-family residential homes equals a 14- to 20-foot-wide paved or all-weather surface. Width shall depend upon adequacy of line of sight and number of homes.

Staff Finding 52: No lots will access arterials (Rosemont and Parker Roads). All lots will have direct access to a local street with the exception of the five flag lots which will use individual or shared private driveways to access the local street. These driveways will be at least 14 feet wide in the case of the shared ones. These criteria are met.

3. Maximum driveway grade shall be 15 percent. (...)

4. The driveway shall include a minimum of 20 feet in length between the garage door and the back of sidewalk, or, if no sidewalk is proposed, to the paved portion of the right-of-way.

C. When any portion of one or more homes is more than 150 feet from the adjacent right-of-way, the provisions of subsection B of this section shall apply in addition to the following provisions.
1. A turnaround may be required as prescribed by the Fire Chief.
(....)

Staff Finding 53: All driveways will meet these criteria at the time of building plan review.

D. Access to five or more single-family homes shall be by a street built to full construction code standards. All streets shall be public. This full street provision may only be waived by variance.

Staff Finding 54: All access will be via streets built to City construction code standards or by shared driveways serving only two lots each. These driveways will be built to meet Chapter 48 standards and TVFR requirements. This criterion is met.

E. Access and/or service drives for multi-family dwellings shall be fully improved with hard surface pavement:
(....)

Staff Finding 55: The provisions of 48.030(E) do not apply since this is not a multi-family project.

F. Where on-site maneuvering and/or access drives are necessary to accommodate required parking, in no case shall said maneuvering and/or access drives be less than that required in Chapters 46 and 48 CDC.

Staff Finding 56: The provisions of 48.030(F) do not apply since no on-site maneuvering or on site drives for parking are proposed. This criteria is intended for non-single family residential projects.

G. The number of driveways or curb cuts shall be minimized on arterials or collectors. Consolidation or joint use of existing driveways shall be required when feasible.

Staff Finding 57: No driveways will access either of the two arterials per Condition of Approval 5. The criteria is met.

H. In order to facilitate through traffic and improve neighborhood connections, it may be necessary to construct a public street through a multi-family site.
I. Gated accessways to residential development other than a single-family home are prohibited.

Staff Finding 58: The provisions of 48.030(H) do not apply since this is not a multi-family project. The provisions of 48.030(I) do not apply since no gated accessway is proposed and this is a single family residential development. This criterion is met.

48.060 WIDTH AND LOCATION OF CURB CUTS AND ACCESS SEPARATION REQUIREMENTS
A. Minimum curb cut width shall be 16 feet.
B. Maximum curb cut width shall be 36 feet, except along Highway 43 in which case the maximum curb cut shall be 40 feet. For emergency service providers, including fire stations, the maximum shall be 50 feet.
(....)

Staff Finding 59: All curb cuts for driveways to homes will be reviewed at the time of building permit applications and shall be required to comply with these setbacks and standards. These criteria are met.

G. Adequate line of sight pursuant to engineering standards should be afforded at each driveway or accessway.

Staff Finding 60: All curb cuts will be reviewed at the time of building permit applications and shall be required to comply with the clear vision area standards of CDC Chapter 42. This criterion is met.

48.070 PLANNING DIRECTOR'S AUTHORITY TO RESTRICT ACCESS APPEAL PROVISIONS

(...)
48.080 BICYCLE AND PEDESTRIAN CIRCULATION

(...)

Staff Finding 61: Bicycle and pedestrian circulation is provided for by the interior streets, adjacent sidewalks and trails within the Open Space Tracts. These criteria are met.

CHAPTER 55, DESIGN REVIEW

55.100 APPROVAL STANDARDS – CLASS II DESIGN REVIEW

B. Relationship to the natural and physical environment.
1. The buildings and other site elements (...)
2. All heritage trees (...)
a. Non-residential and residential projects on Type I and II lands (...)

Staff Finding 62: Staff incorporates applicant findings. The City Arborist finds that there are no heritage trees at the site. The wetlands are Type II lands (the only on-site Type I or II land) and are addressed in staff findings 72-80. These criteria are met.

b. Non-residential and residential projects on non-Type I and II lands shall set aside up to 20 percent of the area to protect trees and tree clusters that are determined to be significant, plus any heritage trees. Therefore, in the event that the City Arborist determines that a significant tree cluster exists at a development site, then up to 20 percent of the non-Type I and II lands shall be devoted to the protection of those trees, either by dedication or easement. (.....)

Staff Finding 63: The site comprises no heritage trees. There are 101 significant trees on the site. Of these trees, 73 will be retained for a retention rate of 72 percent. The applicant proposes mitigation for the significant trees to be removed. (See condition of approval 2.) Notable is the fact that the applicant will be preserving the stand of significant trees, mostly Douglas Firs, near the intersection of Salamo Road and Rosemont Road through the establishment of an Open Space tract. Other trees will be protected within the WRA boundary and will provide useful temperature control for waters within that area.
This criterion is met.

c. Where stubouts of streets occur on abutting properties, and the extension of those streets will mean the loss of significant trees, tree clusters, or heritage trees, it is understood that tree loss may be inevitable. In these cases, the objective shall be to minimize tree loss. These provisions shall also apply in those cases where access, per construction code standards, to a lot or parcel is blocked by a row or screen of significant trees or tree clusters.

Staff Finding 64: No street stubouts occur on abutting properties. This criterion does not apply.

d. For both non-residential and residential development, the layout shall achieve at least 70 percent of maximum density for the developable net area. The developable net area excludes all Type I and II lands and up to 20 percent of the remainder of the site for the purpose of protection of stands or clusters of trees as defined in subsection (B)(2) of this section.

Staff Finding 65: The R-10 zone permits a maximum density of 4.356 dwelling units per net acre. Net acre is defined as "The total gross acres less the public right-of-way (ROW) and other acreage deductions, as applicable".

The gross site comprises 695,610 square feet. The ROW comprises 124,185 square feet for a Net Acreage of 571,425 square feet. Type I or II lands, WRA and Open Space areas comprise 168,668 square feet which yields 11.57 lots through density allowances ranging from 50 to 100 percent. Type III and IV lands comprise 402,757 square feet for an allowable density of 40.27 lots. This yields an allowable total of 51.84 lots. The applicant is proposing 50 lots. Seventy percent of 51.84 lots translates into a minimum density of 36.28 lots. The applicant is proposing 50 lots which meets the 70 percent density requirement. The criteria is met.

There are 101 significant trees on the site. Of these trees, 73 will be retained for a retention rate of 72 percent. Mitigation for the significant trees to be removed is provided for in condition of approval 2 as proposed by the applicant. Notable is the fact that the applicant

will be saving clusters of significant trees, mostly Douglas Firs, near the intersection of Salamo Road and Rosemont Road through the proposed dedication of an Open Space Tract. Other trees will be protected within the WRA boundary and will provide useful temperature control for waters within that area. This criterion is met.

e. For arterial and collector street projects, including Oregon Department of Transportation street improvements, the roads and graded areas shall avoid tree clusters where possible. Significant trees, tree clusters, and heritage tree loss may occur, however, but shall be minimized.

Staff Finding 66: There are no arterials or collectors within this project boundary; therefore the criteria does not apply.

f. If the protection of significant tree(s) or tree clusters is to occur in an area of grading that is necessary for the development of street grades, per City construction codes, which will result in an adjustment in the grade of over or under two feet, which will then threaten the health of the tree(s), the applicant will submit evidence to the Planning Director that all reasonable alternative grading plans have been considered and cannot work. The applicant will then submit a mitigation plan to the City Arborist to compensate for the removal of the tree(s) on an "inch by inch" basis (e.g., a 48-inch Douglas fir could be replaced by 12 trees, each four-inch). The mix of tree sizes and types shall be approved by the City Arborist.

Staff Finding 67: Heron Court construction and grading will result in the loss of 13 significant trees. This tree loss will be mitigated for as part of the applicant's proposed inch for inch mitigation plan. This criterion is met by Condition of Approval 8.

CHAPTER 92, REQUIRED IMPROVEMENTS

92.010 PUBLIC IMPROVEMENTS FOR ALL DEVELOPMENT
The following improvements shall be installed at the expense of the developer and meet all City codes and standards:

A. Streets within subdivisions.
B. Extension of streets to subdivisions
C. Local and minor collector streets
D. Monuments

Staff Finding 68: The applicant shall install improvements to meet the West Linn Public Works Standards. These criteria are met.

E. Surface drainage and storm sewer system. A registered civil engineer shall prepare a plan and statement which shall be supported by factual data that clearly shows that there will be no adverse impacts from increased intensity of runoff off site of a 100-year storm, or the plan and statement shall identify all off-site impacts and measures to mitigate those impacts *commensurate to the particular land use application. Mitigation measures shall maintain pre-existing levels and meet buildout volumes, and meet planning and engineering requirements*

Staff Finding 69: The applicant has submitted a Preliminary Storm Water Report (subsection of the GeoPacific report page 159) that complies with City of West Linn Public Works Standards. The applicant shall install improvements to meet the Standards, including the proposed storm water facility.

The development of this subdivision will result in a reduction of cross property storm water flow since storm water runoff from all impervious surfaces (streets, sidewalks, roofs, driveways, patios, etc.) will be intercepted and directed to the storm water lines on the streets in front of the subdivision's homes. Storm water will then be directed to the detention/treatment facility and then into Tanner Creek. This criterion is met.

F. Sanitary sewers
(...)
Q. Joint mailbox facilities

Staff Finding 70: The applicant shall comply with the requirements and install improvements to meet the West Linn Public Works Standards. These criteria are met.

92.030 IMPROVEMENT PROCEDURES
(...)

Staff Finding 71: The applicant shall comply with the requirements and install improvements to meet the West Linn Public Works Standards. These criteria are met by Condition of Approval 2.

CHAPTER 32: WATER RESOURCE AREA

32.060 APPROVAL CRITERIA

No application for development on property containing a WRA shall be approved unless the approval authority finds that the proposed development is consistent with the following approval criteria, or can satisfy the criteria by conditions of approval:

- *A. WRA protection/minimizing impacts.*
  1. *Development shall be conducted in a manner that will avoid or, if avoidance is not possible, minimize adverse impact on WRAs.*
  2. *Mitigation and re-vegetation of disturbed WRAs shall be completed per CDC 32.090 and 32.100 respectively.*

Staff Finding 72: The applicant's wetland consultant, Schott and Associates, inventoried and delineated eight wetlands in the south portion of the site adjacent to, and within, the Tanner Creek alignment. (See "Natural Resource Assessment within Water Resource Area" by Schott

and Associates, dated March 2016 (page 337).) All wetlands are to be protected within Open Space Tract B.

Two ephemeral streams that are shown on the City's adopted WRA Map. Schott and Associates inventoried the property and determined that neither ephemeral streams constituted a WRA drainageway.

Regarding the northeast ephemeral stream originating near lots 3 and 4, Schott and Associates found that, *"The LWI (Local Wetland Inventory), as well as the WRA map, showed a drainage entering the property from the north near the eastern property boundary flowing southwest thru the property. Onsite observations showed two converging slopes forming a slight, narrow depression fully vegetated with grasses, rather than a drainage channel. Two sample plots were taken at the low end of the narrow depression prior to the band of Himalayan blackberry and Tanner Creek. Both sample plots were dominated by tall fescue and colonial bentgrass. Sample plot J10 was taken further upslope. Soils read as 7.5YR 3/3 with saturation at 6" from the top. Sample plot C4 was taken further down slope. Soils were a 10YR 3/2 to 11" and 10YR 4/4 with 20% 10YR 4/2 redox 11-21". Saturation was at the surface. The slight depression was clearly not a drainage channel, nor a wetland as soils criterion was not met."*

The mapped northwest ephemeral stream extends from Rosemont Road between lots 41 and 42.

The applicant proposes to construct channels for both ephemeral streams within 30-foot wide easements which should create a greater opportunity for them to develop WRA functions and values, especially, an identifiable water flow and the growth of vegetation. The criteria is met.

B. Storm water and storm water facilities.

1. Proposed developments shall be designed to maintain the existing WRAs (....)

Staff Finding 73: The applicant is proposing to locate a storm treatment pond within the WRA adjacent to the Parker Road ROW. Schott and Associates have reviewed the impact of the proposed facility and find that it will be compatible with the function and value of the WRA and wetlands. The Public Works Department has reviewed this proposal and location and finds it appropriate subject to the completion of Conditions of Approval (including but not limited to Conditions 1 & 2). The criteria is met.

C. Dedications and easements. The City shall request dedications of the WRA to the City when acquisition of the WRA by dedication or easement would serve a public purpose. When such a dedication or easement is mutually agreed upon, the applicant shall provide the documentation for the dedication or easement. Nothing in this section shall prohibit the City from condemning property if:

1. *The property is necessary to serve an important public purpose; and*
2. *Alternative means of obtaining the property are unsuccessful.*

Staff Finding 74: The applicant is proposing to dedicate Tract B, which comprises the WRA, to the City. The proposed addition of a trail at the outer edge of the WRA and its proximity to the existing heavily used bike and pedestrian path in the Parker Road ROW should serve an important public purpose. The dedication of Tract A will be beneficial in that it preserves a significant and visually prominent stand of Douglas Fir trees at the Salamo and Rosemont Road intersection. The City Parks Director supports these dedications conditional upon the removal of all invasive plant material and re-vegetation with native plant material per Condition of Approval 8. Private drainageway easements (15 feet on each side of the two streams) will be provided for the two ephemeral streams. The criteria is met. (It should be noted that this application pre-dates recent amendment to this criteria.)

D. WRA width. Except for the exemptions in CDC 32.040, applications that are using the alternate review process of CDC 32.070, or as authorized by the approval authority consistent with the provisions of this chapter, all development is prohibited in the WRA as established in Table 32-2 below: (....)

Staff Finding 75: Schott and Associates (March 2016) have inventoried and delineated the wetland and stream corridor. Schott and Associates used the "Alternate Review Process" and determined that a 50 foot setback is sufficient to retain the functions and values of the wetlands and Tanner Creek. The ephemeral stream setback and private easements of 15 feet on each side of the two streams meet the standard setback. The criteria is met.

E. Roads, driveways and utilities.
1. New roads, driveways, or utilities shall avoid WRAs unless the applicant demonstrates that no other practical alternative exists. In that case, road design and construction techniques shall minimize impacts and disturbance to the WRA by the following methods (....)

Staff Finding 76: The east ephemeral stream, originating between lots 3 and 4, is traversed by Heron Drive and Meadowlark Drive. The west ephemeral stream is traversed by Heron Court. None of the street crossings compromise the WRAs on this site since Schott and Associates found that neither ephemeral stream met the scientific definition of a WRA or ephemeral stream. Nonetheless, the applicant is providing each stream with a protective easement measuring 30 feet wide (15 feet on each side) in total. The criteria is met.

F. Passive recreation. Low impact or passive outdoor recreation facilities for public use including, but not limited to, multi-use paths and trails, subject to the following standards:

1. Trails shall be constructed using non-hazardous, water permeable materials with a maximum width of four feet...

3. All trails in the WRA shall be set back from the water resource at least 30 feet except at stream crossing points or at points where the topography forces the trail closer to the water resource.

Staff Finding 77: The proposed trail runs along the north side of the Tanner Creek and associated wetlands. Currently, the trail is shown as 25 feet from the WRA resource. The criteria (F) (3) calls for a minimum setback of 30 feet. Staff finds that the criteria is met by condition requiring a 30 foot setback.

G. Daylighting Piped Streams (....)

Staff Finding 78: There are no existing piped streams on this property. This criteria is not applicable.

H. The following habitat friendly development practices shall be incorporated into the design of any improvements or projects in the WRA to the degree possible.
1. Restore disturbed soils to original or higher level of porosity to regain infiltration and storm water storage capacity.
2. Apply a treatment train or series of storm water treatment measures to provide multiple opportunities for storm water treatment and reduce the possibility of system failure.
3. Incorporate storm water management in road rights-of-way.
4. Landscape with rain gardens to provide on-lot detention, filtering of rainwater, and groundwater recharge....
11. Use shared driveways....
13. Reduce street length, primarily in residential areas, by encouraging clustering.

Staff Finding 79: The applicant will be utilizing all of the measures listed above (1-4, 11, and 15). The criteria is met.

32.080 APPROVAL CRITERIA (ALTERNATE REVIEW PROCESS)

Applications reviewed under the alternate review process shall meet the following approval criteria:
A. The proposed WRA shall be, at minimum, qualitatively equal, in terms of maintaining the level of functions allowed by the WRA standards of CDC 32.060(D).
(.....)

Staff Finding 80: Schott and Associates (March 2016) provided findings to allow the WRA setback to be reduced to 50 feet. The standard setback is 65 feet for sites like this with slopes under 25 percent. Schott and Associates have recommended specific enhancement/mitigation for the wetland areas and the associated WRA setback areas. Staff concurs with their findings. The criteria is met.

CHAPTER 24: PLANNED UNIT DEVELOPMENT

24.100 APPROVAL CRITERIA

A. The approval criteria of CDC 55.100, design review, shall apply to non-exempted projects per CDC 55.025. Single-family detached, single-family attached, and duplex residential units proposed shall comply with the provisions of Chapter 43 CDC at time of building permit application.
B. The application shall also demonstrate compliance with the following criteria:
1. The proposal shall preserve the existing amenities of the site to the greatest extent possible by relating the type and design of the development to the topography, landscape features, and natural amenities existing on the site and in the vicinity.

Staff Finding 81: The approval criteria of CDC 55.100, design review, does not apply since this is a single family detached PUD. The side yard transitions of CDC Chapter 43 shall be applied when building permits are being sought by homebuilders.

The existing amenities of the site: Tanner Creek, eight wetland areas, significant tree groves were noted by the applicant and will be preserved by the establishments of Tracts A and B. (The applicant proposes to transfer the allowed density from those resource areas to the non-constrained portions of the site with smaller lot sizes as allowed by these PUD provisions.) The criteria is met.

2. The proposed PUD shall provide a desirable, attractive, and stable environment in harmony with that of the surrounding area through thorough, well-developed, detailed planning and by comprehensively correlating the provisions of this code and all applicable adopted plans.
3. The placement and design of buildings, use of open spaces, circulation facilities, off-street parking areas, and landscaping shall be designed to best utilize the potentials of the site characterized by special features of geography, topography, size, and shape.

Staff Finding 82: Rather than having a standard subdivision with lots covering the entire site all the way up to the Salamo Road and Rosemont Road intersection and the concomitant loss of natural resources and trees, the layout of lots on the non-constrained east and north portions of the site and the protection of resource areas (Tracts A and B) on the west and south side provides a desirable and attractive configuration. The street pattern provides a "north to south connector" between Rosemont Road and Parker Road, which meets the connectivity standards of CDC Chapter 85.200(A) (1). The applicant's Traffic Impact Study (Lancaster Engineering, March 9, 2016 (page 240)) reports "*all study intersections are currently operating acceptably through year 2018 either with or without the addition of site trips resulting from the proposed development.*" The criteria is met.

4. The PUD shall be developed so that it is compatible with neighboring development in terms of architecture, massing, and scale. Where that cannot be accomplished, appropriate transitions shall be provided that are deferential or sympathetic to existing development.

Staff Finding 83: This PUD will be developed as a single family residential subdivision with lots ranging from 5,885 square feet to 19,426 square feet. The majority of lots exceed 7,300 square feet. The lots will be occupied by single family detached homes. Per 24.140(A) (1), on-site single family homes are considered compatible with off-site or neighboring single family homes: *"Transitions are not required in all cases, however. The following exceptions shall apply: 1. Single-family PUD next to single-family non-PUD does not require a transition (e.g., even though it is R-5 single-family next to R-10, etc.). Also, similar type housing does not need to transition (e.g., duplex next to duplex);"*

This PUD is compatible with the two subdivisions on the east lot line which are similarly developed with single family detached homes. Lots in those neighboring subdivisions range from 7,070 square feet to larger 13,074 square feet. No transitions are required per 24.140(A) (1). The criteria is met.

C. All densities, density transfers, transitions, density bonuses, and proposed setbacks shall conform to provisions of this chapter as required by CDC 24.080 and 24.110 through 24.170 inclusive.

Staff Finding 84: CDC 24.080 and 24.110 through 24.170, inclusive, are addressed elsewhere in this application. (24.080 are submittal requirements and not approval criteria.) The criteria is met.

24.110 RESIDENTIAL DENSITY CALCULATIONS

A. The PUD allows density to be transferred on residential portions of the site. The following sections explain how the allowed number of dwelling units per acre is calculated. The standards are also intended to ensure that PUDs and adjoining developments are compatible and maintain a sense of neighborhood unity.
(....)
C. The allowed density or number of dwelling units on the site, subject to the limitations in CDC 24.140 and 24.150, is computed by dividing the number of square feet in the net acres by the minimum number of square feet required for each lot or parcel, by the base zone.

Staff Finding 85: Staff has reviewed the applicant's density calculations and finds that they are correct. The R-10 zone permits a maximum density of 4.356 dwelling units per net acre. Net acre is defined as "The total gross acres less the public right-of-way (ROW) and other acreage deductions, as applicable".

The gross site comprises 695,610 square feet. The ROW comprises 124,185 square feet for a Net Acreage of 571,425 square feet. Type I or II lands, WRA and Open Space areas comprise

168,668 square feet which yields 11.57 lots through density allowances ranging from 50 to 100 percent. Type III and IV lands comprise 402,757 square feet for an allowable density of 40.27 lots. This yields an allowable total of 51.84 lots (page 114, table on sheet 1/5 "Tentative Plan"). The applicant is proposing 50 lots. Seventy percent of 51.84 lots translates into a minimum density of 36.28 lots. The applicant is proposing 50 lots which meets the 70 percent density requirement. The criteria is met.

24.120 EXAMPLES OF RESIDENTIAL DENSITY CALCULATIONS

When density is to be transferred on a land area with Type I or Type II land, the following procedure will apply:
(....)

Staff Finding 86: This criteria provides examples of how density is calculated. In the previous finding, staff determined that the applicant's calculations were correct and the criteria is met.

24.130 ALLOWABLE DENSITY ON TYPE I AND II LANDS

A. This table relates to the allowed density of development on Type I and II lands. "Development" means when the footprint of a home is placed on Type I or II lands, or when over 50 percent of the lot comprises Type I or II lands. Generally speaking, the greater the constraints, the lower the density; and the lower the constraints, the higher the allowable density.
(....)

Staff Finding 87: This criteria provides examples of how density is calculated. In the previous finding staff determined that the applicant's calculations were correct: they only proposed transfer densities of 50 percent for Type I and II lands. The criteria is met.

24.140 TRANSITIONS AND LIMITATIONS ON DENSITY TRANSFER

A. Because the PUD and the provisions of this chapter allow increased residential densities and various housing types, it is necessary that some kind of transition be provided between the project site and the surrounding properties. These transitions will, for example, mitigate the impacts of multi-family housing next to single-family housing. Transitions are not required in all cases, however. The following exceptions shall apply:
1. Single-family PUD next to single-family non-PUD does not require a transition (e.g., even though it is R-5 single-family next to R-10, etc.). Also, similar type housing does not need to transition (e.g., duplex next to duplex);
(....)

Staff Finding 88: No transitions are required per 24.140(A) (1). The criteria is met.

24.150 DENSITY BONUSES

A. Although the density may be reduced by CDC 24.130, applicants are encouraged to seek density bonus credits under such categories as "site planning and design excellence." The permitted number of dwelling units may be increased up to 29 percent above those computed under the formula above based on a finding of the Planning Director that the density bonus credits have been satisfied as set forth in the following section and in CDC 24.160:
(....)

24.160 DENSITY BONUS CHART

The cumulative density bonus for all categories except for design excellence or low cost housing cannot exceed 20 percent. To achieve the maximum 29 percent density bonus, the application must qualify for the low cost housing bonus, the design excellence bonus, or both.
(....)
Staff Finding 89: The applicant is not proposing any density bonuses. This criteria is met.

24.170 USABLE OPEN SPACE REQUIRED

Residential planned unit developments (PUDs) shall comply with the following usable open space requirements:
A. PUDs that contain multi-family units shall comply with the requirements of CDC 55.100(F).
B. PUDs that contain 10 or more single-family detached, single-family attached, or duplex residential units shall comply with the following usable open space requirements.
1. The plan shall include an open space area with at least 300 square feet of usable area per dwelling unit.
2. The usable open space shall meet the design requirements of CDC 55.100(F)(2).
3. The usable open space shall be owned in common by the residents of the development unless the decision-making authority determines, based upon a request from the applicant and the recommendation of the City Director of Parks and Recreation, that the usable open space should be dedicated to the City for public use. If owned in common by the residents of the development, then a homeowner's association shall be organized prior to occupancy to maintain the usable open space.
(....)

Staff Finding 90: This PUD has over 10 lots so "Useable Open Space" must be provided at 300 square feet per lot. That translates to a minimum open space requirement of 15,000 square feet (50 X 300). The applicant is requesting to dedicate 158,994 square feet of open space including walking trails to the City. This amount exceeds the minimum required "Useable Open Space" area. The criteria is met.

24.180 APPLICABILITY OF THE BASE ZONE PROVISIONS

The provisions of the base zone are applicable as follows:
(....)

Staff Finding 91: The applicant will meet the building height of the R-10 base zone. (See Staff Finding 2.) Per 24.180(D) the applicant proposes to use the structure setback provisions allowed by the PUD chapter. Specifically, this allows a five foot side yard setback and a side street setback of 10 feet. The front yard and rear yard setbacks shall be 15 feet. Front and rear porches may encroach forward another five feet. Allowed lot coverage is 45 percent. Setback areas contiguous to the perimeter of the project, excluding ROW, shall be the same as those required by the base zone. The criteria is met by Condition of Approval 11.

CHAPTER 28: WILLAMETTE AND TUALATIN RIVER PROTECTION

28.070 PLANNING DIRECTOR VERIFICATION OF METRO HABITAT PROTECTION MAP BOUNDARIES

A. The HCA Map is the basis for identifying and designating the habitat conservation areas in the City. A copy of the latest, updated HCA Map is on file at the City and is adopted by reference for use with this chapter.

(...)

B. The Planning Director shall verify the appropriate HCA or non-HCA designation by site visits or consultations with Metro or by other means. Determination is based on whether the Metro criteria are met or whether the Metro designation was based solely on tree overstory in which case a redesignation is appropriate. In cases where the determination is that the map is incorrect, the Planning Director will make a written finding of this as well as the site conditions that led to that conclusion.

C. Class B public notice, per Chapter 99 CDC, shall be required prior to issuance of the redesignation decision if it involves redesignation of the HCA boundary to allow the construction of, or addition to, a house.

D. This determination and findings shall become part of the City record and part of the record for any associated land use application. The Planning Director shall also include in the record the revised map boundary. The Planning Director's determination and map revisions shall also be sent to Metro so that their map may be corrected as necessary.

E. The Planning Director determination is appealable to the City Council per Chapter 99 CDC.

F. Lands that are designated as an HCA only due to a forested overstory are exempt under CDC 28.040, Exemptions, since trees are already protected in the municipal code and Chapters 55 and 85 CDC. Similar exemptions apply to lands that exhibit no constraints.

Staff Finding 92: The applicant has requested that the HCA boundary be verified and subsequently modified to reduce the HCA boundary width and thus allow development of the proposed lot 24 and more flexible building envelopes for lots 35, 23 and 25 (see map on page 361). This section (28.070) lays out procedures to verify and change the boundary.

The applicant has requested that the HCA boundary be verified by the Planning Commission based upon the criteria found in 28.070. (Ordinarily, this would be a Planning Director decision but this verification request has been consolidated with the PUD application at the applicant's request. Class B notice (14-day notice) was satisfied through consolidation of the "verification" notice requirements with this PUD application which had a 20-day notice. (See Public Notice exhibit.)

The applicant's wetland and natural resource consultant, Schott and Associates, have provided findings (page 358) using Metro's criteria that the adjustment of the boundary is appropriate based on the standards set out in Metro's Title 13 Model Ordinance Section 9(G): "Detailed Verification Approach".
http://www.oregonmetro.gov/sites/default/files/title_13_model_ordinance.pdf

The Schott and Associates report, dated August 25, 2016, part of the applicant's submittal (page 358), found that Metro's designation of the pink mapped areas as Moderate HCA was erroneous (see map on page 361) and the HCA boundary should be revised to eliminate those areas as HCAs. The report concludes with the finding: *"In conclusion, The HCA is low quality due to the non-native, invasive vegetation. There is an area of tree cover in the northwest portion of the property* (including lot 35) *with an understory dominated by Himalayan blackberry. The rest of the site bordering the drainage and wetland consists mainly of blackberry and ivy, both non-native and invasive. The HCA boundary lines are mapped erroneous and need to be redesignated based on the location of the drainage and wetlands delineated on site and not the tree cover based on 2002 summer photos. There are two areas in specific where map changes are requested. (See Figure 2 HCA map, pink highlight areas). The northern extent of the HCA does contain a tree overstory that is less dense, however, the entire understory is dominated by Himalayan blackberry. The second area is at the southern extent of the HCA at the eastern boundary line* (including lots 23, 24 and 25). *This area is entirely Himalayan blackberry. The vegetation is non-native, invasive and of very low value and these areas should not be mapped as HCA."*

The Planning Commission's role is to review the attached findings of Schott and Associates. If the consensus is that the consultant's findings are credible, then the Planning Commission should accept the revised HCA boundary which deletes the "*Moderate*" HCAs shown in pink on Sheet 3/5 of the applicant's HCA map dated June 2016 and re-designates those areas as: "*Habitat and Impact Areas not designated as HCAs*." If the Planning Commission does not accept the findings of Schott and Associates then the existing HCA boundary would be retained or another boundary could be proposed.

Once the Planning Commission's HCA boundary verification is complete, condition of approval 10 must be satisfied. With this condition, the criteria is met.

28.110 APPROVAL CRITERIA

No application for development on property within the protection area shall be approved unless the decision-making authority finds that the following standards have been met or can be met by conditions of approval. The development shall comply with the following criteria as applicable:

A. Development: All sites.

1. Sites shall first be reviewed using the HCA Map to determine if the site is buildable or what portion of the site is buildable. HCAs shall be verified by the Planning Director per CDC 28.070 and site visit. Also, "tree canopy only" HCAs shall not constitute a development limitation and may be exempted per CDC 28.070(A). The municipal code protection for trees and Chapters 55 and 85 CDC tree protection shall still apply.

Staff Finding 93: The Metro HCA map was revised in 2011 and shows a Habitat Conservation Area (HCA) on this property which generally coincides with the WRA boundary but expands beyond that boundary in the vicinity of lot 35 and along the south property line impacting lots 23, 24 and 25.

The applicant has provided an HCA delineation by wetland specialist Schott and Associates (August 25, 2016) (page 358) which indicates that the existing HCA boundary is incorrect in that it was based on Metro's misinterpretation of a 2002 aerial photograph of the site. Schott and Associates found that the WRA boundary "*was based solely on tree overstory and a redesignation is appropriate*". The applicant has requested an HCA boundary verification by the Planning Commission to delete the "*Moderate*" HCAs shown in pink on Sheet 3/5 of the applicant's HCA map dated June 2016 and re-designates those areas as: "*Habitat and Impact Areas not designated as HCAs.*" (This would have the effect of removing lots 35 and 23, 24 and 25 from HCA designation.) By that decision, the criteria is met.

2. HCAs shall be avoided to the greatest degree possible and development activity shall instead be directed to the areas designated "Habitat and Impact Areas Not Designated as HCAs," consistent with subsection (A)(3) of this section.

3. If the subject property contains no lands designated "Habitat and Impact Areas Not Designated as HCAs" and development within HCA land is the only option it shall be directed towards the low HCA areas first, then medium HCA areas and then to high HCA as the last choice. The goal is to, at best, avoid or, at least, minimize disturbance of the HCAs. (Water-dependent uses are exempt from this provision.)

4. All development, including exempted activities of CDC 28.040, shall have approved erosion control measures per Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual, rev. 2008, in place prior to site disturbance and be subject to the requirements of CDC 32.070 and 32.080 as deemed applicable by the Planning Director.

Staff Finding 94: The majority of the development will occur in "*Habitat and Impact Areas Not Designated as HCAs*". HCAs are avoided with the exception of lot 35 and along the south property line impacting lots 23, 24 and 25 including the Meadowlark Drive intersection with

Parker Road. This criteria would be met by a supportive Planning Commission HCA verification decision based on Schott and Associates findings.

B. Single-family or attached residential. Development of single-family homes or attached housing shall be permitted on the following HCA designations and in the following order of preference with "a" being the most appropriate and "d" being the least appropriate:

a "Habitat and Impact Areas Not Designated as HCAs"

b Low HCA

c Moderate HCA

d High HCA

Staff Finding 95: The majority of the single family residential development will occur in *"Habitat and Impact Areas Not Designated as HCAs".* HCAs are avoided with the exception of lot 35 and along the south property line impacting lots 23, 24 and 25 including the Meadowlark Drive intersection with Parker Road. This criteria would be met by a supportive Planning Commission HCA verification decision based on Schott and Associates findings.

1. Development of land classifications in "b," "c" and "d" shall not be permitted if at least a 5,000-square-foot area of buildable land ("a") exists for home construction, and associated impermeable surfaces (driveways, patios, etc.). (....)
6. Table showing development allowed by land classification:

	Development Allowed
Non-HCA ("a")	*Yes*
Low-Medium HCA ("b" and "c")	*Yes, if less than 5,000 sq. ft. of non-HCA land available. Avoid "d."*
High HCA ("d")	*Yes, but only if less than 5,000 sq. ft. of "a," "b" and "c" land available.*

Staff Finding 96: Lot 35 is impacted by a Moderate HCA ("b" and "c"); however, it comprises sufficient buildable land to accommodate a house on the east portion of the lot outside the HCA. Lots 23 and 25 could accommodate a house outside the Moderate HCA ("b" and "c") but the house footprint would be limited in size. Lot 24 cannot accommodate a house without an amended HCA boundary. This criteria would be met by a supportive Planning Commission HCA verification decision based on Schott and Associates findings (August 25, 2016).

C. Setbacks from top of bank.

1. Development of single-family homes or attached housing on lands designated as "Habitat and Impact Areas Not Designated as HCAs" shall require a structural setback of 15 feet from any top of bank that represents the edge of the land designated as "Habitat and Impact Areas Not Designated as HCAs."

3. For properties that lack a distinct top of bank the applicant shall identify the boundary of the area designated as "Habitat and Impact Areas Not Designated as HCAs" which is closest to the river. A structural setback of 15 feet is required from that boundary line. That 15-foot measurement extends from the boundary line away from the river. At-grade water-permeable patios or decks within 30 inches of grade may encroach into that setback 10 feet but must keep five feet from the boundary and cannot cantilever into the five-foot setback area. For vacant lots of record that comprise no lands with "Habitat and Impact Areas Not Designated as HCAs" designation or insufficient lands with those designations so that the above setbacks cannot be met, the house shall be set back as far from river as possible to accommodate house as part of the allowed 5,000 square feet of impermeable surfaces.

Staff Finding 97: This criteria does not apply since there is no river on this property.

D. Development of lands designated for industrial, commercial, office, public and other non-residential uses.
(.....)

Staff Finding 98: This criteria does not apply since there are no industrial, commercial, office, public and other non-residential uses on this property.

E. Hardship provisions and non-conforming structures.

1. For the purpose of this chapter, non-conforming structures are existing structures whose building footprint is completely or partially on HCA lands. Any additions, alterations, replacement, or rehabilitation of existing non-conforming non-water-related structures (including decks), roadways, driveways, accessory uses and accessory structures shall avoid encroachment upon the HCAs, especially high HCAs, except that:
(.....)

Staff Finding 99: This criteria does not apply since there are no non-conforming structures on this property.

F. Access and property rights.

1. Private lands within the protection area shall be recognized and respected.

2. Where a legal public access to the river or elsewhere in the protection area exists, that legal public right shall be recognized and respected.
(....)

Staff Finding 100: This criteria does not apply since the property is not on the Willamette or Tualatin River.

G. Incentives to encourage access in industrial, multi-family, mixed use, commercial, office, public and non-single-family residential zoned areas.
(....)

Staff Finding 101: This criteria does not apply since there are no industrial, commercial, office, public and other non-residential uses on this property.

H. Partitions, subdivisions and incentives.

1. When dividing a property into lots or parcels, an applicant shall verify the boundaries of the HCA on the property.

2. Applicant shall partition or subdivide the site so that all lots or parcels have a buildable site or envelope available for home construction located on non-HCA land or areas designated "Habitat and Impact Areas Not Designated as HCAs" per the HCA Map.

3. Development of HCA-dominated lands shall be undertaken as a last resort. A planned unit development (PUD) of Chapter 24 CDC may be required.

4. Incentives are available to encourage provision of public access to, and/or along, the river. By these means, planned unit developments shall be able to satisfy the shared outdoor recreation area requirements of CDC 55.100(F). Specifically, for every square foot of riverfront path, the applicant will receive credit for two square feet in calculating the required shared outdoor recreation area square footage. Applicants shall also be eligible for a density bonus under CDC 24.150(B). To be eligible to receive either of these incentives, applicants shall:

a. Provide a minimum 20-foot-wide all-weather public access path along the project's entire river frontage (reduced dimensions would only be permitted in response to physical site constraints such as rock outcroppings, significant trees, etc.); and

b. Provide a minimum 10-foot-wide all-weather public access path from an existing public right-of-way to that riverfront path or connect the riverfront path to an existing riverfront path on an adjoining property that accesses a public right-of-way;

c. Fencing may be required near steep dropoffs or grade changes.

Staff Finding 102: The use of the PUD provisions was intended to facilitate a subdivision design that avoids all HCAs. The applicant's layout includes four lots that are within the HCA. The lots must be designed to provide... *"a buildable site or envelope available for home construction located on non-HCA land or areas designated "Habitat and Impact Areas Not Designated as HCAs" per the HCA Map."*

This criteria would be met by a supportive Planning Commission HCA verification decision based on Schott and Associates findings (page 358) and completion of Condition of Approval 10. It should be noted that lots 23, 25 and 35 have *"...buildable site or envelope available for home construction located on non-HCA land or areas designated "Habitat and Impact Areas Not Designated as HCAs" per the HCA Map,"* so they already meet the criteria but the verification process would provide a larger area for building on those lots. In the case of lot 35, the verification will also allow the applicant to avoid constructing the house on the east

side of the lot and thus save some significant trees. Lot 24 will have to either eliminated or reconfigured if a supportive Planning Commission HCA verification decision is not approved. The remainder of the criteria (4) (a-c) does not apply since the property is not on the Willamette or Tualatin River.

I. Docks and other water-dependent structures.
(….)

Staff Finding 103: This criteria does not apply since the property is not on the Willamette or Tualatin River.

L. Roads, driveways, utilities, or passive use recreation facilities. Roads, driveways, utilities, public paths, or passive use recreation facilities may be built in those portions of HCAs that include wetlands, riparian areas, and water resource areas when no other practical alternative exists but shall use water-permeable materials unless City engineering standards do not allow that.

Staff Finding 104: The lower section of Meadowlark Drive near the intersection with Parker Road is in a Moderate ("b" and "c") HCA. The narrow frontage of this property along Parker Road dictates the street's location. No other practical alternative exists; the street is therefore permitted. The criteria is met.

M. Structures. All buildings and structures in HCAs and riparian areas, including all exterior mechanical equipment, should be screened, colored, or surfaced so as to blend with the riparian environment. (….)

Staff Finding 105: No building permits are proposed in this application. The criteria does not apply.

N. Water-permeable materials for hardscapes. The use of water-permeable materials for parking lots, driveways, patios, and paths as well as flow-through planters, box filters, bioswales and drought tolerant plants are strongly encouraged in all "a" and "b" land classifications and shall be required in all "c" and "d" land classifications. The only exception in the "c" and "d" classifications would be where it is demonstrated that water-permeable driveways/hardscapes could not structurally support the axle weight of vehicles or equipment/storage load using those areas. Flow through planters, box filters, bioswales, drought tolerant plants and other measures of treating and/or detaining runoff would still be required in these areas.

Staff Finding 106: The applicant will be providing water permeable trails and storm water facilities in the HCAs. The criteria is met.

O. Signs and graphics. (….)

Staff Finding 107: This criteria does not apply since the property is not on the Willamette or Tualatin River and no signs are proposed.

P. Lighting. Lighting shall not be focused or oriented onto the surface of the river except as required by the Coast Guard. Lighting elsewhere in the protection area shall be the minimum necessary and shall not create off-site glare or be omni-directional. Screens and covers will be required.

Staff Finding 108: This criteria does not apply since the property is not on the Willamette or Tualatin River. (Street lights will be provided to Public Works standards with hoods to minimize off site glare.)

Q. Parking. Parking and unenclosed storage areas located within or adjacent to the protection area boundary shall be screened from the river in accordance with Chapter 46 CDC, Off-Street Parking, Loading and Reservoir Areas. (....)

Staff Finding 109: This criteria does not apply since the property is not on the Willamette or Tualatin River.

R. Views. Significant views of the Willamette and Tualatin Rivers shall be protected as much as possible (....)

S. Aggregate deposits (....)

T. Changing the landscape/grading.
(....)

Staff Finding 110: The above criteria do not apply since the property is not on the Willamette or Tualatin River.

U. Protect riparian and adjacent vegetation. Vegetative ground cover and trees upon the site shall be preserved, conserved, and maintained according to the following provisions:
1. Riparian vegetation below OHW removed during development shall be replaced with indigenous vegetation, which shall be compatible with and enhance the riparian environment and approved by the approval authority as part of the application.
2. Vegetative improvements to areas within the protection area may be required if the site is found to be in an unhealthy or disturbed state by the City Arborist or his designated expert. "Unhealthy or disturbed" includes those sites that have a combination of native trees, shrubs, and groundcover on less than 80 percent of the water resource area and less than 50 percent tree canopy coverage in the primary and secondary habitat conservation area to be preserved. (....)

Staff Finding 111: Tanner Creek's riparian corridor will be protected and enhanced by the applicant's proposal and the re-vegetation/mitigation program. The criteria is met.

3. Tree cutting shall be prohibited in the protection area except that:
a. Diseased trees or trees in danger of falling may be removed with the City Arborist's approval; and
b. Tree cutting may be permitted in conjunction with those uses listed in CDC 28.030 with City Arborist approval; to the extent necessary to accommodate the listed uses;
(....)

Staff Finding 112: Tree cutting is proposed as part of these land use permits per 3(b). The criteria is met.

CHAPTER 75: VARIANCES AND SPECIAL WAIVERS

75.020 CLASSIFICATION OF VARIANCES

B. Class II Variance. Class II variances may be utilized when strict application of code requirements would be inconsistent with the general purpose of the CDC and would create a burden upon a property owner with no corresponding public benefit. A Class II variance will involve a significant change from the code requirements and may create adverse impacts on adjacent property or occupants. It includes any variance that is not classified as a Class I variance or special waiver.

Variance 1

Staff Finding 113: The applicant has applied for two Class II variances; one for cul de sac length, the second for distance between local street intersections.

The first variance seeks relief from 85.200(A) (11): *"New cul-de-sacs and other closed-end streets, consistent with subsection (A) (11) (a) of this section, shall not exceed 200 feet in length or serve more than 25 dwelling units unless the design complies with all adopted Tualatin Valley Fire and Rescue (TVFR) access standards and adequately provides for anticipated traffic, consistent with the Transportation System Plan (TSP)."*

Heron Court is 600 feet long as measured from the intersection of Meadowlark Drive to the end of the cul de sac. This exceeds the 200 foot standard. Nineteen homes are on the cul de sac which is less than the maximum 25 homes allowed.

1. Class II Variance Approval Criteria. The approval authority may impose appropriate conditions to ensure compliance with the criteria. The appropriate approval authority shall approve a variance request if all the following criteria are met and corresponding findings of fact prepared.

a. The variance is the minimum variance necessary to make reasonable use of the property. To make this determination, the following factors may be considered, together with any other relevant facts or circumstances:

1) *Whether the development is similar in size, intensity and type to developments on other properties in the City that have the same zoning designation.*
2) *Physical characteristics of the property such as lot size or shape, topography, or the existence of natural resources.*
3) *The potential for economic development of the subject property.*

Staff Finding 114: Staff adopts the applicant's findings on pages 110-111. Additionally, staff finds that the proposed development is consistent with the allowed density of the R-10 zone and surrounding residential development.

The physical characteristics (including the natural resources) of the site are best served by a cul de sac design. Specifically, the southwest portion of the site is constrained by a WRA while a significant tree stand to the west makes a connecting street (non-cul de sac design) impossible in those directions. Connecting Heron Court north to Rosemont Road, which is an arterial, would diminish that street's function and is not possible given the topography near the north property line which exceeds the allowable 15 percent street grade.

Staff also finds that connecting Heron Court north to Rosemont Road would create a 500 foot long block in the direction of Meadowlark Drive which would not meet the intersection spacing standard of 600 feet per CDC 48.025(C)(2) (as referenced in Table 8-4 of the TSP) which would require another variance. The criteria is met.

b. The variance will not result in violation(s) of any other code standard, and the variance will meet the purposes of the regulation being modified.

Staff Finding 115: Staff adopts the applicant's findings on pages 110-111. Staff finds that no violations of the CDC would result from approval of the variance. TVFR has approved this cul de sac design with a radius large enough to accommodate emergency vehicle turn around. The criteria is met.

c. The need for the variance was not created by the applicant and/or owner requesting the variance.

Staff Finding 116: Staff adopts the applicant's findings on pages 110-111. The criteria is met.

d. If more than one variance is requested, the cumulative effect of the variances results in a project that is consistent with the overall purpose of the zone.

Staff Finding 117: Staff adopts the applicant's findings on pages 110-111. The criteria is met.

Variance 2

Staff Finding 118: The second variance is to address the fact that Meadowlark Drive's intersections on both Rosemont Road and Parker Road occur at locations that do not meet the intersection separation standards of CDC "Access Control" 48.025(B)(6)(a) (as referenced in Table 8-3 of the TSP .

CDC "Access Control" 48.025(B)(6)(a) requires a public intersection separation of 600 feet. The centerline of the Meadowlark Drive intersection on Parker Road is 228 feet from the centerline of Dillon Drive to the east. Consequently, the Meadowlark Drive intersection on Parker Road is 372 feet shy of the standard.

TSP Table 8-3 requires a separation of 300 feet on arterials between intersections and private driveways. The Meadowlark Drive intersection on Rosemont Road is 205 feet from the driveway to Oppenlander Field on the north side of Rosemont Road. Consequently, the Meadowlark Drive intersection on Parker Road is 95 feet shy of the standard.

1. Class II Variance Approval Criteria. The approval authority may impose appropriate conditions to ensure compliance with the criteria. The appropriate approval authority shall approve a variance request if all the following criteria are met and corresponding findings of fact prepared.

a. The variance is the minimum variance necessary to make reasonable use of the property. To make this determination, the following factors may be considered, together with any other relevant facts or circumstances:

1) *Whether the development is similar in size, intensity and type to developments on other properties in the City that have the same zoning designation.*
2) *Physical characteristics of the property such as lot size or shape, topography, or the existence of natural resources.*
3) *The potential for economic development of the subject property.*

Staff Finding 119: Staff adopts the applicant's findings on page 111-113. Staff also finds that the proposed development is consistent with the allowed density of the R-10 zone and surrounding residential development.

b. The variance will not result in violation(s) of any other code standard, and the variance will meet the purposes of the regulation being modified.

Staff Finding 120: Staff adopts the applicant's findings on page 111-113. Staff finds that no violations of the CDC would result from approval of the variance. Staff finds that the variance will *"meet the purposes of the regulation being modified"* in that the lines of sight meet engineering standards on both Parker Road and Rosemont Road which addresses one of the

main concerns of intersection separation which is to ensure that there are adequate opportunities to see traffic entering the same road you are trying to access. Staff also finds that the Oppenlander Field driveway on Rosemont Road generates most of its traffic during weekday evening non-peak hour periods and during the weekends so weekday AM and PM peak hour conflicts are unlikely. Similarly, Dillon Drive serves only 10 homes which would not generate a significant amount of traffic during the weekday AM and PM peak hour. The criteria is met.

c. The need for the variance was not created by the applicant and/or owner requesting the variance.

d. If more than one variance is requested, the cumulative effect of the variances results in a project that is consistent with the overall purpose of the zone.

Staff Finding 121: Staff adopts the applicant's findings on page 111-113. The criteria is met.

EXHIBIT 1: LOCATION

EXHIBIT 2: ZONING

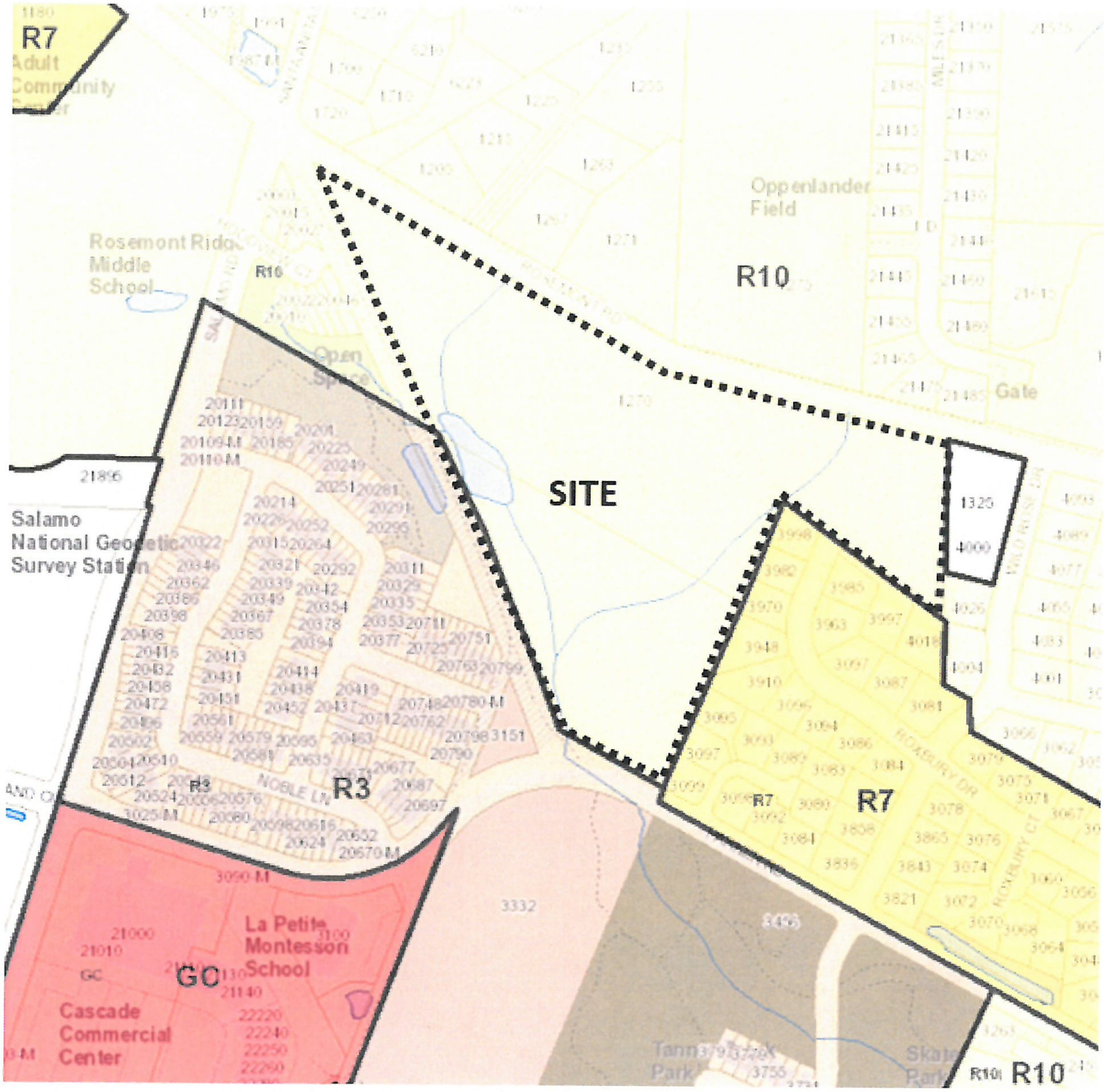
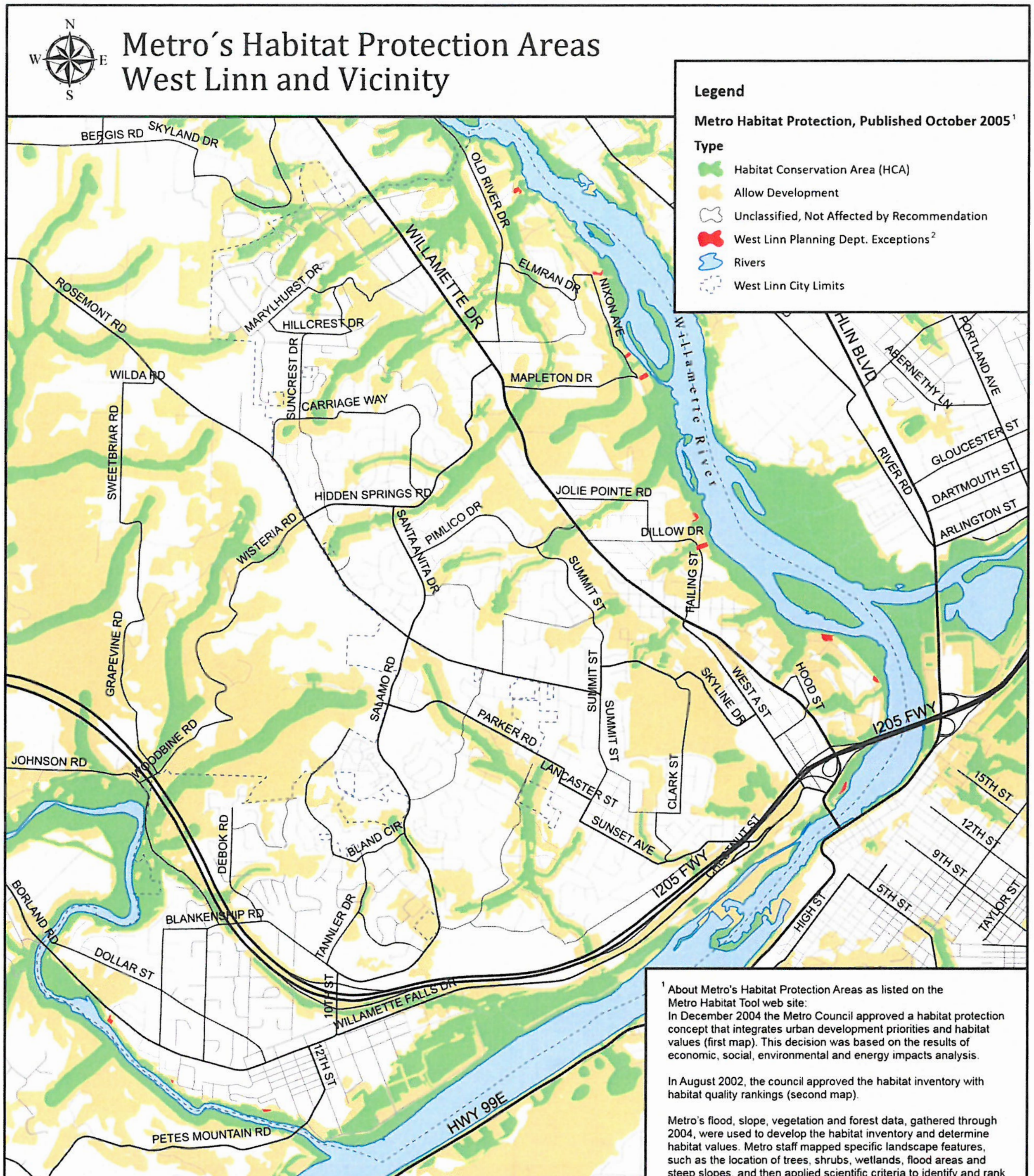


EXHIBIT 3: West Linn HCA Map (adopted 2011)



View Metro's On-Line Habitat Tool at:
http://www.oregonmetro.gov/index.cfm/go/by.web/id=8385

0 0.25 0.5 1 Miles

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Habitat Data Source: Metro DRC Map Produced by West Linn GIS

PLANNING2\METRO_HABITAT_2008\NININVENTORY_MAP_20110128MXD | AHA | 1-26-2011

West Linn GIS
GEOGRAPHIC INFORMATION SYSTEMS

[1] About Metro's Habitat Protection Areas as listed on the Metro Habitat Tool web site:
In December 2004 the Metro Council approved a habitat protection concept that integrates urban development priorities and habitat values (first map). This decision was based on the results of economic, social, environmental and energy impacts analysis.

In August 2002, the council approved the habitat inventory with habitat quality rankings (second map).

Metro's flood, slope, vegetation and forest data, gathered through 2004, were used to develop the habitat inventory and determine habitat values. Metro staff mapped specific landscape features, such as the location of trees, shrubs, wetlands, flood areas and steep slopes, and then applied scientific criteria to identify and rank habitat areas. The data are presented below on aerial photos, taken in 2003, to illustrate the correlation between the data and landscape features.

Streamside habitat areas, floodplains and wetlands are the most valuable, vulnerable and, in some cases, well-protected habitats in Metro's inventory. To protect water quality and ecological benefits, the council recommends the mandatory use of habitat-friendly development practices in these areas.

[2] West Linn Exceptions include the Planning Director's land use decisions: MISC-08-19, MISC-10-26, and memo dated January 25, 2011.

(cont.) Metro 2005 HCA map showing protection classifications

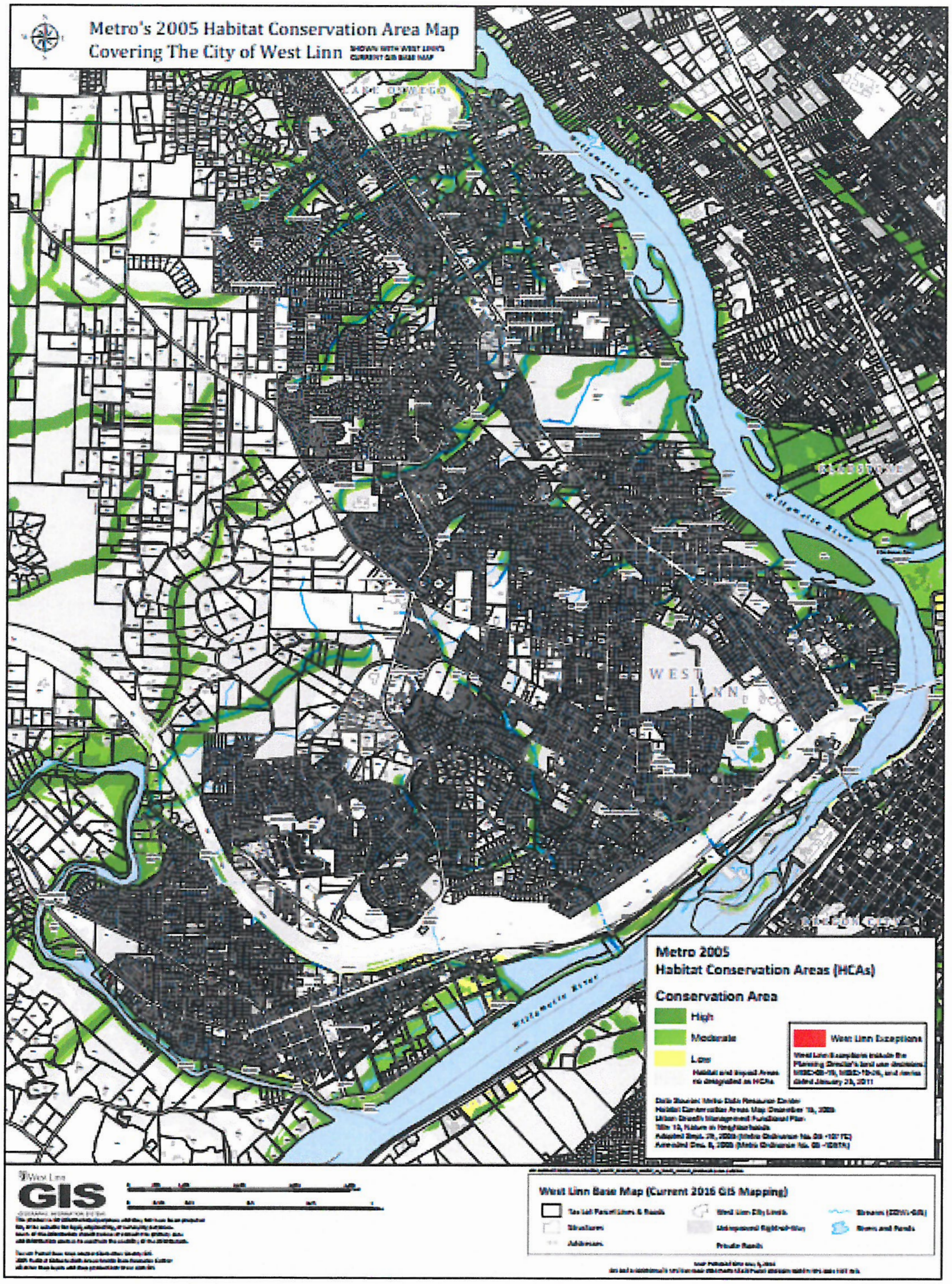


Exhibit 4: Site specific 2005 HCA Map (green areas) provided to show gradations of HCAs

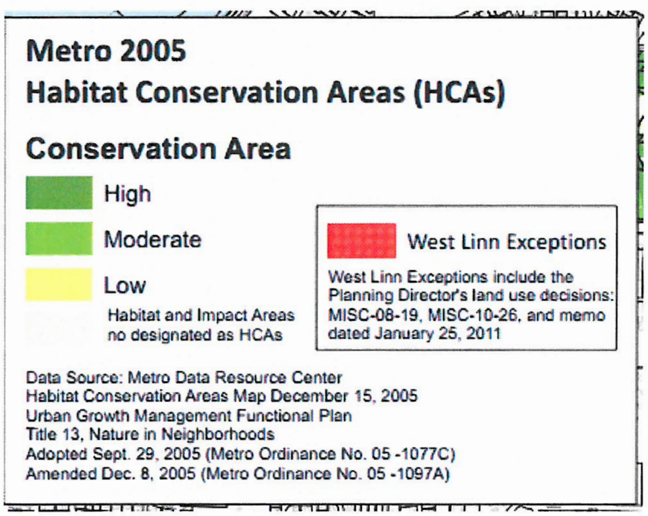
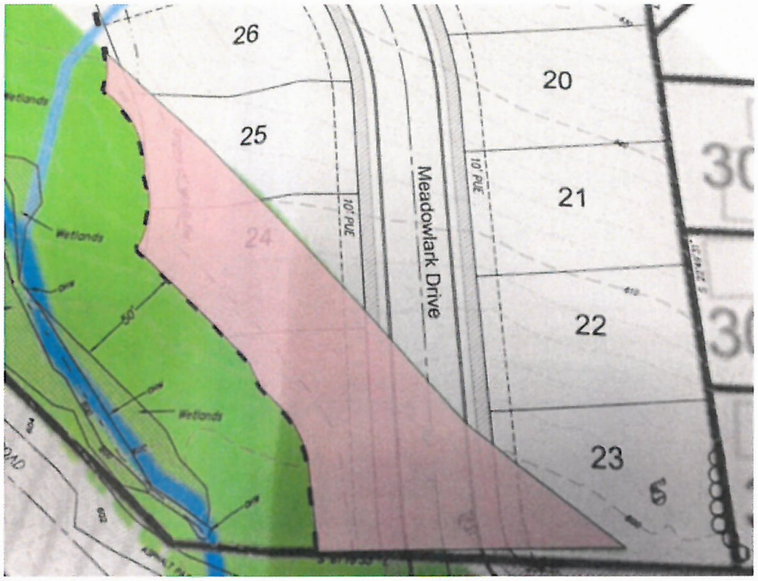


EXHIBIT 5: VERIFICATION FOR MODERATE HCAs ON LOTS 23, 24, 25 and 35. The pink colored area is a moderate HCA, just like the green colored area, but it identifies the area that the applicant wants to re-classify as "Habitat and Impact Areas not designated as HCAs."



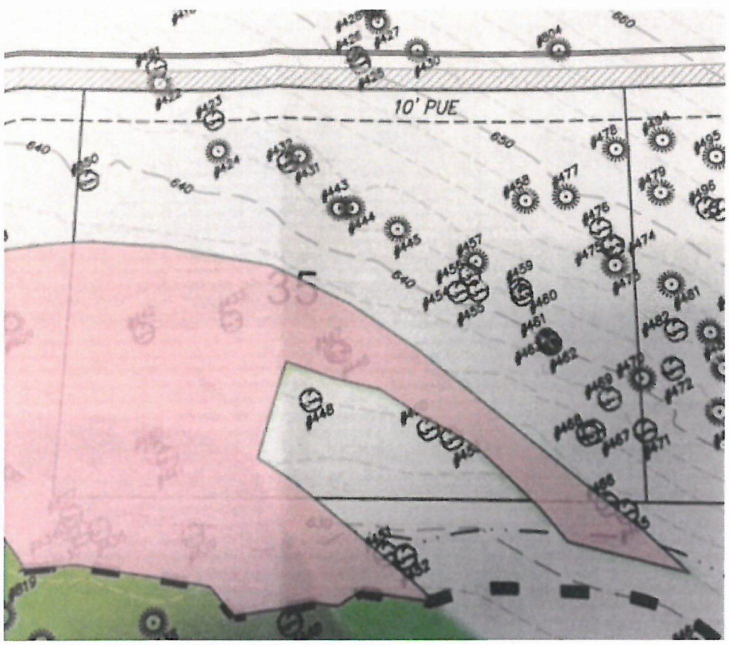


EXHIBIT 6:

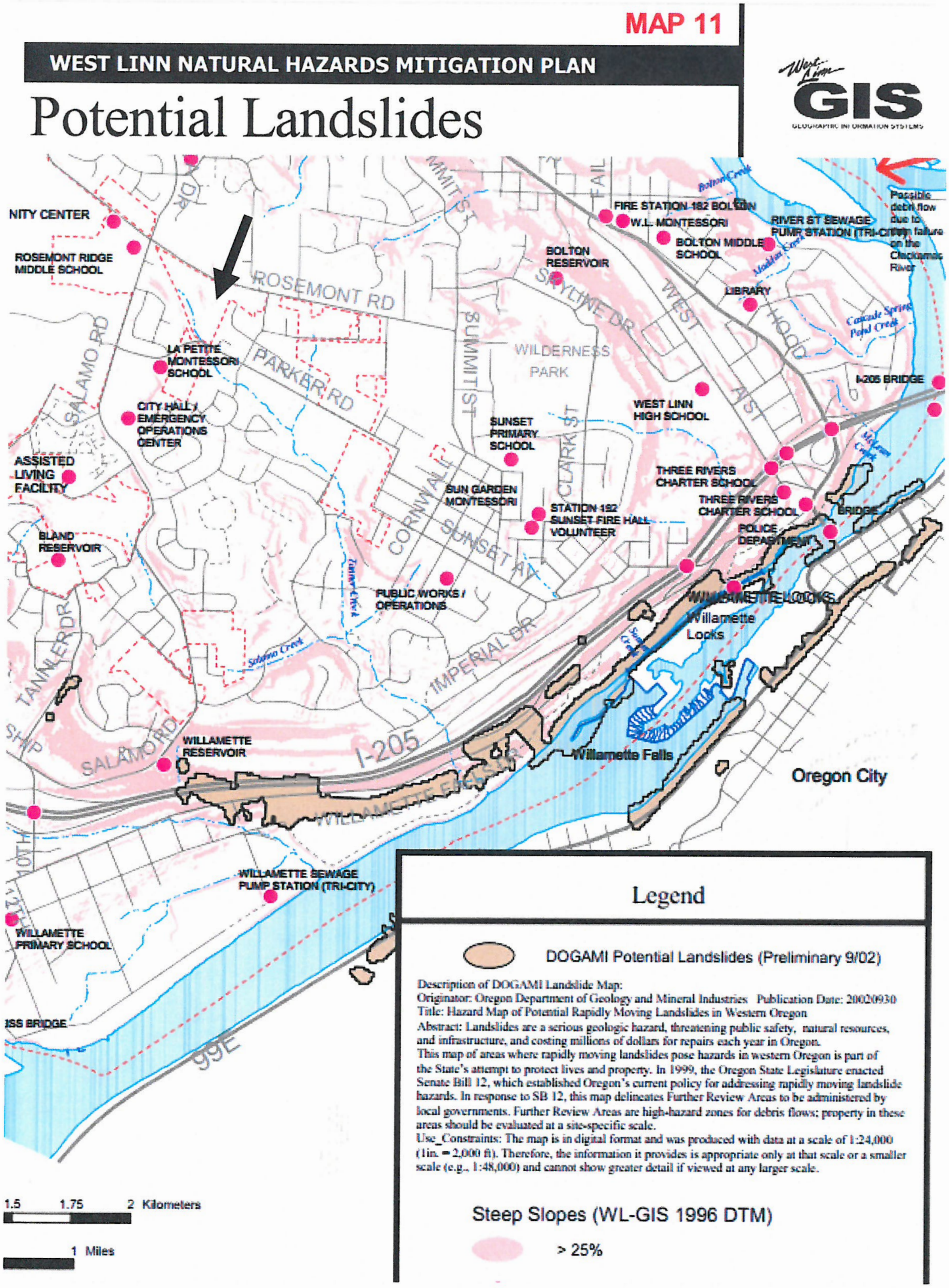
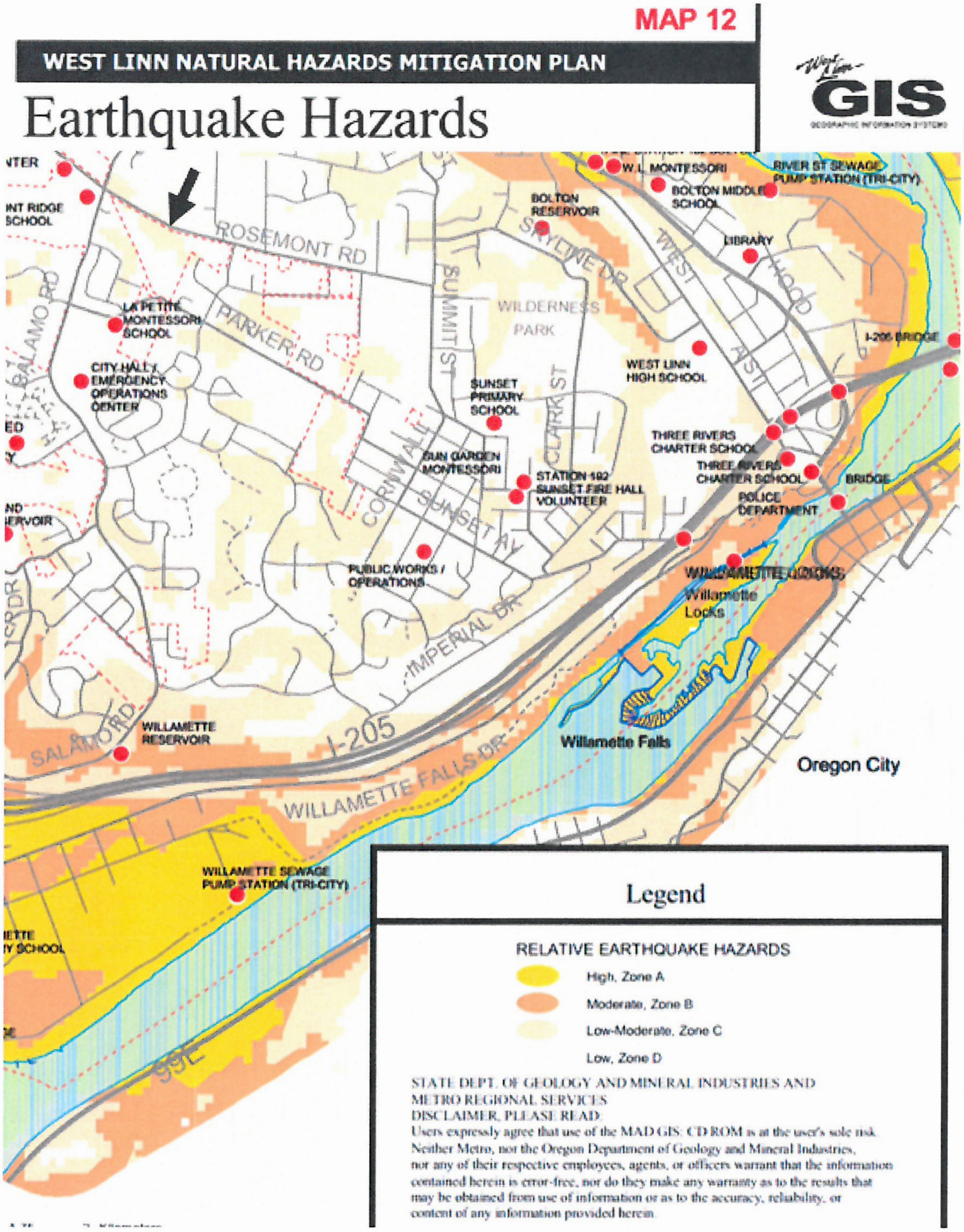
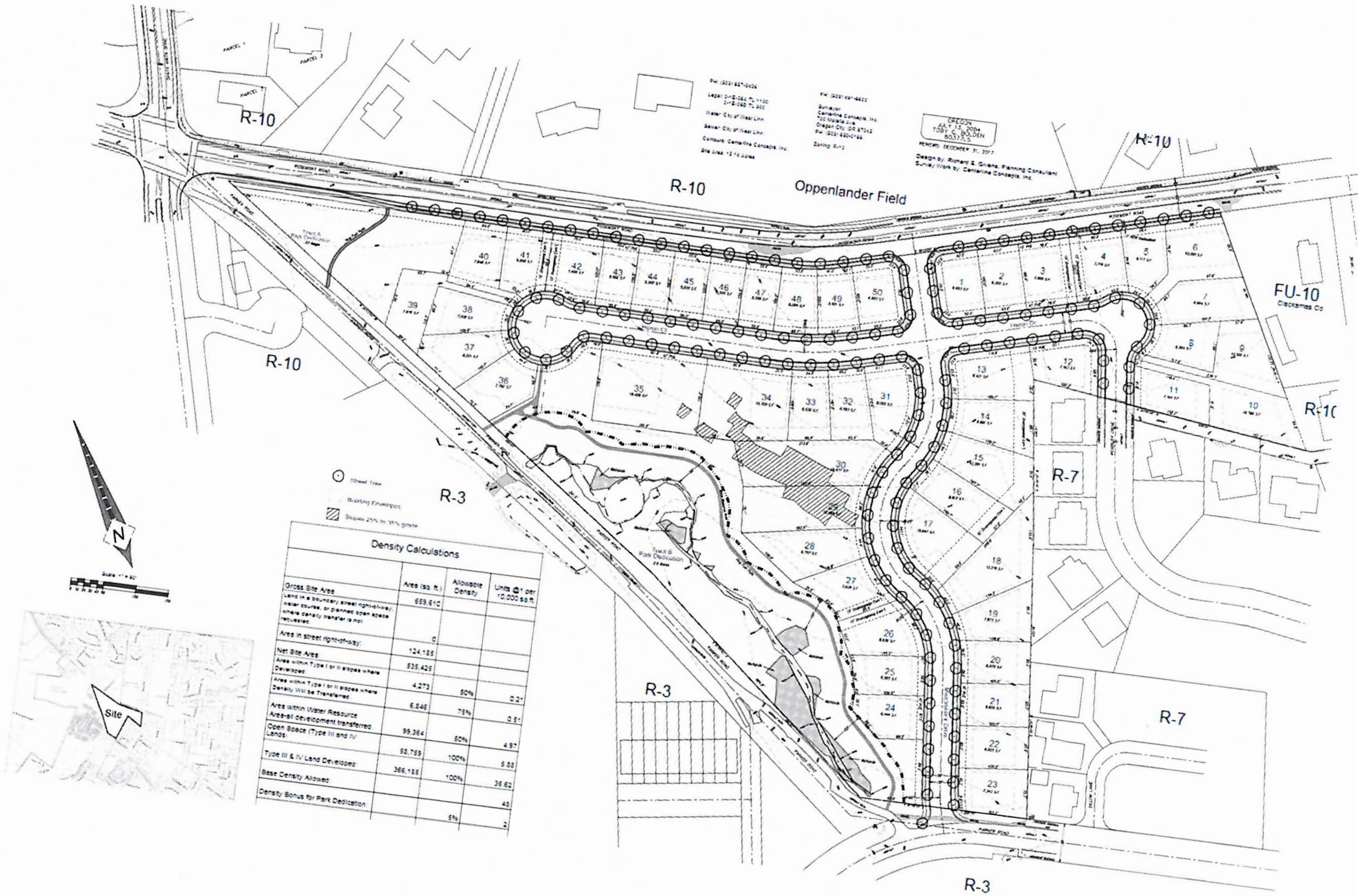

MAP 11
WEST LINN NATURAL HAZARDS MITIGATION PLAN
Potential Landslides
GIS
NITY CENTER
ROSEMONT RIDGE MIDDLE SCHOOL
ROSEMONT RD
LA PETITE MONTESSORI SCHOOL
CITY HALL / EMERGENCY OPERATIONS CENTER
ASSISTED LIVING FACILITY
BLAND RESERVOIR
SALAMO RD
PARKER RD
SUMMIT ST
WILDERNESS PARK
SKYLINE DR
FIRE STATION 182 BOLTON
W.L. MONTESSORI
BOLTON MIDDLE SCHOOL
BOLTON RESERVOIR
RIVER ST SEWAGE PUMP STATION (TRI-CITY)
Possible debri flow due to dam failure on the Clackamas River
LIBRARY
WEST LINN HIGH SCHOOL
I-205 BRIDGE
SUNSET PRIMARY SCHOOL
SUN GARDEN MONTESSORI
STATION 192 SUNSET FIRE HALL VOLUNTEER
THREE RIVERS CHARTER SCHOOL
POLICE DEPARTMENT
PUBLIC WORKS / OPERATIONS
IMPERIAL DR
WILLAMETTE LOCKS
Willamette Locks
Willamette Falls
Oregon City
I-205
WILLAMETTE RESERVOIR
TANNLER DR
WILLAMETTE SEWAGE PUMP STATION (TRI-CITY)
WILLAMETTE PRIMARY SCHOOL
99E
1.5 1.75 2 Kilometers
1 Miles
Legend
DOGAMI Potential Landslides (Preliminary 9/02)
Description of DOGAMI Landslide Map:
Originator: Oregon Department of Geology and Mineral Industries Publication Date: 20020930
Title: Hazard Map of Potential Rapidly Moving Landslides in Western Oregon
Abstract: Landslides are a serious geologic hazard, threatening public safety, natural resources, and infrastructure, and costing millions of dollars for repairs each year in Oregon.
This map of areas where rapidly moving landslides pose hazards in western Oregon is part of the State's attempt to protect lives and property. In 1999, the Oregon State Legislature enacted Senate Bill 12, which established Oregon's current policy for addressing rapidly moving landslide hazards. In response to SB 12, this map delineates Further Review Areas to be administered by local governments. Further Review Areas are high-hazard zones for debris flows; property in these areas should be evaluated at a site-specific scale.
Use_Constraints: The map is in digital format and was produced with data at a scale of 1:24,000 (1in. = 2,000 ft). Therefore, the information it provides is appropriate only at that scale or a smaller scale (e.g., 1:48,000) and cannot show greater detail if viewed at any larger scale.
Steep Slopes (WL-GIS 1996 DTM)
> 25%

EXHIBIT 7:


MAP 12
WEST LINN NATURAL HAZARDS MITIGATION PLAN
Earthquake Hazards
GIS
ROSEMONT RD
PARKER RD
SUMMIT ST
WILDERNESS PARK
SKYLINE DR
CLARK ST
CORNWALL ST
SUNSET AV
IMPERIAL DR
I-205
WILLAMETTE FALLS DR
SALAMO RD
W.L. MONTESSORI
RIVER ST SEWAGE PUMP STATION (TRI-CITY)
BOLTON MIDDLE SCHOOL
BOLTON RESERVOIR
LIBRARY
I-205 BRIDGE
LA PETITE MONTESSORI SCHOOL
CITY HALL / EMERGENCY OPERATIONS CENTER
SUNSET PRIMARY SCHOOL
WEST LINN HIGH SCHOOL
THREE RIVERS CHARTER SCHOOL
BRIDGE
POLICE DEPARTMENT
SUN GARDEN MONTESSORI
STATION 192 SUNSET FIRE HALL VOLUNTEER
PUBLIC WORKS / OPERATIONS
Willamette Locks
WILLAMETTE RESERVOIR
Willamette Falls
Oregon City
WILLAMETTE SEWAGE PUMP STATION (TRI-CITY)
99E
Legend
RELATIVE EARTHQUAKE HAZARDS
High, Zone A
Moderate, Zone B
Low-Moderate, Zone C
Low, Zone D
STATE DEPT. OF GEOLOGY AND MINERAL INDUSTRIES AND METRO REGIONAL SERVICES
DISCLAIMER, PLEASE READ
Users expressly agree that use of the MAD GIS: CD ROM is at the user's sole risk. Neither Metro, nor the Oregon Department of Geology and Mineral Industries, nor any of their respective employees, agents, or officers warrant that the information contained herein is error-free, nor do they make any warranty as to the results that may be obtained from use of information or as to the accuracy, reliability, or content of any information provided herein.

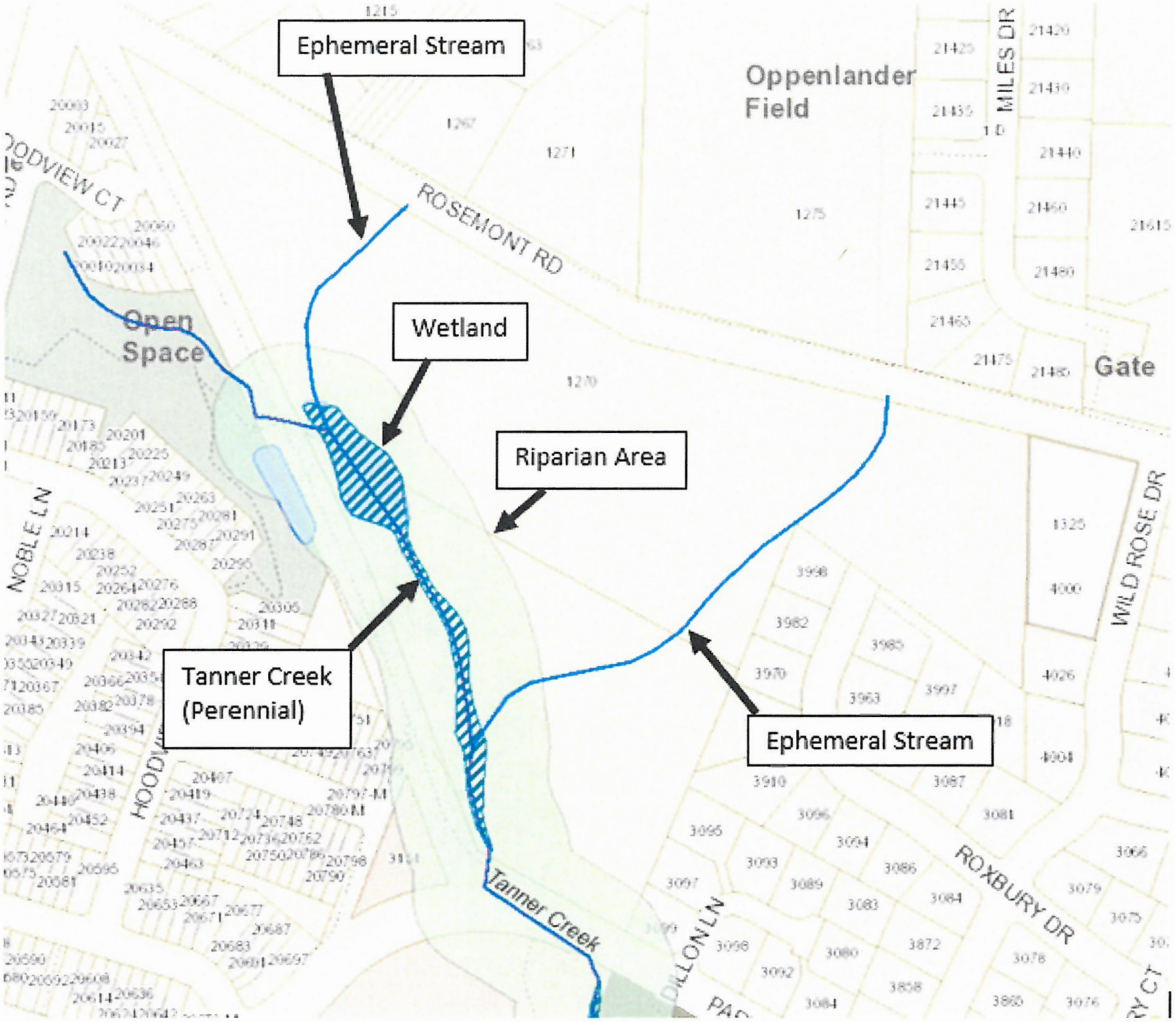
58

EXHIBIT 8: TENTATIVE PLAN



Density Calculations	Area (sq. ft.)	Allowable Density	Units @1 per 10,000 sq.ft.
Gross Site Area	659,610		
Land in a boundary street right-of-way, water course, or planned open space where density transfer is not requested			
Area in street right-of-way:	0		
Net Site Area	124,185		
Area within Type I or II slopes where Developed	535,425		
Area within Type I or II slopes where Density Will be Transferred	4,273	50%	0.21
Area within Water Resource Area-all development transferred	6,846	75%	0.51
Open Space (Type III and IV Lands)	99,364	50%	4.97
Type III & IV Land Developed:	58,759	100%	5.88
Base Density Allowed:	366,185	100%	36.62
Density Bonus for Park Dedication:			43
		5%	2

EXHIBIT 9: WATER RESOURCE AREAS (setbacks from ephemeral streams are 15 feet on each side)



PC-1 AFFIDAVIT AND NOTICE PACKET

AFFIDAVIT OF NOTICE

We, the undersigned do hereby certify that, in the interest of the party (parties) initiating a proposed land use, the following took place on the dates indicated below:

GENERAL

File No. PUD-16-01 Applicant's Name ICON CONSTRUCTION

Development Name TANNER RIDGE at ROSEMONT

Scheduled ~~Meeting~~ PC/Decision Date 9-21-16

NOTICE: Notices were sent at least 20 days prior to the scheduled hearing, meeting, or decision date per Section 99.080 of the Community Development Code. **(check below)**

TYPE A ✓

A.	The applicant (date) 8-31-16	(signed)	S. Shroyer
B.	Affected property owners (date) 8-31-16	(signed)	S. Shroyer
C.	School District/Board (date)	(signed)	
D.	Other affected gov't. agencies (date) 8-31-16	(signed)	S. Shroyer
E.	Affected neighborhood assns. (date) 8-31-16 ALL	(signed)	S. Shroyer
F.	All parties to an appeal or review (date)	(signed)	

At least 10 days prior to the scheduled hearing or meeting, notice was published/posted:

Tidings (published date) 9-8-16 (signed) S. Shroyer

City's website (posted date) 8-31-16 (signed) S. Shroyer

SIGN

At least 10 days prior to the scheduled hearing, meeting or decision date, a sign was posted on the property per Section 99.080 of the Community Development Code.

(date) Sept 1 2016 (signed) [signature]

NOTICE: Notices were sent at least 14 days prior to the scheduled hearing, meeting, or decision date per Section 99.080 of the Community Development Code. **(check below)**

TYPE B ______

A.	The applicant (date)	(signed)
B.	Affected property owners (date)	(signed)
C.	School District/Board (date)	(signed)
D.	Other affected gov't. agencies (date)	(signed)
E.	Affected neighborhood assns. (date)	(signed)

Notice was posted on the City's website at least 10 days prior to the scheduled hearing or meeting.

Date: ______ (signed) ______

STAFF REPORT mailed to applicant, City Council/Planning Commission and any other applicable parties 10 days prior to the scheduled hearing.

(date) ______ (signed) ______

FINAL DECISION notice mailed to applicant, all other parties with standing, and, if zone change, the County surveyor's office.

(date) ______ (signed) ______

p:\devrvw\forms\affidvt of notice-land use (9/09)

CITY OF WEST LINN PLANNING COMMISSION
PUBLIC HEARING NOTICE
FILE NO. PUD-16-01/SUB-16-01/ WAP-16-05/VAR-16-01/ VAR-16-02/WRG-16-01

The West Linn Planning Commission is scheduled to hold a public hearing on **Wednesday, September 21, 2016, starting at 6:30 p.m.** in the Council Chambers of City Hall, 22500 Salamo Road, West Linn, to consider a request for a 50-lot Planned Unit Development (PUD), Subdivision, Water Resource Area Permit, Class II Variances (x 2), and Willamette and Tualatin River Protection Area Permits (WRG) including verification and re-designation of the Habitat Conservation Area boundary at 1270 Rosemont Road.

The criteria applicable are found in Community Development Code (CDC) Chapter 11, Single-Family Residential, R 10; Chapter 85, Land Division General Provisions; Chapter 32, Water Resource Area Protection; Chapter 24: PUD; Chapter 75: Class II Variances, Chapter 28: WRG. The decision by the Planning Commission to approve or deny this request will be based upon the applicable criteria. At the hearing, it is important that comments relate specifically to the applicable criteria.

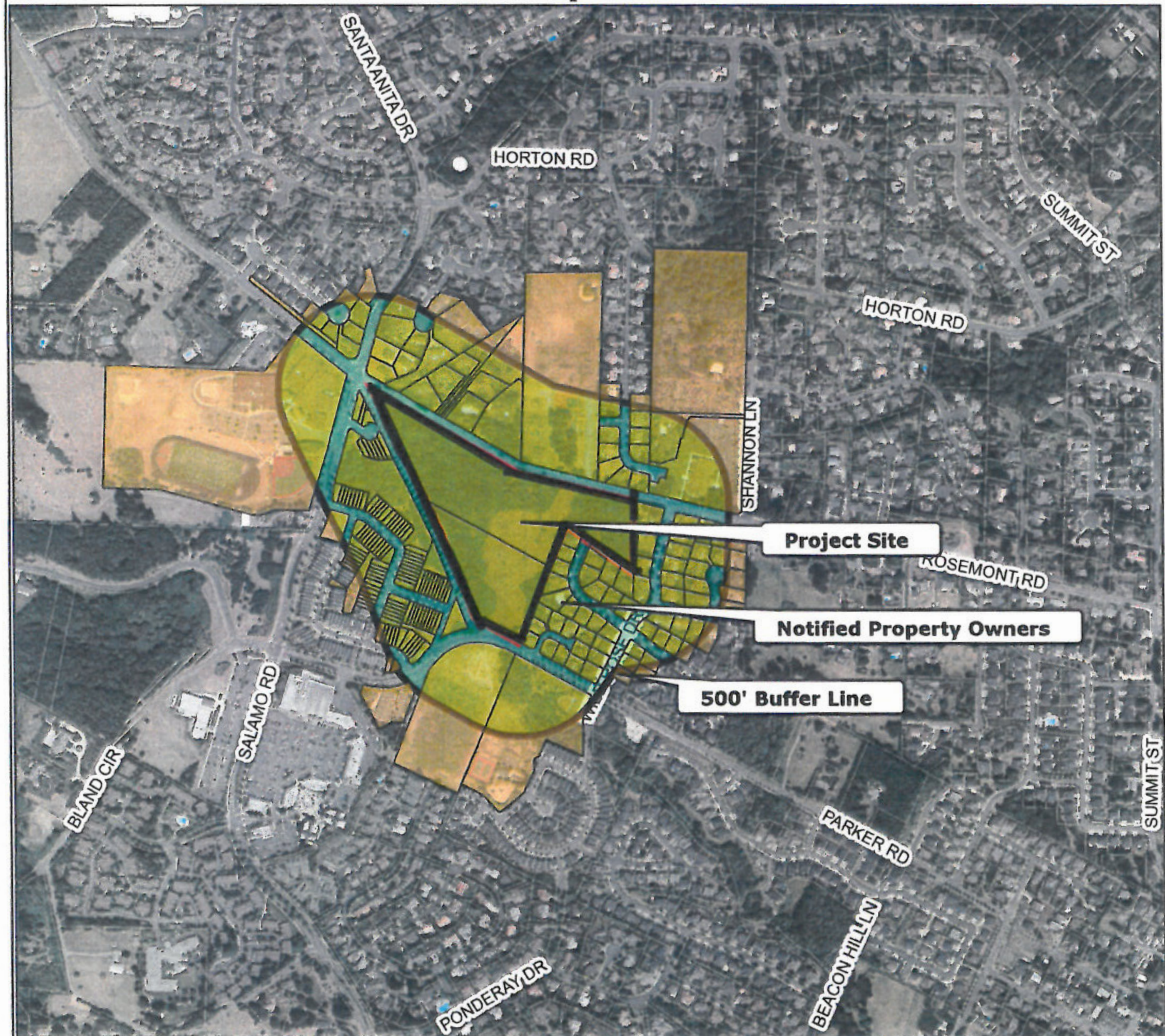
You have been notified of this proposal because County records indicate that you own property within 500 feet of the subject property (Clackamas County Assessor's Map 2S1E26A tax lot 1100 and 2S1E26D tax lot 300) or as otherwise required by Chapter 99 of the CDC.

The complete application is available for inspection at no cost at City Hall or via the web site at http://westlinnoregon.gov/planning/1270-rosemont-road-planned-unit-development-and-subdivision. Printed copies can be obtained at City Hall for a minimal charge per page.

At least ten days prior to the hearing, a copy of the staff report will be available for inspection at no cost or copies can be obtained for a minimal charge per page. For further information, please contact Associate Planner Peter Spir at pspir@westlinnoregon.gov or 503-723-2539 or at City Hall, 22500 Salamo Road, West Linn, OR 97068.

The hearing will be conducted in accordance with the rules of Section 99.170 of the CDC. Anyone wishing to present written testimony on this proposed action may do so in writing prior to, or at the public hearing. Oral testimony may be presented at the public hearing. At the public hearing, the Planning Commission will receive a staff presentation, and invite both oral and written testimony. The Planning Commission may continue the public hearing to another meeting to obtain additional information, leave the record open for additional evidence, arguments, or testimony, or close the public hearing and take action on the application as provided by state law. **It is important to submit all evidence (in writing or at the hearing) to the Planning Commission. City Council review of any appeal is on the record**. Failure to raise an issue in person or by letter at some point prior to the close of the hearing, or failure to provide sufficient specificity to afford the decision maker an opportunity to respond to the issue, precludes an appeal to the Land Use Board of Appeals (LUBA) based on that issue.

1270 Rosemont Road Notification Map

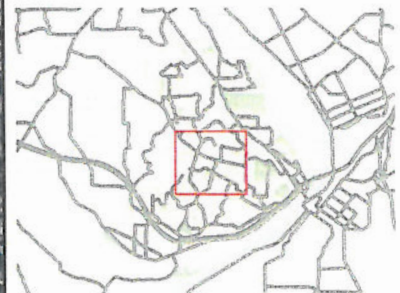


City of West Linn

N W E S

Feet
0 400

Scale 1:9,600 - 1 in = 800 ft
Scale is based on 8-1/2 x 11 paper size



Map created by: SSHROYER
Date Created: 29-Aug-16 02:04 PM

WEST LINN GIS

DISCLAIMER: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Map scale is approximate. Source: West Linn GIS (Geographic Information System) MapOptix.

CITY OF
West Linn

CITY OF WEST LINN
PLANNING COMMISSION MEETING

PROJECT # PUD-16-01/SUB-16-01/WAP-16-05/VAR-16-01/VAR-16-02/WRG-16-01

MAIL: 8/31/16 TIDINGS: 9/8/16

CITIZEN CONTACT INFORMATION

To lessen the bulk of agenda packets, land use application notice, and to address the worries of some City residents about testimony contact information and online application packets containing their names and addresses as a reflection of the mailing notice area, this sheet substitutes for the photocopy of the testimony forms and/or mailing labels. A copy is available upon request.

PC-2 COMPLETENESS LETTER

City of West Linn

July 1, 2016

Mark Handris
ICON Construction and Development LLC
1980 Willamette Falls Drive
Suite 200
West Linn, OR 97068

SUBJECT: Determination of Completeness PUD-16-01, et al, at 1270 Rosemont Road

Dear Mark:

On June 27, 2016, the Planning Department received your most recent resubmittal (Schott and Associates letter dated June 27, 2016). This submittal fulfills the applicable requirements necessary to make a determination that **your application is now complete**. The City has 120 days, from June 27, 2016, to exhaust all local review; that period ends October 25, 2016.

Please be aware that a determination of a complete application does not guarantee a recommendation of approval from staff for your proposal as submitted – it signals that staff believes you have provided the necessary information for the Planning Commission to render a decision on your proposal.

A 20-day public notice will be prepared and mailed for a public hearing before the Planning Commission.

Contact me at 503-723-2539, or by email at pspir@westlinnoregon.gov if you have any questions or comments.

Sincerely,

PeterSpir

Peter Spir
Associate Planner

PC-3 APPLICANT'S SUBMITTAL

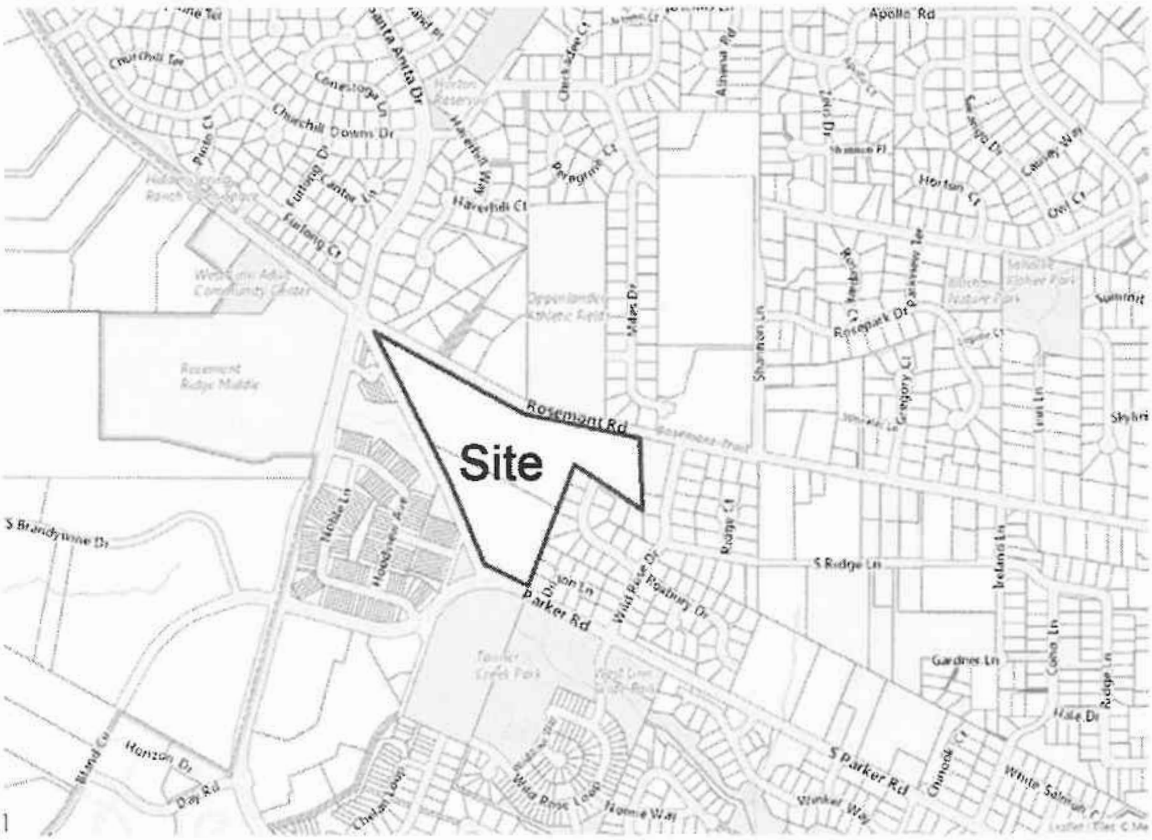
TANNER RIDGE AT ROSEMONT

Planned Unit Development Subdivision Application

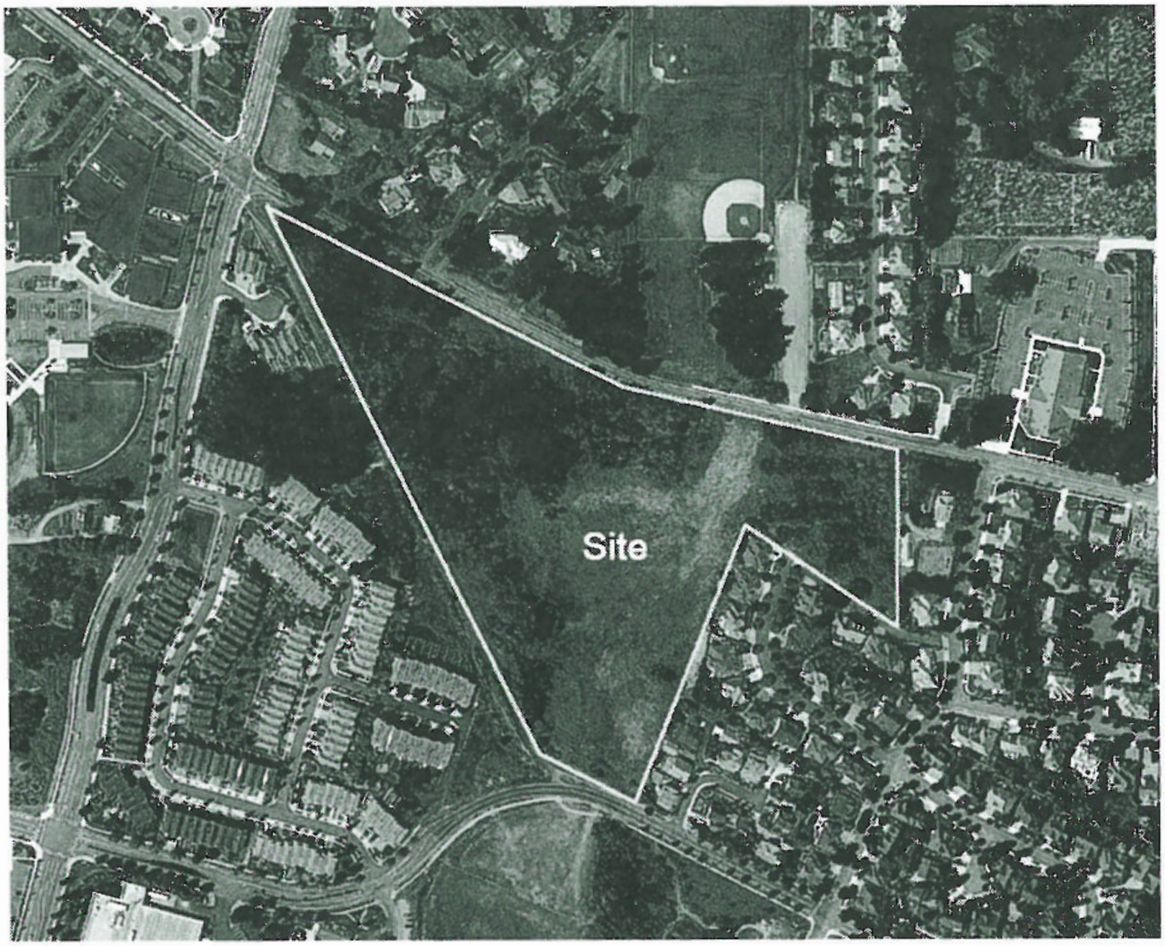
Icon Construction & Development, LLC

Proposal: This application requests approval of a 50-lot Planned Unit Development subdivision to be developed on property located at 1270 Rosemont Road in West Linn. The property is situated southeast of Remington Drive and northwest of Douglas Park. The subject property is described as Tax Lots 21E26A 1100 and 21E26D 300. The site is 15.97 acres (695,610 square feet) in area and is presently vacant. The subject property is zoned R-10.

The application is being proposed for development pursuant to the Planned Unit Development provisions of Chapter 24 of the West Linn Community Development Code (CDC). These provisions allow for greater design flexibility and for the creation of common area open space.



Vicinity Map



The proposed development conforms to the applicable provisions of the CDC as follows:

CHAPTER 24 – PLANNED UNIT DEVELOPMENT

24.010 PURPOSE

The purpose of the Planned Unit Development overlay zone is to provide a means for creating planned environments:

A. To produce a development which would be as good or better than that resulting from traditional lot-by-lot development.

B. To preserve, to the greatest extent possible, the existing landscape features and amenities through the use of a plan that relates the type and design of the development to a particular site.

C. To correlate comprehensively the provisions of this title and all applicable plans; to encourage developments which will provide a desirable, attractive, and stable environment in harmony with that of the surrounding area.

D. To allow flexibility in design, placement of buildings, use of open spaces, circulation facilities, off-street parking areas, and to best utilize the potentials of sites characterized by special features of geography, topography, size, and shape.

E. To allow a mixture of densities between zoning districts and plan designations when more than one district or designation is included in the development.

F. To develop projects that are compatible with neighboring development in terms of architecture, massing, and scale. Where that cannot be accomplished, appropriate transitions should be provided that are deferential or sympathetic to existing development.

G. To carry out the goals of West Linn's Vision, Imagine West Linn, especially goals relating to housing, commercial, and public facilities.

Applicant Response: The proposed development will be better than that which would result from the traditional R-10 subdivision process. The lots will be developed with single-family homes and will be compatible with the surrounding neighborhood in size and setbacks. The benefit of the PUD process, however, is that clustering of homes within the proposed development will provide for the preservation and dedication of 3.63 acres of the site to the City of West Linn as park space. This open space will provide for the preservation of wetlands and wooded areas of the site and, in conjunction with the adjoining Parker Rd. right-of-way walking path, will provide for a nature park that will benefit the proposed development and the surrounding neighborhood.

24.020 ADMINISTRATION AND APPROVAL PROCESS

A. The Planned Unit Development (PUD) zone is an overlay zone and the following are preconditions to filing an application:

> *1. Attending a pre-application conference with the City Community Development Department pursuant to CDC 99.030;*
>
> *2. Attending a meeting with the respective City-recognized neighborhood association(s), per CDC 99.038, and presenting their preliminary proposal and receiving comments.*

B. The application shall be filed by the owner of record or authorized agent.

C. Action on the application shall be as provided by Chapter 99 CDC, Procedures for Decision-Making: Quasi-Judicial. (Ord. 1474, 2001; Ord. 1590 § 1, 2009; Ord. 1621 § 25, 2014)

Applicant Response: The applicant attended a pre-application conference with City staff on January 21, 2016, as required by this section. A meeting with the Parker Crest Neighborhood Association was held on March 16, 2016. The Savanna Oaks and Hidden Falls Neighborhood Associations were also invited to attend this meeting as the site is located within 500 feet of the boundary line between these neighborhoods. The application is being filed by Icon Construction and Development, LLC, who will be the developer of the subject property. The owner of the subject property, Terwilliger Plaza Foundation Holdings, LLC., has given its authorization for the filing of this application by signing the attached City of West Linn Development Review Application form.The required decision-making procedures of Chapter 99 will be followed by the City of West Linn in the review of this application.

24.030 EXPIRATION OR EXTENSION OF APPROVAL

Applicant Response: Not applicable.

24.040 NON-COMPLIANCE – BOND

Applicant Response: Not applicable.

24.050 STAGED DEVELOPMENT

The applicant may elect to develop the site in stages. "Staged development" is defined as an application that proposes numerous phases or stages to be undertaken over a period of time. Typically, the first phase will be sufficiently detailed pursuant to the submittal standards of Chapter 85 CDC. Subsequent phases shall provide the type of use(s); the land area(s) involved; the number of units; generalized location and size (square feet) of commercial, industrial, or office projects; parks and open space; street layout, access, and circulation; etc. Generalized building footprints for commercial, office, public, and multi-family projects and parking lot layout will be required. Staged development shall be subject to the provisions of CDC 99.125.

Applicant Response: Not applicable. The project will be developed in a single phase.

24.060 AREA OF APPLICATION

A. Planned unit developments (PUDs) may be established in all residential, commercial, and industrial districts on parcels of land which are suitable for and of sufficient size to be planned and developed in a manner consistent with the purposes of this section.

B. All qualifying non-residential, all mixed use developments, and all qualifying residential developments of five or more lots shall be developed as PUDs with the Hearings Officer as the decision-making body, while all qualifying residential developments of four or fewer lots shall be developed as a PUD with the Planning Director as the decision-making body, whenever one of the following qualifying criteria apply:

1. Any development site composed of more than 25 percent of Type I or Type II lands, as defined by CDC 24.060(C), shall be developed as a PUD.

2. More than 20 percent of the dwelling units are to be attached on common wall except in the R-3 and R-2.1 zones. A PUD is not required in R-3 and R-2.1 zones where common wall/multi-family projects are proposed. However, other criteria (such as density transfer, mixed uses, etc.) may trigger a PUD.

3. A large area is specifically identified by the Planning Director or Planning Commission as needing greater design flexibility, increased open space, or a wider variety of housing types. (Ord. 1408, 1998)

Applicant Response: The site contains 11,119 sq. ft. of Type II slopes and an additional 22,835 sq. ft. of drainageway and associated wetlands. The combined total Type II land is 33,954 sq. ft., or 5.1% of the 659,610 sq. ft. total site area. Since the site does not contain more than 25 percent Type I or Type II lands, it is not required to be developed as a PUD. The applicant is proposing that this project be developed as a PUD because of the increased flexibility in design standards afforded by Chapter 24 and the opportunity to preserve significant trees and drainage corridor areas as open space. The property is large enough to be planned and developed in a manner that is consistent with the purposes of the PUD provisions, as demonstrated by the site plan. It provides for appropriate building sites while preserving open space that will make a positive addition to the City's park system in this area.

24.070 EXEMPTIONS FROM PLANNED UNIT DEVELOPMENT REQUIREMENTS

A planned unit development (PUD) shall not apply in cases where all the following conditions exist:

A. No density transfer is proposed pursuant to provisions of this chapter.

B. No development, construction, or grading will take place on Type I and II lands.

C. All the Type I and II lands shall be dedicated to the City as open space, or protected by easement with appropriate delineation.

Applicant Response: Density transfer is being proposed from the areas planned to be dedicated to the City as park land. The proposed development, therefore, is consistent with this section.

24.080 SUBMITTAL REQUIREMENTS

The submittal requirements shall apply to non-exempt projects as identified in CDC 55.025, and shall include the following:

A. Narrative discussing proposal and applicability of the PUD and addressing approval criteria of this chapter and design review, CDC 55.100.

B. Narrative and table showing applicable density calculations.

C. Map showing how the densities will be distributed within the project site.

D. Compliance with submittal requirements of Chapter 55 CDC, Design Review, including full response to approval criteria for Chapter 55 CDC, Design Review, and Chapter 85 CDC, if it is a single-family PUD.

E. Narrative, tables, and showing all density transfers.

F. Tables and maps identifying all Type I, II, III and IV lands by acreage, location and type (please refer to definitions of these lands in Chapter 02CDC).

G. Other material as required by the Planning Director. (Ord. 1408, 1998; Ord. 1463, 2000)

Applicant Response: This narrative is provided in response to Item A. Density calculations are provided in a table depicted on the Tentative Plat. The site plan shows the distribution of densities for this project. The tree preservation provisions of Chapter 55 of the CDC apply to this project and have been satisfied in the design of the site plan, as discussed below in this report. The provisions of Chapter 85 are addressed below in this narrative. The density calculations and open spaces depicted on the Tentative Plan satisfy the requirement of Subsection E. Areas of Type II land exist on the property and are depicted on the Tentative Plan as the drainageway and associated wetlands areas, as well as a minor area of slopes in the range of 25 to 35% grade. No other additional materials were identified for this property by the Planning Director.

24.090 APPLICABILITY AND ALLOWED USES

Applicant Response: The provisions of this section allow the PUD Overlay Zone to be applied to the subject property since it is in a residential zone. The only uses proposed are single-family detached homes and open space that will be dedicated to the City of West Linn as park land for nature preservation and recreational hiking purposes. These uses are authorized by this section. No commercial uses are proposed.

24.100 APPROVAL CRITERIA

A. The approval criteria of CDC 55.100, design review, shall apply to non-exempted projects per CDC 55.025. Single-family detached, single-family attached, and duplex residential units proposed shall comply with the provisions of Chapter 43 CDC at time of building permit application.

Applicant Response: Only single-family detached homes are proposed so the approval criteria of CDC 55.025 do not apply. The provisions of Chapter 43 will be reviewed at the time of building permit application.

B. The application shall also demonstrate compliance with the following criteria:

1. The proposal shall preserve the existing amenities of the site to the greatest extent possible by relating the type and design of the development to the topography, landscape features, and natural amenities existing on the site and in the vicinity.

2. The proposed PUD shall provide a desirable, attractive, and stable environment in harmony with that of the surrounding area through thorough, well-developed, detailed planning and by comprehensively correlating the provisions of this code and all applicable adopted plans.

3. The placement and design of buildings, use of open spaces, circulation facilities, off-street parking areas, and landscaping shall be designed to best utilize the potentials of the site characterized by special features of geography, topography, size, and shape.

4. The PUD shall be developed so that it is compatible with neighboring development in terms of architecture, massing, and scale. Where that cannot be accomplished, appropriate transitions shall be provided that are deferential or sympathetic to existing development.

Applicant Response: The existing amenities of the site are the significant trees as mapped on the Tree Plan and the pond, wetlands and stream corridor areas located along the west side of this site. Except where grading associated with the construction of the cul-de-sac street requires removal, the significant trees will be preserved in park areas and through the use of conservation easements on lots.

The proposed development pattern provides suitable building sites for detached single-family homes consistent with the character of the surrounding single-family neighborhood. As discussed in this narrative, this project has been designed to conform to all applicable review and approval criteria.

The site plan provides for the dedication of 3.63 acres as park for purposes of preservation of significant trees and a main drainage corridor and associated wetlands. The plan also provides for drainage corridor easements in various areas of the site to provide of the passage of ephemeral drainageways depicted on City maps.

Ensuring compatibility with the surrounding neighborhood was a primary concern in preparing this application. Homes will be of a similar size and value as is found in the single-family neighborhood on Roxbury Drive. At the neighborhood meeting conducted prior to the submittal of this application, neighborhood concerns regarding potential for cut-through traffic from Rosemont Road to Parker Road via Roxbury Drive. Taking consideration of this commentary, the applicant has redesigned the street layout since the date of the meeting so as to provide for a direct connection from Rosemont to Parker Drive via the new Meadowlark Drive within the subdivision.

C. All densities, density transfers, transitions, density bonuses, and proposed setbacks shall conform to provisions of this chapter as required by CDC 24.080 and 24.110 through 24.170 inclusive.

Applicant Response: As addressed in this narrative and shown in density calculations on the Tentative Plan, the proposed development is consistent with these provisions.

24.110 RESIDENTIAL DENSITY CALCULATIONS

A. The PUD allows density to be transferred on residential portions of the site. The following sections explain how the allowed number of dwelling units per acre is calculated. The standards are also intended to ensure that PUDs and adjoining developments are compatible and maintain a sense of neighborhood unity.

B. Net acres for land to be developed with detached single-family dwellings, or multi-family dwellings including duplexes, is computed by subtracting the following from the gross acres:

> *1. Any land area which is included in a boundary street right-of-way or water course, or planned open space areas if density transfer is not requested.*
>
> *2. An allocation of 25 percent for public or private facilities (e.g., streets, paths, right-of-way, etc.) or, when a tentative plat or plan has been developed, the total land area allocated for public or private facilities.*
>
> *3. A lot of at least the size required by the applicable base zone, if an existing dwelling is to remain on the site.*

C. The allowed density or number of dwelling units on the site, subject to the limitations in CDC 24.140 and 24.150, is computed by dividing the number of square feet in the net acres by the minimum number of square feet required for each lot, by the base zone.

Applicant Response: See Density shown on the Tentative Plan and in response to Chapter 24.130.

24.130 ALLOWABLE DENSITY ON TYPE I AND II LANDS

Applicant Response:

This subsection provides for reduced density of development for various types of physical features that may exist on a given property. In the case of the subject property, there are minor areas of slopes in the 25% to 35% category (Type II). When density is transferred from such slopes, the density is reduced to 50% (if developed) or 75% (if undeveloped) of that normally permitted by the underlying zone. Building envelopes area shown on the Tentative Plan to show the limits of Type II lands proposed to be developed. Additionally, lands within Water Resource Areas are limited to transfer of 50% of density that would normally accrue from the underlying zone. Taking into account these areas, density calculations are shown in Table 1, below:

Table 1: Density Calculations

	Area in Sq. Ft.
Gross Site Area	659,610
Land in a boundary street right-of-way, water course, or planned open space where density transfer is not requested	0
Area in street rights-of-way:	124,185
Net Site Area:	535,425
Type II Slopes Developed: 4,273 sq.ft. /10,000 x .5 =	0.21 Units
Type II Slopes Undeveloped: 6,846 sq. ft./10,000 x .75 =	0.51 Units
Water Resource Area: 99,364 sq.ft./10,000 x .5 =	4.97 Units
Open space (Type III and IV lands) 58,759 sq. ft./10,000 =	5.88 Units
Type III & IV lands developed: 366,185 sq. ft./10,000 =	36.62 Units
Total allowable base density:	48 Units
Density Bonus for Park Dedication: 5% (See Section 24.150)	2 Units
TOTAL ALLOWABLE DENSITY:	50 UNITS

24.140 TRANSITIONS AND LIMITATIONS ON DENSITY TRANSFER

A. Because the PUD and the provisions of this chapter allow increased residential densities and various housing types, it is necessary that some kind of transition be provided between the project site and the surrounding properties. These transitions will, for example, mitigate the impacts of multi-family housing next to single-family housing. Transitions are not required in all cases, however. The following exceptions shall apply:

> *1. Single-family PUD next to single-family non-PUD does not require a transition (e.g., even though it is R-5 single-family next to R-10, etc.). Also, similar type housing does not need to transition (e.g., duplex next to duplex);*

Applicant Response: The subject property is being developed with lots for single-family detached homes so no transition is required.

24.150 DENSITY BONUSES

A. Although the density may be reduced by CDC 24.130, applicants are encouraged to seek density bonus credits under such categories as "site planning and design excellence." The permitted number of dwelling units may be increased up to 29 percent above those computed under the formula above based on a finding of the Planning Director that the density bonus credits have been satisfied as set forth in the following section and in CDC 24.160:

Applicant Response: Pursuant to Section 24.160(3), a density bonus of five percent is permissible for "improved site area is dedicated and accepted by the City, or other public agency, as usable, accessible park land." The applicant has had positive preliminary discussions with the City Park Department regarding the dedication of Tracts A and B to the City of West Linn for park purposes. Although the primary purpose of the parks will be for preservation of natural areas, the applicant proposes to improve the park sites by removing invasive blackberries, doing mitigation plantings of wetland landscape materials as discussed in the report prepared by Schott and Associates that is appended to this application, and by developing pedestrian pathways as shown on the Tentative Plan.

24.170 USABLE OPEN SPACE REQUIRED

Residential planned unit developments (PUDs) shall comply with the following usable open space requirements:

A. PUDs that contain multi-family units shall comply with the requirements of CDC 55.100(F).

Applicant Response: Not applicable. No multi-family units are proposed.

B. PUDs that contain 10 or more single-family detached, single-family attached, or duplex residential units shall comply with the following usable open space requirements.

Applicant Response: The proposed development contains 50 lots for single-family detached homes. These provisions apply, as discussed below:

1. *The plan shall include an open space area with at least 300 square feet of usable area per dwelling unit.*

   Comment: The plan proposes 50 units, which, at 300 sq. ft. per unit, would require a total of at least 15,000 sq. ft. of usable area. The site plan provides for usable open space areas: Tract A (0.75 acres or 32,682 sq. ft.) and Tract B (2.9 acres or 126,250 sq. ft.). Tract A, alone, contains more than double the required usable area per dwelling unit. This criterion is met.

2. *The usable open space shall meet the design requirements of CDC 55.100(F)(2).*

Comment: CDC 55.100(F)(2) states:

2. *The required recreation space may be provided as follows:*

   a. *It may be all outdoor space; or*

   b. *It may be part outdoor space and part indoor space; for example, an outdoor tennis court and indoor recreation room; and*

   c. *Where some or all of the required recreation area is indoor, such as an indoor recreation room, then these indoor areas must be readily accessible to all residents of the development subject to clearly posted restrictions as to hours of operation and such regulations necessary for the safety of minors.*

   d. *In considering the requirements of this subsection F, the emphasis shall be on usable recreation space. No single area of outdoor recreational space shall encompass an area of less than 250 square feet. All common outdoor recreational space shall be clearly delineated and readily identifiable as such. Small, marginal, and incidental lots or parcels of land are not usable recreation spaces. The location of outdoor recreation space should be integral to the overall design concept of the site and be free of hazards or constraints that would interfere with active recreation.*

All of the proposed open space is outdoor area. All of the open space exists in contiguous tracts that are well in excess of 200 square feet. The proposed open space will be dedicated as park land. No small, marginal, or incidental lots or parcels of open space are proposed. The two park tracts are contiguous to the Park Road pedestrian pathway and the proposed pedestrian paths within the new park land will provide for a logical connected pedestrian trail system.

3. *The usable open space shall be owned in common by the residents of the development unless the decision-making authority determines, based upon a request from the applicant and the recommendation of the City Director of Parks and Recreation, that the usable open space should be dedicated to the City for public use. If owned in common by the residents of the development, then a homeowner's association shall be organized prior to occupancy to maintain the usable open space.*

Comment: The open space is proposed to be dedicated to the City of West Linn as park land. Preliminary discussions with the City of West Linn Parks Director indicates support for this proposal.

4. *If the usable open space contains active recreational facilities such as hard surface athletic courts or swimming pools, then the usable open space area*

shall not be located on the perimeter of the development unless buffered by a transition pursuant to CDC 24.140(B).

Comment: No such active recreational facilities are proposed so buffering is not required.

24.180 APPLICABILITY OF THE BASE ZONE PROVISIONS

The provisions of the base zone are applicable as follows:

A. <u>Lot dimensional standards</u>. The minimum lot size and lot depth and lot width standards do not apply except as related to the density computation under this chapter.

B. <u>Lot coverage</u>. The lot coverage provisions of the base zone shall apply for detached single-family units. For single-family attached residential units, duplex residential units, and multiple-family residential units, the following lot coverage provisions shall apply, based upon the underlying base zone.

R-40, R-20	*35 percent*
R-15	*40 percent*
R-10, R-7	*45 percent*
R-5, R-4.5	*50 percent*
R-3, R-2.1	*60 percent*

Applicant Response: The proposed homes will conform to the maximum 45 percent lot coverage standard for the R-10 zone.

C. <u>Building height</u>. The building height provisions of the underlying zone shall apply.

Applicant Response: The proposed homes will comply with the height standards of the R-10 zone.

D. <u>Structure setback provisions</u>.

1. Setback areas contiguous to the perimeter of the project shall be the same as those required by the base zone unless otherwise provided by the base zone or Chapter 55 CDC.

2. The side yard setback provisions shall not apply except that all detached structures shall maintain a minimum side yard setback of five feet, or meet the Uniform Building Code requirement for fire walls.

3. The side street setback shall be 10 feet.

4. The front yard and rear yard setbacks shall be 15 feet. Porches may encroach forward another five feet. Additional encroachments, such as porches, are allowed per Chapter 38 CDC.

5. The setback for a garage in the front yard that opens onto the street shall be 20 feet unless the provisions of CDC 41.010 apply. Garages in the rear yard may meet the standards of CDC 34.060.

6. The applicant may propose alternative setbacks. The proposed setbacks must be approved by the decision-making body and established as conditions of approval, or by amendment to conditions of approval. The decision-making body will consider among other things maintenance of privacy, adequate light, defensible space, traffic safety, etc.

Applicant Response: The proposed development will comply with these structure setbacks.

E. All other provisions of the base zone shall apply except as modified by this chapter.

Applicant Response: Plans will be reviewed at the time of building permit submittal to ensure that all other provisions of the R-10 zone are met.

24.190 PUD AMENDMENT TRIGGER

Applicant Response: Not applicable. No amendment of a prior PUD approval is being requested.

85.170(B) (2): Per the requirements of this section, a traffic analysis is required whenever a proposed development will generate traffic in excess of 250 vehicle trips per day. A traffic report has been prepared for this project by Lancaster Engineering and is attached to this application. Please refer to that report.

85.200 APPROVAL CRITERIA

No tentative subdivision or partition plan shall be approved unless adequate public facilities will be available to provide service to the partition or subdivision area prior to final plat approval and the Planning Commission or Planning Director, as applicable, finds that the following standards have been satisfied, or can be satisfied by condition of approval.

A. Streets.

Comment: The subject property fronts on Rosemont Road, on the north, and Parker Road, on the south. Rosemont Road and Parker Road are classified by the City of West Linn as Minor Arterial streets. These streets are both paved with two travel lanes. Both will require half-street improvements along the project frontage to bring them into compliance with full City standards. Additional right-of-way dedication is proposed along Rosemont Road to meet minor arterial standards. Internal streets are all local streets. Meadowlark Drive is a proposed north-south street that connects directly between Rosemont Road and Parker Road. Heron Drive is an east-west street that provides for a connection to the stub of Roxbury Drive to the east. To the west, Heron Ct. ends in a cul-de-sac as a connection to Rosemont is impractical due to grades and the Parker pedestrian path precludes any future connection to the west. All of these streets are proposed to be improved to full City local street standards with 56 feet of right-of-way, 32' of pavement, curbs, 5' planters and sidewalks on both sides of the street. This standard conforms to the specifications in the City of West Linn Roadway Cross-Section Standards table in Section 85.200(A)2.

No reserve strips are warranted as there are no stub streets proposed. The extension of Roxbury Drive aligns with the current centerline of that street. No other streets that could be extended abut the subject property. The intersections of Meadowlark Drive with Parker Road and Rosemont Road are "T" intersections that do not have other intersecting streets located within 200 feet of their proposed locations. There are no adjoining undeveloped properties so no stub streets are necessary. All intersection angles are at approximately 90 degrees, as required. Additional right-of-way dedication is proposed along Rosemont Road, consistent with minor arterial standards and the dedication widths obtained with the development of other nearby subdivisions.

Section 85.200(A)7 states, "The staggering of street alignments resulting in "T" intersections shall, wherever practical, leave a minimum distance of 200 feet between the centerlines of streets having approximately the same direction and otherwise shall not be less than 100 feet." This criterion is applicable to the intersection of the proposed Meadowlark Drive/Parker Road and the existing intersection of Dillon Lane with Parker Road. The separation distance between these two intersections is 229 feet, which exceeds the minimum 200' standard.

One cul-de-sac street, Heron Ct., is proposed in this development. The following provisions of Section 85.200(A)11 are applicable:

a. *New cul-de-sacs and other closed-end streets (not including stub streets intended to be connected) on sites containing less than five acres, or sites accommodating uses other than residential or mixed use development, are not allowed unless the applicant demonstrates that there is no feasible alternative due to:*

   1) *Physical constraints (e.g., existing development, the size or shape of the site, steep topography, or a fish bearing stream or wetland protected by Chapter 32 CDC), or*

   2) *Existing easements or leases.*

Comment: The subject property contains over 15 acres, so this provision does not apply.

b. *New cul-de-sacs and other closed-end streets, consistent with subsection (A)(11)(a) of this section, shall not exceed 200 feet in length or serve more than 25 dwelling units unless the design complies with all adopted Tualatin Valley Fire* *and Rescue (TVFR) access standards and adequately provides for anticipated traffic, consistent with the Transportation System Plan (TSP).*

Comment: Not applicable.

c. *New cul-de-sacs and other closed-end streets (not including stub streets intended to be connected) on sites containing five acres or more that are proposed to accommodate residential or mixed use development are prohibited unless barriers (e.g., existing development, steep topography, or a fish bearing stream or wetland protected by Chapter 32 CDC, or easements, leases or covenants established prior to May 1, 1995) prevent street extensions. In that case, the street shall not exceed 200 feet in length or serve more than 25 dwelling units, and its design shall comply with all adopted TVFR access standards and adequately provide for anticipated traffic, consistent with the TSP.*

Comment: The physical constraints of site topography, and grading due to a desire to minimize removal of trees, precludes Heron Ct. connecting to Rosemont Road. Sight distance would also be problematic. The Parker pedestrian path precludes extension of Heron Drive to the west. The proposed Heron Ct. cul-de-sac is approximately 585 feet long and serves 20 lots. The width of the road, with a full 56' of right-of-way and 32' of paving will meet all TVFR standards and will accommodate anticipated traffic from 20 homes.. A variance to the 200' maximum cul-de-sac length standard is being requested. Please refer to the discussion of Chapter 75 below in this report.

d. *Applicants for a proposed subdivision, partition or a multifamily, commercial or industrial development accessed by an existing cul-de-sac/closed-end street shall demonstrate that the proposal is consistent with all applicable traffic standards and TVFR access standards.*

Comment: Not applicable. The site is not accessed from an existing cul-de-sac or closed-end street.

e. *All cul-de-sacs and other closed-end streets shall include direct pedestrian and bicycle accessways from the terminus of the street to an adjacent street or pedestrian and bicycle accessways unless the applicant demonstrates that such connections are precluded by physical constraints or that necessary easements cannot be obtained at a reasonable cost.*

Comment: A pathway from the end of the cul-de-sac to the Parker Rd. pedestrian trail is shown on the Tentative Plan.

f. *All cul-de-sacs/closed-end streets shall terminate with a turnaround built to one of the following specifications (measurements are for the traveled way and do not include planter strips or sidewalks).*

Comment: The cul-de-sac terminates in a circular turn-around consistent with City standards.

The proposed street names do not duplicate other street names in West Linn. The maximum street grade proposed is 15% for Meadowlark Drive, which is consistent with City standards. The minimum centerline curve radius proposed is 125 feet, which exceeds the minimum standard of 50 feet. City staff have indicated at the pre-application conference that the proposed intersections with Rosemont and Parker are acceptable. No alleys are proposed. All proposed streets have sidewalks and planter strips, consistent with City standards. All proposed streets will be dedicated without any reservations or restrictions. All lots in the subdivision have access to a public street, as shown on the Tentative Plan. No gated streets or special entry designs are proposed.

B. *Blocks and lots.*

Comment: No new blocks having a length of more than 800 feet are proposed. Due to terrain and surrounding development patterns, it is not practicable to make blocks that are shorter. The proposed lots are rectangular; contain sufficient area to meet the requirements of the R-10 zone, as modified by the PUD provisions. The lots have buildable depths that do not exceed 2.5 times their width.

The development conforms to the provisions of Chapter 48, as discussed below in this report.

85.200(B) (5). This section states, "Double frontage lots and parcels shall be avoided except where they are essential to provide separation of residential development from arterial streets or adjacent non-residential activities, or to overcome specific disadvantages of topography and orientation. A planting screen or impact mitigation easement at least 10 feet wide, and across which there shall be no right of access, may be required along the line of building sites abutting such a traffic artery or other incompatible use."

The only through lots proposed are those that back up to Rosemont Road (Lots 1-6 and 40-50). Rosemont Road is a minor arterial street. As stated in Section 85.200(B)(5), double frontage lots are appropriate to provide separation of residential development from arterial streets. Further, site grading will provide for a substantial cut in the vicinity of Lots 40-50. This topographic break also warrants the use of double frontage lots per the criteria of that section. Direct access to lots from a minor arterial street is not appropriate, especially given the limited sight distance along Rosemont Road. Fencing will be provided on the Rosemont Road frontage of lots where there is no grading/retaining wall to provide for mitigation of impacts of Rosemont Road. We would also note that the provisions of Section 48.025(B)(4) require that local streets or alleys be used to provide access to residential lots adjacent to arterial streets. The proposed design is consistent with this standard.

The proposed lot lines within the development are approximately at right angles to the streets on which they front, as required by Section 85.200(B)(6).

Flag lots are proposed in three areas of this site where frontage is limited. Lot 6 is located on the knuckle at the intersection of Heron Dr. and Roxbury Drive. It has a

20' accessway, which exceeds City standards. Lots 9 and 10 are located on the east side of Roxbury Dr. where the depth of the lot is approximately 220 feet from the right-of-way to the east property line. There is no practicable street configuration that would serve that area. The combined access drive to those two lots 20 feet, which exceeds City standards. Lots 39 and 40 also share a 20' wide accessway. Those lots are at the end of Heron Ct., where there is insufficient frontage for them to be directly accessed from the cul-de-sac. Common accessways proposed will have mutual maintenance agreements and reciprocal access and utility easements.

The proposed lots are not large enough to allow for future re-division under the provisions of the R-10 zone.

C. *Pedestrian and bicycle trails.*

Comment: A pedestrian trail is proposed from the end of Heron Ct. to the pathway on the old Parker Road right-of-way. This pathway will be developed to City standards. No bicycle land improvements were listed on the Bicycle Master Plan.

D. *Transit facilities.*

Comment: Not applicable. No transit facilities are proposed or required as there is no TriMet service in this area.

E. *Lot grading.*

Comment: Grading of the proposed building site will conform to City standards. Preliminary grading plans for the street area is shown on the Preliminary Grading Plan submitted with this application. Compliance for individual homes will be reviewed at the time of building permit application.

F. *Water.*

Comment: City water is available in Rosemont Road and Roxbury Dr. Comments from City Public Works at the pre-application conference indicate that the existing 8-inch line in Rosemont Road will have to be upgraded by the developer to a 12-inch line. The Preliminary Utility Plan shows the proposed water system within the development, which provides for a looped system with the existing line in Roxbury Drive and extends service through to Parker Road. All lots will be served from this public water system.

G. *Sewer.*

Comment: As shown on the Preliminary Utility Plan, there are existing public sewer lines located in Parker Road and in Roxbury Drive. These sewer lines will be extended to service all lots within the proposed subdivision.

H. Storm.

Comment: Tanner Creek, which crosses the subject property along its western border will accommodate storm water from the proposed development. As shown on the Preliminary Utility Plan, storm sewer will be installed in the new streets and directed to a detention and treatment facility to be developed in Tract "B". Treated storm water will be discharged to the creek at pre-development levels, consistent with City standards.

I. Utility easements. Utility easements are shown on the plans submitted with this application.

J. Supplemental provisions.

1. Wetland and natural drainageways. Comment: Please refer to the Natural Resource Assessment report by Schott and Associates for discussion of compliance with Water Resource Area requirements.
2. Willamette and Tualatin Greenways. Comment: Not applicable. The site is not located in a greenway area.
3. Street trees. Comment: Street trees will be provided as required, as shown on the Tentative Plan.
4. Lighting. Comment: Prior to final plat approval an analysis of existing street lighting will be conducted and, if necessary, improvements made to comply with these standards. The preliminary design for streetlight placement within the subdivision is shown on the preliminary utility plan. To reduce ambient light and glare, high or low pressure sodium light bulbs will be provided for all streetlights within the subdivision. The lights will be shielded so that the light is directed downwards rather than omni-directional.
5. Dedications and exactions. Comment: No new dedications or exactions to service off-site properties are anticipated in conjunction with this application.
6. Underground utilities. Comment: All utilities within the development will be placed underground, as required by this section. Existing overhead utilities on Rosemont will also be placed underground.
7. Density requirement. Comment: The density calculations submitted with this application demonstrate that the maximum density permitted on this site is 50 units. The proposed density of 50 units satisfies the minimum density standard.
8. Mix requirement. Comment: Not applicable. This requirement only applies in the R-2.1 and R-3 zones. The subject property is zoned R-10.
9. Heritage trees/significant tree and tree cluster protection. Comment: No heritage trees, as defined in the Municipal Code, are present on the site. Other existing trees are mapped on the Tree Plan, including those identified by the City Arborist as "significant". Please see discussion of Chapter 55, below.
10. Annexation and street lights. Comment: Not applicable. The subject property is within the city limits.

Chapter 48 - ACCESS, EGRESS AND CIRCULATION

48.025 ACCESS CONTROL

B. <u>Access control standards</u>.

1. <u>Traffic impact analysis requirements</u>. The City or other agency with access jurisdiction may require a traffic study prepared by a qualified professional to determine access, circulation and other transportation requirements. (See also CDC 55.125, Traffic Impact Analysis.)

Comment: A Traffic Impact Analysis has been prepared by Lancaster Engineering and is included in the application package.

2. The City or other agency with access permit jurisdiction may require the closing or consolidation of existing curb cuts or other vehicle access points, recording of reciprocal access easements (i.e., for shared driveways), development of a frontage street, installation of traffic control devices, and/or other mitigation as a condition of granting an access permit, to ensure the safe and efficient operation of the street and highway system. Access to and from off-street parking areas shall not permit backing onto a public street.

Comment: Access to the site will be via new intersections of Meadowlark Dr. with Rosemont Road and Parker Road. No driveway accesses onto Rosemont or Parker will remain following development.

3. <u>Access options</u>. When vehicle access is required for development (i.e., for off-street parking, delivery, service, drive-through facilities, etc.), access shall be provided by one of the following methods (planned access shall be consistent with adopted public works standards and TSP). These methods are "options" to the developer/subdivider.

a) <u>Option 1</u>. Access is from an existing or proposed alley or mid-block lane. If a property has access to an alley or lane, direct access to a public street is not permitted.

b) <u>Option 2</u>. Access is from a private street or driveway connected to an adjoining property that has direct access to a public street (i.e., "shared driveway"). A public access easement covering the driveway shall be recorded in this case to assure access to the closest public street for all users of the private street/drive.

c) <u>Option 3</u>. Access is from a public street adjacent to the development lot or parcel. If practicable, the owner/developer may be required to close or consolidate an existing access point as a condition of approving a new access. Street accesses shall comply with the access spacing standards in subsection (B)(6) of this section.

Comment: All lots will take access from the new local street system within the PUD.

4. *<u>Subdivisions fronting onto an arterial street</u>. New residential land divisions fronting onto an arterial street shall be required to provide alleys or secondary (local or collector) streets for access to individual lots. When alleys or secondary streets cannot be constructed due to topographic or other physical constraints, access may be provided by consolidating driveways for clusters of two or more lots (e.g., includes flag lots and mid-block lanes).*

Comment: The site plan provides local street access for all lots. No access will be provided via the minor arterial streets (Rosemont Rd. and Parker Rd.).

5. *<u>Double-frontage lots</u>. When a lot or parcel has frontage onto two or more streets, access shall be provided first from the street with the lowest classification. For example, access shall be provided from a local street before a collector or arterial street. When a lot or parcel has frontage opposite that of the adjacent lots or parcels, access shall be provided from the street with the lowest classification.*

Comment: Double-frontage lots are proposed along Rosemont Road. All of these lots will take access from the local streets (Heron Dr. and Heron Ct.).

6. *<u>Access spacing</u>.*

   a. *The access spacing standards found in Chapter 8 of the adopted Transportation System Plan (TSP) shall be applicable to all newly established public street intersections and non-traversable medians.*

   b. *Private drives and other access ways are subject to the requirements of CDC 48.060.*

Comment: The proposed intersections of Meadowlark Dr. with Rosemont Rd. and Parker Rd. comply with the access spacing standards of the TSP.

7. *<u>Number of access points</u>. For single-family (detached and attached), two-family, and duplex housing types, one street access point is permitted per lot or parcel, when alley access cannot otherwise be provided; except that two access points may be permitted corner lots (i.e., no more than one access per street), subject to the access spacing standards in subsection (B)(6) of this section. The number of street access points for multiple family, commercial, industrial, and public/institutional developments shall be minimized to protect the function, safety and operation of the street(s) and sidewalk(s) for all users. Shared access may be required, in conformance with subsection (B)(8) of this section, in order to maintain the required access spacing, and minimize the number of access points.*

Comment: Each proposed lot will have one access point, as specified in this section. Shared accesses for flag lots are proposed.

8. *<u>Shared driveways</u>. The number of driveway and private street intersections with public streets shall be minimized by the use of shared driveways with adjoining lots where feasible. The City shall require shared driveways as a condition of land division or site design review, as applicable, for traffic safety and access management purposes in accordance with the following standards:*

a. Shared driveways and frontage streets may be required to consolidate access onto a collector or arterial street. When shared driveways or frontage streets are required, they shall be stubbed to adjacent developable parcels to indicate future extension. "Stub" means that a driveway or street temporarily ends at the property line, but may be extended in the future as the adjacent lot or parcel develops. "Developable" means that a lot or parcel is either vacant or it is likely to receive additional development (i.e., due to infill or redevelopment potential).

b. Access easements (i.e., for the benefit of affected properties) shall be recorded for all shared driveways, including pathways, at the time of final plat approval or as a condition of site development approval.

c. Exception. Shared driveways are not required when existing development patterns or physical constraints (e.g., topography, lot or parcel configuration, and similar conditions) prevent extending the street/driveway in the future.

Comment: Shared accesses for flag lots are proposed. All other lots will have individual driveway accesses.

C. Street connectivity and formation of blocks required. In order to promote efficient vehicular and pedestrian circulation throughout the City, land divisions and large site developments shall produce complete blocks bounded by a connecting network of public and/or private streets, in accordance with the following standards:

1. Block length and perimeter. The maximum block length shall not exceed 800 feet or 1,800 feet along an arterial.

Comment: No block lengths in excess of 800 feet are proposed.

2. Street standards. Public and private streets shall also conform to Chapter 92 CDC, Required Improvements, and to any other applicable sections of the West Linn Community Development Code and approved TSP.

Comment: Proposed streets will comply with the public street standards of Chapter 92 (see below).

3. Exception. Exceptions to the above standards may be granted when blocks are divided by one or more pathway(s), in conformance with the provisions of CDC 85.200(C), Pedestrian and Bicycle Trails, or cases where extreme topographic (e.g., slope, creek, wetlands, etc.) conditions or compelling functional limitations preclude implementation, not just inconveniences or design challenges. (Ord. 1635 § 25, 2014; Ord. 1636 § 33, 2014)

Comment: No exceptions to block length are necessary.

48.030 MINIMUM VEHICULAR REQUIREMENTS FOR RESIDENTIAL USES

A. Direct individual access from single-family dwellings and duplex lots to an arterial street, as designated in the transportation element of the Comprehensive Plan, is *prohibited for lots or parcels created after the effective date of this code where an alternate access is either available or is expected to be available by imminent development application. Evidence of alternate or future access may include temporary cul-de-sacs, dedications or stubouts on adjacent lots or parcels, or tentative street layout plans submitted at one time by adjacent property owner/developer or by the owner/developer, or previous owner/developer, of the property in question.*

Comment: No individual access from the proposed lots to Rosemont Rd. or Parker Rd. is proposed. All lots will take access from the internal local street system.

B. When any portion of any house is less than 150 feet from the adjacent right-of-way, access to the home is as follows:

1. One single-family residence, including residences with an accessory dwelling unit as defined in CDC 02.030, shall provide 10 feet of unobstructed horizontal clearance. Dual-track or other driveway designs that minimize the total area of impervious driveway surface are encouraged.

2. Two to four single-family residential homes equals a 14- to 20-foot-wide paved or all-weather surface. Width shall depend upon adequacy of line of sight and number of homes.

3. Maximum driveway grade shall be 15 percent. The 15 percent shall be measured along the centerline of the driveway only. Variations require approval of a Class II variance by the Planning Commission pursuant to Chapter 75 CDC. Regardless, the last 18 feet in front of the garage shall be under 12 percent grade as measured along the centerline of the driveway only. Grades elsewhere along the driveway shall not apply.

4. The driveway shall include a minimum of 20 feet in length between the garage door and the back of sidewalk, or, if no sidewalk is proposed, to the paved portion of the right-of-way.

Comment: All lots will have individual driveways that conform to these standards. Driveways will be reviewed at the time of building permit application.

C. When any portion of one or more homes is more than 150 feet from the adjacent right-of-way, the provisions of subsection B of this section shall apply in addition to the following provisions.

1. A turnaround may be required as prescribed by the Fire Chief.

2. Minimum vertical clearance for the driveway shall be 13 feet, six inches.

3. A minimum centerline turning radius of 45 feet is required unless waived by the Fire Chief.

4. There shall be sufficient horizontal clearance on either side of the driveway so that the total horizontal clearance is 20 feet.

Comment: Lots 9, 10 and 39 may have portions of the homes located more than 150 feet for the adjacent right-of-way. The applicant will coordinate with TVFR to ensure that these standards are met to the Fire Chief's satisfaction.

D. Access to five or more single-family homes shall be by a street built to full construction code standards. All streets shall be public. This full street provision may only be waived by variance.

Comment: All proposed streets will be built to full City standards for local streets.

E. Access and/or service drives for multi-family dwellings shall be fully improved with hard surface pavement:

Comment: Not applicable. No multi-family dwellings are proposed.

F. Where on-site maneuvering and/or access drives are necessary to accommodate required parking, in no case shall said maneuvering and/or access drives be less than that required in Chapters 46 and 48 CDC.

Comment: Not applicable. All lots are for single-family homes and all parking will be provided on the home's driveway.

G. The number of driveways or curb cuts shall be minimized on arterials or collectors. Consolidation or joint use of existing driveways shall be required when feasible.

Comment: No driveways onto arterial or collector streets are proposed.

H. In order to facilitate through traffic and improve neighborhood connections, it may be necessary to construct a public street through a multi-family site.

Comment: Not applicable. No multi-family development is proposed.

I. Gated accessways to residential development other than a single-family home are prohibited. (Ord. 1408, 1998; Ord. 1463, 2000; Ord. 1513, 2005; Ord. 1584, 2008; Ord. 1590 § 1, 2009; Ord. 1636 § 34, 2014)

Comment: Not applicable. No gated accesses are proposed.

Chapter 55 - DESIGN REVIEW

As required by this chapter, the applicant retained the services of an arborist (Multnomah Tree Experts) to identify the size, species, and condition of existing trees on the subject property. The trees were surveyed and mapped by Centerline Concepts, Inc., as shown on the Existing Conditions Map submitted with this application. Subsequently, the City Arborist visited the site and identified 101 significant trees. These trees are shown on the Tree Preservation Plan submitted with this application. The following provisions of Chapter 55 relating to tree preservation are applicable to this proposal:

B. <u>Relationship to the natural and physical environment</u>.

1. The buildings and other site elements shall be designed and located so that all heritage trees, as defined in the municipal code, shall be saved. Diseased heritage trees, as determined by the City Arborist, may be removed at his/her direction.

Comment: No heritage trees are located on the subject property.

2. All heritage trees, as defined in the municipal code, all trees and clusters of trees ("cluster" is defined as three or more trees with overlapping driplines; however, native oaks need not have an overlapping dripline) that are considered significant by the City Arborist, either individually or in consultation with certified arborists or similarly qualified professionals, based on accepted arboricultural standards including consideration of their size, type, location, health, long term survivability, and/or numbers, shall be protected pursuant to the criteria of subsections (B)(2)(a) through (f) of this section. In cases where there is a difference of opinion on the significance of a tree or tree cluster, the City Arborist's findings shall prevail. It is important to acknowledge that all trees are not significant and, further, that this code section will not necessarily protect all trees deemed significant.

a. Non-residential and residential projects on Type I and II lands shall protect all heritage trees and all significant trees and tree clusters by either the dedication of these areas or establishing tree conservation easements. Development of Type I and II lands shall require the careful layout of streets, driveways, building pads, lots, and utilities to avoid heritage trees and significant trees and tree clusters, and other natural resources pursuant to this code. The method for delineating the protected trees or tree clusters ("dripline + 10 feet") is explained in subsection (B)(2)(b) of this section. Exemptions of subsections (B)(2)(c), (e), and (f) of this section shall apply.

Comment: None of the significant trees identified by the City Arborist are located on Type I or II lands.

b. Non-residential and residential projects on non-Type I and II lands shall set aside up to 20 percent of the area to protect trees and tree clusters that are determined to be significant, plus any heritage trees. Therefore, in the event that the City Arborist determines that a significant tree cluster exists at a development site, then up to 20 percent of the non-Type I and II lands shall be *devoted to the protection of those trees, either by dedication or easement. The exact percentage is determined by establishing the driplines of the trees or tree clusters that are to be protected. In order to protect the roots which typically extend further, an additional 10-foot measurement beyond the dripline shall be added. The square footage of the area inside this "dripline plus 10 feet" measurement shall be the basis for calculating the percentage (see figure below). The City Arborist will identify which tree(s) are to be protected. Development of non-Type I and II lands shall also require the careful layout of streets, driveways, building pads, lots, and utilities to avoid significant trees, tree clusters, heritage trees, and other natural resources pursuant to this code. Exemptions of subsections (B)(2)(c), (e), and (f) of this section shall apply. Please note that in the event that more than 20 percent of the non-Type I and II lands comprise significant trees or tree clusters, the developer shall not be required to save the excess trees, but is encouraged to do so.*

Comment: The Tree Preservation Plan identifies all of the significant trees on non-Type I and II lands. The plan shows a total of 69,424 sq. ft. of the site being devoted to the preservation of significant trees. Seventy-three of the 101 identified significant trees (72%) will be preserved. The portion of the site devoted to tree preservation equates to 10.5% of the site area. While this is less than the required 20% maximum set-aside for preservation of significant trees, the significant trees that are being removed are located in an area that must be graded due to street construction. Please see discussion of subsection f, below.

c. Where stubouts of streets occur on abutting properties, and the extension of those streets will mean the loss of significant trees, tree clusters, or heritage trees, it is understood that tree loss may be inevitable. In these cases, the objective shall be to minimize tree loss. These provisions shall also apply in those cases where access, per construction code standards, to a lot or parcel is blocked by a row or screen of significant trees or tree clusters.

Comment: Not applicable. No stubouts of streets on abutting properties will require the removal of significant trees.

d. For both non-residential and residential development, the layout shall achieve at least 70 percent of maximum density for the developable net area. The developable net area excludes all Type I and II lands and up to 20 percent of the remainder of the site for the purpose of protection of stands or clusters of trees as defined in subsection (B)(2) of this section.

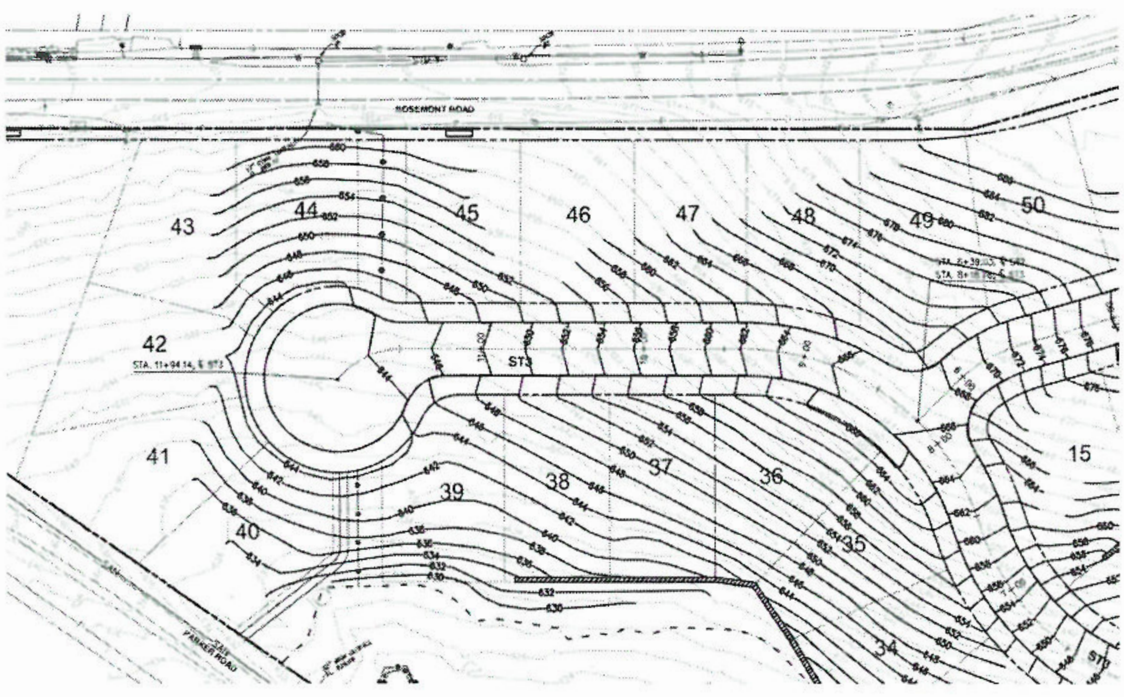
Comment: The density calculations submitted with this application demonstrate that the project will achieve more than 70% of maximum density.

e. For arterial and collector street projects, including Oregon Department of Transportation street improvements, the roads and graded areas shall avoid tree clusters where possible. Significant trees, tree clusters, and heritage tree loss may occur, however, but shall be minimized.

Comment: While the project will require the widening of Rosemont Road, it is not anticipated that this construction will require the removal of significant trees.

f. If the protection of significant tree(s) or tree clusters is to occur in an area of grading that is necessary for the development of street grades, per City construction codes, which will result in an adjustment in the grade of over or under two feet, which will then threaten the health of the tree(s), the applicant will submit evidence to the Planning Director that all reasonable alternative grading plans have been considered and cannot work. The applicant will then submit a mitigation plan to the City Arborist to compensate for the removal of the tree(s) on an "inch by inch" basis (e.g., a 48-inch Douglas fir could be replaced by 12 trees, each four-inch). The mix of tree sizes and types shall be approved by the City Arborist.

Comment: The subject property is located on a hillside that poses difficulties in grading for streets, particularly those in cross-slope configurations such as Heron Ct. The natural grade falls 8 or more feet across the street section in this area. In the initial grading plan configuration of Heron Ct., the project engineer followed standard grading practice of matching the street grade to the centerline profile of the street. This resulted in significant grading on both sides of the road, with cuts on the uphill side and fills on the downhill side, together with a retaining wall at the bottom of the slope to avoid impacting the wetlands buffer. The grading plan below is for an earlier configuration of the site plan, but illustrates that the grading would have been extensive on both sides of the street and would have required the cutting of the significant trees throughout the graded area.



Original Grading Plan

In order to minimize grading impacts, the plan now proposed provides for a retaining wall along Rosemont Road and excavating the north side of Heron Ct. so that the street grade will match as closely as possible the natural grade on the downhill side of the street (see Grading Plan). This reduces the number of significant trees that will be impacted by the development by eliminating most of the fill on the downhill side of the street. A total of 23 significant trees are proposed to be cut due to grading impacts. The Tree Preservation Plan indicates the location of these trees and a table is provided showing the inch-for-inch number of mitigation trees that will need to be planted to satisfy the requirements of this section. Because the location of mitigation trees will be dependent upon the footprint of the homes to be built on the lot, the applicant proposes that a planting plan be prepared for each individual lot and submitted to the City Arborist for review at the time of building permit application.

Chapter 92: REQUIRED IMPROVEMENTS

92.010 PUBLIC IMPROVEMENTS FOR ALL DEVELOPMENT

The following improvements shall be installed at the expense of the developer and meet all City codes and standards:

A. Streets within subdivisions.

1. All streets within a subdivision, including alleys, shall be graded for the full right-of-way width and improved to the City's permanent improvement standards and specifications which include sidewalks and bicycle lanes, unless the decision-making authority makes the following findings:

Comment: As shown on the Tentative Plan, the developer proposes to construct all streets within the subdivision to full City standards.

2. When the decision-making authority makes these findings, the decision-making authority may impose any of the following conditions of approval:

Comment: Not applicable. This subsection applies only when an applicant is proposing to construct less than full standard streets.

B. Extension of streets to subdivisions. The extension of subdivision streets to the intercepting paving line of existing streets with which subdivision streets intersect shall be graded for the full right-of-way width and improved to a minimum street structural section and width of 24 feet.

Comment: As shown on the Grading Plan submitted with this application, the proposed streets will be graded to their intersection with intersecting streets and improved to full City standards.

C. Local and minor collector streets within the rights-of-way abutting a subdivision shall be graded for the full right-of-way width and approved to the City's permanent improvement standards and specifications. The City Engineer shall review the need for street improvements and shall specify whether full street or partial street improvements shall be required. The City Engineer shall also specify the extent of storm drainage *improvements required. The City Engineer shall be guided by the purpose of the City's systems development charge program in determining the extent of improvements which are the responsibility of the subdivider.*

Comment: As shown on the Grading Plan submitted with this application, the proposed streets will be graded for the full right-of-way and improved to City standards.

D. Monuments. Upon completion of the first pavement lift of all street improvements, monuments shall be installed and/or reestablished at every street intersection and all points of curvature and points of tangency of street centerlines with an iron survey control rod. Elevation benchmarks shall be established at each street intersection monument with a cap (in a monument box) with elevations to a U.S. Geological Survey datum that exceeds a distance of 800 feet from an existing benchmark.

Comment: Monumentation will be installed and/or reestablished at street intersections in accordance with this subsection.

E. Surface drainage and storm sewer system. A registered civil engineer shall prepare a plan and statement which shall be supported by factual data that clearly shows that there will be no adverse impacts from increased intensity of runoff off site of a 100-year storm, or the plan and statement shall identify all off-site impacts and measures to mitigate those impacts commensurate to the particular land use application. Mitigation measures shall maintain pre-existing levels and meet buildout volumes, and meet planning and engineering requirements.

Comment: The project engineer has prepared a storm drainage plan, as shown on the Utility Plan, and a storm report for this project. Please refer to those documents.

F. Sanitary sewers. Sanitary sewers shall be installed to City standards to serve the subdivision and to connect the subdivision to existing mains.

1. If the area outside the subdivision to be directly served by the sewer line has reached a state of development to justify sewer installation at the time, the Planning Commission may recommend to the City Council construction as an assessment project with such arrangement with the subdivider as is desirable to assure financing his share of the construction.

2. If the installation is not made as an assessment project, the City may reimburse the subdivider an amount estimated to be a proportionate share of the cost for each connection made to the sewer by property owners outside of the subdivision for a period of 10 years from the time of installation of the sewers. The actual amount shall be determined by the City Administrator considering current construction costs.

Comment: Sanitary sewers are available to this project from existing lines in Parker Rd. and Roxbury Dr. Sewer will be extended to service all lots within the development, as required by this subsection.

G. Water system. Water lines with valves and fire hydrants providing service to each building site in the subdivision and connecting the subdivision to City mains shall be installed. Prior to starting building construction, the design shall take into account provisions for extension beyond the subdivision and to adequately grid the City system.

Hydrant spacing is to be based on accessible area served according to the City Engineer's recommendations and City standards. If required water mains will directly serve property outside the subdivision, the City may reimburse the developer an amount estimated to be the proportionate share of the cost for each connection made to the water mains by property owners outside the subdivision for a period of 10 years from the time of installation of the mains. If oversizing of water mains is required to areas outside the subdivision as a general improvement, but to which no new connections can be identified, the City may reimburse the developer that proportionate share of the cost for oversizing. The actual amount and reimbursement method shall be as determined by the City Administrator considering current or actual construction costs.

Comment: Water lines will be installed within the proposed development and will connect to existing lines in Parker Rd. and Roxbury Dr. Additionally, the developer will replace and upgrade the existing water line in Rosemont Rd. to City standards and the system within the proposed subdivision will be connected to this line. Tying these lines together will improve the water system in this area by providing looping that will aid in maintaining appropriate flows and will avoid sedimentation associated with dead-end lines.

H. Sidewalks.

1. Sidewalks shall be installed on both sides of a public street and in any special pedestrian way within the subdivision, except that in the case of primary or secondary arterials, or special type industrial districts, or special site conditions, the Planning Commission may approve a subdivision without sidewalks if alternate pedestrian routes are available.

In the case of the double-frontage lots, provision of sidewalks along the frontage not used for access shall be the responsibility of the developer. Providing front and side yard sidewalks shall be the responsibility of the land owner at the time a request for a building permit is received. Additionally, deed restrictions and CC&Rs shall reflect that sidewalks are to be installed prior to occupancy and it is the responsibility of the lot or homeowner to provide the sidewalk, except as required above for double-frontage lots.

Comment: As required by this subsection, sidewalks will be installed along all street *frontages* in this development.

2. On local streets serving only single-family dwellings, sidewalks may be constructed during home construction, but a letter of credit shall be required from the developer to ensure construction of all missing sidewalk segments within four years of final plat approval pursuant to CDC 91.010(A)(2).

Comment: Sidewalks will be constructed during home construction on each lot. The required letter of credit will be provided.

3. The sidewalks shall measure at least six feet in width and be separated from the curb by a six-foot minimum width planter strip. Reductions in widths to preserve trees or other topographic features, inadequate right-of-way, or constraints, may be permitted if approved by the City Engineer in consultation with the Planning Director.

Comment: Sidewalks will be installed to City specifications.

4. Sidewalks should be buffered from the roadway on high volume arterials or collectors by landscape strip or berm of three and one-half-foot minimum width.

Comment: The proposed plans provide for a landscape strip between the sidewalk and the roadway along minor arterial streets abutting this property.

5. The City Engineer may allow the installation of sidewalks on one side of any street only if the City Engineer finds that the presence of any of the factors listed below justifies such waiver:
a. The street has, or is projected to have, very low volume traffic density;
b. The street is a dead-end street;
c. The housing along the street is very low density; or
d. The street contains exceptional topographic conditions such as steep slopes, unstable soils, or other similar conditions making the location of a sidewalk undesirable.

Comment: Sidewalks are proposed on both sides of all streets within this subdivision.

I. <u>Bicycle routes</u>. If appropriate to the extension of a system of bicycle routes, existing or planned, the Planning Commission may require the installation of separate bicycle lanes within streets and separate bicycle paths.

Comment: The street section along Rosemont Rd. and Parker Rd. provides for bicycle routes. No routes are called for on the local streets within this subdivision.

J. <u>Street name signs</u>. All street name signs and traffic control devices for the initial signing of the new development shall be installed by the City with sign and installation costs paid by the developer.

Comment: The developer will provide all required signs, consistent with City standards.

K. <u>Dead-end street signs</u>. Signs indicating "future roadway" shall be installed at the end of all discontinued streets. Signs shall be installed by the City per City standards, with sign and installation costs paid by the developer.

Comment: Not applicable. No dead-end streets are proposed.

L. <u>Signs indicating future use</u> shall be installed on land dedicated for public facilities (e.g., parks, water reservoir, fire halls, etc.). Sign and installation costs shall be paid by the developer.

Comment: The developer will provide signs designating future use for the proposed park dedication, as required by this section.

M. <u>Street lights</u>. Street lights shall be installed and shall be served from an underground source of supply. The street lighting shall meet IES lighting standards. The street lights shall be the shoe-box style light (flat lens) with a 30-foot bronze pole in residential (non-intersection) areas. The street light shall be the cobra head style (drop lens) with an approximate 50-foot (sized for intersection width) bronze pole. The *developer shall submit to the City Engineer for approval of any alternate residential, commercial, and industrial lighting, and alternate lighting fixture design. The developer and/or homeowners association is required to pay for all expenses related to street light energy and maintenance costs until annexed into the City.*

Comment: Street lights will be installed by the developer, consistent with the requirements of this subsection.

N. <u>Utilities</u>. The developer shall make necessary arrangements with utility companies or other persons or corporations affected for the installation of underground lines and facilities. Electrical lines and other wires, including but not limited to communication, street lighting, and cable television, shall be placed underground.

Comment: The developer will coordinate with utility companies for the installation of underground facilities for electrical, cable, natural gas, telephone, and street lighting. As required by this section.

O. <u>Curb cuts and driveways</u>. Curb cuts and driveway installations are not required of the subdivider at the time of street construction, but, if installed, shall be according to City standards. Proper curb cuts and hard-surfaced driveways shall be required at the time buildings are constructed.

Comment: Curb cuts will be installed at the time of home construction and will be installed to City standards.

P. <u>Street trees</u>. Street trees shall be provided by the City Parks and Recreation Department in accordance with standards as adopted by the City in the Municipal Code. The fee charged the subdivider for providing and maintaining these trees shall be set by resolution of the City Council.

Comment: The developer will coordinate with the City Parks and Recreation Department regarding installation of street trees and will be responsible for paying the appropriate fee.

Q. <u>Joint mailbox facilities</u> shall be provided in all residential subdivisions, with each joint mailbox serving at least two, but no more than eight, dwelling units. Joint mailbox structures shall be placed in the street right-of-way adjacent to roadway curbs. Proposed locations of joint mailboxes shall be designated on a copy of the tentative plan of the subdivision, and shall be approved as part of the tentative plan approval. In addition, sketch plans for the joint mailbox structures to be used shall be submitted and approved by the City Engineer prior to final plat approval. (Ord. 1180, 1986; Ord. 1192, 1987; Ord. 1287, 1990; Ord. 1321, 1992; Ord. 1339, 1993; Ord. 1401, 1997; Ord. 1408, 1998; Ord. 1442, 1999)

Comment: The developer will coordinate with the US Postal Service and the City Engineer regarding the location of joint mailbox clusters and will install them in accordance with this section.

CHAPTER 28 - WILLAMETTE AND TUALATIN RIVER PROTECTION

City Planning staff has indicated that they have adopted a new policy determining that the provisions of Chapter 28 are applicable to developments containing Habitat Conservation Areas shown on City mapping. The applicant strongly disagrees with this interpretation. These provisions have never been applied to other developments outside of the Willamette River and Tualatin River Greenways, and we believe that this interpretation is in direct conflict with the plain language of that section. Although we are paying the required fee deposit and will address the language of this section, we request that the Planning Commission determine that these provisions do not, in fact, apply and that the fee deposit be refunded.

28.030 APPLICABILITY

A. The Willamette and Tualatin River Protection Area is an overlay zone. The zone boundaries are identified on the City's zoning map, and include:

1. All land within the City of West Linn's Willamette River Greenway Area.

2. All land within 200 feet of the ordinary low water mark of the Tualatin River, and all land within the 100-year floodplain of the Tualatin River.

3. In addition to the Willamette Greenway and Tualatin River Protection Area boundaries, this chapter also relies on the HCA Map to delineate where development should or should not occur. Specifically, the intent is to keep out of, or minimize disturbance of, the habitat conservation areas (HCAs). Therefore, if all, or any part, of a lot or parcel is in the Willamette Greenway and Tualatin River Protection Area boundaries, and there are HCAs on the lot or parcel, a Willamette and Tualatin River Protection Area permit shall be required unless the development proposal is exempt per CDC 28.040.

Comment: The subject property is not within the identified Willamette River Greenway or within 200 feet of the ordinary low water mark of the Tualatin River. The Planning staff interpretation is based upon subsection 28.030(A)3. The site contains a minor area of HCA outside of the Water Resource Area boundary and staff's opinion is that the language of this subsection makes these provisions applicable to this project. However, we note that the plain language states that "*if all, or any part, of a lot or parcel is in the Willamette Greenway and Tualatin River Protection Area boundaries,* ***and*** *there are HCAs on the lot or parcel, a Willamette and Tualatin River Protection Area permit shall be required*" (emphasis added). The property must be within one of the river areas and have an HCA before the provisions of subsection 28.030(A)3 apply. This has been the consistent policy of the City of West Linn for years sense the adoption of this Chapter. The property is not in either river resource area and, therefore, this chapter is not applicable despite there being Habitat Conservation Area on the property.

28.040 EXEMPTIONS/USES PERMITTED OUTRIGHT

The use of Habitat Conservation Areas for residential purposes is not listed as a use that is exempt or permitted outright. However CDC 28.040AA does apply to this proposal:

AA. Lands that are designated as an HCA only due to a forested canopy shall be exempted since trees are already protected in the municipal code and Chapters 55 and 85 CDC. Development of lands that are designated as HCA due to other variables such as wetlands, flood areas and steep slopes shall still be regulated by the provisions of this chapter and not exempted.

Please see discussion of this provision under section 28.070, below.

28.050 PROHIBITED USES

The following are prohibited:

1. *Residential floating structures, also known as floating homes or houseboats.*

2. *Permanent ski jumps.*

3. *More than one dock with or without a boat house per riverfront lot of record, except City-owned tax lots 100, 200, 300, 400, and 500 of Assessor's Map 21 East 24.*

4. *The location of any dock under any water condition that prevents what would otherwise be historic, safe, uninterrupted water passage.*

5. *Any new lawn area or garden area consisting primarily of non-native vegetation within HCA lands. A lawn area in the "Allowed Development" area is permitted.*

6. *Planting of any species identified as nuisance or prohibited plants on the Metro Native Plant List.*

7. *Non-permitted storage of hazardous materials as defined by the Oregon Department of Environmental Quality and dumping of any materials of any kind.*

8. *Excessive trimming or removal of existing native vegetation within the HCA unless it is to reestablish native vegetation in place of non-native or invasive vegetation. (Ord. 1576, 2008)*

Comment: None of the uses listed in this section are proposed within the Habitat Conservation Area.

28.060 ADMINISTRATION AND APPROVAL PROCESS

An application for a protection area permit shall be processed pursuant to the provisions of Chapter 99 CDC, Procedures for Decision-Making: Quasi-Judicial.

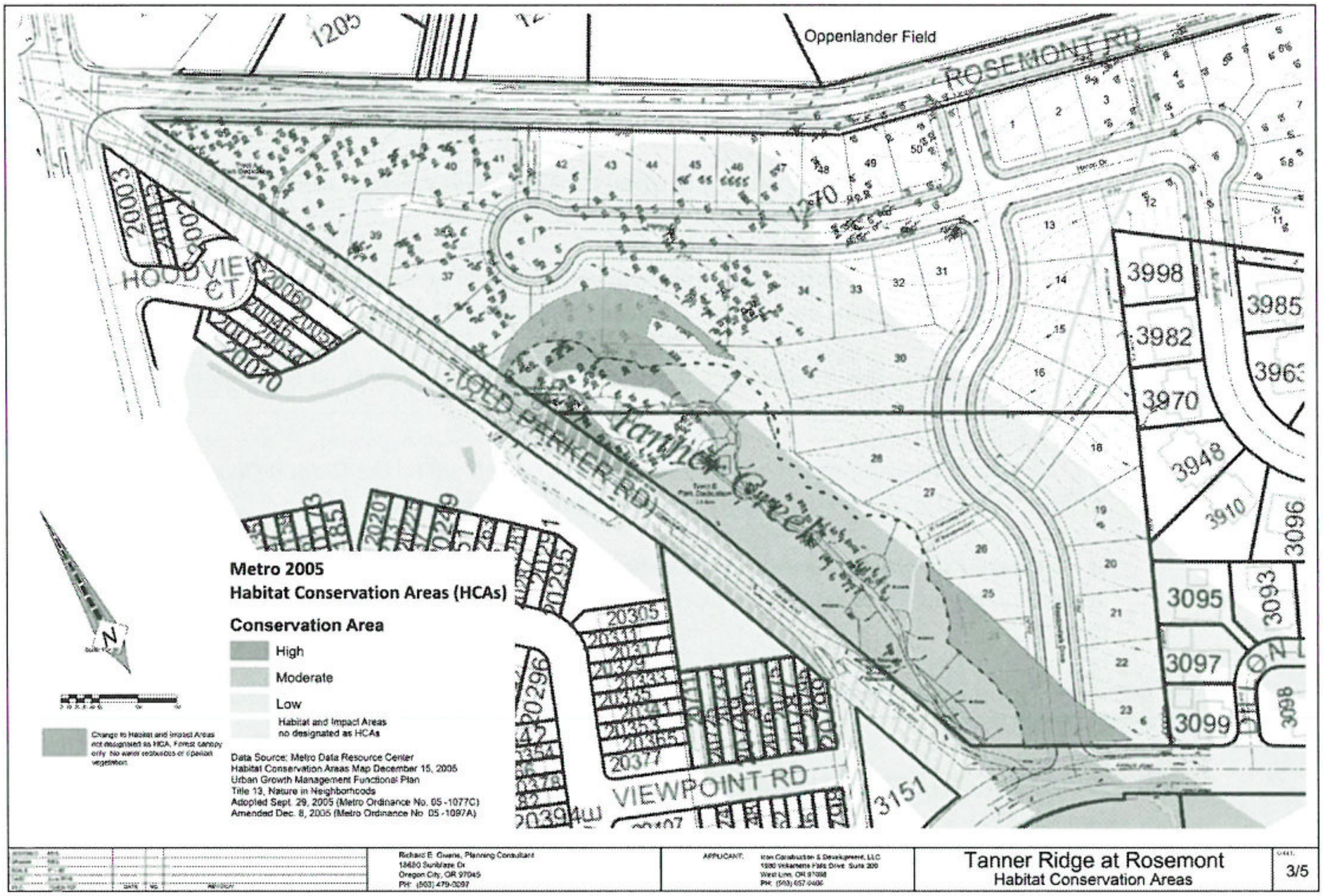
Comment: The application is being processed quasi-judicially, in accordance with the provisions of Chapter 99 of the CDC.

28.070 PLANNING DIRECTOR VERIFICATION OF METRO HABITAT PROTECTION MAP BOUNDARIES

A. The HCA Map is the basis for identifying and designating the habitat conservation areas in the City. A copy of the latest, updated HCA Map is on file at the City and is adopted by reference for use with this chapter.

It is inevitable, given the large area that Metro's HCA Map covers, that there may be some errors. In cases where, for example, three properties share the same contours and the same natural features but the map shows the middle lot with an HCA designation on it, it is reasonable to question the accuracy of that HCA designation. Using tree overstory as the sole basis for HCA *designation will also allow a change in designation since trees are already protected in the municipal code and Chapters 55 and 85 CDC.*

The Habitat Conservation Areas map submitted with this application shows the location of the HCA per the City of West Linn GIS mapping system. A reduced versions of this map is shown below for illustration purposes:



The areas that are designated HCA due strictly to forested tree canopy are shown in gray. As noted in section 28.070(F) "Lands that are designated as an HCA only due to a forested overstory are exempt under CDC 28.040, Exemptions, since trees are already protected in the municipal code and Chapters 55 and 85 CDC." Therefore, the areas mapped in gray are not subject to the provisions of Chapter 28.

The HCA areas mapped in green are associated with water resources and, other than our objection to applicability of Chapter 28 outside of the Willamette River Greenway and Tualatin River areas, would otherwise be subject to these provisions.

There are discrepancies in two areas between the general mapping of water resources shown on the City's HCA map and the field surveyed locations mapped in preparation of this application. These two areas are highlighted in light red on the Habitat Conservation Areas map.The first area is in the vicinity of Lots 24 and 25 and the intersection of Meadowlark Dr. with Parker Road. The surveyed location of Tanner Creek swings to the west and exits the property at the southwest corner of the site. The GIS mapped HCA boundary does not follow the stream alignment but instead continues straight, intersecting Parker Road near the southeast corner of the property. The vegetation in this area of the site is predominantly invasive Himalyan blackberries. There is no riparian vegetation and slope are less than 15% in grade so there are no reasons for the HCA to be farther than 50 feet from the stream corridor as it is elsewhere along the stream.

The second area of discrepancy between field surveyed water resource areas and the GIS mapping lies in the vicinity of Lot 35. The GIS mapping shows wetlands farther to the north than the field-delineated mapping found and, as a result, the HCA bumps farther to the north than it should. The GIS mapping also shows a finger of HCA running through the central portion of Lot 35 and exiting at the southeast corner of that lot. Schott & Associates reviewed that area of the site to confirm whether there were any water resources in that area, but they found no water resources there. That portion of the site is under forested canopy and has upland vegetation consisting of Himalayan blackberry and English Ivy (see Schott & Associates letter to Rick Givens dated May 23, 2016). These two areas should be designated in the gray color as Habitat and Impact Areas not designated as HCAs.

B. The Planning Director shall verify the appropriate HCA or non-HCA designation by site visits or consultations with Metro or by other means. Determination is based on whether the Metro criteria are met or whether the Metro designation was based solely on tree overstory in which case a redesignation is appropriate. In cases where the determination is that the map is incorrect, the Planning Director will make a written finding of this as well as the site conditions that led to that conclusion.

Comment: We request that the Planning Director conduct any necessary field visits and review the information in this report, the Schott & Associates report and letter, and mapping submitted with this application to confirm that the two areas discussed above are not within the portion of the HCA that is subject to this section. As discussed in A, above, these two areas should be designated in the gray color as Habitat and Impact Areas not designated as HCAs.

C. Class B public notice, per Chapter 99 CDC, shall be required prior to issuance of the redesignation decision if it involves redesignation of the HCA boundary to allow the construction of, or addition to, a house.

Comment: The appropriate public notice will be provided by the City per the provisions of Chapter 99 CDC.

D. This determination and findings shall become part of the City record and part of the record for any associated land use application. The Planning Director shall also include in the record the revised map boundary. The Planning Director's determination and map revisions shall also be sent to Metro so that their map may be corrected as necessary.

Comment: The determination and findings will be a part of the record of this application.

E. The Planning Director determination is appealable to the City Council per Chapter 99 CDC.

Comment: It is understood that actions by the Planning Director or Planning Commission on this matter may be appealed to the City Council.

F. Lands that are designated as an HCA only due to a forested overstory are exempt under CDC 28.040, Exemptions, since trees are already protected in the municipal code and Chapters 55 and 85 CDC. Similar exemptions apply to lands that exhibit no constraints. (Ord. 1576, 2008; Ord. 1604 §§ 25 – 28, 2011)

Comment: The areas shown in gray, plus the two areas shown in light red, are exempt due to this provision as there are no habitat resources other than forested overstory.

28.110 APPROVAL CRITERIA

No application for development on property within the protection area shall be approved unless the decision-making authority finds that the following standards have been met or can be met by conditions of approval. The development shall comply with the following criteria as applicable:

A. <u>Development: All sites</u>.

1. Sites shall first be reviewed using the HCA Map to determine if the site is buildable or what portion of the site is buildable. HCAs shall be verified by the Planning Director per CDC 28.070 and site visit. Also, "tree canopy only" HCAs shall not constitute a development limitation and may be exempted per CDC 28.070(A). The municipal code protection for trees and Chapters 55 and 85 CDC tree protection shall still apply.

2. HCAs shall be avoided to the greatest degree possible and development activity shall instead be directed to the areas designated "Habitat and Impact Areas Not Designated as HCAs," consistent with subsection (A)(3) of this section.

3. If the subject property contains no lands designated "Habitat and Impact Areas Not Designated as HCAs" and development within HCA land is the only option it shall be directed towards the low HCA areas first, then medium HCA areas and then to high HCA as the last choice. The goal is to, at best, avoid or, at least, minimize disturbance of the HCAs. (Water-dependent uses are exempt from this provision.)

4. All development, including exempted activities of CDC 28.040, shall have approved erosion control measures per Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual, rev. 2008, in place prior to site disturbance and be subject to the requirements of CDC 32.070 and 32.080 as deemed applicable by the Planning Director.

Comment: With the proposed modification of the HCA boundaries discussed above, all of the HCA falls within the area of Tract B, which is proposed to be dedicated to the City of West Linn for park purposes. The only development proposed within this area is construction of storm water and detention facilities, as shown on the Preliminary Utility Plan, and the proposed pedestrian pathway surface in hog fuel chips.

B. Single-family or attached residential. Development of single-family homes or attached housing shall be permitted on the following HCA designations and in the following order of preference with "a" being the most appropriate and "d" being the least appropriate:

Comment: No residential development is proposed within the HCA.

C. Setbacks from top of bank.

1. Development of single-family homes or attached housing on lands designated as "Habitat and Impact Areas Not Designated as HCAs" shall require a structural setback of 15 feet from any top of bank that represents the edge of the land designated as "Habitat and Impact Areas Not Designated as HCAs."

Comment: No homes are proposed within 15 feet of the top of any bank.

D. Development of lands designated for industrial, commercial, office, public and other non-residential uses.

Comment: Not applicable. The site does not contain lands designated for such uses.

E. Hardship provisions and non-conforming structures.

Comment: Not applicable. The HCA does not contain any non-conforming structures and no hardship conditions exist.

F. Access and property rights.

Comment: Not applicable. The area within the nonexempt HCA is proposed to be dedicated to the City of West Linn for park purposes. No issues of access or property rights will exist following dedication.

G. Incentives to encourage access in industrial, multi-family, mixed use, commercial, office, public and non-single-family residential zoned areas.

Comment: Not applicable. The property is located in a single-family residentially zoned area.

H. Partitions, subdivisions and incentives.

1. When dividing a property into lots or parcels, an applicant shall verify the boundaries of the HCA on the property.

Comment: The HCA map submitted with this application shows the location of the boundaries and is based upon field work performed by Schott & Associates and survey work performed by Centerline Concepts, Inc.

2. *Applicant shall partition or subdivide the site so that all lots or parcels have a buildable site or envelope available for home construction located on non-HCA land or areas designated "Habitat and Impact Areas Not Designated as HCAs" per the HCA Map.*

Comment: All lots are located outside of the HCA lands (as they are proposed to be adjusted in this application.)

3. *Development of HCA-dominated lands shall be undertaken as a last resort. A planned unit development (PUD) of Chapter 24 CDC may be required.*

Comment: The proposed project is being developed as a planned unit development, consistent with this policy, in part so that the HCA area can be preserved as open space and dedicated to the City for park purposes.

4. *Incentives are available to encourage provision of public access to, and/or along, the river...*

Comment: Not applicable. The subject property is not located near a river.

I. Docks and other water-dependent structures.

Comment: Not applicable. The proposed development does not include a dock or other water-dependent structures.

J. Joint docks.

Comment: Not applicable. The proposed development does not include a dock of any kind.

K. Non-conforming docks and other water-related structures.

Comment: Not applicable. The subject property does not contain a dock or other water-related structure.

L. Roads, driveways, utilities, or passive use recreation facilities. Roads, driveways, utilities, public paths, or passive use recreation facilities may be built in those portions of HCAs that include wetlands, riparian areas, and water resource areas when no other practical alternative exists but shall use water-permeable materials unless City engineering standards do not allow that. Construction to the minimum dimensional standards for roads is required. Full mitigation and revegetation is required, with the applicant to submit a mitigation plan pursuant to CDC32.070 and a revegetation plan pursuant to CDC 32.080. The maximum disturbance width for utility corridors is as follows:

1. *For utility facility connections to utility facilities, no greater than 10 feet wide.*

2. *For upgrade of existing utility facilities, no greater than 15 feet wide.*

3. *For new underground utility facilities, no greater than 25 feet wide, and disturbance of no more than 200 linear feet of water quality resource area, or 20 percent of the total linear feet of water quality resource area, whichever is greater.*

Comment: The proposed public pathway in the HCA in Tract B, is proposed to be surfaced with hog fuel chips, a water permeable material. The new storm sewer lines that outfall to the creek area, together with riprap to dissipate the energy of the water outfalling to the creek, will not disturb a width of more than 25 feet and disturb less than 200 linear feet of water quality resource area.

M. *Structures. All buildings and structures in HCAs and riparian areas...*

Comment: Not applicable. No buildings or structures are proposed in the HCA or riparian area.

N. *Water-permeable materials for hardscapes. The use of water-permeable materials for parking lots, driveways, patios, and paths...*

Comment: The proposed public pathway in the HCA in Tract B, is proposed to be surfaced with hog fuel chips, a water permeable material. No other hardscapes are proposed.

O. *Signs and graphics. No sign or graphic display inconsistent with the purposes of the protection area shall have a display surface oriented toward or visible from the Willamette or Tualatin River. A limited number of signs may be allowed to direct public access along legal routes in the protection area.*

Comment: Not applicable. The subject property is not located near the Willamette or Tualatin Rivers. No signs are proposed in the HCA area.

P. *Lighting. Lighting shall not be focused or oriented onto the surface of the river except as required by the Coast Guard. Lighting elsewhere in the protection area shall be the minimum necessary and shall not create off-site glare or be omni-directional. Screens and covers will be required.*

Comment: Not applicable. The subject property is not located near the Willamette or Tualatin Rivers. No lights are proposed in the HCA area.

Q. *Parking. Parking and unenclosed storage areas located within or adjacent to the protection area boundary shall be screened from the river in accordance with Chapter 46 CDC, Off-Street Parking, Loading and Reservoir Areas. The use of water-permeable material to construct the parking lot is either encouraged or required depending on HCA classification per CDC 28.110(N)(4).*

Comment: Not applicable. The subject property is not located near the Willamette or Tualatin Rivers. No parking is proposed in the vicinity of the HCA area.

R. *Views. Significant views of the Willamette and Tualatin Rivers shall be protected as much as possible as seen from the following public viewpoints: Mary S. Young Park, Willamette Park,* *Cedar Oak Park, Burnside Park, Maddox Park, Cedar Island, the Oregon City Bridge, Willamette Park, and Fields Bridge Park.*

Comment: Not applicable. The subject property is not located near the Willamette or Tualatin Rivers.

S. *Aggregate deposits. Extraction of aggregate deposits or dredging shall be conducted in a manner designed to minimize adverse effects on water quality, fish and wildlife, vegetation, bank stabilization, stream flow, visual quality, noise and safety, and to promote necessary reclamation.*

Comment: Not applicable. There are no aggregate deposits on the subject property.

T. *Changing the landscape/grading.*

1. *Existing predominant topographical features of the bank line and escarpment shall be preserved and maintained except for disturbance necessary for the construction or establishment of a water related or water dependent use. Measures necessary to reduce potential bank and escarpment erosion, landslides, or flood hazard conditions shall also be taken.*

   Any construction to stabilize or protect the bank with rip rap, gabions, etc., shall only be allowed where there is clear evidence of erosion or similar hazard and shall be the minimum needed to stop that erosion or to avoid a specific and identifiable hazard. A geotechnical engineer's stamped report shall accompany the application with evidence to support the proposal.

2. *The applicant shall establish to the satisfaction of the approval authority that steps have been taken to minimize the impact of the proposal on the riparian environment (areas between the top of the bank and the low water mark of the river including lower terrace, beach and river edge).*

3. *The applicant shall demonstrate that stabilization measures shall not cause subsequent erosion or deposits on upstream or downstream properties.*

4. *Prior to any grading or development, that portion of the HCA that includes wetlands, creeks, riparian areas and water resource area shall be protected with an anchored chain link fence (or approved equivalent) at its perimeter and shall remain undisturbed except as specifically allowed by an approved Willamette and Tualatin River Protection and/or water resource area (WRA) permit. Such fencing shall be maintained until construction is complete. That portion of the HCA that includes wetlands, creeks, riparian areas and water resource area shall be identified with City-approved permanent markers at all boundary direction changes and at 30- to 50-foot intervals that clearly delineate the extent of the protected area.*

5. *Full erosion control measures shall be in place and approved by the City Engineer prior to any grading, development or site clearing.*

Comment: As shown on the Grading Plan submitted with this application, erosion control measures will be provided to protect the riparian area associated with the HCA. The only grading proposed in the HCA area is associated with the construction of detention facilities.

U. *Protect riparian and adjacent vegetation. Vegetative ground cover and trees upon the site shall be preserved, conserved, and maintained according to the following provisions:*

1. *Riparian vegetation below OHW removed during development shall be replaced with indigenous vegetation, which shall be compatible with and enhance the riparian environment and approved by the approval authority as part of the application.*

Comment: The only riparian vegetation below OHW that may be removed would be in the vicinity of the detention facility proposed in the area of the existing pond on the property. A plan for replacing indigenous vegetation with appropriate riparian plants will be submitted for review and approval with the construction plans for this project.

2. *Vegetative improvements to areas within the protection area may be required if the site is found to be in an unhealthy or disturbed state by the City Arborist or his designated expert. "Unhealthy or disturbed" includes those sites that have a combination of native trees, shrubs, and groundcover on less than 80 percent of the water resource area and less than 50 percent tree canopy coverage in the primary and secondary habitat conservation area to be preserved. "Vegetative improvements" will be documented by submitting a revegetation plan meeting CDC 28.160 criteria that will result in the primary and secondary habitat conservation area to be preserved having a combination of native trees, shrubs, and groundcover on more than 80 percent of its area, and more than 50 percent tree canopy coverage in its area. The vegetative improvements shall be guaranteed for survival for a minimum of two years. Once approved, the applicant is responsible for implementing the plan prior to final inspection.*

Comment: No vegetative improvements have been identified by the City Arborist as being necessary.

3. *Tree cutting shall be prohibited in the protection area except that:*

   a. *Diseased trees or trees in danger of falling may be removed with the City Arborist's approval; and*

   b. *Tree cutting may be permitted in conjunction with those uses listed in CDC 28.030 with City Arborist approval; to the extent necessary to accommodate the listed uses;*

   c. *Selective cutting in accordance with the Oregon Forest Practices Act, if applicable, shall be permitted with City Arborist approval within the area between the OHW and the greenway boundary provided the natural scenic qualities of the greenway are maintained.*

Comment: A few trees may be cut in conjunction with the construction of the detention facility in the area of the existing pond. The construction plans will include provision for mitigation plantings.

Chapter 75 – Variance

As discussed above in this report, the Tentative Plan proposes a cul-de-sac street having a length of more than 200 feet, which requires approval of a variance. The proposed variance satisfies the approval criteria as follows:

B. Class II Variance. Class II variances may be utilized when strict application of code requirements would be inconsistent with the general purpose of the CDC and would create a burden upon a property owner with no corresponding public benefit. A Class II variance will involve a significant change from the code requirements and may create adverse impacts on adjacent property or occupants. It includes any variance that is not classified as a Class I variance or special waiver.

1. Class II Variance Approval Criteria. The approval authority may impose appropriate conditions to ensure compliance with the criteria. The appropriate approval authority shall approve a variance request if all the following criteria are met and corresponding findings of fact prepared.

a. The variance is the minimum variance necessary to make reasonable use of the property. To make this determination, the following factors may be considered, together with any other relevant facts or circumstances:

1) Whether the development is similar in size, intensity and type to developments on other properties in the City that have the same zoning designation.

2) Physical characteristics of the property such as lot size or shape, topography, or the existence of natural resources.

3) The potential for economic development of the subject property.

Comment: The application proposes a cul-de-sac (Heron Ct.) to service the western portion of the property. Access to that area is needed in order to achieve reasonable density for this site, as demonstrated by the density calculations submitted with this application. Not extending a street into that area would require that lot sizes elsewhere be much smaller; something that neighbors were seriously opposed to at the neighborhood meeting.

b. The variance will not result in violation(s) of any other code standard, and the variance will meet the purposes of the regulation being modified.

Comment: No other code provisions would be violated by granting this variance. All lots would have adequate access and the number of homes accessed by the cul-de-sac would not exceed the 25 lot maximum standard.

c. The need for the variance was not created by the applicant and/or owner requesting the variance.

Comment: The need for the variance relates to the physical characteristics of the property. Specifically, the fact that the Parker Rd. pedestrian trail abuts the property on its western border precludes connecting to other streets to the west. Similarly, the grade of the property, which drops significantly from Rosemont Road, precludes providing an additional intersection with that street so as to avoid a cul-de-sac configuration. Further, sight distance issues would not allow for an additional intersection in that area.

d. If more than one variance is requested, the cumulative effect of the variances results in a project that is consistent with the overall purpose of the zone.

Comment: The applicant is proposing one additional variance that relates to access spacing (see below). Both variances relate only to street standards and will have no impact upon density of development or type of housing allowed by the R-10 zoning district. For this reason, this standard is met.

The proposed development also proposes a variance to the access spacing standards for Meadowlark Drive. Specifically, CDC 48.025B(6) states:

6. Access spacing.

a. The access spacing standards found in Chapter 8 of the adopted Transportation System Plan (TSP) shall be applicable to all newly established public street intersections and non-traversable medians.

b. Private drives and other access ways are subject to the requirements of CDC 48.060.

Table 8-3 of the TSP lists the desired spacing distance between local streets on an arterial street, such as Rosemont and Parker, as 600 feet. On Parker Road, the distance between the proposed Meadowlark Dr./Parker Road intersection and the existing Dillon Ln./Parker Road intersection is only about 225 feet, so a variance is needed. It should be noted that the City Council has approved a change to the designation of Parker Road from arterial to collector, but this change won't go into effect until September. The intersection of Meadowlark Dr. with Rosemont Road is in conformance with the spacing standard in that there are no other local streets within 600 feet of the new intersection. However, City staff has raised the issue of whether the spacing distance of 300 feet listed for private driveways on arterial streets must be met. The driveway to Oppenlander Field is about 225' centerline to centerline from the new intersection. It is the applicant's position that this standard is not applicable in light of the fact that CDC 48.025(6)b makes the access spacing for private drives not subject to the TSP, but rather to CDC 48.060, and the standard in that section is only 100 feet of spacing for a driveway from the intersection of a local street with an arterial. As the access separation distance between the new intersection and the driveway exceeds this distance, a variance should not be required. Since staff does not agree with this interpretation, we will address the approval standards for both access spacing issues in a combined variance request, with the understanding that it is the applicant's position that the Rosemont/Meadowlark Drive is not in violation of access spacing requirements.

The requested variance conforms to the variance approval criteria as follows:

B. Class II Variance. Class II variances may be utilized when strict application of code requirements would be inconsistent with the general purpose of the CDC and would create a burden upon a property owner with no corresponding public benefit. A Class II variance will involve a significant change from the code requirements and may create adverse impacts on adjacent property or occupants. It includes any variance that is not classified as a Class I variance or special waiver.

1. Class II Variance Approval Criteria. The approval authority may impose appropriate conditions to ensure compliance with the criteria. The appropriate approval authority shall approve a variance request if all the following criteria are met and corresponding findings of fact prepared.

a. The variance is the minimum variance necessary to make reasonable use of the property. To make this determination, the following factors may be considered, together with any other relevant facts or circumstances:

1) Whether the development is similar in size, intensity and type to developments on other properties in the City that have the same zoning designation.

2) Physical characteristics of the property such as lot size or shape, topography, or the existence of natural resources.

3) The potential for economic development of the subject property.

Comment: The intersection of Meadowlark Drive with Rosemont Road is the minimum variance necessary to make reasonable use of the property for the following reasons:

1) Access to Rosemont Road is necessary in order to provide for connectivity from Rosemont through to Parker Road, as well as to avoid placing undue traffic onto Roxbury Drive.

2) Sight distance at the intersection is limited by a vertical curve in Rosemont Road so that it would be unsafe to move the proposed intersection farther away from the Oppenlander driveway. Moving the intersection to the east, so as to align with the park driveway, would bring it within approximately 450 feet of the Wildrose Drive intersection with Rosemont, which would violate the 600 foot minimum separation distance. That location would also fail to provide for

a direct alignment through the site from Rosemont to Parker, which is something that was stated as a strong preference by the neighbors at the neighborhood meeting on this project, who wanted to avoid traffic being directed onto Roxbury Drive.

The intersection of Meadowlark Drive with Parker Road provides for the minimum variance necessary to make reasonable use of the subject property for the following reasons:

1) Access to Parker Road is necessary in order to provide for connectivity from Rosemont through to Parker Road, as well as to avoid creation of a long cul-de-sac street serving the lower portion of the property.

2) The presence of the Tanner Creek stream corridor to the west of the proposed intersection precludes moving the intersection in that direction. The proposed location is as far removed from Dillon Drive as is reasonably practicable.

b. The variance will not result in violation(s) of any other code standard, and the variance will meet the purposes of the regulation being modified.

Comment: No other code provisions would be violated by granting this variance. Access spacing does not impact any other code provisions.

c. The need for the variance was not created by the applicant and/or owner requesting the variance.

Comment: The need for the variance relates to the physical characteristics of the property. Specifically, the fact Rosemont Road access is only available in a limited area due to sight distance issues and this condition makes it impracticable to comply with the 300 foot separation to a private drive listed in Table 8-3. In the case of the intersection with Parker Drive, the Tanner Creek stream corridor precludes moving the intersection to a point where the 600 foot separation standard could be met. Neither of these physical conditions were created by the applicant.

d. If more than one variance is requested, the cumulative effect of the variances results in a project that is consistent with the overall purpose of the zone.

Comment: The other variance proposed relates to cul-de-sac length, as discussed above. Both variances relate only to street standards and will have no impact upon density of development or type of housing allowed by the R-10 zoning district. For this reason, this standard is met.

Density Calculations			
	Area (sq. ft.)	Allowable Density	Units @1 per 10,000 sq.ft.
Gross Site Area	695,810		
Land in a boundary street right-of-way, water course, or planned open space where density transfer is not requested:	0		
Area in street right-of-way:	124,185		
Net Site Area:	571,425		
Area within Type I or II slopes where Developed:	4,273	50%	0.21
Area within Type I or II slopes where Density Will be Transferred:	6,846	75%	0.51
Area within Water Resource Area-all development transferred.	99,364	50%	4.97
Open Space (Type III and IV Lands)	58,759	100%	5.88
Type III & IV Land Developed:	402,757	100%	40.27
Base Density Allowed:			51.84
TOTAL ALLOWED DENSITY:			51 UNITS

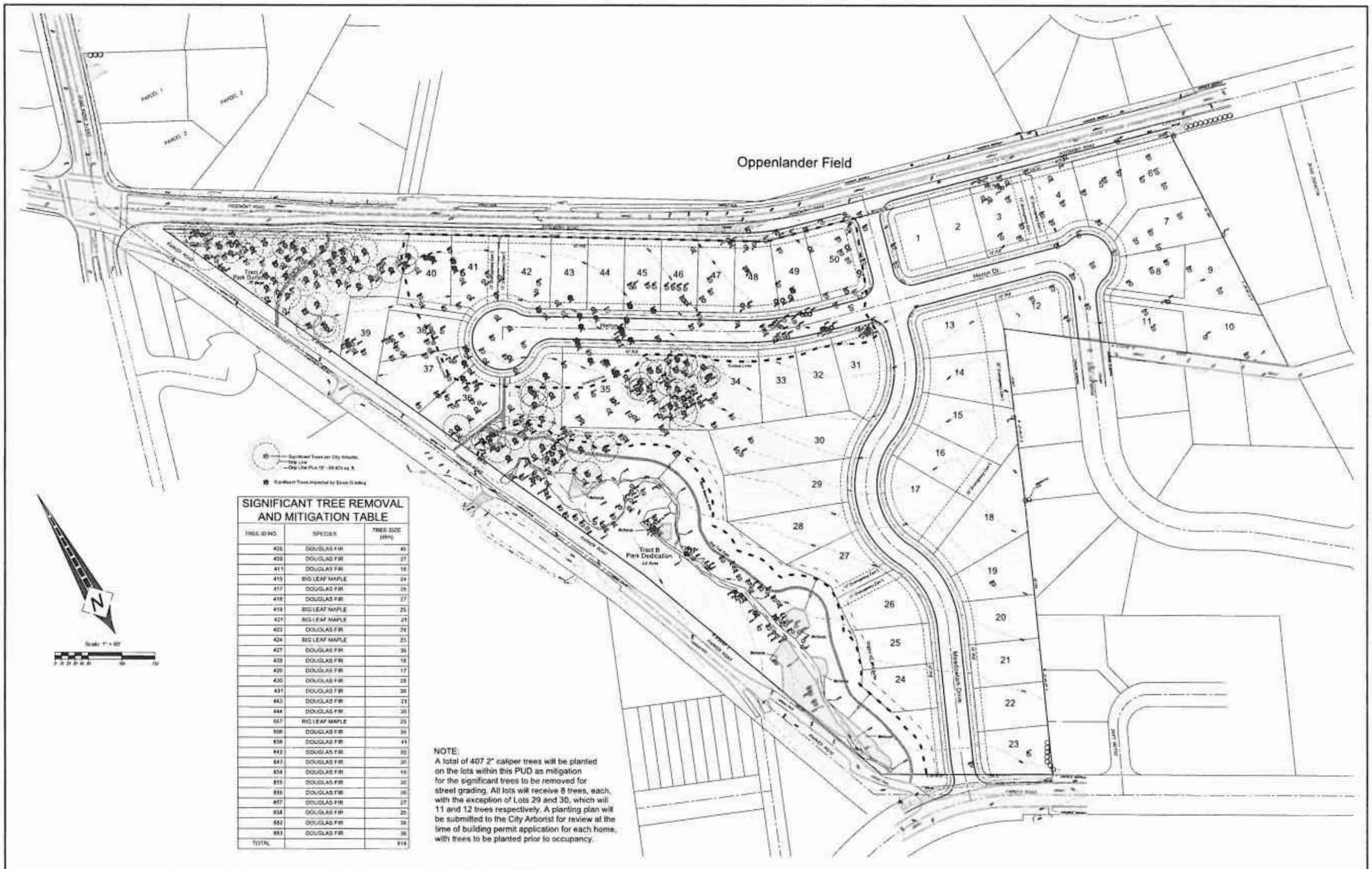
DESIGNED:	REG			
DRAWN:	REG			
SCALE:	1" = 60'			
DATE:	June 6, 2016			
FILE:	15-ICN-107	DATE	NO.	REVISION

Richard E. Givens, Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045
PH: (503) 479-0097

APPLICANT: Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406

Tanner Ridge at Rosemont
Tentative Plan

SHEET 1/5



SIGNIFICANT TREE REMOVAL AND MITIGATION TABLE

TREE ID NO.	SPECIES	TREE SIZE (dbh)
405	DOUGLAS FIR	45
409	DOUGLAS FIR	27
411	DOUGLAS FIR	18
415	BIG LEAF MAPLE	24
417	DOUGLAS FIR	29
418	DOUGLAS FIR	27
419	BIG LEAF MAPLE	25
421	BIG LEAF MAPLE	21
423	DOUGLAS FIR	29
424	BIG LEAF MAPLE	23
427	DOUGLAS FIR	36
428	DOUGLAS FIR	18
429	DOUGLAS FIR	17
430	DOUGLAS FIR	28
431	DOUGLAS FIR	38
443	DOUGLAS FIR	21
444	DOUGLAS FIR	33
667	BIG LEAF MAPLE	25
808	DOUGLAS FIR	39
838	DOUGLAS FIR	41
842	DOUGLAS FIR	32
843	DOUGLAS FIR	30
854	DOUGLAS FIR	19
855	DOUGLAS FIR	32
856	DOUGLAS FIR	26
857	DOUGLAS FIR	27
858	DOUGLAS FIR	25
882	DOUGLAS FIR	34
883	DOUGLAS FIR	36
TOTAL		814

NOTE:
A total of 407 2" caliper trees will be planted on the lots within this PUD as mitigation for the significant trees to be removed for street grading. All lots will receive 8 trees, each, with the exception of Lots 29 and 30, which will 11 and 12 trees respectively. A planting plan will be submitted to the City Arborist for review at the time of building permit application for each home, with trees to be planted prior to occupancy.

DESIGNED:	REG			
DRAWN:	REG			
SCALE:	1" = 60'			
DATE:	April 2016			
FILE:	154DN-107	DATE	NO.	REVISION

Richard E. Givens, Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045
PH: (503) 479-0097

APPLICANT: Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406

Tanner Ridge at Rosemont
Tree Preservation Plan

SHEET: 2/5

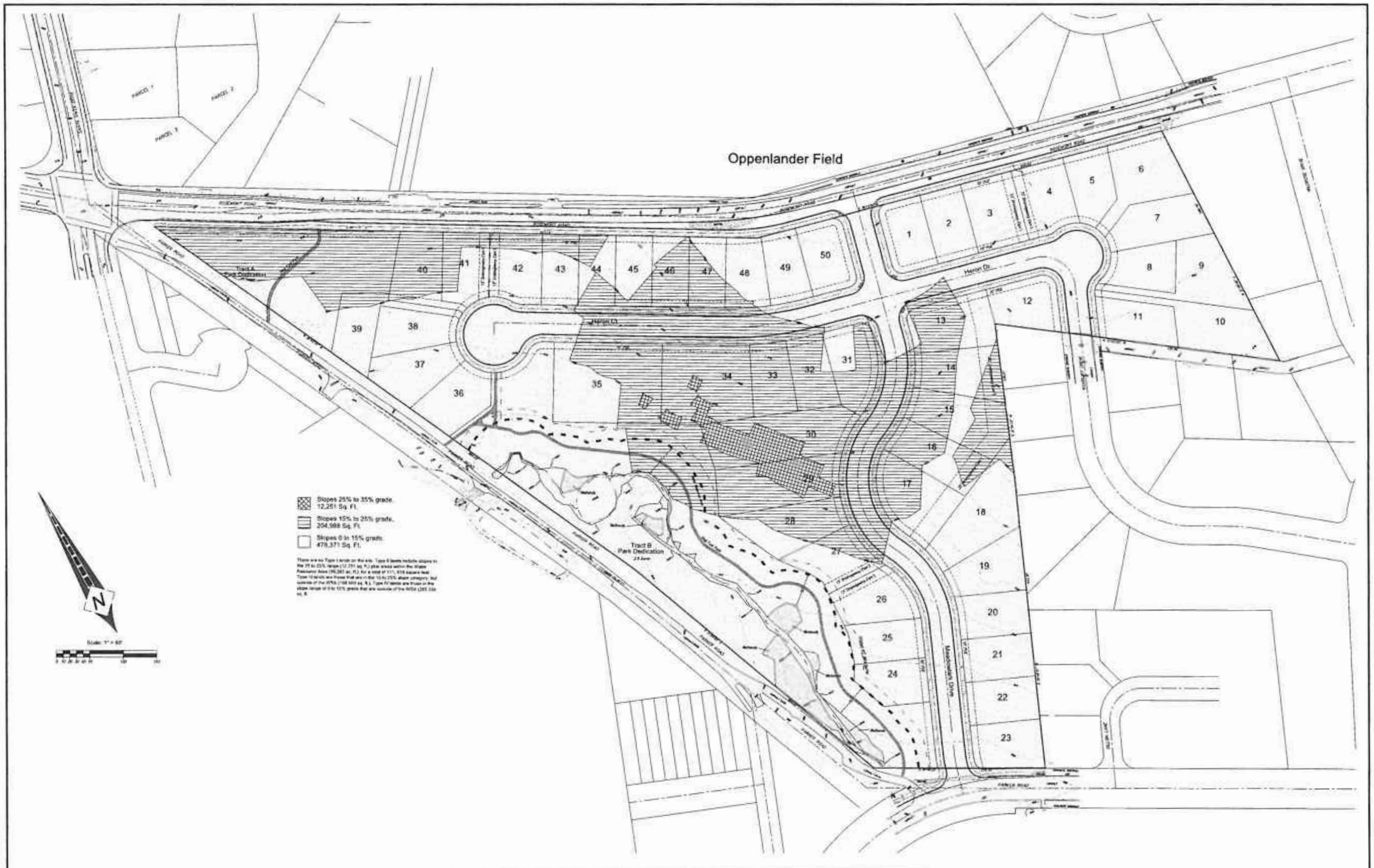
DESIGNED: REG				
DRAWN: REG				
SCALE: 1" = 60'				
DATE: June 2016				
FILE: 15-ICN-107	DATE	NO.	REVISION	

Richard E. Givens, Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045
PH: (503) 479-0097

APPLICANT: Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406

Tanner Ridge at Rosemont
Habitat Conservation Areas

SHEET: 3/5



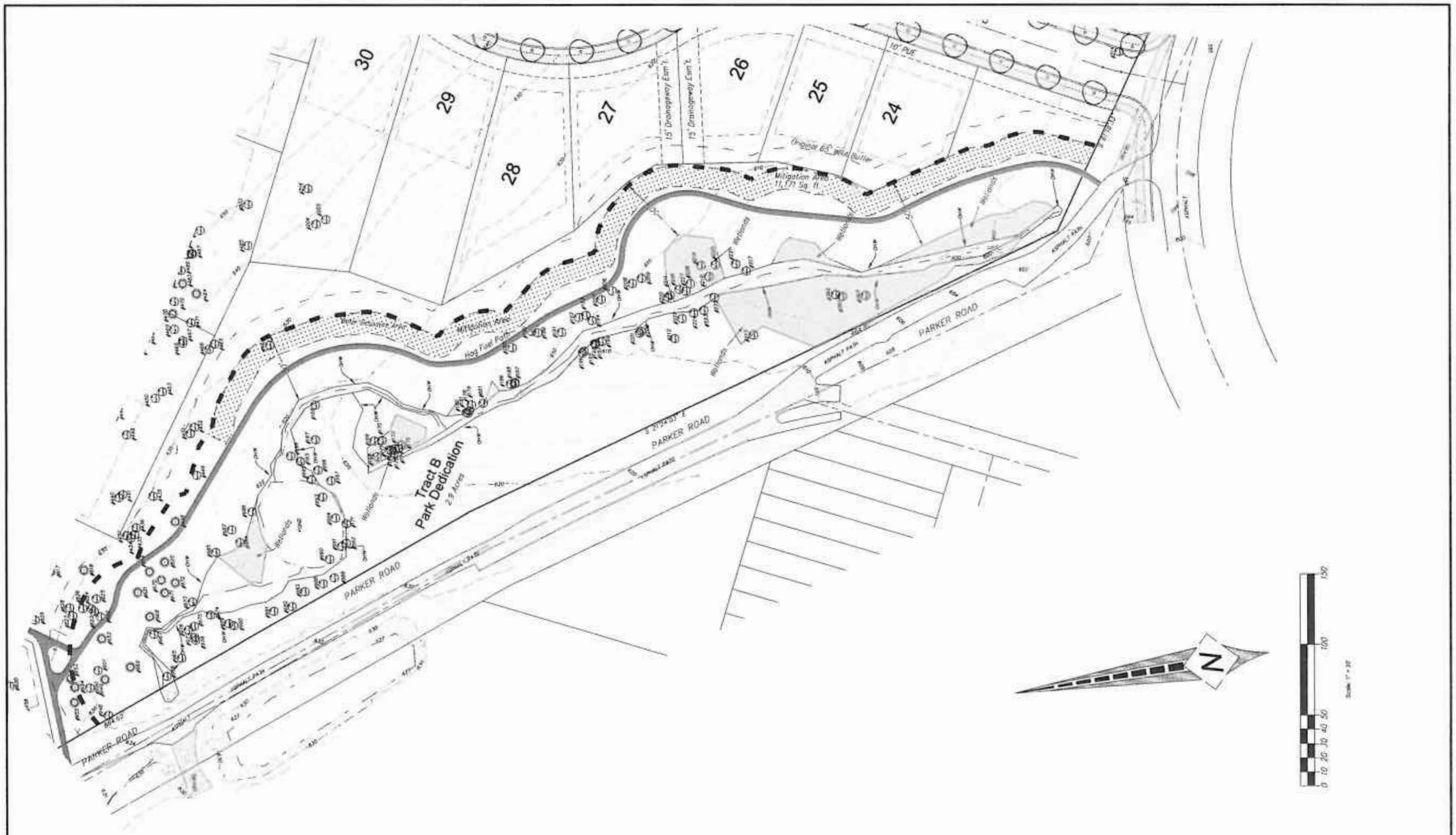
DESIGNED: REG				
DRAWN: REG				
SCALE: 1" = 60'				
DATE: May 2016				
FILE: 15-4CN-107		DATE	NO.	REVISION

Richard E. Givens, Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045
PH: (503) 479-0097

APPLICANT: Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406

Tanner Ridge at Rosemont
Slope Analysis

SHEET 4/5



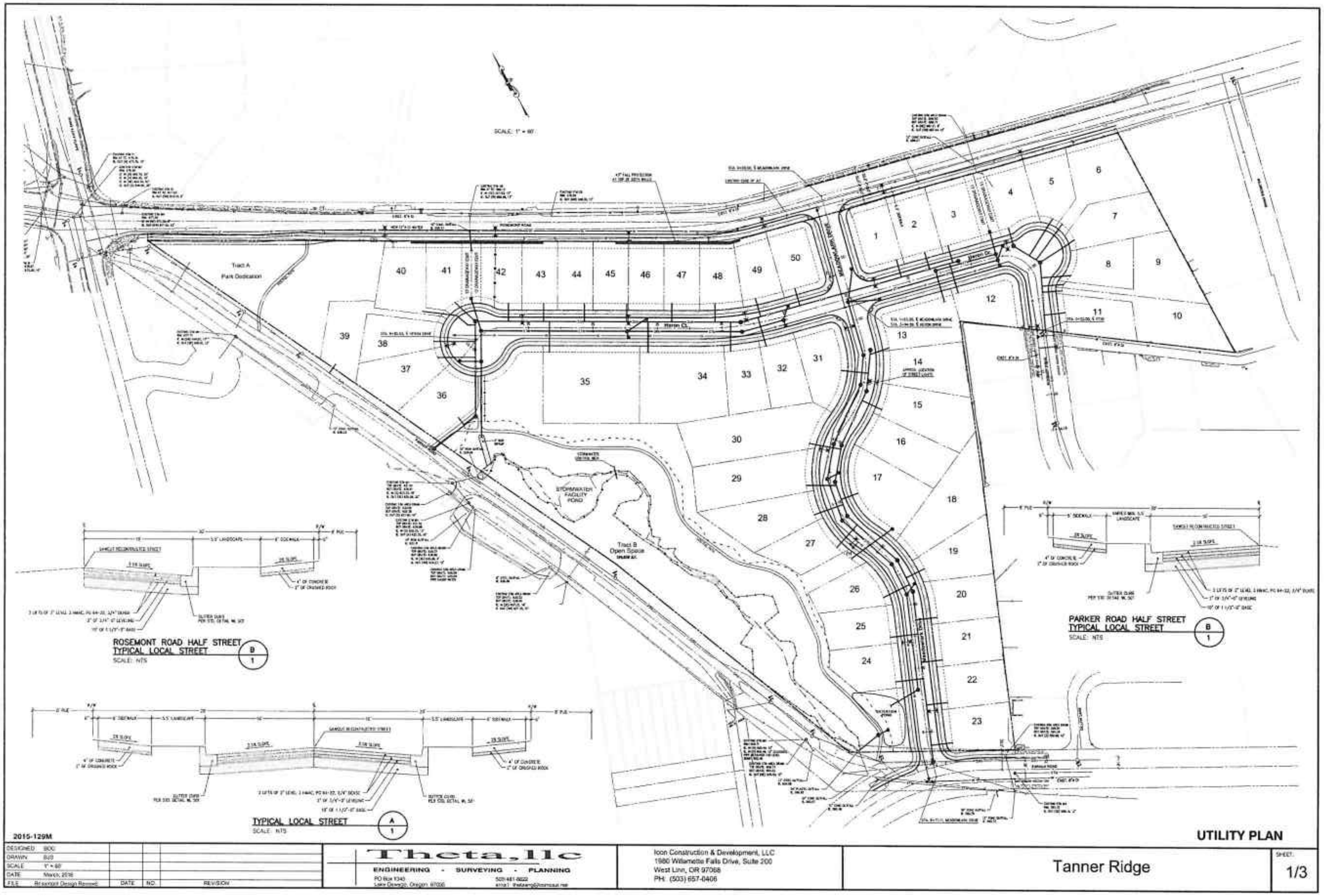
DESIGNED:	REG			
DRAWN:	REG			
SCALE:	1" = 30'			
DATE:	June 2016			
FILE:	15-ICN-107	DATE	NO.	REVISION

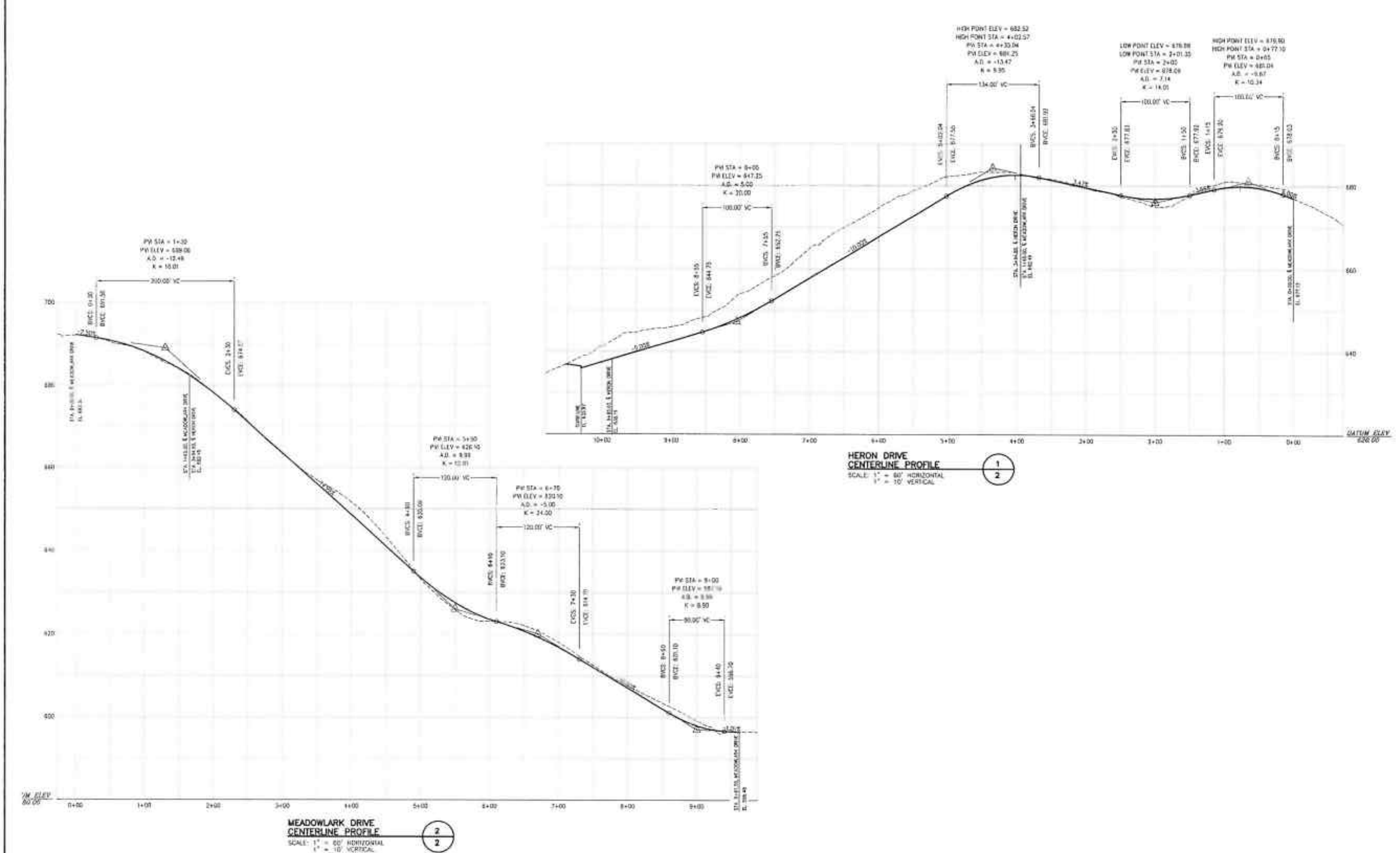
Richard E. Givens, Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045
PH: (503) 479-0097

APPLICANT: Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406

Tanner Ridge at Rosemont
Wetlands Plan

SHT: 5/5


Tract A
Park Dedication
Tract B
Open Space
STORMWATER FACILITY POND
ROSEMONT ROAD HALF STREET
TYPICAL LOCAL STREET
SCALE: NTS
PARKER ROAD HALF STREET
TYPICAL LOCAL STREET
SCALE: NTS
TYPICAL LOCAL STREET
SCALE: NTS
2015-129M
UTILITY PLAN
Theta, llc
ENGINEERING - SURVEYING - PLANNING
Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406
Tanner Ridge
SHEET:
1/3



2015-129M

STREET PROFILES

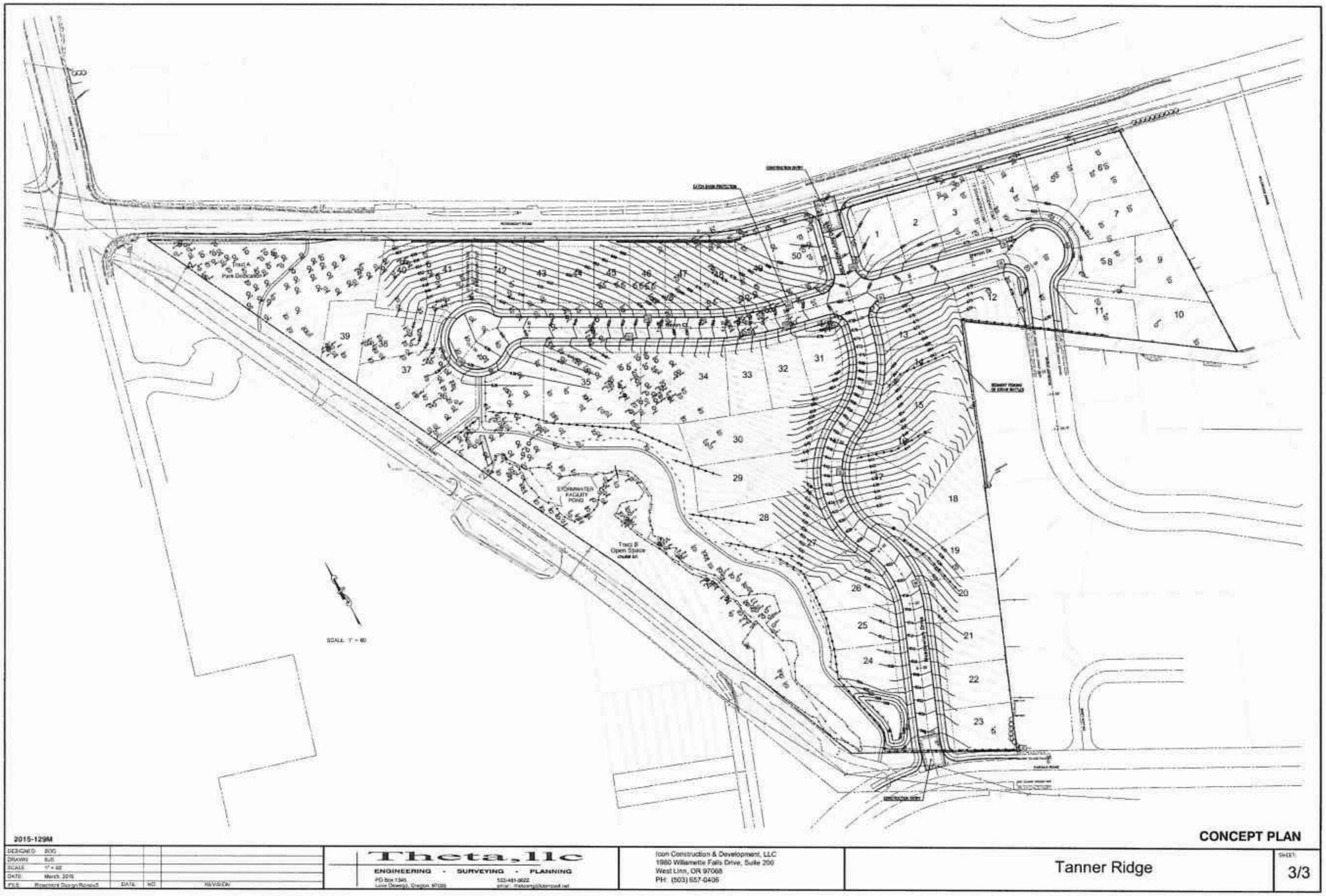
DESIGNED	BJC		
DRAWN	BJS		
SCALE	1" = 60'		
DATE	March 2015		
FILE	Pavement Design Revised	DATE	NO.	REVISION

Theta, llc
ENGINEERING - SURVEYING - PLANNING
PO Box 1345, Lake Oswego, Oregon 97035

Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406

Tanner Ridge

SHEET: 2/3


STORMWATER FACILITY POND
Tract B Open Space
2015-129M
CONCEPT PLAN
Theta, llc
ENGINEERING - SURVEYING - PLANNING
Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406
Tanner Ridge
SHEET:
3/3

Rick Givens
Planning Consultant
18680 Sunblaze Dr.
Oregon City, Oregon 97045

July 8, 2016

Mr. Peter Spir
City of West Linn
Planning Department
PO Box 29
West Linn, OR 97068

RE: Tanner Ridge at Rosemont (PUD 16-01)

Dear Peter:

As you correctly pointed out in your email of July 5, 2016, the findings submitted by Schott & Associates only address the criteria for the "alternate review process" listed in CDC 32.080. The following findings address the approval criteria of CDC 32.060.

32.060 APPROVAL CRITERIA (STANDARD PROCESS)

No application for development on property containing a WRA shall be approved unless the approval authority finds that the proposed development is consistent with the following approval criteria, or can satisfy the criteria by conditions of approval:

A. *WRA protection/minimizing impacts.*
   1. *Development shall be conducted in a manner that will avoid or, if avoidance is not possible, minimize adverse impact on WRAs.*
   2. *Mitigation and re-vegetation of disturbed WRAs shall be completed per CDC 32.090 and 32.100 respectively.*

Response: The only development activities proposed in the WRA are storm water facilities, as shown on the Preliminary Utility Plan, and a walking path. The storm water facilities must be placed in the WRA because they need to be sited near the creek. The adverse impacts of the improvements will be minimized by:

a. Making the size the minimum necessary to provide for storm detention and treatment functions.
b. Locating the ponds where no trees will need to be removed and where terrain is level enough to minimize grading requirements.
c. Providing for the pond to be planted with native species for water quality functions.
d. Surfacing the pathway with hogfuel chips so that no impervious surfacing is used.

Mitigation plantings will be provided, as discussed in the Schott & Associates letter dated June 27, 2016 and will be installed in accordance with CDC 32.090 and 32.100. The drainageways that will outfall in the WRA will be protected with riprap to prevent erosion impacts.

phone: 503-479-0097 | fax: 503-479-0097 | e-mail: rickgivens@gmail.com

B. Storm water and storm water facilities.

1. Proposed developments shall be designed to maintain the existing WRAs and utilize them as the primary method of storm water conveyance through the project site unless:

a. The surface water management plan calls for alternate configurations (culverts, piping, etc.); or

b. Under CDC 32.070, the applicant demonstrates that the relocation of the water resource will not adversely impact the function of the WRA including, but not limited to, circumstances where the WRA is poorly defined or not clearly channelized. Re-vegetation, enhancement and/or mitigation of the re-aligned water resource shall be required as applicable.

Comment: The site contains one WRA area. The proposed development plan will maintain this existing WRA and use it as the primary method of storm water conveyance, as shown on the Preliminary Utility Plan. Storm water from streets will be piped to the two detention facilities shown on that plan and will then outfall to the stream corridor.

2. Public and private storm water detention, storm water treatment facilities and storm water outfall or energy dissipaters (e.g., rip rap) may encroach into the WRA if:

a. Accepted engineering practice requires it;

b. Encroachment on significant trees shall be avoided when possible, and any tree loss shall be consistent with the City's Tree Technical Manual and mitigated per CDC 32.090;

c. There shall be no direct outfall into the water resource, and any resulting outfall shall not have an erosive effect on the WRA or diminish the stability of slopes; and

d. There are no reasonable alternatives available.

A geotechnical report may be required to make the determination regarding slope stability.

Comment: The placement of storm water detention and treatment facilities within the WRA is required by accepted engineering practice. City standards require such facilities so as to maintain the rate of storm water runoff from new development at acceptable levels. There are no other areas that reasonably could be used for these facilities as the lot areas are sloped and would require extensive grading to accommodate a detention pond. Accepted engineering practice is to place detention facilities close to drainageways so as to maintain natural drainage patterns as closely as possible.

As shown on the Preliminary Utility Plan, there are two detention ponds proposed within this project. The first, near the intersection of Meadowlark Drive and Parker Road, is located partially within and partly outside of the WRA. The second pond, located on the west side of the project adjacent to the old Parker Rd. right-of-way walking path, will be entirely within the WRA. These locations were chosen by the project engineer as the best locations to service the project and were coordinated with City of West Linn engineering staff. Neither pond is located in an area that would require the removal of trees. No storm water from developed areas will directly outfall into the water resource, but instead will first be detained and treated within the detention pond areas. Outfalls from those facilities will be designed to ensure that there are no erosive effects on the WRA or slopes adjacent to it. A geotechnical report is being prepared for this project.

3. *Roadside storm water conveyance swales and ditches may be extended within rights-of-way located in a WRA. When possible, they shall be located along the side of the road furthest from the water resource. If the conveyance facility must be located along the side of the road closest to the water resource, it shall be located as close to the road/sidewalk as possible and include habitat friendly design features (treatment train, rain gardens, etc.).*

Comment: Because of the steepness of the site, the use of roadside swales and ditches is not practicable for this project.

4. *Storm water detention and/or treatment facilities in the WRA shall be designed without permanent perimeter fencing and shall be landscaped with native vegetation.*

Comment: No permanent fencing of the detention pond areas will be provided. Landscaping for the detention facilities will incorporate native vegetation.

5. *Access to public storm water detention and/or treatment facilities shall be provided for maintenance purposes. Maintenance driveways shall be constructed to minimum width and use water permeable paving materials. Significant trees, including roots, shall not be disturbed to the degree possible. The encroachment and any tree loss shall be mitigated per CDC 32.090. There shall also be no adverse impacts upon the hydrologic conditions of the site.*

Comment: Access to the detention facility along Meadowlark Drive will be from that City street. Access to the westerly detention pond will be from the old Parker Road pedestrian trail. This trail also provides access to other existing detention facilities in this area.

C. *Dedications and easements. The City shall request dedications of the WRA to the City when acquisition of the WRA by dedication or easement would serve a public purpose. When such a dedication or easement is mutually agreed upon, the applicant shall provide the documentation for the dedication or easement. Nothing in this section shall prohibit the City from condemning property if:*
   1. *The property is necessary to serve an important public purpose; and*
   2. *Alternative means of obtaining the property are unsuccessful.*

Comment: The WRA is proposed to be dedicated to the City of West Linn as a nature park.

D. *WRA width. Except for the exemptions in CDC 32.040, applications that are using the alternate review process of CDC 32.070, or as authorized by the approval authority consistent with the provisions of this chapter, all development is prohibited in the WRA as established in Table 32-2 below:*

Comment: This project is proposing to make use of the alternate review process of CDC 32.070. Please see findings discussed in the Schott & Associates report.

E. *Roads, driveways and utilities.*

1. *New roads, driveways, or utilities shall avoid WRAs unless the applicant demonstrates that no other practical alternative exists. In that case, road design and construction techniques shall minimize impacts and disturbance to the WRA by the following methods:*
   a. *New roads and utilities crossing riparian habitat areas or streams shall be aligned as close to perpendicular to the channel as possible.*
   b. *Roads and driveways traversing WRAs shall be of the minimum width possible to comply with applicable road standards and protect public safety. The footprint of grading and site clearing to accommodate the road shall be minimized.*
   c. *Road and utility crossings shall avoid, where possible:*
      1) *Salmonid spawning or rearing areas;*
      2) *Stands of mature conifer trees in riparian areas;*
      3) *Highly erodible soils;*
      4) *Landslide prone areas;*
      5) *Damage to, and fragmentation of, habitat; and*
      6) *Wetlands identified on the WRA Map.*

Comment: No new roads or driveways are proposed within the WRA. The only utilities proposed are the storm lines associated with the storm water detention facilities discussed above. None of the storm lines cross the channel of Tanner Creek.

2. *Crossing of fish bearing streams and riparian corridors shall use bridges or arch-bottomless culverts or the equivalent that provides comparable fish protection, to allow passage of wildlife and fish and to retain the natural stream bed.*

Comment: No roads, driveways or utilities are proposed that cross the Tanner Creek corridor.

3. *New utilities spanning fish bearing stream sections, riparian corridors, and wetlands shall be located on existing roads/bridges, elevated walkways, conduit, or other existing structures or installed underground via tunneling or boring at a depth that avoids tree roots and does not alter the hydrology sustaining the water resource, unless the applicant demonstrates that it is not physically possible or it is cost prohibitive. Bore pits associated with the crossings shall be restored upon project completion. Dry, intermittent streams may be crossed with open cuts during a time period approved by the City and any agency with jurisdiction.*

Comment: No utilities are proposed that cross the Tanner Creek corridor or within wetland areas. There are no existing roads, bridges, walkways or other existing structures within the WRA.

4. *No fill or excavation is allowed within the ordinary high water mark of a water resource, unless all necessary permits are obtained from the City, U.S. Army Corps of Engineers and Oregon Department of State Lands (DSL).*

Comment: No fill or excavation is proposed within the ordinary high water mark of the Tanner Creek corridor.

5. *Crossings of fish bearing streams shall be aligned, whenever possible, to serve multiple properties and be designed to accommodate conduit for utility lines. The applicant shall,*

to the extent legally permissible, work with the City to provide for a street layout and crossing location that will minimize the need for additional stream crossings in the future to serve surrounding properties.

Comment: No crossings of the stream are proposed.

F. *Passive recreation. Low impact or passive outdoor recreation facilities for public use including, but not limited to, multi-use paths and trails, not exempted per CDC 32.040(B)(2), viewing platforms, historical or natural interpretive markers, and benches in the WRA, are subject to the following standards:*

1. *Trails shall be constructed using non-hazardous, water permeable materials with a maximum width of four feet or the recommended width under the applicable American Association of State Highway and Transportation Officials (AASHTO) standards for the expected type and use, whichever is greater.*
2. *Paved trails are limited to the area within 20 feet of the outer boundary of the WRA, and such trails must comply with the storm water provisions of this chapter.*
3. *All trails in the WRA shall be set back from the water resource at least 30 feet except at stream crossing points or at points where the topography forces the trail closer to the water resource.*
4. *Trails shall be designed to minimize disturbance to existing vegetation, work with natural contours, avoid the fall line on slopes where possible, avoid areas with evidence of slope failure and ensure that trail runoff does not create channels in the WRA.*
5. *Foot bridge crossings shall be kept to a minimum. When the stream bank adjacent to the foot bridge is accessible (e.g., due to limited vegetation or topography), where possible, fences or railings shall be installed from the foot bridge and extend 15 feet beyond the terminus of the foot bridge to discourage trail users and pets from accessing the stream bank, disturbing wildlife and habitat areas, and causing vegetation loss, stream bank erosion and stream turbidity. Bridges shall not be made of continuous impervious materials or be treated with toxic substances that could leach into the WRA.*
6. *Interpretive facilities (including viewpoints) shall be at least 10 feet from the top of the water resource's bankfull flow/OHW or delineated wetland edge and constructed with a fence between users and the resource. Interpretive signs may be installed on footbridges.*

Comment: A pedestrian trail is proposed within the WRA, as shown on the Tentative Plan. The trail is proposed to be 4 feet in width and surfaced with hogfuel chips. The alignment of the trail maintains a 30' setback from the water resource. No crossings are proposed. The trail follows the natural terrain and provides for a connection between Meadowlark Drive, Heron Ct., and the old Parker Rd. right-of-way walking path. The path alignment has been designed to avoid removal of existing trees. No interpretive facilities are proposed.

G. *Daylighting Piped Streams.*

Comment: Not applicable. There are no daylighted piped streams associated with this site or project. Two ephemeral streams are shown on the City's mapping of water resources, but site investigation by Schott & Associates found no evidence of any channelized seasonal drainageways. The site plan calls for the creation of drainage corridors to handle surface drainage that outfalls to this site, but there are no streams that are piped.

H. *The following habitat friendly development practices shall be incorporated into the design of any improvements or projects in the WRA to the degree possible:*

Comment: The only improvements within the WRA are the detention ponds and associated storm pipes, and the pervious walking path. None of the design features listed relate directly to these improvements.

Thank you for your inclusion of these additional findings within the record. Please let me know if you have any questions or require additional information.

Sincerely yours,

Rick Givens

Rick Givens

cc: Mark Handris, Icon Construction & Development, LLC
Mike Robinson, Perkins Coie

Rick Givens
Planning Consultant
18680 Sunblaze Dr.
Oregon City, Oregon 97045

June 6, 2016

Mr. Peter Spir
Associate Planner
City of West Linn
22500 Salamo Rd.
West Linn, Oregon 97068

SUBJECT: SUB-16-01, et al, at 1270 Rosemont Road

Dear Peter:

We have revised our application materials to address the items raised in your letter of incompleteness dated May 4, 2015. Specifically, the following changes and corrections have been made:

99.038(E) (3): The "affidavit of posting sign at property" identifies this as a six lot subdivision. Please correct the affidavit to state 52 lots which is the number you represented at the neighborhood meeting.

Action: A corrected affidavit of posting has been prepared and is attached to this submittal.

85.170(B) (2): Provide written comment from the Lancaster Engineering as to whether the TIA findings for the 52 lot subdivision are valid for the 50 lot proposal. Please reconcile the TIA findings (e.g. trip distribution, etc.) given the fact that the tentative plan, as submitted, shows Meadowlark Drive with a different alignment (dogleg vs straight connection between Rosemont Road and Parker Road) from the plan that Lancaster Engineering relied upon when the TIA was done. Please note that additional comments on the TIA are expected in the next week from DKS Engineering who provide third party review for the City.

Action: A technical memorandum from Lancaster Engineering, Inc. dated May 20, 2016 has been prepared to address this issue and is attached to this submittal.

32.000: Please map and discuss the western ephemeral stream that originates on Rosemont Road at a storm water pipe outfall.
Discuss the appropriateness of re-aligning the two ephemeral streams.
Discuss the ephemeral stream outfall into the WRA and proposed means of dissipating the flow.
Please provide the five appendices referred to on page nine (final page) of the Schott and Associates report.

Action: A letter dated May 23, 2016 from Schott and Associates is attached. It states that there is no western ephemeral stream on the property. The previous report from Schott and Associates noted that there is also no eastern ephemeral stream. There are to culverts that pass under Rosemont Road and drain onto the property, but the flow is not channelized. It is proposed that the water from these two drainages be directed to manmade channels, as shown on the site plan, in accordance with City policy on ephemeral streams. The flows are minimal and the water will continue to be direct to the Tanner Creek Water Resource Area. Riprap will be installed at the outfalls into the Water Resource Area to dissipate energy from the flows and ensure that there will be no erosion associated with the drainages.

The Schott and Associates Natural Resources Assessment for the WRA listed the following five items in its appendix: Site Vicinity Map, Aerial photo, Development Plan, Existing Conditions Plan, Delineation

phone: 503-479-0097 | fax: 503-479-0097 | e-mail: rickgivens@gmail.com

Plan. The vicinity map, aerial photo, and Existing Conditions maps are attached to this letter. The Development Plan is a reference to the Tentative Plan, which is being re-submitted. The Delineation Plan is now labeled "Wetlands Plan" and is included as Sheet 5 of 5 of my plan set. Reduced copies of these two plans are enclosed to be included with the Natural Resources Assessment report.

32.080 (C). Discuss whether the hogfuel trail within the reduced WRA boundary (between lots 24 and 35) is appropriate to the WRA's functions.

Action: Addressed in Schott & Associates May 23rd letter.

32.100(E) (2). Please provide map showing where re-vegetation mitigation will occur.

Action: Shown on Wetlands Plan.

24.170(B) (1). Please provide map showing where the useable open space is (300 square feet per lot.)

Action: The usable open space is mapped as Tracts A and B on the Tentative Plan.

28.000. Please provide complete application and $1,700 deposit fee for a Willamette and Tualatin River Protection Area permit. The application should address the presence of Habitat Conservation Areas (HCA), particularly on lot 35. The HCA does not allow development within its boundary. HCAs need to be mapped on one of the plan sheets. The HCA will also impact the density calculations of 24.110 and may require seeking a park dedication density bonus to achieve 50 lots.

Action: The application and $1,700 fee were submitted with our initial application. The application narrative has been revised to provide a full analysis of compliance with Chapter 28. The HCA is mapped on Sheet 5 of 5 of my plan set. In the narrative, we are requesting that the boundaries of the HCA be corrected to conform to information provided via the Schott & Associates field work and field surveying provided by Centerline Concepts, Inc. The HCA, as adjusted, conforms to the area of the WRA and, since this area was accounted for in our initial density calculations, no further adjustment is necessary.

85.200(B) (5). Please discuss or justify the use of double frontage lots (see criteria in 85.200(B) (5)). Chapter 48 "Access" 48.025 (B) (5) is also relevant in this discussion.

Action: This issue is now addressed in our revised application narrative.

85.160 (F) (2) Show erosion control measures on the grading plan.
Action: Erosion control measures are shown on the grading plan.

85.160(F) (1) Provide cross section for Rosemont Road and Parker Road including any needed dedication.

Action: A cross section drawing is now included for these roads. Required dedications are depicted on the Tentative Plan.

85.170 (A) (8). Please provide map and table of slope breakdowns per 55.110(B) (3).

Action: Noted on the Slope Analysis drawing.

85.200(J) (4). Provide sheet plan with illumination analysis of existing street lights and proposed street lighting plan.

Action: The location of proposed street lights has been added to the Utility Plan. Per discussion with staff, the illumination analysis is not a requirement for tentative plan submittal.

85.200(J) (6). Please state that existing overhead utilities will be placed underground.

Action: The narrative for this section has been revised to address this concern.

85.180 (F). Storm drainage report must address detention requirements.
The design engineer needs to issue a statement similar to the one attached (below) in addition to the stormwater report.

Action: The storm drainage report has been revised to address this requirement.

85.200(A) (7). Please address the spacing requirement between the intersection of Meadowlark Drive and Dillon Lane to the east on Parker Road.

Action: The application report has been updated to address this concern.

85.200(A) (16). Interior sidewalks are shown as five feet wide on Sheet 1/3 with a swale. The sidewalks must be six feet wide. Also, is the swale intended to perform a storm drainage function?

Action: The sidewalks have been corrected to a six foot width. The swale has been removed from the plan.

85.170(C) Please confirm the height of retaining walls along Rosemont Road and if any fencing/railings will be needed along top of retaining wall.

Action: The retaining walls are approximately four feet high. The utility plan now notes that fall-protection fencing will be provided along the sections where walls are proposed.

24.090(F). Please provide table and map identifying all Type I-IV lands per this section.

Action: This information is shown on the Slope Analysis drawing.

We believe that with this new and/or revised information we have addressed all items listed in your letter of incompleteness. We hope that you will now be able to determine the application complete and schedule it for hearing. If you have any questions, please let me know so that we can address them as soon as possible.

Sincerely yours,

Rick Givens

Rick Givens

Cc: Mark Handris, Mike Robinson

Rick Givens
Planning Consultant
18680 Sunblaze Dr.
Oregon City, Oregon 97045

June 24, 2016

Mr. Peter Spir
City of West Linn
Planning Department
PO Box 29
West Linn, OR 97068

Dear Peter:

As requested by staff, we are submitting the following revisions to the application for the Tanner Ridge at Rosemont PUD application:

1) Revised application narrative requesting an access spacing variance and providing analysis of the relevant approval criteria.

2) Revised storm report prepared by Theta Engineering, Inc., together with revised Preliminary Utility Plan and Grading Plan drawings.

3) CD containing digital copies of the revised documents.

4) Check for $1,450.00 for the application fee for the additional variance.

We are requesting that the requirement for a geotechnical report be removed due to the very small area of the site that is in excess of 25% grade, and because the fact that the vast majority of this area is in rear yards where no construction will be built.

It is our understanding that this additional material will complete our application so that it may now be scheduled for hearing.

Sincerely yours,

Rick Givens

phone: 503-479-0097 | fax: 503-479-0097 | e-mail: rickgivens@gmail.com

Rick Givens
Planning Consultant
18680 Sunblaze Dr.
Oregon City, Oregon 97045

July 8, 2016

Mr. Peter Spir
City of West Linn
Planning Department
PO Box 29
West Linn, OR 97068

RE: Tanner Ridge at Rosemont (PUD 16-01)

Dear Peter:

As you correctly pointed out in your email of July 5, 2016, the findings submitted by Schott & Associates only address the criteria for the "alternate review process" listed in CDC 32.080. The following findings address the approval criteria of CDC 32.060.

32.060 APPROVAL CRITERIA (STANDARD PROCESS)

No application for development on property containing a WRA shall be approved unless the approval authority finds that the proposed development is consistent with the following approval criteria, or can satisfy the criteria by conditions of approval:

A. WRA protection/minimizing impacts.
   1. Development shall be conducted in a manner that will avoid or, if avoidance is not possible, minimize adverse impact on WRAs.
   2. Mitigation and re-vegetation of disturbed WRAs shall be completed per CDC 32.090 and 32.100 respectively.

Response: The only development activities proposed in the WRA are storm water facilities, as shown on the Preliminary Utility Plan, and a walking path. The storm water facilities must be placed in the WRA because they need to be sited near the creek. The adverse impacts of the improvements will be minimized by:

a. Making the size the minimum necessary to provide for storm detention and treatment functions.
b. Locating the ponds where no trees will need to be removed and where terrain is level enough to minimize grading requirements.
c. Providing for the pond to be planted with native species for water quality functions.
d. Surfacing the pathway with hogfuel chips so that no impervious surfacing is used.

Mitigation plantings will be provided, as discussed in the Schott & Associates letter dated June 27, 2016 and will be installed in accordance with CDC 32.090 and 32.100. The drainageways that will outfall in the WRA will be protected with riprap to prevent erosion impacts.

phone: 503-479-0097 | fax: 503-479-0097 | e-mail: rickgivens@gmail.com

B. *Storm water and storm water facilities.*

1. *Proposed developments shall be designed to maintain the existing WRAs and utilize them as the primary method of storm water conveyance through the project site unless:*
   a. *The surface water management plan calls for alternate configurations (culverts, piping, etc.); or*
   b. *Under CDC 32.070, the applicant demonstrates that the relocation of the water resource will not adversely impact the function of the WRA including, but not limited to, circumstances where the WRA is poorly defined or not clearly channelized. Re-vegetation, enhancement and/or mitigation of the re-aligned water resource shall be required as applicable.*

Comment: The site contains one WRA area. The proposed development plan will maintain this existing WRA and use it as the primary method of storm water conveyance, as shown on the Preliminary Utility Plan. Storm water from streets will be piped to the two detention facilities shown on that plan and will then outfall to the stream corridor.

2. *Public and private storm water detention, storm water treatment facilities and storm water outfall or energy dissipaters (e.g., rip rap) may encroach into the WRA if:*
   a. *Accepted engineering practice requires it;*
   b. *Encroachment on significant trees shall be avoided when possible, and any tree loss shall be consistent with the City's Tree Technical Manual and mitigated per CDC 32.090;*
   c. *There shall be no direct outfall into the water resource, and any resulting outfall shall not have an erosive effect on the WRA or diminish the stability of slopes; and*
   d. *There are no reasonable alternatives available.*

   A geotechnical report may be required to make the determination regarding slope stability.

Comment: The placement of storm water detention and treatment facilities within the WRA is required by accepted engineering practice. City standards require such facilities so as to maintain the rate of storm water runoff from new development at acceptable levels. There are no other areas that reasonably could be used for these facilities as the lot areas are sloped and would require extensive grading to accommodate a detention pond. Accepted engineering practice is to place detention facilities close to drainageways so as to maintain natural drainage patterns as closely as possible.

As shown on the Preliminary Utility Plan, there are two detention ponds proposed within this project. The first, near the intersection of Meadowlark Drive and Parker Road, is located partially within and partly outside of the WRA. The second pond, located on the west side of the project adjacent to the old Parker Rd. right-of-way walking path, will be entirely within the WRA. These locations were chosen by the project engineer as the best locations to service the project and were coordinated with City of West Linn engineering staff. Neither pond is located in an area that would require the removal of trees. No storm water from developed areas will directly outfall into the water resource, but instead will first be detained and treated within the detention pond areas. Outfalls from those facilities will be designed to ensure that there are no erosive effects on the WRA or slopes adjacent to it. A geotechnical report is being prepared for this project.

3. *Roadside storm water conveyance swales and ditches may be extended within rights-of-way located in a WRA. When possible, they shall be located along the side of the road furthest from the water resource. If the conveyance facility must be located along the side of the road closest to the water resource, it shall be located as close to the road/sidewalk as possible and include habitat friendly design features (treatment train, rain gardens, etc.).*

Comment: Because of the steepness of the site, the use of roadside swales and ditches is not practicable for this project.

4. *Storm water detention and/or treatment facilities in the WRA shall be designed without permanent perimeter fencing and shall be landscaped with native vegetation.*

Comment: No permanent fencing of the detention pond areas will be provided. Landscaping for the detention facilities will incorporate native vegetation.

5. *Access to public storm water detention and/or treatment facilities shall be provided for maintenance purposes. Maintenance driveways shall be constructed to minimum width and use water permeable paving materials. Significant trees, including roots, shall not be disturbed to the degree possible. The encroachment and any tree loss shall be mitigated per CDC 32.090. There shall also be no adverse impacts upon the hydrologic conditions of the site.*

Comment: Access to the detention facility along Meadowlark Drive will be from that City street. Access to the westerly detention pond will be from the old Parker Road pedestrian trail. This trail also provides access to other existing detention facilities in this area.

C. *Dedications and easements. The City shall request dedications of the WRA to the City when acquisition of the WRA by dedication or easement would serve a public purpose. When such a dedication or easement is mutually agreed upon, the applicant shall provide the documentation for the dedication or easement. Nothing in this section shall prohibit the City from condemning property if:*
   1. *The property is necessary to serve an important public purpose; and*
   2. *Alternative means of obtaining the property are unsuccessful.*

Comment: The WRA is proposed to be dedicated to the City of West Linn as a nature park.

D. *WRA width. Except for the exemptions in CDC 32.040, applications that are using the alternate review process of CDC 32.070, or as authorized by the approval authority consistent with the provisions of this chapter, all development is prohibited in the WRA as established in Table 32-2 below:*

Comment: This project is proposing to make use of the alternate review process of CDC 32.070. Please see findings discussed in the Schott & Associates report.

E. *Roads, driveways and utilities.*

1. *New roads, driveways, or utilities shall avoid WRAs unless the applicant demonstrates that no other practical alternative exists. In that case, road design and construction techniques shall minimize impacts and disturbance to the WRA by the following methods:*
   a. *New roads and utilities crossing riparian habitat areas or streams shall be aligned as close to perpendicular to the channel as possible.*
   b. *Roads and driveways traversing WRAs shall be of the minimum width possible to comply with applicable road standards and protect public safety. The footprint of grading and site clearing to accommodate the road shall be minimized.*
   c. *Road and utility crossings shall avoid, where possible:*
      1) *Salmonid spawning or rearing areas;*
      2) *Stands of mature conifer trees in riparian areas;*
      3) *Highly erodible soils;*
      4) *Landslide prone areas;*
      5) *Damage to, and fragmentation of, habitat; and*
      6) *Wetlands identified on the WRA Map.*

Comment: No new roads or driveways are proposed within the WRA. The only utilities proposed are the storm lines associated with the storm water detention facilities discussed above. None of the storm lines cross the channel of Tanner Creek.

2. *Crossing of fish bearing streams and riparian corridors shall use bridges or arch-bottomless culverts or the equivalent that provides comparable fish protection, to allow passage of wildlife and fish and to retain the natural stream bed.*

Comment: No roads, driveways or utilities are proposed that cross the Tanner Creek corridor.

3. *New utilities spanning fish bearing stream sections, riparian corridors, and wetlands shall be located on existing roads/bridges, elevated walkways, conduit, or other existing structures or installed underground via tunneling or boring at a depth that avoids tree roots and does not alter the hydrology sustaining the water resource, unless the applicant demonstrates that it is not physically possible or it is cost prohibitive. Bore pits associated with the crossings shall be restored upon project completion. Dry, intermittent streams may be crossed with open cuts during a time period approved by the City and any agency with jurisdiction.*

Comment: No utilities are proposed that cross the Tanner Creek corridor or within wetland areas. There are no existing roads, bridges, walkways or other existing structures within the WRA.

4. *No fill or excavation is allowed within the ordinary high water mark of a water resource, unless all necessary permits are obtained from the City, U.S. Army Corps of Engineers and Oregon Department of State Lands (DSL).*

Comment: No fill or excavation is proposed within the ordinary high water mark of the Tanner Creek corridor.

5. *Crossings of fish bearing streams shall be aligned, whenever possible, to serve multiple properties and be designed to accommodate conduit for utility lines. The applicant shall,*

to the extent legally permissible, work with the City to provide for a street layout and crossing location that will minimize the need for additional stream crossings in the future to serve surrounding properties.

Comment: No crossings of the stream are proposed.

F. *Passive recreation. Low impact or passive outdoor recreation facilities for public use including, but not limited to, multi-use paths and trails, not exempted per CDC 32.040(B)(2), viewing platforms, historical or natural interpretive markers, and benches in the WRA, are subject to the following standards:*

1. *Trails shall be constructed using non-hazardous, water permeable materials with a maximum width of four feet or the recommended width under the applicable American Association of State Highway and Transportation Officials (AASHTO) standards for the expected type and use, whichever is greater.*
2. *Paved trails are limited to the area within 20 feet of the outer boundary of the WRA, and such trails must comply with the storm water provisions of this chapter.*
3. *All trails in the WRA shall be set back from the water resource at least 30 feet except at stream crossing points or at points where the topography forces the trail closer to the water resource.*
4. *Trails shall be designed to minimize disturbance to existing vegetation, work with natural contours, avoid the fall line on slopes where possible, avoid areas with evidence of slope failure and ensure that trail runoff does not create channels in the WRA.*
5. *Foot bridge crossings shall be kept to a minimum. When the stream bank adjacent to the foot bridge is accessible (e.g., due to limited vegetation or topography), where possible, fences or railings shall be installed from the foot bridge and extend 15 feet beyond the terminus of the foot bridge to discourage trail users and pets from accessing the stream bank, disturbing wildlife and habitat areas, and causing vegetation loss, stream bank erosion and stream turbidity. Bridges shall not be made of continuous impervious materials or be treated with toxic substances that could leach into the WRA.*
6. *Interpretive facilities (including viewpoints) shall be at least 10 feet from the top of the water resource's bankfull flow/OHW or delineated wetland edge and constructed with a fence between users and the resource. Interpretive signs may be installed on footbridges.*

Comment: A pedestrian trail is proposed within the WRA, as shown on the Tentative Plan. The trail is proposed to be 4 feet in width and surfaced with hogfuel chips. The alignment of the trail maintains a 30' setback from the water resource. No crossings are proposed. The trail follows the natural terrain and provides for a connection between Meadowlark Drive, Heron Ct., and the old Parker Rd. right-of-way walking path. The path alignment has been designed to avoid removal of existing trees. No interpretive facilities are proposed.

G. *Daylighting Piped Streams.*

Comment: Not applicable. There are no daylighted piped streams associated with this site or project. Two ephemeral streams are shown on the City's mapping of water resources, but site investigation by Schott & Associates found no evidence of any channelized seasonal drainageways. The site plan calls for the creation of drainage corridors to handle surface drainage that outfalls to this site, but there are no streams that are piped.

H. *The following habitat friendly development practices shall be incorporated into the design of any improvements or projects in the WRA to the degree possible:*

Comment: The only improvements within the WRA are the detention ponds and associated storm pipes, and the pervious walking path. None of the design features listed relate directly to these improvements.

Thank you for your inclusion of these additional findings within the record. Please let me know if you have any questions or require additional information.

Sincerely yours,

Rick Givens

Rick Givens

cc: Mark Handris, Icon Construction & Development, LLC
Mike Robinson, Perkins Coie

AFFIDAVIT OF POSTING

STATE OF OREGON)
) SS
County of Clackamas)

I, Richard Givens, Planning Consultant for Icon Construction and Development, LLC, in the case of Tanner Ridge at Rosemont Planned Unit Development Subdivision, declare that on February 23, 2016, pursuant to Chapter 99.083 of the West Linn Community Development Code. a sign providing notice of a neighborhood meeting to discuss the proposed 52-lot project. The sign exceeded the required 11" x 17" standard and was posted on the subject property's frontage at 1270 Rosemont Road, as well as its frontage on Parker Road.

Richard Givens 6/6/2016

RICHARD GIVENS DATE
PLANNING CONSULTANT

OFFICIAL STAMP
RENEE L. GONZALES
NOTARY PUBLIC-OREGON
COMMISSION NO. 944398
MY COMMISSION EXPIRES NOVEMBER 03, 2019

6/6/16

AFFIDAVIT OF NOTICE

STATE OF OREGON)
) SS
County of Clackamas)

I. Richard Givens, Planning Consultant for Icon Construction and Development, LLC, declare that on February 23, 2016 notice of a neighborhood meeting was provided, in the case of the Tanner Ridge at Rosemont Planned Unit Development Subdivision, pursuant to Chapter 99.083 of the West Linn Community Development Code. Notice was mailed to property owners within 500 feet of the project site, and to the Parker Crest, Savanna Oaks and Hidden Springs neighborhood associations. This notice was for the a 52-lot planned unit development, which has subsequently been reduced to 50 lots.

Richard Givens April 4, 2016

RICHARD GIVENS DATE
PLANNING CONSULTANT

OFFICIAL STAMP
RENEE L. GONZALES
NOTARY PUBLIC-OREGON
COMMISSION NO. 944398
MY COMMISSION EXPIRES NOVEMBER 03, 2019

4/4/16
Renee L. Gonzales

Rick Givens
Planning Consultant
18680 Sunblaze Dr.
Oregon City, Oregon 97045

February 23, 2016

Mr. William Relyea, President
Ms. Claudia Relyea, Treasurer
Parker Crest Neighborhood Association
3016 Sabo Lane
West Linn, OR 97068

Dear Mr. & Mrs. Relyea:

I'd like to thank you for your assistance in arranging a neighborhood meeting date for the proposed development of property located at 1270 Rosemont Road. Our correspondence to date has been via email, but this letter is being sent to you to fulfill the technical requirements of Section 99.038C of the West Linn Community Development Code that we contact you via certified mail to arrange the date for the meeting. Just to confirm, the date you proposed of March 16, 2016 at the West Linn Adult Community Center will work fine for us and we will be sending out the required neighborhood notice letters for that time and place.

Thanks again,

Rick Givens

Rick Givens

cc: Icon Construction & Development, LLC

phone: 503-479-0097 | fax: 503-479-0097 | e-mail: rickgivens@gmail.com

Notice of Neighborhood Meeting Regarding
A Proposed 52-Lot Planned Unit Development Subdivision
Located at 1270 Rosemont Road

Hello,

You are invited to attend a neighborhood meeting to discuss a proposed development in your area. Icon Construction & Development, LLC is proposing to construct a 52-lot Planned Unit Development subdivision on property located at 1270 Rosemont Road in West Linn.

As required by the West Linn Community Development Code, prior to the submittal of an application to the City of West Linn for preliminary approval of this project, a meeting with neighbors will be held to present the conceptual plan for the project, to answer questions and for the developer to receive feedback from those in attendance. This notice of the meeting is being mailed to owners of property located within 500 feet of the boundaries of the subject property. The notice is also being mailed to officers of the Parker Crest, Savanna Oaks and Hidden Springs/Rosemont Neighborhood Associations. The property is located within the Parker Crest Neighborhood Association boundaries and is within 500 feet of the Savanna Oaks and Hidden Springs/Rosemont Neighborhood Association boundaries.

The proposed development is scheduled to be presented at a March 16, 2016 meeting of the Parker Crest Neighborhood Association. There may be other items on the agenda in addition to this project. Meeting time and place are:

7:00 PM, Wednesday, March 16, 2016.
West Linn Adult Community Center
1180 Rosemont Rd.
West Linn, Oregon

We look forward to meeting with you. If you cannot attend in person but have questions regarding the project, please feel free to contact the project planning consultant, Rick Givens. You may phone him at (503) 479-0097 or contact him via email at rickgivens@gmail.com.

Notice of Neighborhood Meeting

Regarding A Proposed
52-Lot Planned Unit Development Subdivision for Property
Located at 1270 Rosemont Road

You are invited to attend a neighborhood meeting to discuss a proposed development on this property. The project will be presented at a March 16, 2016 meeting of the Parker Crest Neighborhood Association. Other items may be on the agenda in addition to this one.

The applicant for this project is Icon Construction & Development, LLC. Additional information may be obtained by telephoning the project planning consultant, Rick Givens, at (503) 479-0097 or by email at rickgivens@gmail.com.

The meeting time and place are:

7:00 PM on Wednesday, March 16, 2016
Adult Community Center
1180 Rosemont Rd
West Linn, Oregon

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

William & Claudia Relyea
3016 Sabo Lane
West Linn, OR 97068

9590 9403 0591 5183 3127 84

2. Article Number (Transfer from service label)

7015 1730 0001 1229 7956

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X
☐ Agent
☐ Addressee

B. Received by (Printed Name)

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
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Street and Apt. No., or PO Box No. 3016 Sabo Lane
City, State, ZIP+4® West Linn, OR 97068

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

CITY OF West Linn

PROJECT # PUD-16-01/SUB-16-01/WAP-16-05/ VAR-16-01/WRG-16-01

CITIZEN CONTACT INFORMATION

To lessen the bulk of agenda packets, land use application notice, and to address the worries of some City residents about testimony contact information and online application packets containing their names and addresses as a reflection of the mailing notice area, this sheet substitutes for the photocopy of the testimony forms and/or mailing labels. A copy is available upon request.

Tanner Ridge at Rosemont

Neighborhood Meeting Notes

March 16, 2016

A neighborhood meeting of the Parker Crest Neighborhood Association was held on March 16, 2016 at 7:00 PM at the West Linn Adult Community Center, 1180 Rosemont Road, West Linn, OR. Rick Givens, Planning Consultant, and Mark Handris of Icon Construction and Development, LLC were in attendance to present the proposed development for a Planned Unit Development subdivision located at 1280 Rosemont Road. Mr. Givens made introductory comments regarding the nature of the proposed development, noting that it was planned as a 52 lot development for single-family detached homes. He explained the process and anticipated timeline for the submittal and review of the application and then opened the floor for questions and comments. These are summarized below:

Traffic – Several neighbors on Roxbury Drive expressed concerns about the potential for cut-through traffic from Rosemont Road to Parker Road making use of Roxbury Drive. Questions were asked as to why a more direct route through the project couldn't be designed to reduce the potential for this impact. Mr. Givens explained that there are street grade and intersection sight distance issues to be considered. He also noted that the traffic report didn't identify any major traffic making use of that route, but he said that he would look at that issue again. Some neighbors were in favor of closing Roxbury entirely, or installing speed humps. Mr. Givens noted that they could make those requests of the City during the review of the project. Some suggested making the project a gated community, but Mr. Givens noted that would conflict with City standards.

Timing of Construction – Questions were asked about when the project would begin construction and what the timetable would be. Mr. Givens and Mr. Handris explained that the project would have to complete the review process through the City of West Linn and that it was difficult to know how long that would take. Mr. Handris indicated that this project would likely begin site development in Spring of 2017. Site development would take about 4 months and homes would be built over approximately a 2 year period.

Type of Homes – Questions were asked regarding the type of homes and pricing. Mr. Handris said there would be a mix of spec and custom homes. All homes will be single-family detached. Home sizes will begin at about 2,800 sq. ft., with sizing dependent upon lot size and lot coverage standards. Home prices will begin at around $700,000.

Rosemont Road Widening – People were interested in whether Rosemont Road would be widened. Mr. Givens noted that frontage improvements would be made along that street to widen it to City Minor Arterial standards.

Schools – Questions were asked about what schools would serve the site and whether there would be problems with traffic congestion during pick-up and drop-off times. Mr. Givens said he wasn't sure exactly which primary and middle schools would be involved, but said he would check with West Linn School District.

Fencing – Neighbors on Roxbury wanted to know whether homes would be fenced. Mr. Handris said fencing of rear yards was typically provided. They would coordinate with neighbors regarding existing fences.

Storm Drainage – Neighbors on Roxbury noted that they have drainage issues and wanted assurance that the development would not impact their homes with run-off. Mr. Givens noted that the site would be served with storm sewers and would provide for storm water detention in the open space area. He also noted that existing ephemeral streams would be channeled through drainageways to the stream corridor.

Home Size – Some neighbors objected to large homes on small lots. Mr. Handris noted that the City has standards regarding lot coverage and floor area ratios that relate to lot size. He said homes would be similar to the Douglas Grove project that Icon developed in West Linn and suggested that people could look at that development as an example.

Phasing – Mr. Handris answered a question regarding phasing by noting the project would be built in a single phase.

Construction Traffic – Mr. Handris assured neighbors that construction traffic would not use local streets. A project construction entrance will be developed and construction traffic will make use of that.

Parker Crest Neighborhood Association wants to provide for sidewalk continuity for the off-site property to the east and noted that they have some funds that could be used for that purpose.

Concerns were expressed about construction traffic interfering with school traffic. Mr. Handris indicated that they would try to coordinate with the School District on this concern.

PERKINS COIE

1120 NW Couch Street
10th Floor
Portland, OR 97209-4128

+1.503.727.2000
+1.503.727.2222
PerkinsCoie.com

April 28, 2016

Michael C. Robinson
MRobinson@perkinscoie.com
D. +1.503.727.2264
F. +1.503.346.2264

VIA E-MAIL

Peter Spir, Associate Planner
City of West Linn
22500 Salamo Road
West Linn, OR 97068

Re: Proposed Tanner Ridge at Rosemont Planned Unit Development
Applicability of CDC Chapter 28

Dear Mr. Spir:

This office represents ICON Construction and Development, LLC ("Icon") in its application for a 50-lot planned unit development, known as Tanner Ridge at Rosemont (the "Project"). The Project is to be constructed on an approximately 16-acre property located at 1270 Rosemont Road (the "Property"). A substantial portion of the Property is covered by Metro-designated habitat areas, some of which are classified as Habitat Conservation Areas ("HCAs"). City staff has said that a Willamette and Tualatin River Protection Area Permit is required pursuant to West Linn Community Development Code ("CDC") Chapter 28 due to the presence of designated HCA. The purpose of this letter is to explain why that interpretation misconstrues applicable law, and request that City staff find that a Protection Area Permit is not required and return any application fee(s) for that permit.

1. CDC Chapter 28 standards do not apply to HCAs located outside of the Willamette and Tualatin River Protection overlay zone.

CDC Chapter 28 is the "Willamette and Tualatin River Protection" overlay zone. As evident on the City's zoning map, this overlay zone does not extend onto the Property. CDC 28.030.A establishes the applicability of the overlay zone:

> **"A. The Willamette and Tualatin River Protection Area is an overlay zone. The zone boundaries are identified on the City's zoning map, and include:**
>
> **1. All land within the City of West Linn's Willamette River Greenway Area.**
>
> **2. All land within 200 feet of the ordinary low water mark of the Tualatin River, and all land within the 100-year floodplain of the Tualatin River.**

63830-0013/130525501.1

> **3. In addition to the Willamette Greenway and Tualatin River Protection Area boundaries, this chapter also relies on the HCA Map to delineate where development should or should not occur. Specifically, the intent is to keep out of, or minimize disturbance of, the habitat conservation areas (HCAs). Therefore, if all, or any part, of a lot or parcel is in the Willamette Greenway and Tualatin River Protection Area boundaries, and there are HCAs on the lot or parcel, a Willamette and Tualatin River Protection Area permit shall be required unless the development proposal is exempt per CDC 28.040."**

The Property is not within the mapped Willamette Greenway, nor is it within 200 feet of the ordinary low water mark of the Tualatin River. Therefore, the overlay zone does not include the Property. For this reason alone, CDC Chapter 28 does not apply to the Project.

We understand City staff's position to be that a Protection Area Permit is required by CDC 28.030.D, which provides that the "construction of a structure in the HCA or the expansion of a structure into the HCA when the new intrusion is closer to the protected water feature than the pre-existing structure." This interpretation is incorrect for several reasons.

First, CDC 28.030.A explains that the zone is an overlay zone and therefore restricted to certain geographical boundaries. These boundaries limit the applicability of the chapter. CDC 28.030.A.3 unambiguously requires a permit only when two conditions are present: (1), the property is in the Willamette and Tualatin River Protection overlay zone <u>and</u> (2), there are mapped HCAs on the Property. Because the Property is not located within the Willamette Greenway and Tualatin River Protection Area, there is no basis for the City to require a Protection Area Permit for the Project.

Second, CDC 28.030.D does not expand the application of Chapter 28 beyond the geographic boundaries of the overlay zone. Rather, it simply explains how development of a structure within the overlay zone is subject to Chapter 28 standards. When this provision is read with CDC 28.030.A, its correct interpretation is that CDC Chapter 28 applies when a structure or expansion is proposed <u>within</u> the zone boundaries established in 28.030.A. The fact that the second clause of CDC 28.030.D references a "protected water feature" supports this interpretation.

Third, staff's interpretation is inconsistent with the purposes of CDC Chapter 28. Purpose statements A-C, E, F, and H all reference the Willamette and Tualatin Rivers and their related protection areas. As explained above, the Property is not located near these rivers or within the Protection Area boundary. Purpose statement G simply states that development should be encouraged in appropriate areas, not that Chapter 28 is intended to regulate all mapped HCAs.

Finally, purpose statement D explains that the chapter is intended to provide for the review of "any intensification of use, change of use, or development within the Willamette and Tualatin Protection Areas." This purpose statement directly supports an interpretation that Chapter 28 only applies in these areas and does not apply on the Property.

Fourth, the regulatory context of the CDC supports an interpretation that Chapter 28 only applies within the Willamette and Tualatin Protection Areas. For example, see the following definitions, set forth in CDC Chapter 02:

- "Development. Any manmade change defined as the construction of buildings or other structures, mining, dredging, paving, filling, grading or site clearing, and grubbing in amounts greater than 10 cubic yards on any lot, parcel, or lot of record. Within the flood management area, this term shall also include storage of equipment or materials. Within the Willamette and Tualatin River Protection Areas, this term shall also include any change of use or intensification of the use of land or water, including construction of structures (such as houses, structures, docks and associated pilings or piers), significant grading, or removal or addition of vegetation and groundcover unless specifically exempted per CDC 28.040."

- "Protection area. Collective term to describe areas within the Willamette River Greenway boundary and/or Tualatin River Protection Area boundary."

- "Habitat conservation areas (HCA). Areas identified on the Habitat Conservation Areas Map and subject to the standards found in Chapter 28 CDC, Willamette and Tualatin River Protection."

As evident above, these definitions indicate that development within the "Protection Area" is subject to Chapter 28, but do not support an interpretation that any development within any HCA is subject to Chapter 28. Even the definition of "Habitat Conservation Area" does not support such an interpretation because it defines HCAs as those identified on the HCA map and subject to the standards found in Chapter 28.

Other provisions of Chapter 28 support Icon's interpretation. For example, CDC 28.110.B.4 provides that "when only HCA land is available then the structure shall be placed as far away from the water resource area or river as possible." CDC 28.110.C explains how structures must be set back from the top of bank, or, if no top of bank is discernable, "the applicant shall identify the boundary of the area designated as 'Habitat and Impact Areas Not Designated' as HCAs which is closest to the river." These provisions make little sense if all HCAs are subject to Chapter 28 regardless of whether they are proximate to the Willamette or Tualatin rivers.

Finally, note that City staff's own comments on the Department of Land Conservation and Development notice of adoption for Chapter 28 summarizes the chapter as follows: "Consolidated Tualatin River Protection and Willamette River Greenway Chapters into one emphasizing resource protection by using Metro's habitat conservation mapping system." **Exhibit 1**. This articulated purpose is consistent with CDC 28.030.A, which applies HCAs in the Willamette and Tualatin River protection areas. It is not consistent with the City's position that a single ambiguous code provision, CDC 28.030.D, can boot-strap Chapter 28 onto all mapped HCAs in the City regardless of whether such areas are actually in the Willamette and Tualatin River Protection overlay zone.

2. **If CDC Chapter 28 does apply to development on the Property, staff can find that the Project is exempt because the HCA at issue is composed entirely of forested overstory.**

Even if staff does maintain its interpretation that a Protection Area Permit is required for any development in the HCA, it can find that a permit is not required pursuant to CDC 28.040.AA and CDC 28.070.F because the HCA designation on land proposed for development is based only on the presence of forested overstory.

According to Metro's habitat map, three (3) categories of habitat areas are mapped on the Property: a large area of Class C Upland Habitat, a smaller corridor of Class II Riparian/Wildlife Habitat which runs southward from the onsite pond, and a small area of Class I Riparian/Wildlife Habitat surrounding the pond and wetlands. **Exhibit 2**. The HCA classifications of these habitat areas are determined by Title 13 of the Metro Urban Growth Functional Plan ("UGFP"), Table 3.07-13a. **Exhibit 3.** This table indicates that the upland habitat area is not designated as HCA at all, and that the Class II and Class I Riparian Habitat areas are designated as Moderate and High HCA, respectively.

Thus, most of the upland habitat located on the Property is "Habitat and Impact Areas Not Designated as HCAs" and is exempt from any permit requirement pursuant to CDC 28.040.T. Other HCA within a corridor running southward from the onsite pond has been delineated by Martin Schott, Professional Wetland Scientist. As demonstrated on the tentative PUD plan (**Exhibit 4**), all proposed building envelopes will be outside of this delineated area. The remaining HCA is not proposed for development, except for a small portion of Moderate HCA located near proposed lot 35.

The CDC does not explain how an applicant can demonstrate that designated HCA is based only on forested overstory. As the HCA's were designated by Metro, the City must look to Metro's data and applicable regulations of the UGFP to determine how the HCA at this location was designated. Metro Title 13 explains how HCAs are determined; in particular, it explains that HCAs were identified using Metro's Vegetated Cover Map. UGFP 3.07.1340(d)(4)(A)(ii)(2). This map demonstrates that the HCA that affects proposed lot 35 is based only on identified forested overstory. **Exhibits 5** and **6** (the dark green area is designated by Metro as tree canopy).

A determination that this HCA is forested overstory is supported by CDC 28.040.AA, which provides as follows:

> **"Lands that are designated as an HCA only due to a forested canopy shall be exempted since trees are already protected in the municipal code and Chapters 55 and 58 CDC. Development of lands that are designated as HCA due to other variables such as wetlands, flood areas and steep slopes shall still be regulated by the provisions of this chapter and not exempted."**

As explained above, Metro's vegetated area map shows that the Moderate HCA in which development is proposed is identified as "tree canopy." This HCA area does not have identified wetlands or flood areas. The tentative PUD plan map also demonstrates that this area is not mapped over areas with steep slopes because it is outside of the 25% slope area. **Exhibit 4**.

3. Conclusion.

The correct interpretation of CDC Chapter 28 is that it only applies in the Willamette and Tualatin Protection Areas. If staff finds that Chapter 28 applies to the HCA mapped on the Property, it can find that a Protection Area Permit is not required because the HCA proposed for development is entirely composed of forested overstory.

Very truly yours,

Michael C Robinson

Michael C. Robinson
MCR:rsr
Enclosures
cc: Mr. John Boyd (via email) (w/ encls.)
Ms. Megan Thornton (via email) (w/ encls.)
Mr. Rick Givens (via email) (w/ encls.)
Mr. Mark Handris (via email) (w/ encls.)
Mr. Garrett Stephenson (via email) (w/ encls.)

Oregon
Theodore R. Kulongoski, Governor
Department of Land Conservation and Development
635 Capitol Street, Suite 150
Salem, OR 97301-2540
(503) 373-0050
Fax (503) 378-5518
www.lcd.state.or.us

NOTICE OF ADOPTED AMENDMENT

October 22, 2008

TO: Subscribers to Notice of Adopted Plan or Land Use Regulation Amendments

FROM: Mara Ulloa, Plan Amendment Program Specialist

SUBJECT: City of West Linn Plan Amendment
DLCD File Number 001-08

The Department of Land Conservation and Development (DLCD) received the attached notice of adoption. A copy of the adopted plan amendment is available for review at the DLCD office in Salem and the local government office.

Appeal Procedures*

DLCD ACKNOWLEDGMENT or DEADLINE TO APPEAL: November 4, 2008

This amendment was submitted to DLCD for review 45 days prior to adoption. Pursuant to ORS 197.830 (2)(b) only persons who participated in the local government proceedings leading to adoption of the amendment are eligible to appeal this decision to the Land Use Board of Appeals (LUBA).

If you wish to appeal, you must file a notice of intent to appeal with the Land Use Board of Appeals (LUBA) no later than 21 days from the date the decision was mailed to you by the local government. If you have questions, check with the local government to determine the appeal deadline. Copies of the notice of intent to appeal must be served upon the local government and others who received written notice of the final decision from the local government. The notice of intent to appeal must be served and filed in the form and manner prescribed by LUBA, (OAR Chapter 661, Division 10). Please call LUBA at 503-373-1265, if you have questions about appeal procedures.

***NOTE: THE APPEAL DEADLINE IS BASED UPON THE DATE THE DECISION WAS MAILED BY LOCAL GOVERNMENT. A DECISION MAY HAVE BEEN MAILED TO YOU ON A DIFFERENT DATE THAN IT WAS MAILED TO DLCD. AS A RESULT YOUR APPEAL DEADLINE MAY BE EARLIER THAN THE ABOVE DATE SPECIFIED.**

Cc: Gloria Gardiner, DLCD Urban Planning Specialist
Amanda Punton, DLCD Natural Resource Specialist
Peter Spir, City of West Linn

paa ya/l

FORM 2

D L C D NOTICE OF ADOPTION

This form must be mailed to DLCD within 5 working days after the final decision
per ORS 197.610, OAR Chapter 660 - Division 18

(See reverse side for submittal requirements)

DEPT OF
OCT 15 2008
LAND CONSERVATION AND DEVELOPMENT

Jurisdiction: CITY OF WEST LINN Local File No.: CDC-07-04
(If no number, use none)

Date of Adoption: SEPT 25 2008 (Must be filled in) Date Mailed: 10-14-08 (Date mailed or sent to DLCD)

(BUT MAYOR DID NOT SIGN ORDINANCE UNTIL 10-13-08)

Date the Notice of Proposed Amendment was mailed to DLCD: ________

___ Comprehensive Plan Text Amendment
___ Comprehensive Plan Map Amendment
X Land Use Regulation Amendment
___ Zoning Map Amendment
___ New Land Use Regulation
___ Other: ________ (Please Specify Type of Action)

Summarize the adopted amendment. Do not use technical terms. Do not write ASee Attached.≅

Consolidated Tualatin River Protection and Willamette River Greenway chapters into one emphasizing resource protection by using Metro's habitat conservation mapping system.

Describe how the adopted amendment differs from the proposed amendment. If it is the same, write ASame.≅ If you did not give notice for the proposed amendment, write AN/A.≅

Same

Plan Map Changed from: N/A to ________

Zone Map Changed from: N/A to ________

Location: City wide Acres Involved: ________

Specify Density: Previous: N/A New: ________

Applicable Statewide Planning Goals: 15 AND 5

Was an Exception Adopted? Yes: ____ No: ✓

DLCD File No.: 001-08 (16834)

EXHIBIT 1
Page 2 of 3

Did the Department of Land Conservation and Development **receive** a notice of Proposed Amendment **FORTY FIVE (45) days prior to the first evidentiary hearing**. Yes: ✓ No: ___

If no, do the Statewide Planning Goals apply. Yes: ___ No: ___

If no, did The Emergency Circumstances Require immediate adoption. Yes: ___ No: ___

Affected State or Federal Agencies, Local Governments or Special Districts: Metro, DSL, USACE, ODFW

Local Contact: PETER SPIR Area Code + Phone Number: 503-656-4211

Address: 22500 SALAMO ROAD City: WEST LINN

Zip Code+4: 97068 Email Address: PSPIR@WESTLINN OREGON.GOV

ADOPTION SUBMITTAL REQUIREMENTS

This form **must be mailed** to DLCD **within 5 working days after the final decision**
per ORS 197.610, OAR Chapter 660 - Division 18.

1. Send this Form and TWO (2) Copies of the Adopted Amendment to:

ATTENTION: PLAN AMENDMENT SPECIALIST
DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT
635 CAPITOL STREET NE, SUITE 150
SALEM, OREGON 97301-2540

2. Submit **TWO (2) copies** the adopted material, if copies are bounded please submit **TWO (2) complete copies** of documents and maps.

3. Please Note: Adopted materials must be sent to DLCD not later than **FIVE (5) working days** following the date of the final decision on the amendment.

4. Submittal of this Notice of Adoption must include the text of the amendment plus adopted findings and supplementary information.

5. The deadline to appeal will not be extended if you submit this notice of adoption within five working days of the final decision. Appeals to LUBA may be filed within **TWENTY-ONE (21) days** of the date, the ANotice of Adoption≅ is sent to DLCD.

6. In addition to sending the ANotice of Adoption≅ to DLCD, you must notify persons who participated in the local hearing and requested notice of the final decision.

7. **Need More Copies?** You can copy this form on to 8-1/2x11 green paper only ; or call the DLCD Office at (503) 373-0050; or Fax your request to:(503) 378-5518; or Email your request to Larry.French@state.or.us - ATTENTION: PLAN AMENDMENT SPECIALIST.

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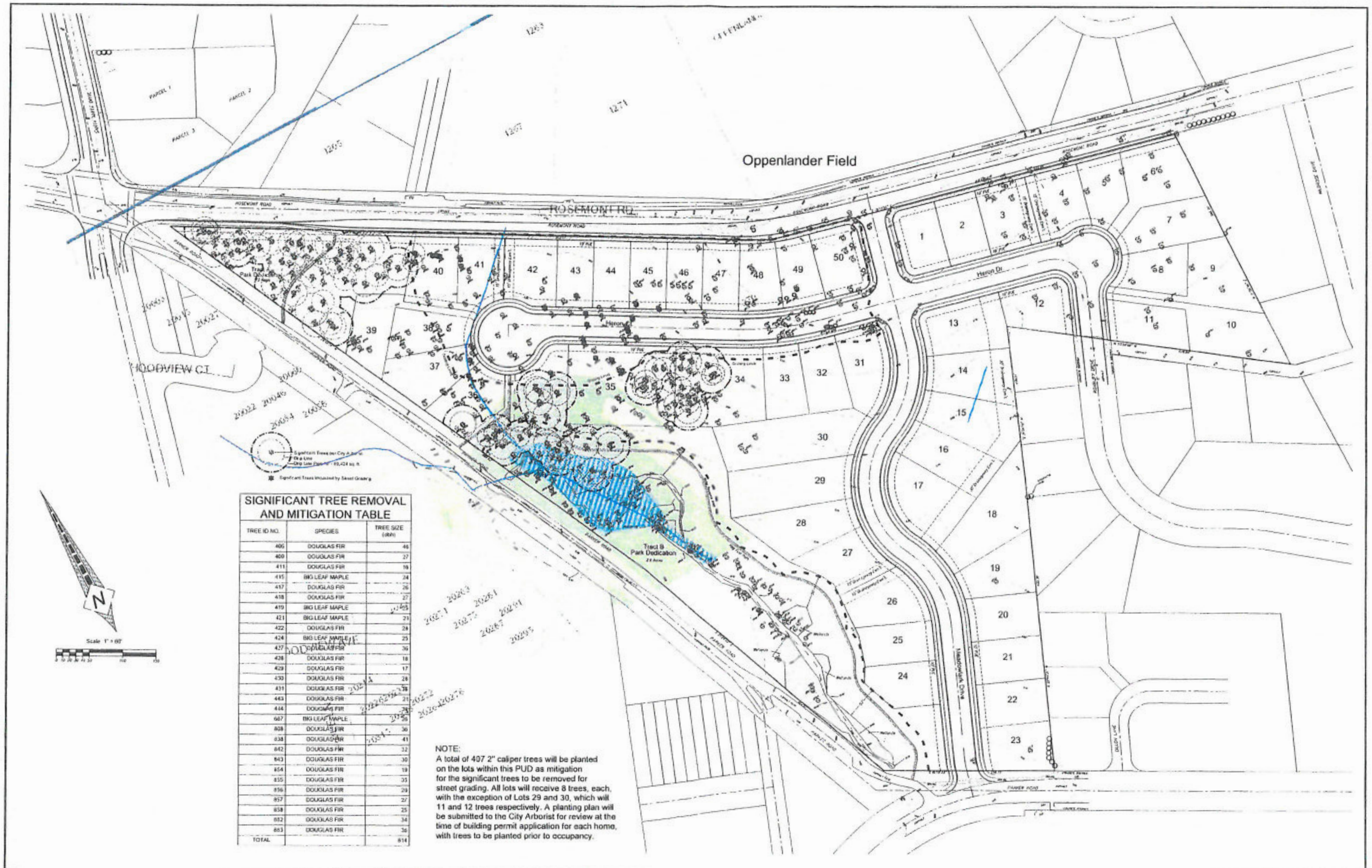
EXHIBIT 1
Page 3 of 3



SIGNIFICANT TREE REMOVAL AND MITIGATION TABLE

TREE ID NO.	SPECIES	TREE SIZE (dbh)
406	DOUGLAS FIR	46
409	DOUGLAS FIR	27
411	DOUGLAS FIR	16
415	BIG LEAF MAPLE	24
417	DOUGLAS FIR	26
418	DOUGLAS FIR	27
419	BIG LEAF MAPLE	25
421	BIG LEAF MAPLE	21
422	DOUGLAS FIR	28
424	BIG LEAF MAPLE	25
427	DOUGLAS FIR	36
428	DOUGLAS FIR	18
429	DOUGLAS FIR	17
430	DOUGLAS FIR	28
431	DOUGLAS FIR	38
443	DOUGLAS FIR	21
444	DOUGLAS FIR	38
687	BIG LEAF MAPLE	26
808	DOUGLAS FIR	36
838	DOUGLAS FIR	41
842	DOUGLAS FIR	32
843	DOUGLAS FIR	30
854	DOUGLAS FIR	19
855	DOUGLAS FIR	35
856	DOUGLAS FIR	29
857	DOUGLAS FIR	27
858	DOUGLAS FIR	25
882	DOUGLAS FIR	34
883	DOUGLAS FIR	36
TOTAL		814

NOTE:
A total of 407 2" caliper trees will be planted on the lots within this PUD as mitigation for the significant trees to be removed for street grading. All lots will receive 8 trees, each, with the exception of Lots 29 and 30, which will 11 and 12 trees respectively. A planting plan will be submitted to the City Arborist for review at the time of building permit application for each home, with trees to be planted prior to occupancy.

DESIGNED	REG			
DRAWN	REG			
SCALE	1" = 60'			
DATE	April 2016			
FILE	15-ICN-107	DATE	NO.	REVISION

Richard E. Givens, Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045
PH: (503) 479-0097

APPLICANT
Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH (503) 657-0406

Tanner Ridge at Rosemont
Tree Preservation Plan

SHEET: 2/2

EXHIBIT 2
Page 1 of 1

9/21/16 PC Meeting
156

Density Calculations

	Area (sq. ft.)	Allowable Density	Units @1 per 10,000 sq.ft.
Gross Site Area	659,610		
Land in a boundary street right-of-way, water course, or planned open space where density transfer is not requested:	0		
Area in street right-of-way:	124,185		
Net Site Area:	535,425		
Area within Type I or II slopes where Developed:	4,273	50%	0.21
Area within Type I or II slopes where Density Will be Transferred:	6,846	75%	0.51
Area within Water Resource Area-all development transferred.	99,364	50%	4.97
Open Space (Type III and IV Lands)	58,759	100%	5.88
Type III & IV Land Developed:	366,185	100%	36.62
Base Density Allowed			48
Density Bonus for Park Dedication.		5%	2
TOTAL ALLOWED DENSITY			50 UNITS

DESIGNED	REG			
DRAWN	REG			
SCALE	1" = 60'			
DATE	April 2016			
FILE	15-ICM-107	DATE	NO.	REVISION

Richard E. Givens, Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045
PH: (503) 479-0097

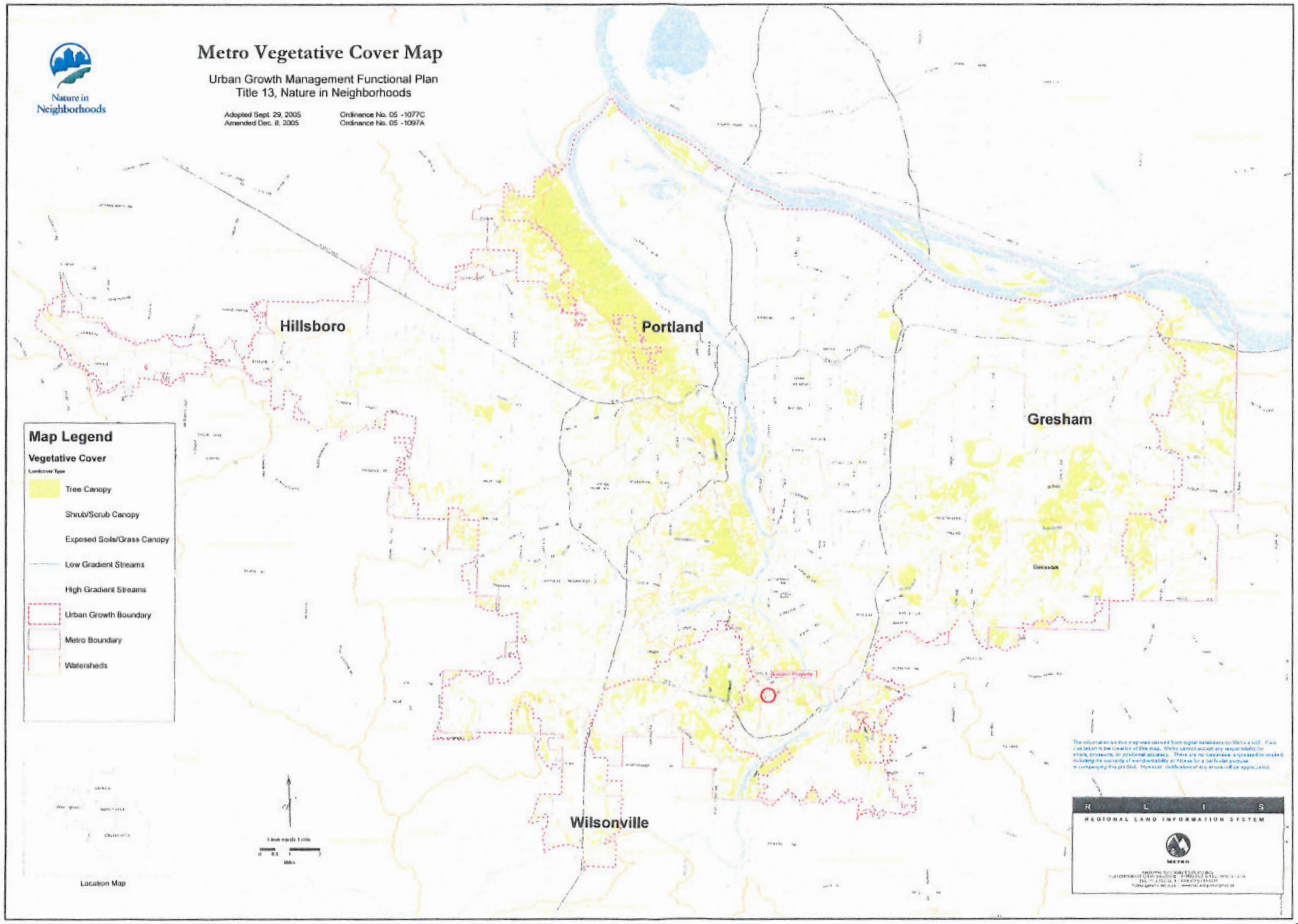
APPLICANT: Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406

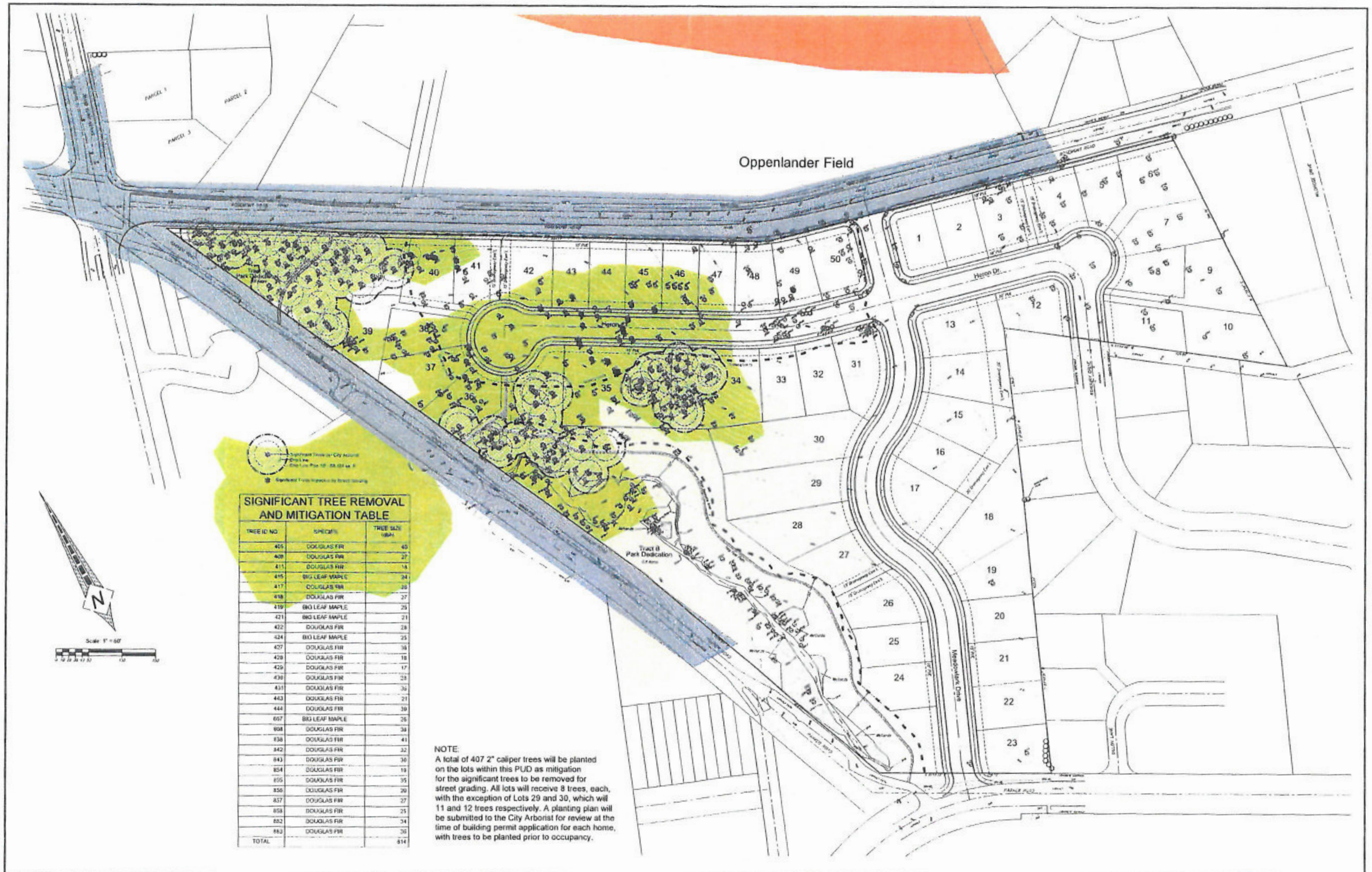
Tanner Ridge at Rosemont
Tentative Plan

SHEET 1/2

EXHIBIT 4
Page 1 of 1

9/21/16 PC Meeting
157





SIGNIFICANT TREE REMOVAL AND MITIGATION TABLE

TREE ID NO.	SPECIES	TREE SIZE (DBH)
405	DOUGLAS FIR	40
408	DOUGLAS FIR	27
411	DOUGLAS FIR	14
415	BIG LEAF MAPLE	24
417	DOUGLAS FIR	28
418	DOUGLAS FIR	27
419	BIG LEAF MAPLE	25
421	BIG LEAF MAPLE	21
422	DOUGLAS FIR	28
424	BIG LEAF MAPLE	25
427	DOUGLAS FIR	36
428	DOUGLAS FIR	18
429	DOUGLAS FIR	17
430	DOUGLAS FIR	23
431	DOUGLAS FIR	36
443	DOUGLAS FIR	21
444	DOUGLAS FIR	30
667	BIG LEAF MAPLE	26
808	DOUGLAS FIR	38
838	DOUGLAS FIR	41
842	DOUGLAS FIR	32
843	DOUGLAS FIR	30
854	DOUGLAS FIR	19
855	DOUGLAS FIR	35
856	DOUGLAS FIR	20
857	DOUGLAS FIR	27
858	DOUGLAS FIR	25
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883	DOUGLAS FIR	36
TOTAL		814

NOTE:
A total of 407 2" caliper trees will be planted on the lots within this PUD as mitigation for the significant trees to be removed for street grading. All lots will receive 8 trees, each, with the exception of Lots 29 and 30, which will 11 and 12 trees respectively. A planting plan will be submitted to the City Arborist for review at the time of building permit application for each home, with trees to be planted prior to occupancy.

DESIGNED:	REG			
DRAWN:	REG			
SCALE:	1" = 60'			
DATE:	April 2016			
FILE:	15-ICN-107	DATE	NO.	REVISION

Richard E. Givens, Planning Consultant
18660 Sunblaze Dr.
Oregon City, OR 97045
PH: (503) 479-0097

APPLICANT: Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406

Tanner Ridge at Rosemont
Tree Preservation Plan

SHEET: 2/2

EXHIBIT 6
Page 1 of 1

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

Geotechnical Engineering Report

Tanner Ridge Subdivision
1270 Rosemont Road
West Linn, Oregon 97068

GeoPacific Engineering, Inc. Job No. 16-4281
July 20, 2016

14835 SW 72nd Avenue
Portland, Oregon 97224

Tel (503) 598-8445
Fax (503) 941-9281

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Real-World Geotechnical Solutions
Investigation • Design • Construction Support

July 20, 2016
Project No. 16-4281

ICON Construction and Development
Mr. Darren Gusdorf
1980 Willamette Falls Drive, Suite 200
West Linn, Oregon 97068
Phone: (503)657-0406
Email: darrnen@iconconstruction.net

SUBJECT: GEOTECHNICAL ENGINEERING REPORT
TANNER RIDGE SUBDIVISION
1270 ROSEMONT ROAD
WEST LINN, OREGON 97068

PROJECT INFORMATION

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-5698, dated July 5, 2016, and your subsequent authorization of our proposal and *General Conditions for Geotechnical Services.*

Site Location:	1270 Rosemont Road West Linn, Oregon 97068 Clackamas County Parcel No. 00388459 and 00391739 (see Figures 1 through 3)
Developer:	ICON Construction and Development 1980 Willamette Falls Drive, Suite 200 West Linn, Oregon 97068 Phone: (503)657-0406
Jurisdictional Agency:	City of West Linn, Oregon
Prepared By:	GeoPacific Engineering, Inc 14835 SW 72nd Avenue Portland, Oregon 97224 Tel (503) 598-8445 Fax (503) 941-9281

SITE AND PROJECT DESCRIPTION

As indicated on Figures 1 through 3, the subject site is located at 1270 Rosemont Road in West Linn, Oregon. The site is comprised of Clackamas County Parcel No. 00388459 and 00391739, which total approximately 15.82-acres in size, and is irregular in shape. The site latitude and longitude is 45.367028, -122.642572, and the legal description is the NE ¼ of Section 26, T2S, R1E, Willamette Meridian. The regulatory jurisdictional agency is the City of West Linn, Oregon. The site is bordered by Rosemont Road to the north, by Wild Rose Drive and existing residential development to the east, by Parker Road to the south, and by a paved walking path, and Salamo Road to the west. The site is gently to moderately sloping to the south and southwest with site elevations ranging from approximately 598 to 690 feet above mean sea level (amsl). The ground surface slopes with gradients ranging from approximately 5 to 20 percent. The northern and western portions of the site are heavily vegetated with deciduous and coniferous trees, ivy, blackberries, grasses, and native understory vegetation. Extensive clearing was required to access the noted areas. The northwestern most portion of the site was too densely vegetated to access. The southern portion of the site is primarily vegetated with tall grasses. The southwestern portion of the site contains wetland areas. We understand that the wetland areas will not be developed. The eastern portion of the site contains a shallow, historic drainage. No water was observed in the drainage during our investigation, however it appears to convey seasonal stormwater.

Based upon communication with the client, GeoPacific understands that the proposed subdivision at the subject site will consist of development of fifty residential building lots to support construction two-story, wood framed, residential homes, construction of new public streets, and associated underground utilities. We anticipate that the homes will incorporate typical spread foundations with crawl spaces and wood-framing, or potentially daylight basements. We anticipate maximum bearing pressures from columns and walls to be on the order of 1,500 psf. We anticipate cut and fill on the order of five feet.

REGIONAL GEOLOGIC SETTING

Regionally, the subject site lies within the Willamette Valley/Puget Sound lowland, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. A series of discontinuous faults subdivide the Willamette Valley into a mosaic of fault-bounded, structural blocks (Yeats et al., 1996). Uplifted structural blocks form bedrock highlands, while down-warped structural blocks form sedimentary basins.

According to the *Geologic Map of the Lake Oswego Quadrangle, Clackamas, Multnomah, and Washington Counties, Oregon (Beeson, Tolan, and Madin, DOGAMI 1989),* the site is underlain by middle Miocene-aged, Columbia River Basalts (Tcr). According to the mapping, the basalt flows consist of accordantly layered flows of dark gray to black, locally porphyritic basalts that are commonly blocky to columnar jointed, often displaying well-formed prismatic colonnades. Fresh exposures are dark gray to black, weathered surfaces are commonly reddish brown to gray. The Web Soil Survey (United States Department of Agriculture, Natural Resource Conservation Service (USDA NRCS 2016 Website), indicates that near-surface soils primarily consist of the Cornelius silt loam, and Saum silt loam soils series. Cornelius soils generally consist of moderately deep to a fragipan, moderately well drained soils that formed in silty loess-like materials. Saum soils generally consist of very deep, well drained soils that formed in basalt colluvium.

REGIONAL SEISMIC SETTING

At least four 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 Lacamas Creek/Sandy River 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 reportedly 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 located approximately 3.6 miles northeast of the site. The Oatfield Fault occurs along the western side of the Portland Hills, and is located approximately 2.8 miles northeast of the site. The East Bank Fault occurs along the eastern margin of the Willamette River, and is located approximately 7.8 miles northeast of the site. The accuracy of the fault mapping is stated to be within 500 meters (Wong, et al., 2000).

According to the USGS Earthquake Hazards Program, the fault was originally mapped as a down-to-the-northeast normal fault, but has also been mapped as part of a regional-scale zone of right-lateral, oblique slip faults, and as a steep escarpment caused by asymmetrical folding above a south-west dipping, blind thrust fault. The Portland Hills fault offsets Miocene Columbia River Basalts, and Miocene to Pliocene sedimentary rocks of the Troutdale Formation. No fault scarps on surficial Quaternary deposits have been described along the fault trace, and the fault is mapped as buried by the Pleistocene aged Missoula flood deposits. 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).

Lacamas Creek / Sandy River Fault Zone

The Lacamas Creek Fault intersects the northeast trending Sandy River Fault north of Camas, Washington at Lacamas Lake, approximately 20 miles northeast of the subject site. The Lacamas Creek Fault extends northwest to southeast, intersecting the northeast, southwest trending Sandy River Fault. According to the USGS Earthquake Hazards Program the fault has been mapped as a normal fault with down-to-the-southwest displacement, and has also been described as a steeply northeast or southwest-dipping, oblique, right-lateral, slip-fault. The trace of the Lacamas Lake fault is marked by the very linear lower reach of Lacamas Creek. No fault scarps on Quaternary surficial deposits have been described. The Lacamas Lake fault offsets Pliocene-aged sedimentary conglomerates generally identified as the Troutdale formation, and Pliocene to

Pleistocene aged basalts generally identified as the Boring Lava formation. Recent seismic reflection data across the probable trace of the fault under the Columbia River yielded no unequivocal evidence of displacement underlying the Missoula flood deposits, however, recorded mild seismic activity during the recent past indicates this area may be potentially seismogenic.

Gales Creek-Newberg-Mt. Angel Structural Zone

The Gales Creek-Newberg-Mt. Angel Structural Zone is a 50-mile-long zone of discontinuous, NW-trending faults that lies about 16.5 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 (the fault closest to the subject site); however, these faults are considered to be potentially active because they may connect with the seismically active Mount Angel Fault and the rupture plane of the 1993 M5.6 Scotts Mills earthquake (Werner et al. 1992; Geomatrix Consultants, 1995).

According to the USGS Earthquake Hazards Program, the Mount Angel fault is mapped as a high-angle, reverse-oblique fault, which offsets Miocene rocks of the Columbia River Basalts, and Miocene and Pliocene sedimentary rocks. The fault appears to have controlled emplacement of the Frenchman Spring Member of the Wanapum Basalts, and thus must have a history that predates the Miocene age of these rocks. No unequivocal evidence of deformation of Quaternary deposits has been described, but a thick sequence of sediments deposited by the Missoula floods covers much of the southern part of the fault trace.

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 along the Oregon Coast at depths of between 20 and 40 kilometers below the surface.

FIELD EXPLORATION AND SUBSURFACE CONDITIONS

Our subsurface explorations for this report were conducted on July 7, 2016. A total of ten exploratory test pits (TP-1 through TP-10) were excavated at the site to a maximum depth of 11 feet below the existing ground surface (bgs) using a track-mounted excavator provided by the client. The approximate locations of the explorations are indicated on Figures 2 and 3. It should be noted that exploration locations were located in the field by pacing or taping distances from apparent property corners and other site features shown on the plans provided. As such, the locations of the explorations should be considered approximate. During the explorations, GeoPacific observed and recorded pertinent soil information such as color, stratigraphy, strength, and soil moisture content. Soils were classified in accordance with the Unified Soil Classification System (USCS). At the completion of each test, the test pit excavations were backfilled loosely with onsite soil. Soil and groundwater conditions encountered in the explorations are summarized below.

Soil Descriptions

Topsoil: At the location of test pit explorations TP-1 through TP-7, and TP-10 the ground surface was underlain by approximately 12 to 18 inches of dark brown, very moist, soft, organic Lean CLAY (OL-CL), containing blackberry roots and tree roots. At the locations of test pits TP-8 and TP-9 the ground surface was underlain by approximately 8 inches of brown, moist, organic, Lean CLAY (OL-CL), containing fine grass roots. It is likely that the thickness of the organic soil horizon will increase where there are trees.

Residual Soil/Lean CLAY: Underlying the topsoil layer at the locations of our explorations, soils were observed to consist of reddish brown with gray mottling, very stiff to hard, moist, low to moderately plastic, Lean CLAY(CL). The soil type was observed to extend to depths ranging from 3 to 11 feet bgs. The soil type appeared to represent residual soils which had weathered from basaltic bedrock.

Residual Soil/Clayey GRAVEL: Underlying the Lean CLAY soil type at the locations of test pits TP-1 through TP-7, and TP-10, soils were observed to transition to moist, medium dense to dense, Clayey GRAVEL (GC), containing black and dark gray angular basalt gravel to cobble sized rock in a reddish brown, Lean CLAY matrix. The soil type was observed to extend to depths ranging from approximately 5 to 9 feet, and represents a transition zone from thoroughly altered basalt, into more intact, less weathered material.

Basalt Bedrock: Underlying the Clayey GRAVEL soil layer at the locations of test pits TP-1 through TP-5, and TP-10, soils were observed to transition into dark gray to black, fractured, dense, moist, angular basalt bedrock, containing gravel to boulder sized rock in a clayey matrix. Excavation into the layer was difficult and refusal occurred at various depths ranging from approximately 6 to 9 feet bgs where encountered.

Groundwater and Soil Moisture

On July 7, 2016, observed soil moisture conditions were generally moist. No groundwater seepage was observed within our subsurface explorations, however wetland areas are present on the western margin of the site. High soil moisture content was observed within test pit TP-8 at a depth of approximately 6 to 8 feet. According to the *Estimated Depth to Groundwater in the Portland, Oregon Area, (United States Geological Survey, Snyder 2016 website)*, groundwater may be encountered at an approximate depth of 315 feet below the ground surface at the subject site. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors. Perched groundwater may be encountered in localized areas. Seeps and springs may exist in areas not explored, and may become evident during site grading.

SLOPE STABILITY STUDY

The site contains gentle to moderate sloping conditions, typically underlain by stiff clay soils and shallow bedrock. Based upon communication with the client and civil engineer we anticipate that site grading will include approximately 5 feet of cut and fill which will further reduce the site gradients. The site is gently to moderately sloping to the south with site elevations ranging from approximately 598 to 690 feet above mean sea level (amsl). The ground surface slopes with gradients ranging from approximately 5 to 20 percent.

For the purpose of evaluating global slope stability of the site with the proposed construction, we reviewed published geologic and hazard mapping, reviewed regional site topography and LIDAR imagery, reviewed legal property records, performed field reconnaissance, and evaluated subsurface soil conditions in exploratory test pits to a maximum depth of 11 feet bgs. LIDAR imagery utilized in our site evaluation are presented in Figure 4.

Hazard Mapping Literature Review

The *Generalized Geologic Map of the Willamette Lowland*, (Marshall W. Gannett and Rodney R. Caldwell, U.S. Department of the Interior, U.S. Geological Survey, 1998), indicates that the site is underlain by Miocene-aged (approximately 23 to 5 million years ago) Columbia River basalt flows, which consist of phyric basalt and basaltic-andesite flows erupted eastern Oregon, Washington, and Idaho, (Tcr). The basalts are generally composed of dense, finely crystalline rock that is commonly fractured along blocky and columnar vertical joints.

The Oregon Department of Geology and Mineral Industries (DOGAMI), Oregon HazVu: Statewide Geohazards Viewer indicates that the subject site is located in an area considered at risk for *very strong* ground shaking, and *low* risk for liquefaction during an earthquake. Published regional geologic mapping and the DOGAMI online landslide database show no landslides at the property (Madin, 1990; Burns et al., 2011; DOGAMI SLIDO database, 2015). As shown on Figure 4, the site primarily displays smooth, broad, even topography. A shallow, seasonal drainage is present along the eastern margin of the site. No clear indication of recent earth movement or historic landslide activity is visible on the LIDAR imagery of the site.

Field Reconnaissance

We conducted field reconnaissance of the site to observe geomorphic features and assess the relative slope stability. During our field exploration we did not observe geomorphic evidence of prior slope instability (such as hummocky topography, benches, or old scarps). No tension cracks, slumping, or areas of recent soil creek were observed. Trees were observed to be growing with straight trunks. In general the site displayed relatively smooth, even topography consistent with stable slope conditions.

Subsurface Exploration

Test pit explorations were conducted at the site to a maximum depth of 11 feet bgs. The approximate locations of the explorations are indicated on the attached Figures 2 and 3. Subsurface exploration logs are attached in the appendix of this report. Subsurface conditions encountered within our explorations indicated that the site is underlain by very stiff residual clay soils, and dense, basaltic bedrock.

Conclusion

Based upon the results of our literature review, geologic mapping review, field reconnaissance, subsurface conditions encountered within our test pit explorations, and our understanding of the proposed development, we do not anticipate that the proposed development will present concerns to global slope instability at the subject site.

CONCLUSIONS AND RECOMMENDATIONS

Our site investigation indicates that the proposed construction is geotechnically feasible, provided that the recommendations of this report are incorporated into the design and construction phases of the project. The primary geotechnical concern associated with development at the site is relatively shallow bedrock in portions of the site which may create difficult excavation conditions during installation of deep utility systems.

Keyways, Benching, and Subdrains for Fill Slopes

Due to the presence of relatively gentle to moderate slopes and shallow proposed engineered fills, keying and benching may or may not be needed during site grading. Engineered fill placed on existing sloped areas inclining steeper than an approximately twenty percent grade should be constructed on a keyway and benches in accordance with the typical design shown in the attached Fill Slope Detail (Figure 6). Keyways should have a minimum depth of four feet, and a minimum width of ten feet. Additional removal of weakened or soft soils may be required depending on the conditions observed during construction. Benches and keyways should be roughly horizontal in the down slope direction, but may slope up to a 5 percent grade along a topographic contour. Keyways sloping more than a 20 percent grade along a topographic contour should be benched or configured as approved by the geotechnical engineer or his designated representative.

If groundwater seepage is observed during excavation, keyways should include a subdrain consisting of a minimum 4-inch-diameter, ADS Heavy Duty Grade (or equivalent), perforated plastic pipe enveloped in a minimum of 4 cubic feet per lineal foot of 2"- ½", open-graded gravel drain rock wrapped with geotextile filter fabric (Mirafi 140N or equivalent). A minimum 1 percent gradient should be maintained throughout all subdrain pipes and outlets. GeoPacific should inspect keyways, subdrains and benching prior

Site Preparation Recommendations

Areas of proposed construction and areas to receive fill should be cleared of vegetation, and any organic and inorganic debris. Inorganic debris and organic materials from clearing should be removed from the site. Organic-rich soils and root zones should then be stripped from construction areas of the site or where engineered fill is to be placed. Depth of stripping of organic soils is estimated to be approximately 8 to 18 inches across the majority of the site, however depth of organic soil layers may increase in areas where trees are present. 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 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. Prior to placement of engineered fill, subgrade soils should be aerated and re-compacted to minimum depth of 12 inches below the existing topsoil layer.

If encountered, undocumented fills and any subsurface structures (dry wells, basements, driveway and landscaping fill, old utility lines, septic leach fields, etc.) should be completely removed and the excavations backfilled with approved engineered fill.

Engineered Fill

All grading for the proposed construction should be performed as engineered grading in accordance with the applicable building code at the time of construction with the exceptions and additions noted herein. Areas proposed for fill placement should be prepared as described in the *Site Preparation Recommendations* section. Surface soils should then be scarified and recompacted prior to placement of structural fill. 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 percent 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. During periods of wet-weather site earthwork may be impacted by soil moisture.

Excavating Conditions and Utility Trench Backfill

We anticipate that on-site soils can be excavated using conventional heavy equipment across much of the site, however, dense basaltic bedrock caused refusal of excavation in some locations (see test pit logs). It is likely that large excavators and rock chippers may be needed during underground utility installation, particularly in the northern portion of the site. 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. All temporary cuts in excess of 4 feet in height should be sloped in accordance with U.S. Occupational Safety and Health Administration

(OSHA) regulations (29 CFR Part 1926), or be shored. The existing soils classify as Type B Soil and temporary excavation side slope inclinations as steep as 1H:1V may be assumed for planning purposes. This cut slope inclination is applicable to excavations above the water table only and conditions may differ depending upon the time of year.

Shallow, perched groundwater may be encountered during the wet weather season and should be anticipated in excavations and utility trenches. 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 and the City of West Linn standards. We recommend that structural trench backfill be compacted be compacted to at least 95 percent of the maximum dry density determined by ASTM D1557 (Modified Proctor) or equivalent. Initial backfill lift thicknesses 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, at least one density test is taken for every 4 vertical feet of backfill on each 100-lineal-foot section of trench.

Erosion Control Considerations

During our field exploration program, we did not observe soil conditions 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 waddles, fiber rolls, and silt fences. If used, these erosion control devices should 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 areas where fill may be proposed 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 passing the No. 200 sieve. The fines should be non-plastic. Alternatively, cement treatment of on-site soils may be performed to facilitate wet weather placement;
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller, or equivalent, and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials;
- Excavation and placement of fill should be observed by the geotechnical engineer to verify that all unsuitable materials are removed and suitable compaction and site drainage is achieved; and
- Geotextile silt fences, straw waddles, and fiber rolls should be strategically located to control erosion.

If cement or lime treatment is used to facilitate wet weather construction, GeoPacific should be contacted to provide additional recommendations and field monitoring.

Spread Foundations

The proposed residential structures may be supported on shallow foundations bearing on stiff, re-compacted native soils and/or engineered fill, appropriately designed and constructed as recommended in this report. Foundation design, construction, and setback requirements should conform to the applicable building code at the time of construction. For maximization of bearing strength and protection against frost heave, spread footings should be embedded at a minimum depth of 18 inches below exterior grade. If soft soil conditions are encountered at footing subgrade elevation, they should be removed and replaced with compacted crushed aggregate.

The anticipated allowable soil bearing pressure is 1,500 lbs/ft^2 for footings bearing on competent, native soil and/or engineered fill. The recommended maximum allowable bearing pressure may be increased by 1/3 for short-term transient conditions such as wind and seismic loading. For loads heavier than 35 kips, the geotechnical engineer should be consulted. If heavier loads than described above are proposed, it may be necessary to over-excavate point load areas and replace with additional compacted crushed aggregate. The coefficient of friction between on-site soil and poured-in-place concrete may be taken as 0.42, 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 disturbed soil to competent subgrade that is suitable for bearing support. All footing excavations should be trimmed neat, and all loose or softened soil should be removed from the excavation bottom prior to placing reinforcing steel bars. Due to the moisture sensitivity of on-site native soils, foundations constructed during the wet weather season may require over-excavation of footings and backfill with compacted, crushed aggregate.

Our recommendations are for residential construction incorporating raised wood floors and conventional spread footing foundations. After site development, a Final Soil Engineer's Report should either confirm or modify the above recommendations.

Concrete Slabs-on-Grade

Preparation of areas beneath concrete slab-on-grade floors should be performed as recommended in the *Site Preparation Recommendations* section. Care should be taken during excavation for foundations and floor slabs, to avoid disturbing subgrade soils. If subgrade soils have been adversely impacted by wet weather or otherwise disturbed, the surficial soils should be scarified to a minimum depth of 8 inches, moisture conditioned to within about 3 percent of optimum moisture content, and compacted to engineered fill specifications. Alternatively, disturbed soils may be removed and the removal zone backfilled with additional crushed rock.

For evaluation of the concrete slab-on-grade floors using the beam on elastic foundation method, a modulus of subgrade reaction of 150 kcf (87 pci) should be assumed for the stiff, fine-grained soils anticipated to be present in the upper four feet at the site. This value assumes the concrete slab system is designed and constructed as recommended herein, with a minimum thickness of 8 inches of 1½"-0 crushed aggregate beneath the slab. The total thickness of crushed aggregate will be dependent on the subgrade conditions at the time of construction, and should be verified visually by proof-rolling. Under-slab aggregate should be compacted to at least 95 percent of its maximum dry density as determined by ASTM D1557 (Modified Proctor) or equivalent.

In areas where moisture will be detrimental to floor coverings or equipment inside the proposed structure, appropriate vapor barrier and damp-proofing measures should be implemented. A commonly applied vapor barrier system consists of a 10-mil polyethylene vapor barrier placed directly over the capillary break material. Other damp/vapor barrier systems may also be feasible. Appropriate design professionals should be consulted regarding vapor barrier and damp proofing systems, ventilation, building material selection and mold prevention issues, which are outside GeoPacific's area of expertise.

Drainage

The outside edge of the 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 1½" - ¾" 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 1 percent fall should be maintained throughout the drain and non-perforated pipe outlet. The footing drains should include clean-outs to allow periodic maintenance and inspection. In our opinion, footing drains may outlet at the curb, or on the back sides of lots where sufficient fall is not available to allow drainage to the street. Figure 5 presents a typical perimeter footing drain detail.

Construction should include typical measures for controlling subsurface water beneath the homes, including positive crawlspace drainage to an adequate low-point drain exiting the foundation, visqueen covering the exposed ground in the crawlspace, and crawlspace ventilation (foundation vents). The owners should be informed and educated that some slow flowing water in the crawlspaces is considered normal and not necessarily detrimental to the home given these other design elements incorporated into its construction. Appropriate design professionals should be consulted regarding crawlspace ventilation, building material selection and mold prevention issues, which are outside GeoPacific's area of expertise.

Down spouts and roof drains should collect roof water in a system separate from the footing drains in order to reduce the potential for clogging. Roof drain water should be directed to an appropriate discharge point well away from structural foundations. Grades should be sloped downward and away from buildings to reduce the potential for ponded water near structures.

Permanent Below-Grade Walls

Lateral earth pressures against below-grade retaining walls will depend upon the inclination of any adjacent slopes, type of backfill, degree of wall restraint, method of backfill placement, degree of backfill compaction, drainage provisions, and magnitude and location of any adjacent surcharge loads. At-rest soil pressure is exerted on a retaining wall when it is restrained against rotation. In contrast, active soil pressure will be exerted on a wall if its top is allowed to rotate or yield a distance of roughly 0.001 times its height or greater.

If the subject retaining walls will be free to rotate at the top, they should be designed for an active earth pressure equivalent to that generated by a fluid weighing 35 pcf for level backfill against the wall. For restrained wall, an at-rest equivalent fluid pressure of 55 pcf should be used in design, again assuming level backfill against the wall. These values assume that the recommended drainage provisions are incorporated, and hydrostatic pressures are not allowed to develop against the wall.

During a seismic event, lateral earth pressures acting on below-grade structural walls will increase by an incremental amount that corresponds to the earthquake loading. Based on the Mononobe-Okabe equation and peak horizontal accelerations appropriate for the site location, seismic loading should be modeled using the active or at-rest earth pressures recommended above, plus an incremental rectangular-shaped seismic load of magnitude 6.5H, where H is the total height of the wall.

We assume relatively level ground surface below the base of the walls. As such, we recommend passive earth pressure of 320 pcf for use in design, assuming wall footings are cast against competent native soils or engineered fill. If the ground surface slopes down and away from the base of any of the walls, a lower passive earth pressure should be used and GeoPacific should be contacted for additional recommendations.

A coefficient of friction of 0.42 may be assumed along the interface between the base of the wall footing and subgrade soils. The recommended coefficient of friction and passive earth pressure values do not include a safety factor, and an appropriate safety factor should be included in design. The upper 12 inches of soil should be neglected in passive pressure computations unless it is protected by pavement or slabs on grade.

The above recommendations for lateral earth pressures assume that the backfill behind the subsurface walls will consist of properly compacted structural fill, and no adjacent surcharge loading. If the walls will be subjected to the influence of surcharge loading within a horizontal distance equal to or less than the height of the wall, the walls should be designed for the additional horizontal pressure. For uniform surcharge pressures, a uniformly distributed lateral pressure of 0.3 times the surcharge pressure should be added. Traffic surcharges may be estimated using an additional vertical load of 250 psf (2 feet of additional fill), in accordance with local practice.

The recommended equivalent fluid densities assume a free-draining condition behind the walls so that hydrostatic pressures do not build-up. This can be accomplished by placing a 12 to 18-inch wide zone of sand and gravel containing less than 5 percent passing the No. 200 sieve against the walls. A 3-inch minimum diameter perforated, plastic drain pipe should be installed at the base of the walls and connected to a suitable discharge point to remove water in this zone of sand and gravel. The drain pipe should be wrapped in filter fabric (Mirafi 140N or other as approved by the geotechnical engineer) to minimize clogging.

Wall drains are recommended to prevent detrimental effects of surface water runoff on foundations – not to dewater groundwater. Drains should not be expected to eliminate all potential sources of water entering a basement 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.

Water collected from the wall 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 wall drains in order to reduce the potential for clogging. The 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.

GeoPacific should be contacted during construction to verify subgrade strength in wall keyway excavations, to verify that backslope soils are in accordance with our assumptions, and to take density tests on the wall backfill materials.

Structures should be located a horizontal distance of at least 1.5H away from the back of the retaining wall, where H is the total height of the wall. GeoPacific should be contacted for additional foundation recommendations where structures are located closer than 1.5H to the top of any wall.

Seismic Design

The Oregon Department of Geology and Mineral Industries (DOGAMI), Oregon HazVu: 2016 Statewide GeoHazards Viewer indicates that the site is in an area where *very strong* ground shaking is anticipated during an earthquake. Structures should be designed to resist earthquake loading in accordance with the methodology described in the 2012 International Building Code (IBC) with applicable Oregon Structural Specialty Code (OSSC) revisions (current 2014). We recommend Site Class D be used for design per the OSSC, Table 1613.5.2 and as defined in ASCE 7, Chapter 20, Table 20.3-1. Design values determined for the site using the USGS (United States Geological Survey) 2016 Seismic Design Maps Summary Report are summarized in Table 1, and are based upon existing soil conditions.

Table 1 - Recommended Earthquake Ground Motion Parameters (USGS 2016)

Parameter	Value
Location (Lat, Long), degrees	45.366, -122.642
Probabilistic Ground Motion Values, 2% Probability of Exceedance in 50 yrs	
Peak Ground Acceleration	0.413 g
Short Period, S_s	0.953 g
1.0 Sec Period, S_1	0.410 g
Soil Factors for Site Class D:	
F_a	1.119
F_v	1.590
$SD_s = 2/3 \times F_a \times S_s$	0.711 g
$SD_1 = 2/3 \times F_v \times S_1$	0.434 g
Seismic Design Category	D

Soil Liquefaction

The Oregon Department of Geology and Mineral Industries (DOGAMI), Oregon HazVu: 2016 Statewide GeoHazards Viewer indicates that the site is in an area considered to be at *low* risk for soil liquefaction during an earthquake. Soil liquefaction is a phenomenon wherein saturated soil deposits temporarily lose strength and behave as a liquid in response to ground shaking caused by strong earthquakes. Soil liquefaction typically occurs in loose sands and granular soils located below the water table, and fine-grained soils with a plasticity index less than 15. The subsurface profile observed within our hand auger explorations which extended to a maximum depth of 8 feet bgs, indicated that the site is underlain by medium stiff to stiff, Lean CLAY, with moderate plasticity. Geologic mapping indicates that the clayey soils are underlain by dense basaltic bedrock. No groundwater seepage was observed within our subsurface explorations. According to the *Estimated Depth to Groundwater in the Portland, Oregon Area, (United States Geological Survey, Snyder 2016 website)*, groundwater may be encountered at an approximate depth of 315 feet below the ground surface at the subject site. Based upon our observations of the subsurface profile in the upper 8 feet of the ground surface, and our review of available geologic literature, it is our opinion that the risk of soil liquefaction during a seismic event at the subject site may be considered to be low.

UNCERTAINTIES AND LIMITATIONS

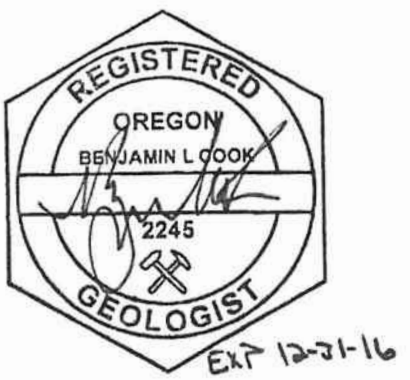
We have prepared this report for the owner and his/her consultants for use in design of this project only. The conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary 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.

Within the limitations of scope, schedule and budget, GeoPacific executed 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, express 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.



Benjamin L. Cook, R.G.
Senior Geologist

James D. Imbrie, G.E., C.E.G.
Principal Geotechnical Engineer

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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 Modified Proctor)	During backfilling, tested every 4 vertical feet for every 200 lineal feet	Soil Technician	
6	Street Subgrade Inspection	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	Final Geotechnical Engineer's Report	Completion of project	Geotechnical Engineer	

FIGURES

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Portland, Oregon 97224

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Fax (503) 941-9281

GeoPacific Engineering, Inc.
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Portland, Oregon 97224
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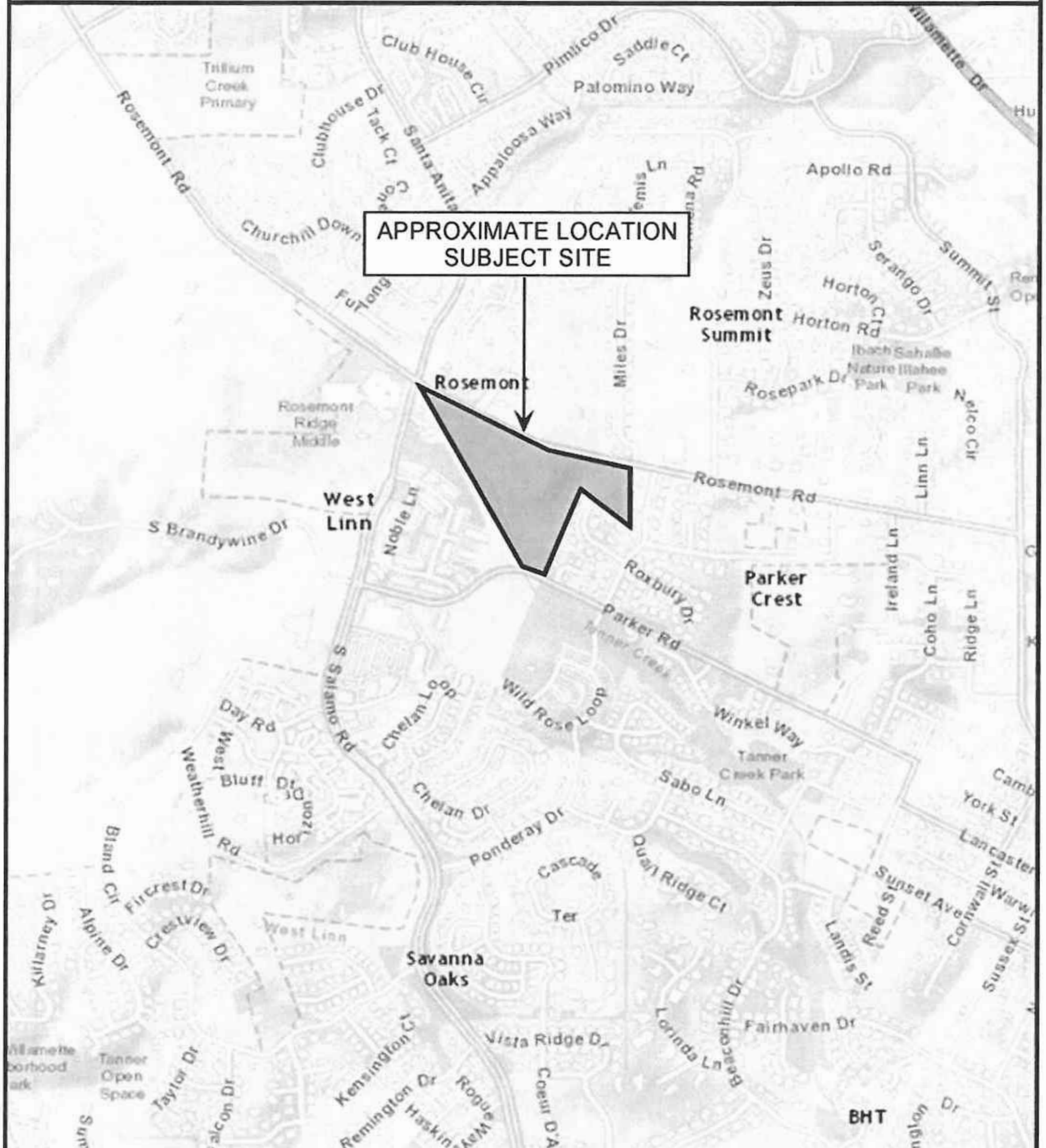
SITE VICINITY MAP



Drawn by: BLC
Date: 7/19/2016
Base maps: DOGAMI HAZVU 2016

NORTH

Project: Tanner Ridge Subdivision 1270 Rosemont Road, West Linn, Oregon	Project No. 16-4281	FIGURE 1

GeoPacific Engineering, Inc.
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Tel: (503) 598-8445 Fax: (503) 941-9281

SITE AERIAL AND EXPLORATION LOCATIONS

Legend:
Test Pit Exploration Designation and Approximate Location

APPROXIMATE SCALE (FEET)
150 0 150 300

Drawn by: BLC
Date: 7/18/2016

North

Project: Tanner Ridge Subdivision 1270 Rosemont Road, West Linn, Oregon	Project No. 16-4281	FIGURE 2

GeoPacific Engineering, Inc.
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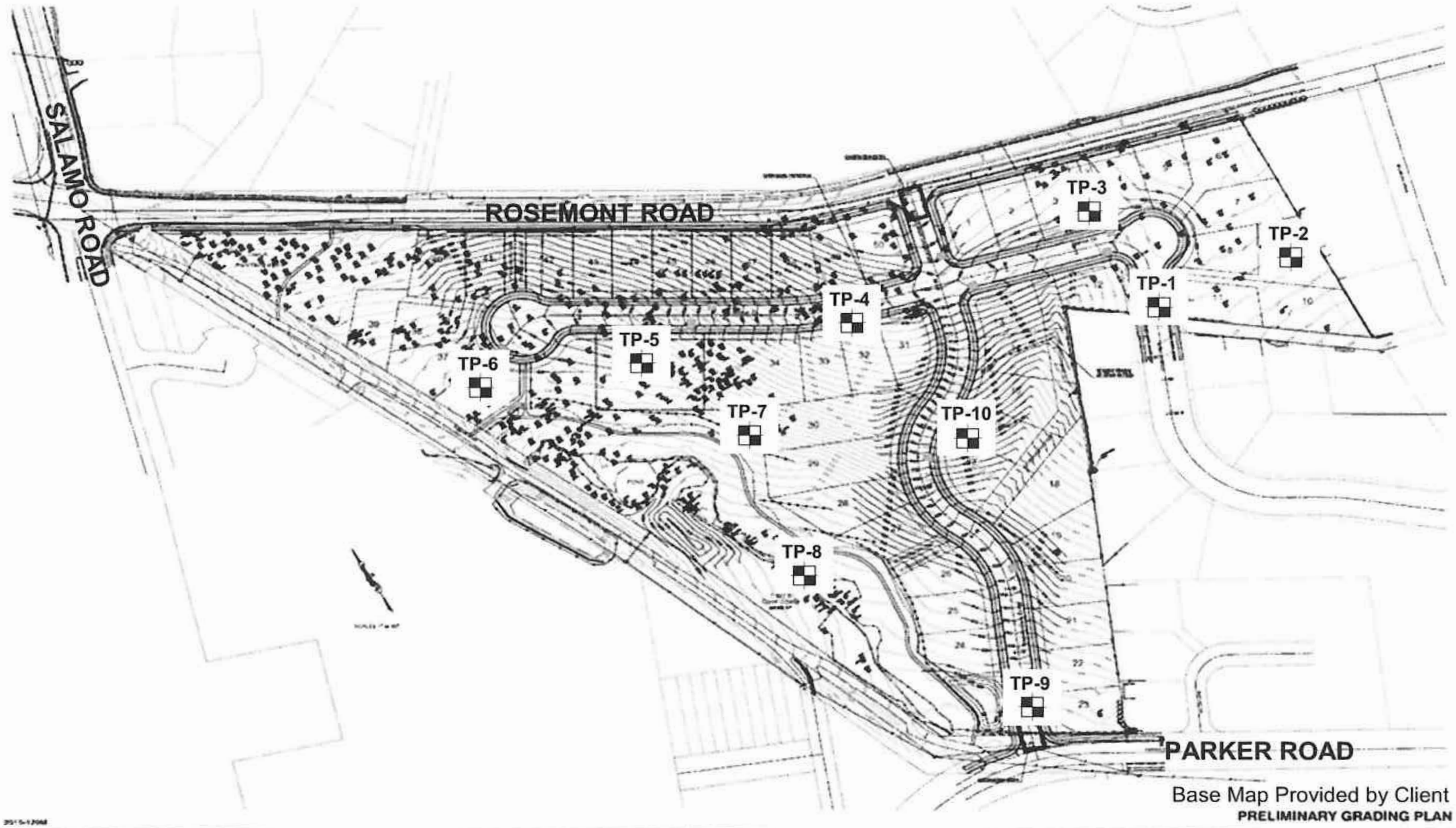
SITE PLAN AND EXPLORATION LOCATIONS



Legend:

Test Pit Exploration Designation and Approximate Location

APPROXIMATE SCALE (FEET)

120 0 120 240

Drawn by: BLC

Date: 7/18/2016

North

Project: Tanner Ridge Subdivision 1270 Rosemont Road, West Linn, Oregon	Project No. 16-4281	FIGURE 3

GeoPacific Engineering, Inc.

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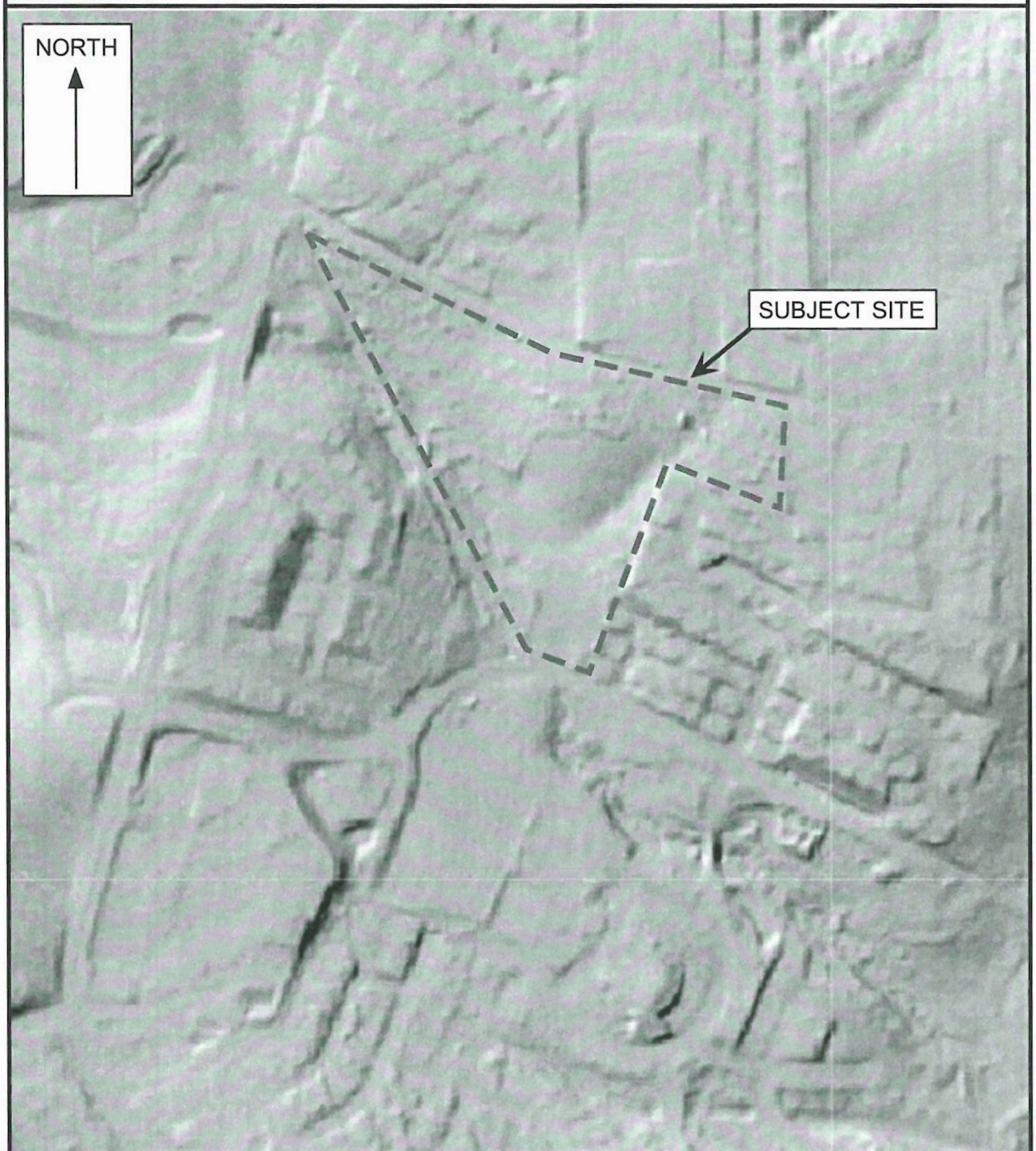
DOGAMI SLIDO MAP



Legend

0 400'

APPROXIMATE SCALE 1"=400'

Date: 7/19/2016
Drawn by: BLC

Map Source: *Oregon Department of Geology and Mineral Industries*
SLIDO: Statewide Landslide Information, Oregon, 2016

Project: Tanner Ridge Subdivision 1270 Rosemont Road, West Linn, Oregon	Project No. 16-4281	FIGURE 4

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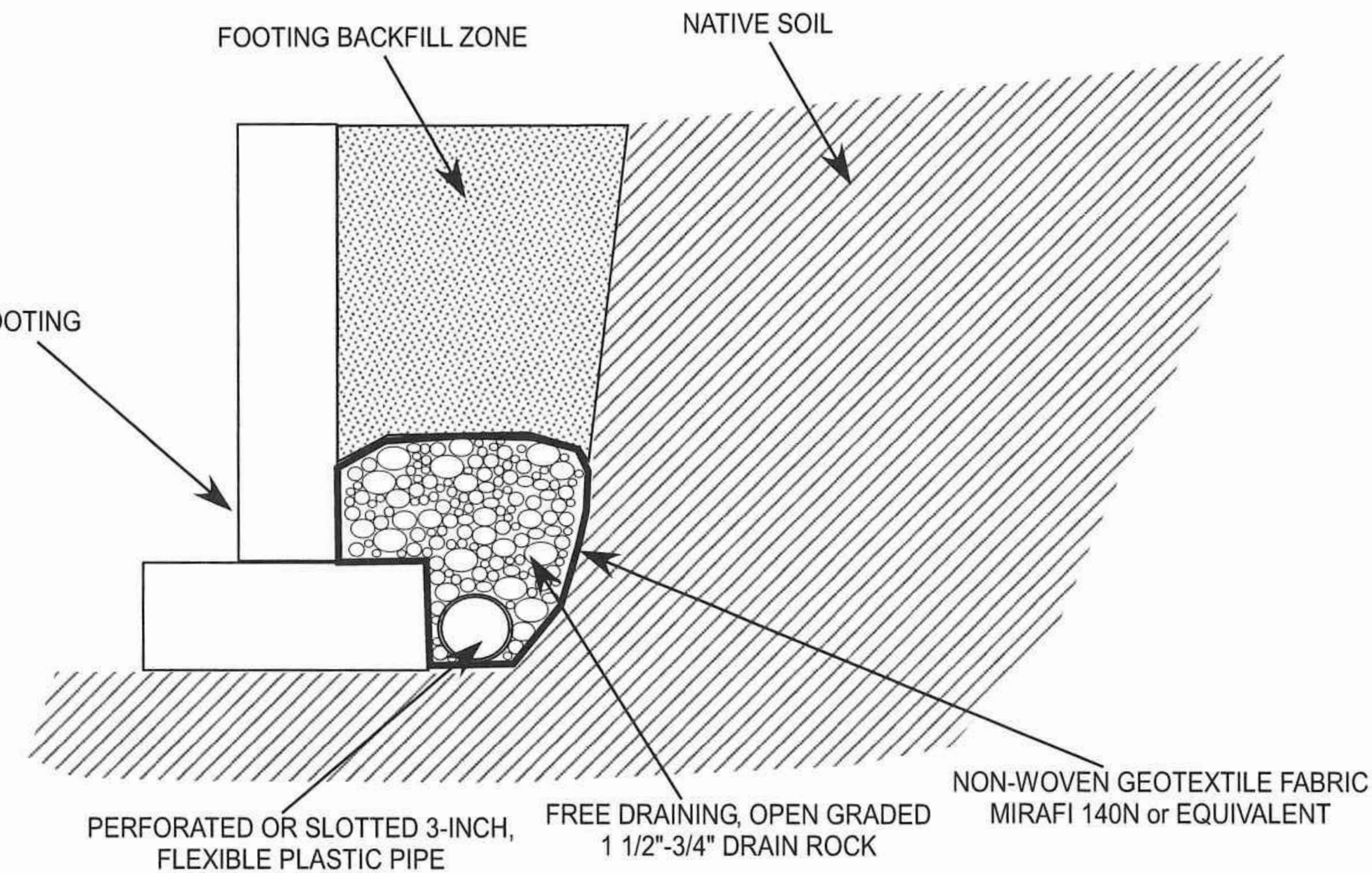
TYPICAL PERIMETER FOOTING DRAIN DETAIL



Notes:
1) Drain rock should contain no more than 5 percent fines passing the U.S. No. 200 Sieve.
2) Trench bottom and drain pipe should be sloped to drain to approved discharge location.

Date: 7/19/2016
Drawn by: BLC

Project: Tanner Ridge Subdivision 1270 Rosemont Road, West Linn, Oregon	Project No. 16-4281	FIGURE 5

GeoPacific Engineering, Inc.
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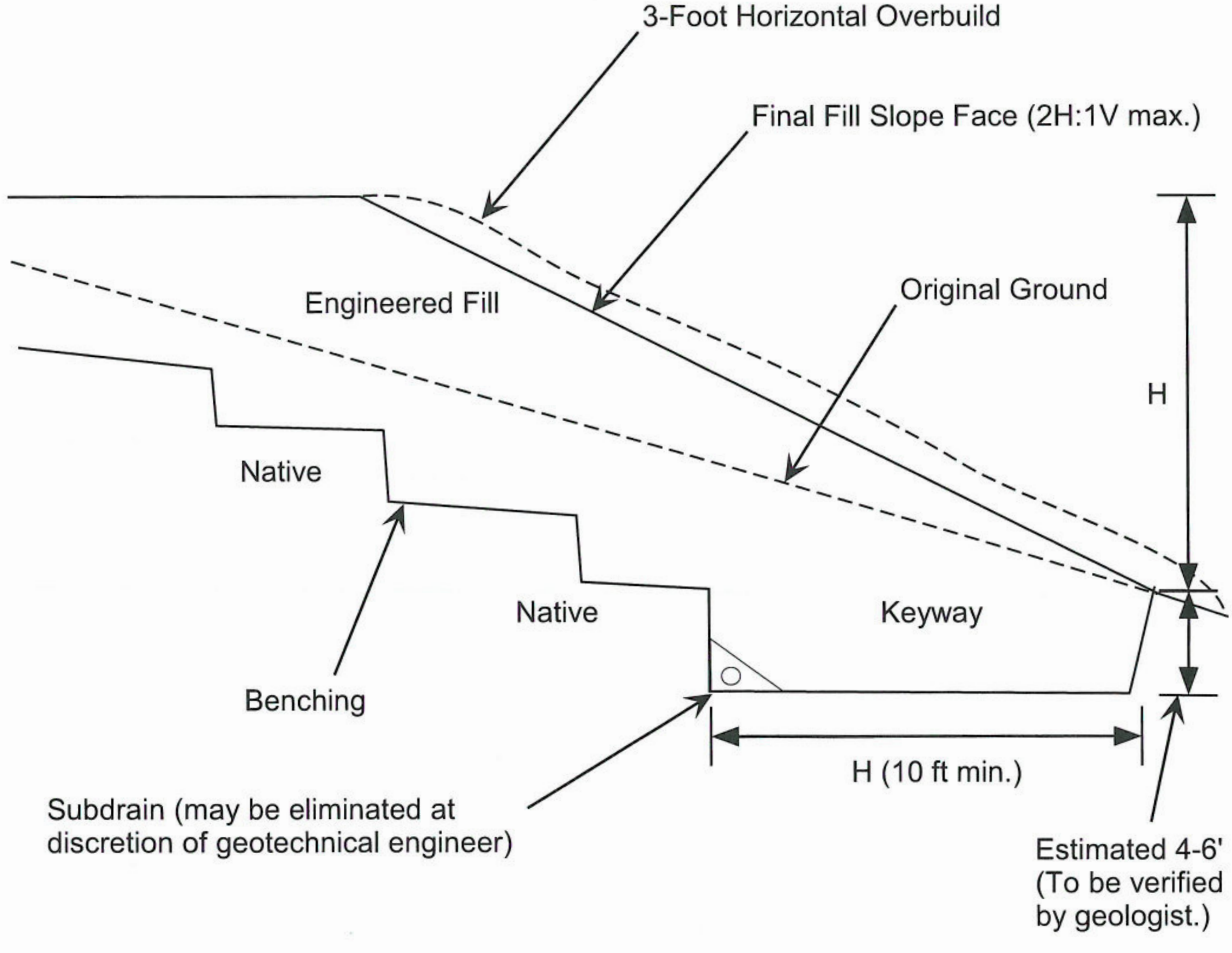
FILL SLOPE DETAIL

TYPICAL KEYWAY, BENCHING & FILL SLOPE DETAIL



Recommended subdrain is minimum 3-inch-diameter ADS Heavy Duty grade (or equivalent), perforated plastic pipe enveloped in a minimum of 3 cubic feet per lineal foot of 2" to 1/2" open-graded gravel drain rock wrapped with geotextile filter fabric (Mirafi 140N or equivalent).

Project: Tanner Ridge Subdivision 1270 Rosemont Road, West Linn, OR	Project No. 16-4281	FIGURE 6

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

EXPLORATION LOGS

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Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Tanner Ridge Subdivision West Linn, Oregon	Project No. 16-4281	Test Pit No. **TP-1**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	% Passing No. 200 Sieve	Moisture Content (%)	Water Bearing Zone	**Material Description**
						TOPSOIL. Heavy blackberry growth. Brown, organic, moist, Lean CLAY (OL-CL), with roots extending to 18 inches.
1	3.0					Residual Soil. Lean CLAY (CL), reddish brown, very stiff becoming hard, moist, low to moderate plasticity, gray mottling.
2	4.0	100 to 1,000 g				
3	>4.5					
4	>4.5	100 to 1,000 g				
5						Residual Soil. Clayey GRAVEL (GC), black angular basalt fragments in a reddish brown Lean CLAY matrix, medium dense to dense, moist, low plasticity. Basalt fragments are gravel to cobble sized.
6		100 to 1,000 g				Basalt. Dark gray to black, fractured, angular basalt, gravel to boulder sized, clayey matrix, dense, moist, very difficult excavation.
7						
8		100 to 1,000 g				Excavation refusal at 9 feet bgs.
9						Test pit terminated at 9 feet bgs due to refusal on bedrock. No groundwater seepage observed during excavation.
10						
11						
12						
13						
14						
15						
16						
17						

LEGEND

100 to 1,000 g	5 Gal. Bucket				
Bag Sample	Bucket Sample	Shelby Tube Sample	Seepage	Water Bearing Zone	Water Level at Abandonment

Date Excavated: 7/7/2016
Logged By: B. Cook
Surface Elevation: 680 feet

GeoPacific Engineering, Inc.
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TEST PIT LOG

Project: Tanner Ridge Subdivision, West Linn, Oregon	Project No. 16-4281	Test Pit No. **TP-2**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	% Passing No. 200 Sieve	Moisture Content (%)	Water Bearing Zone	Material Description
0–1.5						TOPSOIL. Heavy blackberry growth. Brown, organic, moist, Lean CLAY (OL-CL), with roots extending to 18 inches.
1.5–4.5						Residual Soil. Lean CLAY (CL), reddish brown, very stiff becoming hard, moist, low to moderate plasticity, gray mottling.
1	3.0					
2	3.0	Bag Sample (100 to 1,000 g)				
3	>4.5					
4	>4.5	Bag Sample (100 to 1,000 g)				
4.5–5.75						Residual Soil. Clayey GRAVEL (GC), black angular basalt fragments in a reddish brown Lean CLAY matrix, medium dense to dense, moist, low plasticity. Basalt fragments are gravel to cobble sized.
5.75–7		Bag Sample (100 to 1,000 g)				Basalt. Dark gray to black, fractured, angular basalt, gravel to boulder sized, clayey matrix, dense, moist, very difficult excavation. Excavation refusal at 7 feet bgs.
7						Test pit terminated at 7 feet bgs due to refusal on bedrock. No groundwater seepage observed during excavation.

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: 7/7/2016
Logged By: B. Cook
Surface Elevation: 680 feet

GeoPacific Engineering, Inc.

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Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Tanner Ridge Subdivision West Linn, Oregon	Project No. 16-4281	Test Pit No. **TP-3**

Depth (ft)	Pocket Penetrometer (tons/ft^2)	Sample Type	% Passing No. 200 Sieve	Moisture Content (%)	Water Bearing Zone	Material Description
0–1						TOPSOIL. Grass and blackberry growth. Brown, organic, moist, Lean CLAY (OL-CL),with roots extending to 12 inches.
1	3.0					Residual Soil. Lean CLAY (CL), reddish brown, very stiff becoming hard, moist, low to moderate plasticity, gray mottling.
2	3.0	100 to 1,000 g				
3	>4.5					
4	>4.5	100 to 1,000 g				Residual Soil. Clayey GRAVEL (GC), black angular basalt fragments in a reddish brown Lean CLAY matrix, medium dense to dense, moist, low plasticity. Basalt fragments are gravel to cobble sized.
5						
6		100 to 1,000 g				Basalt. Dark gray to black, fractured, angular basalt, gravel to boulder sized, clayey matrix, dense, moist, very difficult excavation.
7						
8						Excavation refusal at 9 feet bgs.
9						Test pit terminated at 9 feet bgs due to refusal on bedrock. No groundwater seepage observed during excavation.
10						
11						
12						
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14						
15						
16						
17						

LEGEND

100 to 1,000 g — Bag Sample
5 Gal. Bucket — Bucket Sample
Shelby Tube Sample
Seepage
Water Bearing Zone
Water Level at Abandonment

Date Excavated: 7/7/2016
Logged By: B. Cook
Surface Elevation: 684 feet

GeoPacific Engineering, Inc.
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TEST PIT LOG

Project: Tanner Ridge Subdivision West Linn, Oregon	Project No. 16-4281	Test Pit No. **TP-4**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	% Passing No. 200 Sieve	Moisture Content (%)	Water Bearing Zone	Material Description
0–1						TOPSOIL. Heavy blackberry growth. Brown, organic, moist, Lean CLAY (OL-CL) with roots extending to 18 inches.
1	3.0					Residual Soil. Lean CLAY (CL), reddish brown, very stiff becoming hard, moist, low to moderate plasticity, gray mottling.
2	4.0	100 to 1,000 g				
3	>4.5					Residual Soil. Clayey GRAVEL (GC), black angular basalt fragments in a reddish brown Lean CLAY matrix, medium dense to dense, moist, low plasticity. Basalt fragments are gravel to cobble sized.
4	>4.5	100 to 1,000 g				
5						Basalt. Dark gray to black, fractured, angular basalt, gravel to boulder sized, clayey matrix, dense, moist, very difficult excavation. Excavation refusal at 6 feet.
6						Test pit terminated at 6 feet bgs due to refusal on bedrock. No groundwater seepage observed during excavation.
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						

LEGEND

100 to 1,000 g — Bag Sample
5 Gal. Bucket — Bucket Sample
Shelby Tube Sample
Seepage
Water Bearing Zone
Water Level at Abandonment

Date Excavated: 7/7/2016
Logged By: B. Cook
Surface Elevation: 680 feet

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TEST PIT LOG

Project: Tanner Ridge Subdivision West Linn, Oregon	Project No. 16-4281	Test Pit No. **TP-5**

Depth (ft)	Pocket Penetrometer (tons/ft^2)	Sample Type	% Passing No. 200 Sieve	Moisture Content (%)	Water Bearing Zone	Material Description
0–1						TOPSOIL. Heavy blackberry growth. Brown, organic, moist, Lean CLAY (OL-CL) with roots extending to 18 inches.
1	3.0					Residual Soil. Lean CLAY (CL), reddish brown, very stiff becoming hard, moist, low to moderate plasticity, gray mottling.
2	4.0	100 to 1,000 g				
3	>4.5					
4	>4.5	100 to 1,000 g				Residual Soil. Clayey GRAVEL (GC), black angular basalt fragments in a reddish brown Lean CLAY matrix, medium dense to dense, moist, low plasticity. Basalt fragments are gravel to cobble sized.
5						
6		100 to 1,000 g				Basalt. Dark gray to black, fractured, angular basalt, gravel to boulder sized, clayey matrix, dense, moist, very difficult excavation. Excavation refusal at 7 feet bgs.
7						Test pit terminated at 7 feet bgs due to refusal on bedrock. No groundwater seepage observed during excavation.
8						
9						
10						
11						
12						
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: 7/7/2016
Logged By: B. Cook
Surface Elevation: 646 feet

GeoPacific Engineering, Inc.

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TEST PIT LOG

Project: Tanner Ridge Subdivision West Linn, Oregon	Project No. 16-4281	Test Pit No. **TP-6**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	% Passing No. 200 Sieve	Moisture Content (%)	Water Bearing Zone	Material Description
0–1.5						TOPSOIL. Heavy blackberry growth. Brown, organic, moist, Lean CLAY (OL-CL), with roots extending to 18 inches.
1	3.0					Residual Soil. Lean CLAY (CL), reddish brown, very stiff becoming hard, moist, low to moderate plasticity, gray mottling.
2	4.0	Bag Sample (100 to 1,000 g)				
3	>4.5					
4	>4.5	Bag Sample (100 to 1,000 g)				
5						
6		Bag Sample (100 to 1,000 g)				Residual Soil. Clayey GRAVEL (GC), black angular basalt fragments in a reddish brown Lean CLAY matrix, medium dense to dense, very moist, low plasticity. Basalt fragments are gravel to cobble sized.
7						
8		Bag Sample (100 to 1,000 g)				
9						Test pit terminated at 9 feet bgs. No groundwater seepage observed during excavation.
10						
11						
12						
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: 7/7/2016
Logged By: B. Cook
Surface Elevation: 638 feet

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TEST PIT LOG

Project: Tanner Ridge Subdivision West Linn, Oregon	Project No. 16-4281	Test Pit No. **TP-7**

Depth (ft)	Pocket Penetrometer (tons/ft^2)	Sample Type	% Passing No. 200 Sieve	Moisture Content (%)	Water Bearing Zone	Material Description
0						TOPSOIL. Heavy blackberry growth. Brown, organic, moist, Lean CLAY (OL-CL), with roots extending to 18 inches.
1	3.0					Residual Soil. Lean CLAY (CL), reddish brown, very stiff becoming hard, moist, low to moderate plasticity, gray mottling.
2	4.0					
3	>4.5					
4	>4.5					
5						Residual Soil. Clayey GRAVEL (GC), black angular basalt fragments in a reddish brown Lean CLAY matrix, medium dense to dense, very moist, low plasticity. Basalt fragments are gravel to cobble sized.
6						
7						
8						
9						
10						
11						Test pit terminated at 11 feet bgs. No groundwater seepage observed during excavation.
12						
13						
14						
15						
16						
17						

LEGEND

100 to 1,000 g — Bag Sample
5 Gal. Bucket — Bucket Sample
Shelby Tube Sample
Seepage
Water Bearing Zone
Water Level at Abandonment

Date Excavated: 7/7/2016
Logged By: B. Cook
Surface Elevation: 628 feet

GeoPacific Engineering, Inc.
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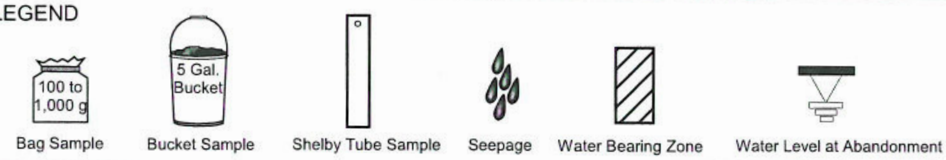
TEST PIT LOG

Project: Tanner Ridge Subdivision, West Linn, Oregon	Project No. 16-4281	Test Pit No. **TP-8**

Depth (ft)	Pocket Penetrometer (tons/ft^2)	Sample Type	% Passing No. 200 Sieve	Moisture Content (%)	Water Bearing Zone	Material Description
0–0.7						TOPSOIL. Grassy surfacing Brown, organic, moist, Lean CLAY (OL-CL), with roots extending to 8 inches.
1	2.0					Residual Soil. Lean CLAY (CL), reddish brown, medium stiff becoming very stiff, moist, low to moderate plasticity, gray mottling.
2	2.5					
3	3.5					
4	4.0					
5						Increased soil moisture at -4 feet.
6						
7						
8						Soils are wet at -8 feet.
9						
10						
11						Test pit terminated at 11 feet bgs. No groundwater seepage observed during excavation.
12						
13						
14						
15						
16						
17						

LEGEND



Date Excavated: 7/7/2016
Logged By: B. Cook
Surface Elevation: 614 feet

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TEST PIT LOG

Project: Tanner Ridge Subdivision West Linn, Oregon	Project No. 16-4281	Test Pit No. **TP-9**

Depth (ft)	Pocket Penetrometer (tons/ft^2)	Sample Type	% Passing No. 200 Sieve	Moisture Content (%)	Water Bearing Zone	Material Description
0–1						TOPSOIL. Grassy surfacing. Brown, organic, moist, Lean CLAY (OL-CL), with roots extending to 8 inches.
1	2.0					Residual Soil. Lean CLAY (CL), reddish brown, medium stiff becoming very stiff, moist, low to moderate plasticity, gray mottling.
2	3.0					
3	3.5					
4	4.0					
5						
6						Isolated basalt cobbles observed at 6 feet, deep red clayey matrix.
7						
8						
9						
10						
11						Test pit terminated at 11 feet bgs. No groundwater seepage observed during excavation.
12						
13						
14						
15						
16						
17						

LEGEND

100 to 1,000 g — Bag Sample; 5 Gal. Bucket — Bucket Sample; Shelby Tube Sample; Seepage; Water Bearing Zone; Water Level at Abandonment

Date Excavated: 7/7/2016
Logged By: B. Cook
Surface Elevation: 614 feet

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TEST PIT LOG

Project: Tanner Ridge Subdivision West Linn, Oregon	Project No. 16-4281	Test Pit No. **TP-10**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	% Passing No. 200 Sieve	Moisture Content (%)	Water Bearing Zone	Material Description
						TOPSOIL. Heavy blackberry growth. Brown, organic, moist, Lean CLAY (OL-CL) with roots extending to 18 inches.
1	3.0					Residual Soil. Lean CLAY (CL), reddish brown, very stiff becoming hard, moist, low to moderate plasticity, gray mottling.
2	4.0					
3	>4.5					
4	>4.5					Residual Soil. Clayey GRAVEL (GC), black angular basalt fragments in a reddish brown Lean CLAY matrix, medium dense to dense, moist, low plasticity. Basalt fragments are gravel to cobble sized.
5						
6						Basalt. Dark gray to black, fractured, angular basalt, gravel to boulder sized, clayey matrix, dense, moist, very difficult excavation. Excavation refusal at 7 feet bgs.
7						
8						
9						
10						Test pit terminated at 10 feet bgs due to refusal on bedrock. No groundwater seepage observed during excavation.
11						
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LEGEND

100 to 1,000 g — Bag Sample
5 Gal. Bucket — Bucket Sample
Shelby Tube Sample
Seepage
Water Bearing Zone
Water Level at Abandonment

Date Excavated: 7/7/2016
Logged By: B. Cook
Surface Elevation: 640 feet

SITE RESEARCH

Soil Map—Clackamas County Area, Oregon

Map Scale: 1:6,350 if printed on A landscape (11" x 8.5") sheet.

N

0 50 100 200 300 Meters

0 300 600 1200 1800 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

9/21/16 PC Meeting
198

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clackamas County Area, Oregon
Survey Area Data: Version 10, Sep 18, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Clackamas County Area, Oregon (OR610)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
7B	Borges silty clay loam, 0 to 8 percent slopes	0.2	0.1%
13C	Cascade silt loam, 8 to 15 percent slopes	7.4	3.8%
23B	Cornelius silt loam, 3 to 8 percent slopes	52.9	27.6%
23C	Cornelius silt loam, 8 to 15 percent slopes	56.8	29.6%
23D	Cornelius silt loam, 15 to 30 percent slopes	33.2	17.3%
30C	Delena silt loam, 3 to 12 percent slopes	20.9	10.9%
64B	Nekia silty clay loam, 2 to 8 percent slopes	0.0	0.0%
64C	Nekia silty clay loam, 8 to 15 percent slopes	0.6	0.3%
78B	Saum silt loam, 3 to 8 percent slopes	8.4	4.4%
78C	Saum silt loam, 8 to 15 percent slopes	11.5	6.0%
Totals for Area of Interest		**191.8**	**100.0%**

USGS Design Maps Summary Report

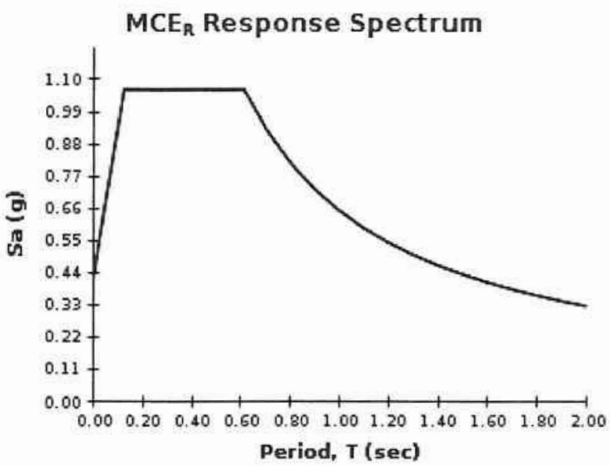
User–Specified Input

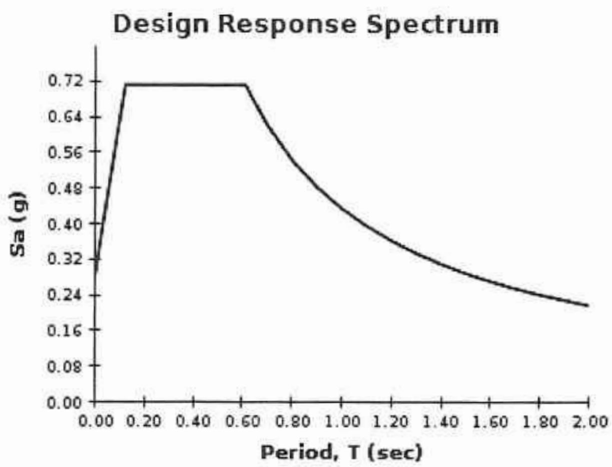
Report Title	16-4281, Tanner Ridge Subdivision Tue July 19, 2016 16:17:55 UTC
Building Code Reference Document	ASCE 7-10 Standard (which utilizes USGS hazard data available in 2008)
Site Coordinates	45.36657°N, 122.64214°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	I/II/III

USGS–Provided Output

S_S =	0.953 g	S_{MS} =	1.066 g	S_{DS} =	0.711 g
S_1 =	0.410 g	S_{M1} =	0.651 g	S_{D1} =	0.434 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





For PGA_M, T_L, C_{RS}, and C_{R1} values, please view the detailed report.

USGS Design Maps Detailed Report

ASCE 7-10 Standard (45.36657°N, 122.64214°W)

Site Class D – "Stiff Soil", Risk Category I/II/III

Section 11.4.1 — Mapped Acceleration Parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_S) and 1.3 (to obtain S_1). Maps in the 2010 ASCE-7 Standard are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 11.4.3.

From Figure 22-1 [1] $S_S = 0.953$ g

From Figure 22-2 [2] $S_1 = 0.410$ g

Section 11.4.2 — Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Chapter 20.

Table 20.3–1 Site Classification

Site Class	$\bar{v}_S$	$\bar{N}$ or $\bar{N}_{ch}$	$\bar{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
	Any profile with more than 10 ft of soil having the characteristics: • Plasticity index $PI > 20$, • Moisture content $w \geq 40\%$, and • Undrained shear strength $\bar{s}_u < 500$ psf		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 11.4.3 — Site Coefficients and Risk-Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters

Table 11.4–1: Site Coefficient F_a

Site Class	Mapped MCE $_R$ Spectral Response Acceleration Parameter at Short Period				
	$S_S \le 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \ge 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of S_S

For Site Class = D and S_S = 0.953 g, F_a = 1.119

Table 11.4–2: Site Coefficient F_v

Site Class	Mapped MCE $_R$ Spectral Response Acceleration Parameter at 1–s Period				
	$S_1 \le 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \ge 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of S_1

For Site Class = D and S_1 = 0.410 g, F_v = 1.590

Equation (11.4–1): $S_{MS} = F_aS_S = 1.119 \times 0.953 = 1.066$ g

Equation (11.4–2): $S_{M1} = F_vS_1 = 1.590 \times 0.410 = 0.651$ g

Section 11.4.4 — Design Spectral Acceleration Parameters

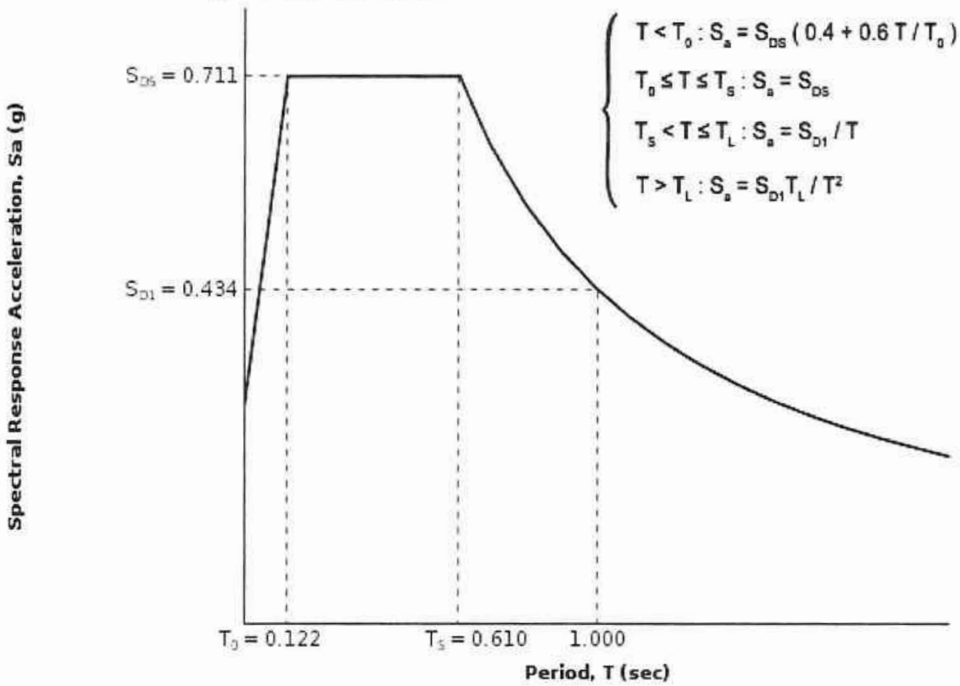
Equation (11.4–3): $S_{DS} = ⅔ S_{MS} = ⅔ \times 1.066 = 0.711$ g

Equation (11.4–4): $S_{D1} = ⅔ S_{M1} = ⅔ \times 0.651 = 0.434$ g

Section 11.4.5 — Design Response Spectrum

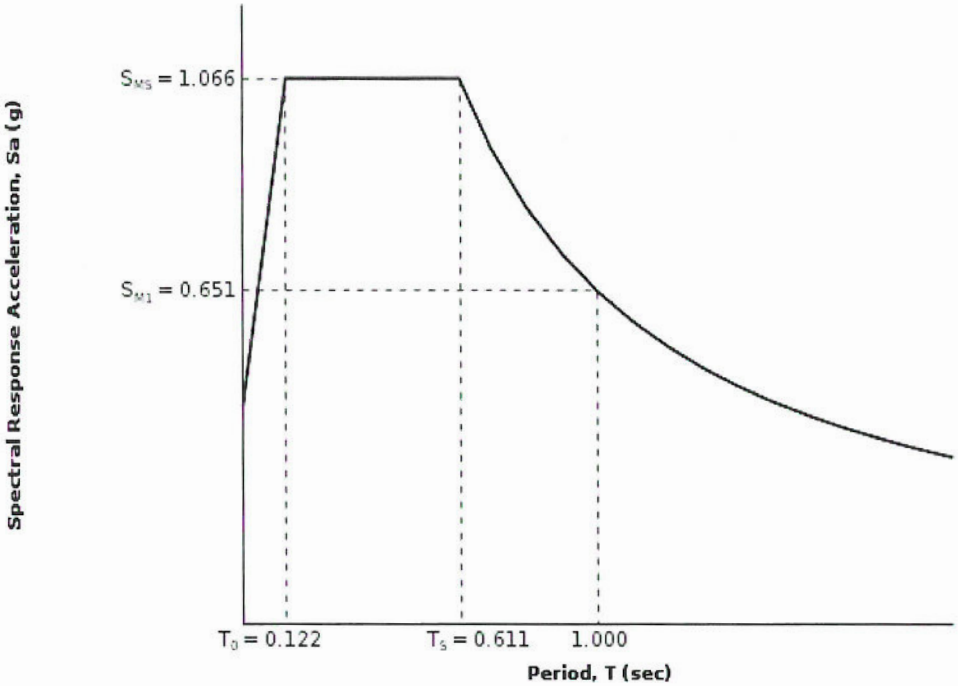
From Figure 22-12 [3] $T_L = 16$ seconds

Figure 11.4–1: Design Response Spectrum



Section 11.4.6 — Risk-Targeted Maximum Considered Earthquake (MCE_R) Response Spectrum

The MCE_R Response Spectrum is determined by multiplying the design response spectrum above by 1.5.



Section 11.8.3 — Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

From Figure 22-7 [4] PGA = 0.413

Equation (11.8–1): $PGA_M = F_{PGA}PGA = 1.087 \times 0.413 = 0.449$ g

Table 11.8–1: Site Coefficient F_{PGA}

Site Class	Mapped MCE Geometric Mean Peak Ground Acceleration, PGA				
	PGA ≤ 0.10	PGA = 0.20	PGA = 0.30	PGA = 0.40	PGA ≥ 0.50
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of PGA

For Site Class = D and PGA = 0.413 g, F_{PGA} = 1.087

Section 21.2.1.1 — Method 1 (from Chapter 21 – Site-Specific Ground Motion Procedures for Seismic Design)

From Figure 22-17 [5] C_{RS} = 0.905

From Figure 22-18 [6] C_{R1} = 0.873

Section 11.6 — Seismic Design Category

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \le S_{DS} < 0.33g$	B	B	C
$0.33g \le S_{DS} < 0.50g$	C	C	D
$0.50g \le S_{DS}$	D	D	D

For Risk Category = I and S_{DS} = 0.711 g, Seismic Design Category = D

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \le S_{D1} < 0.133g$	B	B	C
$0.133g \le S_{D1} < 0.20g$	C	C	D
$0.20g \le S_{D1}$	D	D	D

For Risk Category = I and S_{D1} = 0.434 g, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category ≡ "the more severe design category in accordance with Table 11.6-1 or 11.6-2" = D

Note: See Section 11.6 for alternative approaches to calculating Seismic Design Category.

References

1. *Figure 22-1*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-1.pdf
2. *Figure 22-2*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-2.pdf
3. *Figure 22-12*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-12.pdf
4. *Figure 22-7*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-7.pdf
5. *Figure 22-17*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-17.pdf
6. *Figure 22-18*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-18.pdf

PHOTOGRAPHIC LOG

14835 SW 72nd Avenue
Portland, Oregon 97224

Tel (503) 598-8445
Fax (503) 941-9281

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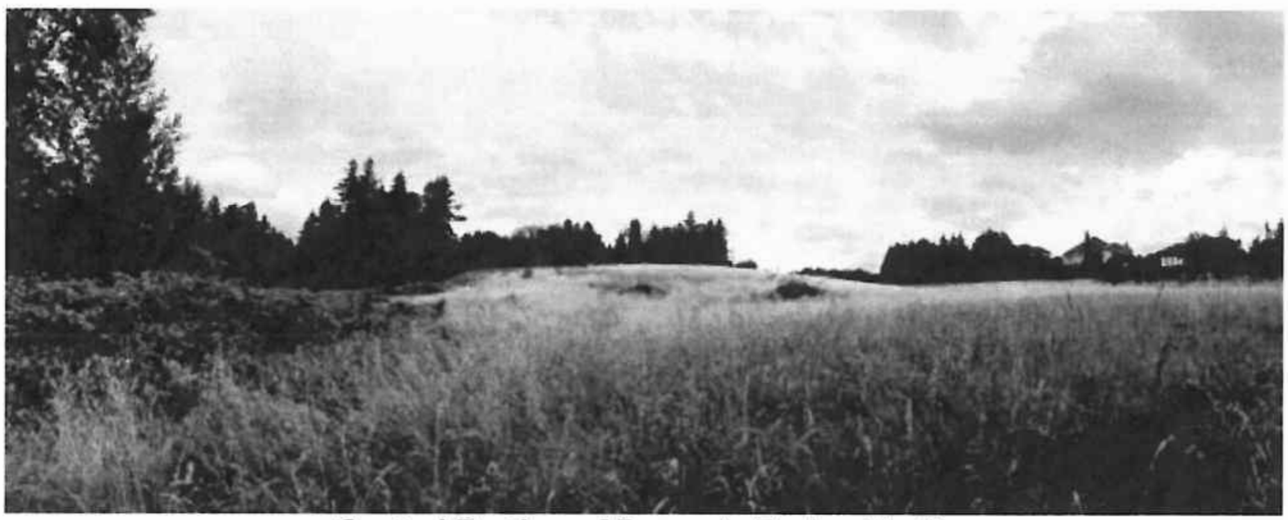
TANNER RIDGE SUBDIVISION
GEOTECHNICAL SITE INVESTIGATION
PHOTOGRAPHIC LOG

Central Portion of Property Facing South



Central Portion of Property Facing North

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GEOTECHNICAL SITE INVESTIGATION
PHOTOGRAPHIC LOG

Northern Portion of Site, Dense Vegetation

Northern Portion of Site, Dense Vegetation

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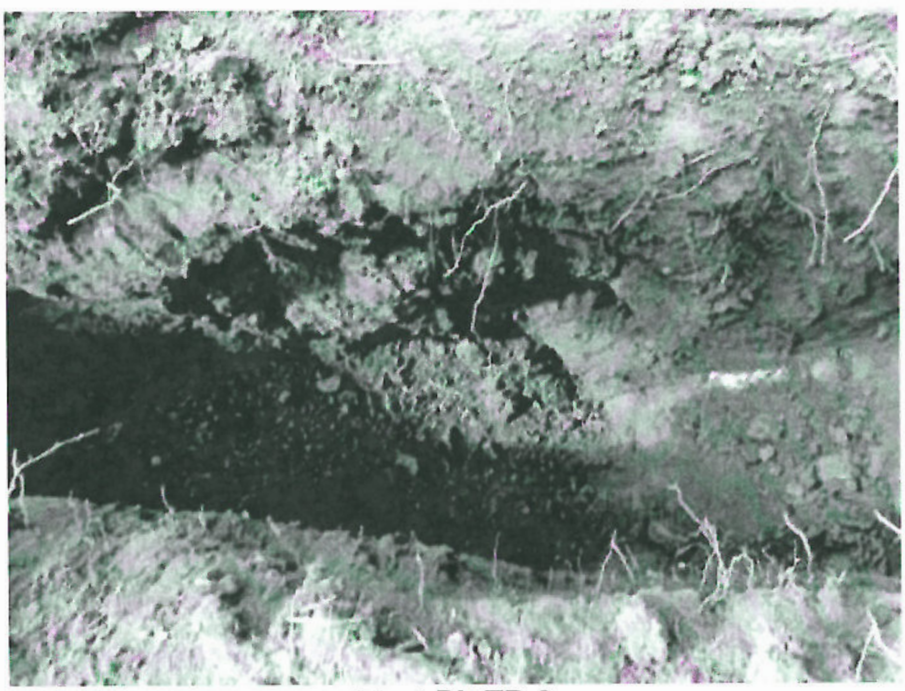
PHOTOGRAPHIC LOG

Test Pit TP-1

Test Pit TP-1

TANNER RIDGE SUBDIVISION
GEOTECHNICAL SITE INVESTIGATION
PHOTOGRAPHIC LOG

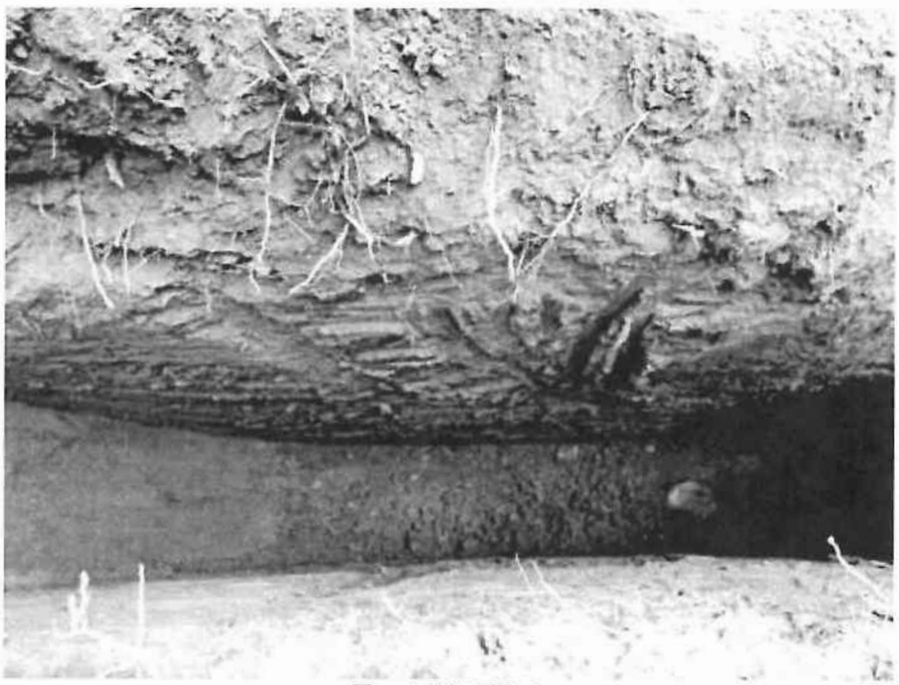
Test Pit TP-2



Test Pit TP-3

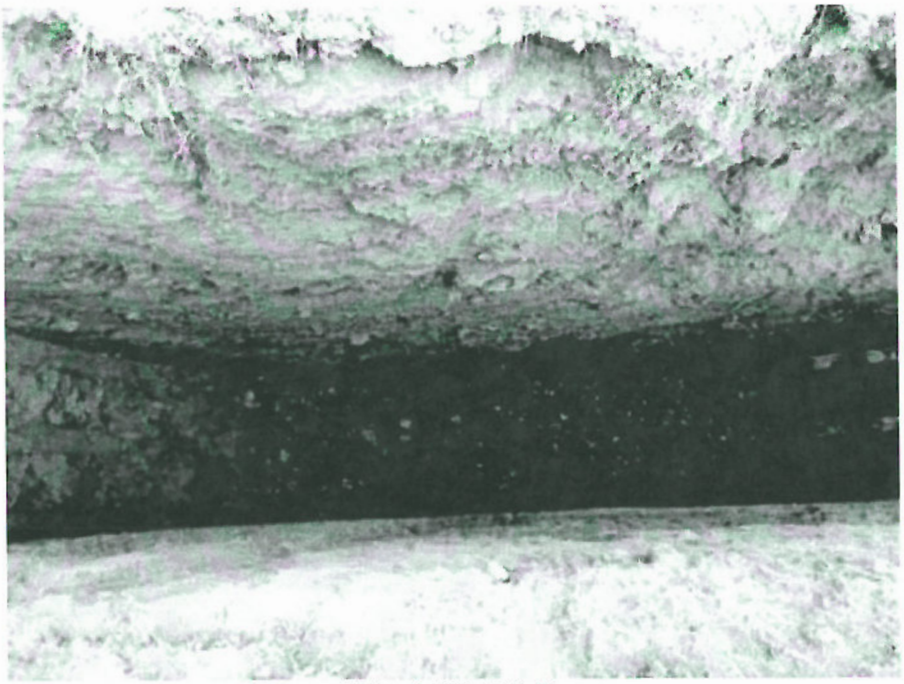
TANNER RIDGE SUBDIVISION
GEOTECHNICAL SITE INVESTIGATION
PHOTOGRAPHIC LOG

Test Pit TP-4

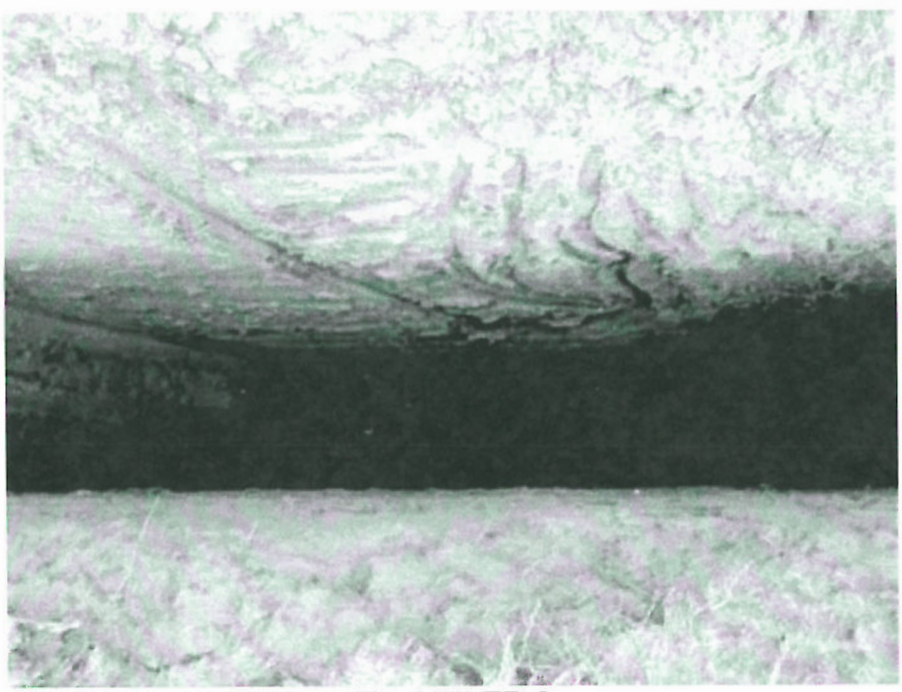


Test Pit TP-6

TANNER RIDGE SUBDIVISION
GEOTECHNICAL SITE INVESTIGATION
PHOTOGRAPHIC LOG



Test Pit TP-7



Test Pit TP-8

TANNER RIDGE SUBDIVISION
GEOTECHNICAL SITE INVESTIGATION
PHOTOGRAPHIC LOG

Test Pit TP-9

Test Pit TP-10

Preliminary storm drainage report for

Tanner Ridge

Site Conditions:

This vacant parcel is a triangular tract containing approximately 15.8 acres and comprised of two tax lots (2 1E 26D, 00300 & 2 1E 26A, 1100), 1270 Rosemont Road. It is bounded on north by Rosemont Road and the south by Parker Rd and Parker Road right-of-way. The property slopes from north to south with a maximum slope of approximately 15%. An existing wetland and pond are located on the southerly side of the property, adjacent to the pathway in the Parker Road right-of-way. The preliminary plans sites 50 single family residential lots with significant sized open spaces to the west and south.

With development two internal drainage basins will be created. To the north the proposed Heron Ct slopes to the west and Meadowlark Drive slopes to the south. The Heron Ct sub-basin will be collected in a new detention facility and discharged into the natural drainage corridor. The pond will be used for flow control and water quality.

The Meadowlark sub-basin will collect storm water in a detention pond facility that will include both water quantity and quality. This facility will discharge into the drainage course on the property that flows southerly across Parker Road.

The two existing drainage corridors that discharge onto the site from Rosemont Road will be routed through the site and be discharged into the natural drainage corridor.;

Hydrologic Soils Group:

The Oregon Soil Survey was used to determine the soil type and Hydrologic Soil Group.

Map unit Symbol	Map unit name	Rating
23B	Cornelius silt loam	C
23D	Cornelius silt loam	C
78C	Saum silt loam	C

Additionally, Delena silt loam is reported in the wetland, resource area. Group C soils have a moderate infiltration rate when thoroughly wet. The Oregon Soil Survey lists the infiltration rate at 6.5410to 8.3369 microns/second or approximately 1 inch/hr. Because this is a sloping site significant grading will be required to construct the road system and residential building pads. As a result significant fills will be required that will preclude effective and prudent use of rain gardens.

Summary:

Heron Ct.			
Event	Pre-development	Post-development	Release rate
2-year	0.97 cfs	1.71 cfs	0.97 cfs
5-year	1.36 cfs	2.18 cfs	1.12 cfs
10-year	1.60 cfs	2.46 cfs	1.59 cfs
25-year	2.09 cfs	3.03 cfs	2.09 cfs
100-year	N/A	3.52 cfsj	N/A

Meadowlark			
Event	Pre-developed	Post-development	Release rate
2-year	1.78 cfs	2.32 cfs	1.78 cfs
5-year	2.35 cfs	2.95 cfs	2.32 cfs
10-year	2.70 cfs	3.33 cfs	2.73 cfs
25-year	3.40 cfs	4.10 cfs	3.49 cfs
100-year	N/A	4.76 cfs	N/A

Storm facility on north side of project (Heron Ct.)

Time of Concentration

$T = 0.42(n\ L)^{.8} / (P_2)^{0.5} (S_0)^{0.4}$ & $T = L/60k(s_0)^{05}$

Heron Ct.

Pre-Development: $(.42)[(0.24(300)]^{0.8} / (2.6)^{0.5} (0.14)^{.4} = 17.5$ min & $160/(60)(17)(0.147)^{.5} =$ 0.5min = total 18.0 minutes

Post-Development $(.42)[(0.15(60)]^{0.8} / (2.6)^{0.5} (0.1125)^{.4} = 7.9$ min + $160/(60)(27)(0.125)^{.5} = 0.3$ min + $160/(60)(27)(0.064)^{.5} = 0.6$ = total 8.8 minutes

HYDROGRAPH RESULTS

KING COUNTY DEPARTMENT OF PUBLIC WORKS

Surface Water Management Division

HYDROGRAPH PROGRAMS

Version 4.21B

1 - INFO ON THIS PROGRAM

2 - SBUHYD

3 - MODIFIELD SBUHYD

4 - ROUTE

5 - ROUTE2

6 - ADDHYD

7 - BASEFLOW

8 - PLOTHYD

9 - DTATA

10 - REFAC

11 - RETURN TO DOS

ENTER OPTION:

2

SBUN/SCS METHOD FOR COMPUTING RUNOFF HYDROGRAPH

STORM OPTIONS:

1 - S.C.S. TYPE-1A

2 - 7-DAY DESIGN STORM

3 - STORM DATA FILE

SPECIFY STORM OPTION:

1

S.C.S. TYPE - 1A RAINFALL DISTRIBUTION

ENTER; FREQ(YEAR), DURATION(HOUR), PRECIP(INCHES)

2,24,2.6

Xxxxxxxxxxxxxxxxxxxxxxx S.C.S.TYPE-1A DISTRIBUTION xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

XXXXXXXXXXXX 2-YEAR 24-HOUR STORM xxxx 2.60 "TOTAL PRECIP Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx/

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

3.9,85,0.0,98,26.2

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
3.9	3.9	85	0.0	98	18.0

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
.97	7.83	17750

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:tan2

SPECIFY: C - CONTINUE, N - NEWSTORM, P - PRINT, S – STOP

C

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

2.3,86,1.6,98,8.8

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
3.9	2.3	86	1.6	98	8.8

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
1.71	7.83	24824

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:ta2

SPECIFY: C – CONTINUE, N – NEWSTORM, P – PRINT, S – STOP

N

STORM OPTIONS:

1 - S.C.S. TYPE-1A

2 - 7-DAY DESIGN STORM

3 - STORM DATA FILE

SPECIFY STORM OPTION:

1

S.C.S. TYPE - 1A RAINFALL DISTRIBUTION

ENTER; FREQ(YEAR), DURATION(HOUR), PRECIP(INCHES)

5,24,3.1

Xxxxxxxxxxxxxxxxxxxxxxx S.C.S.TYPE-1A DISTRIBUTION xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

XXXXXXXXXXX 5-YEAR 24-HOUR STORM xxxx 3.1O" TOTAL PRECIP Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

---

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

3.9,85,0.0,98,18.0

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
3.9	3.9	85	0.0	98	18.0

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
1.36	7.83	23593

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:tan5

SPECIFY: C-CONTINUE, N-NEWSTORM,P-PRINT,S-STOP

C

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

2.3,86,1.6,98,8.8

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	

3.9	2.3	86	1.6	98	8.8

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
2.18	7.83	31243

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:ta5

SPECIFY: C – CONTINUE, N – NEWSTORM, P – PRINT, S – STOP

N

STORM OPTIONS:

1 – S.C.S. TYPE-1A

2 - 7-DAY DESIGN STORM

3 - STORM DATA FILE

SPECIFY STORM OPTION:

1

S.C.S. TYPE - 1A RAINFALL DISTRIBUTION

ENTER; FREQ(YEAR), DURATION(HOUR), PRECIP(INCHES)

10,24,3.4

Xxxxxxxxxxxxxxxxxxxxxxx S.C.S.TYPE-1A DISTRIBUTION xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

XXXXXXXXXXXX 10-YEAR 24-HOUR STORM xxxx 3.40" TOTAL PRECIP Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

3.9,85,0.0,98,18.0

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
3.9	3.9	85	0.0	98	18.0

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
1.60	7.83	27221

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:tan10

SPECIFY: C-CONTINUE, N-NEWSTORM,P-PRINT,S-STOP

C

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

2.3,86,1.6,98,8.8

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
3.9	2.3	86	1.6	98	8.8

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
2.46	7.83	35162

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:ta10

SPECIFY: C – CONTINUE, N – NEWSTORM, P – PRINT, S – STOP

N

STORM OPTIONS:

1 - S.C.S. TYPE-1A

2 - 7-DAY DESIGN STORM

3 - STORM DATA FILE

SPECIFY STORM OPTION:

1

S.C.S. TYPE - 1A RAINFALL DISTRIBUTION

ENTER; FREQ(YEAR), DURATION(HOUR), PRECIP(INCHES)

25,24,4

Xxxxxxxxxxxxxxxxxxxxxxx S.C.S.TYPE-1A DISTRIBUTION xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

XXXXXXXXXXXX 25-YEAR 24-HOUR STORM xxxx 4.00" TOTAL PRECIP Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

---

3 - STORM DATA FILE

SPECIFY STORM OPTION:

1

S.C.S. TYPE - 1A RAINFALL DISTRIBUTION

ENTER; FREQ(YEAR), DURATION(HOUR), PRECIP(INCHES)

100,24,4.5

Xxxxxxxxxxxxxxxxxxxxxxx S.C.S.TYPE-1A DISTRIBUTION xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

XXXXXXXXXXXX 100-YEAR 24-HOUR STORM xxxx 4.50" TOTAL PRECIP Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

---

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

2.3,86,1.6,98,8.8

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
3.9	2.3	86	1.6	98	8.8

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
3.52	7.83	49023

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:tan100

SPECIFY: C – CONTINUE, N – NEWSTORM, P – PRINT, S – STOP

S

1 - INFO ON THIS PROGRAM

2 - SBUHYD

3 - MODIFIELD SBUHYD

4 - ROUTE

5 - ROUTE2

6 - ADDHYD

7 - BASEFLOW

8 - PLOTHYD

9 - DTATA

10 - REFAC

11 - RETURN TO DOS

ENTER OPTION:

DETENTION SIZING

ENTER OPTION

10

R/D FACILITY DESIGN ROUTINE

SPEFICY TYPE OF R/D FACILTY

1 - POND	4 - INFILTRATION POND
2 - TANK	5 - INFILTRATION TANK
3 -VAULT	6 - GRAVEL TRENCH/BED

1

ENTER: POND SIDE SLOPE (HORIZ. COMPOENT)

4

ENTER: EFFECTIVE STORAGE DEPTH(ft) BEFORE OVERFLOW

3

ENTER [d:][path]filename[.ext] OF PRIMARY DESIGN INFLOW HYDROGRAPH:

C:TA25

PRELIMINARY DESIGN INFLOW PEAK = 3.03 CFS

ENTER PRIMARY DESIGN RELEASE RATE(cfs)

2.09

ENTER NUMBER OF INFLOW HYDROGRAPHS TO BE TESTED FOR PERFORMANCE (5 MAXIMUM)

3

ENTER [d:][path]filename[ext] OF HYDROGRAPH 1:

C:TA10

ENTER TARGET RELEASE RATE(cfs)

1.60

ENTER [d:][path]filename[ext] OF HYDROGRAPH 2:

C:TA5

ENTER TARGET RELEASE RATE(cfs)

1.36

ENTER [d:][path]filename[ext] OF HYDROGRAPH 3:

C:TA2

ENTER TARGET RELEASE RATE(cfs)

0.97

ENTER: NUMBER OF ORIFICES, RISER-HEAD(ft), RISER-DIAMETER(in)

2,3,12

RISER OVERFLOW DEPTH FOR PRIMARY PEAK INFLOW= .64FT

SPECIFY ITERATION DISPLAY: Y -YES, N - NO

N

SPECIFY: R - REVIEW/REVISE INPUT, C - CONTINUE

C

INITIAL STORAGE VALUE FOR ITERATION PURPOSES: 14202 CU-FT

BOTTOM ORIFICE: ENTER Q-MAX(cfs)

1.20

DIA.= 5.05 INCHES

TOP ORIFICE: ENTER HEIGHT (ft)

2.51

DIA.= 6.85 INCHES

PERFORMANCE: INFLOW TARGET-OUTFLOW ACTUAL-OUTFLOW PK-STAGE STORAGE

DESIGN HYD:	3.03	2.09	2.09	3.00	3393
TEST HYD 1:	2.46	1.60	1.59	2.67	2760
TEST HYD 2:	2.18	1.36	1.12	2.52	2490
TEST HYD 3:	1.71	.97	.97	1.95	1640

SPECIFY: D - DOCUMENT, R -REVISE, A - ADJUST ORIF, E -ENLARGE, S -STOP

PRELIMINARY DESIGN NORTH (Heron Ct)

A proposed detention facility will be constructed in an area without trees within the wetland buffer. Other sites would involve removal of significant trees. The preliminary plan illustrates a facility with sufficient volume as indicated in the calculations. Water quality will be provided in the bottom on the pond. The 100-year event for the North side will be accommodated with 12-inch piping and minimum slopes of 1.0%.

STORM DRAINAGE FACILITY OF THE SOUTHERLY SIDE – Meadowlark Drive

Time of Concentration

$T = 0.42(n\ L)^{.8} / (P2\ )^{.5}\ (S0\ )^{.4}$ & $T = L/60k(s0\ )^{.5}$

Tanner site B

Pre-Development: $(.42)[(0.24(300)]^{.8} / (2.6)^{.5}\ (0.153)^{.4} = 16.9$ min & $280/(60)(17)(0.10)^{.5} =$ 0.9min = total 17.8 minutes

Post-Development $(.42)[(0.15(200)]^{.8} / (2.6)^{.5}\ (0.16)^{.4} = 8.3$ min + $60/(60)(27)(0.125)^{.5} = 0.1$ min + $230/(60)(42)(.12)^{.5} = 0.3$ = Total 8.7 minutes

ENTER OPTION:

2

SBUN/SCS METHOD FOR COMPUTING RUNOFF HYDROGRAPH

STORM OPTIONS:

1 - S.C.S. TYPE-1A

2 - 7-DAY DESIGN STORM

3 - STORM DATA FILE

SPECIFY STORM OPTION:

1

S.C.S. TYPE - 1A RAINFALL DISTRIBUTION

ENTER; FREQ(YEAR), DURATION(HOUR), PRECIP(INCHES)

2,24,2.6

Xxxxxxxxxxxxxxxxxxxxxxx S.C.S.TYPE-1A DISTRIBUTION
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

XXXXXXXXXXXX 2-YEAR 24-HOUR STORM xxxx 2.60 "TOTAL PRECIP
Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx/

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

5.25,89,0.0,98,16.9

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
5.3	5.3	89	.0	98	16.9

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
1.78	7.83	29309

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:PAR2

SPECIFY: C - CONTINUE, N - NEWSTORM, P -PRINT, S - STOP

C

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

3.04,86,2.21,98,8.7

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS	IMPERVIOUS	TC(MINUTES)

	A	CN	A	CN	
5.3	3.0	86	2.2	98	8.7

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
2.32	7.83	33631

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:2PAR

SPECIFY: C - CONTINUE, N - NEWSTORM, P - PRINT, S – STOP

N

STORM OPTIONS:

1 - S.C.S. TYPE-1A

2 - 7-DAY DESIGN STORM

3 - STORM DATA FILE

SPECIFY STORM OPTION:

1

S.C.S. TYPE - 1A RAINFALL DISTRIBUTION

ENTER; FREQ(YEAR), DURATION(HOUR), PRECIP(INCHES)

5,24,3.1

Xxxxxxxxxxxxxxxxxxxxxxxx S.C.S.TYPE-1A DISTRIBUTION
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

XXXXXXXXXXXX 5-YEAR 24-HOUR STORM xxxx 3.1O" TOTAL PRECIP
Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

5.25,89,0.0,98,16.9

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
5.3	5.3	89	0.0	98	16.9

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
2.35	7.83	37826

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:par5

SPECIFY: C-CONTINUE, N-NEWSTORM,P-PRINT,S-STOP

C

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

3.04,86,2.21,98,8.7

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
5.3	5.3	89	0.0	98	16.9

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
2.95	7.83	42287

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:5PAR

STORM OPTIONS:

1 – S.C.S. TYPE-1A

2 - 7-DAY DESIGN STORM

3 - STORM DATA FILE

SPECIFY STORM OPTION:

1

S.C.S. TYPE - 1A RAINFALL DISTRIBUTION

ENTER; FREQ(YEAR), DURATION(HOUR), PRECIP(INCHES)

10,24,3.4

Xxxxxxxxxxxxxxxxxxxxxxx S.C.S.TYPE-1A DISTRIBUTION
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

XXXXXXXXXXXX 10-YEAR 24-HOUR STORM xxxx 3.40" TOTAL PRECIP
Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

5.25,89,0.0,98,16.9

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
5.3	5.3	89	.0	98	16.9

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
2.70	7.83	43044

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:par10

SPECIFY: C-CONTINUE, N-NEWSTORM,P-PRINT,S-STOP

C

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

3.04,86,2.21,98,8.7

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
5.3	3.0	86	2.2	98	8.7

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
3.33	7.83	47571

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:10PAR

SPECIFY: C-CONTINUE, N-NEWSTORM,P-PRINT,S-STOP

N

STORM OPTIONS:

1 - S.C.S.. TYPE-1A

2 - 7-DAY DESIGN STORM

3 - STORM DATA FILE

SPECIFY STORM OPTION:

1

S.C.S. TYPE - 1A RAINFALL DISTRIBUTION

ENTER; FREQ(YEAR), DURATION(HOUR), PRECIP(INCHES)

25,24,4

Xxxxxxxxxxxxxxxxxxxxxxxx S.C.S.TYPE-1A DISTRIBUTION xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

XXXXXXXXXXXX 25-YEAR 24-HOUR STORM xxxx 4.00" TOTAL PRECIP Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

5.25,89,0.0,98,16.9

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
5.3	5.3	89	.0	98	16.9

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
3.40	7.83	53657

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:par25

SPECIFY: C-CONTINUE, N-NEWSTORM,P-PRINT, S-STOP

C

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

3.04,86,2.21,98,8.7

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
5.3	3.0	86	2.2	98	8.7

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
4.10	7.83	58285

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:25PAR

SPECIFY: C - CONTINUE, N - NEWSTORM, P -PRINT, S - STOP

N

STORM OPTIONS:

1 - S.C.S. TYPE-1A

2 - 7-DAY DESIGN STORM

3 - STORM DATA FILE

SPECIFY STORM OPTION:

1

S.C.S. TYPE - 1A RAINFALL DISTRIBUTION

ENTER; FREQ(YEAR), DURATION(HOUR), PRECIP(INCHES)

100,24,4.5

Xxxxxxxxxxxxxxxxxxxxxxx S.C.S.TYPE-1A DISTRIBUTION xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

XXXXXXXXXXXX 100-YEAR 24-HOUR STORM xxxx 4.50" TOTAL PRECIP Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

3.04,86,2.21,98,8.7

DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
5.3	3.0	86	2.2	98	8.7

PEAK-Q(CFS)	T-PEAK(HRS)	VOL(CU-FT)
4.76	7.83	67327

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:

C:PAR100

SPECIFY: C – CONTINUE, N – NEWSTORM, P – PRINT, S – STOP

s

DETENTION SIZING

ENTER OPTION

10

R/D FACILITY DESIGN ROUTINE

SPEFICY TYPE OF R/D FACILTY

1 - POND 4 - INFILTRATION POND

2 - TANK 5 - INFILTRATION TANK

3 -VAULT 6 - GRAVEL TRENCH/BED

1

ENTER: POND SIDE SLOPE (HORIZ. COMPOENT)

3

ENTER: EFFECTIVE STORAGE DEPTH(ft) BEFORE OVERFLOW

3.5

ENTER [d:][path]filename[.ext] OF PRIMARY DESIGN INFLOW HYDROGRAPH:

C:25PAR

PRELIMINARY DESIGN INFLOW PEAK = 4.10

ENTER PRIMARY DESIGN RELEASE RATE(cfs)

3.40

ENTER NUMBER OF INFLOW HYDROGRAPHS TO BE TESTED FOR PERFORMANCE (5 MAXIMUM)

3

ENTER [d:][path]filename[ext] OF HYDROGRAPH 1:

C:10PAR

ENTER TARGET RELEASE RATE(cfs)

2.70

ENTER [d:][path]filename[ext] OF HYDROGRAPH 2:

C:5PAR

ENTER TARGET RELEASE RATE(cfs)

2.35

ENTER [d:][path]filename[ext] OF HYDROGRAPH 3:

C:2PAR

ENTER TARGET RELEASE RATE(cfs)

1.78

ENTER: NUMBER OF ORIFICES, RISER-HEAD(ft), RISER-DIAMETER(in)

2,3.5,18

RISER OVERFLOW DEPTH FOR PRIMARY PEAK INFLOW= 0.43FT

SPECIFY ITERATION DISPLAY: Y -YES, N - NO

N

SPECIFY: R - REVIEW/REVISE INPUT, C - CONTINUE

C

INITIAL STORAGE VALUE FOR ITERATION PURPOSES: 18057 hCU-FT

BOTTOM ORIFICE: ENTER Q-MAX(cfs)

2.25

DIA.= 6.66 INCHES

TOP ORIFICE: ENTER HEIGHT (ft)

2.79

DIA.= 7.13 INCHES

PERFORMANCE:	INFLOW	TARGET-OUTFLOW	ACTUAL-OUTFLOW	PK-STAGE	STORAGE
DESIGN HYD:	4.10	3.40	3.40	3.50	2397
TEST HYD 1:	3.33	2.70	2.73	3.05	1860
TEST HYD 2:	2.95	2.35	2.32	2.87	1660
TEST HYD 3:	2.32	1.70	1.78	2.20	1050

SPECIFY: D - DOCUMENT, R -REVISE, A - ADJUST ORIF, E -ENLARGE, S –STOP

PRELIMINARY DESIGN SOUTH (Meadowlark)

The proposed detention facility can easily be sited in adjacent to the road and near the proposed open space that will provide water quantity and quality. This pond is located at the south edge of the project as illustrated on the preliminary plans. Water quality swale can be routed inside the detention pond. This facility would have a control manhole with discharge to the existing drainage way at Parker Road. Storm piping following the road gradient will easily allow the 100-year event to past.

DOWNSTREAM CAPACITY:

The existing 36-inch culvert in Parker road has a capacity of approximately 68 CFS and the estimated 100-year flow for the entire drainage basin is approximately 49CFS.

Conclusion:

This preliminary analysis of the storm water collection and discharge for the Tanner Ridge development demonstrates feasibility and to meet the minimum standards of the City of West Linn. Calculations and preliminary drawings show that the storm water can be collected and discharged per standard engineering practice and City standards for the 2, 5, 10, & 25 year storm events with detention facilities that control the flow to the pre-design rates. . A final report will be prepared with the design phase that will provide necessary detail and final sizing.

Prepared By:

Bruce D. Goldson, PE

Theta

June 21, 2016

REGISTERED PROFESSIONAL ENGINEER
OREGON
BRUCE D GOLDSON
EXPIRES: 06/30/2017
SIGNATURE DATE 6/21/16

Table 4-1 MANNING'S COEFFICIENTS/"K" FACTORS		
"n" AND "k" Value Used in Time Calculations for Hydrographs "n" Sheet Flow Equation Manning's Values (for initial 300 ft. of travel)		n
Smooth surfaces (concrete, asphalt, gravel, or bare hand packed soil)		0.01
Fallow fields or loose soil surface (no residue)		0.05
Cultivated soil with residue cover (s # 0.20 ft/ft)		0.06
Cultivated soil with residue cover (s > 0.20 ft/ft)		0.17
Short prairie grass and lawns		0.15
Dense grasses		0.24
Bermuda grass		0.41
Range (natural)		0.13
Woods or forest with light underbrush		0.40
Woods or forest with dense underbrush		0.80
* Manning values for sheet flow only, from Overton and Meadows 1976 (See SCS TR-55, 1986) "k" Values Used in Travel Time/Time of Concentration Calculations Shallow Concentrated Flow (After the initial 300 ft. of sheet flow, R = 0.1)		k
1.	Forest with heavy ground litter and meadows (n = 0.10)	3
2.	Brushy ground with some trees (n = 0.060)	5
3.	Fallow or minimum tillage cultivation (n=0.040)	8
4.	High grass (n=0.035)	9
5.	Short grass, pasture, and lawns (n=0.030)	11
6.	Nearly bare ground (n=0.025)	13
7.	Paved and gravel areas (n=0.012)	27
Channel flow (intermittent) (At beginning of visible channels R=0.2)		k
1.	Forested swale with heavy ground litter (n=0.10)	5
2.	Forested drainage course/ravine with defined channel bed (n=0.050)	10
3.	Rock-lined waterway (n=0.035)	15
4.	Grassed waterway (n=0.030)	17
5.	Earth-lined waterway (n=0.025)	20
6.	CMP pipe (n=0.024)	21
7.	Concrete pipe (0.012)	42
8.	Other waterways and pipe 0.508/n	
Channel flow (Continuous stream, R=0.4)		k
9.	Meandering stream with some pools (n=0.040)	20
10.	Rock-lined stream (n=0.035)	23
11.	Grass-lined stream (n=0.030)	27
12.	Other streams, man-made channels and pipe 0.807/n **	
** See Table 6-3 for additional Mannings "n" values for open channels.		

18

Table 4-3 MODIFIED CURVE NUMBERS

SCS Western Washington Runoff Curve Numbers

Runoff curve numbers for selected agricultural, suburban, and urban land use for Type 1A rainfall distribution, 24-hour storm duration. (Published by SCS in 1982)

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 grassland.	74	82	89	92
Meadow or pasture:		65	78	85	89
Wood or forest land:	Undisturbed	42	64	76	81
	Established second growth[2]	48	68	78	83
	Young second growth or brush	55	72	81	86
Orchard:	With over crop	81	88	92	94
Open spaces, lawns, parks, golf courses, cemeteries, landscaping					
Good Condition:	Grass cover on >=75% of area	68	80	86	90
Fair Condition:	Grass cover on 50-75% of 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[3]:		Select a separate curve number for pervious and impervious portions of the site or basin.			
Dwelling unit/gross acre	% Impervious[4]				
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 businesses & industrial areas[3]	% impervious[4] Must be computed	Select a separate curve number for pervious and impervious portions of the site or basin.			

1 For a more detailed description of agricultural land use curve numbers, refer to National Engineering Handbook, Sec. 4, Hydrology, Chapter 9, August 1972.

2 Modified by KCFW, 1995.

3 Assumes roof and driveway runoff is directed into street/storm system.

4 The remaining pervious areas (lawn) are considered to be in good condition for these curve numbers.

4.1.2.1 RAINFALL DISTRIBUTION

The rainfall distribution to be used within the City is the design storm of 24-hour duration based on the standard SCS Type 1A rainfall distribution (See Figure 4-2).

Table 4-1 below links the total depth per year of reoccurrence.

Table 4-1: TOTAL DEPTH

Reoccurrence Year	Total Depth
2	2.6
5	3.1
10	3.4
25	4.0
50	4.4
100	4.5

TANNER RIDGE AT ROSEMONT
TRAFFIC IMPACT STUDY

WEST LINN, OREGON

DATE:
March 9, 2016

PREPARED FOR:
Mark Handris
Icon Construction & Development LLC

PREPARED BY:
Daniel Stumpf, EI
William Farley, PE
Michael Ard, PE

REGISTERED PROFESSIONAL ENGINEER
83582PE
OREGON
DEC. 17, 2014
WILLIAM R. FARLEY
RENEWS: 12/31/2017

LANCASTER
ENGINEERING

321 SW 4th Ave., Suite 400 | Portland, OR 97204 | 503.248.0313 | lancasterengineering.com

1e

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EXECUTIVE SUMMARY

1. A subdivision has been proposed for development on approximately 15.82 acres located at 1270 Rosemont Road in West Linn, Oregon. The proposed subdivision will consist of 52 lots, each to contain a single-family detached dwelling. Internal streets will serve each lot that are accessed from Rosemont Road, Parker Road, and Roxbury Drive.

2. The trip generation calculations show that the proposed 52-lot subdivision is projected to generate up to 39 site trips during the morning peak hour, 52 site trips during the evening peak hour, and up to a total of 496 daily trips.

3. Based on the results of the operational analysis, all study intersections are currently operating acceptably per City of West Linn standards and are projected to continue operating acceptably through year 2018 either with or without the addition of site trips resulting from the proposed development. No operational mitigation is necessary or recommended.

4. A detailed examination of the most recent five years of crash reports at the study intersections shows no significant safety concerns and no trends that are indicative of design deficiencies. No safety mitigations are recommended.

5. Based on the detailed analysis, adequate sight distance is available for the proposed site accesses along Rosemont Road and Parker Road. No sight distance mitigation is necessary or recommended.

6. Left-turn lane warrants are not projected to be met for any of the study intersections where such treatments would be applicable under any of the year 2018 analysis scenarios. No new turn lanes are recommended.

7. Due to insufficient main and side-street traffic volumes, traffic signal warrants will not be met for any of the unsignalized study intersections under any analysis scenarios through year 2018.

1e

PROJECT DESCRIPTION & LOCATION

INTRODUCTION

A 52-lot subdivision has been proposed for development on approximately 15.82 acres located at 1270 Rosemont Road in West Linn, Oregon. Each lot will contain a single-family detached dwelling served by an internal street network accessed from Rosemont Road, Parker Road, and Roxbury Drive.

This report addresses the transportation impacts of the proposed development on the nearby street system. Based on conversations with Khoi Le with the City of West Linn, analysis was required at the following intersections:

1. Rosemont Road at Salamo Road/Santa Anita Drive;
2. Site access at Rosemont Road;
3. Rosemont Road at Wild Rose Drive;
4. Salamo Road at Parker Road/Brandywine Drive;
5. Site access at Parker Road; and
6. Wild Rose Drive at Roxbury Drive.

The purpose of this study is to determine whether the transportation system in the vicinity of the site is capable of safely and efficiently supporting the existing and proposed uses and to determine any mitigation that may be necessary to do so. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

LOCATION DESCRIPTION

The subject property is located south of and adjacent to Rosemont Road, north of and adjacent to Parker Road, west of Wild Rose Drive, and east of Salamo Road in West Linn, Oregon. The project site is currently vacant and undeveloped.

The subject site is located in a predominantly residential area. More specifically, single-family detached homes and Oppenlander Field are located to the north, single-family detached homes are located to the east, Tanner Creek Park is located to the south, row houses are located to the southwest, and Rosemont Ridge Middle School is located to the west of the project site. Other notable developments within a half-mile walking distance from the project site include an adult community center, Cascade Summit Montessori School, a Safeway Grocery Store, and West Linn City Hall.

VICINITY STREETS

Rosemont Road is classified by the City of West Linn as a Minor Arterial. The roadway has a two-lane cross-section and has a posted speed of 25 mph in the site vicinity. A school speed zone is in effect on school days from 7:00 AM to 5:00 PM between approximately 200 feet east and

2e

approximately 600 feet west of Salamo Road. Curbs, sidewalks, and bicycle lanes are intermittently provided along both sides of the roadway.

Salamo Road is classified by the City of West Linn as a Minor Arterial. The roadway has a three-lane cross-section, with one travel lane in each direction and a center raised median, and has a posted speed of 35 mph. A school speed zone is in effect on school days from 7:00 AM to 5:00 PM from approximately 180 feet south of Hoodview Avenue and extends past Rosemont Road onto Santa Anita Drive. Curbs, sidewalks, and bicycle lanes are provided along both sides of the roadway.

Santa Anita Drive is classified by the City of West Linn as a Minor Arterial. The roadway has a two-lane cross-section and has a posted speed limit of 25 mph. A school speed zone is in effect on school days from 7:00 AM to 5:00 PM from approximately 200 feet north of Rosemont Road and extends past Rosemont Road onto Salamo Road. Curbs, sidewalks, and bicycle lanes are provided along both sides of the roadway.

Parker Road is classified by the City of West Linn as a Minor Arterial. The roadway has a two-lane cross-section east and a three-lane cross-section, with one travel lane in each direction and a center raised median, west of Noble Lane. It has a posted speed of 35 mph. Partial curbs, sidewalks and bicycle lanes are provided along both sides of the roadway; however, these facilities are not available on either side of the road in the immediate site vicinity.

Brandywine Drive is classified by the City of West Linn as a Local Street. The roadway has a two-lane cross-section without centerline striping delineating directional travel lanes, except within approximately 140 feet of the intersection of Salamo Road at Parker Road/Brandywine Drive. It does not have a posted speed limit; however, a statutory residential speed of 25 mph applies. Curbs and bicycle lanes are provided along both sides of the roadway while sidewalks are only provided along the south side for approximately 200 feet east of Salamo Road at Parker Road/Brandywine Drive.

Wild Rose Drive is classified by the City of West Linn as a Neighborhood Route. The roadway has a two-lane cross-section without centerline striping delineating directional travel lanes, and has a posted speed of 25 mph. On-street parking is permitted along both sides of the roadway except between Parker Road and Wild Rose Loop south of Parker Road. Curbs and sidewalks are provided along both sides of the roadway.

Roxbury Drive is classified by the City of West Linn as a Local Street. The roadway has a two-lane cross-section without centerline striping delineating directional travel lanes. It does not have a posted speed limit; however, a statutory residential speed of 25 mph applies. On-street parking is permitted along both sides of the roadway. Curbs and sidewalks are provided along both sides of the roadway.

STUDY INTERSECTIONS

The intersection of Rosemont Road at Salamo Road/Santa Anita Drive is a four-legged intersection that is controlled by a traffic signal. The northbound and southbound approaches each have one left-turn lane served by permitted/protected phasing, one shared through/right-turn lane, and a bicycle lane to the right of the outermost standard travel lane. The eastbound and westbound approaches of

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Rosemont Road each have one left-turn lane served by permitted phasing, one shared through/right-turn lane, and a bicycle lane to the right of the outermost standard travel lane. Crosswalks are marked across all intersections legs.

The intersection of Rosemont Road at Wild Rose Drive is a four-legged intersection that is stop-controlled for the northbound and southbound approaches. The intersection approaches each have one shared lane for all turning movements. The north leg of the intersection is formed by a private driveway for a church.

The intersection of Salamo Road at Parker Road/Brandywine Drive is a four-legged intersection that is stop-controlled for the eastbound and westbound approaches. The intersection approaches each have one left-turn lane, one shared through/right-turn lane, and a bicycle lane to the right of the outermost standard travel lane. Crosswalks are marked across all intersection legs.

The intersection of Wild Rose Drive at Roxbury Drive is a four-legged intersection that is stop-controlled for the eastbound and westbound approaches of Roxbury Drive. The intersection approaches each have a single, shared lane for all turning movements. A crosswalk is marked across the southern intersection leg.

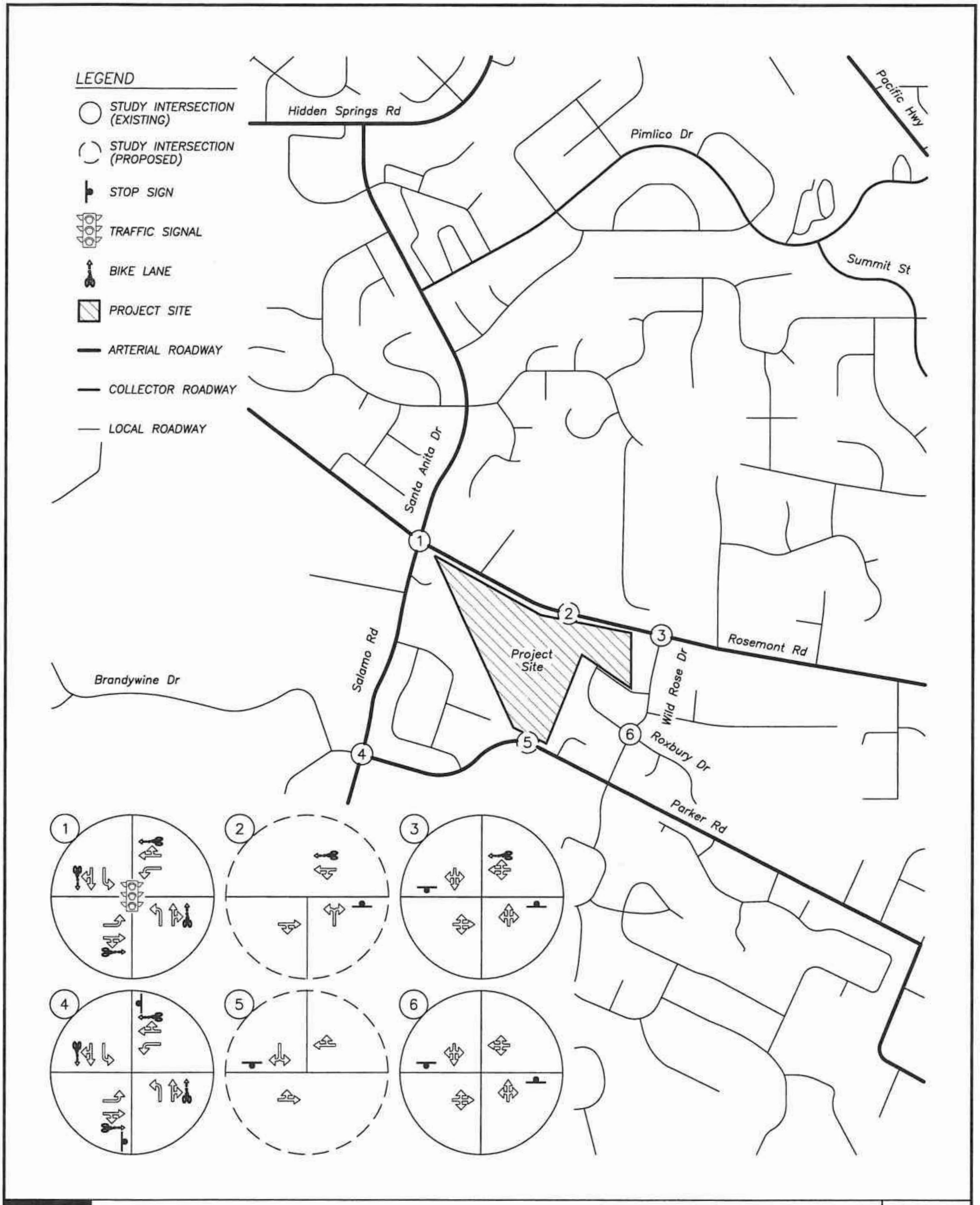
A vicinity map displaying the project site, vicinity streets, and the study intersections with their associated lane configurations is shown in Figure 1 on page 7.

TRAFFIC COUNTS

Traffic counts were conducted at the intersections of Rosemont Road at Salamo Road/Santa Anita Drive, Rosemont Road at Wild Rose Drive, and Salamo Road at Parker Road/Brandywine Drive on Wednesday, January 27th, 2016, from 7:00 AM to 9:00 PM and on Tuesday, January 26th, 2016, from 4:00 PM to 6:00 PM. Data was used from each intersection's morning and evening peak hours.

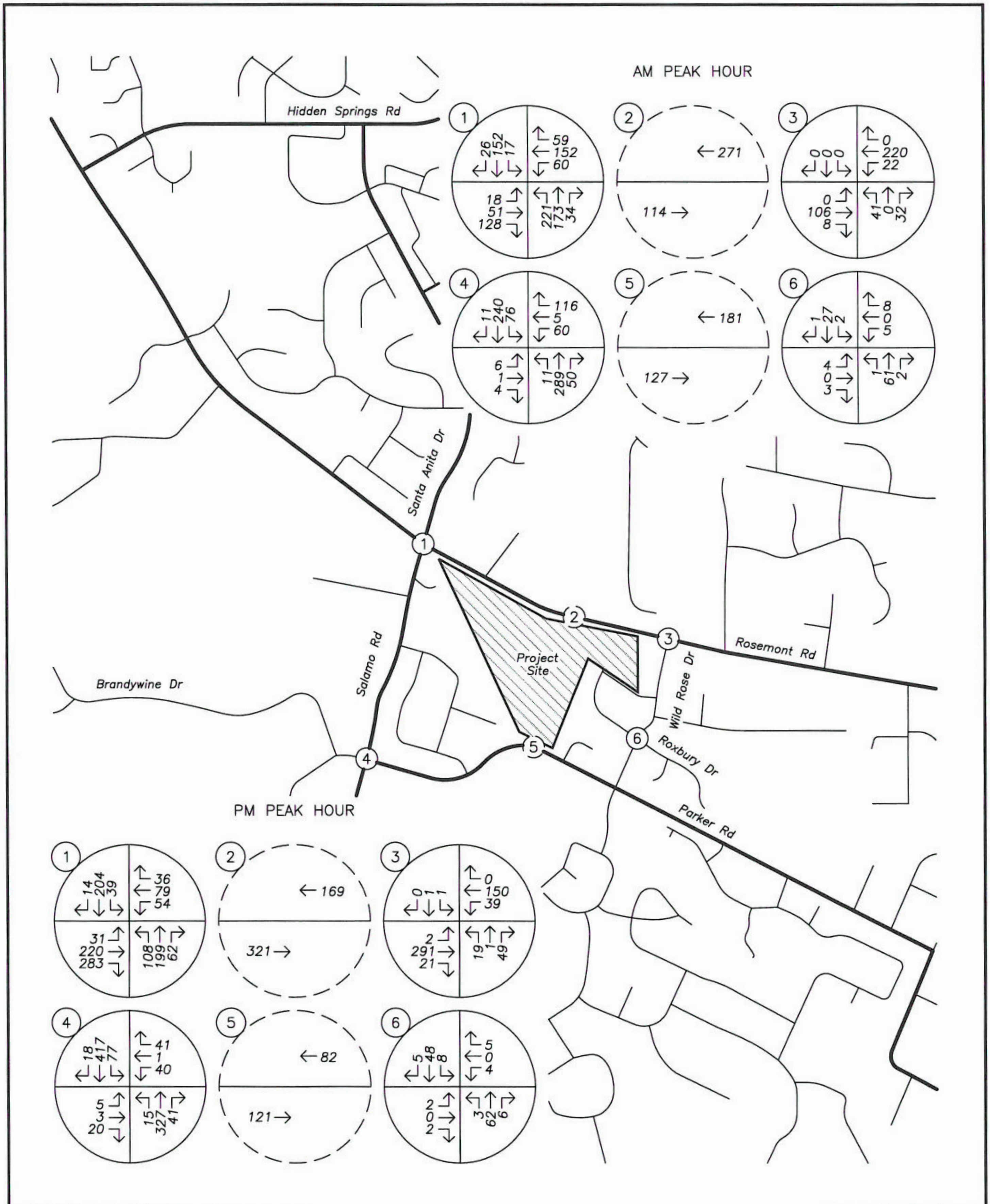
Traffic volumes for the intersection of Wild Rose Drive at Roxbury Drive were determined by balancing traffic volumes with the intersection of Rosemont Road at Wild Rose Drive. Turning volumes onto and off of Roxbury Drive were estimated using trip generation based on the number of single-family detached homes that would utilize the roadway.

Figure 2 on page 8 shows the existing morning and evening peak hour traffic volumes at the study intersections.



VICINITY MAP

FIGURE 1



TRAFFIC VOLUMES
Existing Conditions
AM & PM Peak Hours

no scale

FIGURE 2

PAGE 8

1e

SITE TRIPS

TRIP GENERATION

The proposed development will construct a 52-lot subdivision within the project site. To estimate the number of trips that will be generated by the proposed development, trip rates from the *TRIP GENERATION MANUAL*[1] were used. Data from land-use code 210, *Single-Family Detached Housing*, was used to estimate the proposed development's trip generation based on the number of dwelling units.

The trip generation calculations show that the proposed development is projected to generate 39 site trips during the morning peak hour, 52 site trips during the evening peak hour, and a total of 496 weekday trips. The trip generation estimates are summarized in Table 1 and detailed trip generation calculations are included in the technical appendix to this report.

Table 1 - Trip Generation Summary

	ITE Code	Size	Morning Peak Hour			Evening Peak Hour			Weekday
			In	Out	Total	In	Out	Total	Total
Proposed Subdivision	210	52 units	10	29	39	33	19	52	496

TRIP DISTRIBUTION

The directional distribution of site trips to/from the proposed development was estimated based on locations of likely trip destinations, locations of major transportation facilities in the site vicinity, and existing travel patterns at study intersections. The following trip distribution was estimated and used for analysis:

- Approximately 35 percent of site trips will travel to/from the east along Rosemont Road;
- Approximately 25 percent of site trips will travel to/from the east along Parker Road;
- Approximately 20 percent of site trips will travel to/from the west along Rosemont Road;
- Approximately 15 percent of site trips will travel to/from the south along Salamo Road; and
- Approximately 5 percent of site trips will travel to/from the north along Santa Anita Drive.

Trips to and from the proposed development are anticipated to utilize three site accesses. Based on the site layout and access locations, site trips are anticipated to utilize site accesses accordingly.

- Approximately 55 percent of site trips will utilize the site access at Rosemont Road;
- Approximately 35 percent of site trips will utilize the site access at Parker Road; and
- Approximately 10 percent of site trips will utilize Roxbury Drive.

The trip assignment for the site trips generated by the proposed development during the morning and evening peak hours is shown in Figure 3 on page 10.

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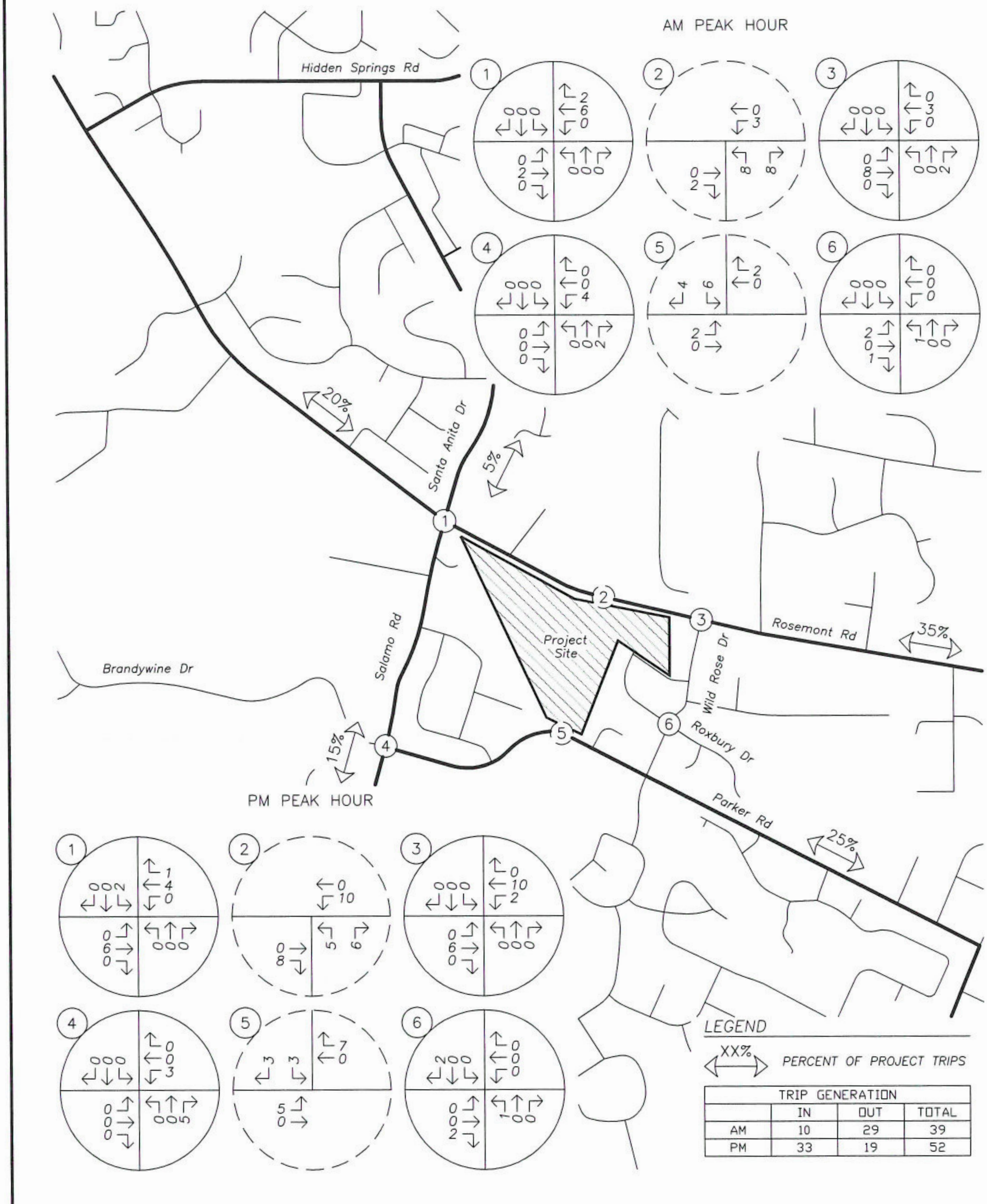
[1] Institute of Transportation Engineers (ITE), *TRIP GENERATION MANUAL*, 9th Edition, 2012.



TRIP GENERATION			
	IN	OUT	TOTAL
AM	10	29	39
PM	33	19	52

SITE TRIP DISTRIBUTION & ASSIGNMENT
Proposed Development Plan – Site Trips
AM & PM Peak Hours

no scale

FIGURE 3

PAGE 10

2e

OPERATIONAL ANALYSIS

BACKGROUND VOLUMES

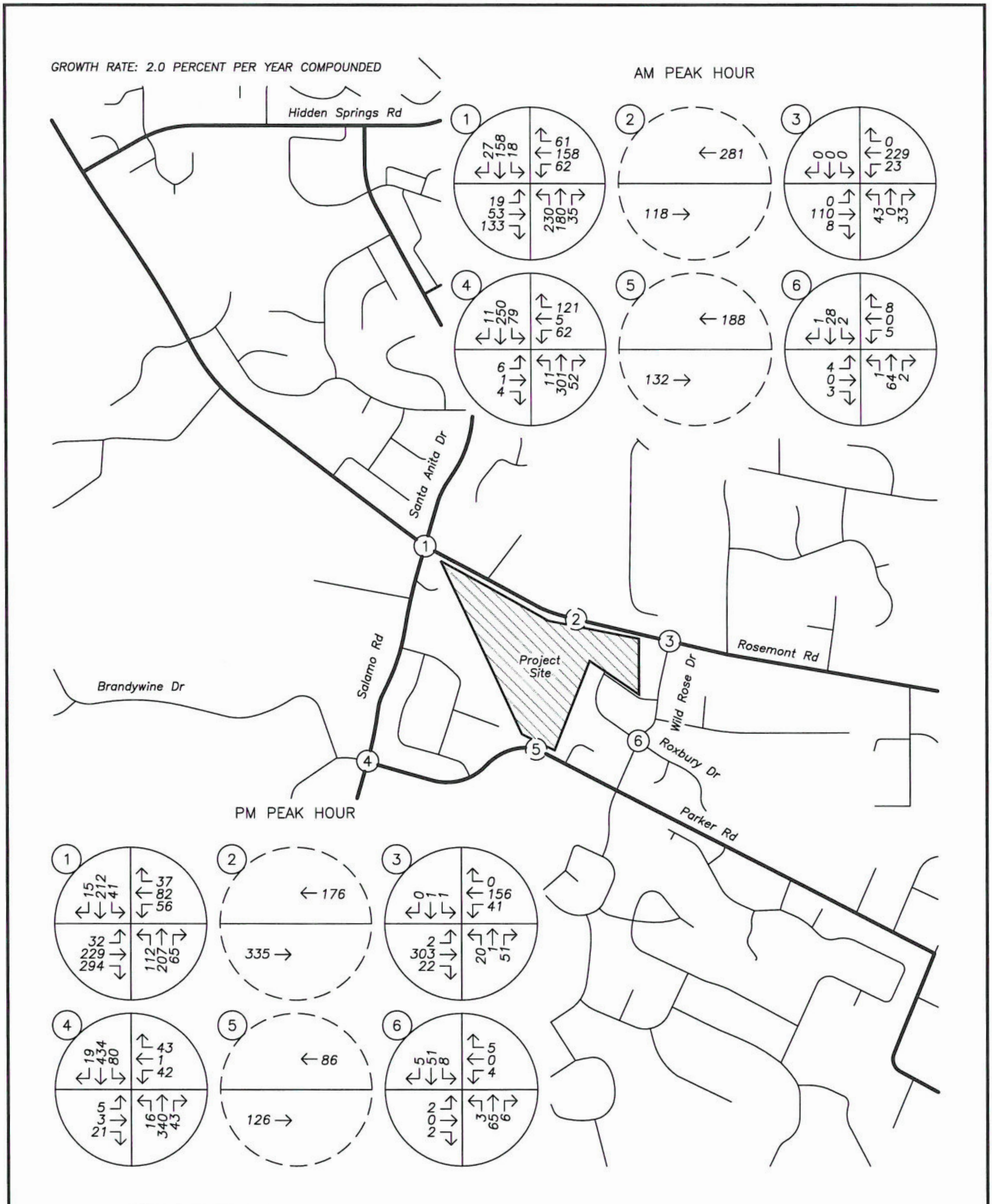
To provide analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. In order to calculate the future traffic volumes, a compounded growth rate of two percent per year for an assumed build-out condition of two years was applied to the measured existing traffic volumes to approximate year 2018 background conditions.

Figure 4 on page 12 shows the projected year 2018 background traffic volumes for the morning and evening peak hours at the study intersections.

BACKGROUND VOLUMES PLUS SITE TRIPS

Peak hour trips calculated to be generated from the proposed development, as described earlier within the Site Trips section, were added to the projected year 2018 background traffic volumes to obtain the expected 2018 background volumes plus site trips.

Figure 5 on page 13 shows the projected year 2018 peak hour background traffic volumes plus proposed development site trips at the study intersections.

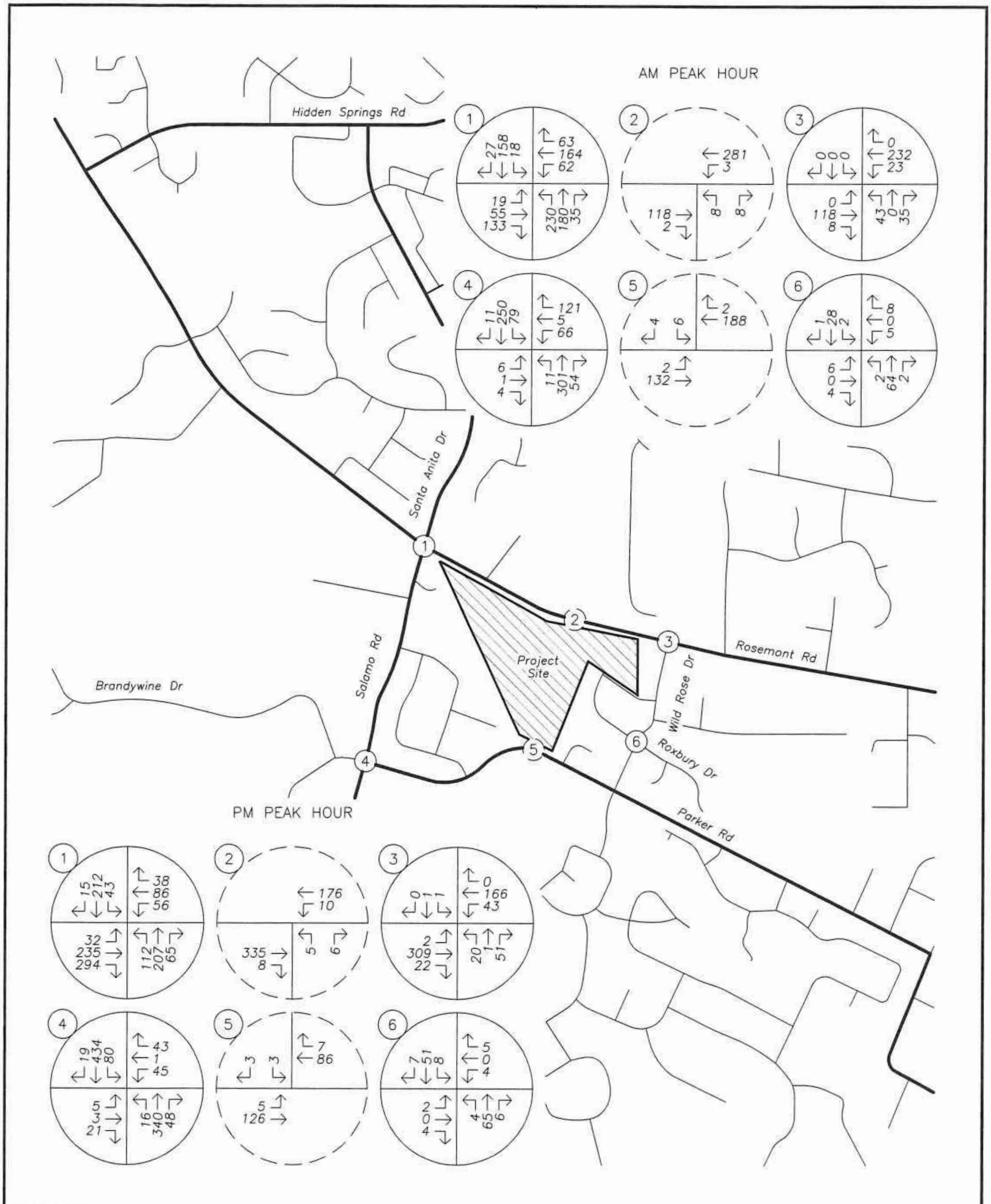


TRAFFIC VOLUMES
Year 2018 Background Conditions
AM & PM Peak Hours

no scale

FIGURE 4

PAGE 12



TRAFFIC VOLUMES
Year 2018 Background plus Site Trips
AM & PM Peak Hours

no scale

FIGURE 5

PAGE 13

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CAPACITY ANALYSIS

A capacity and delay analysis was conducted for each of the study intersections. The analysis was conducted according to the signalized and unsignalized intersection analysis methodologies in the *HIGHWAY CAPACITY MANUAL* (HCM) published by the Transportation Research Board. According to the City of West Linn's Transportation System Plan (TSP), both signalized and unsignalized intersections are required to operate at level of service (LOS) D or better, except principal arterial facilities which are required to operate at LOS E or better. The level of service of an intersection can range from A, which indicates very little or no delay experienced by vehicles, to F, which indicates a high degree of congestion and delay.

The intersection of Rosemont Road at Salamo Road/Santa Anita Drive is projected to operate at LOS B during the morning and evening peak hours under all analysis scenarios through year 2018.

The proposed site access intersection on Rosemont Road is projected to operate at LOS B during the morning and evening peak hours upon build-out of the proposed development.

The intersection of Rosemont Road at Wild Rose Drive currently operates at LOS B during both the morning and evening peak hours. Under year 2018 conditions, with or without the addition of site trips, the intersection is projected to operate at LOS B during the morning peak hour and at LOS C during the evening peak hour.

The intersection of Salamo Road at Parker Road/Brandywine Drive is projected to operate at LOS D during the morning and evening peak hours upon build-out of the proposed development.

The proposed site access intersection on Parker Road is projected to operate at LOS B during the morning peak hour and at LOS during the evening peak hour upon build-out of the proposed development.

The intersection of Wild Rose Drive at Roxbury Drive is projected to operate at LOS A during the morning and evening peak hours under all analysis scenarios through year 2018.

The v/c, delay, and LOS results of the capacity analysis are shown in Table 2 for the morning and evening peak hours. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

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Table 2 - Capacity Analysis Summary

	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay	V/C	LOS	Delay	V/C
Rosemont Rd at Salamo Rd/ Santa Anita Dr						
Existing Conditions	B	12	0.45	B	13	0.53
2018 Background Conditions	B	13	0.47	B	13	0.55
2018 Background plus Site Conditions	B	13	0.48	B	13	0.56
Site Access at Rosemont Rd						
2018 Background plus Site Conditions	B	10	0.08	B	12	0.22
Rosemont Rd at Wild Rose Dr						
Existing Conditions	B	12	0.13	B	15	0.13
2018 Background Conditions	B	12	0.14	C	15	0.14
2018 Background plus Site Conditions	B	12	0.14	C	16	0.14
Salamo Rd at Parker Rd/Brandywine Dr						
Existing Conditions	D	26	0.26	D	29	0.27
2018 Background Conditions	D	28	0.29	D	32	0.28
2018 Background plus Site Conditions	D	28	0.31	D	33	0.28
Site Access at Parker Rd						
2018 Background plus Site Conditions	B	10	0.13	A	9	0.06
Wild Rose Dr at Roxbury Dr						
Existing Conditions	A	9	0.02	A	9	0.01
2018 Background Conditions	A	9	0.02	A	9	0.01
2018 Background plus Site Conditions	A	9	0.02	A	9	0.01

Based on the results of the operational analysis, all study intersections are currently operating acceptably per City of West Linn standards and are projected to continue operating acceptably through year 2018 either with or without the addition of site trips from the proposed development. No operational mitigation is necessary or recommended.

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SAFETY ANALYSIS

CRASH DATA ANALYSIS

Using data obtained from ODOT's Crash Analysis and Reporting Unit, a review of the most recent available five years of crash history (January 2010 to December 2014) at the study intersections was performed. The crash data was evaluated based on the number of crashes, the type of collisions, the severity of the collisions, and the resulting crash rate for the intersection. Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak period represents 10 percent of average daily traffic (ADT) at the intersection. Crash rates in excess of one to two crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

The intersection of Rosemont Road at Salamo Road/Santa Anita Drive had two reported crashes during the analysis period. The crashes consisted of one rear-end collision and one pedestrian collision where a vehicle operator failed to yield right-of-way to a pedestrian due to inattention. Both of the reported crashes were classified as "Possible Injury – Complaint of Pain" (*Injury C*). The crash rate at the intersection was calculated to be 0.08 CMEV.

The intersection of Rosemont Road at Wild Rose Drive had two reported crashes during the analysis period. The crashes consisted of one rear-end collision and one turning-movement collision. Both of the reported crashes were classified as "Property Damage Only" (*PDO*). The crash rate at the intersection was calculated to be 0.19 CMEV.

The intersection of Salamo Road at Parker Road had one reported crash during the analysis period. The crash was a rear-end collision and was classified as "Possible Injury – Complaint of Pain" (*Injury C*). The crash rate at the intersection was calculated to be 0.06 CMEV.

The intersection of Wild Rose Drive at Roxbury Drive had no reported crashes during the analysis period.

Based on the most recent five years of crash data, no significant safety hazards were identified at any of the study intersections and no mitigation is recommended.

INTERSECTION SIGHT DISTANCE

Intersection sight distance was examined for the proposed new driveways along McCormick Drive in accordance with the standards established in *A Policy on Geometric Design of Highways and Streets*, published in 2011 by the American Association of State Highway and Transportation Officials (AASHTO). According to AASHTO and the City of West Linn's *Design & Construction Standards Section 5 – Street Requirements* the driver's eye is assumed to be 14.5 feet from the near edge of the nearest lane of the intersecting street and at a height of 3.5 feet above the approach street pavement. Vehicle/object height is assumed to be 3.5 feet above the cross-street pavement.

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Based on the posted speed of 25 mph on Rosemont Road, a minimum intersection sight distance of 280 feet is required to the east and west of the proposed site access at Rosemont Road. Intersection sight distance was measured to be in excess of 400 feet to the east, limited by on-site vegetation, and in excess of 300 feet to the west, limited by a crest in the vertical curvature of the roadway.

Based on the posted speed of 35 mph on Parker Road, a minimum intersection sight distance of 390 feet is required to the east and west of the proposed site access at Parker Road. Intersection sight distance was measured to be in excess of 600 feet to the east, measured to the near-side edge of the roadway of Wild Rose Drive, and 507 feet to the west, measured to the near-side edge of the roadway of Noble Lane.

Based on the detailed analysis, adequate sight distance is available for the proposed site accesses along Rosemont Road and Parker Road. No sight distance mitigation is necessary or recommended.

Warrant Analysis

Left-turn lane and traffic signal warrants were examined for the study intersections where such treatments would be applicable.

A left-turn refuge is primarily a safety consideration for the major street, removing left-turning vehicles from the through traffic stream. The left-turn lane warrants examined used the methodology outlined in the National Cooperative Highway Research Project's (NCHRP) Report 457. The left-turn lane warrants were evaluated based on the number of advancing and opposing vehicles as well as the number of turning vehicles and the travel speed of the roadway.

Left-turn lane warrants are not projected to be met for any of the study intersections where such treatments would be applicable under any of the year 2018 analysis scenarios. No new turn lanes are recommended.

Traffic signal warrants were examined for all unsignalized study intersections to determine whether the installation of a new traffic signal will be warranted at the intersections upon completion of the proposed development. Due to insufficient main and side-street traffic volumes, traffic signal warrants will not be met for any of the unsignalized study intersections under any analysis scenarios through year 2018.

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CONCLUSIONS

Based on the results of the operational analysis, all study intersections are currently operating acceptably per City of West Linn standards, and are projected to continue operating acceptably through year 2018 either with or without the addition of site trips from the proposed development. No operational mitigation is necessary or recommended.

Based on the most recent five years of crash data, no significant safety hazards were identified at any of the study intersections and no mitigation is recommended.

Based on the detailed analysis, adequate sight distance is available for the proposed site accesses along Rosemont Road and Parker Road. No sight distance mitigation is necessary or recommended.

Left-turn lane warrants are not projected to be met for any of the study intersections where such treatments would be applicable under any of the year 2018 analysis scenarios. No new turn lanes are recommended.

Due to insufficient main and side-street traffic volumes, traffic signal warrants will not be met for any of the unsignalized study intersections under any analysis scenarios through year 2018.

Based on the detailed analyses, the transportation system in the vicinity of the site will safely and efficiently support the proposed development of a 52-lot subdivision on Rosemont Road. No mitigations are recommended.

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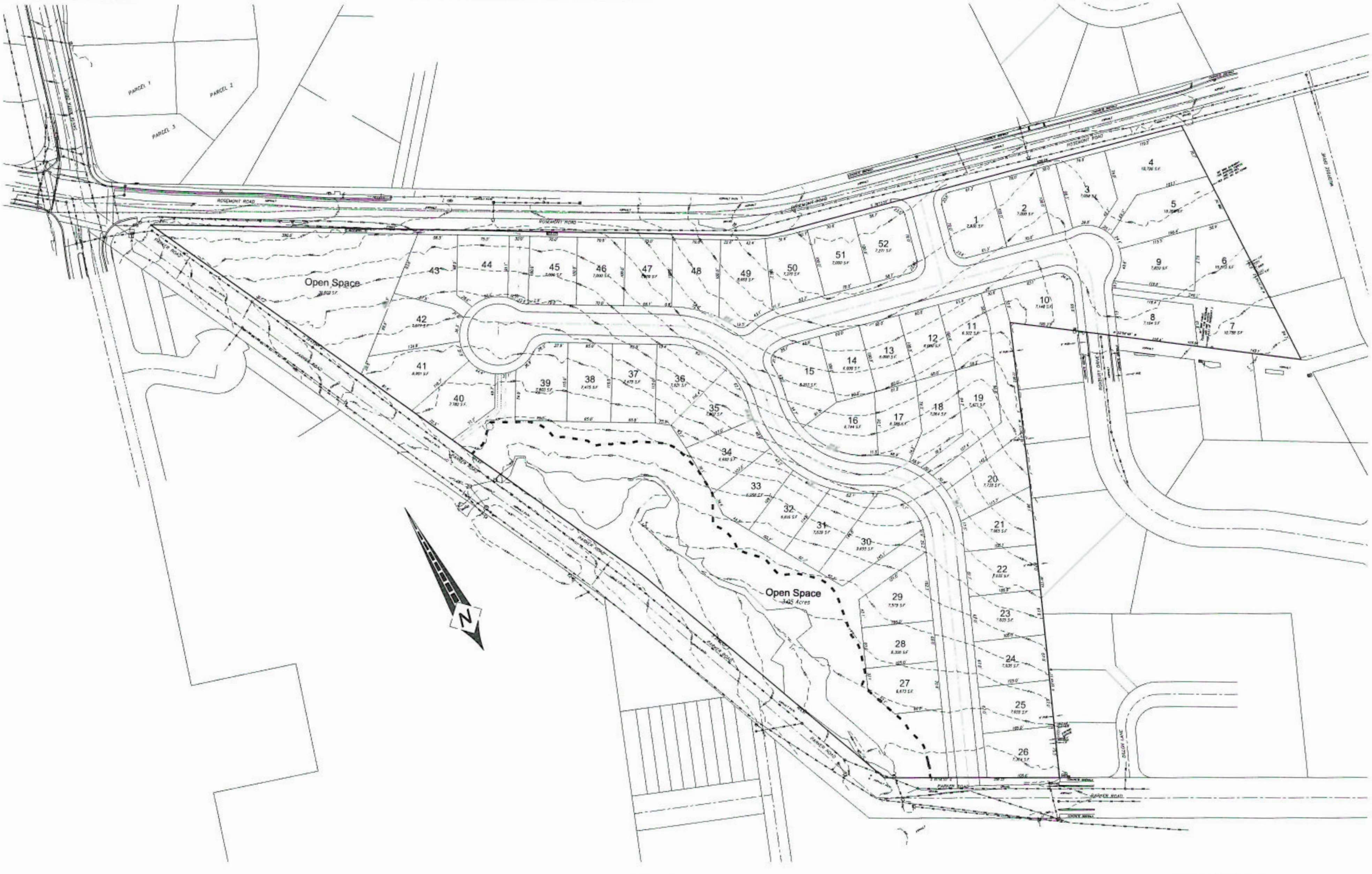
APPENDIX

9/21/16 PC Meeting
259



DESIGNED	REG			
DRAWN	REG			
SCALE	1" = 60'			
DATE	January 2016			
FILE	15-ICN-107	DATE	NO	REVISION

Richard E. Givens, Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045
PH. (503) 479-0097

APPLICANT: Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406

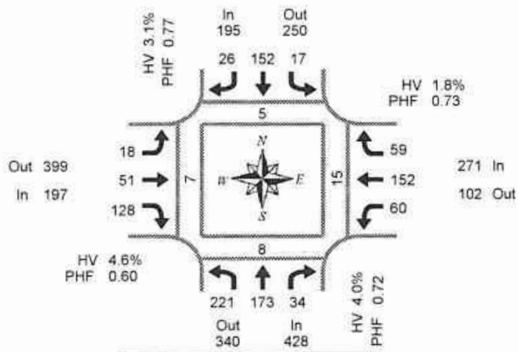
Tanner Ridge at Rosemont
Preliminary Plan

SHEET: 1/2

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
7:30 AM to 8:30 AM

Salamo Rd & Rosemont Rd

Wednesday, January 27, 2016
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Rosemont Rd				Westbound Rosemont 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
7:00 AM	12	5	2	0	0	2	1	0	0	0	5	0	2	8	0	0	37	0	0	0	1
7:05 AM	12	9	2	0	1	5	0	0	0	0	5	0	0	10	0	0	44	0	0	0	0
7:10 AM	22	13	1	0	0	3	1	0	0	3	3	0	2	12	3	0	63	0	0	1	0
7:15 AM	13	11	2	0	2	7	2	0	1	2	4	0	0	13	3	0	60	1	0	0	0
7:20 AM	11	7	2	0	4	7	2	0	0	4	3	0	2	11	6	0	59	0	0	2	1
7:25 AM	18	13	4	0	0	6	2	0	0	4	4	0	3	22	7	0	83	0	0	0	0
7:30 AM	21	17	0	0	1	3	1	0	0	3	1	0	5	10	5	0	67	1	0	2	0
7:35 AM	30	16	2	0	1	7	6	0	1	2	5	0	3	26	4	0	103	0	0	1	0
7:40 AM	29	11	3	0	1	12	4	0	1	6	16	0	2	24	14	0	123	1	0	0	3
7:45 AM	31	25	1	0	1	16	2	0	1	9	14	0	3	9	2	0	114	0	0	4	0
7:50 AM	18	11	2	0	3	11	2	0	6	7	16	0	4	8	2	0	90	1	2	2	0
7:55 AM	13	15	2	0	1	7	2	0	2	3	24	0	1	1	2	0	73	0	0	0	0
8:00 AM	15	19	5	0	1	18	2	0	1	5	16	0	6	15	5	0	108	0	1	0	0
8:05 AM	12	15	2	0	2	10	2	0	0	2	7	0	8	15	3	0	78	1	1	0	1
8:10 AM	12	13	8	0	1	14	1	0	1	5	11	0	13	6	7	0	92	0	2	2	1
8:15 AM	10	12	1	0	2	15	1	0	2	4	10	0	3	8	5	0	73	0	1	3	1
8:20 AM	19	9	8	0	2	16	2	0	1	3	3	0	2	8	3	0	76	1	1	1	0
8:25 AM	11	10	0	0	1	23	1	0	2	2	5	0	10	22	7	0	94	0	0	0	1
8:30 AM	5	14	2	0	2	12	2	0	0	3	4	0	4	9	3	0	60	1	0	0	3
8:35 AM	19	15	2	0	2	6	2	0	0	0	13	0	3	7	4	0	73	1	0	1	2
8:40 AM	9	16	1	1	0	6	0	0	0	3	6	0	6	12	3	0	62	2	0	0	3
8:45 AM	10	19	5	0	2	14	2	0	0	2	3	0	6	10	5	0	78	1	4	4	5
8:50 AM	13	8	4	0	3	17	0	0	1	6	9	0	5	6	4	0	76	1	4	2	3
8:55 AM	10	11	3	0	3	19	1	0	3	7	7	0	9	8	3	0	84	1	8	5	5
Total Survey	375	314	64	1	36	256	41	0	23	85	194	0	102	280	100	0	1,870	13	24	30	30

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Rosemont Rd				Westbound Rosemont 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
7:00 AM	46	27	5	0	1	10	2	0	0	3	13	0	4	30	3	0	144	0	0	1	1
7:15 AM	42	31	8	0	6	20	6	0	1	10	11	0	5	46	16	0	202	1	0	2	1
7:30 AM	80	44	5	0	3	22	11	0	2	11	22	0	10	60	23	0	293	2	0	3	3
7:45 AM	62	51	5	0	5	34	6	0	9	19	54	0	8	18	6	0	277	1	2	6	0
8:00 AM	39	47	15	0	4	42	5	0	2	12	34	0	27	36	15	0	278	1	4	2	2
8:15 AM	40	31	9	0	5	54	4	0	5	9	18	0	15	38	15	0	243	1	2	4	2
8:30 AM	33	45	5	1	4	24	4	0	0	6	23	0	13	28	10	0	195	4	0	1	8
8:45 AM	33	38	12	0	8	50	3	0	4	15	19	0	20	24	12	0	238	3	16	11	13
Total Survey	375	314	64	1	36	256	41	0	23	85	194	0	102	280	100	0	1,870	13	24	30	30

Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Rosemont Rd				Westbound Rosemont Rd				Total
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	428	340	768	0	195	250	445	0	197	399	596	0	271	102	373	0	1,091
%HV	4.0%				3.1%				4.6%				1.8%				3.4%
PHF	0.72				0.77				0.60				0.73				0.80

Pedestrians Crosswalk			
North	South	East	West
5	8	15	7

By Movement	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Rosemont Rd				Westbound Rosemont Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	221	173	34	428	17	152	26	195	18	51	128	197	60	152	59	271	1,091
%HV	2.7%	2.9%	17.6%	4.0%	11.8%	2.0%	3.8%	3.1%	22.2%	9.8%	0.0%	4.6%	6.7%	0.0%	1.7%	1.8%	3.4%
PHF	0.61	0.83	0.50	0.72	0.85	0.70	0.54	0.77	0.50	0.58	0.57	0.60	0.56	0.63	0.64	0.73	0.80

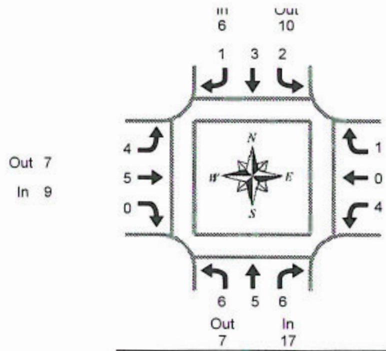
Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Rosemont Rd				Westbound Rosemont 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
7:00 AM	230	153	23	0	15	86	25	0	12	43	100	0	27	154	48	0	916	4	2	12	5
7:15 AM	223	173	33	0	18	118	28	0	14	52	121	0	50	160	60	0	1,050	5	6	13	6
7:30 AM	221	173	34	0	17	152	26	0	18	51	128	0	60	152	59	0	1,091	5	8	15	7
7:45 AM	174	174	34	1	18	154	19	0	16	46	129	0	63	120	46	0	993	7	8	13	12
8:00 AM	145	161	41	1	21	170	16	0	11	42	94	0	75	126	52	0	954	9	22	18	25

Heavy Vehicle Summary

All Traffic Data
Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
7:30 AM to 8:30 AM

Salamo Rd & Rosemont Rd

Wednesday, January 27, 2016
7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Rosemont Rd				Westbound Rosemont Rd				Interval
Time	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
7:10 AM	1	1	0	2	0	0	0	0	0	0	1	1	0	0	0	0	3
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:25 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
7:30 AM	3	0	0	3	0	1	0	1	0	0	0	0	1	0	0	1	5
7:35 AM	2	1	1	4	0	0	0	0	1	0	0	1	0	0	0	0	5
7:40 AM	1	1	0	2	0	2	1	3	0	1	0	1	0	0	0	0	6
7:45 AM	0	1	0	1	0	0	0	0	1	1	0	2	1	0	0	1	4
7:50 AM	0	0	1	1	0	0	0	0	1	1	0	2	0	0	0	0	3
7:55 AM	0	1	1	2	0	0	0	0	1	1	0	2	0	0	0	0	4
8:00 AM	0	1	1	2	1	0	0	1	0	0	0	0	1	0	0	1	4
8:05 AM	0	0	1	1	0	0	0	0	0	1	0	1	1	0	0	1	3
8:10 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	2
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	1	0	0	1	0	0	0	0	0	0	0	0	1
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:50 AM	0	0	0	0	0	3	0	3	0	2	0	2	1	0	0	1	6
8:55 AM	0	0	0	0	0	2	0	2	0	1	0	1	0	0	0	0	3
Total Survey	7	6	6	19	2	8	2	12	4	8	3	15	5	2	2	9	55

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Rosemont Rd				Westbound Rosemont Rd				Interval
Time	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	Total
7:00 AM	1	1	0	2	0	0	0	0	0	0	1	1	0	1	0	1	4
7:15 AM	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	2
7:30 AM	6	2	1	9	0	3	1	4	1	1	0	2	1	0	0	1	16
7:45 AM	0	2	2	4	0	0	0	0	3	3	0	6	1	0	0	1	11
8:00 AM	0	1	3	4	1	0	0	1	0	1	0	1	2	0	1	3	9
8:15 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	0	0	1	1	0	1	1	2	3
8:45 AM	0	0	0	0	0	5	0	5	0	3	0	3	1	0	0	1	9
Total Survey	7	6	6	19	2	8	2	12	4	8	3	15	5	2	2	9	55

Heavy Vehicle Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound Salamo Rd			Southbound Salamo Rd			Eastbound Rosemont Rd			Westbound Rosemont Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	17	7	24	6	10	16	9	7	16	5	13	18	37
PHF	0.47			0.38			0.38			0.42			0.58

By Movement	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Rosemont Rd				Westbound Rosemont Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	6	5	6	17	2	3	1	6	4	5	0	9	4	0	1	5	37
PHF	0.25	0.42	0.50	0.47	0.50	0.25	0.25	0.38	0.33	0.42	0.00	0.38	0.50	0.00	0.25	0.42	0.58

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Rosemont Rd				Westbound Rosemont Rd				Interval
Time	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	Total
7:00 AM	7	5	3	15	0	3	2	5	4	4	2	10	2	1	0	3	33
7:15 AM	6	5	6	17	1	3	2	6	4	5	1	10	4	0	1	5	38
7:30 AM	6	5	6	17	2	3	1	6	4	5	0	9	4	0	1	5	37
7:45 AM	0	3	5	8	2	0	0	2	3	4	1	8	3	1	2	6	24
8:00 AM	0	1	3	4	2	5	0	7	0	4	1	5	3	1	2	6	22

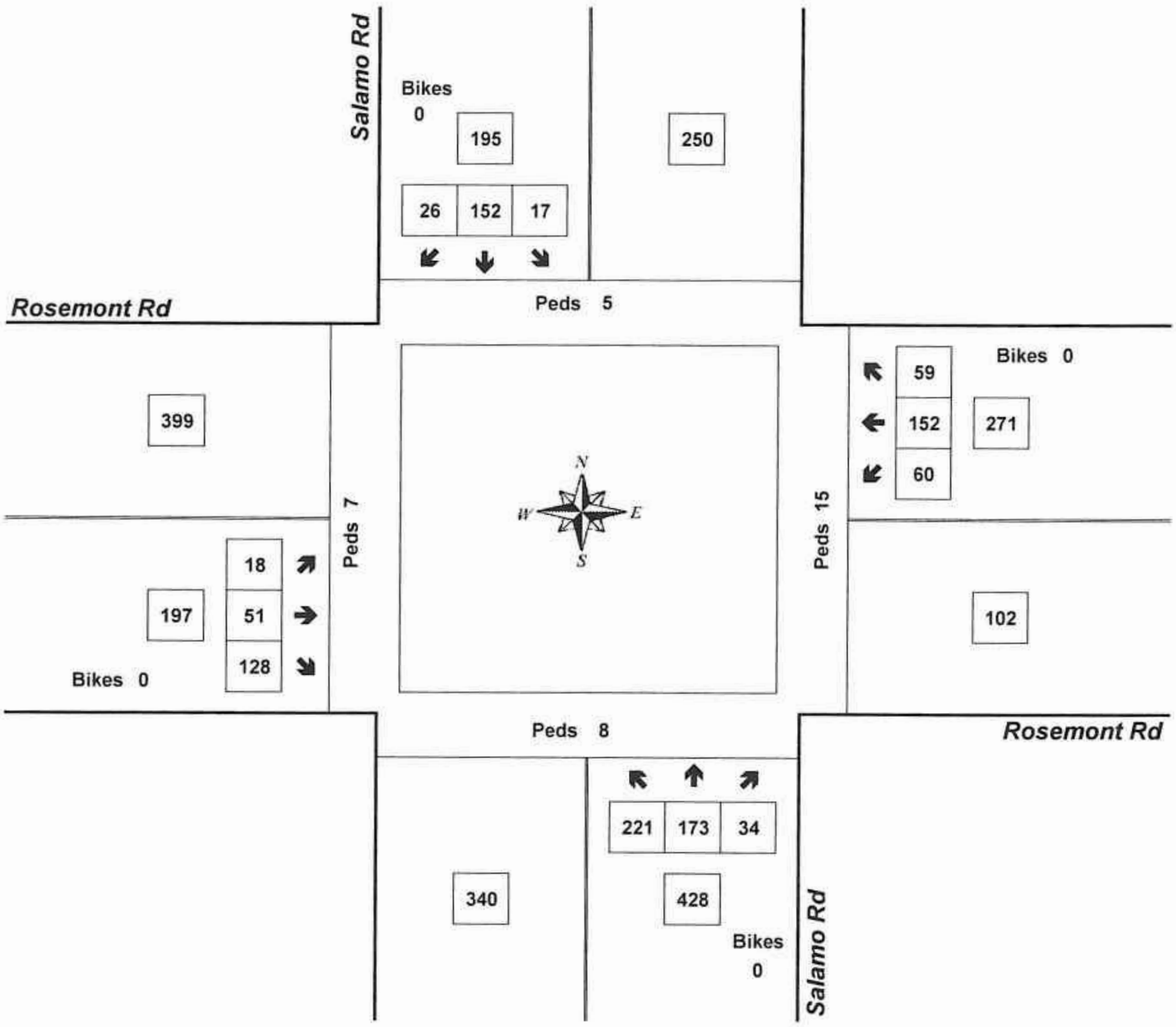
Peak Hour Summary

All Traffic Data
Services Inc.

Clay Carney
(503) 833-2740

Salamo Rd & Rosemont Rd

7:30 AM to 8:30 AM
Wednesday, January 27, 2016

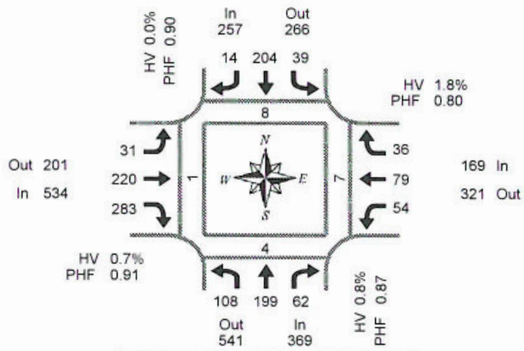


Approach	PHF	HV%	Volume
EB	0.60	4.6%	197
WB	0.73	1.8%	271
NB	0.72	4.0%	428
SB	0.77	3.1%	195
Intersection	0.80	3.4%	1,091

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:55 PM to 5:55 PM

Salamo Rd & Rosemont Rd

Tuesday, January 26, 2016
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd L	T	R	Bikes	Southbound Salamo Rd L	T	R	Bikes	Eastbound Rosemont Rd L	T	R	Bikes	Westbound Rosemont Rd L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	14	18	1	0	5	11	0	0	2	12	17	0	4	4	4	0	92	1	2	4	2
4:05 PM	7	14	1	0	8	15	0	0	2	13	18	0	0	5	3	0	86	0	0	0	0
4:10 PM	12	20	4	0	2	26	1	0	2	10	11	0	2	2	2	0	94	0	0	2	1
4:15 PM	11	15	3	0	3	14	1	0	2	10	16	0	3	7	3	0	88	0	0	0	3
4:20 PM	4	12	5	0	4	14	0	0	3	9	14	0	1	3	2	0	71	1	0	1	0
4:25 PM	12	17	4	0	2	16	1	0	5	15	18	0	6	4	4	0	104	0	0	1	0
4:30 PM	8	12	3	0	4	17	4	0	2	14	14	0	4	7	6	0	95	1	2	1	0
4:35 PM	9	9	1	0	3	11	2	0	3	17	15	0	1	4	3	0	78	1	0	1	1
4:40 PM	6	8	2	0	4	14	0	0	4	24	20	0	1	11	2	0	96	0	2	0	1
4:45 PM	6	14	5	0	2	19	2	0	0	16	22	0	6	5	2	0	99	0	0	0	0
4:50 PM	8	13	4	0	5	16	1	0	2	13	23	0	1	3	4	0	93	0	0	1	0
4:55 PM	10	19	3	0	0	23	0	0	2	18	32	0	4	5	3	0	119	0	0	1	0
5:00 PM	6	14	5	0	3	17	1	0	1	23	19	0	2	9	1	0	101	0	0	1	0
5:05 PM	16	22	6	0	6	15	4	0	2	12	17	0	3	6	0	0	109	0	0	0	0
5:10 PM	6	13	3	0	3	13	1	0	2	32	22	0	7	8	4	0	114	0	0	1	0
5:15 PM	15	18	7	0	7	18	2	0	3	17	25	0	5	9	2	0	128	0	0	0	0
5:20 PM	5	20	4	0	3	18	1	0	1	12	32	0	4	8	6	0	114	4	2	0	0
5:25 PM	9	18	7	0	4	16	2	0	0	15	16	0	4	2	2	0	95	2	0	2	0
5:30 PM	12	19	6	0	2	18	0	0	4	25	25	0	5	6	2	0	124	0	1	0	0
5:35 PM	8	12	4	0	4	20	1	0	3	20	24	0	4	7	5	0	112	0	0	0	0
5:40 PM	9	19	4	0	0	13	2	0	5	14	23	0	5	6	3	0	103	0	0	0	0
5:45 PM	6	17	7	0	1	17	0	0	1	16	16	0	7	5	3	0	96	0	0	0	0
5:50 PM	6	8	6	0	6	16	0	0	7	16	32	0	4	8	5	0	114	2	1	2	1
5:55 PM	6	17	3	0	1	22	0	0	2	15	24	0	3	8	1	0	102	0	0	0	0
Total Survey	211	368	98	0	82	399	26	0	60	388	495	0	86	142	72	0	2,427	12	10	18	9

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd L	T	R	Bikes	Southbound Salamo Rd L	T	R	Bikes	Eastbound Rosemont Rd L	T	R	Bikes	Westbound Rosemont Rd L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	33	52	6	0	15	52	1	0	6	35	46	0	6	11	9	0	272	1	2	6	3
4:15 PM	27	44	12	0	9	44	2	0	10	34	48	0	10	14	9	0	263	1	0	2	3
4:30 PM	23	29	6	0	11	42	6	0	9	55	49	0	6	22	11	0	269	2	4	2	2
4:45 PM	24	46	12	0	7	58	3	0	4	47	77	0	11	13	9	0	311	0	0	2	0
5:00 PM	28	49	14	0	12	45	6	0	5	67	58	0	12	23	5	0	324	0	0	2	0
5:15 PM	29	56	18	0	14	52	5	0	4	44	73	0	13	19	10	0	337	6	2	2	0
5:30 PM	29	50	14	0	6	51	3	0	12	59	72	0	14	19	10	0	339	0	1	0	0
5:45 PM	18	42	16	0	8	55	0	0	10	47	72	0	14	21	9	0	312	2	1	2	1
Total Survey	211	368	98	0	82	399	26	0	60	388	495	0	86	142	72	0	2,427	12	10	18	9

Peak Hour Summary
4:55 PM to 5:55 PM

By Approach	Northbound Salamo Rd In	Out	Total	Bikes	Southbound Salamo Rd In	Out	Total	Bikes	Eastbound Rosemont Rd In	Out	Total	Bikes	Westbound Rosemont Rd In	Out	Total	Bikes	Total
Volume	369	541	910	0	257	266	523	0	534	201	735	0	169	321	490	0	1,329
%HV	0.8%				0.0%				0.7%				1.8%				0.8%
PHF	0.87				0.90				0.91				0.80				0.93

Pedestrians Crosswalk North	South	East	West
8	4	7	1

By Movement	Northbound Salamo Rd L	T	R	Total	Southbound Salamo Rd L	T	R	Total	Eastbound Rosemont Rd L	T	R	Total	Westbound Rosemont Rd L	T	R	Total	Total
Volume	108	199	62	369	39	204	14	257	31	220	283	534	54	79	36	169	1,329
%HV	1.9%	0.0%	1.6%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.7%	0.0%	3.8%	0.0%	1.8%	0.8%
PHF	0.73	0.87	0.86	0.87	0.61	0.93	0.50	0.90	0.60	0.82	0.90	0.91	0.84	0.79	0.75	0.80	0.93

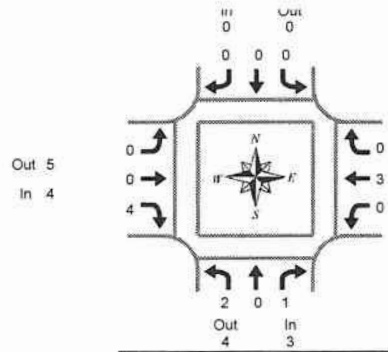
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd L	T	R	Bikes	Southbound Salamo Rd L	T	R	Bikes	Eastbound Rosemont Rd L	T	R	Bikes	Westbound Rosemont Rd L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	107	171	36	0	42	196	12	0	29	171	220	0	33	60	38	0	1,115	4	6	12	8
4:15 PM	102	168	44	0	39	189	17	0	28	203	232	0	39	72	34	0	1,167	3	4	8	5
4:30 PM	104	180	50	0	44	197	20	0	22	213	257	0	42	77	35	0	1,241	8	6	8	2
4:45 PM	110	201	58	0	39	206	17	0	25	217	280	0	50	74	34	0	1,311	6	3	6	0
5:00 PM	104	197	62	0	40	203	14	0	31	217	275	0	53	82	34	0	1,312	8	4	6	1

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:55 PM to 5:55 PM

Salamo Rd & Rosemont Rd

Tuesday, January 26, 2016
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Rosemont Rd				Westbound Rosemont 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	0	0	0
4:05 PM	0	0	0	0	1	0	0	1	0	1	0	1	0	1	0	1	3
4:10 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
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	1	0	1	0	0	1	1	2
4:40 PM	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	2
4:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:05 PM	0	0	1	1	0	0	0	0	0	0	1	1	0	1	0	1	3
5:10 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
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	1	0	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	1	1	0	0	0	0	1
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:50 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	2	2	1	5	1	2	0	3	0	3	5	8	0	4	1	5	21

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Rosemont Rd				Westbound Rosemont Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	1	0	1	1	1	0	2	0	1	0	1	0	1	0	1	5
4:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
4:30 PM	0	1	0	1	0	0	0	0	0	1	1	2	0	0	1	1	4
4:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	1	1	0	0	0	0	0	0	2	2	0	2	0	2	5
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
5:45 PM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Survey	2	2	1	5	1	2	0	3	0	3	5	8	0	4	1	5	21

Heavy Vehicle Peak Hour Summary
4:55 PM to 5:55 PM

By Approach	Northbound Salamo Rd			Southbound Salamo Rd			Eastbound Rosemont Rd			Westbound Rosemont Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	3	4	7	0	0	0	4	5	9	3	1	4	10
PHF	0.38			0.00			0.33			0.38			0.42

By Movement	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Rosemont Rd				Westbound Rosemont Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	0	1	3	0	0	0	0	0	0	4	4	0	3	0	3	10
PHF	0.25	0.00	0.25	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.00	0.38	0.00	0.38	0.42

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Rosemont Rd				Westbound Rosemont Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	2	0	2	1	2	0	3	0	3	1	4	0	1	1	2	11
4:15 PM	0	1	1	2	0	1	0	1	0	2	3	5	0	2	1	3	11
4:30 PM	0	1	1	2	0	1	0	1	0	1	4	5	0	3	1	4	12
4:45 PM	0	0	1	1	0	1	0	1	0	0	4	4	0	3	0	3	9
5:00 PM	2	0	1	3	0	0	0	0	0	0	4	4	0	3	0	3	10

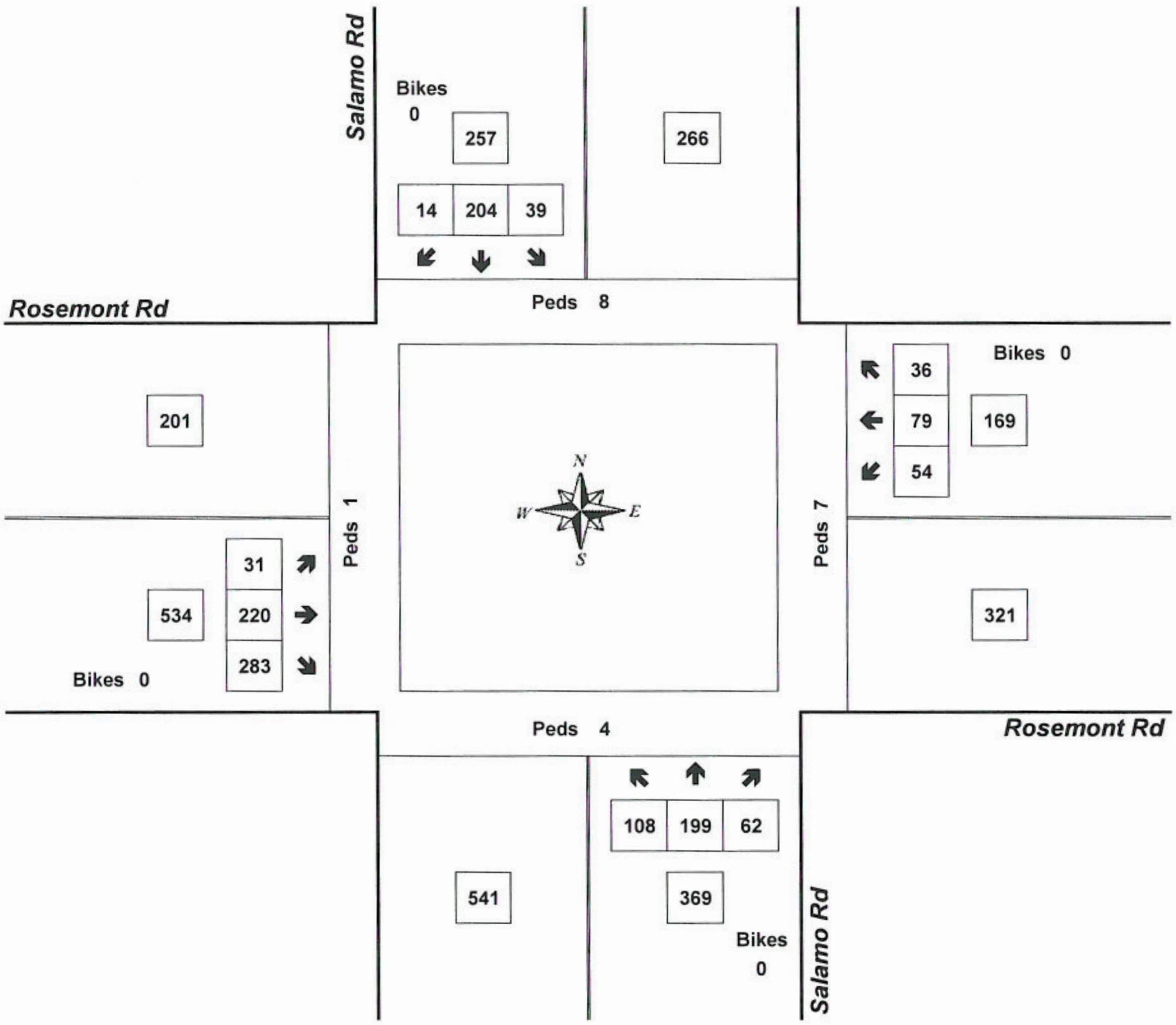
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

Salamo Rd & Rosemont Rd

4:55 PM to 5:55 PM
Tuesday, January 26, 2016



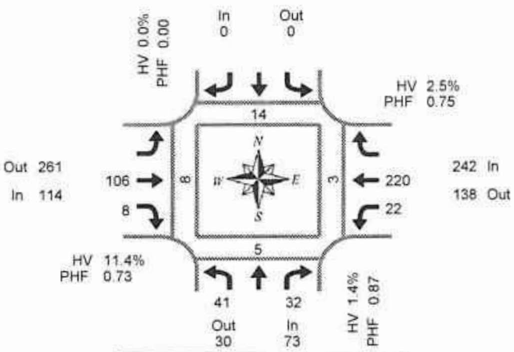
Approach	PHF	HV%	Volume
EB	0.91	0.7%	534
WB	0.80	1.8%	169
NB	0.87	0.8%	369
SB	0.90	0.0%	257
Intersection	0.93	0.8%	1,329

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
7:25 AM to 8:25 AM

Wild Rose Dr & Rosemont Rd

Wednesday, January 27, 2016
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Wild Rose Dr L	R	Bikes	Southbound Wild Rose Dr Bikes	Eastbound Rosemont Rd T	R	Bikes	Westbound Rosemont Rd L	T	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
7:00 AM	1	2	0	0	3	0	0	0	7	0	13	0	0	0	0
7:05 AM	0	0	0	0	2	0	0	0	11	1	13	2	0	0	1
7:10 AM	2	0	0	0	4	0	0	1	18	0	25	0	0	0	0
7:15 AM	2	3	0	0	6	0	0	1	9	0	21	1	0	0	0
7:20 AM	3	0	0	0	9	0	0	2	20	0	34	0	0	0	0
7:25 AM	10	2	0	0	8	0	0	4	24	0	48	2	0	0	0
7:30 AM	5	0	0	0	5	0	0	2	18	0	30	1	0	0	0
7:35 AM	2	1	0	0	4	1	1	1	32	0	41	1	0	0	0
7:40 AM	6	2	0	0	8	2	0	1	23	0	42	4	0	0	0
7:45 AM	1	2	0	0	11	1	0	1	15	0	31	1	0	0	0
7:50 AM	0	3	0	0	12	0	0	1	11	0	27	1	0	0	1
7:55 AM	4	2	0	0	4	0	0	4	9	0	23	2	0	1	0
8:00 AM	2	6	0	0	9	2	0	0	14	0	33	0	5	0	6
8:05 AM	3	4	0	0	8	0	0	1	29	0	45	1	0	0	0
8:10 AM	3	3	0	0	15	0	1	3	18	0	42	0	0	1	1
8:15 AM	2	5	0	0	7	2	0	1	12	0	29	1	0	1	0
8:20 AM	3	2	0	0	15	0	0	3	15	0	38	0	0	0	0
8:25 AM	1	1	0	0	4	1	0	7	34	0	48	0	1	1	0
8:30 AM	1	3	0	0	6	0	0	0	18	0	28	0	0	0	0
8:35 AM	0	1	0	0	4	1	0	1	17	0	24	3	0	2	0
8:40 AM	1	4	0	0	3	1	0	4	19	0	32	1	0	0	0
8:45 AM	3	0	0	0	6	2	0	3	15	0	29	2	0	0	0
8:50 AM	1	3	0	0	10	1	0	3	18	0	36	5	0	2	0
8:55 AM	6	2	0	0	12	4	0	1	13	0	38	6	0	0	2
Total Survey	62	51	0	0	175	18	2	45	419	1	770	34	6	8	11

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Wild Rose Dr L	R	Bikes	Southbound Wild Rose Dr Bikes	Eastbound Rosemont Rd T	R	Bikes	Westbound Rosemont Rd L	T	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
7:00 AM	3	2	0	0	9	0	0	1	36	1	51	2	0	0	1
7:15 AM	15	5	0	0	23	0	0	7	53	0	103	3	0	0	0
7:30 AM	13	3	0	0	17	3	1	4	73	0	113	6	0	0	0
7:45 AM	5	7	0	0	27	1	0	6	35	0	81	4	0	1	1
8:00 AM	8	13	0	0	32	2	1	4	61	0	120	1	5	1	7
8:15 AM	6	8	0	0	26	3	0	11	61	0	115	1	1	2	0
8:30 AM	2	8	0	0	13	2	0	5	54	0	84	4	0	2	0
8:45 AM	10	5	0	0	28	7	0	7	46	0	103	13	0	2	2
Total Survey	62	51	0	0	175	18	2	45	419	1	770	34	6	8	11

Peak Hour Summary
7:25 AM to 8:25 AM

By Approach	Northbound Wild Rose Dr In	Out	Total	Bikes	Southbound Wild Rose Dr In	Out	Total	Bikes	Eastbound Rosemont Rd In	Out	Total	Bikes	Westbound Rosemont Rd In	Out	Total	Bikes	Total
Volume	73	30	103	0	0	0	0	0	114	261	375	2	242	138	380	0	429
%HV	1.4%				0.0%				11.4%				2.5%				4.7%
PHF	0.87				0.00				0.73				0.75				0.89

Pedestrians Crosswalk North	South	East	West
14	5	3	8

By Movement	Northbound Wild Rose Dr L		R	Total	Southbound Wild Rose Dr			Total	Eastbound Rosemont Rd	T	R	Total	Westbound Rosemont Rd L	T		Total	Total
Volume	41		32	73				0		106	8	114	22	220		242	429
%HV	0.0%	NA	3.1%	1.4%	NA	NA	NA	0.0%	NA	9.4%	37.5%	11.4%	4.5%	2.3%	NA	2.5%	4.7%
PHF	0.60		0.62	0.87				0.00		0.72	0.50	0.73	0.79	0.74		0.75	0.89

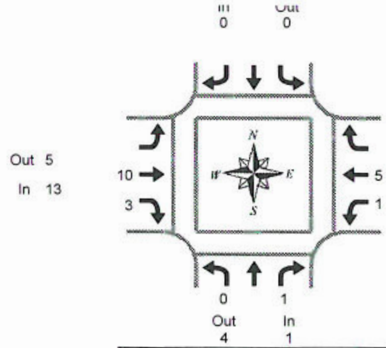
Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Wild Rose Dr L	R	Bikes	Southbound Wild Rose Dr Bikes	Eastbound Rosemont Rd T	R	Bikes	Westbound Rosemont Rd L	T	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
7:00 AM	36	17	0	0	76	4	1	18	197	1	348	15	0	1	2
7:15 AM	41	28	0	0	99	6	2	21	222	0	417	14	5	2	8
7:30 AM	32	31	0	0	102	9	2	25	230	0	429	12	6	4	8
7:45 AM	21	36	0	0	98	8	1	26	211	0	400	10	6	6	8
8:00 AM	26	34	0	0	99	14	1	27	222	0	422	19	6	7	9

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
7:25 AM to 8:25 AM

Wild Rose Dr & Rosemont Rd

Wednesday, January 27, 2016
7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Wild Rose Dr L	R	Total	Southbound Wild Rose Dr Total	Eastbound Rosemont Rd T	R	Total	Westbound Rosemont Rd L	T	Total	Interval Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0
7:05 AM	0	0	0	0	0	0	0	0	1	1	1
7:10 AM	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0
7:20 AM	0	0	0	0	0	0	0	0	0	0	0
7:25 AM	0	0	0	0	0	0	0	1	1	2	2
7:30 AM	0	0	0	0	0	0	0	0	0	0	0
7:35 AM	0	0	0	0	0	1	1	0	0	0	1
7:40 AM	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	2	0	2	0	1	1	3
7:50 AM	0	1	1	0	2	0	2	0	0	0	3
7:55 AM	0	0	0	0	0	0	0	0	1	1	1
8:00 AM	0	0	0	0	1	2	3	0	0	0	3
8:05 AM	0	0	0	0	2	0	2	0	1	1	3
8:10 AM	0	0	0	0	2	0	2	0	0	0	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	0
8:20 AM	0	0	0	0	1	0	1	0	1	1	2
8:25 AM	0	0	0	0	1	0	1	0	0	0	1
8:30 AM	0	1	1	0	0	0	0	0	0	0	1
8:35 AM	0	0	0	0	0	0	0	0	0	0	0
8:40 AM	0	1	1	0	0	0	0	0	1	1	2
8:45 AM	0	0	0	0	0	0	0	1	0	1	1
8:50 AM	0	0	0	0	2	0	2	0	2	2	4
8:55 AM	0	0	0	0	1	1	2	0	0	0	2
Total Survey	0	3	3	0	14	4	18	2	9	11	32

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Wild Rose Dr L	R	Total	Southbound Wild Rose Dr Total	Eastbound Rosemont Rd T	R	Total	Westbound Rosemont Rd L	T	Total	Interval Total
7:00 AM	0	0	0	0	0	0	0	0	1	1	1
7:15 AM	0	0	0	0	0	0	0	1	1	2	2
7:30 AM	0	0	0	0	0	1	1	0	0	0	1
7:45 AM	0	1	1	0	4	0	4	0	2	2	7
8:00 AM	0	0	0	0	5	2	7	0	1	1	8
8:15 AM	0	0	0	0	2	0	2	0	1	1	3
8:30 AM	0	2	2	0	0	0	0	0	1	1	3
8:45 AM	0	0	0	0	3	1	4	1	2	3	7
Total Survey	0	3	3	0	14	4	18	2	9	11	32

Heavy Vehicle Peak Hour Summary
7:25 AM to 8:25 AM

By Approach	Northbound Wild Rose Dr In	Out	Total	Southbound Wild Rose Dr In	Out	Total	Eastbound Rosemont Rd In	Out	Total	Westbound Rosemont Rd In	Out	Total	Total
Volume	1	4	5	0	0	0	13	5	18	6	11	17	20
PHF	0.25			0.00			0.46			0.75			0.63

By Movement	Northbound Wild Rose Dr L	R	Total	Southbound Wild Rose Dr Total	Eastbound Rosemont Rd T	R	Total	Westbound Rosemont Rd L	T	Total	Total
Volume	0	1	1	0	10	3	13	1	5	6	20
PHF	0.00	0.25	0.25	0.00	0.50	0.38	0.46	0.25	0.63	0.75	0.63

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

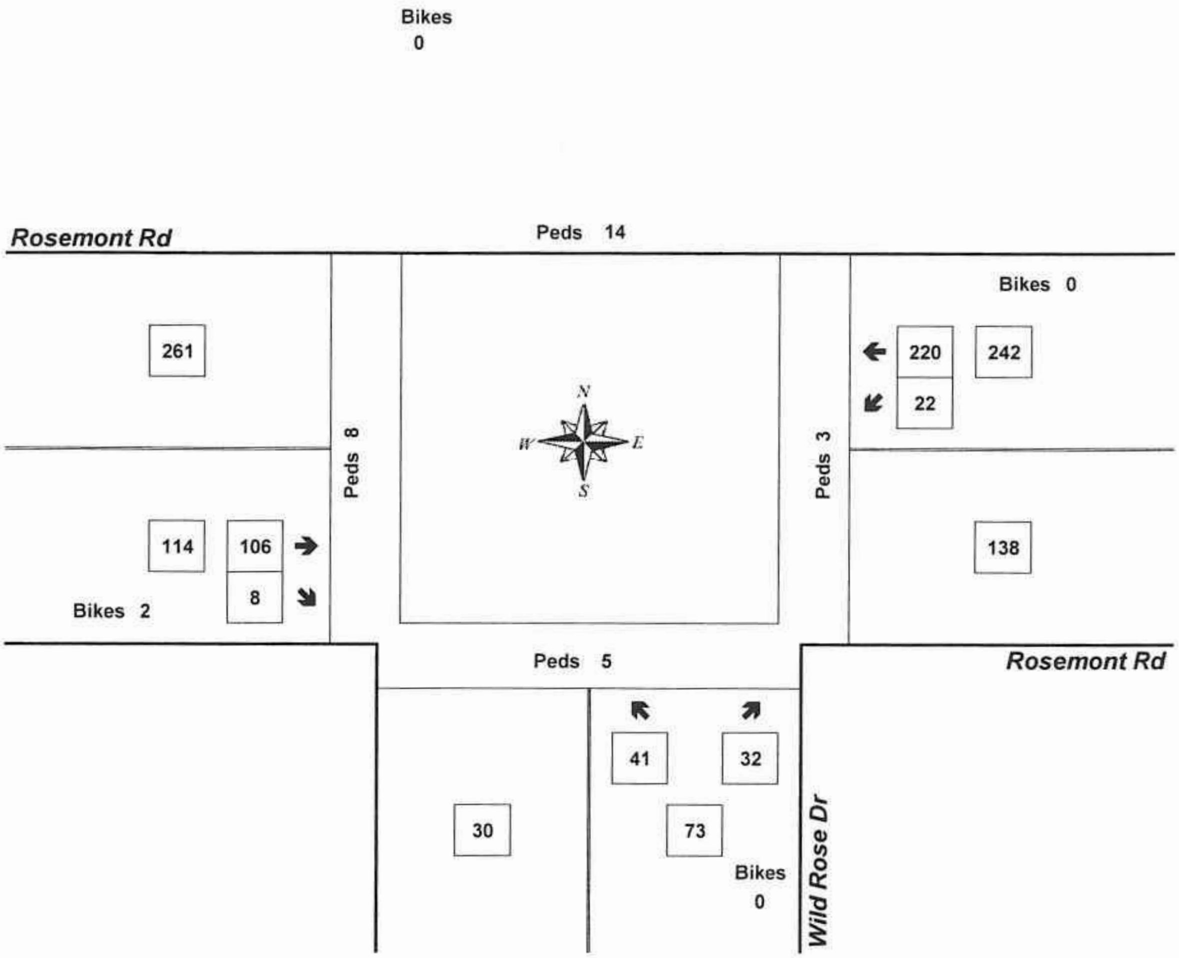
Interval Start Time	Northbound Wild Rose Dr L	R	Total	Southbound Wild Rose Dr Total	Eastbound Rosemont Rd T	R	Total	Westbound Rosemont Rd L	T	Total	Interval Total
7:00 AM	0	1	1	0	4	1	5	1	4	5	11
7:15 AM	0	1	1	0	9	3	12	1	4	5	18
7:30 AM	0	1	1	0	11	3	14	0	4	4	19
7:45 AM	0	3	3	0	11	2	13	0	5	5	21
8:00 AM	0	2	2	0	10	3	13	1	5	6	21

Peak Hour Summary

Clay Carney
(503) 833-2740

Wild Rose Dr & Rosemont Rd

7:25 AM to 8:25 AM
Wednesday, January 27, 2016



Approach	PHF	HV%	Volume
EB	0.73	11.4%	114
WB	0.75	2.5%	242
NB	0.87	1.4%	73
SB	0.00	0.0%	0
Intersection	0.89	4.7%	429

Count Period: 7:00 AM to 9:00 AM

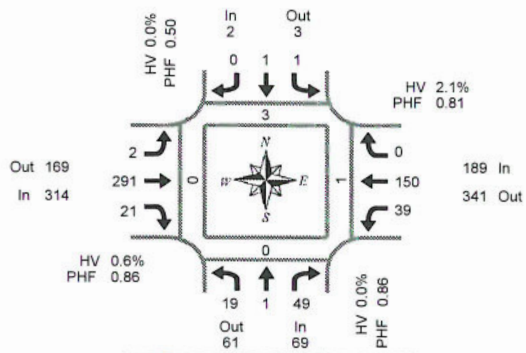
Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

Wild Rose Dr & Rosemont Rd

Tuesday, January 26, 2016
4:00 PM to 6:00 PM



Peak Hour Summary
5:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Wild Rose Dr				Southbound Wild Rose Dr				Eastbound Rosemont Rd				Westbound Rosemont Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	1	0	0	0	0	0	0	0	0	17	2	0	1	8	0	0	29	4	0	0	3
4:05 PM	2	0	6	0	0	0	0	0	0	17	1	0	2	6	0	0	34	2	0	0	0
4:10 PM	1	0	4	0	0	0	0	0	0	15	1	0	3	6	0	0	30	0	0	0	3
4:15 PM	3	0	4	0	0	0	0	0	0	17	1	0	0	7	0	0	32	1	0	0	0
4:20 PM	0	0	2	0	0	0	0	0	0	15	2	0	1	6	0	0	26	0	0	0	0
4:25 PM	2	0	1	1	0	0	0	0	0	9	4	0	4	11	0	0	31	1	0	0	0
4:30 PM	2	0	3	0	0	0	0	0	0	23	2	0	2	14	0	0	46	2	0	0	0
4:35 PM	2	0	2	0	0	0	0	0	0	20	2	0	1	9	0	0	36	2	0	0	0
4:40 PM	0	0	2	0	0	0	0	0	0	29	0	0	3	12	0	0	46	0	0	0	0
4:45 PM	0	0	1	0	0	0	0	0	0	25	0	0	1	14	0	0	41	0	1	0	0
4:50 PM	1	0	4	0	0	0	0	0	0	24	0	0	1	7	0	0	37	0	0	0	0
4:55 PM	0	0	3	0	0	0	0	0	0	20	2	0	5	11	0	0	41	1	0	0	0
5:00 PM	3	0	3	0	0	0	0	0	0	23	1	0	3	12	0	0	45	0	0	0	0
5:05 PM	2	0	6	0	0	0	0	0	0	25	4	0	3	7	0	0	47	0	0	0	0
5:10 PM	2	0	4	0	0	0	0	0	1	30	2	0	4	15	0	0	58	0	0	0	0
5:15 PM	0	0	2	0	0	0	0	0	0	25	4	0	2	19	0	0	52	1	0	0	0
5:20 PM	2	0	7	0	0	0	0	0	0	23	0	0	4	14	0	0	50	0	0	0	0
5:25 PM	0	0	3	0	0	1	0	0	0	25	2	0	6	9	0	0	46	0	0	0	0
5:30 PM	0	0	5	0	0	0	0	0	0	27	5	0	4	10	0	0	51	0	0	0	0
5:35 PM	2	0	3	0	0	0	0	0	0	23	0	0	4	15	0	0	47	0	0	0	0
5:40 PM	1	0	5	0	0	0	0	0	0	24	1	0	2	9	0	0	42	0	0	0	0
5:45 PM	1	1	4	0	0	0	0	0	0	22	0	0	3	16	0	0	47	1	0	0	0
5:50 PM	4	0	3	0	1	0	0	0	0	24	1	0	2	12	0	0	47	0	0	0	0
5:55 PM	2	0	4	0	0	0	0	0	1	20	1	0	2	12	0	0	42	1	0	1	0
Total Survey	33	1	81	1	1	1	0	0	2	522	38	0	63	261	0	0	1,003	16	1	1	6

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Wild Rose Dr				Southbound Wild Rose Dr				Eastbound Rosemont Rd				Westbound Rosemont Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	4	0	10	0	0	0	0	0	0	49	4	0	6	20	0	0	93	6	0	0	6
4:15 PM	5	0	7	1	0	0	0	0	0	41	7	0	5	24	0	0	89	2	0	0	0
4:30 PM	4	0	7	0	0	0	0	0	0	72	4	0	6	35	0	0	128	4	0	0	0
4:45 PM	1	0	8	0	0	0	0	0	0	69	2	0	7	32	0	0	119	1	1	0	0
5:00 PM	7	0	13	0	0	0	0	0	1	78	7	0	10	34	0	0	150	0	0	0	0
5:15 PM	2	0	12	0	0	1	0	0	0	73	6	0	12	42	0	0	148	1	0	0	0
5:30 PM	3	0	13	0	0	0	0	0	0	74	6	0	10	34	0	0	140	0	0	0	0
5:45 PM	7	1	11	0	1	0	0	0	1	66	2	0	7	40	0	0	136	2	0	1	0
Total Survey	33	1	81	1	1	1	0	0	2	522	38	0	63	261	0	0	1,003	16	1	1	6

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Wild Rose Dr				Southbound Wild Rose Dr				Eastbound Rosemont Rd				Westbound Rosemont 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	69	61	130	0	2	3	5	0	314	169	483	0	189	341	530	0	574	3	0	1	0
%HV	0.0%				0.0%				0.6%				2.1%				1.0%				
PHF	0.86				0.50				0.86				0.81				0.90				

By Movement	Northbound Wild Rose Dr				Southbound Wild Rose Dr				Eastbound Rosemont Rd				Westbound Rosemont Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	19	1	49	69	1	1	0	2	2	291	21	314	39	150	0	189	574
%HV	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.6%	0.0%	2.7%	0.0%	2.1%	1.0%
PHF	0.68	0.25	0.82	0.86	0.25	0.25	0.00	0.50	0.50	0.91	0.53	0.86	0.70	0.78	0.00	0.81	0.90

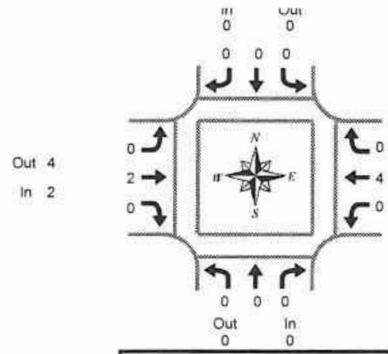
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Wild Rose Dr				Southbound Wild Rose Dr				Eastbound Rosemont Rd				Westbound Rosemont Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	14	0	32	1	0	0	0	0	0	231	17	0	24	111	0	0	429	13	1	0	6
4:15 PM	17	0	35	1	0	0	0	0	1	260	20	0	28	125	0	0	486	7	1	0	0
4:30 PM	14	0	40	0	0	1	0	0	1	292	19	0	35	143	0	0	545	6	1	0	0
4:45 PM	13	0	46	0	0	1	0	0	1	294	21	0	39	142	0	0	557	2	1	0	0
5:00 PM	19	1	49	0	1	1	0	0	2	291	21	0	39	150	0	0	574	3	0	1	0

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

Wild Rose Dr & Rosemont Rd

Tuesday, January 26, 2016
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Wild Rose Dr				Southbound Wild Rose Dr				Eastbound Rosemont Rd				Westbound Rosemont 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	0	0	0
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
4:10 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
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	1	0	1	0	1	0	1	2
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
5:10 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
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	1	0	1	1
5:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
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	1	0	1	1
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	0	0	0	0	0	6	0	6	0	6	0	6	12

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Wild Rose Dr				Southbound Wild Rose Dr				Eastbound Rosemont Rd				Westbound Rosemont Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
4:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
4:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
5:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	0	0	0	0	0	6	0	6	0	6	0	6	12

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Wild Rose Dr			Southbound Wild Rose Dr			Eastbound Rosemont Rd			Westbound Rosemont Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	2	4	6	4	2	6	6
PHF	0.00			0.00			0.50			0.50			0.50

By Movement	Northbound Wild Rose Dr				Southbound Wild Rose Dr				Eastbound Rosemont Rd				Westbound Rosemont Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	0	0	0	0	0	2	0	2	0	4	0	4	6
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.50	0.00	0.50	0.00	0.50	0.50

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Wild Rose Dr				Southbound Wild Rose Dr				Eastbound Rosemont Rd				Westbound Rosemont 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	4	0	4	0	2	0	2	6
4:15 PM	0	0	0	0	0	0	0	0	0	4	0	4	0	3	0	3	7
4:30 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	4	0	4	7
4:45 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	4	0	4	7
5:00 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	4	0	4	6

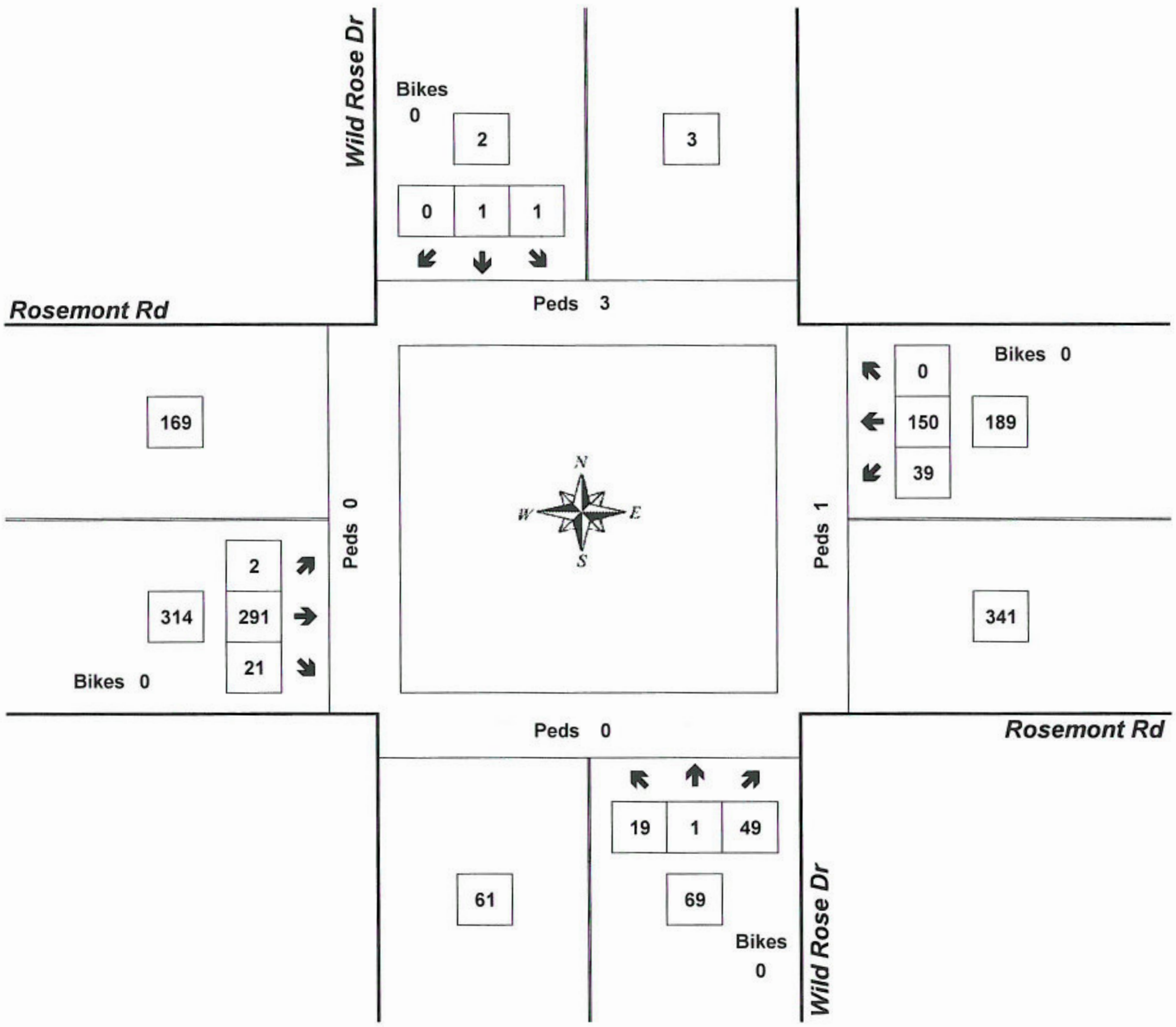
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

Wild Rose Dr & Rosemont Rd

5:00 PM to 6:00 PM
Tuesday, January 26, 2016



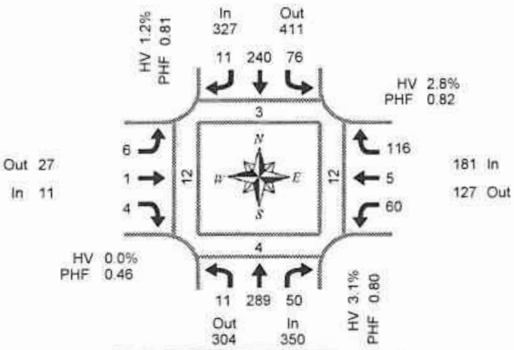
Approach	PHF	HV%	Volume
EB	0.86	0.6%	314
WB	0.81	2.1%	189
NB	0.86	0.0%	69
SB	0.50	0.0%	2
Intersection	0.90	1.0%	574

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
7:40 AM to 8:40 AM

Salamo Rd & Parker Rd

Wednesday, January 27, 2016
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Salamo Rd L	T	R	Bikes	Southbound Salamo Rd L	T	R	Bikes	Eastbound Parker Rd L	T	R	Bikes	Westbound Parker Rd L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
7:00 AM	1	15	2	0	1	10	0	0	0	0	0	0	1	0	4	0	34	0	0	0	0
7:05 AM	0	23	1	0	2	6	0	0	0	0	0	0	1	0	2	0	35	0	0	0	0
7:10 AM	0	23	2	0	1	11	0	0	0	0	0	0	1	0	8	0	46	0	0	0	0
7:15 AM	0	19	2	0	1	9	1	0	0	0	0	0	2	1	6	0	41	0	0	3	0
7:20 AM	0	25	1	0	1	11	0	0	0	0	1	0	5	0	5	0	49	0	0	0	1
7:25 AM	1	22	5	0	0	10	0	0	0	0	0	0	7	0	7	0	52	0	0	1	0
7:30 AM	0	28	2	0	1	7	0	0	1	0	0	0	4	0	10	0	53	0	0	2	0
7:35 AM	0	34	2	0	0	12	0	0	1	0	0	0	4	0	9	0	62	0	0	0	0
7:40 AM	0	36	3	0	1	22	1	0	1	0	0	0	4	0	9	0	77	0	0	0	0
7:45 AM	0	41	5	0	5	29	0	0	0	0	1	0	3	0	12	0	96	0	0	0	1
7:50 AM	0	19	5	0	6	22	1	0	0	0	0	0	4	0	8	0	65	0	0	0	0
7:55 AM	1	22	1	0	5	16	0	0	1	0	2	0	3	0	7	0	58	0	0	4	0
8:00 AM	0	32	4	0	7	32	0	0	2	0	0	0	5	0	16	0	98	0	1	0	0
8:05 AM	1	22	6	0	11	21	0	0	1	0	0	0	6	0	9	0	77	0	1	1	1
8:10 AM	0	24	2	0	11	18	1	0	0	0	0	0	7	0	7	0	70	0	0	2	0
8:15 AM	1	13	6	0	10	15	2	0	0	0	0	0	5	0	17	0	69	1	0	1	0
8:20 AM	3	23	4	0	5	9	1	0	0	0	0	0	8	2	9	0	64	0	0	1	2
8:25 AM	2	17	4	0	6	34	1	0	0	0	1	0	4	2	8	0	79	0	0	0	0
8:30 AM	1	16	7	0	5	12	0	0	0	1	0	0	7	0	2	0	51	0	2	0	7
8:35 AM	2	24	3	0	4	10	4	0	1	0	0	0	4	1	12	0	65	2	0	3	1
8:40 AM	2	19	1	1	3	16	0	0	0	0	1	0	2	0	5	0	49	0	0	4	0
8:45 AM	0	27	1	0	4	14	0	0	1	0	0	0	3	0	11	0	61	0	2	0	2
8:50 AM	2	24	2	0	4	21	2	0	1	0	0	0	3	1	15	0	75	0	0	0	6
8:55 AM	2	30	3	0	11	29	1	0	1	0	1	0	3	0	7	0	88	4	1	4	6
Total Survey	19	578	74	1	105	396	15	0	11	1	7	0	96	7	205	0	1,514	7	7	26	27

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Salamo Rd L	T	R	Bikes	Southbound Salamo Rd L	T	R	Bikes	Eastbound Parker Rd L	T	R	Bikes	Westbound Parker Rd L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
7:00 AM	1	61	5	0	4	27	0	0	0	0	0	0	3	0	14	0	115	0	0	0	0
7:15 AM	1	66	8	0	2	30	1	0	0	0	1	0	14	1	18	0	142	0	0	4	1
7:30 AM	0	98	7	0	2	41	1	0	3	0	0	0	12	0	28	0	192	0	0	2	0
7:45 AM	1	82	11	0	16	67	1	0	1	0	3	0	10	0	27	0	219	0	0	4	1
8:00 AM	1	78	12	0	29	71	1	0	3	0	0	0	18	0	32	0	245	0	2	3	1
8:15 AM	6	53	14	0	21	58	4	0	0	0	1	0	17	4	34	0	212	1	0	2	2
8:30 AM	5	59	11	1	12	38	4	0	1	1	1	0	13	1	19	0	165	2	2	7	8
8:45 AM	4	81	6	0	19	64	3	0	3	0	1	0	9	1	33	0	224	4	3	4	14
Total Survey	19	578	74	1	105	396	15	0	11	1	7	0	96	7	205	0	1,514	7	7	26	27

Peak Hour Summary
7:40 AM to 8:40 AM

By Approach	Northbound Salamo Rd In	Out	Total	Bikes	Southbound Salamo Rd In	Out	Total	Bikes	Eastbound Parker Rd In	Out	Total	Bikes	Westbound Parker Rd In	Out	Total	Bikes	Total
Volume	350	304	654	0	327	411	738	0	11	27	38	0	181	127	308	0	869
%HV	3.1%				1.2%				0.0%				2.8%				2.3%
PHF	0.80				0.81				0.46				0.82				0.89

Pedestrians Crosswalk North	South	East	West
3	4	12	12

By Movement	Northbound Salamo Rd L	T	R	Total	Southbound Salamo Rd L	T	R	Total	Eastbound Parker Rd L	T	R	Total	Westbound Parker Rd L	T	R	Total	Total
Volume	11	289	50	350	76	240	11	327	6	1	4	11	60	5	116	181	869
%HV	0.0%	2.8%	6.0%	3.1%	0.0%	1.7%	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	1.7%	0.0%	3.4%	2.8%	2.3%
PHF	0.46	0.75	0.83	0.80	0.59	0.82	0.55	0.81	0.38	0.25	0.33	0.46	0.75	0.31	0.85	0.82	0.89

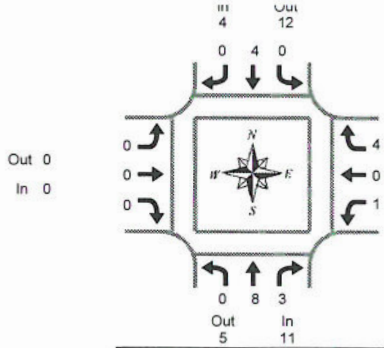
Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Salamo Rd L	T	R	Bikes	Southbound Salamo Rd L	T	R	Bikes	Eastbound Parker Rd L	T	R	Bikes	Westbound Parker Rd L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
7:00 AM	3	307	31	0	24	165	3	0	4	0	4	0	39	1	87	0	668	0	0	10	2
7:15 AM	3	324	38	0	49	209	4	0	7	0	4	0	54	1	105	0	798	0	2	13	3
7:30 AM	8	311	44	0	68	237	7	0	7	0	4	0	57	4	121	0	868	1	2	11	4
7:45 AM	13	272	48	1	78	234	10	0	5	1	5	0	58	5	112	0	841	3	4	16	12
8:00 AM	16	271	43	1	81	231	12	0	7	1	3	0	57	6	118	0	846	7	7	16	25

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
7:40 AM to 8:40 AM

Salamo Rd & Parker Rd

Wednesday, January 27, 2016
7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:10 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	2
7:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
7:20 AM	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	4	1	5	0	1	0	1	0	0	0	0	0	0	0	0	6
7:35 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:40 AM	0	2	1	3	0	1	0	1	0	0	0	0	0	0	1	1	5
7:45 AM	0	2	0	2	0	1	0	1	0	0	0	0	0	0	0	0	3
7:50 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:55 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
8:00 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	3	3	5
8:05 AM	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	2
8:10 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:35 AM	0	0	0	0	0	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	0	0	0	0	0	1	1	1
8:50 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	2
8:55 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Survey	0	17	4	21	0	6	0	6	0	0	0	0	2	0	7	9	36

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	2
7:15 AM	0	1	0	1	0	1	0	1	0	0	0	0	1	0	0	1	3
7:30 AM	0	7	2	9	0	2	0	2	0	0	0	0	0	0	1	1	12
7:45 AM	0	4	1	5	0	1	0	1	0	0	0	0	0	0	0	0	6
8:00 AM	0	2	1	3	0	2	0	2	0	0	0	0	0	0	3	3	8
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2	2	4
Total Survey	0	17	4	21	0	6	0	6	0	0	0	0	2	0	7	9	36

Heavy Vehicle Peak Hour Summary
7:40 AM to 8:40 AM

By Approach	Northbound Salamo Rd			Southbound Salamo Rd			Eastbound Parker Rd			Westbound Parker Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	11	5	16	4	12	16	0	0	0	5	3	8	20
PHF	0.46			0.50			0.00			0.42			0.56

By Movement	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	8	3	11	0	4	0	4	0	0	0	0	1	0	4	5	20
PHF	0.00	0.50	0.38	0.46	0.00	0.50	0.00	0.50	0.00	0.00	0.00	0.00	0.25	0.00	0.33	0.42	0.56

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	13	3	16	0	4	0	4	0	0	0	0	1	0	2	3	23
7:15 AM	0	14	4	18	0	6	0	6	0	0	0	0	1	0	4	5	29
7:30 AM	0	13	4	17	0	5	0	5	0	0	0	0	1	0	4	5	27
7:45 AM	0	6	2	8	0	3	0	3	0	0	0	0	1	0	3	4	15
8:00 AM	0	4	1	5	0	2	0	2	0	0	0	0	1	0	5	6	13

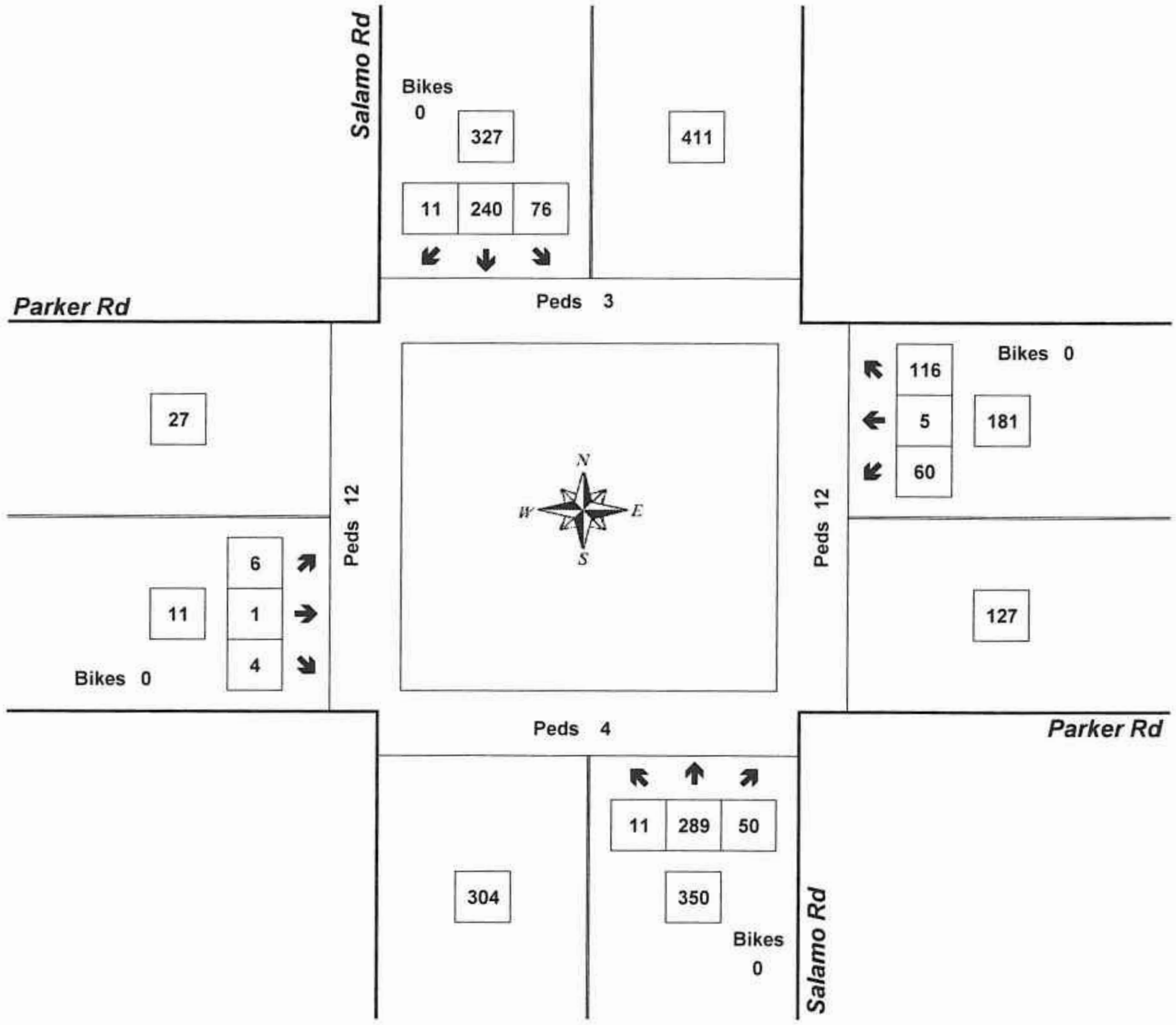
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

Salamo Rd & Parker Rd

7:40 AM to 8:40 AM
Wednesday, January 27, 2016



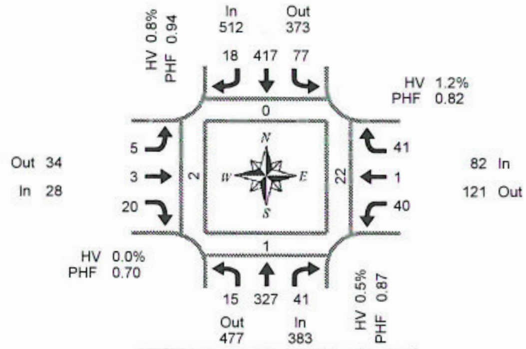
Approach	PHF	HV%	Volume
EB	0.46	0.0%	11
WB	0.82	2.8%	181
NB	0.80	3.1%	350
SB	0.81	1.2%	327
Intersection	0.89	2.3%	869

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:55 PM to 5:55 PM

Salamo Rd & Parker Rd

Tuesday, January 26, 2016
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	19	3	0	10	41	1	0	0	1	4	0	2	0	5	0	86	10	0	10	0
4:05 PM	0	23	5	0	7	33	0	0	0	0	2	0	2	0	3	0	75	0	1	2	0
4:10 PM	0	27	2	0	7	25	0	0	2	0	0	0	4	0	1	0	68	0	0	0	0
4:15 PM	0	23	4	0	4	30	0	0	0	0	0	0	4	0	1	0	66	0	0	1	0
4:20 PM	1	30	6	0	5	24	1	0	0	0	1	0	2	0	4	0	74	2	0	2	0
4:25 PM	0	30	2	0	4	41	0	0	0	0	0	0	1	0	1	0	79	0	0	2	0
4:30 PM	1	21	5	0	6	29	0	0	0	0	0	0	2	0	4	0	68	0	0	1	0
4:35 PM	2	14	6	1	3	25	0	0	0	0	0	0	4	0	2	0	56	0	0	2	0
4:40 PM	0	11	4	0	4	33	0	0	0	0	0	0	3	0	2	0	57	0	0	0	1
4:45 PM	0	23	4	0	5	43	0	0	1	0	2	0	3	0	2	0	83	0	0	1	1
4:50 PM	1	25	3	0	4	30	1	0	0	0	0	0	1	0	3	0	68	0	0	0	0
4:55 PM	0	27	2	0	7	52	1	0	0	1	1	0	1	0	1	0	93	0	0	1	0
5:00 PM	0	24	5	0	6	26	1	0	2	0	3	0	1	0	1	0	69	0	1	2	0
5:05 PM	3	35	6	0	6	29	0	0	0	1	2	0	3	0	2	0	87	0	0	0	1
5:10 PM	0	21	0	0	7	37	0	0	0	1	1	0	4	0	7	0	78	0	0	2	0
5:15 PM	0	34	4	0	7	34	2	0	1	0	0	0	5	1	2	0	90	0	0	2	0
5:20 PM	2	24	2	0	8	41	0	0	0	0	1	0	2	0	4	0	84	0	0	0	0
5:25 PM	0	27	4	0	7	29	2	0	0	0	6	0	2	0	6	0	83	0	0	0	0
5:30 PM	0	36	4	0	7	34	3	0	1	0	2	0	6	0	2	0	95	0	0	5	0
5:35 PM	1	23	9	0	8	29	2	0	0	0	0	0	3	0	4	0	79	0	0	2	1
5:40 PM	5	32	0	0	4	39	2	0	1	0	2	0	2	0	5	0	92	0	0	2	0
5:45 PM	4	24	3	0	5	30	1	0	0	0	0	0	5	0	5	0	77	0	0	3	0
5:50 PM	0	20	2	0	5	37	4	0	0	0	2	0	6	0	2	0	78	0	0	3	0
5:55 PM	3	24	4	0	9	36	5	0	0	0	2	0	0	0	2	0	85	0	0	0	0
Total Survey	23	597	89	1	145	807	26	0	8	4	31	0	68	1	71	0	1,870	12	2	43	4

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	69	10	0	24	99	1	0	2	1	6	0	8	0	9	0	229	10	1	12	0
4:15 PM	1	83	12	0	13	95	1	0	0	0	1	0	7	0	6	0	219	2	0	5	0
4:30 PM	3	46	15	1	13	87	0	0	0	0	0	0	9	0	8	0	181	0	0	3	1
4:45 PM	1	75	9	0	16	125	2	0	1	1	3	0	5	0	6	0	244	0	0	2	1
5:00 PM	3	80	11	0	19	92	1	0	2	2	6	0	8	0	10	0	234	0	1	4	1
5:15 PM	2	85	10	0	22	104	4	0	1	0	7	0	9	1	12	0	257	0	0	2	0
5:30 PM	6	91	13	0	19	102	7	0	2	0	4	0	11	0	11	0	266	0	0	9	1
5:45 PM	7	68	9	0	19	103	10	0	0	0	4	0	11	0	9	0	240	0	0	6	0
Total Survey	23	597	89	1	145	807	26	0	8	4	31	0	68	1	71	0	1,870	12	2	43	4

Peak Hour Summary
4:55 PM to 5:55 PM

By Approach	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker 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	383	477	860	0	512	373	885	0	28	34	62	0	82	121	203	0	1,005	0	1	22	2
%HV	0.5%				0.8%				0.0%				1.2%				0.7%				
PHF	0.87				0.94				0.70				0.82				0.94				

By Movement	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	15	327	41	383	77	417	18	512	5	3	20	28	40	1	41	82	1,005
%HV	0.0%	0.3%	2.4%	0.5%	1.3%	0.7%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	1.2%	0.7%
PHF	0.38	0.90	0.60	0.87	0.88	0.93	0.64	0.94	0.63	0.38	0.56	0.70	0.77	0.25	0.73	0.82	0.94

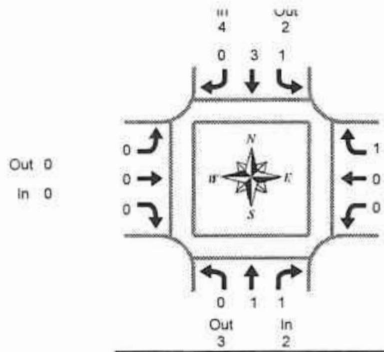
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	5	273	46	1	66	406	4	0	3	2	10	0	29	0	29	0	873	12	1	22	2
4:15 PM	8	284	47	1	61	399	4	0	3	3	10	0	29	0	30	0	878	2	1	14	3
4:30 PM	9	286	45	1	70	408	7	0	4	3	16	0	31	1	36	0	916	0	1	11	3
4:45 PM	12	331	43	0	76	423	14	0	6	3	20	0	33	1	39	0	1,001	0	1	17	3
5:00 PM	18	324	43	0	79	401	22	0	5	2	21	0	39	1	42	0	997	0	1	21	2

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:55 PM to 5:55 PM

Salamo Rd & Parker Rd

Tuesday, January 26, 2016
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker 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	0	0	0
4:05 PM	0	1	0	1	0	1	0	1	0	0	0	0	1	0	0	1	3
4:10 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:35 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	0	0	0	0	1	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	0	0	0
5:05 PM	0	1	0	1	0	0	0	0	0	0	0	0	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	1	1	1	1	0	2	0	0	0	0	0	0	0	0	3
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	0	0	0
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	1	0	1	0	0	0	0	0	0	1	1	2
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	3	2	5	2	5	0	7	0	0	0	0	1	0	1	2	14

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	1	0	1	1	1	0	2	0	0	0	0	1	0	0	1	4
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
5:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	1	1	1	1	0	2	0	0	0	0	0	0	0	0	3
5:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	3	2	5	2	5	0	7	0	0	0	0	1	0	1	2	14

Heavy Vehicle Peak Hour Summary
4:55 PM to 5:55 PM

By Approach	Northbound Salamo Rd			Southbound Salamo Rd			Eastbound Parker Rd			Westbound Parker Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	3	5	4	2	6	0	0	0	1	2	3	7
PHF	0.25			0.50			0.00			0.25			0.44

By Movement	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	1	1	2	1	3	0	4	0	0	0	0	0	0	1	1	7
PHF	0.00	0.25	0.25	0.25	0.25	0.75	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.25	0.44

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	2	1	3	1	3	0	4	0	0	0	0	1	0	0	1	8
4:15 PM	0	2	1	3	0	2	0	2	0	0	0	0	0	0	0	0	5
4:30 PM	0	2	2	4	1	3	0	4	0	0	0	0	0	0	0	0	8
4:45 PM	0	1	1	2	1	4	0	5	0	0	0	0	0	0	1	1	8
5:00 PM	0	1	1	2	1	2	0	3	0	0	0	0	0	0	1	1	6

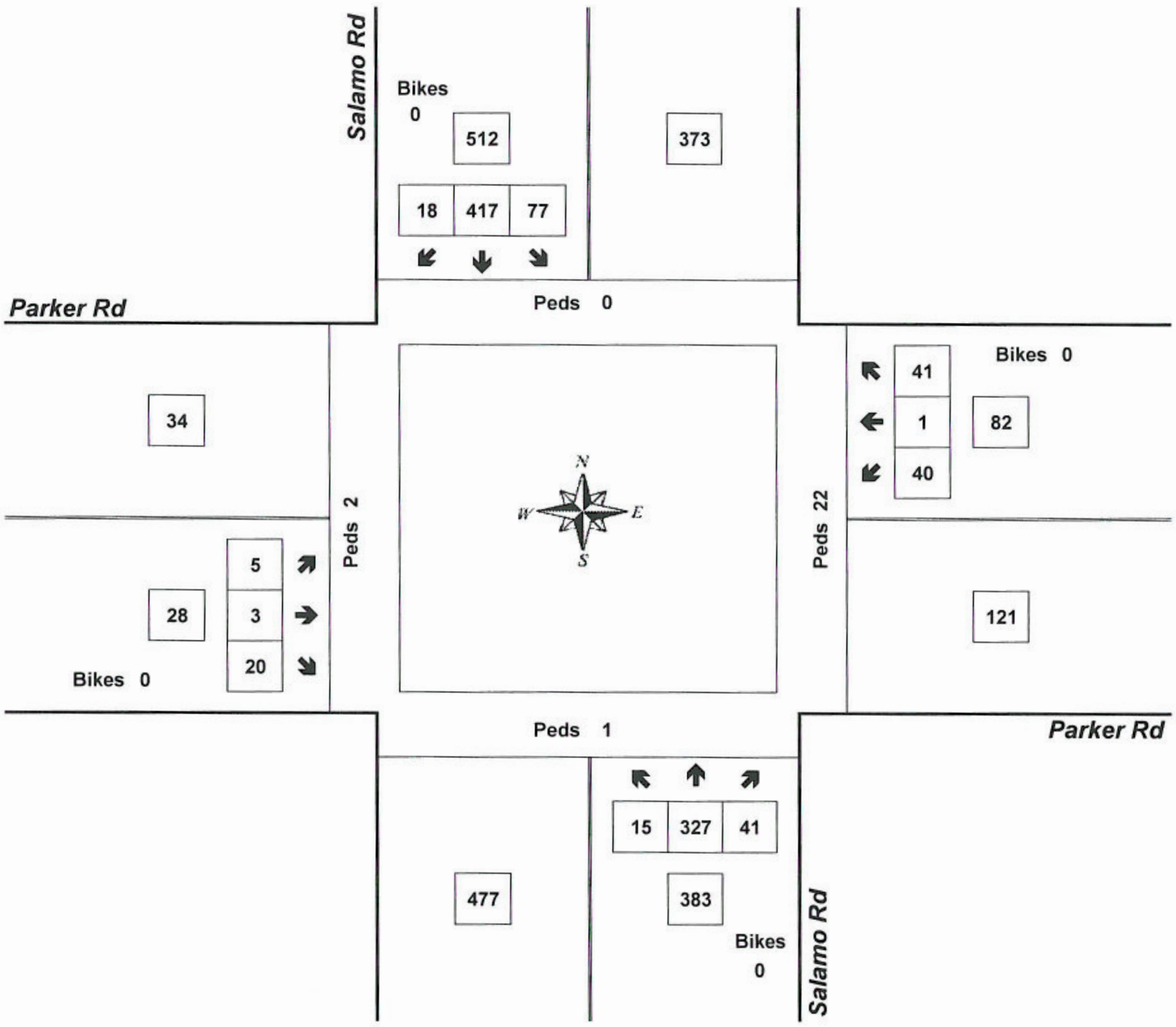
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

Salamo Rd & Parker Rd

4:55 PM to 5:55 PM
Tuesday, January 26, 2016



Approach	PHF	HV%	Volume
EB	0.70	0.0%	28
WB	0.82	1.2%	82
NB	0.87	0.5%	383
SB	0.94	0.8%	512
Intersection	0.94	0.7%	1,005

Count Period: 4:00 PM to 6:00 PM

2e

TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Variable: Dwelling Units
Variable Value: 52

AM PEAK HOUR

Trip Rate: 0.75

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	**10**	**29**	**39**

PM PEAK HOUR

Trip Rate: 1.00

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	**33**	**19**	**52**

WEEKDAY

Trip Rate: 9.52

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**248**	**248**	**496**

SATURDAY

Trip Rate: 9.91

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**258**	**258**	**516**

Source: TRIP GENERATION, Ninth Edition

1e

LEVEL OF SERVICE

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

Level of service A: Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.

Level of service B: Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.

Level of service C: Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.

Level of service D: Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.

Level of service E: Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.

Level of service F: Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

1e

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.89		1.00	0.96		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1580		1755	1771		1730	1770		1737	1797	
Flt Permitted	0.45	1.00		0.53	1.00		0.50	1.00		0.60	1.00	
Satd. Flow (perm)	819	1580		977	1771		912	1770		1096	1797	
Volume (vph)	18	51	128	60	152	59	221	173	34	17	152	26
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	22	64	160	75	190	74	276	216	42	21	190	32
RTOR Reduction (vph)	0	129	0	0	27	0	0	9	0	0	9	0
Lane Group Flow (vph)	22	95	0	75	237	0	276	249	0	21	213	0
Confl. Peds. (#/hr)	5		8	8		5	7		15	15		7
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	4%	4%	4%	3%	3%	3%
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8	8		2			6		
Actuated Green, G (s)	8.8	8.8		8.8	8.8		29.1	24.2		18.0	17.1	
Effective Green, g (s)	8.8	8.8		8.8	8.8		29.1	24.2		18.0	17.1	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.63	0.53		0.39	0.37	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	157	303		187	340		721	933		442	669	
v/s Ratio Prot		0.06			c0.13		c0.07	0.14		0.00	0.12	
v/s Ratio Perm	0.03			0.08			c0.18			0.02		
v/c Ratio	0.14	0.31		0.40	0.70		0.38	0.27		0.05	0.32	
Uniform Delay, d1	15.4	15.9		16.2	17.3		3.9	6.0		8.6	10.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.6		1.4	6.1		0.3	0.2		0.0	0.3	
Delay (s)	15.8	16.5		17.7	23.4		4.2	6.1		8.6	10.5	
Level of Service	B	B		B	C		A	A		A	B	
Approach Delay (s)		16.5			22.2			5.1			10.4	
Approach LOS		B			C			A			B	

Intersection Summary			
HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	45.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	106	8	22	220	0	41	0	32	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	119	9	25	247	0	46	0	36	0	0	0
Pedestrians		8			3			5			14	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	261			133			433	439	132	473	444	269
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	261			133			433	439	132	473	444	269
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			91	100	96	100	100	100
cM capacity (veh/h)	1238			1440			516	496	914	466	495	760

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	128	272	82	0
Volume Left	0	25	46	0
Volume Right	9	0	36	0
cSH	1238	1440	637	1700
Volume to Capacity	0.00	0.02	0.13	0.00
Queue Length 95th (ft)	0	1	11	0
Control Delay (s)	0.0	0.8	11.5	0.0
Lane LOS		A	B	A
Approach Delay (s)	0.0	0.8	11.5	0.0
Approach LOS			B	A

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	32.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	1	4	60	5	116	11	289	50	76	240	11
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	7	1	4	67	6	130	12	325	56	85	270	12
Pedestrians		12			12			4			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	944	876	292	839	854	368	294			393		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	944	876	292	839	854	368	294			393		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	100	99	74	98	80	99			93		
cM capacity (veh/h)	176	260	742	256	265	667	1249			1159		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	7	6	67	136	12	381	85	282
Volume Left	7	0	67	0	12	0	85	0
Volume Right	0	4	0	130	0	56	0	12
cSH	176	542	256	628	1249	1700	1159	1700
Volume to Capacity	0.04	0.01	0.26	0.22	0.01	0.22	0.07	0.17
Queue Length 95th (ft)	3	1	26	20	1	0	6	0
Control Delay (s)	26.3	11.7	24.0	12.3	7.9	0.0	8.4	0.0
Lane LOS	D	B	C	B	A		A	
Approach Delay (s)	19.6		16.2		0.2		1.9	
Approach LOS	C		C					

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	4	0	3	5	0	8	1	61	2	2	27	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	0	3	6	0	9	1	69	2	2	30	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	116	108	31	111	108	70	31			71		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	116	108	31	111	108	70	31			71		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	99	100	99	100			100		
cM capacity (veh/h)	851	780	1043	863	781	993	1581			1530		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	15	72	34
Volume Left	4	6	1	2
Volume Right	3	9	2	1
cSH	924	939	1581	1530
Volume to Capacity	0.01	0.02	0.00	0.00
Queue Length 95th (ft)	1	1	0	0
Control Delay (s)	8.9	8.9	0.1	0.5
Lane LOS	A	A	A	A
Approach Delay (s)	8.9	8.9	0.1	0.5
Approach LOS	A	A		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	13.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.95		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1771	1698		1766	1758		1786	1801		1799	1879	
Flt Permitted	0.68	1.00		0.25	1.00		0.53	1.00		0.58	1.00	
Satd. Flow (perm)	1263	1698		468	1758		999	1801		1094	1879	
Volume (vph)	31	220	283	54	79	36	108	199	62	39	204	14
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	33	237	304	58	85	39	116	214	67	42	219	15
RTOR Reduction (vph)	0	87	0	0	24	0	0	18	0	0	4	0
Lane Group Flow (vph)	33	454	0	58	100	0	116	263	0	42	230	0
Confl. Peds. (#/hr)	8		4	4		8	1		7	7		1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	0%	0%	0%
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8	8		2			6		
Actuated Green, G (s)	15.9	15.9		15.9	15.9		15.4	13.0		13.0	11.8	
Effective Green, g (s)	15.9	15.9		15.9	15.9		15.4	13.0		13.0	11.8	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.37	0.31		0.31	0.28	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	477	641		177	664		410	556		358	527	
v/s Ratio Prot		c0.27			0.06		c0.02	c0.15		0.00	0.12	
v/s Ratio Perm	0.03			0.12			0.09			0.03		
v/c Ratio	0.07	0.71		0.33	0.15		0.28	0.47		0.12	0.44	
Uniform Delay, d1	8.4	11.1		9.3	8.6		9.1	11.8		10.3	12.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	3.6		1.1	0.1		0.4	0.6		0.1	0.6	
Delay (s)	8.4	14.7		10.4	8.7		9.5	12.4		10.4	13.0	
Level of Service	A	B		B	A		A	B		B	B	
Approach Delay (s)		14.3			9.3			11.6			12.6	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	42.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	291	21	39	150	0	19	1	49	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	323	23	43	167	0	21	1	54	1	1	0
Pedestrians					1						3	
Lane Width (ft)					12.0						12.0	
Walking Speed (ft/s)					4.0						4.0	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	170			347			593	596	336	652	607	170
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	170			347			593	596	336	652	607	170
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			95	100	92	100	100	100
cM capacity (veh/h)	1410			1212			406	403	710	342	397	877

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	349	210	77	2
Volume Left	2	43	21	1
Volume Right	23	0	54	0
cSH	1410	1212	584	367
Volume to Capacity	0.00	0.04	0.13	0.01
Queue Length 95th (ft)	0	3	11	0
Control Delay (s)	0.1	1.9	12.1	14.9
Lane LOS	A	A	B	B
Approach Delay (s)	0.1	1.9	12.1	14.9
Approach LOS			B	B

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	3	20	40	1	41	15	327	41	77	417	18
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	3	21	43	1	44	16	348	44	82	444	19
Pedestrians		2			22			1				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			2			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1043	1064	456	1055	1052	392	465			413		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1043	1064	456	1055	1052	392	465			413		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	*3.0	4.0	3.3	2.2			2.2		
p0 queue free %	97	98	96	78	99	93	99			93		
cM capacity (veh/h)	179	201	607	193	204	647	1100			1130		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	5	24	43	45	16	391	82	463
Volume Left	5	0	43	0	16	0	82	0
Volume Right	0	21	0	44	0	44	0	19
cSH	179	481	193	615	1100	1700	1130	1700
Volume to Capacity	0.03	0.05	0.22	0.07	0.01	0.23	0.07	0.27
Queue Length 95th (ft)	2	4	20	6	1	0	6	0
Control Delay (s)	25.8	12.9	28.8	11.3	8.3	0.0	8.4	0.0
Lane LOS	D	B	D	B	A		A	
Approach Delay (s)	15.2		19.8		0.3		1.3	
Approach LOS	C		C					

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	0	2	4	0	5	3	62	6	8	48	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	0	2	4	0	6	3	69	7	9	53	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	158	156	56	155	156	72	59			76		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	158	156	56	155	156	72	59			76		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	99	100			99		
cM capacity (veh/h)	798	730	1010	805	730	990	1545			1524		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	10	79	68
Volume Left	2	4	3	9
Volume Right	2	6	7	6
cSH	892	898	1545	1524
Volume to Capacity	0.00	0.01	0.00	0.01
Queue Length 95th (ft)	0	1	0	0
Control Delay (s)	9.1	9.1	0.3	1.0
Lane LOS	A	A	A	A
Approach Delay (s)	9.1	9.1	0.3	1.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	16.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.89		1.00	0.96		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1579		1755	1772		1730	1770		1737	1796	
Flt Permitted	0.45	1.00		0.51	1.00		0.49	1.00		0.59	1.00	
Satd. Flow (perm)	810	1579		933	1772		889	1770		1086	1796	
Volume (vph)	19	53	133	62	158	61	230	180	35	18	158	27
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	24	66	166	78	198	76	288	225	44	22	198	34
RTOR Reduction (vph)	0	134	0	0	26	0	0	10	0	0	9	0
Lane Group Flow (vph)	24	98	0	78	248	0	288	259	0	22	223	0
Confl. Peds. (#/hr)	5		8	8		5	7		15	15		7
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	4%	4%	4%	3%	3%	3%
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8	8		2			6		
Actuated Green, G (s)	8.9	8.9		8.9	8.9		29.7	25.0		17.9	17.2	
Effective Green, g (s)	8.9	8.9		8.9	8.9		29.7	25.0		17.9	17.2	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.64	0.54		0.38	0.37	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	155	302		178	338		720	950		427	663	
v/s Ratio Prot		0.06			c0.14		c0.07	0.15		0.00	0.12	
v/s Ratio Perm	0.03			0.08			c0.18			0.02		
v/c Ratio	0.15	0.32		0.44	0.73		0.40	0.27		0.05	0.34	
Uniform Delay, d1	15.7	16.3		16.6	17.7		3.9	5.9		9.0	10.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.6		1.7	8.0		0.4	0.2		0.1	0.3	
Delay (s)	16.2	16.9		18.4	25.8		4.3	6.0		9.0	10.9	
Level of Service	B	B		B	C		A	A		A	B	
Approach Delay (s)		16.8			24.1			5.1			10.7	
Approach LOS		B			C			A			B	

Intersection Summary			
HCM Average Control Delay	13.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	46.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	110	8	23	229	0	43	0	33	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	124	9	26	257	0	48	0	37	0	0	0
Pedestrians		8			3			5			14	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	271			138			450	456	136	491	461	279
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	271			138			450	456	136	491	461	279
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			90	100	96	100	100	100
cM capacity (veh/h)	1227			1434			502	485	909	452	484	750

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	133	283	85	0
Volume Left	0	26	48	0
Volume Right	9	0	37	0
cSH	1227	1434	623	1700
Volume to Capacity	0.00	0.02	0.14	0.00
Queue Length 95th (ft)	0	1	12	0
Control Delay (s)	0.0	0.8	11.7	0.0
Lane LOS		A	B	A
Approach Delay (s)	0.0	0.8	11.7	0.0
Approach LOS			B	A

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	1	4	62	5	121	11	301	52	79	250	11
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	7	1	4	70	6	136	12	338	58	89	281	12
Pedestrians		12			12			4			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	981	910	303	872	887	382	305			409		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	981	910	303	872	887	382	305			409		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	100	99	71	98	79	99			92		
cM capacity (veh/h)	163	248	732	243	252	654	1237			1144		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	7	6	70	142	12	397	89	293
Volume Left	7	0	70	0	12	0	89	0
Volume Right	0	4	0	136	0	58	0	12
cSH	163	526	243	616	1237	1700	1144	1700
Volume to Capacity	0.04	0.01	0.29	0.23	0.01	0.23	0.08	0.17
Queue Length 95th (ft)	3	1	29	22	1	0	6	0
Control Delay (s)	28.0	11.9	25.7	12.6	7.9	0.0	8.4	0.0
Lane LOS	D	B	D	B	A		A	
Approach Delay (s)	20.7		16.9		0.2		2.0	
Approach LOS	C		C					

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	4	0	3	5	0	8	1	64	2	2	28	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	0	3	6	0	9	1	72	2	2	31	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	121	113	32	115	112	73	33			74		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	121	113	32	115	112	73	33			74		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	99	100	99	100			100		
cM capacity (veh/h)	845	776	1042	857	776	989	1579			1525		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	15	75	35
Volume Left	4	6	1	2
Volume Right	3	9	2	1
cSH	920	934	1579	1525
Volume to Capacity	0.01	0.02	0.00	0.00
Queue Length 95th (ft)	1	1	0	0
Control Delay (s)	8.9	8.9	0.1	0.5
Lane LOS	A	A	A	A
Approach Delay (s)	8.9	8.9	0.1	0.5
Approach LOS	A	A		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	13.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.95		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1771	1698		1766	1759		1786	1801		1799	1879	
Flt Permitted	0.67	1.00		0.24	1.00		0.53	1.00		0.54	1.00	
Satd. Flow (perm)	1258	1698		453	1759		1006	1801		1016	1879	
Volume (vph)	32	229	294	56	82	37	112	207	65	41	212	15
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	34	246	316	60	88	40	120	223	70	44	228	16
RTOR Reduction (vph)	0	86	0	0	25	0	0	18	0	0	4	0
Lane Group Flow (vph)	34	476	0	60	103	0	120	275	0	44	240	0
Confl. Peds. (#/hr)	8		4	4		8	1		7	7		1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	0%	0%	0%
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8	8		2			6		
Actuated Green, G (s)	16.4	16.4		16.4	16.4		14.9	13.0		13.3	12.2	
Effective Green, g (s)	16.4	16.4		16.4	16.4		14.9	13.0		13.3	12.2	
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.35	0.31		0.31	0.29	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	485	655		175	679		388	551		338	539	
v/s Ratio Prot		c0.28			0.06		c0.01	c0.15		0.00	0.13	
v/s Ratio Perm	0.03			0.13			0.09			0.04		
v/c Ratio	0.07	0.73		0.34	0.15		0.31	0.50		0.13	0.44	
Uniform Delay, d1	8.2	11.1		9.2	8.5		9.7	12.1		10.3	12.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	4.0		1.2	0.1		0.5	0.7		0.2	0.6	
Delay (s)	8.3	15.2		10.4	8.6		10.1	12.8		10.5	13.0	
Level of Service	A	B		B	A		B	B		B	B	
Approach Delay (s)		14.8			9.2			12.0			12.6	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	42.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	303	22	41	156	0	20	1	51	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	337	24	46	173	0	22	1	57	1	1	0
Pedestrians					1						3	
Lane Width (ft)					12.0						12.0	
Walking Speed (ft/s)					4.0						4.0	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	176			361			618	621	350	679	633	176
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	176			361			618	621	350	679	633	176
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			94	100	92	100	100	100
cM capacity (veh/h)	1402			1198			390	389	697	326	383	870

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	363	219	80	2
Volume Left	2	46	22	1
Volume Right	24	0	57	0
cSH	1402	1198	567	352
Volume to Capacity	0.00	0.04	0.14	0.01
Queue Length 95th (ft)	0	3	12	0
Control Delay (s)	0.1	2.0	12.4	15.3
Lane LOS	A	A	B	C
Approach Delay (s)	0.1	2.0	12.4	15.3
Approach LOS			B	C

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	3	21	42	1	43	16	340	43	80	434	19
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	3	22	45	1	46	17	362	46	85	462	20
Pedestrians		2			22			1				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			2			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1086	1108	475	1097	1095	407	484			429		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1086	1108	475	1097	1095	407	484			429		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	*3.0	4.0	3.3	2.2			2.2		
p0 queue free %	97	98	96	75	99	93	98			92		
cM capacity (veh/h)	165	189	592	179	191	635	1082			1115		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	5	26	45	47	17	407	85	482
Volume Left	5	0	45	0	17	0	85	0
Volume Right	0	22	0	46	0	46	0	20
cSH	165	467	179	603	1082	1700	1115	1700
Volume to Capacity	0.03	0.05	0.25	0.08	0.02	0.24	0.08	0.28
Queue Length 95th (ft)	2	4	24	6	1	0	6	0
Control Delay (s)	27.5	13.1	31.7	11.5	8.4	0.0	8.5	0.0
Lane LOS	D	B	D	B	A		A	
Approach Delay (s)	15.6		21.3		0.3		1.3	
Approach LOS	C		C					

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	0	2	4	0	5	3	65	6	8	51	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	0	2	4	0	6	3	72	7	9	57	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	165	163	59	162	162	76	62			79		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	165	163	59	162	162	76	62			79		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	99	100			99		
cM capacity (veh/h)	790	724	1006	797	724	986	1541			1519		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	10	82	71
Volume Left	2	4	3	9
Volume Right	2	6	7	6
cSH	885	892	1541	1519
Volume to Capacity	0.01	0.01	0.00	0.01
Queue Length 95th (ft)	0	1	0	0
Control Delay (s)	9.1	9.1	0.3	1.0
Lane LOS	A	A	A	A
Approach Delay (s)	9.1	9.1	0.3	1.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	16.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.89		1.00	0.96		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1582		1755	1772		1730	1770		1737	1796	
Flt Permitted	0.43	1.00		0.50	1.00		0.49	1.00		0.59	1.00	
Satd. Flow (perm)	783	1582		927	1772		887	1770		1086	1796	
Volume (vph)	19	55	133	62	164	63	230	180	35	18	158	27
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	24	69	166	78	205	79	288	225	44	22	198	34
RTOR Reduction (vph)	0	133	0	0	27	0	0	9	0	0	9	0
Lane Group Flow (vph)	24	102	0	78	257	0	288	260	0	22	223	0
Confl. Peds. (#/hr)	5		8	8		5	7		15	15		7
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	4%	4%	4%	3%	3%	3%
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8	8		2			6		
Actuated Green, G (s)	9.2	9.2		9.2	9.2		29.7	25.0		17.9	17.2	
Effective Green, g (s)	9.2	9.2		9.2	9.2		29.7	25.0		17.9	17.2	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.63	0.53		0.38	0.37	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	154	310		182	348		714	943		424	659	
v/s Ratio Prot		0.06			c0.15		c0.07	0.15		0.00	0.12	
v/s Ratio Perm	0.03			0.08			c0.18			0.02		
v/c Ratio	0.16	0.33		0.43	0.74		0.40	0.28		0.05	0.34	
Uniform Delay, d1	15.6	16.2		16.5	17.7		4.1	6.0		9.1	10.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.6		1.6	8.0		0.4	0.2		0.1	0.3	
Delay (s)	16.1	16.8		18.2	25.7		4.4	6.2		9.1	11.0	
Level of Service	B	B		B	C		A	A		A	B	
Approach Delay (s)		16.7			24.1			5.3			10.9	
Approach LOS		B			C			A			B	

Intersection Summary			
HCM Average Control Delay	13.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	46.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	118	2	3	281	8	8
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	133	2	3	316	9	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	1231					
pX, platoon unblocked						
vC, conflicting volume			135		456	134
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			135		456	134
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	99
cM capacity (veh/h)			1443		561	915

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	135	319	18
Volume Left	0	3	9
Volume Right	2	0	9
cSH	1700	1443	696
Volume to Capacity	0.08	0.00	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.1	10.3
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	10.3
Approach LOS			B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	118	8	23	232	0	43	0	35	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	133	9	26	261	0	48	0	39	0	0	0
Pedestrians		8			3			5			14	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	275			147			462	468	145	506	473	283
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	275			147			462	468	145	506	473	283
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			90	100	96	100	100	100
cM capacity (veh/h)	1224			1423			493	477	899	441	476	747

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	142	287	88	0
Volume Left	0	26	48	0
Volume Right	9	0	39	0
cSH	1224	1423	618	1700
Volume to Capacity	0.00	0.02	0.14	0.00
Queue Length 95th (ft)	0	1	12	0
Control Delay (s)	0.0	0.8	11.8	0.0
Lane LOS		A	B	A
Approach Delay (s)	0.0	0.8	11.8	0.0
Approach LOS			B	A

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	37.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	1	4	66	5	121	11	301	54	79	250	11
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	7	1	4	74	6	136	12	338	61	89	281	12
Pedestrians		12			12			4			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	981	912	303	873	888	384	305			411		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	981	912	303	873	888	384	305			411		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	100	99	69	98	79	99			92		
cM capacity (veh/h)	163	247	732	242	252	653	1237			1142		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	7	6	74	142	12	399	89	293
Volume Left	7	0	74	0	12	0	89	0
Volume Right	0	4	0	136	0	61	0	12
cSH	163	525	242	615	1237	1700	1142	1700
Volume to Capacity	0.04	0.01	0.31	0.23	0.01	0.23	0.08	0.17
Queue Length 95th (ft)	3	1	31	22	1	0	6	0
Control Delay (s)	28.0	11.9	26.3	12.6	7.9	0.0	8.4	0.0
Lane LOS	D	B	D	B	A		A	
Approach Delay (s)	20.7		17.3		0.2		2.0	
Approach LOS	C		C					

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	2	132	188	2	6	4
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	2	148	211	2	7	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	213				365	212
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	213				365	212
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1369				633	828

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	151	213	11
Volume Left	2	0	7
Volume Right	0	2	4
cSH	1369	1700	699
Volume to Capacity	0.00	0.13	0.02
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.1	0.0	10.2
Lane LOS	A		B
Approach Delay (s)	0.1	0.0	10.2
Approach LOS			B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	20.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	0	4	5	0	8	2	64	2	2	28	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	7	0	4	6	0	9	2	72	2	2	31	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	123	115	32	119	115	73	33			74		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	123	115	32	119	115	73	33			74		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	99	100	99	100			100		
cM capacity (veh/h)	842	773	1042	852	773	989	1579			1525		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	11	15	76	35
Volume Left	7	6	2	2
Volume Right	4	9	2	1
cSH	912	931	1579	1525
Volume to Capacity	0.01	0.02	0.00	0.00
Queue Length 95th (ft)	1	1	0	0
Control Delay (s)	9.0	8.9	0.2	0.5
Lane LOS	A	A	A	A
Approach Delay (s)	9.0	8.9	0.2	0.5
Approach LOS	A	A		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	14.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.95		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1771	1700		1766	1760		1786	1801		1799	1879	
Flt Permitted	0.67	1.00		0.24	1.00		0.53	1.00		0.53	1.00	
Satd. Flow (perm)	1253	1700		445	1760		1003	1801		1011	1879	
Volume (vph)	32	235	294	56	86	38	112	207	65	43	212	15
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	34	253	316	60	92	41	120	223	70	46	228	16
RTOR Reduction (vph)	0	83	0	0	25	0	0	18	0	0	4	0
Lane Group Flow (vph)	34	486	0	60	108	0	120	275	0	46	240	0
Confl. Peds. (#/hr)	8		4	4		8	1		7	7		1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	0%	0%	0%
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8	8		2			6		
Actuated Green, G (s)	16.7	16.7		16.7	16.7		15.0	13.1		13.4	12.3	
Effective Green, g (s)	16.7	16.7		16.7	16.7		15.0	13.1		13.4	12.3	
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.35	0.31		0.31	0.29	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	488	662		173	685		385	550		336	539	
v/s Ratio Prot		c0.29			0.06		c0.01	c0.15		0.00	0.13	
v/s Ratio Perm	0.03			0.13			0.10			0.04		
v/c Ratio	0.07	0.73		0.35	0.16		0.31	0.50		0.14	0.44	
Uniform Delay, d1	8.2	11.2		9.2	8.5		9.8	12.2		10.4	12.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	4.2		1.2	0.1		0.5	0.7		0.2	0.6	
Delay (s)	8.3	15.4		10.5	8.6		10.3	12.9		10.6	13.1	
Level of Service	A	B		B	A		B	B		B	B	
Approach Delay (s)		15.0			9.2			12.2			12.7	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	13.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	42.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	335	8	10	176	5	6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	372	9	11	196	6	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	1231					
pX, platoon unblocked						
vC, conflicting volume			381		594	377
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			381		594	377
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1177		463	670

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	381	207	12
Volume Left	0	11	6
Volume Right	9	0	7
cSH	1700	1177	557
Volume to Capacity	0.22	0.01	0.02
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.5	11.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	11.6
Approach LOS			B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	28.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	309	22	43	166	0	20	1	51	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	343	24	48	184	0	22	1	57	1	1	0
Pedestrians					1						3	
Lane Width (ft)					12.0						12.0	
Walking Speed (ft/s)					4.0						4.0	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	187			368			641	643	357	701	655	187
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	187			368			641	643	357	701	655	187
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			94	100	92	100	100	100
cM capacity (veh/h)	1389			1191			377	377	691	314	371	858

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	370	232	80	2
Volume Left	2	48	22	1
Volume Right	24	0	57	0
cSH	1389	1191	556	340
Volume to Capacity	0.00	0.04	0.14	0.01
Queue Length 95th (ft)	0	3	13	0
Control Delay (s)	0.1	2.0	12.6	15.7
Lane LOS	A	A	B	C
Approach Delay (s)	0.1	2.0	12.6	15.7
Approach LOS			B	C

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	3	21	45	1	43	16	340	48	80	434	19
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	3	22	48	1	46	17	362	51	85	462	20
Pedestrians		2			22			1				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			2			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1086	1113	475	1100	1097	409	484			435		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1086	1113	475	1100	1097	409	484			435		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	*3.0	4.0	3.3	2.2			2.2		
p0 queue free %	97	98	96	73	99	93	98			92		
cM capacity (veh/h)	165	187	592	178	190	633	1082			1110		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	5	26	48	47	17	413	85	482
Volume Left	5	0	48	0	17	0	85	0
Volume Right	0	22	0	46	0	51	0	20
cSH	165	466	178	601	1082	1700	1110	1700
Volume to Capacity	0.03	0.05	0.27	0.08	0.02	0.24	0.08	0.28
Queue Length 95th (ft)	2	4	26	6	1	0	6	0
Control Delay (s)	27.5	13.2	32.5	11.5	8.4	0.0	8.5	0.0
Lane LOS	D	B	D	B	A		A	
Approach Delay (s)	15.6		22.1		0.3		1.3	
Approach LOS	C		C					

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	5	126	86	7	3	3
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	134	91	7	3	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	99				240	95
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	99				240	95
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1507				746	961

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	139	99	6
Volume Left	5	0	3
Volume Right	0	7	3
cSH	1507	1700	840
Volume to Capacity	0.00	0.06	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.3	0.0	9.3
Lane LOS	A		A
Approach Delay (s)	0.3	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	20.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	0	4	4	0	5	4	65	6	8	51	7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	0	4	4	0	6	4	72	7	9	57	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	168	166	61	167	167	76	64			79		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	168	166	61	167	167	76	64			79		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	99	100			99		
cM capacity (veh/h)	786	720	1005	788	720	986	1538			1519		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	7	10	83	73
Volume Left	2	4	4	9
Volume Right	4	6	7	8
cSH	919	887	1538	1519
Volume to Capacity	0.01	0.01	0.00	0.01
Queue Length 95th (ft)	1	1	0	0
Control Delay (s)	8.9	9.1	0.4	0.9
Lane LOS	A	A	A	A
Approach Delay (s)	8.9	9.1	0.4	0.9
Approach LOS	A	A		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

ROSEMONT RD at SANTA ANITA DR, City of West Linn, Clackamas County, 01/01/2010 to 12/31/2014

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2012														
PEDESTRIAN	0	1	0	1	0	1	0	1	0	0	1	1	0	0
YEAR 2012 TOTAL	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**
FINAL TOTAL	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**

9/21/16 PC Meeting
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Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF WEST LINN, CLACKAMAS COUNTY

ROSEMONT RD at SANTA ANITA DR, City of West Linn, Clackamas County, 01/01/2010 to 12/31/2014

Total crash records: 1

SER# INVEST	S P E E D	A L C	D 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	SPCL USE TRLR QTY OWNER V# TYPE	MOVE FROM TO	P# TYPE	PRTC INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
03279	N	N	N			09/05/2012	17	ROSEMONT RD	INTER	CROSS	N	N	CLR	PED	01 NONE 0	TURN-R									02,27
CITY						WE	0	SANTA ANITA DR	N		FLASHBCN-R	N	DRY	PED	GOVMT	E -N								000	00
						7A			05	0		N	DAWN	INJ	PSNGR CAR		01 DRVR	NONE	34	M	OR-Y OR<25		029,016	000	02
																- STRGHT W E	01 PED	INJC	24	F		I XWLK	000	035	00

9/21/16 PC Meeting
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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

ROSEMONT RD at SALAMO RD, City of West Linn, Clackamas County, 01/01/2010 to 12/31/2014

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2010														
REAR-END	0	1	0	1	0	1	0	0	1	1	0	1	0	0
YEAR 2010 TOTAL	0	1	0	1	0	1	0	0	1	1	0	1	0	0
FINAL TOTAL	0	1	0	1	0	1	0	0	1	1	0	1	0	0

CITY OF WEST LINN, CLACKAMAS COUNTY

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

ROSEMONT RD at SALAMO RD, City of West Linn, Clackamas County, 01/01/2010 to 12/31/2014

Total crash records: 1

SER# INVEST	S P E E D	A L C	D R U G S	S C H L	W O R K	DATE DAY TIME	CLASS DIST FROM	CITY STREET FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	V#	SPCL USE TRLR QTY OWNER TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
01073	N	N	N			04/01/2010	17	ROSEMONT RD	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										07
NONE						TH	0	SALAMO RD	SW		STOP SIGN	N	WET	REAR		PRVTE	SW-NE									000	00
						8A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	24	F	OR-Y		026	000	07
																							OR<25				
															02	NONE 0	STOP										
																PRVTE	SW-NE									011	00
																PSNGR CAR		01	DRVR	INJC	26	F	OR-Y		000	000	00
																							OR<25				

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

ROSEMONT RD at WILD ROSE DR, City of West Linn, Clackamas County, 01/01/2010 to 12/31/2014

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2012														
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	0	1	1	0	0
YEAR 2012 TOTAL	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**1**	**0**	**0**
YEAR: 2010														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR 2010 TOTAL	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**0**
FINAL TOTAL	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**2**	**0**	**0**

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF WEST LINN, CLACKAMAS COUNTY

ROSEMONT RD at WILD ROSE DR, City of West Linn, Clackamas County, 01/01/2010 to 12/31/2014

Total crash records: 2

SER# / INVEST	SPEED / ALC / DRUGS / SCHL / WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04762	N N N	12/13/2010	17	ROSEMONT RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											27
NO RPT		MO	0	WILD ROSE DR	E		UNKNOWN	N	DRY	REAR		PRVTE	E -W									000		00
		1P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	69	M	OR-Y		016,026	000		27
																			OR<25					
											02	NONE 0	STOP											
												PRVTE	E -W									012		00
												PSNGR CAR		01	DRVR	NONE	58	F	OR-Y		000	000		00
																			OR<25					
00051	N N N	01/05/2012	17	ROSEMONT RD	INTER	3-LEG	N	N	UNK	ANGL-OTH	01	NONE 0	TURN-L											02
CITY		TH	0	WILD ROSE DR	CN		STOP SIGN	N	WET	TURN		PRVTE	S -W									015		00
		8P			01	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y		028	000		02
																			OR<25					
											02	NONE 0	STRGHT											
												PRVTE	E -W									000		00
												PSNGR CAR		01	DRVR	NONE	42	F	OR-Y		000	000		00
																			OR<25					

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SALAMO RD at PARKER RD, City of West Linn, Clackamas County, 01/01/2010 to 12/31/2014

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2012														
REAR-END	0	1	0	1	0	2	0	1	0	1	0	1	0	0
YEAR 2012 TOTAL	**0**	**1**	**0**	**1**	**0**	**2**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**0**
FINAL TOTAL	**0**	**1**	**0**	**1**	**0**	**2**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**0**

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Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF WEST LINN, CLACKAMAS COUNTY

SALAMO RD at PARKER RD, City of West Linn, Clackamas County, 01/01/2010 to 12/31/2014

Total crash records: 1

SER# INVEST	S P E E D	A L C	D R U G S	C R S H L	W O R K	DATE DAY TIME	CLASS DIST FROM	CITY STREET FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	V#	SPCL USE TRLR QTY OWNER TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
01595	N	N	N	N	N	05/02/2012	17	PARKER RD	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										004	27,07
CITY						WE	0	SALAMO RD	SW		NONE	N	DRY	REAR		PRVTE	SW-NE									000		00
						6P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	61	F	OR-Y		016,026	038		27,07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	SW-NE									011	004	00
																PSNGR CAR		01	DRVR	INJC	44	F	OR-Y		000	000		00
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	SW-NE									011	004	00
																PSNGR CAR		02	PSNG	INJC	21	F			000	000		00

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CRASH SUMMARIES BY YEAR BY COLLISION TYPE

ROXBURY DR at WILD ROSE DR, City of West Linn, Clackamas County, 01/01/2010 to 12/31/2014

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
FINAL TOTAL														

9/21/16 PC Meeting
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Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

Left-Turn Lane Warrant Analysis

1e

Project:	16019 - 1270 Rosemont Road TIA
Intersection:	Site Access at Rosemont Road
Date:	2/4/2016
Scenario:	2018 Background + Site Conditions - AM Peak Hour

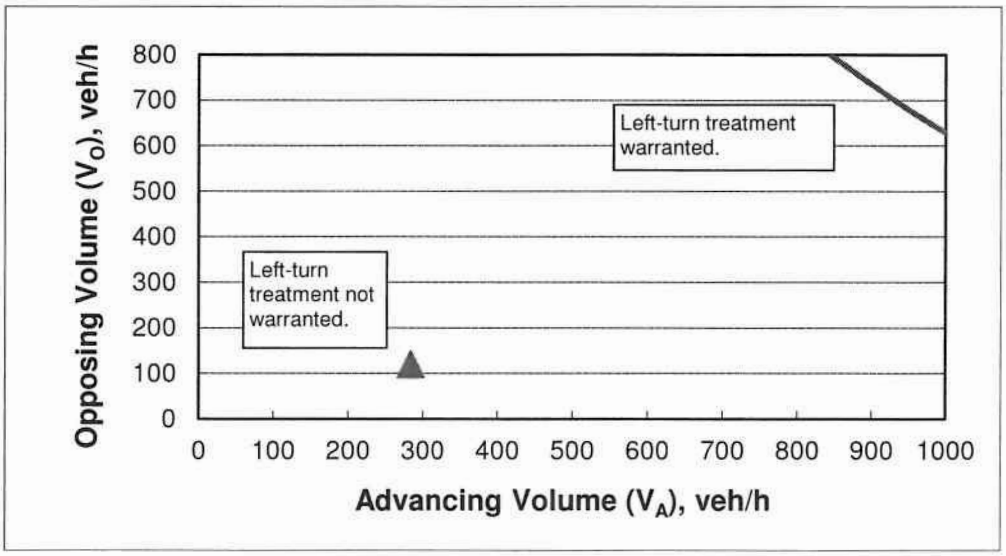
2-lane roadway (English)

INPUT

Variable	Value
85^{th} percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	284
Opposing volume (V_O), veh/h:	120

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1727
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

1e

Project: 16019 - 1270 Rosemont Road TIA
Intersection: Site Access at Rosemont Road
Date: 2/4/2016
Scenario: 2018 Background + Site Conditions - PM Peak Hour

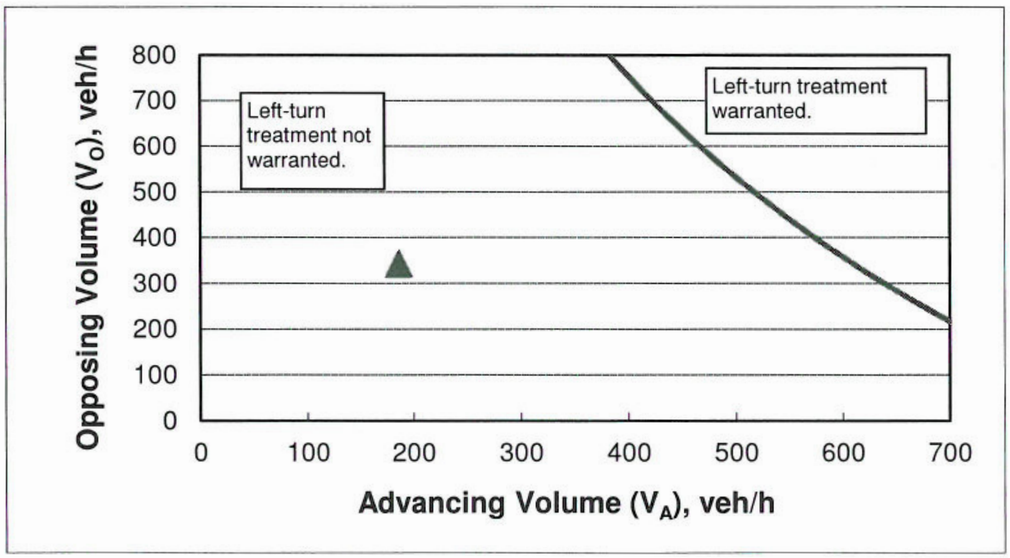
2-lane roadway (English)

INPUT

Variable	Value
85^{th} percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	5%
Advancing volume (V_A), veh/h:	186
Opposing volume (V_O), veh/h:	343

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	610
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

1e

Project:	16019 - 1270 Rosemont Road TIA
Intersection:	Rosemont Road at Wild Rose Drive
Date:	2/4/2016
Scenario:	2018 Background + Site Conditions - AM Peak Hour (WB LT)

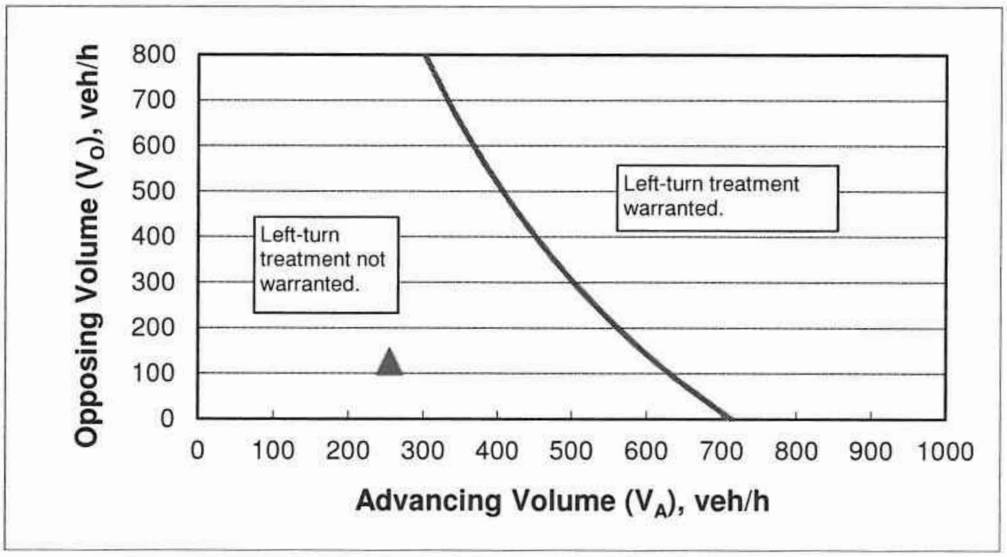
2-lane roadway (English)

INPUT

Variable	Value
85^{th} percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	9%
Advancing volume (V_A), veh/h:	255
Opposing volume (V_O), veh/h:	126

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	612
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

1e

Project: 16019 - 1270 Rosemont Road TIA
Intersection: Rosemont Road at Wild Rose Drive
Date: 2/4/2016
Scenario: 2018 Background + Site Conditions - PM Peak Hour (WB LT)

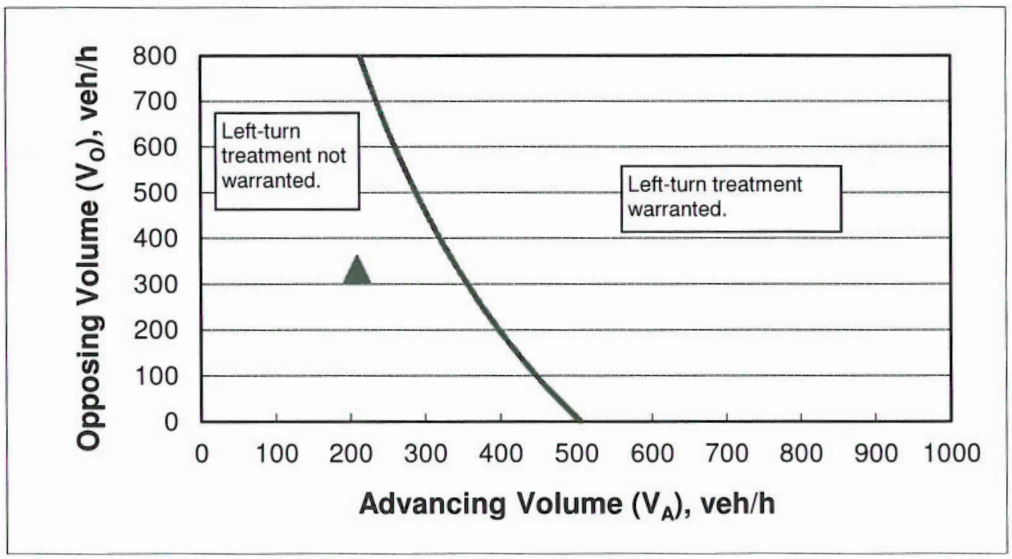
2-lane roadway (English)

INPUT

Variable	Value
85^{th} percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	21%
Advancing volume (V_A), veh/h:	209
Opposing volume (V_O), veh/h:	333

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	344
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

1e

Project:	16019 - 1270 Rosemont Road TIA
Intersection:	Rosemont Road at Wild Rose Drive
Date:	2/4/2016
Scenario:	2018 Background + Site Conditions - PM Peak Hour (EB LT)

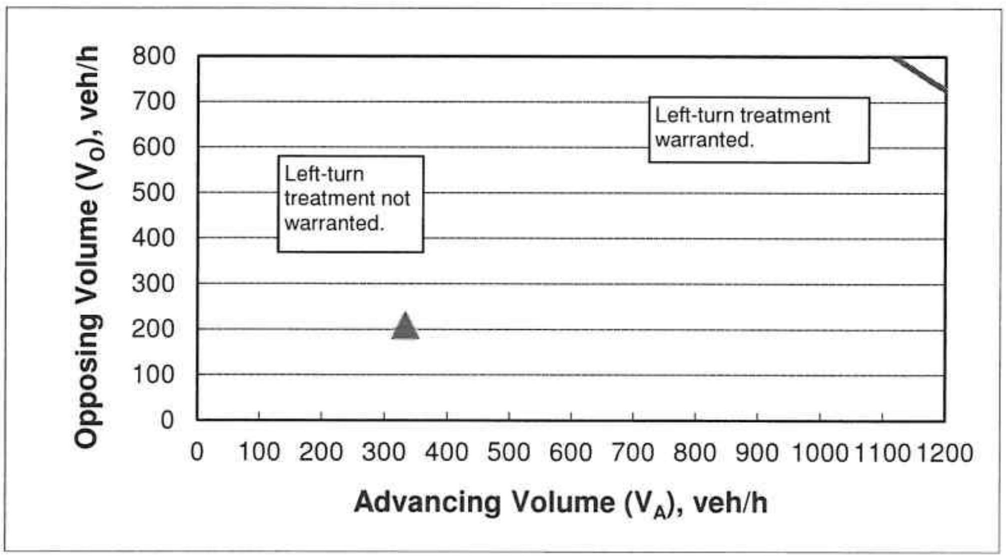
2-lane roadway (English)

INPUT

Variable	Value
85^{th} percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	333
Opposing volume (V_O), veh/h:	209

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	2063
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

1e

Project: 16019 - 1270 Rosemont Road TIA
Intersection: Site Access at Parker Road
Date: 2/4/2016
Scenario: 2018 Background + Site Conditions - AM Peak Hour

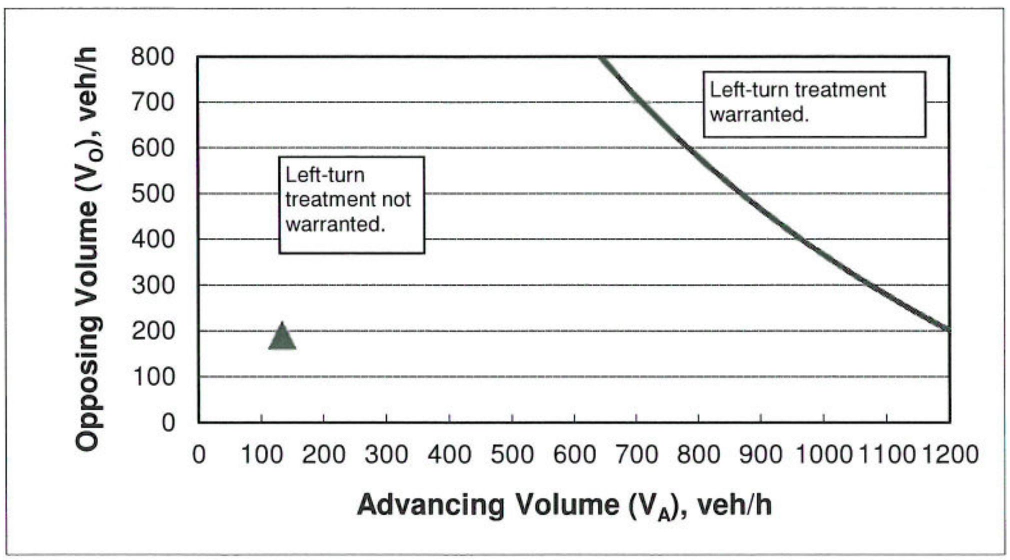
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	35
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	134
Opposing volume (V_O), veh/h:	190

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1215
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

1e

Project: 16019 - 1270 Rosemont Road TIA
Intersection: Site Access at Parker Road
Date: 2/4/2016
Scenario: 2018 Background + Site Conditions - PM Peak Hour

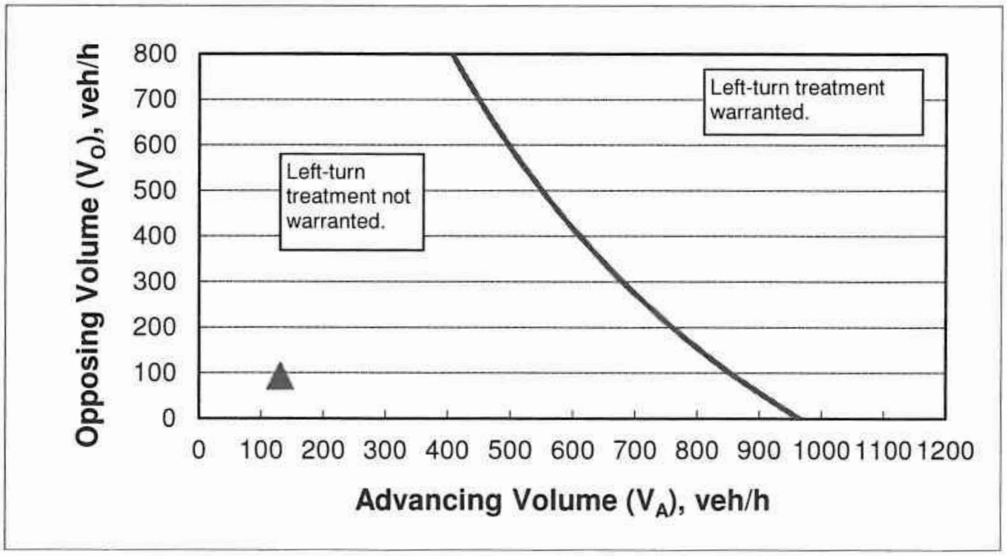
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	35
Percent of left-turns in advancing volume (V_A), %:	4%
Advancing volume (V_A), veh/h:	131
Opposing volume (V_O), veh/h:	93

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	860
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

1e

Project:	16019 - 1270 Rosemont Road TIA
Intersection:	Wild Rose Drive at Roxbury Drive
Date:	2/4/2016
Scenario:	2018 Background + Site Conditions - AM Peak Hour (NB LT)

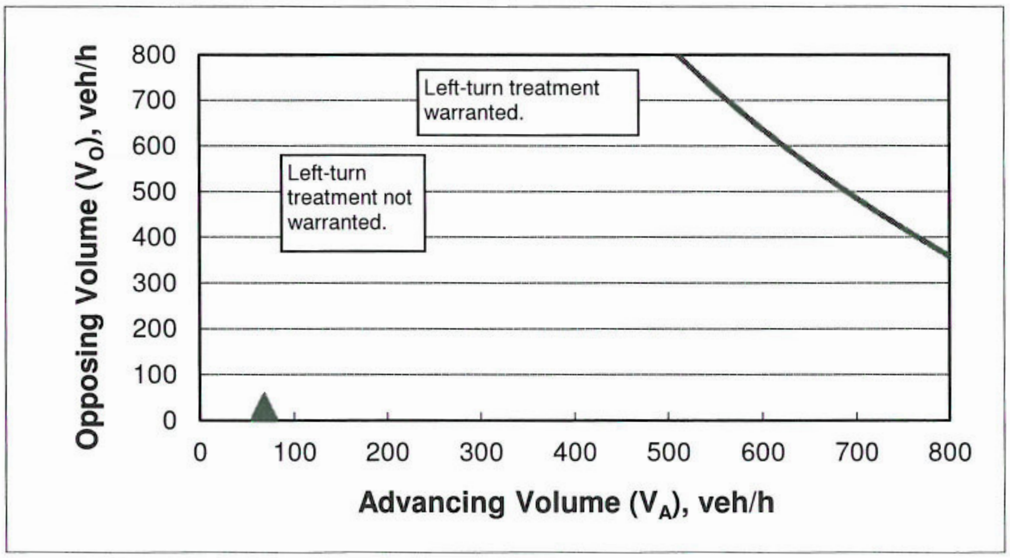
2-lane roadway (English)

INPUT

Variable	Value
85^{th} percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	3%
Advancing volume (V_A), veh/h:	68
Opposing volume (V_O), veh/h:	31

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1163
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

1e

Project: 16019 - 1270 Rosemont Road TIA
Intersection: Wild Rose Drive at Roxbury Drive
Date: 2/4/2016
Scenario: 2018 Background + Site Conditions - PM Peak Hour (NB LT)

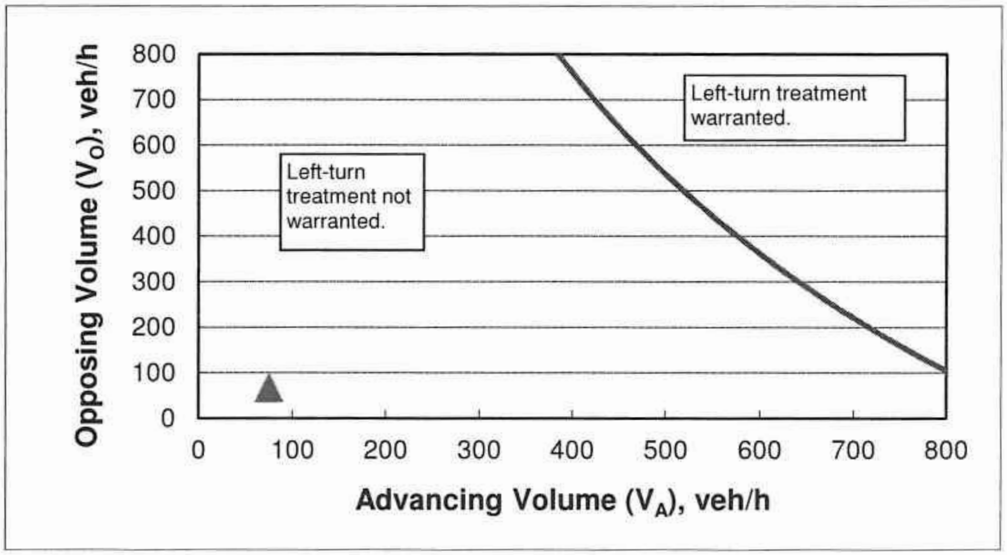
2-lane roadway (English)

INPUT

Variable	Value
85^{th} percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	5%
Advancing volume (V_A), veh/h:	75
Opposing volume (V_O), veh/h:	66

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	838
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

1e

Project: 16019 - 1270 Rosemont Road TIA
Intersection: Wild Rose Drive at Roxbury Drive
Date: 2/4/2016
Scenario: 2018 Background + Site Conditions - AM Peak Hour (SB LT)

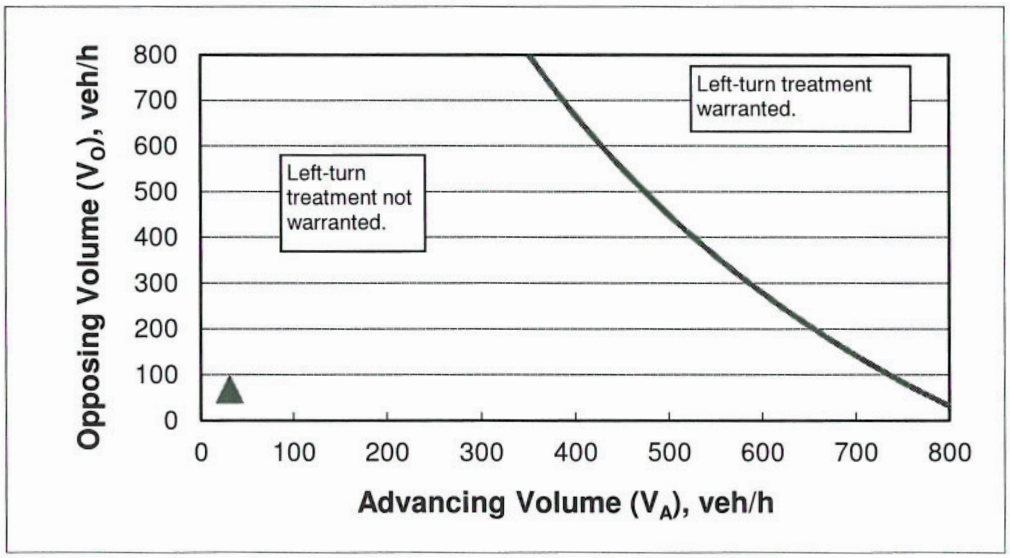
2-lane roadway (English)

INPUT

Variable	Value
85^{th} percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	6%
Advancing volume (V_A), veh/h:	31
Opposing volume (V_O), veh/h:	68

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	764
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

1e

Project: 16019 - 1270 Rosemont Road TIA
Intersection: Wild Rose Drive at Roxbury Drive
Date: 2/4/2016
Scenario: 2018 Background + Site Conditions - PM Peak Hour (SB LT)

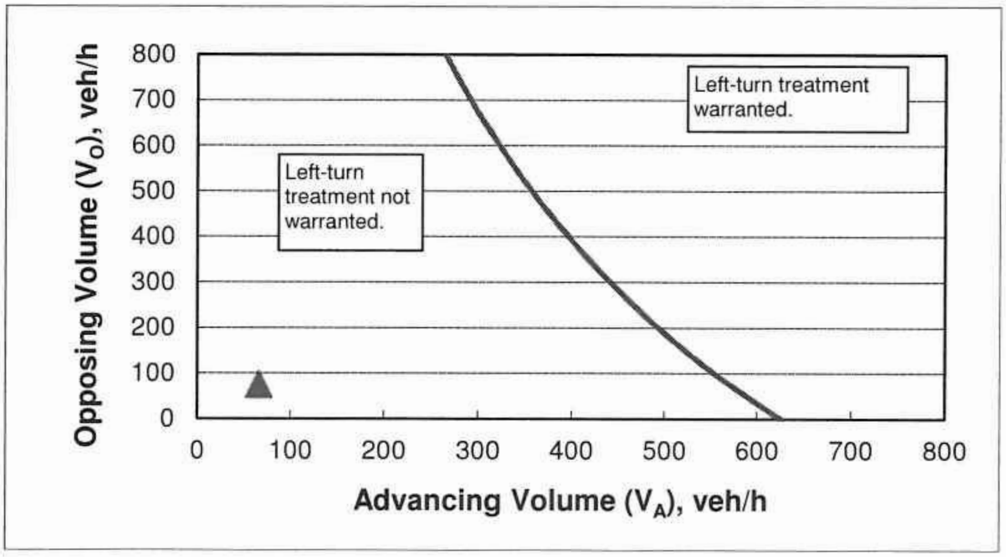
2-lane roadway (English)

INPUT

Variable	Value
85^{th} percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	12%
Advancing volume (V_A), veh/h:	66
Opposing volume (V_O), veh/h:	75

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	571
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Traffic Signal Warrant Analysis

1e

Project: 16019 - Rosemont Road TIA
Date: 2/4/2016
Scenario: 2018 Background plus Site Conditions - PM Peak Hour

Major Street:	Rosemont Road	Minor Street:	Site Access
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	529	PM Peak Hour Volumes:	10

Warrant Used:

____X____ 100 percent of standard warrants used

_________ 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100% Warrants	70% Warrants	100% Warrants	70% Warrants
Major St.	Minor St.				
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	5,290	8,850	
Minor Street*	100	2,650	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	5,290	13,300	
Minor Street*	100	1,350	**No**
Combination Warrant			
Major Street	5,290	10,640	
Minor Street*	100	2,120	**No**

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis

le

Project:	16019 - Rosemont Road TIA
Date:	2/4/2016
Scenario:	2018 Background plus Site Conditions - PM Peak Hour

Major Street:	Rosemont Road	Minor Street:	Wild Rose Drive
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	542	PM Peak Hour Volumes:	59

Warrant Used:

X 100 percent of standard warrants used

____ 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	5,420	8,850	
Minor Street*	590	2,650	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	5,420	13,300	
Minor Street*	590	1,350	**No**
Combination Warrant			
Major Street	5,420	10,640	
Minor Street*	590	2,120	**No**

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis

1e

Project:	16019 - Rosemont Road TIA
Date:	2/29/2016
Scenario:	2018 Background plus Site Conditions - PM Peak Hour

Major Street:	Salamo Road	Minor Street:	Parker Road
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	937	PM Peak Hour Volumes:	78

Warrant Used:

X 100 percent of standard warrants used

____ 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	9,370	8,850	
Minor Street*	780	2,650	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	9,370	13,300	
Minor Street*	780	1,350	**No**
Combination Warrant			
Major Street	9,370	10,640	
Minor Street*	780	2,120	**No**

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis

1e

Project:	16019 - Rosemont Road TIA
Date:	2/4/2016
Scenario:	2018 Background plus Site Conditions - PM Peak Hour

Major Street:	Parker Road	Minor Street:	Site Access
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	224	PM Peak Hour Volumes:	5

Warrant Used:

___X___ 100 percent of standard warrants used

______ 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	2,240	8,850	
Minor Street*	50	2,650	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	2,240	13,300	
Minor Street*	50	1,350	**No**
Combination Warrant			
Major Street	2,240	10,640	
Minor Street*	50	2,120	**No**

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis

1e

Project:	16019 - Rosemont Road TIA
Date:	2/4/2016
Scenario:	2018 Background plus Site Conditions - PM Peak Hour

Major Street:	Wild Rose Drive	Minor Street:	Roxbury Drive
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	141	PM Peak Hour Volumes:	8

Warrant Used:

X 100 percent of standard warrants used

___ 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	1,410	8,850	
Minor Street*	80	2,650	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	1,410	13,300	
Minor Street*	80	1,350	**No**
Combination Warrant			
Major Street	1,410	10,640	
Minor Street*	80	2,120	**No**

* Minor street right-turning traffic volumes reduced by 25%

TECHNICAL MEMORANDUM

LANCASTER ENGINEERING
321 SW 4th Ave., Suite 400
Portland, OR 97204
phone 503 248 0313
fax 503 248 9251
lancasterengineering.com

TO: Khoi Le, City of West Linn

FROM: William Farley, PE

DATE: May 20, 2016

SUBJECT: *Tanner Ridge at Rosemont*
Response to TIS Review Comments

This memorandum is written to respond to comments from the City of West Linn and DKS, reviewing on behalf of the City of West Linn, regarding the Traffic Impact Study (TIS) conducted by Lancaster Engineering dated March 23rd, 2016.

The TIS for Tanner Ridge at Rosemont reviewed traffic impacts resulting from a proposed 52-lot subdivision to be constructed south of Rosemont Road between Salamo Road and Wild Rose Drive. Based on the development plan of 52 single-family detached dwellings and detailed analyses of study intersections scoped with the City prior to the preparation of the traffic impact study, no mitigations were identified to be recommended or required to support the proposed development.

Proposed Lot Count

In the period between the preparation of the TIS and the submittal of the development application, the proposed development plan was reduced from a 52-lot subdivision to a 50-lot subdivision. Comments from the City questioned if findings from the March 23rd TIS remained valid for the construction of 50 single-family detached dwellings given the change in the internal street network.

Based on a review of the updated development plan of 50 lots, dated April of 2016, no additional impacts at any of the study intersections are anticipated. Findings regarding trip distribution, level-of-service/capacity analysis, and warrant analyses remain valid.

Functional Classification of Study Roadways

A comment from DKS was received regarding the stated functional classifications of study roadways within the March 23rd TIS. Specifically, functional class designations within the report did not match the classification identified in the City's existing 2008 Transportation System Plan (TSP).

Functional classifications for the vicinity streets were referenced from the *West Linn Atlas 2011 Street Functional Classification*. As this was a City map that provided functional class designations and that superseded the 2008 TSP, it was considered to be the most current reference. The table on the following page provides a summary of the functional classifications for each of the vicinity roadways identified in the report.

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FUNCTIONAL CLASSIFICATIONS

Street Name	2008 TSP	2011 Atlas	2016 TSP Update[1]
Rosemont Rd	Arterial	Minor Arterial	Collector
Salamo Rd	Arterial	Minor Arterial	Minor Arterial
Santa Anita Dr	Arterial	Minor Arterial	Collector
Parker Rd	Arterial	Minor Arterial	Collector
Brandywine Dr	Local Street	Local Road	Local
Wild Rose Dr	Neighborhood Route	Neighborhood Route	Neighborhood Route
Roxbury Dr	Local Street	Local Road	Local

[1] 2016 TSP Update does not take effect until 180 days after March 28, 2016.

Access Location

A comment from DKS stated that the proposed site access onto Rosemont Road did not align with an existing driveway located on the north side of the street. An additional comment stated that the location of Parker Road did not meet access spacing standards. More information was requested to describe the proposed access locations and the benefits and impacts related to the locations.

Per the April 2016 site plan, the development's access to Rosemont Road is located approximately 238 feet west of the private access to Oppenlander Fields parking area. Although this is less than the 300 feet of space required between Private Driveways on an Arterial in the City's 2008 TSP (Table 1-4), the driveway is located in an area that has sufficient intersection sight distance in both directions along Rosemont Road. Turning volumes and intersection delays will also be low enough that queuing behind opposing left-turning vehicles is unlikely to inhibit any left-turning movements. Also, no safety concerns are anticipated to arise due to the sight distance available for through vehicles to spot a left-turning vehicle from either direction as well as the low speed of Rosemont Road.

It should be noted that with the update to the City's TSP, to be in effect as of September 24th, 2016, that Rosemont Road will be classified as a Collector and will be required to have 75 feet between street intersections and driveways. The proposed development plan will meet this requirement.

Per the April 2016 site plan, the development's access to Parker Road is located approximately 250 feet west of Dillon Lane, a local street that serves ten single-family dwellings. Although the proposed location of the access is less than the 600 feet required between public intersections on an Arterial in the City's 2008 TSP, the driveway is located as far west as possible with respect to development constraints (wetlands and property boundary). The location of the access is not projected to cause any safety issues and both accesses will operate safely and efficiently due to the low speeds along Parker Road.

It should be noted that with the 2016 update to the City's TSP that Parker Road will be classified as a Collector and will be required to have 200 feet between street intersections. The proposed development plan will meet this requirement.

All findings and conclusions from the TIA remain valid. If you have any questions, comments, or concerns, please don't hesitate to contact us directly.

REGISTERED PROFESSIONAL ENGINEER
54853PE
OREGON
JULY 9, 2001
TODD E. MOBLEY
RENEWS: 12/31/2016

NATURAL RESOURCE ASSESSMENT
Within
Water Resource Area

FOR

Tanner Ridge at Rosemont

Prepared for:
Icon Construction and Development
1980 Willamette Falls Drive, Suite 200
West Linn, Oregon 97068

Prepared by:
Schott and Associates

March 2016
Project #: 2409

INTRODUCTION

Site Location

Schott and Associates was contracted by Icon Construction & Development to conduct a wetland delineation and natural resource assessment on the subject property located east of Salamo Road and south of Rosemont Road in West Linn, Clackamas County, Oregon. The property consists of 2 separate tax lots (T2S R1E Sec.26A,D, TL#1100 and 3000).

Site Description

The somewhat triangular shaped subject property is situated between Parker Road to the south and Rosemont Road to the north. The property is bordered by residential housing to the east. To the west the property is bordered by a concrete pathway. Residential apartments and a water quality facility are located west of the path.

A drainage, Tanner Creek, flowed southeast across the property near the western property boundary starting approximately halfway down the property. The drainage entered the property through a large culvert at the western property boundary approximately halfway down the property. An open ditch was observed flowing southeast on the other side of the path and a water quality facility was located directly across from the culvert as well. Water was likely flowing from both sources into the culvert. The culvert was overflowing, causing high volumes of water to flow across the south half of the property near the western property line and on both sides of the creek. The site is fairly steep south, southwest sloping. The southwest portion of the property where the creek is located is gently southwest sloping.

The northwest portion of the property comes to a point at the northwest corner. This area, as well as the northern border, is mainly wooded, containing an overstory of Douglas fir (*Pseudotsuga menziesii*) and red alder (*Alnus rubra*). Within the understory Himalayan blackberry (*Rubus armeniacus*) was dominant but had been cut back for easier access. Also observed was English ivy (*Hedera helix*) and sword fern (*Polystichum munitum*). Along the drainage, pond and western property boundary red alder, common filbert (*Corylus cornuta*) and willow (*Salix sp*) were observed in the overstory. Himalayan blackberry and ivy were dominant in the understory with some reed canary grass (*Phalaris arundinacea*), lady fern (*Athyrium filix-femina*) and sword fern. A majority of the eastern portion of the property was an open field dominated by grasses such as tall fescue (*Schedonorus arundinaceus*) and colonial bentgrass (*Agrostis capillaries*). A thick band of Himalayan blackberry bordered the field to the west, north and east.

Project Objectives

The applicant proposes a 50 lot residential subdivision consistent with existing subdivisions to the north and east. Main access will be from Meadowlark Drive through the middle of the development connecting to Rosemont Road at the north end of the development and Parker Road at the end. The other road entry will be from within the existing development to the east. Roadways will not be within the WRA. At the very back of the some of the proposed lots there would be minimal impacts to the WRA in establishing lots. In order to complete the construction of the development and roadways the applicant proposes a reduced WRA to 50' wide in an otherwise degraded portion of the 65' wide WRA to maximize development potential of the property while maintaining the highest quality onsite resources.

As shown on the WRA Map, the site contains protected water resources. This report will outline the extent of these features and provide verification of these resources as well as provide water resource map verification and a delineation report of site findings.

METHODS

A Wetland delineation and natural resource assessment were conducted on January 19, 2016. As per 32.020 the undisturbed waterway, wetlands and riparian corridor boundary were determined and documented in this report and an attached delineation report.

SENSITIVE AREA CONDITIONS

Waterway

Tanner Creek flows south, southeast through the property and adjacent to onsite wetlands. The creek enters the property midway down through a culvert at the western property boundary, flows into and out of a pond and exits the site through a culvert in the southwest corner of the property. The creek averaged approximately 10 feet in width.

A pond vegetated at the edges was located south of the culvert where the creek entered the property. The creek appeared to flow into and out of the pond. No defined channel was observed adjacent to the pond as water levels were high.

Wetland

Based on soil, vegetation and hydrology data taken in the field eight fringe PEM wetlands, totaling 10,004sf were delineated. Tanner Creek flowed through the wetland area. All of the wetlands connected with the creek.

The first wetland, Wetland A, of 244sf was north and upslope from an existing pond onsite. The PEM wetland was adjacent and east of the creek. The wetland was mostly bare, but the minimal vegetation observed was water parsley (*Oenanthe sarmentosa*-OBL) (SP J4). Hydrology was ½" of surface water. Soils were 10YR 3/1 and organic within the first 5" and 10YR 3/1 to 21". Soils were very dark and saturated, so redox was hard to detect. Other criteria were met and BPJ was used to determine this area as a wetland.

The second PEM wetland, Wetland B, of 945sf was located just south of the pond and bordered on the east and west side by the drainage. Vegetation consisted of red alder, rose (*Rosa sp*) (SP J6), lady fern (J6, C2) and reed canary grass (C2). Some Himalayan blackberry was also observed but discounted as problematic. Soils met the Redox Dark Surface (F6) hydric soil indicator and surface saturation was observed (SP J6, C2).

Wetland E of 1,442sf, further south of the pond, adjacent to and on the slope east of the drainage was dominated by reed canary grass, soils met the Depleted Matrix (F3) hydric indicator and saturation was to the surface (J8).

Wetland F was located at the southern extent of the property adjacent to the west side of the drainage. The majority of the wetland was dominated by reed canary grass with some willows at the northern end. Soils met the Redox Dark Surface (F6) hydric indicator and saturation was at 11" with water in the hole at 12". The southernmost wetland west of the channel was bordered by an asphalt pathway with a small fill slope. This slope clearly defined the majority of the wetland boundary.

The remaining wetlands (C-81sf, D-64sf, G-515sf and H-1,450sf) totaling 2,110 sf were fringe wetlands that clearly met criteria and sample plots were not taken. Wetland C and D were very small and Wetlands G and H were just separated by a narrow channel and bordered by dense Himalayan blackberry to the east.

The LWI, as well as the WRA map, showed a drainage entering the property from the north near the eastern property boundary flowing southwest thru the property. Onsite observations showed two converging slopes forming a slight, narrow depression fully vegetated with grasses, rather than a drainage channel. Two sample plots were taken at the low end of the narrow depression prior to the band of Himalayan blackberry and Tanner Creek. Both sample plots were dominated by tall fescue and colonial bentgrass. Sample plot J10 was taken further upslope. Soils read as 7.5YR 3/3 with saturation at 6" from the top. Sample plot C4 was taken further down slope. Soils were a 10YR 3/2 to 11" and 10YR 4/4 with 20% 10YR 4/2 redox 11-21". Saturation was at the surface. The slight depression was clearly not a drainage channel, nor a wetland as soils criterion was not met.

WRA

The remaining WRA east of the creek and wetlands consisted of a thick band of invasive Himalayan blackberry transitioning to non-native grasses such as tall fescue and colonial bentgrass. To the north of the creek within the 65' WRA vegetation mainly consisted of invasive ivy and Himalayan blackberry. To the west of the creek and wetlands red alder, filbert and willow were observed in the overstory. Himalayan blackberry and ivy were dominant in the understory as well as lady fern, sword fern and reed canary grass with a small amount of sedge.

WRA REQUIREMENTS

As per Chapter 32/Table 32-2 Required Width of WRA; the required width on each side of the water resource is 65' from the OHW or delineated edge of a wetland if slopes adjacent to the protected water source are 0-25%. The slopes do not exceed 25%, therefore the WRA is 65'. Within the required 65' wide WRA boundary at the very eastern end, farthest away from the waterway and wetland edge, lot boundaries will be the only impact. Impact area is 3,562 sqft. As the impact area is just on the very edges of the lots within all non-native and invasive vegetation, performing no functions or protection of functions of the water resource, and the WRA is almost entirely degraded, as well, on the east side of the water resource, it is proposed that the width be reduced to 50 feet. With a 50' wide WRA, there will be no impacts caused by the development. Per 32.070 Alternate Review Process *if there is reason to believe that the width of the WRA prescribed under the standard process (CDC 32.060(D) is larger than necessary to protect the functions of the water resource at a particular site* a reduction in width can be requested if per 32.080(B) it can be shown that the *WRA is already significantly degraded (e.g., native forest and ground cover have been removed or the site dominated by invasive plants, debris or development) and the approval authority may allow a reduced WRA in exchange for mitigation.* In the case of the WRA on the Rosemont site Himalayan blackberry and ivy are non-native, invasive and the ground cover is non-native field grasses.

Undisturbed WRA Conditions

As per Section 32.050 (F8) plant communities within the undisturbed WRA were identified and characterized.

The majority of the WRA for the wetlands and waterway were composed of non-native grasses and Himalayan blackberry. The field to the east of the waterway consisted mainly of non-native grasses including tall fescue and bentgrass. Between the waterway and non-native grasses was a thick band of Himalayan blackberry. The tree canopy or native species was minimal and mainly bordered the edges of the waterway. The condition of the WRA was mainly degraded.

Table 1. Eastern Community within WRA

Scientific Name	Common Name	Layer	% Cover
Alopecurus pratensis	Meadow foxtail	Grass	5
Holcus lanatus	Velvet grass	Grass	5
Schedonorus arundinaceus	Tall fescue	Grass	30
Poa pratensis	Kentucky blue grass	Grass	5
Agrostis capillaris	Colonial bentfrass	Grass	25
Rubus armeniacus	Himalayan blackberry	Shrub	40
% cover by natives			0
% tree canopy			0
% invasive/noxious			40
Condition			Degraded

The WRA in the north portion of the property transitioned from the coniferous forest community to the north. Himalayan blackberry and ivy grew thickly in areas and with a few scattered sapling trees. This WRA was in degraded condition.

Table 2. Northern Community within WRA

Scientific Name	Common Name	Layer	% Cover
Salix sp (sapling)	Willow	Shrub	5
Carex sp	Sedge	Forb	5
Rubus armeniacus	Himalayan blackberry	Shrub	30
Hedera helix	Ivy	Vine	40
% cover by natives			10
% tree canopy			0
% invasive/noxious			70
Condition			Degraded

The western edge of the site consisted of a red alder overstory mainly at the northern end with reed canary grass and Himalayan blackberry as the dominant in the understory. Canopy cover was low to moderate. Native species cover was moderate and invasive species cover was moderate to high. The buffer in this area was in marginal to degraded condition.

Table 3. Western Community within WRA

Scientific Name	Common Name	Layer	% Cover
Phalaris arundinacea	Reed canary grass	forb	45
Alnus rubra	Red alder	Tree	20
Salix sp	Willow	Sapling/shrub	10
Rubus armeniacus	Himalayan blackberry	Shrub	20
Polystichum munitum	Sword fern	Forb	5
% cover by natives			35
% tree canopy			20
% invasive/noxious			65
Condition			Marginal

IMPACTS

Impacts to Wetlands/Waters

No impacts to Wetlands or waters are proposed.

Impacts to the remaining WRA

Within the required 65' wide WRA boundary at the very eastern edge, farthest away from the waterway and wetland edge, lot boundaries will be the only impact. Impact area is 3,562 sqft. As the impact area is just on the very edges of the lots within all non-native and invasive vegetation and the WRA is almost entirely degraded, as well, on the east side of the water resource, it is proposed that the width be reduced to 50 feet. With a 50' wide WRA, there will be no impacts caused by the development. Per 32.070 Alternate Review Process *if there is reason to believe that the width of the WRA prescribed under the standard process (CDC 32.060(D) is larger than necessary to protect the functions of the water resource at a particular site* a reduction in width can be requested if per 32.080(B) it can be shown that the *WRA is already significantly degraded (e.g., native forest and ground cover have been removed or the site dominated by invasive plants, debris or development) and the approval authority may allow a reduced WRA in exchange for mitigation.* In the case of the WRA on the Rosemont site Himalayan blackberry and ivy are non-native invasive and the ground cover is non-native field grasses.

MITIGATION AND ENHANCEMENT

A 15' reduction in the WRA width is being proposed, creating a 50' wide WRA proection. As described for reduction in WRA width, accompanied with Mitigation, the applicant proposes mitigating for the WRA width reduction amount of 15,250sf through enhancement at a 1:1 ratio in a band across the remaining WRA at the eastern WRA boundary (Table 1). Also proposed is the removal of the remaining Himalayan blackberry and ivy within the WRA on the east and north side of the water resource followed by planting with native plant material greatly enhancing otherwise low quality functions than the existing WRA now has.

The goal of the mitigation is protecting the ecological benefit and water quality benefit to the higher quality sensitive areas while maximizing developable area.
WRA mitigation will include removal and control of invasive species, especially Himalayan blackberry and ivy, as well as non-native grasses. A 15' wide band of WRA will be planted with native trees, shrubs and groundcover consistent with CDC 32.100, meeting or exceeding the standards of CDC 32.090(C) as described in the Mitigation Plan (Table 4) to extend the total area of native forested/scrub-shrub community and provide a diverse community adjacent to the onsite water resource.

Additionally, removal of invasive species such as Himalayan blackberry and ivy, beyond the 15' band of proposed enhancement, to the water resource and then replanting with native plant material will further preserve and significantly enhance the essential functions of the remaining WRA by increasing area and diversity of native vegetation adjacent to the sensitive area (Table 5). Tree and shrub species will provide shade, large woody debris, habitat and food sources. In addition it will increase filtration and remove non-native vegetation. Species will be based on the existing native Portland plant list and will include upland species as referenced in Table 4 such as Douglas fir, red alder, big leaf maple, Oregon grape, snowberry, Indian plum and sword fern.

Planting will be done per 32.100 RE-Vegetation Plan Requirements.Trees and shrubs shall be planted in accordance to 32.100 (3a,b). Plant diversity shall be in accordance with 32.100 (4)

Per 32.100 (6) A minimum survival rate of 80% of the trees and shrubs planted is expected by the third anniversary of the date that the mitigation planting is completed. Plants that die must be replaced in kind (32.100(7).

As per City of West Linn WRA protection requirements, 80% success is required for the replanted areas. The mitigation site will be monitored and maintained for three years. If, after each year monitoring period, 80% survival has not been met, dead plants will be replaced up to the 100% success required.

TABLE 4. WRA ENHANCEMENT PLANTING PLAN (15,250)

	Plant Type	Water Require-ments	Light Require-ments	Min. Size	Min. Height	Spacing	Qty
Douglas fir (*Pseudotsuga menziesii*)	Tree	Dry	Sun	2 gal	3'	Single	60
Big leaf maple (*Acer macrophyllum*)	Tree	Dry	Sun	2 gal	3'	Single	40
Red alder (*Alnus Rubra*)	Tree	Moist	Sun	2 gal	3'		55
Red flowering currant (*Ribes sanguineum*)	Shrub	Dry	Sun	1 gal.	1.5'	Cluster	100
Tall Oregon grape (*Mahonia aquifolium*)	Shrub	Dry	Sun	1 gal.	12"	Single	150
Indian Plum (*Oemleria cerasiformis*)	Shrub	Moist	Shade	2 gal.	2'	Cluster	40
Cascade Oregon grape (*Mahonia nervosa*)	Shrub	Moist	Shade	1 gal.	4"	Cluster	125
Snowberry (*Symphoricarpos albus*)	Shrub	Dry	Part	1 gal.	1.5'	Cluster	150
Serviceberry (*Amelanchier alnifolia*)	Shrub	Dry	Part	1 gal.	1.5'	Single	100
Sword fern (*Polystichum munitum*)	Forb	Moist	Shade	2 gal.	n/a	Cluster	100
Native California brome (*Bromus carinatus*)	Grass	Dry	Part	Seed	n/a	10lbs. pls	
Blue Wildrye (*Elymus glaucus*)	Grass	Dry	Part	Seed	n/a	10lbs. pls	

Table 5. Ecological Functions per Table 32-4		
Ecological Functions	**WRA existing conditions**	**WRA enhanced conditions**
Stream flow moderation and/or water storage	Wetland Storage functions moderate, creek water strongly flows into wetland as well as sheet flow across portions of the WRA, some fallen trees slow flow.	Storage functions will be higher with vegetation density increase in WRA to further slow flow for better storage capacity.
Sediment or pollution control	Vegetation is within 100' of all wetland /waterways. To the east of wetland and waterways after 50' vegetation is grasses. Only forested canopy mainly to the north of WRA.	Increased vegetation and tree canopy within first 50' of WRA from point of wetland or waterway will increase functions by slowing water flow and creating more tree canopy.
Bank stabilization	Some large trees along stream bank but there is minimal bank	Increased native vegetation will help bank stabilization although bank is minimal.
Large wood recruitment for a fish bearing section of stream	Stream is likely not fish bearing. There is a tree canopy within 50 to 150' from the north and northwest	Additional trees to the east will increase tree canopy and higher quality functions.
Organic material sources	Same as one above	Same as one above one
Shade (water temperature moderation) and microclimate	Same as one above	Same as one above

APPENDICES

Site Vicinity Map
Aerial photo
Development Plan
Existing Conditions Plan
Delineation

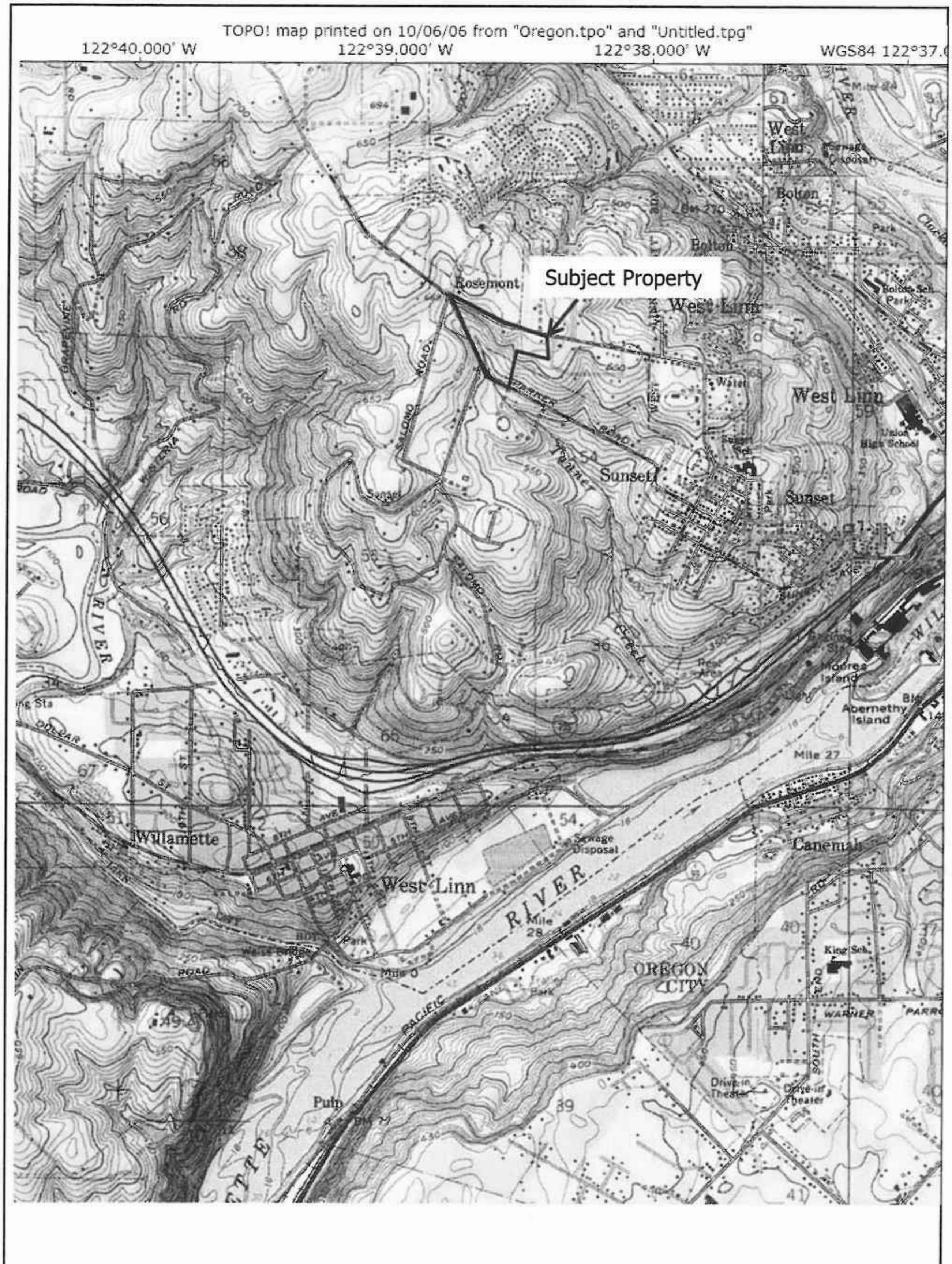


Figure 1: Site Vicinity Map Rosemont Road Property S&A 2409	Schott & Associates P.O. Box 589 Aurora, OR. 97002 503.678.6007

Figure 5: Aerial Photograph – Google Earth 2015
Rosemont Road Property
S&A 2409

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007

Density Calculations			
	Area (sq. ft.)	Allowable Density	Units @1 per 10,000 sq ft
Gross Site Area	695,610		
Land in a boundary street right-of-way, water course, or planned open space where density transfer is not requested:	0		
Area in street right-of-way:	124,185		
Net Site Area:	571,425		
Area within Type I or II slopes where Developed:	4,273	50%	0.21
Area within Type I or II slopes where Density Will be Transferred:	6,846	75%	0.51
Area within Water Resource Area-all development transferred:	99,364	50%	4.97
Open Space (Type III and IV Lands)	58,759	100%	5.88
Type III & IV Land Developed:	402,757	100%	40.27
Base Density Allowed			51.84
TOTAL ALLOWED DENSITY:			51 UNITS

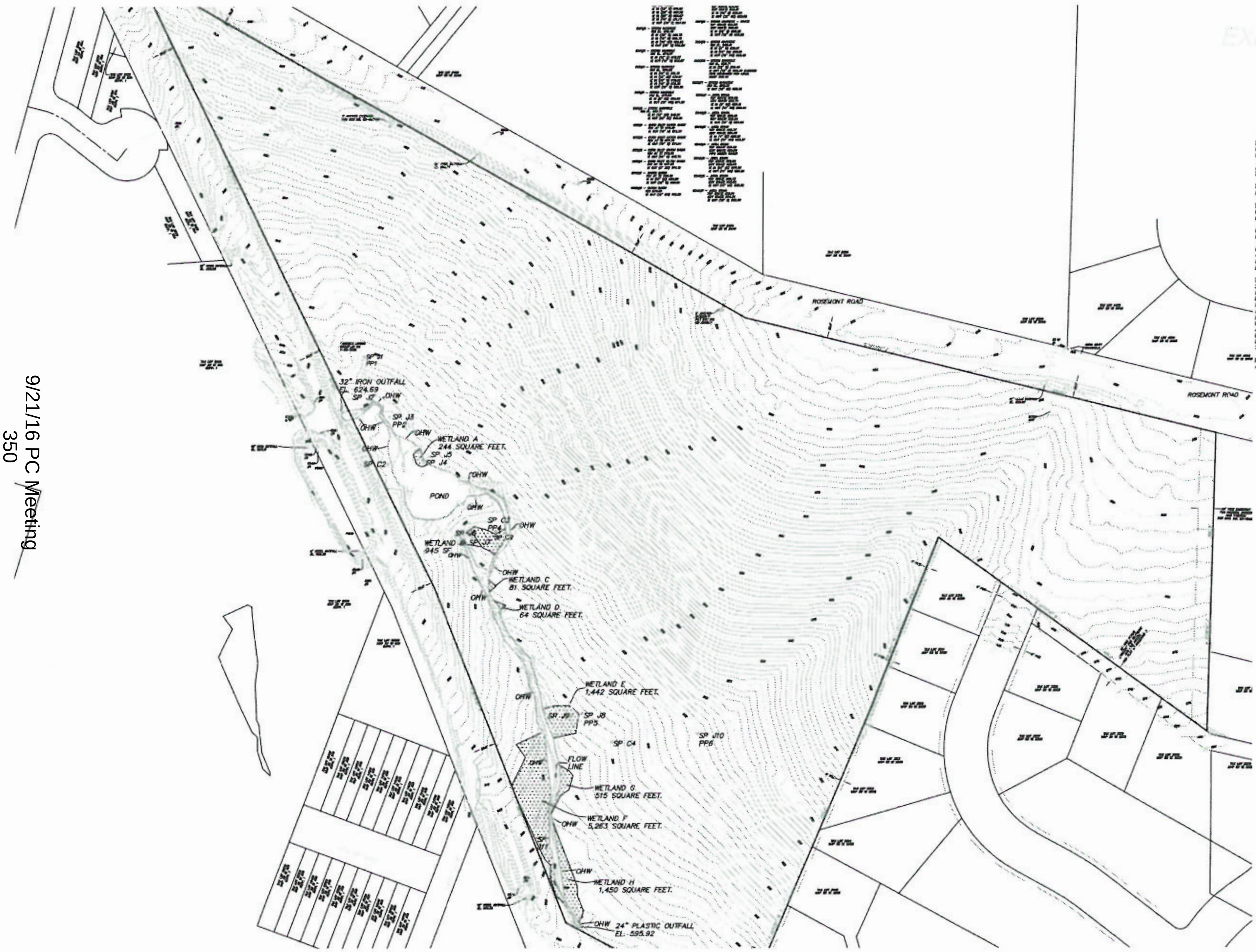
DESIGNED	REG			
DRAWN	REG			
SCALE	1" = 60'			
DATE	June 6, 2016			
FILE	15-ICN-107	DATE	NO	REVISION

Richard E. Givens, Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045
PH. (503) 479-0097

APPLICANT: Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH. (503) 657-0406

Tanner Ridge at Rosemont
Tentative Plan

SHEET: 1/5



EXISTING CONDITIONS MAP

TAX LOTS 300 & 1100
LOCATED IN THE N.E. 1/4 &
S.E. 1/4 SECTION 36, T.2S., R.1E., W.M.,
CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON
JANUARY 13, 2016 SCALE 1"=120'

THE DATUM FOR THIS SURVEY IS BASED UPON NAVD-88, BENCH MARK "SALAMO" WITH AN IDENTIFICATION NUMBER OF PID-AJ8186. THE ELEVATION OF THIS BENCH MARK IS 872.72 FEET.

A TRIMBLE S6-SERIES ROBOTIC INSTRUMENT WAS USED TO COMPLETE A CLOSED LOOP FIELD TRAVERSE.

THE BASIS OF BEARINGS FOR THIS SURVEY IS PER MONUMENTS FOUND AND HELD PER THE PLAT OF "ROSEMONT SUMMIT NO. 2", RECORDS OF CLACKAMAS COUNTY.

THE PURPOSE OF THIS SURVEY IS TO RESOLVE AND DETERMINE THE PERIMETER BOUNDARY OF THE SUBJECT PROPERTY, TO SHOW ALL PERTINENT BOUNDARY ISSUES AND ENCROACHMENTS. NO PROPERTY CORNERS WERE SET IN THIS SURVEY.

NO WARRANTIES ARE MADE AS TO MATTERS OF UNWRITTEN TITLE, SUCH AS ADVERSE POSSESSION, ESTOPPEL, ACQUIESCENCE, ETC.

FIDELITY NATIONAL TITLE COMPANY OF OREGON PRELIMINARY TITLE REPORT NUMBER 4514152835, DATED NOVEMBER 27, 2015 AS PROVIDED HAS BEEN USED AND REFERENCED IN PREPARATION OF THIS MAP. PLEASE REFER TO THIS DOCUMENT FOR DESCRIPTIONS OF EXCEPTIONS TO TITLE INSURANCE.

THE UNDERGROUND UTILITIES AS SHOWN ON THIS MAP HAVE BEEN LOCATED FROM FIELD SURVEY OF ABOVE GROUND STRUCTURES AND AS MARKED BY OTHERS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FUTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. SUBSURFACE AND ENVIRONMENTAL CONDITIONS WERE NOT EXAMINED OR CONSIDERED AS A PART OF THIS SURVEY. NO STATEMENT IS MADE CONCERNING THE EXISTENCE OF UNDERGROUND OR OVERHEAD CONTAINERS OR FACILITIES THAT MAY AFFECT THE USE OR DEVELOPMENT OF THIS TRACT. THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY SURVEYOR.

WETLAND/OHW BOUNDARIES AND SAMPLE PLOTS LOCATED IN THE FIELD BY SCHOTT AND ASSOCIATES. SURVEYED BY CENTERLINE CONCEPTS LAND SURVEYING, PLS.

SIGNED ON:

JULY 13, 2004

RENEWS: DECEMBER 31, 2017

CENTERLINE CONCEPTS
LAND SURVEYING, INC.

Figure 6 - Index Map

EXISTING CONDITIONS MAP

TAX LOTS 300 & 1100
LOCATED IN THE N.E. 1/4 &
S.E. 1/4 SECTION 26, T.2S., R.1E., W.M.,
CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON
JANUARY 18, 2016 SCALE 1"=120'

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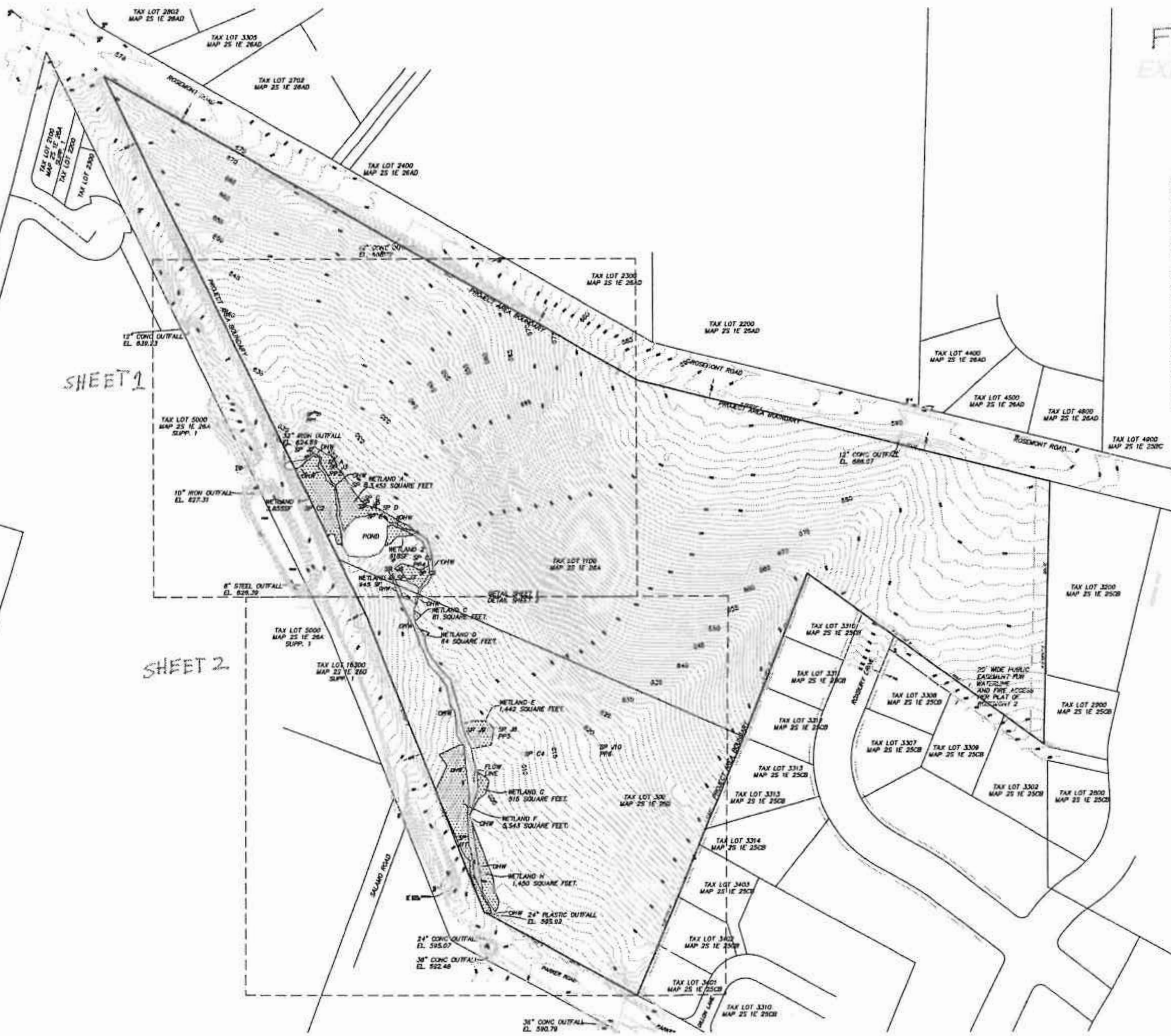
WETLAND/OHW BOUNDARIES AND SAMPLE PLOTS LOCATED IN THE FIELD BY SCHOTT AND ASSOCIATES. SURVEYED BY CENTERLINE CONCEPTS LAND SURVEYING, PLS.



N

GRAPHIC SCALE

DSL WD # 2016-0137

Approval Issued 6/28/2016

Approval Expires 6/28/2021

JULY 13, 2004
TOBY G. BOLDEN
60377LS
RENEWS: DECEMBER 31, 2017

CENTERLINE CONCEPTS
LAND SURVEYING, INC.
729 MOLALLA AVE., SUITE 1 & 2
OREGON CITY, OREGON 97045
PHONE 503.650.0188 FAX 503.650.0189

9/21/16 PC Meeting

9/21/16 PC Meeting
352

Figure 6 - Sheet 1

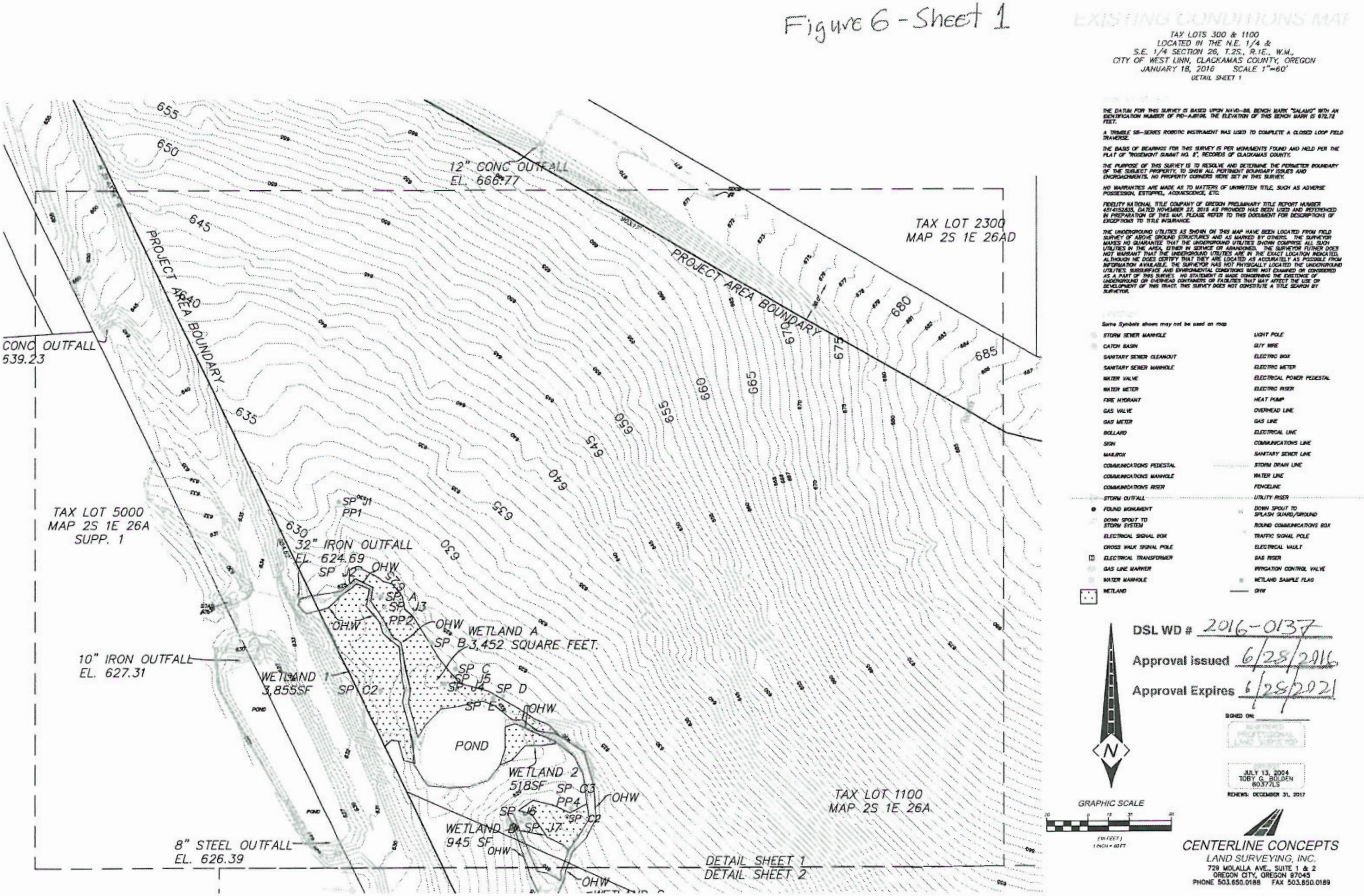
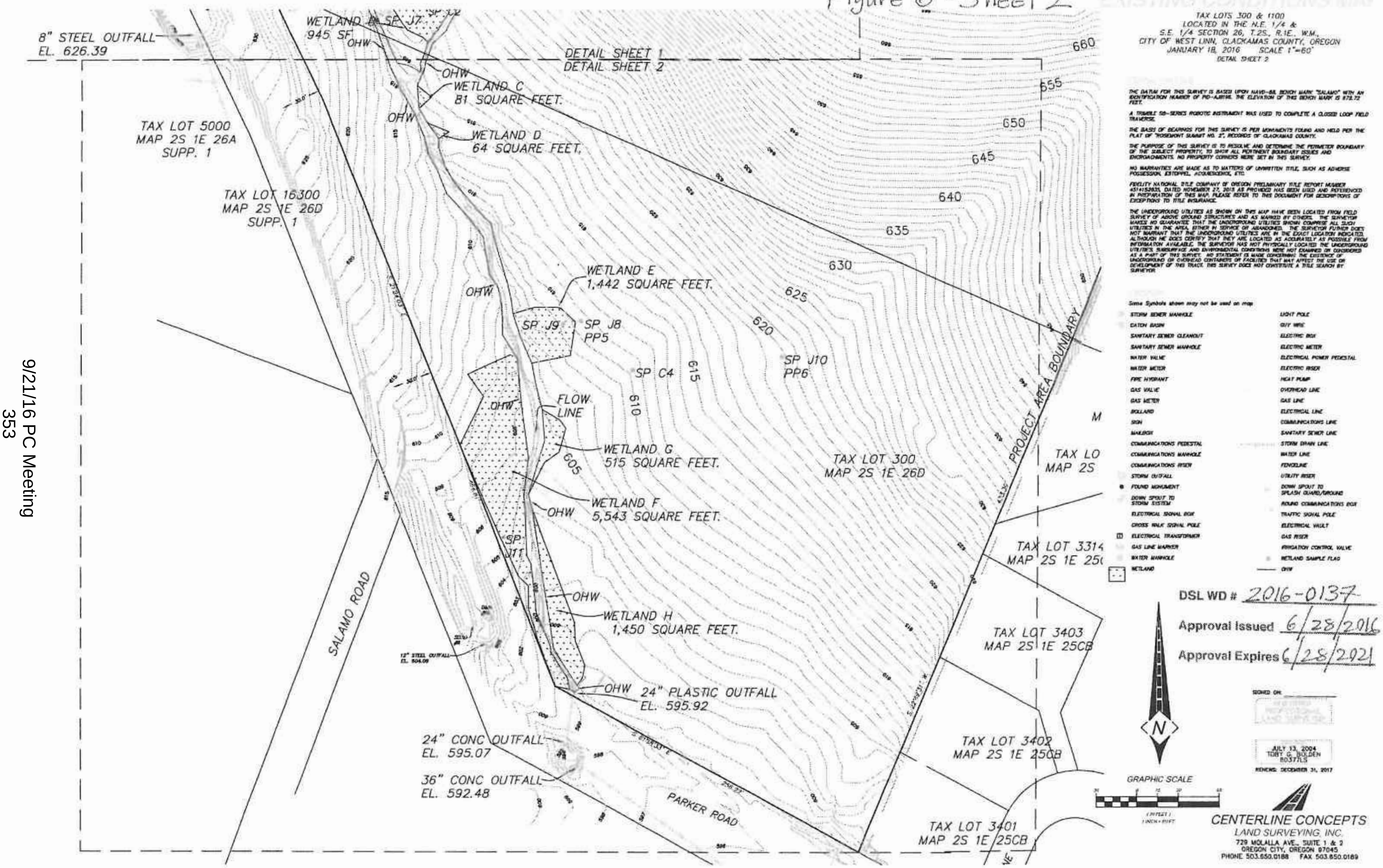


Figure 6 - Sheet 2



9/21/16 PC Meeting
353

SCHOTT & ASSOCIATES
Ecologists & Wetlands Specialists

21018 NE Hwy 99E • P.O. Box 589 • Aurora, OR 97002 • (503) 678-6007 • FAX: (503) 678-6011

June 27, 2016

Richard E Givens
18680 Sunblaze Drive
Oregon City, OR 97045

RE: Rosemont Road Water Detention Pond

Since the time of the original submittal for this project a water detention pond was added to the plan along the western edge of the property just south of the pond. The proposed 2,365 sq ft pond is located within mapped HCA and WRA areas and is subject to the requirements of Chapter 28 and Chapter 32 of the West Linn Development Code. The proposed pond is an allowed use if an alternative location outside the resource is not available.

The proposed pond location is at the low end of the property where connections to the storm system as well as the creek can easily be made. Locating a detention pond upslope away from the waterway is not feasible, making the proposed location the only reasonable location. The pond will be planted with native species for water quality functions and, in spite of any loss of existing vegetation, the proposed activity is not anticipated to significantly affect the existing functions of the resource areas. As described in the report the existing resource in this area is vegetated by a mix of red alder, hazelnut, Himalayan blackberry and reed canary grass and was determined to be in degraded to marginal condition. In addition to planting of the water detention pond area impacts from the pond construction will be mitigated by enhancing an equal area adjacent to the creek, between the proposed pond and the creek. Enhancement will consist of invasive Himalayan blackberry removal and replanting with a mix of trees, shrubs and herbaceous species as outlined in the table below. Enhanced areas all be monitored and maintained for three years as per City of West Linn WRA requirements and per the previously submitted Enhancement/Mitigation Plan.

Enhancement Planting Table (2,365sf)

	Plant Type	Water Require-ments	Light Require-ments	Min. Size	Min. Height	Spacing	Qty
Red alder (*Alnus Rubra*)	Tree	Moist	Sun	2 gal	3'		12
Pacific willow (*Salix lasiandra*)	Tree	Moist	Sun	stakes	2'	Cluster	12
Indian Plum (*Oemleria cerasiformis*)	Shrub	Moist	Shade	2 gal.	2'	Cluster	28
Cascade Oregon grape (*Mahonia nervosa*)	Shrub	Moist	Shade	1 gal.	4"	Cluster	45
Snowberry (*Symphoricarpos albus*)	Shrub	Dry	Part	1 gal.	1.5'	Cluster	45
Sword fern (*Polystichum munitum*)	Forb	Moist	Shade	2 gal.	n/a	Cluster	20
Native California brome (*Bromus carinatus*)	Grass	Dry	Part	Seed	n/a	10lbs. pls	
Blue Wildrye (*Elymus glaucus*)	Grass	Dry	Part	Seed	n/a	10lbs. pls	

SCHOTT & ASSOCIATES
Ecologists & Wetlands Specialists

21018 NE Hwy 99E • P.O. Box 589 • Aurora, OR 97002 • (503) 678-6007 • FAX: (503) 678-6011

May 23, 2016

Richard E Givens
18680 Sunblaze Drive
Oregon City, OR 97045

RE: Rosemont Road Subdivision project

Attn. Rick Givens

Per questions to address by Schott and Associates:

32.000 *Please Map and discuss the western ephemeral stream that originates on Rosemont Road at a storm water pipe outfall.*

There is no western ephemeral stream from Rosemont. There was no defined channel and no drainage starting from Rosemont. We walked the entire site and observed this. Also, we were there in January during very heavy rains, after very heavy December rains and no channel was observed starting from Rosemont at the west nor east end.

However, there is a drainage that starts from a culvert at the western property boundary about half way down the property with a defined channel and flowing water. See existing conditions map.

Discuss the appropriateness of re-aligning the two ephemeral streams. N/A

Discuss the ephemeral stream outfall into the WRA and proposed means of dissipating the flow.
To be addressed by others

Please provide the five appendices of Schott report. Done

32.080 (C) *Discuss whether the hogfuel trail within the reduced WRA boundary (between lots 24 and 35) is appropriate to the WRA's functions.* The paths are a public benefit as they will allow people to enjoy the area but keep them out of the WRA and on the path (Restricted access). The hogfuel trail won't add impervious area and won't impact WRA Functions. Also there is the educational value to the schools nearby.

32.100 (E) *Provide map showing where re-vegetation mitigation will occur.* Mitigation is now shown on the new exhibit.

Regarding Chapter 28. There is a small finger of HCA mapped just to the east of the main HCA mapped area. This area may have been mapped this way because it was thought a drainage way or wetland existed there. In walking the site, no wetland or drainage way was observed in this finger of HCA. Within the HCA mapped on Lot 35, it may have been mapped using tree overstory. The understory contained Himalayan blackberry and or English ivy.

Cari Cramer
Schott and Associates

SCHOTT & ASSOCIATES
Ecologists & Wetlands Specialists

21018 NE Hwy 99E • P.O. Box 589 • Aurora, OR 97002 • (503) 678-6007 • FAX: (503) 678-6011

MEMO

RE: Revisions to Tanner Ridge at Rosemont HCA Mapped Boundaries

August 25, 2016

This memo is being provided as the applicant believes that the Metro HCA mapped boundaries are in error on the subject property containing Tax lots 300 and 1100 located on the corner of Salamo Drive and Rosemont Road.

The City of West Linn uses the Metro HCA map to identify habitat conservation areas in the City. The above subject property is HCA mapped as High and Moderate along 2/3rds of the western property boundary.

Per Chapter 28 Willamette and Tualatin River Protection 28.070 Planning Director Verification of Metro Habitat Protection Map Boundaries-

A) *The HCA Map is the basis for identifying and designating the habitat conservation areas in the City. It is inevitable, given the large area that Metro's HCA Map covers, that there may be some errors. In cases where, for example, three properties share the same contours and the same natural features but the map shows the middle lot with an HCA designation on it, it is reasonable to question the accuracy of that HCA designation. Using tree overstory as the sole basis for HCA designation will also allow a change in designation since tress are already protected in the municipal code and Chapters 55 and 85 CDC.*

Per Metro Title 13: 3.07.1340 d. Administering the Habitat Conservation Areas Map and Site Level Verification of Habitat Location d.4.Aii 2- *In terms of mapping the location of habitat, the only allowed corrections to the vegetative cover status of a property are those based on an area being developed prior to the local program effective date and those based on errors made at the time the vegetative cover status was determined based on analysis of the aerial photographs used to create the Metro Vegetative Cover Map (for the original map, the aerial photos used were Metro's summer 2002 photos) and application of the vegetative cover definitions provided in the footnotes to Table 3.07-13d.*

Through observation of the summer 2002 Aerials we believe the HCA boundary was mapped using the vegetative cover of the tree overstory. The shape of the boundary basically matches the aerial and in particular a finger of HCA boundary at the northeast extent of the HCA boundary. (see figure 1-Metro HCA, figure 2-2002 Aerial)

Chapter 28 28.070 (B)

B) The planning director shall verify the appropriate HCA or non-HCA designation by site visits or *consultations with Metro or by other means. Determination is based on whether the Metro criteria are met of whether the Metro designation was based solely on tree overstory in which case a redesignation is appropriate. In cases where the determination is that the map is incorrect, the Planning Director will make a written finding of this as well as the site conditions that led to that conclusion.*

Metro designation was based solely on tree overstory and a redesignation is appropriate. A site visit and delineation were done by Schott and Associates in January 2016 on the subject property. The entire property was walked and data documented. A pond with a connecting drainage with fringe wetlands were delineated on site, surveyed and mapped. After a DSL site visit the delineation findings were concurred with and determined state jurisdictional June of 2016. The vegetation observed onsite was mainly non-native and/or invasive. The northern portion of the property contains an overstory of Douglas fir (*Pseudotsuga menziesii*) and red alder (*Anlus rubra*). The understory is predominantly Himalayan blackberry (*Rubus armeniacus*) and English ivy (*Hedera helix*) with some scattered sword fern (*Polystichum munitum*). Himalayan blackberry and ivy are considered non-native and invasive. Just along the edge of the drainage and pond and the western property boundary adjacent to the drainage was scattered willow (Salix sp), red alder and common filbert (Corylus cornuta). The understory was again predominantly Himalayan blackberry and ivy with some reed canary grass (*Phalaris arundinacea*), lady fern (*Athyrium filix-femina*) and sword fern. A majority of the eastern portion of the property was an open field dominated by non-native grasses. A thick band of Himalayan blackberry bordered the field to the west, north and east.

Per Metro Title 13: 3.07.1340 d. *Administering the Habitat Conservation Areas Map and Site Level Verification of Habitat Location d.(4) Habitat Boundaries (A) Locating riparian habitat and determining its habitat class is a five step process.*

(i)Step 1. Locate the water feature that is the basis for identifying riparian habitat: 1) Locate the top of bank of all streams, rivers, and open water within 200feet of the property. 2) Locate all flood areas within 100 feet of the property. 3) Locate all wetlands within 150 feet of the property based on the local wetland inventory map (if completed) and on the Metro 2004 Wetland Inventory Map. Identified wetlands shall be further delineated consistent with methods currently accepted by the Oregon Division of State Lands and the US Army Corps of Engineers. All water features were identified as described above. Tanner Creek was identified on the LWI, though no wetlands were mapped on it. There are no flood plains to identify on the property. The drainage, Tanner Creek, was located and flagged by Schott and Associates and then surveyed and mapped. Schott and Associates conducted a delineation, finding wetlands on site, with currently accepted methods. The delineation was concurred with in June of 2016 by DSL and all previous mapping should be replaced by this updated delineation.

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

200ft and 140 to 150' east is an overstory of Douglas fir. The understory is dominated by Himalayan blackberry or ivy. Fringe wetland borders the drainage on both sides up to the pond located south. The fringe wetland to the west has no vegetative border. The fringe wetland to the east of the drainage and south of the pond is bordered by the same vegetation as stated above. The drainage continues south, south of the pond with a few small associated fringe wetlands. At the edge of the drainage a few willow and hazelnut trees were scattered throughout with an understory consisting mainly of ivy, blackberry or reed canary grass. Beyond the narrow band of scattered trees to the east was a thick band of Himalayan blackberry that ended about 60' away from the drainage into an open non-native grass field. To the west of the drainage and fringe wetlands the understory again was predominantly Himalayan blackberry and ivy.

In conclusion, The HCA is low quality due to the non-native, invasive vegetation. There is an area of tree cover in the northwest portion of the property with an understory dominated by Himalayan blackberry. The rest of the site bordering the drainage and wetland consists mainly of blackberry and ivy, both non-native and invasive. The HCA boundary lines are mapped erroneous and need to be redesignated based on the location of the drainage and wetlands delineated on site and not the tree cover based on 2002 summer photos.

There are two areas in specific where map changes are requested. (See Figure 2 HCA map, pink highlight areas). The northern extent of the HCA does contain a tree overstory that is less dense, however, the entire understory is dominated by Himalayan blackberry. The second area is at the southern extent of the HCA at the eastern boundry line. This area is entirely Himalayan blackberry. The vegetation is non-native, invasive and of very low value and these areas should not be mapped as HCA.

Cari Cramer
Schott and Associates

Richard E. Givens, Planning Consultant
18680 Sunblaze Dr
Oregon City, OR 97045
PH: (503) 479-0097

APPLICANT
Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
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PH: (503) 657-0406

Tanner Ridge at Rosemont
Habitat Conservation Areas

3/5

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007

Figure 1: Metro HCA Map
Tanner Ridge at Rosemont
S&A 2409

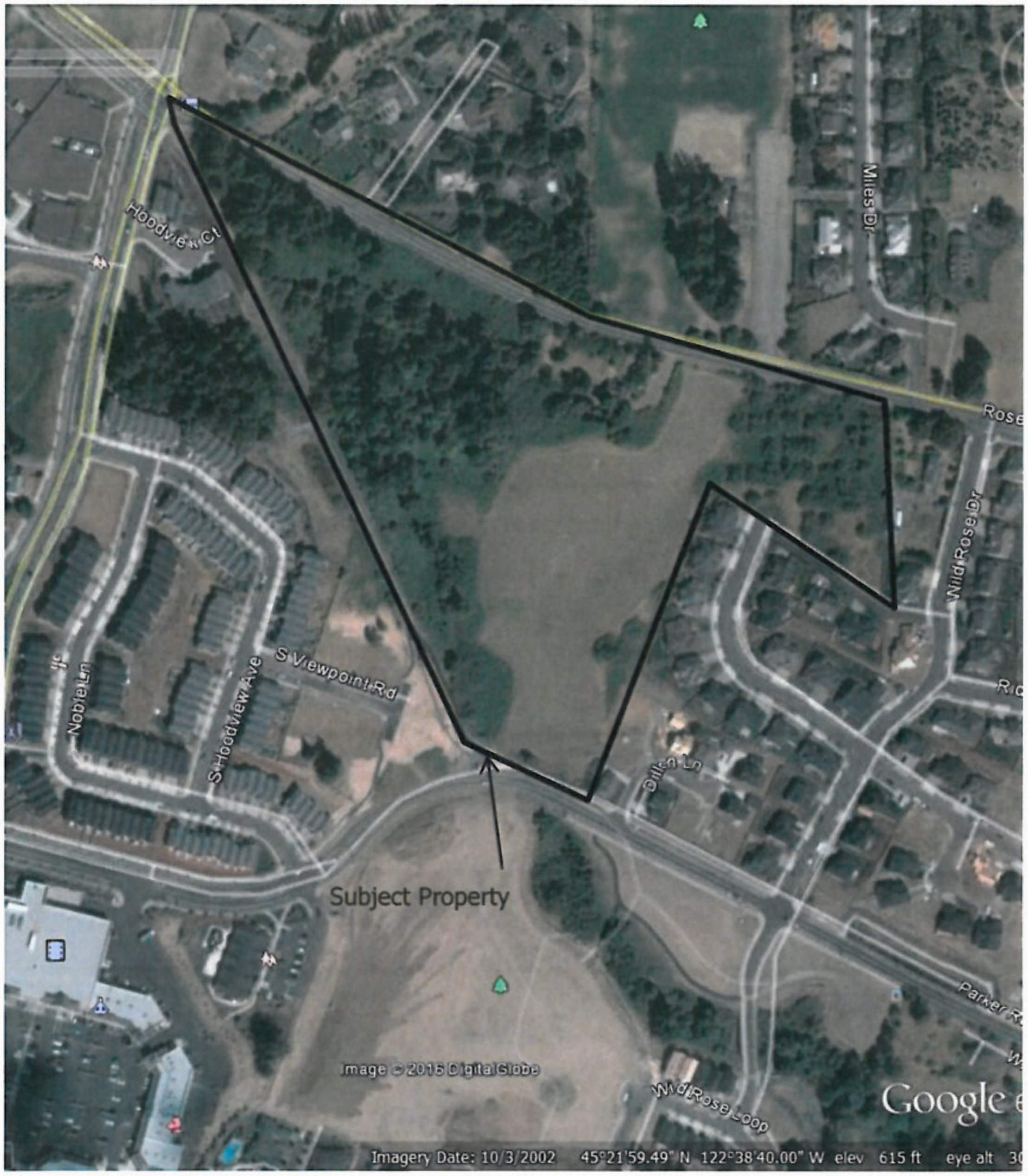

Figure 2: 2002 Aerial Photo Tanner Ridge at Rosemont S&A 2409	Schott & Associates P.O. Box 589 Aurora, OR. 97002 503.678.6007

Oregon
Kate Brown, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 986-5200
FAX (503) 378-4844
www.oregon.gov/dsl

June 28, 2016

ICON Construction & Development, LLC
Attn: Darren Gusdorf
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068

Re: WD # 2016-0137 Wetland Delineation Report for
a Proposed Development on Rosemont Road
Clackamas County; T2S R1E Sec. 26A, Tax Lot 1100,
and Sec. 26D, Tax Lot 300, City of West Linn
Local Wetlands Inventory, Wetland TA-02

Dear Mr. Gusdorf:

The Department of State Lands has reviewed the wetland delineation report prepared by Schott and Associates for the site referenced above. Based upon the information presented in the report, a site visit on May 27, 2016, and additional information submitted upon request, we concur with the wetland and waterway boundaries as mapped in revised Figure 6 - Index Map and Figure 6 - Sheets 1 and 2. Please replace all copies of the preliminary wetland map with these final Department-approved maps.

Within the study area, eight wetlands (totaling approximately 0.31 acres), a segment of Tanner Creek, and a pond created from the creek were identified. The wetlands, creek and pond are subject to the permit requirements of the state Removal-Fill Law. Under current regulations, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in wetlands or below the ordinary high water line (OHWL) of a waterway (or the 2 year recurrence interval flood elevation if OHWL cannot be determined).

This concurrence is for purposes of the state Removal-Fill Law only. Federal or local permit requirements may apply as well. The Army Corps of Engineers will review the report and make a determination of jurisdiction for purposes of the Clean Water Act at the time that a permit application is submitted. We recommend that you attach a copy of this concurrence letter to both copies of any subsequent joint permit application to speed application review.

Please be advised that state law establishes a preference for avoidance of wetland impacts. Because measures to avoid and minimize wetland impacts may include reconfiguring parcel layout and size or development design, we recommend that you work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity or complete permit application. The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

Thank you for having the site evaluated. Please phone me at 503-986-5232 if you have any questions.

Sincerely,

Peter Ryan, PWS
Jurisdiction Coordinator

Approved by Kathy Verble
Kathy Verble, CPSS
Aquatic Resource Specialist

Enclosures

ec: Cari Cramer, Schott and Associates
City of West Linn Planning Department (Maps enclosed for updating LWI)
Dominic Yballe, Corps of Engineers
Anita Huffman, DSL

WD2016-0137

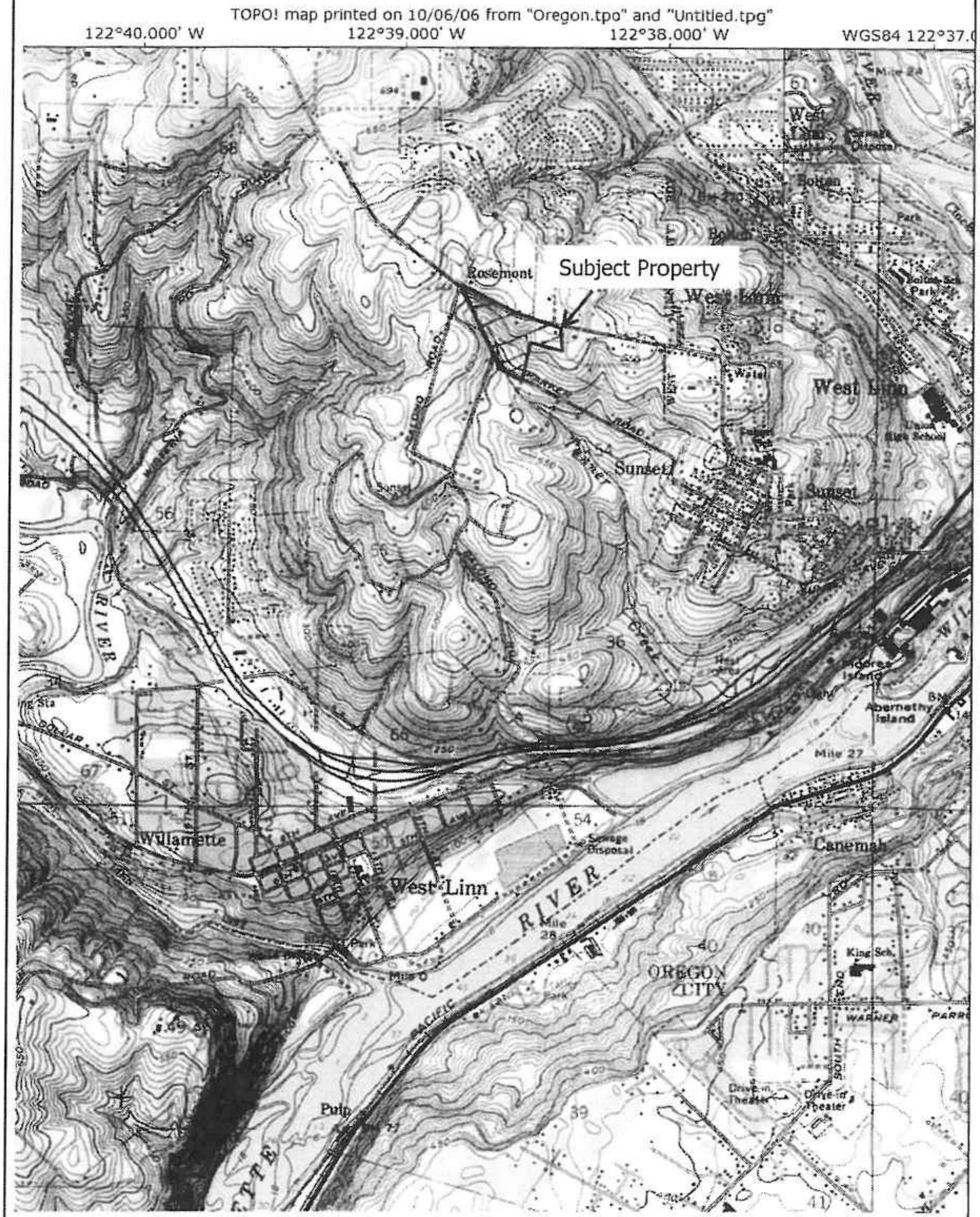

Figure 1: Site Vicinity Map Rosemont Road Property S&A 2409	Schott & Associates P.O. Box 589 Aurora, OR. 97002 503.678.6007

WD2016-0137

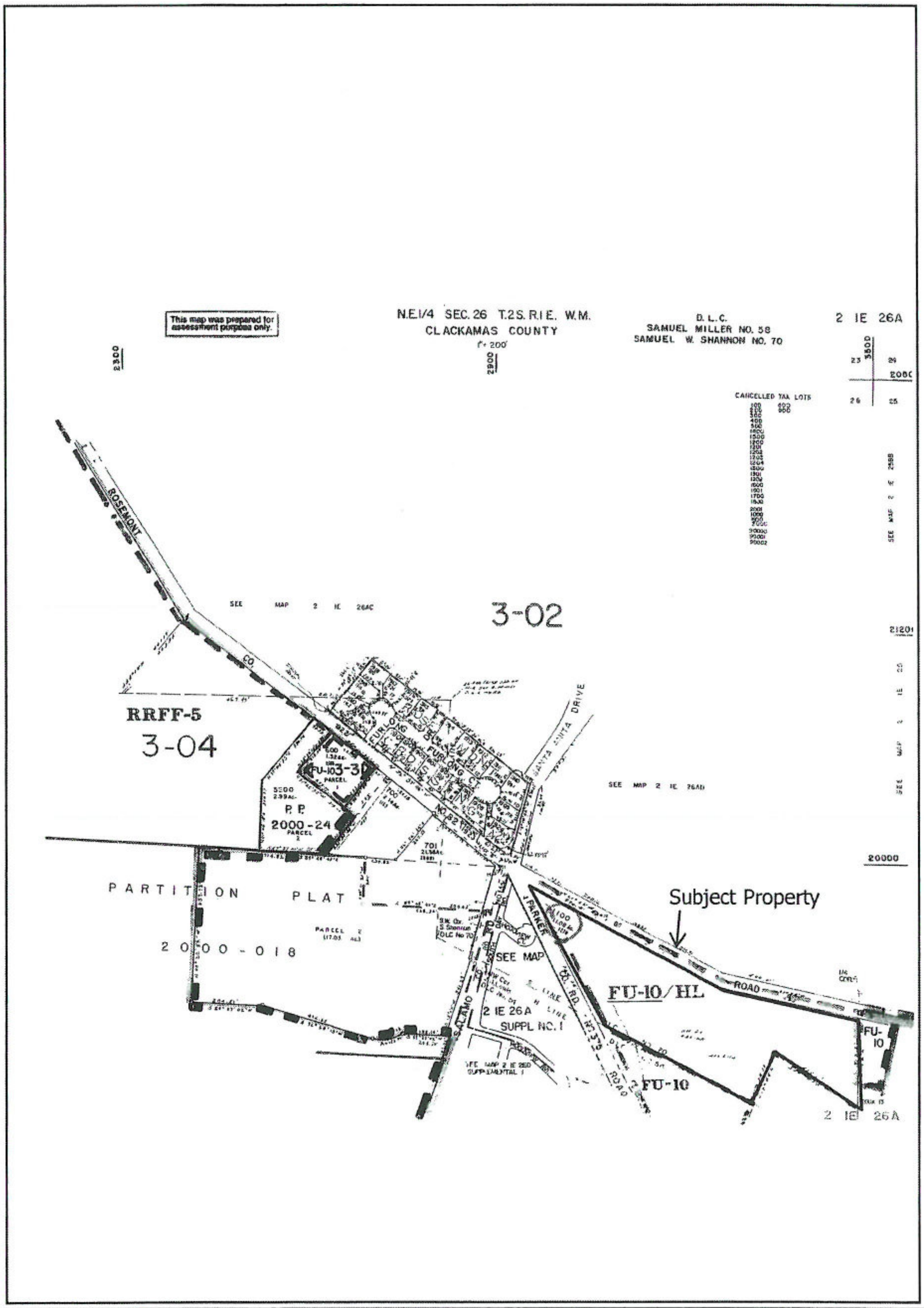

Figure 2: Tax Map-TL 1100 Rosemont Road Property S&A 2409	Schott & Associates P.O. Box 589 Aurora, OR. 97002 503.678.6007

WD2016-0137

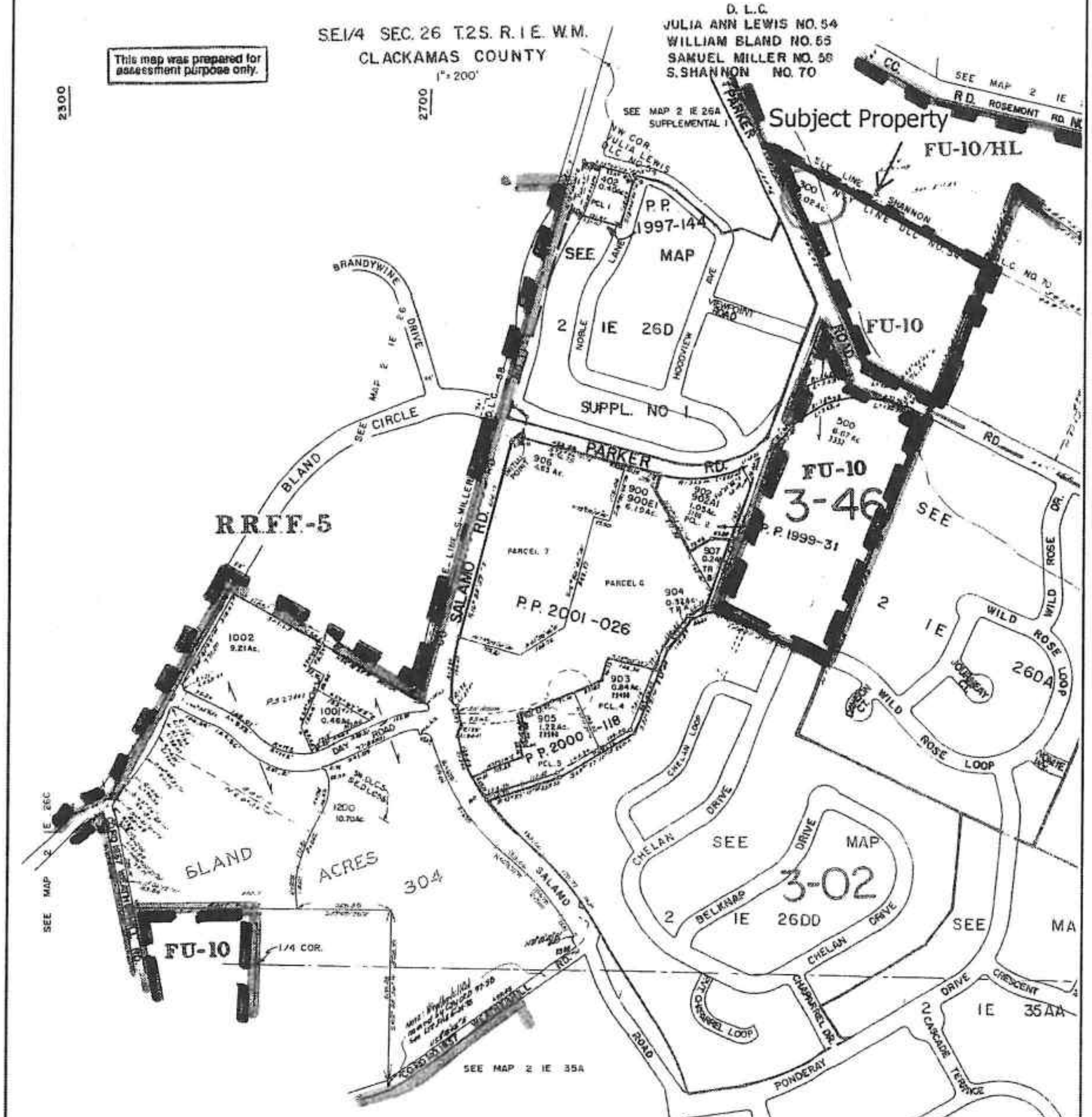

Figure 2a: Tax Map – TL 300
Rosemont Road Property
S&A 2409

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007

Figure 6 - Index Map

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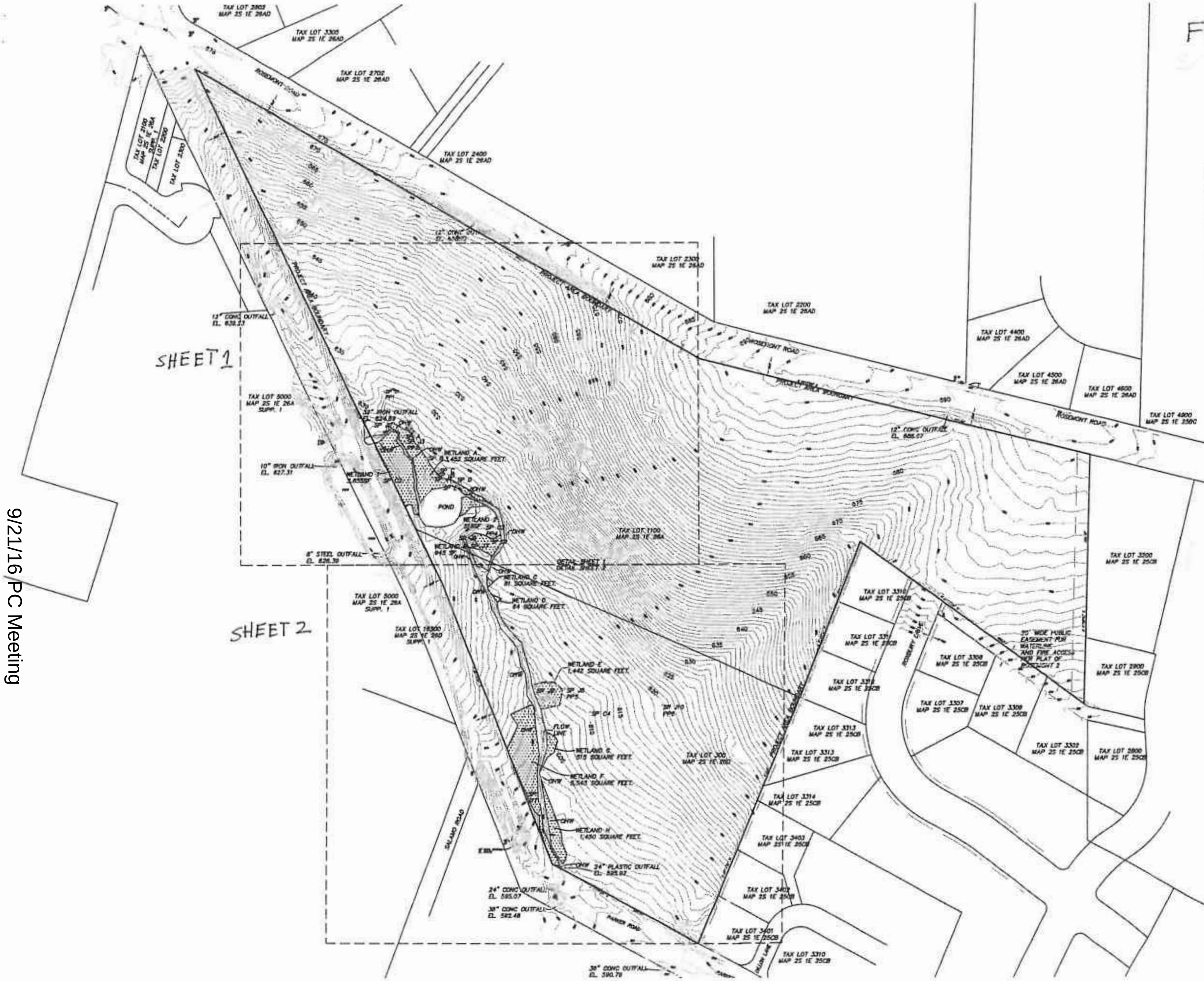

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NO WARRANTIES ARE MADE AS TO MATTERS OF UNWRITTEN TITLE, SUCH AS ADVERSE POSSESSION, ESTOPPEL, ACQUIESCENCE, ETC.

FIDELITY NATIONAL TITLE COMPANY OF OREGON PRELIMINARY TITLE REPORT NUMBER 4514152835, DATED NOVEMBER 27, 2015 AS PROVIDED HAS BEEN USED AND REFERENCED IN PREPARATION OF THIS MAP. PLEASE REFER TO THIS DOCUMENT FOR DESCRIPTIONS OF EXCEPTIONS TO TITLE INSURANCE.

THE UNDERGROUND UTILITIES AS SHOWN ON THIS MAP HAVE BEEN LOCATED FROM FIELD SURVEY OF ABOVE GROUND STRUCTURES AND AS MARKED BY OTHERS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FUTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. SUBSURFACE AND ENVIRONMENTAL CONDITIONS WERE NOT EXAMINED OR CONSIDERED AS A PART OF THIS SURVEY. NO STATEMENT IS MADE CONCERNING THE EXISTENCE OF UNDERGROUND OR OVERHEAD CONTAINERS OR FACILITIES THAT MAY AFFECT THE USE OR DEVELOPMENT OF THIS TRACT. THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY SURVEYOR.

WETLAND/OHW BOUNDARIES AND SAMPLE PLOTS LOCATED IN THE FIELD BY SCHOTT AND ASSOCIATES. SURVEYED BY CENTERLINE CONCEPTS LAND SURVEYING, PLS.

DSL WD # 2016-0137
Approval Issued 6/28/2016
Approval Expires 6/28/2021

SIGNED ON: ________

JULY 13, 2004
TOBY G. BOLDEN
60377LS
RENEWS: DECEMBER 31, 2017

CENTERLINE CONCEPTS
LAND SURVEYING, INC.
729 MOLALLA AVE., SUITE 1 & 2
OREGON CITY, OREGON 97045
PHONE 503.650.0188 FAX 503.650.0189

Figure 6 - Sheet 1

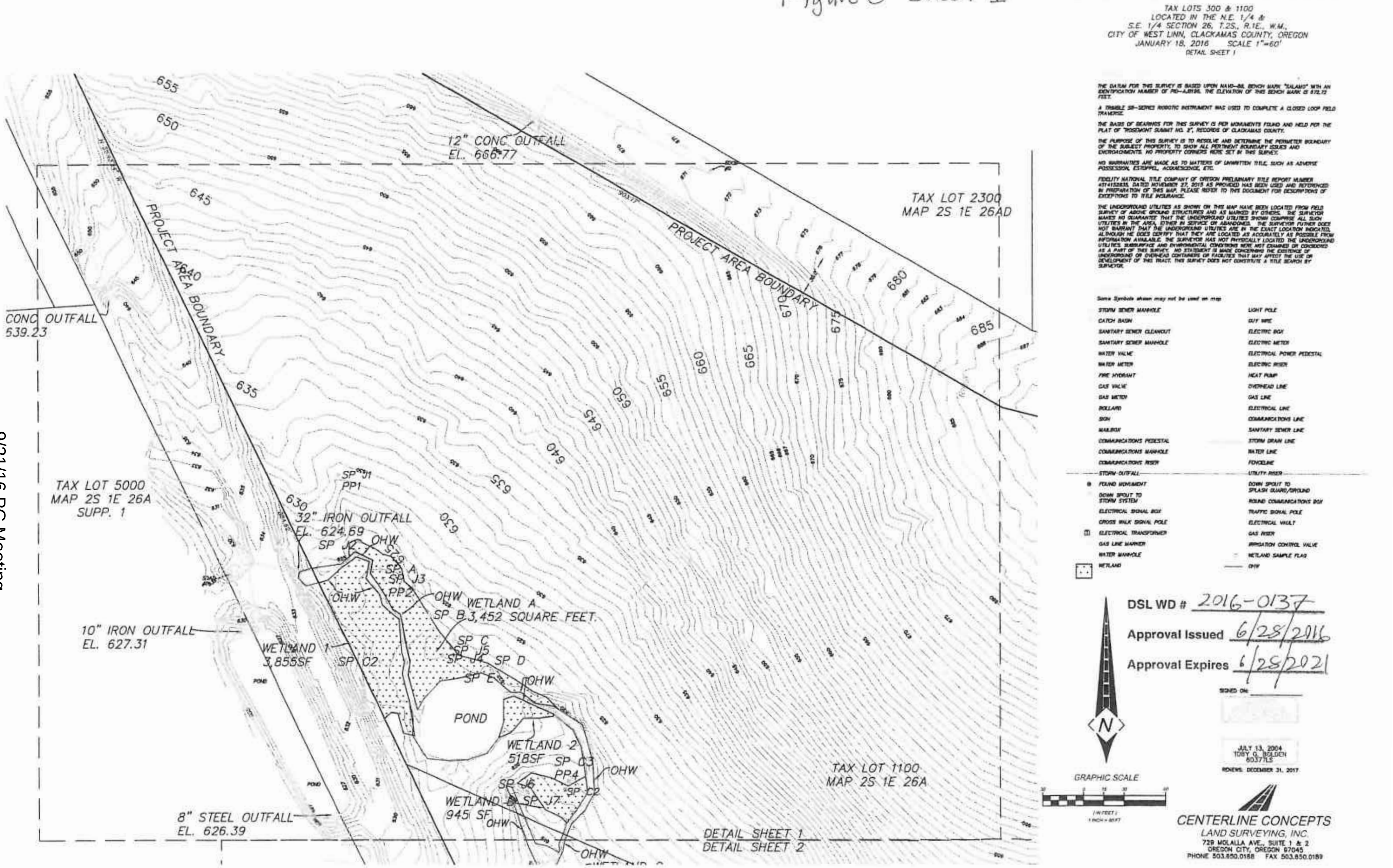
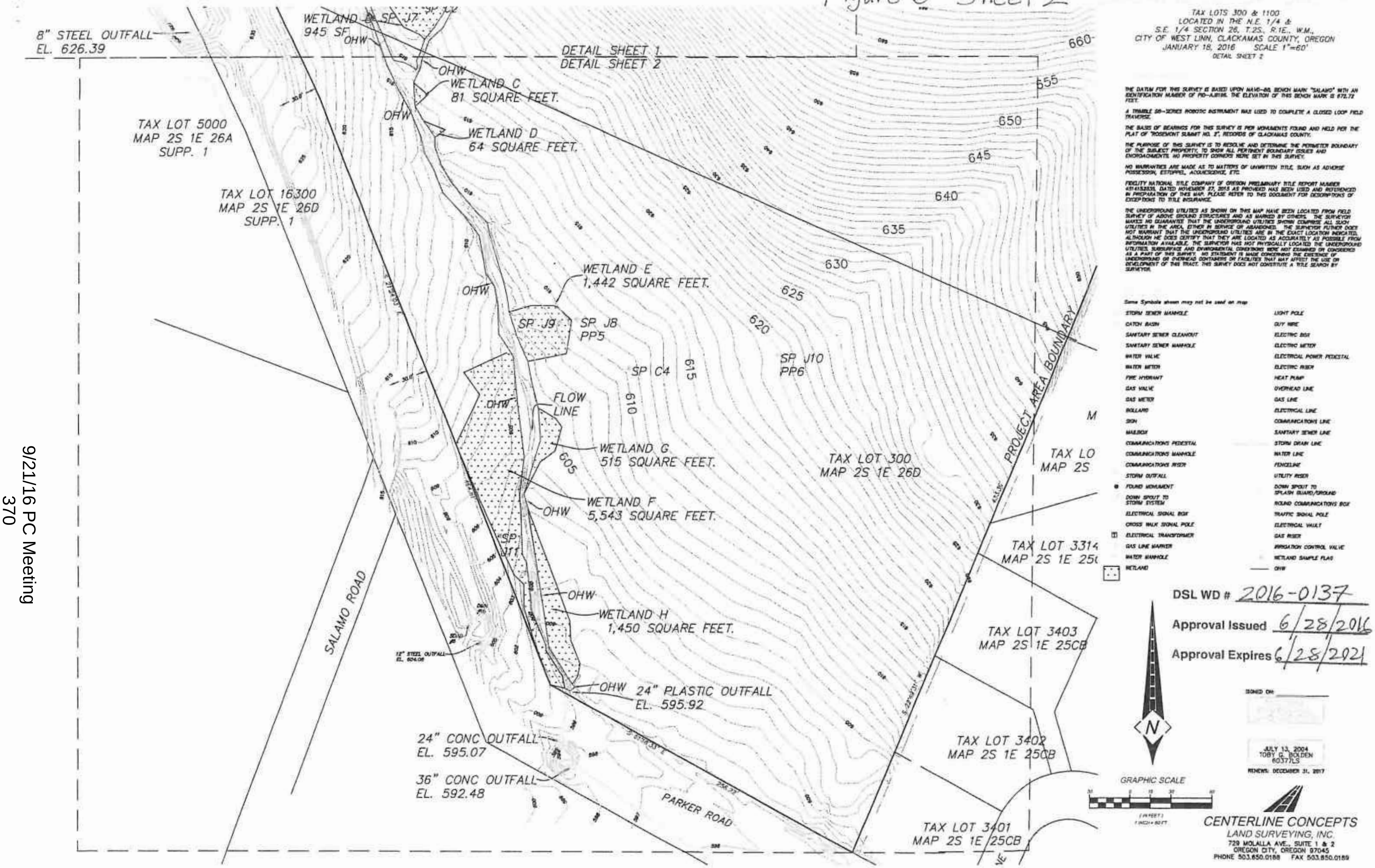


Figure 6 - Sheet 2



Gmail

Rick Givens <rickgivens@gmail.com>

FW: Message from KMBT_C454

Perkins, Michael <Mperkins@westlinnoregon.gov> Mon, Mar 28, 2016 at 4:08 PM
To: "rickgivens@gmail.com" <rickgivens@gmail.com>, Darren Gusdorf <darren@iconconstruction.net>

Significant trees circled in red

From: km_C454_parks@westlinnoregon.gov [mailto:km_C454_parks@westlinnoregon.gov]
Sent: Monday, March 28, 2016 3:59 PM
To: Perkins, Michael <Mperkins@westlinnoregon.gov>
Subject: Message from KMBT_C454

Michael Perkins
City Arborist/Park Development Coordinator
22500 Salamo Rd.
West Linn, Oregon 97068
Mperkins@westlinnoregon.gov
westlinnoregon.gov
Phone (503) 723-2554

City of West Linn

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Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
9	n/a	9	9	DEC	n/a	gone	
159	Port-Orford cedar	12	12	CEDAR	0	terminal decline; diseased hedgerow	
160	Port-Orford cedar	8	8	CEDAR	0	terminal decline; diseased hedgerow	
161	Port-Orford cedar	12	12	CEDAR	0	terminal decline; diseased hedgerow	
162	Port-Orford cedar	CLUSTER	0	CEDAR	0	terminal decline; diseased hedgerow	
163	Port-Orford cedar	CLUSTER	0	CEDAR	0	terminal decline; diseased hedgerow	
164	cherry sp.	CLUSTER	0	DEC	0	stump sprouts, dead main stem. inaccessible blackberry	
165	Scouler willow	CLUSTER	0	DEC	0	undersize	w
166	filbert	CLUSTER	0	DEC	1	undersize	w
167	Scouler willow	CLUSTER	0	DEC	1	undersize	w
168	cottonwood	CLUSTER	0	DEC	1	undersize	w
169	cottonwood	9	9	DEC	2	undersize	w
170	cottonwood	26	26	DEC	2		w
171	cottonwood	16	16	DEC	2		w
172	cottonwood	6	6	DEC	n/a	undersize	w
173	Scouler willow	12	12	DEC	0	broken	w
174	Scouler willow	12	12	DEC	0	broken	w
175	Scouler willow	12	12	DEC	0	broken	w
176	Scouler willow	12	12	DEC	0	broken	w
177	Scouler willow	6	6	DEC	n/a	undersize	w
178	Scouler willow	11	11	DEC	n/a	undersize	w
179	Scouler willow	CLUSTER	0	DEC	n/a	undersize	w
180	Scouler willow	6	6	DEC	n/a	undersize	w
181	Scouler willow	7	7	DEC	n/a	undersize	w
185	Scouler willow	CLUSTER	0	DEC	n/a	undersize	
186	cottonwood	31	31	DEC	2		w

Field work done 2/2016 by Ryan Neumann, PN-5539A

0/dead 1/decline 2/average 3/excellent

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
187	cottonwood	10	10	DEC	2	undersize	w
188	cottonwood	11	11	DEC	2	undersize	w
189	Scouler willow	CLUSTER	0	DEC	n/a	undersize	w
190	Scouler willow	CLUSTER	0	DEC	n/a	undersize	w
191	Scouler willow	7	7	DEC	n/a	undersize	w
192	Scouler willow	12	12	DEC	1		w
193	Scouler willow	13	13	DEC	0	broken	w
194	Scouler willow	CLUSTER	0	DEC	n/a	undersize	w
195	Scouler willow	9	9	DEC	n/a	undersize	w
196	Scouler willow	9	9	DEC	n/a	undersize	w
197	English holly	6	6	HOLLY	n/a	undersize	w
198	Scouler willow	6	6	DEC	n/a	undersize	w
199	English holly	7	7	HOLLY	n/a	undersize	w
201	Scouler willow	12	12	DEC	1		w
202	Scouler willow	13	13	DEC	1		w
203	Scouler willow	6	6	DEC	n/a	undersize	w
204	filbert	CLUSTER	0	DEC	n/a	undersize	
205	hawthorn sp	CLUSTER	0	DEC	n/a	undersize	
206	Scouler willow	6	6	DEC	n/a	undersize	
207	Scouler willow	9	9	DEC	n/a	undersize	w
208	cottonwood	14	14	DEC	2		w
209	cottonwood	6	6	DEC	n/a	undersize	w
210	Scouler willow	8	8	DEC	n/a	undersize	w
211	Scouler willow	6	6	DEC	n/a	undersize	w
212	Scouler willow	7	7	DEC	n/a	undersize	w
213	Scouler willow	8	8	DEC	n/a	undersize	w

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
214	pear	21	21	DEC	1		
215	cottonwood	7	7	DEC	n/a	undersize	
216	Garry oak	7	7	DEC	2		
217	cottonwood	9	9	DEC	n/a	undersize	w
218	cottonwood	10	10	DEC	n/a	undersize	w
219	cottonwood	10	10	DEC	n/a	undersize	w
220	cottonwood	10	10	DEC	n/a	undersize	w
221	cottonwood	9	9	DEC	n/a	undersize	w
222	Scouler willow	6	6	DEC	n/a	undersize	w
223	Scouler willow	7	7	DEC	n/a	undersize	w
224	Scouler willow	CLUSTER	0	DEC	n/a	undersize	w
225	Scouler willow	CLUSTER	0	DEC	n/a	undersize	w
226	cottonwood	22	22	DEC	2		w
227	Scouler willow	CLUSTER	0	DEC	n/a	undersize	w
228	cottonwood	24,18,18,11	47	DEC	2	multiple stems from base	w
229	Douglas fir	32	32	FIR	2	T-947 is hung up in crown	O
230	Douglas fir	24	24	FIR	2		O
231	Garry oak	9	9	DEC	1	broken tops and branches	O
232	deciduous hardwood	9,8,6	16	DEC	1	broken	O
233	Douglas fir	23	23	FIR	2	suppressed	O
234	Douglas fir	26	26	FIR	2	suppressed	O
235	Douglas fir	40	40	FIR	2		O
236	hawthorn sp	7	7	DEC	n/a	undersize	
240	big leaf maple	6	6	DEC	n/a	undersize	
241	big leaf maple	10	10	DEC	n/a	undersize	
242	elderberry	CLUSTER	0	DEC	n/a	undersize	

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
361	Scouler willow	6	6	DEC	n/a	undersize	w
362	Scouler willow	6	6	DEC	n/a	undersize	w
363	Scouler willow	36	36	DEC	2		w
401	English holly	8	8	HOLLY	1	undersize	
402	western red cedar	20	20	CEDAR	0	broken; ivy	
403	big leaf maple	15	15	DEC	1	broken tops; ivy	
405	Douglas fir	46	46	FIR	2	ivy	
406	English holly	CLUSTER	0	HOLLY	1	undersize	
407	big leaf maple	20	20	DEC	2	listed maple next to it	
408	English holly	7	7	HOLLY	1	undersize	
409	Douglas fir	27	27	FIR	2	ivy	
410	big leaf maple	26	26	DEC	1	past failures; hollow	
411	Douglas fir	18	18	FIR	2	ivy	
412	Douglas fir	33	33	FIR	1	co-dominate tops; ivy	
413	Douglas fir	36	36	FIR	1	co-dominate tops; ivy	
414	big leaf maple	20	20	DEC	1	excessive lean	
415	big leaf maple	24	24	DEC	2	ivy	
416	big leaf maple	21	21	DEC	1	past failures; trunk decay	
417	Douglas fir	26	26	FIR	2	ivy; suppressed	
418	Douglas fir	27	27	FIR	2	ivy	
419	big leaf maple	25	25	DEC	0	main stem broken @6'	
420	English holly	CLUSTER	0	HOLLY	1	undersize	
421	big leaf maple	21	21	DEC	2	ivy	
422	Douglas fir	28	28	FIR	2	ivy	
423	big leaf maple	11	11	DEC	1	undersize	
424	big leaf maple	25	25	FIR	2	ivy	

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0/dead 1/decline 2/average 3/excellent

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
425	big leaf maple	16	16	DEC	2	T-425 and T-426 are one tree	
426	big leaf maple	19	19	DEC	2	T-425 and T-426 are one tree	
427	Douglas fir	36	36	FIR	2	ivy	
428	Douglas fir	18	18	FIR	1	ivy; suppressed	
429	Douglas fir	17	17	FIR	1	ivy; suppressed	
430	Douglas fir	28	28	FIR	2		
431	Douglas fir	36	36	FIR	2	ivy	
432	big leaf maple	16	16	DEC	1	ivy; suppressed	
433	Scouler willow	CLUSTER	0	DEC	2	undersize	
434	Scouler willow	6	6	DEC	0	undersize	
435	Scouler willow	6	6	DEC		undersize	
436	Scouler willow	12	12	DEC	2		
437	Scouler willow	6	6	DEC		undersize	
438	Douglas fir	39	39	FIR	2	ivy	w
439	Scouler willow	11	11	DEC	1	undersize	
440	hawthorn sp	20	20	DEC	1		
441	English holly	6	6	HOLLY		undersize	
442	Scouler willow	7	7	DEC	n/a	undersize	
443	Douglas fir	21	21	FIR	2	ivy	
444	Douglas fir	30	30	FIR	2	ivy	
445	Douglas fir	15	15	FIR	0	main stem broken @ 20'	
446	big leaf maple	15	15	DEC	2	T-446 and 447 are one tree; ivy	
447	big leaf maple	7	7	DEC	2		
448	red alder	14,6,4	19	DEC	1	re-sprouted from fallen tree	
449	big leaf maple	46	46	DEC	2	ivy	w
450	big leaf maple	15	15	DEC	1	trunk swoop	

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
451	n/a	CLUSTER	0	DEC	0	on ground	
452	n/a	CLUSTER	0	DEC	0	on ground	
453	big leaf maple	7	7	DEC		undersize	
454	big leaf maple	25	25	DEC	2	ivy	
455	big leaf maple	20	20	DEC	2	ivy	
456	big leaf maple	7	7	DEC		undersize	
457	Douglas fir	34	34	FIR	2	ivy	
458	Douglas fir	37	37	FIR	2	ivy	
459	big leaf maple	16	16	DEC	2	ivy	
460	big leaf maple	15	15	DEC	2	ivy	
461	big leaf maple	32	32	DEC	1	T-461,462, and463 are one tree; one 19" dead stem	
462	n/a	n/a	0	DEC	n/a		
463	n/a	n/a	0	DEC	n/a		
464	hawthorn sp	14	14	DEC	2		w
465	big leaf maple	20,16,9,9	37	DEC	0	basal decay; main stem has failed	
466	hawthorn sp	6	6	DEC	1	undersize	
467	big leaf maple	12	12	DEC	2		
468	English holly	6	6	HOLLY	n/a	undersize	
469	big leaf maple	17	17	DEC	1	ivy	
470	Douglas fir	35	35	FIR	2	ivy	
471	big leaf maple	17	17	DEC	2	ivy	
472	big leaf maple	9	9	DEC	n/a	undersize	
473	Douglas fir	26	26	FIR	2		
474	big leaf maple	12	12	DEC	2		
475	big leaf maple	9	9	DEC	n/a	undersize	
476	n/a	28	28	FIR	n/a	not there	

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
477	Douglas fir	32	32	FIR	2	ivy	
478	Douglas fir	20	20	FIR	0	broken; dead; Schweinitzii root rot	
479	Douglas fir	27	27	FIR	2	ivy	
480	Douglas fir	20	20	FIR	2		
481	Douglas fir	21	21	FIR	2		
482	big leaf maple	8	8	DEC	n/a	undersize	
483	Douglas fir	25	25	FIR	2	ivy	
484	Douglas fir	38	38	FIR	2	ivy	
485	big leaf maple	44,32	60	DEC	1	basal decay; hollow	
486	big leaf maple	11,8	15	DEC	1	T-486 and 487 are one tree; excessive lean	
487	n/a	n/a	0	DEC			
488	big leaf maple	26	26	DEC	1	basal decay	
489	dead	10	10	DEC	0	undersize	
490	dead	11	11	DEC	0	undersize	
491	big leaf maple	8	8	DEC	0	undersize	
492	big leaf maple	12	12	DEC	1	excessive lean	
493	Douglas fir	25	25	FIR	2	ivy	
494	Douglas fir	20	20	FIR	2	ivy	
495	Douglas fir	24	24	FIR	2	ivy	
496	big leaf maple	15	15	DEC	0	broken	
497	big leaf maple	13	13	DEC	2	ivy	
498	Douglas fir	29	29	FIR	2	ivy	
499	Douglas fir	26	26	FIR	2	ivy	
500	Douglas fir	32	32	FIR	2	ivy	
666	Port-Orford cedar	10	10	CEDAR	0	terminal decline; diseased hedgerow	
667	big leaf maple	20	20	DEC	1	broken top; ivy	

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
668	spruce sp.	15	15	FIR	2		
669	spruce sp.	17	17	CON	2	ivy	
670	hawthorn sp	15	15	DEC	1	broken; excessive lean	
671	apple	12	12	DEC	1	decline	
672	cherry sp.	11	11	CHERRY	2	undersize	
673	apple	16	16	DEC	1	basal decay	
674	filbert	CLUSTER	0	DEC	1	undersize	
675	big leaf maple	32	32	DEC	1	broken top	
676	western red cedar	28	28	CEDAR	1	broken top; ivy	
677	big leaf maple	13	13	DEC	1	ivy	
678	dead	20-dead	20	DEC	0	snag	
679	spruce sp.	17	17	CON	0	broken	
680	elm sp.	36	36	DEC	1	ivy	
681	spruce sp.	13	13	CON	2		
682	elm sp.	9	9	DEC	1	undersize	
683	big leaf maple	7	7	DEC	1	undersize	
684	cherry sp.	10	10	DEC	2	undersize	
685	cherry sp.	6	6	DEC	2	undersize	
686	elm sp.	10	10	DEC	2	undersize	
687	cherry sp.	6	6	DEC	2	undersize	
688	elm sp.	21	21	DEC	2	ivy	
689	cherry sp.	7	7	DEC	1	undersize	
690	cherry sp.	7	7	DEC	2	undersize	
691	cherry sp.	6	6	DEC	2	undersize	
692	elm sp.	17	17	DEC	1	ivy	
693	elm sp.	10	10	DEC	2	undersize	

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0/dead 1/decline 2/average 3/excellent

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
694	cherry sp.	8	8	DEC	2	undersize	
695	cherry sp.	6	6	DEC	2	undersize	
696	cherry sp.	7	7	DEC	2	undersize	
697	English holly	12	12	HOLLY	1	hedgerow	
698	English holly	12	12	HOLLY	1	hedgerow	
699	English holly	CLUSTER	0	HOLLY	1	undersize	
700	English holly	13	13	HOLLY	1	hedgerow	
701	hawthorn sp	6	6	DEC	n/a	undersize	
702	cherry sp.	7	7	DEC	2	undersize	
703	hawthorn sp	8	8	DEC	1	undersize	
704	apple	14	14	DEC	0	basal decay; past failures	
705	English walnut	17	17	DEC	1		
706	English laurel	CLUSTER	0	LAUREL	n/a	shrub species; undersize	
707	hawthorn sp	CLUSTER	0	DEC	2	undersize	
708	English walnut	CLUSTER	0	DEC	1	decline	
709	cherry sp.	6	6	DEC	2	undersize	
710	hawthorn sp	CLUSTER	0	DEC	2	undersize	
711	English laurel	CLUSTER	0	LAUREL	0	undersize	
712	English walnut	13	13	DEC	1		
713	hawthorn sp	6x2	0	DEC	1	undersize	o
714	Douglas fir	16	16	FIR	1	topped for power lines	o
715	apple	17	17	DEC	1	trunk and stem decay; past failures	o
716	big leaf maple	36	36	DEC	2	pruned away from power lines	o
717	English walnut	16	16	DEC	2		o
718	dead	14-dead	14	CEDAR	0	dead	o
719	hawthorn sp	7	7	DEC	1	undersize	o

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0/dead 1/decline 2/average 3/excellent

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
720	hawthorn sp	7	7	DEC	2	undersize	
721	cherry sp.	7	7	DEC	2	undersize	
722	dead	10	10	DEC	0	dead	
723	apple	18	18	DEC	1	trunk and stem decay; past failures	
725	english laurel	CLUSTER	0	LAUREL	0	shrub species; undersize	
726	hawthorn sp	15	15	DEC	2		
727	hawthorn sp	CLUSTER	0	DEC	2		
728	apple	14-dead	14	DEC	1	trunk and stem decay; past failures; basal decay	
729	English walnut	CLUSTER	0	DEC	2	undersize	
730	apple	18	18	DEC	1	trunk and stem decay; past failures	
731	English walnut	15	15	DEC	2		
732	hawthorn sp	CLUSTER	0	DEC	1	undersize	
733	English walnut	14	14	DEC	2		
734	English walnut	15	15	DEC	1		
724	big leaf maple	6	6	DEC	1	undersize	
735	English walnut	15	15	DEC	2		
736	English walnut	15	15	DEC	1		
737	English walnut	17	17	DEC	2		
738	Lombardy poplar	22	22	DEC	2		
739	cherry sp.	CLUSTER	0	DEC	1	stump sprouts; undersize	
740	hawthorn sp	CLUSTER	0	DEC	1	undersize	
742	English walnut	16	16	DEC	2		
743	apple	17	17	DEC	1	trunk and stem decay	
744	hawthorn sp	13	13	DEC	2		
745	apple	16	16	DEC	1	trunk and stem decay	
746	English walnut	17	17	DEC	0	severe trunk decay; basal decay	

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
747	apple	12	12	DEC	0	trunk and stem decay; basal decay	
748	apple	17	17	DEC	0	trunk and stem decay; cavity	
749	apple	10	10	DEC	0	trunk and stem decay; basal decay; past failure	
750	apple	24	24	DEC	0	trunk and stem decay; past failure	
751	apple	12	12	DEC	0	trunk and stem decay; cavities	
752	English walnut	14	14	DEC	1	trunk and stem decay; basal decay; cavity in main stem	
753	English walnut	14	14	DEC	2	broken scaffold branches	
754	English walnut	17	17	DEC	2		
755	English walnut	22	22	DEC	1	stem decay	
756	English walnut	19	19	DEC	1	past failure	
757	hawthorn sp	7	7	DEC	1	undersize	
758	English walnut	19	19	DEC	0	terminal decline; trunk decay; dead tops	
759	English walnut	17	17	DEC	1		
760	English walnut	CLUSTER	0	DEC	0	broken; on ground	
761	English walnut	24	24	DEC	1	trunk and stem decay	
762	Norway maple	8	8	DEC	2	undersize	
763	English walnut	16	16	DEC	2		
764	English walnut	21	21	DEC	2		
765	hawthorn sp	7	7	DEC	2	undersize	
766	English walnut	16	16	DEC	0	past failure	
767	hawthorn sp	11	11	DEC	2	undersize	
768	cherry sp.	6	6	DEC	2	undersize	
769	English walnut	22	22	DEC	2		
770	deciduous hardwood	6	6	DEC	n/a	undersize	
771	elm sp.	15X2	0	DEC	2		
772	yew sp.	13	13	DEC	2		

Tag	Species	DBH	DBH²	Type	Rating	Condition	Location
773	elm sp.	17	17	DEC	2		
774	cherry sp.	8	8	DEC	1	undersize	
775	elm sp.	22	22	DEC	2		
776	elm sp.	8	8	DEC	2	undersize	
777	elm sp.	8	8	DEC	2	undersize	
778	elm sp.	8	8	DEC	2	undersize	
779	elm sp.	9	9	DEC	2	undersize	
780	elm sp.	6	6	DEC	2	undersize	
781	elm sp.	6	6	DEC	2	undersize	
782	elm sp.	9	9	DEC	2	undersize	
783	hawthorn sp	8	8	DEC	2	undersize	
784	hawthorn sp	10,9	14	DEC	1	undersize	
785	hawthorn sp	CLUSTER	0	DEC	2	undersize	
786	cherry sp.	9	9	DEC	2	undersize	
787	cherry sp.	8	8	DEC	2	undersize	
788	hawthorn sp	6	6	DEC	2	undersize	
789	apple	10	10	DEC	1	undersize	
790	yew sp.	38	38	CON	2		
791	vine maple	10	10	DEC	2	undersize	
792	apple	8	8	DEC	1	undersize	
793	English walnut	14	14	DEC	1		
794	Douglas fir	15	15	FIR	2	ivy	
795	Douglas fir	11	11	FIR	2		
796	cherry sp.	11	11	DEC	2	undersize	
797	elm sp.	19	19	DEC	2	ivy	
798	Port-Orford cedar	9	9	CEDAR	0	undersize	

Field work done 2/2016 by Ryan Neumann, PN-5539A 0/dead 1/decline 2/average 3/excellent

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
799	Port-Orford cedar	6x2	0	CEDAR	0	undersize	
801	big leaf maple	10,10,8	19	DEC	1	basal decay; excessive lean	
802	big leaf maple	20,18,12	35	DEC	1	basal decay; excessive lean	
803	hawthorn sp	CLUSTER	0	DEC	n/a	undersize	
804	Douglas fir	37	37	FIR	2	ivy	
805	dead	20-dead	20	DEC	0	ivy	
806	English holly	CLUSTER	0	DEC	1	undersize	
807	Scouler willow	18	18	DEC	0	on ground	
808	Douglas fir	36	36	FIR	2		
809	Douglas fir	47	47	FIR	2		
810	Douglas fir	17	17	FIR	2		
811	Douglas fir	44	44	FIR	2		
812	n/a	33	33	FIR	n/a	not there	
813	Douglas fir	14	14	FIR	2		
814	big leaf maple	23	23	DEC	1	ganoderma root rot	
815	red alder	23	23	DEC	1		
816	Scouler willow	7	7	DEC	2	undersize	
817	Douglas fir	35	35	FIR	2		
818	Douglas fir	33	33	FIR	2		
819	Douglas fir	39	39	FIR	2		w
820	Douglas fir	24	24	FIR	1	broken; trunk decay	w
821	Douglas fir	32	32	FIR	2	undersize	w
822	cherry sp.	CLUSTER	0	DEC	n/a	undersize	w
823	cherry sp.	7	7	DEC	n/a	undersize	w
824	cherry sp.	8	8	DEC	n/a	undersize	w
825	cherry sp.	9	9	DEC	n/a	undersize	w

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
826	cherry sp.	7	7	DEC	n/a	undersize	w
827	cherry sp.	7	7	DEC	n/a	undersize	w
828	cherry sp.	8	8	DEC	n/a	undersize	
829	cherry sp.	CLUSTER	0	DEC	2	undersize	
830	cherry sp.	7	7	DEC	n/a	undersize	
831	cherry sp.	CLUSTER	0	DEC	n/a	undersize	
832	cherry sp.	17	17	DEC	2	ivy	
833	elderberry	CLUSTER	0	DEC	2	undersize	
834	Scouler willow	CLUSTER	0	DEC	n/a	undersize	
835	cherry sp.	7	7	DEC	2	undersize	
836	cherry sp.	CLUSTER	0	DEC	n/a	undersize	
837	cherry sp.	7	7	DEC	n/a	undersize	
838	Douglas fir	41	41	FIR	2		
839	cherry sp.	7	7	DEC	n/a	undersize	
840	cherry sp.	8	8	DEC	n/a	undersize	
841	cherry sp.	8	8	DEC	n/a	undersize	
842	Douglas fir	32	32	FIR	2		
843	Douglas fir	30	30	FIR	2		
844	cherry sp.	7	7	DEC	2	undersize	
845	red alder	13	13	DEC	1	broken	
846	cherry sp.	14	14	DEC	1	listed	
847	filbert	CLUSTER	0	DEC	n/a	undersize	
848	dead	CLUSTER	0	DEC	0		
849	red alder	25	25	DEC	2		
850	big leaf maple	30	30	DEC	2		
851	hawthorn sp	11,8	15	DEC	2	undersize	

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
852	big leaf maple	7	7	DEC	1	undersize	
853	cherry sp.	7	7	DEC	2	undersize	o
854	Douglas fir	19	19	FIR	2	suppressed	o
855	Douglas fir	35	35	FIR	2		
856	Douglas fir	20	20	FIR	2	suppressed	
857	Douglas fir	27	27	FIR	2		o
858	Douglas fir	25	25	FIR	2		o
859	cherry sp.	12	12	CHERRY	2		o
860	Douglas fir	39	39	FIR	2		o
861	cherry sp.	8	8	CHERRY	2	undersize	o
862	cherry sp.	7	7	CHERRY	2	undersize	o
863	cherry sp.	8	8	CHERRY	2	undersize	o
864	Douglas fir	35	35	FIR	2		o
865	Douglas fir	29	29	FIR	2		o
866	Douglas fir	28	28	FIR	2		o
867	cherry sp.	6	6	CHERRY	2	undersize	o
868	Douglas fir	30	30	FIR	2		o
869	hawthorn sp	CLUSTER	0	DEC	2	undersize	o
870	Douglas fir	30	30	FIR	2		o
871	Douglas fir	33	33	FIR	2	ivy	
872	Douglas fir	20	20	FIR	2		o
873	Douglas fir	25	25	FIR	2		o
874	Douglas fir	31	31	FIR	2		o
875	Douglas fir	27	27	FIR	2		o
876	Douglas fir	28	28	FIR	2		o
877	red alder	18	18	DEC	2		

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
878	hawthorn sp	24	24	DEC	2		
879	Scouler willow	7	7	DEC	0	on ground	
880	Scouler willow	10	10	DEC	1	listed	
881	Douglas fir	17	17	FIR	0	broken	
882	Douglas fir	34	34	FIR	2		
883	Douglas fir	36	36	FIR	2		
884	hawthorn sp	7	7	DEC	1	undersize	
885	Scouler willow	25	25	DEC	1		
886	Scouler willow	12	12	DEC	1		
887	Scouler willow	16	16	DEC	0	broken	
888	hawthorn sp	6	6	DEC	n/a	undersize	
889	hawthorn sp	10	10	DEC	n/a	undersize	
890	hawthorn sp	6	6	DEC	n/a	undersize	
891	red alder	20	20	DEC	2		
892	cherry sp.	9	9	DEC	n/a	undersize	0
893	cherry sp.	9	9	DEC	n/a	undersize	0
894	Scouler willow	11	11	DEC	1	undersize	0
895	cherry sp.	8	8	DEC	n/a	undersize	
896	Scouler willow	12	12	DEC	1		
897	Scouler willow	30	30	DEC	2		
898	cherry sp.	CLUSTER	0	DEC	n/a	undersize	0
899	n/a	36	36	FIR	n/a	not there	
900	hawthorn sp	7	7	DEC	n/a	undersize	0
901	hawthorn sp	CLUSTER	0	DEC	n/a	undersize	0
902	hawthorn sp	6	6	DEC	n/a	undersize	0
903	hawthorn sp	20	20	DEC	1		0

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
904	hawthorn sp	6	6	DEC	n/a	undersize	0
905	hawthorn sp	8	8	DEC	n/a	undersize	0
906	hawthorn sp	CLUSTER	0	DEC	0	undersize	0
907	Douglas fir	25	25	FIR	2	ivy	0
908	Garry oak	36	36	DEC	2	ivy	0
909	Garry oak	35	35	DEC	2	ivy	0
910	Garry oak	24	24	DEC	2	ivy	0
911	Douglas fir	29	29	FIR	2		0
912	Douglas fir	37	37	FIR	0	broken; snag	0
913	Douglas fir	11	11	FIR	2	undersize	0
914	Douglas fir	12	12	FIR	2	suppressed	0
915	Douglas fir	30	30	FIR	2		0
916	Douglas fir	36	36	FIR	2		0
917	elderberry	7	7	DEC	2	undersize	0
918	Douglas fir	22	22	FIR	2		0
919	Scouler willow	18	18	DEC	1		0
920	big leaf maple	19	19	DEC	2		0
921	Douglas fir	23,18	32	FIR	2	co-dominate from base	0
922	Douglas fir	20	20	FIR	2		0
923	Douglas fir	26	26	FIR	2		0
924	Douglas fir	17	17	FIR	1	red-ring rot	0
925	Douglas fir	33	33	FIR	2		0
926	Douglas fir	32	32	FIR	2		0
927	big leaf maple	22	22	DEC	2		0
928	cherry sp.	8	8	DEC	2	undersize	0
929	Douglas fir	38	38	FIR	2	ivy	o

Field work done 2/2016 by Ryan Neumann, PN-5539A

0/dead 1/decline 2/average 3/excellent

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
930	Douglas fir	29	29	FIR	1	no top	o
931	Douglas fir	16	16	FIR	2		o
932	Douglas fir	22	22	FIR	2		o
933	Douglas fir	27	27	FIR	2		o
934	deciduous hardwood	6	6	DEC	n/a	undersize	o
935	cherry sp.	13	13	DEC	2		
936	Douglas fir	27	27	FIR	2	ivy	o
937	Douglas fir	14	14	FIR	2	ivy; suppressed	o
938	cherry sp.	14	14	DEC	2		o
939	Douglas fir	18	18	FIR	2		o
940	Douglas fir	24	24	FIR	2		o
941	hawthorn sp	18	18	DEC	1	broken branches	o
942	big leaf maple	7	7	DEC	1	undersize	o
943	Douglas fir	17	17	FIR	2	ivy; suppressed	o
944	cherry sp.	8	8	DEC	1	undersize	o
945	cherry sp.	8	8	DEC	2	undersize	o
946	Douglas fir	32	32	FIR	0	dead; snag	o
947	Douglas fir	25	25	FIR	0	listed; hung up in T-229	o
948	hawthorn sp	11	11	DEC	1	undersize	w
949	Douglas fir	29	29	FIR	2		w
950	Garry oak	29	29	DEC	1	excessive lean	w
951	hawthorn sp	CLUSTER	0	DEC	n/a	undersize	w
952	Douglas fir	20	20	FIR	2		w
953	Douglas fir	25	25	FIR	2		
954	Douglas fir	30	30	FIR	2		
955	Douglas fir	23	23	FIR	2		

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
956	elderberry	CLUSTER	0	DEC	n/a	undersize	
957	hawthorn sp	CLUSTER	0	DEC	n/a	undersize	
958	Garry oak	38	38	DEC	2		
959	hawthorn sp	7	7	DEC	n/a	undersize	
960	hawthorn sp	13	13	DEC	1		
961	cherry sp.	6	6	DEC	n/a	undersize	
962	cherry sp.	9	9	DEC	n/a	undersize	
963	red alder	8	8	DEC	n/a	undersize	
964	big leaf maple	CLUSTER	0	DEC	n/a	undersize	
965	red alder	13	13	DEC	1	diseased	w
966	red alder	6	6	DEC	n/a	undersize	w
967	red alder	CLUSTER	0	DEC	n/a	undersize	w
968	dead	13-dead	13	FIR	0	snag	w
969	Douglas fir	26	26	FIR	2		w
970	Douglas fir	19	19	FIR	2		w
971	Douglas fir	18	18	FIR	1	broken	w
972	Douglas fir	26	26	FIR	2		w
973	red alder	12	12	DEC	2		w
974	red alder	10	10	DEC	2		w
975	red alder	11	11	DEC	2		w
976	dead	9-dead	9	DEC	0		w
977	red alder	7	7	DEC	2		w
978	red alder	7	7	DEC	2		w
979	cottonwood	12	12	DEC	2		w
980	cottonwood	24	24	DEC	2		w
981	cottonwood	18	18	DEC	2		w

Field work done 2/2016 by Ryan Neumann, PN-5539A

0/dead 1/decline 2/average 3/excellent

Tag	Species	DBH	DBH^2	Type	Rating	Condition	Location
982	cottonwood	7	7	DEC	n/a	undersize	w
983	red alder	22	22	DEC	1	dead top	w
984	dead	17	17	DEC	0		w
985	Scouler willow	CLUSTER	0	DEC	n/a	undersize	w
986	Scouler willow	CLUSTER	0	DEC	n/a	undersize	w
987	Garry oak	13	13	DEC	2		w
988	Scouler willow	7	7	DEC	1	undersize	w
989	Scouler willow	10	10	DEC	1	undersize	w
990	cottonwood	18	18	DEC	2		w
991	cottonwood	48	48	DEC	2		w
992	Scouler willow	15	15	DEC	0	on ground	w
993	cottonwood	43	43	DEC	2	in pond	w
994	Scouler willow	CLUSTER	0	DEC	n/a	undersize	w
995	Scouler willow	8	8	DEC	n/a	undersize	w
996	cottonwood	24	24	DEC	2		w
997	cottonwood	11	11	DEC	n/a	undersize	w
998	cottonwood	19	19	DEC	1	diseased	w
NO TAG		CLUSTER	0	DEC			
NO TAG		7	7	HOLLY			
NO TAG		CLUSTER	0	DEC			

W indicates tree is in Wetland space. O indicates tree is in Open space.
DBH is diameter at breast height.
DBH^2 is adjusted diameter.

City of West Linn

Planning & Development • 22500 Salamo Rd #1000 • West Linn, Oregon 97068
Telephone 503.656.4211 • Fax 503.656.4106 • westlinnoregon.gov

Development Review Application

For Office Use Only		
Staff Contact Peter Spir	Project No(s). SUB-16-01 / PUD-16-01 / WAP-16-05 / VAR-16-01 / WRG-16-01	
Non-Refundable Fee(s) 5750.00	Refundable Deposit(s) 26,156.00	Total

Type of Review (Please check all that apply):

- [ ] Annexation (ANX)
- [ ] Appeal and Review (AP) *
- [ ] Conditional Use (CUP)
- [ ] Design Review (DR)
- [ ] Easement Vacation
- [ ] Extraterritorial Ext. of Utilities
- [ ] Final Plat or Plan (FP)
- [ ] Flood Management Area
- [ ] Hillside Protection & Erosion Control
- [ ] Historic Review
- [ ] Legislative Plan or Change
- [ ] Lot Line Adjustment (LLA) */**
- [ ] Minor Partition (MIP) (Preliminary Plat or Plan)
- [ ] Non-Conforming Lots, Uses & Structures
- [x] Planned Unit Development (PUD)
- [ ] Pre-Application Conference (PA) */**
- [ ] Street Vacation
- [x] Subdivision (SUB)
- [ ] Temporary Uses *
- [ ] Time Extension *
- [x] Variance (VAR)
- [ ] Water Resource Area Protection/Single Lot (WAP)
- [x] Water Resource Area Protection/Wetland (WAP)
- [x] Willamette & Tualatin River Greenway (WRG)
- [ ] Zone Change

Home Occupation, Pre-Application, Sidewalk Use, Sign Review Permit, and Temporary Sign Permit applications require different or additional application forms, available on the City website or at City Hall.

Site Location/Address: 1270 Rosemont Road, West Linn, OR

Assessor's Map No.: 21E26A 21E26D
Tax Lot(s): 1100 300
Total Land Area: 15.14 Acres

Brief Description of Proposal:
Planned Unit Development to divide the subject property into lots for construction of single-famiy detached homes. A WRA permit is included due to the presence of a drainageway and wetlands on the property. A variance to the maximum cul-de-sac length standard is also being requested.

Applicant Name: (please print) Icon Construction and Development, LLC — Phone: (503) 657-0406
Address: 1980 Willamette Falls Drive, Suite 200 — Email: mark@iconconstruction.net
City State Zip: West Linn, OR 97068

Owner Name (required): (please print) Terwilliger Plaza Foundation Holdings, LLC — Phone: 503-808-7962
Address: 2545 SW Terwilliger Boulevard — Email: EComfort@terwilligerplaza.con
City State Zip: Portland, OR 97201

Consultant Name: (please print) Rick Givens, Planning Consultant — Phone: 503-479-0097
Address: 18680 Sunblaze Dr. — Email: rickgivens@gmail.com
City State Zip: Oregon City, OR 97045

1. All application fees are non-refundable (excluding deposit). Any overruns to deposit will result in additional billing.
2. The owner/applicant or their representative should be present at all public hearings.
3. A denial or approval may be reversed on appeal. No permit will be in effect until the appeal period has expired.
4. Three (3) complete hard-copy sets (single sided) of application materials must be submitted with this application. One (1) complete set of digital application materials must also be submitted on CD in PDF format. If large sets of plans are required in application please submit only two sets.

* No CD required / ** Only one hard-copy set needed

RECEIVED
APR 04 2016
PLANNING & BUILDING
CITY OF WEST LINN
INT. TIME

The undersigned property owner(s) hereby authorizes the filing of this application, and authorizes on site review by authorized staff. I hereby agree to comply with all code requirements applicable to my application. Acceptance of this application does not infer a complete submittal. All amendments to the Community Development Code and to other regulations adopted after the application is approved shall be enforced where applicable. Approved applications and subsequent development is not vested under the provisions in place at the time of the initial application.

Applicant's signature	4/4/2016 Date	Elizabeth Comfort, manager Owner's signature (required)	3/30/2016 Date

Development Review Application (Rev. 2011.07)

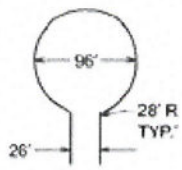
PC-4 TUALATIN VALLEY FIRE & RESCUE COMMENTS

Spir, Peter

From: Darby, Ty M. <Ty.Darby@tvfr.com> on behalf of Darby, Ty M.
Sent: Tuesday, July 12, 2016 10:27 AM
To: Rick Givens
Cc: Spir, Peter; Darren Gusdorf
Subject: RE: Tanner Ridge at Rosemont

Hi Rick,

Per our discussion, see the cul-de-sec specification below:



96' DIAMETER
CUL-DE-SAC

Let me know if you have any questions.

Thank you,

Ty

Ty Darby | Deputy Fire Marshal
Tualatin Valley Fire & Rescue
Direct: 503-259-1409
www.tvfr.com

From: Rick Givens [mailto:rickgivens@gmail.com]
Sent: Monday, July 11, 2016 8:09 AM
To: Darby, Ty M.
Cc: Peter Spir; Darren Gusdorf
Subject: Tanner Ridge at Rosemont

Hi Ty,

I'd appreciate a comment from you on an issue that's come up on the Tanner Ridge at Rosemont subdivision in West Linn (site plan attached). The plan is a little different than the one you saw at the pre-app. In order to address some neighborhood concerns, we had to make Meadowlark Dr. a direct connection from Rosemont to Parker. As a result, we've ended up with a cul-de-sac, Heron Ct., that has an issue with respect to length.

Section 85.200(A) (11) of the West Linn Community Development Code states "*New cul-de-sacs and other closed-end streets, consistent with subsection (A)(11)(a) of this section, shall not exceed 200 feet in length or serve more than 25 dwelling units* *unless the design complies with all adopted Tualatin Valley Fire and Rescue*

(TVFR) access standards and adequately provides for anticipated traffic, consistent with the Transportation System Plan (TSP)".

In order to address this standard, we need a comment from you as to whether there are any TVFR access standards that would be violated by allowing a cul-de-sac that is 585 feet in length and serves 20 homes.

Thanks for your help.

Rick Givens
Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045
(503) 479-0097
Cell: (503) 351-8204
rickgivens@gmail.com

Tualatin Valley Fire & Rescue

www.tvfr.com

April 20, 2016

Associate Planner
Peter Spir
City of West Linn
22500 Salamo Road
West Linn, OR 97068

Re: PUD-16-01
Tax Lots# 21E26A 1100, 21E26D 300

Dear Peter,

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:

FIRE APPARATUS ACCESS:

1. **FIRE APPARATUS ACCESS ROAD DISTANCE FROM BUILDINGS AND FACILITIES:** Access roads shall be within 150 feet of all portions of the exterior wall of the first story of the building as measured by an approved route around the exterior of the building or facility. An approved turnaround is required if the remaining distance to an approved intersecting roadway, as measured along the fire apparatus access road, is greater than 150 feet. (OFC 503.1.1))

2. **DEAD END ROADS AND TURNAROUNDS:** Dead end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround. Diagrams of approved turnarounds are shown below: (OFC 503.2.5 & D103.1)

3. **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.***

4. **ADDITIONAL ACCESS ROADS – MULTIPLE FAMILY RESIDENTIAL DEVELOPMENTS:** Projects having more than 100 dwelling units shall be provided with two separate and approved fire apparatus access roads. Exception: Projects having up to 200 dwelling units may have a single approved fire apparatus access road when all buildings, including nonresidential occupancies, are equipped throughout with an approved automatic sprinkler system in accordance with section 903.3.1.1, 903.3.1.2. Projects having more than 200 dwelling units shall be provided with two separate and approved fire apparatus roads regardless of whether they are equipped with an approved automatic sprinkler system. (OFC D106)

5. **ADDITIONAL ACCESS ROADS – ONE- OR TWO-FAMILY RESIDENTIAL DEVELOPMENTS:** Developments of one- or two-family dwellings, where the number of dwelling units exceeds 30, shall be provided with separate and approved fire apparatus access roads and shall meet the requirements of Section D104.3. Exception: Where there

are more than 30 dwelling units on a single public or private fire apparatus access road and all dwelling units are equipped throughout with an approved automatic sprinkler system in accordance with section 903.3.1.1, 903.3.1.2, or 903.3.1.3 of the International Fire Code, access from two directions shall not be required. (OFC D107)

6. **MULTIPLE ACCESS ROADS SEPARATION:** Where two access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the area to be served (as identified by the Fire Code Official), measured in a straight line between accesses. (OFC D104.3) Exception: Buildings equipped throughout with an approved automatic fire sprinkler system (the approval of this alternate method of construction shall be accomplished in accordance with the provisions of ORS 455.610(5).

7. **FIRE APPARATUS ACCESS ROAD WIDTH AND VERTICAL CLEARANCE:** Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20 feet (26 feet adjacent to fire hydrants (OFC D103.1)) and an unobstructed vertical clearance of not less than 13 feet 6 inches. The fire district will approve access roads of 12 feet for up to three dwelling units and accessory buildings. (OFC 503.2.1 & D103.1)

8. **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. 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)

9. **NO PARKING:** Parking on emergency access roads shall be as follows (OFC D103.6.1-2):
    1. 20-26 feet road width – no parking on either side of roadway
    2. 26-32 feet road width – parking is allowed on one side
    3. Greater than 32 feet road width – parking is not restricted

10. **PAINTED CURBS:** Where required, fire apparatus access roadway curbs shall be painted red (or as approved) and marked "NO PARKING FIRE LANE" at 25 foot intervals. Lettering shall have a stroke of not less than one inch wide by six inches high. Lettering shall be white on red background (or as approved). (OFC 503.3)

11. **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 and shall extend 20 feet before and after the point of the hydrant. (OFC D103.1)

12. **TURNOUTS:** Where access roads are less than 20 feet and exceed 400 feet in length, turnouts 10 feet wide and 30 feet long may be required and will be determined on a case by case basis. (OFC 503.2.2)

13. **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 75,000 pounds live load (gross vehicle weight). Documentation from a registered engineer that the final construction is in accordance with approved plans or the requirements of the Fire Code may be requested. (OFC 503.2.3)

14. **BRIDGES:** Private bridges shall be designed and constructed in accordance with the State of Oregon Department of Transportation and American Association of State Highway and Transportation Officials Standards *Standard Specification for Highway Bridges.* A building permit shall be obtained for the construction of the bridge if required by the building official of the jurisdiction where the bridge is to be built. The design engineer shall prepare a special inspection and structural observation program for approval by the building official. The design engineer shall give, in writing; final approval of the bridge to the fire district after construction is completed. Maintenance of the bridge shall be the responsibility of the party or parties that use the bridge for access to their property. The fire district may at any time, for due cause, ask that a registered engineer inspect the bridge for structural stability and soundness at the expense of the property owner(s) the bridge serves. Vehicle load limits shall be posted at both entrances to bridges when required by the fire code official. Where elevated surfaces designed for emergency vehicle use are adjacent to

surfaces which are not designed for such use, approved barriers, approved signs or both shall be installed and maintained when required by the fire code official. Where elevated surfaces designed for emergency vehicle use are adjacent to surfaces which are not designed for such use, approved barriers, approved signs or both shall be installed and maintained when required by the fire code official. (OFC 503.2.6)

15. **TURNING RADIUS:** The inside turning radius and outside turning radius shall not be less than 28 feet and 48 feet respectively, measured from the same center point. (OFC 503.2.4 & D103.3)

16. **ACCESS ROAD GRADE:** Fire apparatus access roadway grades shall not exceed 12%. When fire sprinklers* are installed, a maximum grade of 15% will be allowed.

0-12%	Allowed
13-15%	Special consideration with submission of written Alternate Methods and Materials request. Ex: Automatic fire sprinkler (13-D) system* in lieu of grade.
≥16%	Special consideration on a case by case basis with submission of written Alternate Methods and Materials request Ex: Automatic fire sprinkler (13-D) system* plus additional engineering controls in lieu of grade.**

*The approval of fire sprinklers as an alternate shall be accomplished in accordance with the provisions of ORS 455.610(5) and OAR 918-480-0100 and installed per section 903.3.1.1, 903.3.1.2, or 903.3.1.3 of the Oregon Fire Code (OFC 503.2.7 & D103.2)

** See Forest Dwelling Access section for exceptions.

17. **ANGLE OF APPROACH/GRADE FOR TURNAROUNDS:** Turnarounds shall be as flat as possible and have a maximum of 5% grade with the exception of crowning for water run-off. (OFC 503.2.7 & D103.2)

18. **ANGLE OF APPROACH/GRADE FOR INTERSECTIONS:** Intersections shall be level (maximum 5%) with the exception of crowning for water run-off. (OFC 503.2.7 & D103.2)

19. **GATES:** Gates securing fire apparatus roads shall comply with all of the following (OFC D103.5, and 503.6):
    1. Gates serving three or less single-family dwellings shall be a minimum of 12 feet in width.
    2. Gates shall be set back at minimum of 30 feet from the intersecting roadway or as approved.
    3. Electric gates shall be equipped with a means for operation by fire department personnel
    4. Electric automatic gates shall comply with ASTM F 2200 and UL 325.

20. **ACCESS DURING CONSTRUCTION:** Approved fire apparatus access roadways shall be installed and operational prior to any combustible construction or storage of combustible materials on the site. Temporary address signage shall also be provided during construction. (OFC 3309 and 3310.1)

FIREFIGHTING WATER SUPPLIES:

21. **MUNICIPAL FIREFIGHTING WATER SUPPLY EXCEPTIONS:** The requirements for firefighting water supplies may be modified as approved by the fire code official where any of the following apply: (OFC 507.5.1 Exceptions)
    1. Buildings are equipped throughout with an approved automatic fire sprinkler system (the approval of this alternate method of construction shall be accomplished in accordance with the provisions of ORS 455.610(5)).
    2. There are not more than three Group R-3 or Group U occupancies.

- In areas where the water system is already developed, the maximum needed fire flow shall be either 3,000 GPM or the available flow in the system at 20 psi, whichever is greater.
- In new developed areas, the maximum needed fire flow shall be 3,000 GPM at 20 psi.
- Tualatin Valley Fire & Rescue does not adopt Occupancy Hazards Modifiers in section B105.4-B105.4.1

22. **SINGLE FAMILY DWELLINGS - REQUIRED FIRE FLOW:** The minimum available fire flow for one and two-family dwellings 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 OFC Appendix B. (OFC B105.2)

23. **FIRE FLOW WATER AVAILABILITY:** Applicants shall provide documentation of a fire hydrant flow test or flow test modeling of water availability from the local water purveyor if the project includes a new structure or increase in the

floor area of an existing structure. Tests shall be conducted from a fire hydrant within 400 feet for commercial projects, or 600 feet for residential development. Flow tests will be accepted if they were performed within 5 years as long as no adverse modifications have been made to the supply system. Water availability information may not be required to be submitted for every project. (OFC Appendix B)

24. **RURAL FIREFIGHTING WATER SUPPLY EXCEPTIONS:** The requirements for firefighting water supplies may be modified as approved by the fire code official where any of the following apply: (OFC 507.5.1 Exception)
    1. Buildings are equipped throughout with an approved automatic fire sprinkler system.
    2. See Appendix for further information on Rural Water Supplies

25. **RURAL ONE- AND TWO-FAMILY DWELLINGS – REQUIRED FIRE FLOW:** Required fire flow for detached one- and two-family dwellings in areas in which adequate and reliable water supply systems do not exist shall be calculated in accordance with National Fire Protection Association Standard 1142, 2012 Edition. (OFC B107)
    - **Exception 1:** One- and Two-Family Dwelling structures where the total area of all floor levels within exterior walls and covered under a roof are less than 3,600 square feet.
    - **Exception 2:** In One- and Two-Family Dwellings in which the garage is separated from the living space, the square footage of the garage shall not count toward the 3,600 square foot exemption above. Separation shall be designed and installed in accordance with the Oregon Residential Specialty Code, by one of the following methods:
        - 2 layers of 5/8 "Type X" gypsum board
        - 1-hour fire rated assembly
    - **Exception 3:** One- and Two-Family Dwellings protected by an approved NFPA 13D automatic sprinkler system are not required to have a water supply other than that required to supply the fire sprinkler system.

26. **RURAL ONE- AND TWO-FAMILY DWELLING ADDITIONS:** Water supplies are required for additions to single family dwellings in areas with or without reliable water supply systems accordance with requirements for new structures.
    - **Exception 1:** Where the total square footage, including the addition, is less than 3,600 square feet.
    - **Exception 2:** Where existing single family dwellings have approved fire department access and the addition(s) increase the square footage of the structure by no more than 50%.
    - **Exception 3:** Where an approved NFPA 13D automatic sprinkler system is provided throughout all areas, including both in the addition and the existing structure.
    - **Exception 4:** Detached U occupancies, that are in excess of 3,600 square feet, are not required to have a water supply when they are accessory to a single family dwelling and have approved fire department access and no exposures within 20 feet of all sides of the structure, or in accordance with ORSC, whichever is greater.

27. **FOREST DWELLING WATER SUPPLY:** Approved Forest Dwellings shall have a firefighting water supply in accordance with NFPA 1142, 2012 Edition. (OFC B107).
    - **Exception 1:** Forest Dwellings less than 3,600 square feet, including all floors, garage(s), basement(s), and covered porches (in which the structure meets all County forest dwelling fire siting, fire retardant roof, and spark arrestor requirements) shall not require a water supply. Dwellings greater than 3,600 square feet shall be reviewed on a case-by-case basis for water supply requirements.

28. **WATER SUPPLY DURING CONSTRUCTION:** Approved firefighting water supplies shall be installed and operational prior to any combustible construction or storage of combustible materials on the site. (OFC 3312.1)

FIRE HYDRANTS:

29. **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)

30. **FIRE HYDRANT(S) PLACEMENT:** (OFC C104)

- Existing hydrants in the area may be used to meet the required number of hydrants as approved. Hydrants that are up to 600 feet away from the nearest point of a subject building that is protected with fire sprinklers may contribute to the required number of hydrants. (OFC 507.5.1)
- Hydrants that are separated from the subject building by railroad tracks shall not contribute to the required number of hydrants unless approved by the fire code official.
- Hydrants that are separated from the subject building by divided highways or freeways shall not contribute to the required number of hydrants. Heavily traveled collector streets may be considered when approved by the fire code official.
- Hydrants that are accessible only by a bridge shall be acceptable to contribute to the required number of hydrants only if approved by the fire code official.

31. **PRIVATE FIRE HYDRANT IDENTIFICATION:** Private fire hydrants shall be painted red in color. Exception: Private fire hydrants within the City of Tualatin shall be yellow in color. (OFC 507)

32. **FIRE HYDRANT DISTANCE FROM AN ACCESS ROAD:** Fire hydrants shall be located not more than 15 feet from an approved fire apparatus access roadway unless approved by the fire code official. (OFC C102.1)

33. **REFLECTIVE HYDRANT MARKERS:** Fire hydrant locations shall be identified by the installation of blue reflective markers. They shall be located adjacent and to the side of the center line of the access roadway that the fire hydrant is located on. In the case that there is no center line, then assume a center line and place the reflectors accordingly. (OFC 507)

34. **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 & OFC 312)

35. **CLEAR SPACE AROUND FIRE HYDRANTS:** A 3 foot clear space shall be provided around the circumference of fire hydrants. (OFC 507.5.5)

BUILDING ACCESS AND FIRE SERVICE FEATURES

36. **PREMISES IDENTIFICATION:** New and existing 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, including monument signs. These numbers shall contrast with their background. Numbers shall be a minimum of 4 inches high with a minimum stroke width of 1/2 inch. (OFC 505.1)

If you have questions or need further clarification, please feel free to contact me at (503) 649-8577.

Sincerely,

Ty Darby

Ty Darby
Deputy Fire Marshal II

Cc: file

PC-5 PUBLIC COMMENTS

(As of September 8, 2016, there have been no public comments submitted)

PC-6 DKS ENGINEERING COMMENTS

(DKS Engineering is contracted by City of West Linn Public Works to provide third party review of traffic studies provided by the applicant)

720 SW Washington St.
Suite 500
Portland, OR 97205
503.243.3500
www.dksassociates.com

MEMORANDUM

DATE: August 31, 2016

TO: Khoi Le, City of West Linn

FROM: Garth Appanaitis, PE

SUBJECT: Tanner Ridge at Rosemont TIS Review
West Linn On Call - Task 3 P16043-003

Per your request of April 22, 2016, we have reviewed the traffic impact study (TIS)[1] and response materials[2] provided for the proposed 50 single-family detached dwellings in the southeast quadrant of Rosemont Road and Salamo Road. This review focused on the technical components of the analysis, which are summarized in the following sections. Based on our review of submitted materials, no additional mitigation to the transportation network is required to offset proposed development impacts.

TECHNICAL REVIEW SUMMARY

The following items summarize the finding of transportation impacts and related recommendations:

- **Proposed Lot Count** - The initial TIS analyzed the impacts of a 52 lot development, which (as noted in the May 20 memorandum) has been revised to a 50 lot development. The findings of the TIS remain valid and there would be a nominal decrease of traffic created by the proposed development.
- **Existing Standards and Pending TSP Update** - The traffic analysis considered the functional classification and access spacing requirements of the existing West Linn TSP. In general, the updated West Linn TSP (effective September 24, 2016) will lower the functional class designation of surrounding roadways (e.g., both Rosemont and Parker are currently arterials and will become collectors) and thus decrease the access spacing requirements. This future change will provide even greater flexibility for this and other planned developments.
- **Connections to Transportation System** - The proposed connections of the internal roadway network to Rosemont Road and Parker Road were reviewed for safety and access spacing requirements. The proposed connections along both roadways address these needs given the constraints of the existing roadway network.
- **Transportation System Capacity** - Six study intersections were analyzed, located along Rosemont Road, Parker Road, Salamo Road, and Wild Rose Drive. These intersections were analyzed for the a.m. and p.m. peak hours under existing conditions, 2018 without site development, and year 2018 with site development. The intersections would meet City of West Linn mobility standards of level-of-service (LOS) D or better during each period and would not require additional mitigation.
- **Safety** - Crash records were reviewed for study intersections and did not reveal any historical safety issues. Each intersection had two or less reported crashes during the five-year period. Sight distance was reviewed and is adequate.
- **New Roadway Connection** - The site plan indicates a new roadway connection between Rosemont Road and Parker Road. This road is not identified as a future arterial, collector, nor neighborhood route

[1] Tanner Ridge at Rosemont Traffic Impact Study, *Lancaster Engineering, March 9, 2016.*
[2] *Technical Memorandum: Tanner Ridge at Rosemont - Response to TIS Review Comments,* Lancaster Engineering, May 20, 2016.

in the TSP functional class map (existing TSP and pending TSP update), and therefore should be designed as a local road. The road is not likely to attract cut through traffic as it includes a bend and is not as direct as the parallel route to the east (Wild Rose Drive), which is more direct, provides a connection to Salamo Road, and is designated a neighborhood route.

- Turn Lane Warrants - Left turn lane warrants were reviewed for the proposed roadway connections to Rosemont Road and Parker Road. Due to the low traffic volumes and speeds, left turn lanes are not needed at this time. However, right of way dedications along the site frontage on Rosemont Road and Parker Road (both arterials) would provide an opportunity for future widening, if needed.

Findings

The TIS reviewed potential impacts to the transportation system in the immediate vicinity of the site as well as the surrounding system. The site would not create impacts to the transportation system that would require additional mitigation. Specifically, the following requirements of the Community Development Code are addressed for transportation facilities:

- Adequate public facilities. Public facilities that must be adequate for an application for new construction, remodeling, or replacement of an existing structure to be approved are transportation, water, sewer, and storm sewer facilities. To be adequate, on-site and adjacent facilities must meet City standards, and off-site facilities must have sufficient capacity to (1) meet all existing demands, (2) satisfy the projected demands from projects with existing land use approvals, plus the additional demand created by the application, and (3) remain compliant with all applicable standards.
  - Response: Transportation facilities are sized to provide adequate capacity for the proposed development and mobility standards are met.
- For purposes of evaluating discretionary permits in situations where the level-of-service or volume-to-capacity performance standard for an affected City or State roadway is currently failing or projected to fail to meet the standard, and an improvement project is not programmed, the approval criteria shall be that the development avoids further degradation of the affected transportation facility. Mitigation must be provided to bring the facility performance standard to existing conditions at the time of occupancy.
  - Response: All roadways analyzed by the proposed development would continue to meet mobility (level-of-service) standards and would not require additional mitigation.

Additional traffic impacts not noted in the TIS or in this review would be addressed through the developer's contributions to System Development Charges.

If you have any questions, please call.

DKS

720 SW Washington St.
Suite 500
Portland, OR 97205
503.243.3500
www.dksassociates.com

MEMORANDUM

DATE: May 9, 2016

TO: Khoi Le, City of West Linn

FROM: Garth Appanaitis, PE

SUBJECT: Tanner Ridge at Rosemont TIS Review
West Linn On Call - Task 3 P16043-003

Per your request of April 22, 2016, we have reviewed the traffic impact study (TIS)[1] provided for the proposed 52 single-family detached dwellings in the southeast quadrant of Rosemont Road and Salamo Road. This review focused on the technical components of the analysis, which are summarized in the following sections. Based on our review of submitted materials, additional analysis components should be considered and clarification should be provided for the noted items.

TECHNICAL REVIEW SUMMARY

This section provide a summary of our technical review, which is organized into significant items and additional review notes for consideration that could be pursued at the City's discretion.

Significant Items

The following items have significant potential to alter the finding of transportation impacts and related recommendations:

- Page 5 - The stated functional class designations do not match the classification identified in the existing Transportation System Plan. The functional class designation affects design standards, including access spacing requirements.
    - *Recommendation: Refer to the 2008 TSP[2], or other superseding updates to the Comprehensive Plan, for roadway functional classification. The 2016 TSP Update[3] was adopted by City Council in April 2016, however it does not take effect until 180 days after March 28, 2016.*
- Page 20 - The preliminary site plan shows proposed site access via public street connections to the existing transportation network. The access on Rosemont Road does not appear to align with the existing driveway on the north side of Rosemont Road. The location on Parker Road does not appear to meet access spacing standards. More information should be provided that describes the proposed access location and benefits and impacts related to the location.
    - *Recommendation: Provide additional information for the location of the proposed public street connections to Rosemont Road and Parker Road. This information should include a summary of existing constraints that may affect the access location, including safety considerations and comparison to the access spacing standards.*

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[1] Tanner Ridge at Rosemont Traffic Impact Study, *Lancaster Engineering, March 9, 2016.*

[2] http://westlinnoregon.gov/sites/default/files/fileattachments/public_works/page/5402/post_1_transportation_system_plan_2008.pdf

[3] https://westlinnoregon.gov/planning/transportation-system-plan-update

DKS

Other Review Notes

The following items were noted during the technical review and are not likely to significantly affect the analysis findings.

- Page 6 - Traffic volumes for the legs of Roxbury Drive were estimated based on trip generation for the number of single family detached homes. There are approximately 23 homes on the east side and 14 homes on the west side. Using ITE Trip Generation would estimate approximately one trip per household during the p.m. peak hour. The total number of trips seem to be slightly underestimated, but does not represent a significant difference.
    - *Recommendation: No action required.*
- Page 11 - There is no mention of in-process development trips. If other significant developments have been approved in the area but have not added traffic to the study intersections, they should be included.
    - *Recommendation: Confirm with City staff if any significant developments have been approved in the area that may require an update to the traffic analysis. Minor developments are not likely to significantly change the findings of the analysis and would not require an update.*

If you have any questions, please call.