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: Tom Soppe	PROJECT NO(S).: SUB-13-05	
NON-REFUNDABLE FEE(S): $500-	REFUNDABLE DEPOSIT(S): $5,000-	TOTAL: $5500-

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
- ☐ Planned Unit Development (PUD)
- ☐ Pre-Application Conference (PA) */**
- ☐ Street Vacation
- ☒ Subdivision (SUB)
- ☐ Temporary Uses *
- ☐ Time Extension *
- ☐ Variance (VAR)
- ☐ Water Resource Area Protection/Single Lot (WAP)
- ☐ Water Resource Area Protection/Wetland (WAP)
- ☐ 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: 4997 SUMMIT STREET, WEST LINN

Assessor's Map No.: 21E25DB
Tax Lot(s): 00500
Total Land Area: 1.0 Acres +/-

Brief Description of Proposal: APPLICANT PROPOSES A 4 LOT SUBDIVISION

Applicant Name: (please print) LF 10, LLC — Phone: 503-209-7555
Address: 5285 MEADOWS ROAD, SUITE 171 — Email: jwyland@jtsmithco.com
City State Zip: LAKE OSWEGO, OR 97035

Owner Name (required): (please print) LF 10, LLC — Phone:
Address: 5285 MEADOWS ROAD, SUITE 171 — Email:
City State Zip: LAKE OSWEGO, OR 97035

Consultant Name: (please print) ANDREW TULL, 3J CONSULTING, INC. — Phone: 503-545-1907
Address: 10445 SW CANYON ROAD, SUITE 245 — Email: andrew.tull@3j-consulting.com
City State Zip: BEAVERTON, OR 97005

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PLANNING & BUILDING
CITY OF WEST LINN
INT. TIME

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

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 — Date: 9/27/13
Owner's signature *(required)* — Date: 9/27/13

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Appendixes

GENERAL INFORMATION

Property Owner and Applicant:	**JT Smith Companies** Attn: John Wyland 5285 Meadows Road, Suite #171 Lake Oswego, OR 97035
Applicant's Representative	**3J Consulting, Inc** 10445 SW Canyon Road Beaverton, OR 97005 Contact: Andrew Tull Phone: 503-545-1907 Email: andrew.tull@3j-consulting.com
Contributing Consultant Contact Details:	**Land Use Planning and Civil Engineering** 3J Consulting, Inc. 10445 SW Canyon Road Suite 245 Beaverton, OR 97005 Contact: Andrew Tull or Brian Feeney, PE Phone: 503-946-9365 Email: andrew.tull@3j-consulting.com or brian.feeney@3j-consulting.com

SITE INFORMATION

Tax Lot Number:	2S1E25DB00500
Address:	4997 Summit Road
Size:	1.0 Acres
Zoning Designation:	R-10 (City of West Linn)
Neighborhood:	Sunset
Comprehensive Plan:	Low Density Residential
Existing Use:	Vacant
Street Functional Classifications:	The site currently takes access from Summit Street, a Collector. As proposed, the lots would take access from Gloria Drive, a Local Street.
Surrounding Zoning:	R-10

INTRODUCTION

APPLICANT'S REQUEST

The Applicant seeks approval of an application for Subdivision Preliminary Plat for the development of four residential lots. This narrative describes the proposed subdivision of the site and documents compliance with the relevant sections of the City of West Linn's Community Development Code ("CDC").

SITE HISTORY

The project site consists of a total of 1.02 acres. The property is located on Summit Street at the western end of cul-de-sac Gloria Drive. Along the property's southern boundary, the previous owner dedicated a portion of the property to the City of West Linn as right-of-way. The dedication was in excess of what the city needed to allow for the construction of a full street section. In order to request the surplus portion of the right-of-way back from the city, the current owner prepared a petition to vacate the surplus. On September 10, 2013 the City issued an ordinance releasing interest in a 3,132 square foot of right-of-way dedication at the south end of the property.

PROPOSED SITE IMPROVEMENTS

The intent of this subdivision is to provide four buildable lots, each a minimum of 10,000 square feet in size, for development with single-family homes, a use permitted outright in the R-10 zone. The concrete foundation from a previously removed single-family residence located on the site will need to be demolished as a part of this project.

TRAFFIC AND PARKING

The preliminary plat shows that access to the four parcels will come from a single shared driveway on Gloria Drive, a local cul-de-sac. Gloria Drive currently terminates in a cul-de-sac east of the subject site. No new access to Summit Street, a Collector, is proposed.

A traffic study is not being submitted with this application because there are no new access points onto the Summit Street Right-of-Way and the proposed improvements are not "newly established" under Chapter 8 of the West Linn TSP (See staff comments on page 4 of the pre-application notes dated August 2, 2012).

APPLICABLE CRITERIA

The following sections of the West Linn Community Development Code (CDC) have been extracted as they have been deemed to be applicable to the proposal. Following each applicable criteria or design standard, the Applicant has provided a series of draft findings. The intent of providing code and detailed responses and findings is to document that the proposed development has satisfied the approval criteria for a Subdivision Preliminary Plat.

DIVISION 8. LAND DIVISION

CHAPTER 85. GENERAL PROVISIONS

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.

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. The functional class of a street aids in defining the primary function and associated design standards for the facility. The hierarchy of the facilities within the network in regard to the type of traffic served (through or local trips), balance of function (providing access and/or capacity), and the level of use (generally measured in vehicles per day) are generally dictated by the functional class. The street system shall assure an adequate traffic or circulation system with intersection angles, grades, tangents, and curves appropriate for the traffic to be carried. Streets should provide for the continuation, or the appropriate projection, of existing principal streets in surrounding areas and should not impede or adversely affect development of adjoining lands or access thereto.

To accomplish this, the emphasis should be upon a connected continuous pattern of local, collector, and arterial streets rather than discontinuous curvilinear streets and cul-de-sacs. Deviation from this pattern of connected streets should only be permitted in cases of extreme topographical challenges including excessive slopes (35 percent-plus), hazard areas, steep drainageways, wetlands, etc. In such cases, deviations may be allowed but the connected continuous pattern must be reestablished once the topographic challenge is passed. Streets should be oriented with consideration of the sun, as site conditions allow, so that over 50 percent of the front building lines of homes are oriented within 30 degrees of an east-west axis. Internal streets are the responsibility of the developer. All streets bordering the development site are to be developed by the developer with, typically, half-street improvements or to City standards prescribed by the City Engineer. Additional travel lanes may be required to be consistent with adjacent road widths or to be consistent with the adopted Transportation System Plan (TSP) and any adopted updated plans.

An applicant may submit a written request for a waiver of abutting street improvements if the TSP prohibits the street improvement for which the waiver is requested. Those areas with

numerous (particularly contiguous) under-developed or undeveloped tracts will be required to install street improvements. When an applicant requests a waiver of street improvements and the waiver is granted, the applicant shall pay an in-lieu fee equal to the estimated cost, accepted by the City Engineer, of the otherwise required street improvements. As a basis for this determination, the City Engineer shall consider the cost of similar improvements in recent development projects and may require up to three estimates from the applicant. The amount of the fee shall be established prior to the Planning Commission's decision on the associated application. The in-lieu fee shall be used for in kind or related improvements.
Streets shall also be laid out to avoid and protect tree clusters and significant trees, but not to the extent that it would compromise connectivity requirements per this subsection (A)(1), or bring the density below 70 percent of the maximum density for the developable net area. The developable net area is calculated by taking the total site acreage and deducting Type I and II lands; then up to 20 percent of the remaining land may be excluded as necessary for the purpose of protecting significant tree clusters or stands as defined in CDC 55.100(B)(2).

Applicant's Finding: A single driveway connecting all four lots will connect to Gloria Drive, an existing local cul-de-sac, which will then provide one access to Summit Street, an existing collector. No other access to Summit Street is proposed.

The requirements of this section have been satisfied.

2. Right-of-way and roadway widths. In order to accommodate larger tree-lined boulevards and sidewalks, particularly in residential areas, the standard right-of-way widths for the different street classifications shall be within the range listed below. But instead of filling in the right-of-way with pavement, they shall accommodate the amenities (e.g., boulevards, street trees, sidewalks). The exact width of the right-of-way shall be determined by the City Engineer or the approval authority. The following ranges will apply:

Street Classification	Right-of-Way
Minor Arterial	**60 -- 80**
Collector	**60 – 80**
Local street	**40 – 60**
Cul-de-sac	**40 -- 60**

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.

Applicant's Finding: The proposed right-of-way width for Gloria Drive, a cul-de-sac, is 50 feet. The existing width of the ROW is sufficient according to the City Engineer. The existing width of southbound Summit Street, a Collector, is 88 feet, exceeding the required 60-80 foot window, while northbound Summit Street, an Arterial, is 60 feet, within the 60-80 foot window.

The requirements of this section have been satisfied.

3. <u>Street widths</u>. 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.

Applicant's Finding: The applicant's proposal includes half-street improvements to the adjacent Summit Street right of way consistent with collector street standards and the adjacent Gloria Drive right-of way, consistent with local street standards. The proposed street improvements include a 6-foot sidewalk and 5.5-foot planter strip along the entire frontage of the property on both Summit Street and Gloria Drive. This is consistent with the pre-application notes provided by the City.

The requirements of this section have been satisfied.

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.**
- **b. The anticipated traffic generation.**
- **c. On-street parking requirements.**
- **d. Sidewalk and bikeway requirements.**
- **e. Requirements for placement of utilities.**
- **f. Street lighting.**
- **g. Drainage and slope impacts.**
- **h. Street trees.**
- **i. Planting and landscape areas.**
- **j. Existing and future driveway grades.**
- **k. Street geometry.**
- **l. Street furniture needs, hydrants.**

Applicant's Finding: The City Engineer has reviewed the proposal and made recommendations to the applicant, which are incorporated into the proposed configuration.

The requirements of this section have been satisfied.

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.

Applicant's Finding: The proposed subdivision will serve an additional four lots, no more than a normal local street traffic load. Northbound Summit Street is an arterial; however, this portion of Summit Street is north of Gloria Drive, the local street that will provide access to the subject site.

The requirements of this section have been satisfied.

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

Applicant's Finding: The applicant does not propose reserve strips or street plugs with this application.

The requirements of this section have been satisfied.

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.

Applicant's Finding: No new streets are proposed.

The requirements of this section have been satisfied.

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.)

Applicant's Finding: A future street extension is not feasible or necessary on this property.

The requirements of this section have been satisfied.

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. Intersections which are not at right angles shall have minimum corner radii of 15 feet along right-of-way lines which form acute angles.

Right-of-way lines at intersections with arterial streets shall have minimum curb radii of not less than 35 feet. Other street intersections shall have curb radii of not less than 25 feet. All radii shall maintain a uniform width between the roadway and the right-of-way lines. The intersection of more than two streets at any one point will not be allowed unless no alternative design exists.

Applicant's Finding: No street intersections are proposed.

The requirements of this section have been satisfied.

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.

Applicant's Finding: No additional right-of-way dedication is needed as both Summit Street and Gloria Drive meet the standards for right-of-way widths along the frontage of the property.

The requirements of this section have been satisfied.

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

2. Existing easements or leases.

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).

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.

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.

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.

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).

Applicant's Finding:

The four lots will take access from Gloria Drive, an existing cul-de-sac, connecting directly to Summit Street, an existing collector Street. Access from Gloria Drive is consistent with applicable traffic standards, as it is the lower classification street adjacent to the proposed lots.

The proposed lots will share an access driveway that will be less than 150 feet in length and therefore will not require a turn-around, in compliance with TVF&R standards for access. All portions of the exterior walls of the proposed single-family residences will be within 150 feet of the access driveway, in compliance with TVFR standards.

Direct pedestrian and bicycle accessways will be provided with a 6 foot wide sidewalk along the frontage of the property along Gloria Drive, and will connect with the pedestrian accessways along the frontage of Summit Street.

There are 13 homes that currently take access from Gloria Drive. The addition of 4 homes will not exceed the maximum of 25 homes served by the street ending in a cul-de-sac, per this standard. Cul-de-sac length is existing and has been reviewed by TVF&R.

The requirements of this section have been satisfied.

12. <u>Street names</u>. 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. Street names shall be subject to the approval of the Planning Commission or Planning Director, as applicable. Continuations of existing streets shall have the name of the existing street. Streets, drives, avenues, ways, boulevards, and lanes shall describe through streets. Place and court shall describe cul-de-sacs. Crescent, terrace, and circle shall describe loop or arcing roads.

Applicant's Finding:

All streets are pre-existing and names will be maintained.

The requirements of this section have been satisfied.

13. <u>Grades and curves</u>. 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.

Willamette Drive/Highway 43 shall be designed to a minimum horizontal and vertical design speed of 45 miles per hour, subject to Oregon Department of Transportation (ODOT) approval. Arterials shall be designed to a minimum horizontal and vertical design speed of 35 miles per hour. Collectors shall be designed to a minimum horizontal and vertical design speed of 30 miles per hour. All other streets shall be designed to have a minimum centerline radii of 50 feet. Super elevations (i.e., banking) shall not exceed four percent. The centerline profiles of all streets may be provided where terrain constraints (e.g., over 20 percent slopes) may result in considerable deviation from the originally proposed alignment.

Applicant's Finding: The existing grades and curves of Summit Street and Gloria Drive will not change.

The requirements of this section have been satisfied.

14. Access to local streets. Intersection of a local residential street with an arterial street may be prohibited by the decision-making authority if suitable alternatives exist for providing interconnection of proposed local residential streets with other local streets. Where a subdivision or partition abuts or contains an existing or proposed major arterial street, the decision-making authority may require marginal access streets, reverse-frontage lots with suitable depth, visual barriers, noise barriers, berms, no-access reservations along side and rear property lines, and/or other measures necessary for adequate protection of residential properties from incompatible land uses, and to ensure separation of through traffic and local traffic.

Applicant's Finding: The subject property does not abut nor contain an existing or proposed Major Arterial Street, nor is an intersection of a Local Residential Street with an Arterial Street proposed.

The requirements of this section have been satisfied.

15. Alleys. Alleys shall be provided in commercial and industrial districts unless other permanent provisions for access to off-street parking and loading facilities are made as approved by the decision-making authority. While alley intersections and sharp changes in alignment should be avoided, the corners of necessary alley intersections shall have radii of not less than 10 feet. Alleys may be provided in residential subdivisions or multi-family projects. The decision to locate alleys shall consider the relationship and impact of the alley to adjacent land uses. ***

Applicant's Finding: No alleys are proposed with this subdivision.

The requirements of this section have been satisfied.

16. Sidewalks. Sidewalks shall be installed per CDC 92.010(H), Sidewalks. The residential sidewalk width is six feet plus planter strip as specified below. Sidewalks in commercial zones shall be constructed per subsection (A)(3) of this section. See also subsection C of this section.

Sidewalk width may be reduced with City Engineer approval to the minimum amount (e.g., four feet wide) necessary to respond to site constraints such as grades, mature trees, rock outcroppings, etc., or to match existing sidewalks or right-of-way limitations.

Applicant's Finding: The applicant proposes to install a 6-foot sidewalk plus planter strip along the frontage of Summit Street. The sidewalk along Gloria drive has been proposed to use a curb-tight approach – matching the existing conditions east of the site.

The requirements of this section have been satisfied.

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 to accommodate a fully matured tree without the boughs interfering with pedestrians on the sidewalk or vehicles along the curbline. Planter strip width may be reduced or eliminated, with City Engineer approval, when it cannot be corrected by site plan, to the minimum amount necessary to respond to site constraints such as grades, mature trees, rock outcroppings, etc., or in response to right-of-way limitations.

Applicant's Finding: The applicant proposes to install a 5.5-foot planter strip between all proposed sidewalks along Summit Street. The Applicant has proposed a curb-tight sidewalk along Gloria Drive as the remainder of the road section utilizes a curb-tight sidewalk. The removal of the planter strip also allows the Applicant to reduce the risk of damage to the root zone of the significant tree to be retained on lot 1.

The requirements of this section have been satisfied.

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

Applicant's Finding: No reservations or restrictions are proposed with the street dedication.

The requirements of this section have been satisfied.

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.

Applicant's Finding: All four lots will have access to a public street via a shared driveway.

The requirements of this section have been satisfied.

20. Gated streets. Gated streets are prohibited in all residential areas on both public and private streets. A driveway to an individual home may be gated.

Applicant's Finding: Gated streets are not proposed.

The requirements of this section have been satisfied.

21. Entryway treatments and street isle design. When the applicant desires to construct certain walls, planters, and other architectural entryway treatments within a subdivision, the following standards shall apply:

a. All entryway treatments except islands shall be located on private property and not in the public right-of-way.

b. Planter islands may be allowed provided there is no structure (i.e., brick, signs, etc.) above the curbline, except for landscaping. Landscaped islands shall be set back a minimum of 24 feet from the curbline of the street to which they are perpendicular.

c. All islands shall be in public ownership. The minimum aisle width between the curb and center island curbs shall be 14 feet. Additional width may be required as determined by the City Engineer.

d. Brick or special material treatments are acceptable at intersections with the understanding that the City will not maintain these sections except with asphalt overlay, and that they must meet the Americans with Disabilities Act (ADA) standards. They shall be laid out to tie into existing sidewalks at intersections.

e. Maintenance for any common areas and entryway treatments (including islands) shall be guaranteed through homeowners association agreements, CC&Rs, etc.

f. Under Chapter 52 CDC, subdivision monument signs shall not exceed 32 square feet in area.

Applicant's Finding: The applicant does not propose to construct any entryway treatments to the subdivision at this time.

The requirements of this section have been satisfied.

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.

Applicant's Finding: Right-of-way dedication and street improvements are proposed with this application proportionate to the construction of four new lots. Off-site improvements are not necessary or proportionate to mitigate impacts from this 4-lot subdivision.

The requirements of this section have been satisfied.

B. Blocks and lots.

1. General. The length, width, and shape of blocks shall be designed with due regard for the provision of adequate building sites for the use contemplated; consideration of the need for traffic safety, convenience, access, circulation, and control; and recognition of limitations and opportunities of topography and solar access.

Applicant's Finding: The block pattern adjacent to this site is established.

The requirements of this section have been satisfied.

2. Sizes. The recommended block size is 400 feet in length to encourage greater connectivity within the subdivision. Blocks shall not exceed 800 feet in length between street lines, except for blocks adjacent to arterial streets or unless topographical conditions or the layout of adjacent streets justifies a variation. Designs of proposed intersections shall demonstrate adequate sight distances to the City Engineer's specifications. Block sizes and proposed accesses must be consistent with the adopted TSP.

Applicant's Finding: The block pattern of this site is established, no new blocks are proposed.

The requirements of this section have been satisfied.

3. Lot size and shape. Lot size, width, shape, and orientation shall be appropriate for the location of the subdivision, for the type of use contemplated, for potential utilization of solar access, and for the protection of drainageways, trees, and other natural features. No lot shall be dimensioned to contain part of an existing or proposed street. All lots shall be buildable, and the buildable depth should not exceed two and one-half times the average width. "Buildable" describes lots that are free of constraints such as wetlands, drainageways, etc., that would make home construction impossible. Lot sizes shall not be less than the size required by the zoning code unless as allowed by planned unit development (PUD).
Depth and width of properties reserved or laid out for commercial and industrial purposes shall be adequate to provide for the off-street parking and service facilities required by the type of use proposed.

Chapter 12- Single-Family Residential Detached and Attached, R-10 standards are as follows:

Lot Size (Detached Dwelling Units)	**10,000 square feet**
Front Lot Line Length/Minimum Lot Width at Front Lot Line	**35 feet**
Average Minimum Lot Width	**50 feet**
Lot Depth	**Less than 2.5x Width and greater than Average Depth of 90 feet**

Applicant's Finding: All proposed lots are a minimum of 10,000 square feet in size to accommodate single-family detached dwelling units. All four proposed lots exceed the minimum requirements for front lot line length, lot width and lot depth.

The requirements of this section have been satisfied.

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

Applicant's Finding: The proposed access to the subdivision conforms to the provisions of CDC Chapter 48 because all parcels will take access from a Local Street that will then access the adjacent Collector.

The requirements of this section have been satisfied.

5. Through lots and parcels. Through lots have frontage on a street at the front and rear of the lot. They are also called double-frontage lots. Through 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.

Applicant's Finding: No through lots are proposed with this application.

The requirements of this section have been satisfied.

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

Applicant's Finding: All side lot lines run at right angles to the streets upon which they face.

The requirements of this section have been satisfied.

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. ***

a. Setbacks applicable to the underlying zone shall apply to the flag lot.

b. Front yard setbacks may be based on the rear property line of the parcel which substantially separates the flag lot from the street from which the flag lot gains access. Alternately, the house and its front yard may be oriented in other directions so long as some measure of privacy is ensured, or it is part of a pattern of development, or it better fits the topography of the site.

c. The lot size shall be calculated exclusive of the accessway; the access strip may not be counted towards the area requirements.

d. The lot depth requirement contained elsewhere in this code shall be measured from the rear property line of the parcel which substantially separates the flag lot from the street from which the flag lot gains access.

e. As per CDC 48.030, the accessway shall have a minimum paved width of 12 feet.

f. If the use of a flag lot stem to access a lot is infeasible because of a lack of adequate existing road frontage, or location of existing structures, the proposed lot(s) may be accessed from the public street by an access easement of a minimum 15-foot width across intervening property.

Applicant's Finding:

Based on the location of this site on a collector street, no other reasonable street access is possible except from Gloria Drive, a local street. Therefore, flag lots are permitted. The two flag lots proposed will have a minimum street frontage of 8 feet in width and the combined access will be 16 feet. Each of these accessways will have mutual maintenance agreements and reciprocal access and utility easements. All lot sizes meet the 10,000 square foot minimum exclusive of the accessway.

All setbacks will meet the requirements of the R-10 zone and the front yard setback allowance discussed in subsection b., above.

All lots meet the lot depth standard of the R-10 zone when calculating depth from the rear property line of the parcel which substantially separates the flag lot from the street from which the lot gains access.

The requirements of this section have been satisfied.

8. Large lots. In dividing tracts into large lots or parcels which, at some future time, are likely to be redivided, the approval authority may require that the blocks be of such size and shape, and be so divided into building sites, and contain such easements and site restrictions as will provide for extension and opening of streets at intervals which will permit a subsequent division of any tract into lots or parcels of smaller size. Alternately, in order to prevent further partition of oversized lots, restrictions may be imposed on the subdivision or partition plat.

Applicant's Finding:

The lots of the proposed subdivision, ranging in size from 10,031 square feet to 12,024 square feet, are not large enough for future division in the R-10 zone.

The requirements of this section have been satisfied.

C. Pedestrian and bicycle trails.

1. Trails or multi-use pathways shall be installed, consistent and compatible with federal ADA requirements and with the Oregon Transportation Planning Rule, between subdivisions, cul-de-sacs, and streets that would otherwise not be connected by streets due to excessive grades, significant tree(s), and other constraints natural or manmade. Trails shall also

accommodate bicycle or pedestrian traffic between neighborhoods and activity areas such as schools, libraries, parks, or commercial districts. Trails shall also be required where designated by the Parks Master Plan.

2. The all-weather surface (asphalt, etc.) trail should be eight feet wide at minimum for bicycle use and six feet wide at minimum for pedestrian use. Trails within 10 feet of a wetland or natural drainageway shall not have an all-weather surface, but shall have a soft surface as approved by the Parks Director. These trails shall be contained within a corridor dedicated to the City that is wide enough to provide trail users with a sense of defensible space. Corridors that are too narrow, confined, or with vegetative cover may be threatening and discourage use. Consequently, the minimum corridor width shall be 20 feet. Sharp curves, twists, and blind corners on the trail are to be avoided as much as possible to enhance defensible space. Deviations from the corridor and trail width are permitted only where topographic and ownership constraints require it.

3. Defensible space shall also be enhanced by the provision of a three- to four-foot-high matte black chain link fence or acceptable alternative along the edge of the corridor. The fence shall help delineate the public and private spaces.

4. The bicycle or pedestrian trails that traverse multi-family and commercial sites should follow the same defensible space standards but do not need to be defined by a fence unless required by the decision-making authority.

5. Except for trails within 10 feet of a wetland or natural drainageway, soft surface or gravel trails may only be used in place of a paved, all-weather surface where it can be shown to the Planning Director that the principal users of the path will be recreational, non-destination-oriented foot traffic, and that alternate paved routes are nearby and accessible.

6. The trail grade shall not exceed 12 percent except in areas of unavoidable topography, where the trail may be up to a 15 percent grade for short sections no longer than 50 feet. In any location where topography requires steeper trail grades than permitted by this section, the trail shall incorporate a short stair section to traverse the area of steep grades.

Applicant's Finding: No trails are proposed with this application. Sidewalks will be installed along the frontages of Summit Street and Gloria Drive, providing pedestrian connectivity.

The requirements of this section have been satisfied.

D. <u>Transit facilities</u>.

1. The applicant shall consult with Tri-Met and the City Engineer to determine the appropriate location of transit stops, bus pullouts, future bus routes, etc., contiguous to or within the development site. If transit service is planned to be provided within the next two years, then facilities such as pullouts shall be constructed per Tri-Met standards at the time of development. More elaborate facilities, like shelters, need only be built when service is existing or imminent. Additional rights-of-way may be required of developers to accommodate buses.

2. The applicant shall make all transit-related improvements in the right-of-way or in easements abutting the development site as deemed appropriate by the City Engineer.

3. Transit stops shall be served by striped and signed pedestrian crossings of the street within 150 feet of the transit stop where feasible. Illumination of the transit stop and crossing is required to enhance defensible space and safety. ODOT approval may be required.

4. Transit stops should include a shelter structure bench plus eight feet of sidewalk to accommodate transit users, non-transit-related pedestrian use, and wheelchair users. Tri-Met must approve the final configuration.

Applicant's Finding: Transit facilities have not been identified by Tri-Met or the City Engineer adjacent to this property.

The requirements of this section have been satisfied.

E. Lot 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:

a. Cut slopes shall not exceed one and one-half feet horizontally to one foot vertically (i.e., 67 percent grade).

b. Fill slopes shall not exceed two feet horizontally to one foot vertically (i.e., 50 percent grade). Please see the following illustration.***

2. The character of soil for fill and the characteristics of lot and parcels made usable by fill shall be suitable for the purpose intended.

3. If areas are to be graded (more than any four-foot cut or fill), compliance with CDC 85.170(C) is required.

4. The proposed grading shall be the minimum grading necessary to meet roadway standards, and to create appropriate building sites, considering maximum allowed driveway grades.

5. Where landslides have actually occurred, where the area is identified as a hazard site in the West Linn Comprehensive Plan Report, or where field investigation by the City Engineer confirms the existence of a severe landslide hazard, development shall be prohibited unless satisfactory evidence is additionally submitted by a registered geotechnical engineer which certifies that methods of rendering a known hazard site safe for construction are feasible for a given site. The City Engineer's field investigation shall include, but need not be limited to, the following elements:

a. Occurrences of geotropism.

b. Visible indicators of slump areas.

c. Existence of known and verified hazards.

d. Existence of unusually erosive soils.

e. Occurrences of unseasonably saturated soils.

The City Engineer shall determine whether the proposed methods or designs are adequate to prevent landslide or slope failure. The City Engineer may impose conditions consistent with the purpose of these ordinances and with standard engineering practices including limits on

type and intensity of land use, which have been determined necessary to assure landslide or slope failure does not occur.

6. All cuts and fills shall conform to the Uniform Building Code.

7. On land with slopes in excess of 12 percent, cuts and fills shall be regulated as follows:

a. Toes of cuts and fills shall be set back from the boundaries of separate private ownerships at least three feet, plus one-fifth of the vertical height of the cut or fill. Where an exception is required from that requirement, slope easements shall be provided.

b. Cuts shall not remove the toe of any slope where a severe landslide or erosion hazard exists (as described in subsection (G)(5) of this section).

c. Any structural fill shall be designed by a registered engineer in a manner consistent with the intent of this code and standard engineering practices, and certified by that engineer that the fill was constructed as designed.

d. Retaining walls shall be constructed pursuant to Section 2308(b) of the Oregon State Structural Specialty Code.

e. Roads shall be the minimum width necessary to provide safe vehicle access, minimize cut and fill, and provide positive drainage control.

8. Land over 50 percent slope shall be developed only where density transfer is not feasible. The development will provide that:

a. At least 70 percent of the site will remain free of structures or impervious surfaces.

b. Emergency access can be provided.

c. Design and construction of the project will not cause erosion or land slippage.

d. Grading, stripping of vegetation, and changes in terrain are the minimum necessary to construct the development in accordance with subsection J of this section.

Applicant's Finding: All grading on site will be done in conformance with these standards.

The requirements of this section have been satisfied.

F. <u>Water</u>.

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.

2. Adequate location and sizing of the water lines.

3. Adequate looping system of water lines to enhance water quality.

4. For all non-single-family developments, there shall be a demonstration of adequate fire flow to serve the site.

5. A written statement, signed by the City Engineer, that water service can be made available to the site by the construction of on-site and off-site improvements and that such water service has sufficient volume and pressure to serve the proposed development's domestic, commercial, industrial, and fire flows.

Applicant's The subject property is located in the Rosemont water pressure zone. The City

Finding: Engineering Department's comments in the pre-application notes dated June 6, 2013 indicate that there is a surplus in supply capacity during normal conditions and that there is no storage volume deficit during normal conditions in the Rosemont pressure zone. The applicant will connect all lots to public water per the submitted public improvement plans. This plan is consistent with the adopted Comprehensive Water System Plan.

The requirements of this section have been satisfied.

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.

2. Sanitary sewer information will include plan view of the sanitary sewer lines, including manhole locations and depth or invert elevations.

3. Sanitary sewer lines shall be located in the public right-of-way, particularly the street, unless the applicant can demonstrate why the alternative location is necessary and meets accepted engineering standards.

4. Sanitary sewer line should be at a depth that can facilitate connection with down-system properties in an efficient manner.

5. The sanitary sewer line should be designed to minimize the amount of lineal feet in the system.

6. The sanitary sewer line shall avoid disturbance of wetland and drainageways. In those cases where that is unavoidable, disturbance shall be mitigated pursuant to Chapter 32 CDC, Water Resource Area Protection, all trees replaced, and proper permits obtained. Dual sewer lines may be required so the drainageway is not disturbed.

7. Sanitary sewer shall be extended or stubbed out to the next developable subdivision or a point in the street that allows for reasonable connection with adjacent or nearby properties.

8. The sanitary sewer system shall be built pursuant to DEQ, City, and Tri-City Service District sewer standards. The design of the sewer system should be prepared by a licensed engineer, and the applicant must be able to demonstrate the ability to satisfy these submittal requirements or standards at the pre-construction phase.

9. A written statement, signed by the City Engineer, that sanitary sewers with sufficient capacity to serve the proposed development and that adequate sewage treatment plant capacity is available to the City to serve the proposed development.

Applicant's Finding: The applicant will connect all lots to public sanitary sewer per the submitted public improvement plans. The proposed sanitary sewer system is consistent with the Sanitary Sewer Master Plan, is in the correct basin and allows for full gravity service.

The requirements of this section have been satisfied.

H. Storm

1. A stormwater quality and detention plan shall be submitted which complies with the submittal criteria and approval standards contained within Chapter 33 CDC. It shall include profiles of proposed drainageways with reference to the adopted Storm Drainage Master Plan.

2. Storm treatment and detention facilities shall be sized to accommodate a 25-year storm incident. 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 off-site impacts from increased intensity of runoff downstream or constriction causing ponding upstream. The plan and statement shall identify all on- or off-site impacts and measures to mitigate those impacts. The plan and statement shall, at a minimum, determine the off-site impacts from a 25-year storm.

3. Plans shall demonstrate how storm drainage will be collected from all impervious surfaces including roof drains. Storm drainage connections shall be provided to each dwelling unit/lot. The location, size, and type of material selected for the system shall correlate with the 25-year storm incident.

4. Treatment of storm runoff shall meet municipal code standards.

Applicant's Finding: The proposed stormwater treatment and detention is designed to meet city standards, as detailed in the submitted stormwater report.

The requirements of this section have been satisfied.

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.

Applicant's Finding: The applicant will establish utility easements as determined by the City Engineer and shown on the preliminary plat.

The requirements of this section have been satisfied.

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.

Applicant's Finding: The proposed subdivision does not impact any wetlands or natural drainageways.

The requirements of this section have been satisfied.

2. 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.

Applicant's Finding: No greenways have been identified for dedication on this property. This property is not adjacent to the Willamette or Tualatin River and, therefore, a river greenway is not feasible on this site.

The requirements of this section have been satisfied.

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

Applicant's Finding: Street trees will be installed as part of the public improvements with the development of this subdivision.

The requirements of this section have been satisfied.

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.

Applicant's Finding: Any street light installation required as part of the subdivision will utilize high or low pressure sodium light bulbs.

The requirements of this section have been satisfied.

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.

Applicant's Finding: The applicant is proposing right-of-way improvements that are roughly proportional to the development of a 4-lot subdivision. Additional dedication and/or public improvements would exceed rough proportionality of this development.

The requirements of this section have been satisfied.

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. The exception would be in those cases where the area is substantially built out and adjacent properties have above-ground utilities and where the development site's frontage is under 200 feet and the site is less than one acre. High voltage transmission lines, as classified by Portland General Electric or electric service provider, would also be exempted. Where adjacent future development is expected or imminent, conduits may be required at

the direction of the City Engineer. All services shall be underground with the exception of standard above-grade equipment such as some meters, etc.

Applicant's Finding: All utilities will be installed in compliance with this section.

The requirements of this section have been satisfied.

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.

Applicant's Finding: The R-10 zone permits a maximum density of 4.35 dwelling units per net acre. Net acre is defined as "The total gross acres less the public right-of-way and other acreage deductions, as applicable". The net acreage of this site after the vacation of dedicated right-of way is 1.02 acre. At 4.35 dwelling units per net acre, the maximum number of dwelling units on this site is 4.35. The proposed 4 dwelling units would be 92 percent of the maximum density, exceeding the 70 percent minimum.

The requirements of this section have been satisfied.

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.

Applicant's Finding: This property is zoned R-10 and, therefore, the use of the parcel as an entirely residential development is permitted.

The requirements of this section have been satisfied.

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.

Applicant's Finding: No heritage trees have been identified on this site. However, the applicant's arborist worked with the City Arborist to create the tree plan included with this submittal.

The requirements of this section have been satisfied.

10. Annexation and street lights. Developer and/or homeowners association shall, as a condition of approval, pay for all expenses related to street light energy and maintenance costs until annexed into the City, and state that: "This approval is contingent on receipt of a final order by the Portland Boundary Commission, approving annexation of the subject property." This means, in effect, that any permits, public improvement agreements, final plats, and certificates of occupancy may not be issued until a final order is received. (Ord. 1377, 1995; Ord. 1382, 1995; Ord. 1401, 1997; Ord. 1403, 1997; Ord. 1408, 1998; Ord. 1425, 1998; Ord. 1442, 1999; Ord. 1463, 2000; Ord. 1526, 2005; Ord. 1544, 2007; Ord. 1584, 2008; Ord. 1590 § 1, 2009; Ord. 1604 § 64, 2011)

Applicant's Finding: This property is within the City limits.

The requirements of this section have been satisfied.

DIVISION 3 SUPPLEMENTAL PROVISIONS AND EXCEPTIONS

CHAPTER 33. STORMWATER QUALITY AND DETENTION

33.040 APPROVAL CRITERIA

The Planning Director and City Engineer shall make written findings with respect to the following criteria when approving, approving with conditions, or denying applications for stormwater detention permits and stormwater quality permits.

A. Stormwater quality facilities shall meet non-point source pollution control standards required by the Public Works Design Standards.

Applicant's Finding: The proposed stormwater design meets non-point source pollution control standards, as shown in the stormwater report.

The requirements of this section have been satisfied.

B. Design of stormwater detention and pollution reduction facilities and related detention and water quality calculations shall meet Public Works Design Standards and shall be prepared by a professional engineer licensed to practice in the State of Oregon.

Applicant's Finding: The stormwater detention and pollution reduction facilities and related calculations were prepared by a professional engineer licensed to practice in the state of Oregon.

The requirements of this section have been satisfied.

C. Soil stabilization techniques, erosion control, and adequate improvements to accommodate the intended drainage through the drainage basin shall be used. Storm drainage shall not be diverted from its natural watercourse unless no feasible alternatives exist. Interbasin transfers of storm drainage will not be permitted.

Applicant's Soil stabilization techniques, erosion control and adequate improvements to

Finding: accommodate drainage are detailed in the stormwater report and meet all standards.

The requirements of this section have been satisfied.

D. Stormwater detention and treatment facilities shall encroach no further than 25 feet into the outside boundary of a water quality resource area. The area of encroachment must be replaced by adding an equal area to the water quality resource area on the subject property.

Applicant's Finding: No stormwater detention or treatment facilities are proposed near or encroaching into the boundary of a water quality resource area.

The requirements of this section have been satisfied.

E. Stormwater detention and treatment facilities shall be vegetated with plants from the Metro's Native Plant List as described in CDC 33.070.

Applicant's Finding: All stormwater detention and treatment facilities will be vegetated with plants from Metro's Native Plant List.

The requirements of this section have been satisfied.

F. Projects must either stockpile existing topsoil for reuse on the site or import topsoil, rather than amend subsoils. Soil amendments are allowed only where the applicant can demonstrate they are the only practical alternative for enabling the soil to support healthy plantings, promoting better stormwater treatment, or improving soil infiltration capacity (where appropriate).

Applicant's Finding: No soil amendments are proposed. Topsoil will be stockpiled and reused on site following bulk earthworks.

The requirements of this section have been satisfied.

G. Interim erosion control measures, such as mulching, shall be placed immediately upon completion of grading of the facilities. (Ord. 1463, 2000)

Applicant's Finding: Interim erosion control measures will be used as necessary.

The requirements of this section have been satisfied.

33.060 MAINTENANCE AND ACCESS REQUIREMENTS

Maintenance and access requirements shall meet Public Works Design Standards. (Ord. 1463, 2000)

Applicant's Finding: The stormwater report includes maintenance and access pursuant to Public Works Design Standards.

The requirements of this section have been satisfied.

33.070 PLANT MATERIAL FOR WATER QUALITY FACILITIES

Metro's Native Plant List is incorporated by reference as a part of this chapter. The applicant shall submit a detailed planting plan using species from Metro's Native Plant List. The intent of this plan is to establish native vegetation to protect against erosion and sediment infiltration. A mix of low maintenance trees, shrubs, and groundcover is preferred with an even distribution.

A. The planting plan shall be prepared by a professional landscape architect if the development site contains more than 5,000 square feet of impervious area. The planting plan shall include a table listing the scientific names, size, and quantity of plants.

B. The plan shall include plant location, species, size, and quantity for stormwater detention and treatment facilities. Evergreen trees shall have a minimum height of four feet and deciduous trees shall be at least one-inch caliper in size at the time of planting. Shrubs shall be a minimum of one gallon in size at the time of planting. Spaces shall be filled at mature growth but not so that overplanting occurs and overcrowding results. Temporary irrigation systems or other means of ensuring establishment of the plantings must be specified.

C. Plantings shall be designed to minimize or eliminate the need for herbicides, fertilizers, pesticides, or soil amendments at any time before, during, or after construction, or on a long-term basis. Plantings shall be designed to minimize or eliminate the need for frequent mowing and irrigation.

D. The applicant is responsible for implementing the planting plan during the next fall or spring planting season following permit approval. Prior to planting, noxious vegetation shall be removed. All soil areas must be covered with specified plants and mulch to prevent erosion.

E. Plantings shall be incorporated into a public improvement guarantee agreement, which includes a maintenance bond as required by CDC 91.010(C). The maintenance bond is required for any project involving stormwater quality and detention facilities. (Ord. 1463, 2000)

Applicant's Finding: The planting plan for the water quality tract is included within the stormwater report and meets the requirements of this section.

The requirements of this section have been satisfied.

CHAPTER 42. CLEAR VISION AREAS

42.020 CLEAR VISION AREAS REQUIRED, USES PROHIBITED

A. A clear vision area shall be maintained on the corners of all property adjacent to an intersection as provided by CDC 42.040 and 42.050.

B. A clear vision area shall contain no planting, fence, wall, structure or temporary or permanent obstruction (except for an occasional utility pole or tree) exceeding three feet in height, measured from the top of the curb, or, where no curb exists, from the street centerline grade, except that trees exceeding this height may be located in this area, provided all branches below eight feet are removed. (Ord. 1192, 1987)

42.030 EXCEPTIONS

The following described area in Willamette shall be exempt from the provisions of this chapter. The parcels of land zoned General Commercial which abut Willamette Falls Drive, located between 10th and 16th Streets. Beginning at the intersection of Willamette Falls Drive and 11th Street on 7th

Avenue to 16th Street; on 16th Street to 9th Avenue; on 9th Avenue to 14th Street to the Tualatin River; following the Tualatin River and Willamette River to 12th Street; on 12th Street to 4th Avenue; on 4th Avenue to 11th Street; on 11th Street to Willamette Falls Drive. This described area does not include the northerly side of Willamette Falls Drive.

42.040 COMPUTATION; STREET AND ACCESSWAY 24 FEET OR MORE IN WIDTH

The clear vision area for all street intersections and street and accessway intersections (accessways having 24 feet or more in width) shall be that triangular area formed by the right-of-way or property lines along such lots and a straight line joining the right-of-way or property line at points which are 30 feet distant from the intersection of the right-of-way line and measured along such lines.

42.050 COMPUTATION; ACCESSWAY LESS THAN 24 FEET IN WIDTH

The clear vision area for street and accessway intersections (accessways having less than 24 feet in width) shall be that triangular area whose base extends 30 feet along the street right-of-way line in both directions from the centerline of the accessway at the front setback line of a single-family and two-family residence, and 30 feet back from the property line on all other types of uses.

Applicant's Finding: All clear vision areas at the intersections of public streets with driveways or other public streets on the subject site will be free of plantings, fences, walls, structures and obstructions, meeting the requirements for clear vision areas.

The requirements of this section have been satisfied.

CHAPTER 44. FENCES

44.020 SIGHT-OBSCURING FENCE; SETBACK AND HEIGHT LIMITATIONS

A. A sight- or non-sight-obscuring fence may be located on the property line or in a yard setback area subject to the following:

1. The fence is located within:

a. A required front yard area, and it does not exceed three feet, except pillars and driveway entry features subject to the requirements of Chapter 42 CDC, Clear Vision Areas, and approval by the Planning Director;

b. A required side yard which abuts a street and it is within that portion of the side yard which is also part of the front yard setback area and it does not exceed three feet;

c. A required side yard which abuts a street and it is within that portion of the side yard which is not also a portion of the front yard setback area and it does not exceed six feet provided the provisions of Chapter 42 CDC are met;

d. A required rear yard which abuts a street and it does not exceed six feet; or

e. A required side yard area which does not abut a street or a rear yard and it does not exceed six feet.

Applicant's Finding: New fences are not indicated on the proposed plans because the exact locations have yet to be determined. All fences constructed as part of this subdivision will meet the requirements of these standards.

The requirements of this section have been satisfied.

B. Fence or wall on a retaining wall. When a fence is built on a retaining wall or an artificial berm, the following standards shall apply:

1. When the retaining wall or artificial berm is 30 inches or less in height from finished grade, the maximum fence or wall height on top of the retaining wall shall be six feet.

2. When the retaining wall or earth berm is greater than 30 inches in height, the combined height of the retaining wall and fence or wall from finished grade shall not exceed eight and one-half feet.

3. Fences or walls located on top of retaining walls or earth berms in excess of 30 inches above finished grade may exceed the total allowed combined height of eight and one-half feet; provided, that the fence or wall is located a minimum of two feet from the retaining wall and the fence or wall height shall not exceed six feet.

Applicant's Finding: Any fences built on retaining walls will meet these standards.

The requirements of this section have been satisfied.

44.030 SCREENING OF OUTDOOR STORAGE

A. All service, repair, and storage activities carried on in connection with any commercial, business or industrial activity and not conducted within an enclosed building shall be screened from view of all adjacent properties and adjacent streets by a sight-obscuring fence.

B. The sight-obscuring fence shall be in accordance with provisions of Chapter 42 CDC, Clear Vision Areas, and shall be subject to the provisions of Chapter 55 CDC, Design Review.

Applicant's Finding: This site is residential and no service, repair or storage activities in connection with commercial, business or industry activities are proposed.

The requirements of this section have been satisfied.

44.040 LANDSCAPING

Landscaping which is located on the fence line and which impairs sight vision shall not be located within the clear vision area as provided in Chapter 42 CDC.

44.050 STANDARDS FOR CONSTRUCTION

A. The structural side of the fence shall face the owner's property; and

B. The sides of the fence abutting adjoining properties and the street shall be maintained. (Ord. 1291, 1990

Applicant's Finding: Any fences built will meet these standards.

The requirements of this section have been satisfied.

CHAPTER 54. LANDSCAPING

54.020 APPROVAL CRITERIA

A. Every development proposal requires inventorying existing site conditions which include trees and landscaping. In designing the new project, every reasonable attempt should be made to preserve and protect existing trees and to incorporate them into the new landscape plan. Similarly, significant landscaping (e.g., bushes, shrubs) should be integrated. The rationale is that saving a 30-foot-tall mature tree helps maintain the continuity of the site, they are qualitatively superior to two or three two-inch caliper street trees, they provide immediate micro-climate benefits (e.g., shade), they soften views of the street, and they can increase the attractiveness, marketability, and value of the development.

B. To encourage tree preservation, the parking requirement may be reduced by one space for every significant tree that is preserved in the parking lot area for a maximum reduction of 10 percent of the required parking. The City Parks Supervisor or Arborist shall determine the significance of the tree and/or landscaping to determine eligibility for these reductions.

C. Developers must also comply with the municipal code chapter on tree protection.

D. Heritage trees. Heritage trees are trees which, because of their age, type, notability, or historical association, are of special importance. Heritage trees are trees designated by the City Council following review of a nomination. A heritage tree may not be removed without a public hearing at least 30 days prior to the proposed date of removal. Development proposals involving land with heritage tree(s) shall be required to protect and save the tree(s). Further discussion of heritage trees is found in the municipal code.

Applicant's Finding: There are no heritage trees identified on this site. Three significant trees have been identified on the site. Two of the three significant trees will be preserved throughout development of the site and one will be removed. One conservation easement for the preservation of a significant tree protection has been identified on the plat and will be recorded in the deeds of the future lots.

The requirements of this section have been satisfied.

F. Landscaping (trees) in new subdivision.

1. Street trees shall be planted by the City within the planting strips (minimum six-foot width) of any new subdivision in conformity with the street tree plan for the area, and in accordance with the planting specifications of the Parks and Recreation Department. All trees shall be planted during the first planting season after occupancy. In selecting types of trees, the City Arborist may determine the appropriateness of the trees to local conditions and whether that tree has been overplanted, and whether alternate species should be selected. Also see subsection (C) of this section.

2. The cost of street trees shall be paid by the developer of the subdivision.

3. The fee per street tree, as established by the City, shall be based upon the following:

a. The cost of the tree;

b. Labor and equipment for original placement;

c. Regular maintenance necessary for tree establishment during the initial two-year period following the City schedule of maintenance; and

d. A two-year replacement warranty based on the City's established failure rate. (Ord. 1408, 1998; Ord. 1463, 2000)

Applicant's Finding: The applicant will pay for the installation of street trees by the City and maintain the trees for the two-year establishment period.

The requirements of this section have been satisfied.

54.030 PLANTING STRIPS FOR MODIFIED AND NEW STREETS

All proposed changes in width in a public street right-of-way or any proposed street improvement shall, where feasible, include allowances for planting strips. Plans and specifications for planting such areas shall be integrated into the general plan of street improvements. This chapter requires any multi-family, commercial, or public facility which causes change in public right-of-way or street improvement to comply with the street tree planting plan and standards.

Applicant's Finding: 6-foot-wide planting strips will be installed between the sidewalk and the asphalt for the length of the frontage of this property along Summit Street and Gloria Drive.

The requirements of this section have been satisfied.

54.040 INSTALLATION

A. All landscaping shall be installed according to accepted planting procedures.

B. The soil and plant materials shall be of good quality.

C. Landscaping shall be installed in accordance with the provisions of this code.

D. Certificates of occupancy shall not be issued unless the landscaping requirements have been met or other arrangements have been made and approved by the City such as the posting of a bond.

Applicant's Finding: All landscaping installation will meet the requirements of this section.

The requirements of this section have been satisfied.

54.050 PROTECTION OF STREET TREES

Street trees may not be topped or trimmed unless approval is granted by the Parks Supervisor or, in emergency cases, when a tree imminently threatens power lines.

Applicant's Finding: There are no existing street trees adjacent to this property.

The requirements of this section have been satisfied.

54.060 MAINTENANCE

A. The owner, tenant and their agent, if any, shall be jointly and severally responsible for the maintenance of all landscaping which shall be maintained in good condition so as to present a healthy, neat, and orderly appearance and shall be kept free from refuse and debris.

B. All plant growth in interior landscaped areas shall be controlled by pruning, trimming, or otherwise so that:

1. **It will not interfere with the maintenance or repair of any public utility;**
2. **It will not restrict pedestrian or vehicular access; and**
3. **It will not constitute a traffic hazard because of reduced visibility.**

Applicant's Finding: The owners of this property, including future homeowners, will be responsible for maintenance of landscaping.

The requirements of this section have been satisfied.

54.070 SPECIFICATION SUMMARY

*****25% of residential/multi-family site must be landscaped.**

Applicant's Finding: A minimum of 25% of this site will be landscaped as part of the yards of future homes.

The requirements of this section have been satisfied.

DIVISION 4. DESIGN REVIEW

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 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.

Applicant's Finding: No heritage trees were identified on this site.

The requirements of this section have been satisfied.

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.

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.

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 parcel is blocked by a row or screen of significant trees or tree clusters.

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.

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.

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.

Applicant's Finding: The applicant has identified three trees located on the site which have been determined to be significant by the City's arborist. No heritage trees have been identified.

The site layout has been prepared in order to limit impacts to significant trees on site. The Applicant is proposing to create one conservation easement for the retention of a 24 inch Douglas Fir encumbering Lot 1. The Applicant will also retain a 23 inch Maple located on Lot 4 without the use of an easement.

The Applicant is proposing to remove one significant tree from the site A 36 inch Douglass Fir has been proposed for removal to accommodate the private access driveway. The total significant caliper inches to be removed is 36 caliper inches.

The Applicant proposes to mitigate for the removal of the significant tree, consistent with the requirements of this section. As part of this mitigation, a total of 36 caliper inches of trees will be planted on the site. The Applicant is proposing the planting of five Scarlet Oak trees and thirteen Western Red Cedar trees, each with a caliper of two inches.

The requirements of this section have been satisfied.

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. <u>Streets within subdivisions</u>.

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:

a. The right-of-way cannot be reasonably improved in a manner consistent with City road standards or City standards for the protection of wetlands and natural drainageways.

b. The right-of-way does not provide a link in a continuous pattern of connected local streets, or, if it does provide such a link, that an alternative street link already exists or the applicant has proposed an alternative street which provides the necessary connectivity, or the applicant has proven that there is no feasible location on the property for an alternative street providing the link.

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

a. A condition that the applicant initiate vacation proceedings for all or part of the right-of-way.

b. A condition that the applicant build a trail, bicycle path, or other appropriate way.

If the applicant initiates vacation proceedings pursuant to subsection (A)(2)(a) of this section, and the right-of-way cannot be vacated because of opposition from adjacent property owners, the City Council shall consider and decide whether to process a City-initiated street vacation pursuant to Chapter 271 ORS.

Construction staging area shall be established and approved by the City Engineer. Clearing, grubbing, and grading for a development shall be confined to areas that have been granted approval in the land use approval process only. Clearing, grubbing, and grading outside of land use approved areas can only be approved through a land use approval modification and/or an approved Building Department grading permit for survey purposes. Catch basins shall be installed and connected to pipe lines leading to storm sewers or drainageways.

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.

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.

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.

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.

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.

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.

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.

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).

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.

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.

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.

I. Bicycle routes. 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.

J. Street name signs. 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.

K. Dead-end street signs. 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.

L. Signs indicating future use 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.

M. Street lights. 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.

N. Utilities. 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.

O. Curb cuts and driveways. 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.

P. Street trees. 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.

Q. Joint mailbox facilities 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)

Applicant's Finding: All improvements will be installed per the submitted plans and in conformance with the requirements of this title.

The requirements of this section have been satisfied.

92.030 IMPROVEMENT PROCEDURES

In addition to other requirements, improvements installed by the developer, either as a requirement of these regulations or at the developer's own option, shall conform to the requirements of this title and permanent improvement standards and specifications adopted by the City and shall be installed in accordance with the following procedure:

A. Improvement work shall not be commenced until plans have been checked for adequacy and approved by the City. To the extent necessary for evaluation of the proposal, the improvement plans may be required before approval of the tentative plan of a subdivision or partition. Plans shall be prepared in accordance with the requirements of the City.

B. Improvement work shall not be commenced until the City has been notified in advance, and if work has been discontinued for any reason, it shall not be resumed until the City has been notified.

C. Improvements shall be constructed under the Engineer. The City may require changes in typical sections and details in the public interest if unusual conditions arise during construction to warrant the change.

D. All underground utilities, sanitary sewers, and storm drains installed in streets by the subdivider or by any utility company shall be constructed prior to the surfacing of the streets. Stubs for service connections for underground utilities and sanitary sewers shall be placed to a length obviating the necessity for disturbing the street improvements when service connections are made.

E. A digital and mylar map showing all public improvements as built shall be filed with the City Engineer upon completion of the improvements. (Ord. 1408, 1998)

Applicant's Finding: All improvements will be installed in conformance with the requirements of this title.

The requirements of this section have been satisfied.

CHAPTER 99 PROCEDURES FOR DECISION MAKING: QUASI-JUDICIAL

99.030 APPLICATION PROCESS: WHO MAY APPLY, PRE-APPLICATION CONFERENCE, REQUIREMENTS, REFUSAL OF APPLICATION, FEES

A. <u>Who may apply</u>.

1. Applications for approval required under this chapter may be initiated by:

a. The owner of the property that is the subject of the application or the owner's duly authorized representative;

b. The purchaser of such property who submits a duly executed written contract or copy thereof, which has been recorded with the Clackamas Clerk;

c. A lessee in possession of such property who submits written consent of the owner to make such application; or

d. Motion by the Planning Commission or City Council.

2. Any person authorized by this chapter to submit an application for approval may be represented by an agent who is authorized in writing by such a person to make the application.

Applicant's Finding: The owner of the property is initiating this application for approval.

The requirements of this section have been satisfied.

B. Pre-application conferences.

1. Subject to subsection (B)(4) of this section, a pre-application conference is required for, but not limited to, ***j. land divisions.

Applicant's Finding: A pre-application meeting was held June 6, 2013.

The requirements of this section have been satisfied.

C. The requirements for making an application.

1. The application shall be made on forms provided by the Director as provided by CDC 99.040(A)(1);

2. The application shall be complete and shall contain the information requested on the form, shall address the appropriate submittal requirements and approval criteria in sufficient detail for review and action, and shall be accompanied by the deposit or fee required by CDC 99.033. No application will be accepted if not accompanied by the required fee or deposit. In the event an additional deposit is required by CDC 99.033 and not provided within the time required, the application shall be rejected without further processing or deliberation and all application materials shall be returned to the applicant, notwithstanding any determination of completeness. (Ord. 1527, 2005; Ord. 1568, 2008; Ord. 1590 § 1, 2009; Ord. 1599 § 6, 2011)

Applicant's Finding: This application has been made on forms provided by the City's Planning Department. The application contains the necessary information and the required fee.

The requirements of this section have been satisfied.

99.033 FEES

The Council shall adopt a schedule of fees reasonably calculated to defray the expenses of the administrative process. The Council may establish either a set fee or a deposit system in which the applicant pays a deposit and the City determines the total administrative cost at the end of the process and refunds any unused amount of the deposit to the applicant. No additional deposit shall be required for additional costs that are incurred because the matter is referred to or called up by a higher decision-making authority. The Council shall charge no fees for City-initiated land use applications or appeals filed by a recognized neighborhood association pursuant to the provisions of CDC 99.240. (Ord. 1527, 2005; Ord. 1568, 2008; Ord. 1604 § 70, 2011)

Applicant's Finding: The required fee was submitted with the land use application.

The requirements of this section have been satisfied.

99.038 NEIGHBORHOOD CONTACT REQUIRED FOR CERTAIN APPLICATIONS

Prior to submittal of an application for any subdivision, conditional use permit, multi-family project, planned unit development, commercial, office, or industrial development of over 1,500 square feet, or a zone change that requires a Comprehensive Plan amendment, the applicant shall contact and discuss the proposed development with any affected neighborhood as provided in this section. Although not required for other or smaller projects, contact with neighbors is highly recommended. The Planning Director may require neighborhood contact pursuant to this section prior to the filing of an application for any other development permit if the Director deems neighborhood contact to be beneficial.

A. Purpose. The purpose of neighborhood contact is to identify potential issues or conflicts regarding a proposed application so that they may be addressed prior to filing. This contact is intended to result in a better application and to expedite and lessen the expense of the review process by avoiding needless delays, appeals, remands, or denials. The City expects an applicant to take the reasonable concerns and recommendations of the neighborhood into consideration when preparing an application. The City expects the neighborhood association to work with the applicant to provide such input.

B. The applicant shall contact by letter all recognized neighborhood associations whose boundaries contain all or part of the site of the proposed development and all property owners within 500 feet of the site.

C. The letter shall be sent by certified mail, return receipt requested, to the president of the neighborhood association, and to one designee as submitted to the City by the neighborhood association, and shall be sent by regular mail to the other officers of the association and the property owners within 500 feet. If another neighborhood association boundary is located within the 500-foot notice radius, the letter shall be sent to that association's president, and to one designee as submitted to the City by the neighborhood association as well. The letter shall briefly describe the nature and location of the proposed development, and invite the association and interested persons to a meeting to discuss the proposal in more detail. The meeting shall be scheduled at the association's regularly scheduled monthly meeting, or at another time at the discretion of the association, and not less than 20 days from the date of mailing of the notice. If the meeting is scheduled as part of the association's regular monthly meeting, the letter shall explain that the proposal may not be the only topic of

discussion on the meeting agenda. The letter shall encourage concerned citizens to contact their association president, or their association designee, with any questions that they may want to relay to the applicant.

Neighborhood contact shall be initiated by the applicant by mailing the association president, and to one designee as submitted to the City by the neighborhood association, a letter, return receipt requested, formally requesting, within 60 days, a date and location to have their required neighborhood meeting. The 60 days shall be calculated from the date that the applicant mails this letter to the association. If the neighborhood association does not want to meet within the 60-day timeframe, or if there is no neighborhood association, the applicant may hold a public meeting during the evening after 6:00 p.m., or on the weekend no less than 20 days from the date of mailing of the notice. All meetings shall be held at a location open to the public within the boundaries of the association or at a public facility within the City of West Linn. If the meeting is held at a business, it shall be posted at the time of the meeting as the meeting place and shall note that the meeting is open to the public and all interested persons may attend.

D. On the same date the letters described in subsections A through C of this section are mailed, the applicant shall provide and post notice on the property subject to the proposed application. The notice shall be posted at a location visible from the public right-of-way. If the site is not located adjacent to a through street, then an additional sign shall be posted on the nearest through street. The sign notice shall be at least 11 inches by 17 inches in size on durable material and in clear, legible writing. The notice shall state that the site may be subject to a proposed development (e.g., subdivision, variance, conditional use) and shall set forth the name of the applicant and a telephone number where the applicant can be reached for additional information. The site shall remain posted until the conclusion of the meeting.

E. An application shall not be accepted as complete unless and until the applicant demonstrates compliance with this section by including with the application:

1. A copy of the certified letter to the neighborhood association with a copy of return receipt;

2. A copy of the letter to officers of the association and to property owners within 500 feet, including an affidavit of mailing and a copy of the mailing list containing the names and addresses of such owners and residents;

3. A copy of the required posted notice, along with an affidavit of posting;

4. A copy of the minutes of the meetings, produced by the neighborhood association, which shall include a record of any verbal comments received, and copies of any written comments from property owners, residents, and neighborhood association members. If there are no minutes, the applicant may provide a summary of the meeting comments. The applicant shall also send a copy of the summary to the chair of the neighborhood association. The chair shall be allowed to supplement the summary with any additional comments regarding the content of the meeting, as long as such comments are filed before the record is closed;

5. An audiotape of the meeting; and

6. In the event that it is discovered by staff that the aforementioned procedures of this section were not followed, or that a review of the audio tape and meeting minutes show the applicant has made a material misrepresentation of the project at the neighborhood meeting, the

application shall be deemed incomplete until the applicant demonstrates compliance with this section. (Ord. 1425, 1998; Ord. 1474, 2001; Ord. 1568, 2008; Ord. 1590 § 1, 2009)

Applicant's Finding:

This section requires the applicant to contact and discuss the proposed development with any affected neighborhood as provided in this section.

A meeting was held with members of the Rosemont, Sunset and Parker Crest neighborhood associations on August 14, 2013. The meeting was scheduled and noticed per the requirements of this section, and the required neighborhood meeting documentation is submitted with this application. The applicant provided renderings and information regarding the proposed subdivision and answered all questions asked by the members of the neighborhood association.

This section does not contain any requirements for the presentation or the materials used to make the presentation. The section describes when a neighborhood meeting is required, how notice of the meeting is to be accomplished and what the application must include from the neighborhood meeting. Some changes have occurred in the proposed plan since the neighborhood meeting; however, the basic information of the subdivision (location, general lot layout, street connections, etc.) was presented to and discussed with the neighborhood association members.

The requirements of this section have been satisfied.

SUMMARY AND CONCLUSION

Based upon the materials submitted herein, the Applicant respectfully requests that the City's Planning Commission approve this Subdivision application.

City of West Linn
PRE-APPLICATION CONFERENCE MEETING
SUMMARY NOTES
June 6, 2013

SUBJECT: 4-lot subdivision and street vacation needing variance for number of houses on a cul-de-sac at 4997 Summit Street (accesses from cul-de-sac Gloria Drive)

ATTENDEES: Applicants: Brian Feeney, Andrew Tull, John Wyland
Staff: Tom Soppe (Planning), Khoi Le (Engineering)

The following is a summary of the meeting discussion provided to you from staff meeting notes. Additional information may be provided to address any "follow-up" items identified during the meeting. These comments are PRELIMINARY in nature. Please contact the Planning Department with any questions regarding approval criteria, submittal requirements, or any other planning-related items. Please note disclaimer statement below.

Project Details

The applicant plans to subdivide an existing R-10 zoned parcel of approximately 41,000 square feet into four lots. The property borders both the local dead-end street Gloria Drive and Summit Street. Summit Street is a collector street along the southern half of the property and an arterial along the northern half. The arterial street Rosemont Road heads west from the intersection where Summit Street switches its classification, so the site is located at this "T" intersection. A house accessing from Summit Street existed at this location until several years ago when it was torn down in anticipation of redevelopment; file MIP-07-03 was approved at that time as a 3-lot minor partition for this site but it expired before platting or improvements were done. To increase the parcel's area before dividing it, the applicant plans to apply for a Street Vacation to vacate a 15-foot-wide strip of right of way all along the Gloria Drive frontage on site. This is where the Gloria Drive right of way is 15 feet wider (only on this side of the street) than it is along the entire rest of this short street.

Fifteen feet at the right edge of this right of way are proposed for vacation so the subject site can include this edge as part of the proposed lots.

The applicant proposes all four lots to access off of Gloria Drive, which would make the northern two lots flaglots despite one of them bordering Summit Street. Community Development Code (CDC) Section 85.200(A)(11) forbids cul-de-sacs from providing vehicular access to more than 12 houses. Gloria Drive is a cul-de-sac with 13 houses currently. It does intersect the undeveloped section of the Prospect Street right of way a block east of here, but Prospect Street is highly unlikely to ever be connected through to Gloria Drive for topographic reasons. Therefore functionally Gloria Drive is and will remain a cul-de-sac. Therefore while providing access to the individual houses from Gloria instead of the collector/arterial Summit is a good idea, it does require a Class II Variance to get around the provisions of 85.200(A)(11). The criteria of Chapter 85 of the Community Development Code (CDC) provides for land divisions. Chapter 11 gives the minimum dimensions and other provisions for lots in the R-10 zone.

Flag lots must measure the minimum depth of 90 feet perpendicularly from the street which they take access, and each flaglot must be served by an access strip at least 8 feet wide (the easement serving both can overlap both stems). Any lot including the front lots must meet the base zone lot size requirement by having at least 10,000 square feet free of access easements. With these stipulations and with the possible approval of the variance, flag lots should be achievable here. Alternately access easements across the two non-flaglots can substitute for stems if the applicant prefers.

Standing at the Rosemont/Summit intersection, looking east approximately down the line that would separate lots 2 and 3 from lots 1 and 4.

While the applicant's proposed plan shows similarly sized and squared-off lots, the exact sizes and shapes of lots may be affected by the need to achieve the minimum 20% of the site for significant tree dripline-plus-10-foot area preservation as required by 55.100(B)(2)(B) (referred to in subdivision criterion 85.200[J][9]). While varying and curved/multi-directional lot lines are otherwise discouraged, they are encouraged to reasonably achieve significant tree preservation as much as possible.

The shared driveway location as proposed may take down this large evergreen.

This grove dominates what is proposed to be Lot 3.

Grading is also to be kept as minimal as possible per 85.200(E) so if the steep bowl in the middle area can be graded minimally instead of more severely by modifying lot lines, this would also be encouraged.

The steep bank that runs diagonally through the site creates the “bowl” effect in the northeast half of the site.

A Planned Unit Development allows trees and/or hillside area to be in an open space tract without reducing the number of lots, and/or allows lot sizes to be modified independent of the base zone minimum (as long as there are not more than four lots) may also be a way to deal with these tree and topographic issues.

Engineering Notes

Property Address: 4997 Summit Street– West Linn, OR 97068

I. TRANSPORTATION

SUMMIT STREET

	EXISTING CONDITIONS	POTENTIAL POST DEVELOPMENT CONDITIONS
Classification	Collector	Collector

Zone	R-10	R-10
Right of Way Width	60'-88'	60' Minimum
Full Pavement Width	22'-31'	36'
Bike Lane	None – Along the frontage	6'
Curb and Gutter	None – Along the frontage	Curb and Gutter
Planter Strip	Along the frontage. Not on the opposite	5.5' Planter
Sidewalk	6' wide along the frontage - Not on the opposite	6' Sidewalk
Street Light	None along the frontage	Yes – Cobra Head
Utility Pole	None	New services to be placed underground
Street Tree	None along the frontage	Yes
ADA Ramps	None along the frontage	Yes
Post Speed	25 MPH	25 MPH
Stripe	Double Center Line and Fog Line	Provide proper stripe as part of street improvement

A. MINIMUM REQUIRED IMPROVEMENTS

1. None

2. Provide a minimum 18' pavement improvement with the following sections:
   - 12" of 1-1/2"-0 Crush Rock
   - 2" of ¾" -0 Leveling Course
   - 5" of AC Pavement consisting of 2" Class "C" over 3" Class "B"
   - See Public Works Standards Section 5.0030 Pavement Design for design requirements.

3. Provide striping including double yellow line and 6' bike lane.

4. Provide illumination analysis of the existing conditions. Install street lights as recommended in accordance to the followings:
   - Average Maintained Illumination: 0.6 foot-candles (Residential)
   - Uniformity Average to Minimum: 4 to 1
   - Street Light should match with existing surrounding lights – Cobra Head on Bronze Pole.
   - Bulb: Flat lens 150 watts maximum

5. Provide Street Tree. Coordinate with Parks Department for requirements.

6. No access on to Summit will be permitted.

7. All new and existing overhead utilities along the development must be placed underground.

8. Reference: No recent as-built of adjacent developments available.

GLORIA DRIVE

	EXISTING CONDITIONS	POTENTIAL POST DEVELOPMENT CONDITIONS
Classification	Local	Local
Zone	R-10	R-10
Right of Way Width	65’	65’ As Existing Conditions
Full Pavement Width	24’	24’
Bike Lane	None – Along the frontage	None
Curb and Gutter	None – Along the frontage	Curb and Gutter
Planter Strip	None Defined	5.5’ Planter
Sidewalk	None	6’ Sidewalk
Street Light	None along the frontage	Yes – Cobra Head
Utility Pole	None	New services to be placed underground
Street Tree	None along the frontage	Yes
ADA Ramps	None along the frontage	Yes
Post Speed	25 MPH	25 MPH
Stripe	None	None

1. None

2. Provide a minimum 12’ pavement improvement with the following sections:
   - 10” of 1-1/2”-0 Crush Rock
   - 2” of ¾” -0 Leveling Course
   - 4” of AC Pavement consisting of 2” Class “C” over 2” Class “B”
   - See Public Works Standards Section 5.0030 Pavement Design for design requirements.

3. Provide illumination analysis of the existing conditions. Install street lights as recommended in accordance to the followings:
   - Average Maintained Illumination: 0.6 foot-candles (Residential)
   - Uniformity Average to Minimum: 4 to 1
   - Street Light should match with existing surrounding lights – Cobra Head on Bronze Pole.
   - Bulb: Flat lens 150 watts maximum

4. Provide Street Tree. Coordinate with Parks Department for requirements.

5. No access on to Summit will be permitted.

6. All new and existing overhead utilities along the development must be placed underground.

7. As-Built: No recent as-built of adjacent developments available.

B. CITY TRANSPORTATION MASTER PLAN

PEDESTRIAN MASTER PLAN

Summit St is indicated in the City Pedestrian Master Plan as one of the roadways with sidewalk deficient. Sidewalk project along Summit from Skyline Dr to Oxford St is identified as project number 77 on Pedestrian Master Plan Project list (See TSP page 5-8). 6' sidewalk along the project frontage will be included as part of the street improvement requirements.

BICYCLE MASTER PLAN

Summit St is indicated in the City Bicycle Master Plan as one of the roadways with bike lane deficiency. Summit St bike lane improvement is listed as project number 10 on Bicycle Master Plan. 6' bike lane along project frontage will be included as part of the street improvement requirements.

MOTOR VEHICLE MASTER PLAN

Existing Operations Conditions

Rosemont Rd and Summit St intersection was analyzed in TSP and currently it serves at LOS A. No additional improvement is required aside from frontage improvement.

C. STREET SDC AND BIKE/PEDESTRIAN EFFECTIVE JULY 1ST 2012

Type of Use	Trip per Use	Factor	Reimbursement	Improvement	Administrative	Total
Per Factor of 1		1.00	$2,167	$4,644	$177	$6,988
Single Family	Per House	1.01	$2,189	$4,690	$179	$7,058

Type of Use	Trip per Use	Factor	Reimbursement	Improvement	Administrative	Total
Per Factor of 1		1.00	$0	$1,518	$40	$1,558
Single Family	Per House	1.00	$0	$1,533	$40	$1,573

II. STORM DRAINAGE

A. EXISTING CONDITIONS

1. There is no public storm main along the project frontage on Summit St. The closest storm conveying system is on Gloria Dr and Woodsprite Ct for connection.
2. As-Built: No recent as-built of adjacent developments available.

B. MINIMUM REQUIRED IMPROVEMENTS

1. Provide treatment for new impervious of 500 square feet or more.
2. Provide detention for new impervious of 5000 square feet or more.
3. Storm Drainage Analysis Report is required.
4. Collect, treat, detain, and provide proper conveying system for new impervious area created along Summit St and Gloria Dr.
5. A public storm drainage easement through adjacent property, large enough to accommodate necessary infrastructure, shall be required if conveying through Woodsprite Ct.

C. SURFACE WATER SDC EFFECTIVE JULY 1ST 2012

Unit		Factor	Reimbursement	Improvement	Administrative	Total
Per Factor of 1		1.00	$780	$234	$52	$1,066
Single Family	Per House	1.00	$780	$234	$52	$1,066

III. SANITARY SEWER

A. EXISTING CONDITIONS

1. There is existing 8" sanitary sewer main located on adjacent property to the East within a public easement for connection.

B. MINIMUM REQUIRED IMPROVEMENTS

1. Existing cleanout must be replaced with a manhole if connection is made to the main between the existing cleanout and manhole.
2. If the existing house is on septic, decommission the septic tank and drain field in accordance to DEQ requirements and submit the City with proper paper works.
6. As-Built: No recent as-built of adjacent developments available.

C. SANITARY SEWER SDC EFFECTIVE JULY 1ST 2012

Unit	Meter Size	Factor	Reimbursement	Improvement	Administrative	Total
Per Factor of 1		1.00	$603	$2,348	$109	$3,060
Single Family	Per House	1.00	$603	$2,348	$109	$3,060

Tri-City Service District Sewer SDC 1 EDU = $2,020

IV. WATER

A. PRESSURE ZONE

1. Zone: Rosemont Pressure Zone
2. Overflow Elevation: 860 Upper Elevation: 750 Lower Elevation: 220

B. RESERVOIR AND PUMP STATION

1. Reservoir: Rosemont Reservoir is located on Suncrest Drive. The reservoir usable capacity is 0.4 million gallon. The reservoir is filled by Horton and View Drive Pump Station.

2. Pump Station: Horton Pump Station has total of 4 pumps. 2 pump at 1300 gpm and 2 pumps at 900 gpm. View Drive has 4 pumps at 600 gpm.

C. EXISTING POPULATION AND PROJECTED POPULATION AT SATURATION

1. Existing Population: 5,435
2. Projected Population at Saturation: 7,130

D. WATER DEMAND AT SATURATION

Average Day Demand (mgd)	Maximum Day Demand (mgd)	Peak Hour Demand (mgd)
1.0	2.3	12.6

E. RESERVOIR AND PUMP STATION CURRENT OPERATNG CONDITIONS

1. In accordance with Water System Plan, both the reservoir and pump station are listed appearing to be in good conditions.

F. ROSEMONT PRESSURE ZONE PEFORMANCE

Year	MDD (mg)	Fire Flow (mg)	Total Supply Need (mg)	Normal Supply Capacity (mg)	Emergency Supply Capacity (mg)	Normal Supply Deficit (mg)	Emergency Supply Deficit (mg)
Current	**1.9**	**0.5**	**2.4**	**6.2**	**1.7**	**(3.8)**	**0.7**
2015	**2.0**	**0.5**	**2.5**	**6.2**	**1.7**	**(3.7)**	**0.8**
2030	**2.2**	**0.5**	**2.7**	**6.2**	**1.7**	**(3.5)**	**1.0**
Saturation	**2.3**	**0.5**	**2.8**	**6.2**	**1.7**	**(3.4)**	**1.1**

1. The table above indicates that there is NO deficiency in supply capacity during a normal condition. There is no improvement project adjacent to development listed in the Water System Master Plan.

G. ROSEMONT PRESSURE ZONE SUPPLY AND STORAGE DEFICIT

Year	Normal Conditions			Emergency Conditions		
	Supply Deficit (mgd)	Storage Volume (mg)	Overall Deficit (mgd)	Supply Deficit (mgd)	Storage Deficit (mgd)	Overall Deficit (mgd)
Current	**0**	**0.3**	**0**	**0.7**	**0.3**	**0.4**
2015	**0**	**0.3**	**0**	**0.8**	**0.3**	**0.5**
2030	**0**	**0.3**	**0**	**1.0**	**0.3**	**0.7**
Saturation	**0**	**0.3**	**0**	**1.1**	**0.3**	**0.8**

1. The table above indicates that there is no overall storage volume deficit during a normal condition but deficient during emergency condition.

H. ROSEMONT ZONE MASTER PROJECT LIST

1. There are 10 water improvement projects listed in the City Water System Plan under the Rosemont Pressure zone. However none of them is along the subject development frontage. Thus there is no improvement required along the proposed project frontage.

I. MINIMUM REQUIRED IMPROVEMENTS

1. Existing public water system is available on both Summit St and Gloria Dr for connection.
2. New water meter shall be set behind curb and out of driveway approaches. No water meters or water main shall allow to be placed in private drive way.
3. As-Built: No recent as-built of adjacent developments available.

J. WATER SDC EFFECTIVE JULY 1ST 2012

Unit	Meter Size	Factor	Reimbursement	Improvement	Administrative	Total
Per Factor of 1		1.00	$576	$6,863	$193	$7,632
5/8" Meter	1		$576	$6,863	$193	$7,632

Process

Street vacation is required, Subdivision is required, and Class II Variance is required to add four lots to a cul-de-sac already providing access to 13 developed lots.

Street vacation should be done separately and first, since this is a City Council decision without CDC criteria. The other two are quasi-judicial Planning Commission applications with CDC criteria.

A neighborhood meeting is required regarding this proposal per 99.038 as it includes a Subdivision request. The property is in the Sunset neighborhood but is adjacent to the Parker Crest and Rosemont Summit neighborhoods across Summit Street, located south and north of Rosemont Road respectively. Contact Troy Bowers, Sunset NA president at 503-703-7303 or sunsetna@westlinnoregon.gov. Contact Bill Relyea, Parker Crest NA President, at 503-636-1292 or parkercrestna@westlinnoregon.gov. Contact Dean Suhr, Rosemont Summit NA President, at 503-656-4808 or rosemontsummitna@westlinnoregon.gov. If the applicant does a neighborhood meeting, conceptual plans of the development should be submitted to the neighborhood association at least 10 days before the meeting. The applicant will need to go to a title company to find out the names and addresses of the property owners within 500 feet for notification.

The Street Vacation will require sign off from the property owners abutting the strip to be vacated (only the property owner for the site and the site to the east) and property owners

representing 2/3 of the land area in an area 200 feet on each side of the strip and 400 feet beyond each end of the strip. Specifically this means 2/3 of the area in a rectangle drawn from these two dimensions. These signatures and a map of how they fulfill the requirements shall be submitted with the application, plus a description of why the applicant requests the vacation. The City Council first decides at a meeting whether the petition should be heard. If they decide it should, notice and hearing then proceed. Oregon Revised Statutes (ORS) 271.110 require the noticing process start at least 2 weeks prior to the hearing. After the testimony of the hearing, the City Council decides whether to approve the requested vacation. All relevant ORS provisions can be found at http://www.leg.state.or.us/ors/271.html.

The Subdivision application will require a full and complete response to the submittal requirements of CDC 85.150-170, which include a site plan, utilities, a city-wide map showing the site, the Development Review Application Form, the aforementioned fee, and a narrative responding to the appropriate criteria. The appropriate criteria are in Section 85.200.

The Variance application will require a complete response to the submittal requirements of 75.050. It will also require a narrative response to the criteria of 75.060.

Submittal requirements may be waived but the applicant must first identify the specific submittal requirement and request, in letter form, that it be waived by the Planning Director and must identify the specific grounds for that waiver. The waiver may or may not be granted by the Planning Director.

The CDC is online at http://westlinnoregon.gov/planning/community-development-code-cdc.

N/A is not an acceptable response to the approval criteria. Prepare the application and submit to the Planning Department with deposit fees and signed application form.

The fee for Street Vacation is $6,000. The deposit for Subdivision is $4,200 plus $200 per lot, which in this case would be $5,000 total. **PLEASE NOTE that this is an initial deposit, and staff time is charged against the deposit account. It is common for there to be more staff time spent on development applications than deposits cover, and therefore additional billing may be likely to occur.** The fee for Class II Variance is $2,900.

When the Subdivision and Variance applications are submitted concurrently and deemed complete, staff will schedule a Planning Commission hearing regarding the concurrent application approvals and send out notice at least 20 days before the hearing. The decision may be appealed by the applicant or anyone with standing to City Council, requiring at least one City Council hearing.

Pre-application notes are void after 18 months. After 18 months with no application approved or in process, a new pre-application conference is required.

Typical land use applications can take 6-10 months from beginning to end.

DISCLAIMER: This summary discussion covers issues identified to date. It does not imply that these are the only issues. The burden of proof is on the applicant to demonstrate that all approval criteria have been met. These notes do not constitute an endorsement of the proposed application. Staff responses are based on limited material presented at this pre-application meeting. New issues, requirements, etc. could emerge as the application is developed. Thus, there is no "shelf life" for pre-apps.

Civil Engineering
Water Resources
Land Use Planning

July 25, 2013

4997 Summit Road
Proposed Residential Subdivision

To Our Neighbors,

3J Consulting acts on behalf of JT Smith Companies regarding the planned subdivision of a small property located off of South Gloria and Summit Road. The location of the property and the proposed project is shown on the attached map. The address of the project is 4997 Summit Road. The tax lot number for the property is 2s1e25db 00500. The property is currently located inside the City of West Linn's boundaries and it is zoned R-10 or Single Family Residential.

JT Smith Companies is considering a subdivision of the 0.93 acre property in order to create four new residential lots. Subject to a pending application for a right-of-way vacation, it is envisaged that each of the proposed lots will exceed 10,000 square feet which is the minimum lot size within the zoning R-10 district. The proposed site improvements will include improvements to S. Gloria Street and Summit Road. The proposed lots will take access to South Gloria Street via a shared driveway.

Before finalizing an application to the City's Planning Department for the proposed subdivision, we would like to take the opportunity to discuss this proposal with the members of the Rosemont, Sunset, and Parker Crest neighborhood associations and property owners residing within 500 feet of the property.

A meeting to discuss this project has been scheduled at the following time and location:

South Gloria Street Subdivision Informational Meeting
Wednesday, August 14 at 7:00 pm
Willamette Fire Station 59
1860 Willamette Falls Drive, West Linn, OR 97068

The purpose of this meeting will be to provide a forum for surrounding property owners and residents to review the proposal and to identify issues so they can be given proper consideration. This meeting will provide the opportunity for the public to share with the project team any special information about the property involved. The project team will try to answer questions related to how the project meets the relevant development standards consistent with West Linn's land use regulations.

Please note that this will be an informational meeting based upon preliminary development plans and that these plans may change before the application is submitted to the City.

3J Consulting, Inc.
10445 SW Canyon Road Suite 245 Beaverton, OR 97005

Ph: 503-946-9365
andrew.tull@3j-consulting.com

We look forward to discussing this proposal with you. Please feel free to contact us by emailing andrew.tull@3j-consulting.com if you have any questions.

Sincerely,

Andrew Tull
Senior Planner
3J Consulting, Inc.

copy: File

Site Location Map | 4997 Summit Road

NEIGHBORHOOD MEETING

AFFIDAVIT OF POSTING NOTICE

STATE OF OREGON)

SS

County of Clackamas)

I, Andrew Tull, being duly sworn, state that I represent the party initiating interest in a proposed subdivision affecting the land located at 4997 Summit Road in West Linn, Oregon and that pursuant to Community development Code Section 99, did on the 26th day of July, 2013 personally post notice indicating that the site may be proposed for a subdivision application.

Two signs were posted along the southern and western property lines.

This 26th day of July , 2013.

OFFICIAL SEAL
KELLY C LINN
NOTARY PUBLIC - OREGON
COMMISSION NO. 470132
MY COMMISSION EXPIRES JULY 19, 2016

Signature

Subscribed and sworn to, or affirmed, before me this 5 day of AUGUST, 2013.

Notary Public for the State of Oregon

County of Washington

My Commission Expires: 7/19/2016

NEIGHBORHOOD MEETING

AFFIDAVIT OF MAILING

STATE OF OREGON)

SS

County of Clackamas)

I, Andrew Tull, being duly sworn, state that I represent the party initiating interest in a proposed subdivision affecting the land located at 4997 Summit Road in West Linn, Oregon and that pursuant to Community development Code Section 99, did on the 26th day of July, 2013 caused to have mailed, to each of the persons on the attached list, a notice of a meeting to discuss the proposed development of the aforementioned property.

I further state that said notices were enclosed in plainly addressed envelopes to said persons and were deposited on the date indicated above in the United States Post Office with postage prepaid thereon.

This 26th day of July , 2013.

OFFICIAL SEAL
KELLY C LINN
NOTARY PUBLIC - OREGON
COMMISSION NO. 470132
MY COMMISSION EXPIRES JULY 19, 2016

Signature

Subscribed and sworn to, or affirmed, before me this 5 day of August, 2013.

Notary Public for the State of Oregon

County of Washington

My Commission Expires: 7/19/2016

7012 3050 0001 3119 0229

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WEST LINN OR 97068

OFFICIAL USE

Postage	$ $0.46	0100
Certified Fee	$3.10	15
Return Receipt Fee (Endorsement Required)	$2.55	Postmark Here
Restricted Delivery Fee (Endorsement Required)	$0.00	
Total Postage & Fees	$ $6.11	07/23/2013

Sent To: DEAN SUHR
Street, Apt. No.; or PO Box No.: 21345 MILES DRIVE
City, State, ZIP+4: WEST LIN, OR 97086 97068

PS Form 3800, August 2006 — See Reverse for Instructions

7012 3050 0001 3119 0212

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WEST LINN OR 97068

OFFICIAL USE

Postage	$ $0.46	0100
Certified Fee	$3.10	15
Return Receipt Fee (Endorsement Required)	$2.55	Postmark Here
Restricted Delivery Fee (Endorsement Required)	$0.00	
Total Postage & Fees	$ $6.11	07/23/2013

Sent To: BILL RELYEA
Street, Apt. No.; or PO Box No.: 3016 SABO LANE
City, State, ZIP+4: WEST LINN, OR 97086 97068

PS Form 3800, August 2006 — See Reverse for Instructions

7012 3050 0001 3119 0205

U.S. Postal Service™
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(Domestic Mail Only; No Insurance Coverage Provided)

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PORTLAND OR 97204

OFFICIAL USE

Postage	$ $0.46	0100
Certified Fee	$3.10	15
Return Receipt Fee (Endorsement Required)	$2.55	Postmark Here
Restricted Delivery Fee (Endorsement Required)	$0.00	
Total Postage & Fees	$ $6.11	07/23/2013

Sent To: TROY BOWERS
Street, Apt. No.; or PO Box No.: 121 SW SALMON, SUITE 900
City, State, ZIP+4: PORTLAND, OR 97204

PS Form 3800, August 2006 — See Reverse for Instructions

First American
Title Company of Oregon

Date of Production: Wednesday, July 03, 2013

The ownership information enclosed is time sensitive and should be utilized as soon as possible.

This mailing list was produced with the use of tax assessor maps available online from OR Maps (www.ormap.org/maps/index.cfm) as well as data purchased from the Portland Metro regional government and Real Estate Solutions Inc.

We assume no liability in connection with this service.

Thank you for your business and for using First American Title.

First American Title Company of Oregon

Customer Service Department
121 SW Morrison Street Suite 300 - Portland, OR 97204
Phone: 503.219.TRIO (8746) Fax: 503.790.7872
Email: cs.portland@firstam.com
Today's Date : 7/3/2013

OWNERSHIP INFORMATION

Owner	: **Lf 10 LLC**	Ref Parcel Number	: 21E25DB00500
Co Owner	:	Parcel Number	: 00385773
Site Address	: 4997 Summit St West Linn 97068	T: 02S R: 01E S: 25 Q: SE QQ: NW	
Mail Address	: 5285 Meadows Rd #171 Lake Oswego Or 97035	County	: Clackamas (OR)
Taxpayer	: Piscitello Vincent & Lorraine	Telephone	:

PROPERTY DESCRIPTION

Map Page & Grid	: 687 A6
Census Tract	: 206.00 Block: 2
Improvement Type	: 142 Sgl Family,R1-4,1-Story (Basement)
Subdivision/Plat	: West Linn Heights 02
Neighborhood	: West Linn Newer
Land Use	: 100 Vacant,Residential Land
Legal	: SECTION 25 TOWNSHIP 2S RANGE 1E
	: QUARTER DB TAX LOT 00500
	:

ASSESSMENT AND TAX INFORMATION

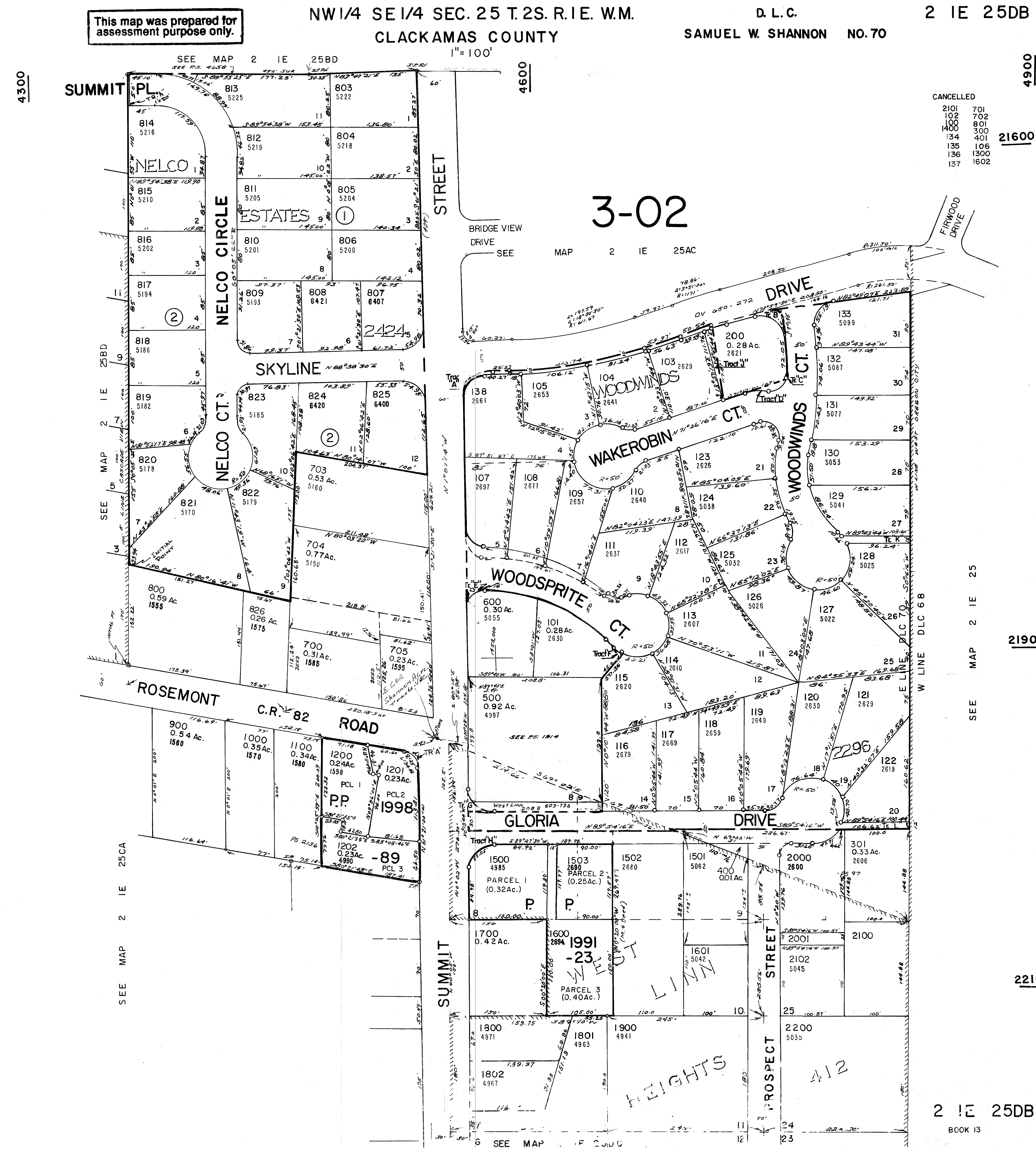
Mkt Land	: $179,087
Mkt Structure	:
Mkt Total	: $179,087
% Improved	:
12-13 Taxes	: $2,794.91
Exempt Amount	:
Exempt Type	:
Levy Code	: 003002
Millage Rate	: 18.7110
M50AssdValue	: $166,113

PROPERTY CHARACTERISTICS

Bedrooms	:	Building SF	:	BldgTotSqFt	:
Bathrooms	:	1st Floor SF	:	Lot Acres	: .92
Full Baths	:	Upper Finished SF	:	Lot SqFt	: 40,075
Half Baths	:	Finished SF	:	Garage SF	:
Fireplace	:	Above Ground SF	:	Year Built	: 1924
Heat Type	: Heat Pump	Upper Total SF	:	School Dist	: 003
Floor Cover	: Carpet	UnFinUpperStorySF	:	Foundation	: Concrete
Stories	: 1 Story-Bsmt	Basement Fin SF	:	Roof Type	: Built Up
Int Finish	: Drywall	Basement Unfin SF	:	Roof Shape	: Gable
Ext Finsh	: Avg Plywood	Basement Total SF	:		

TRANSFER INFORMATION

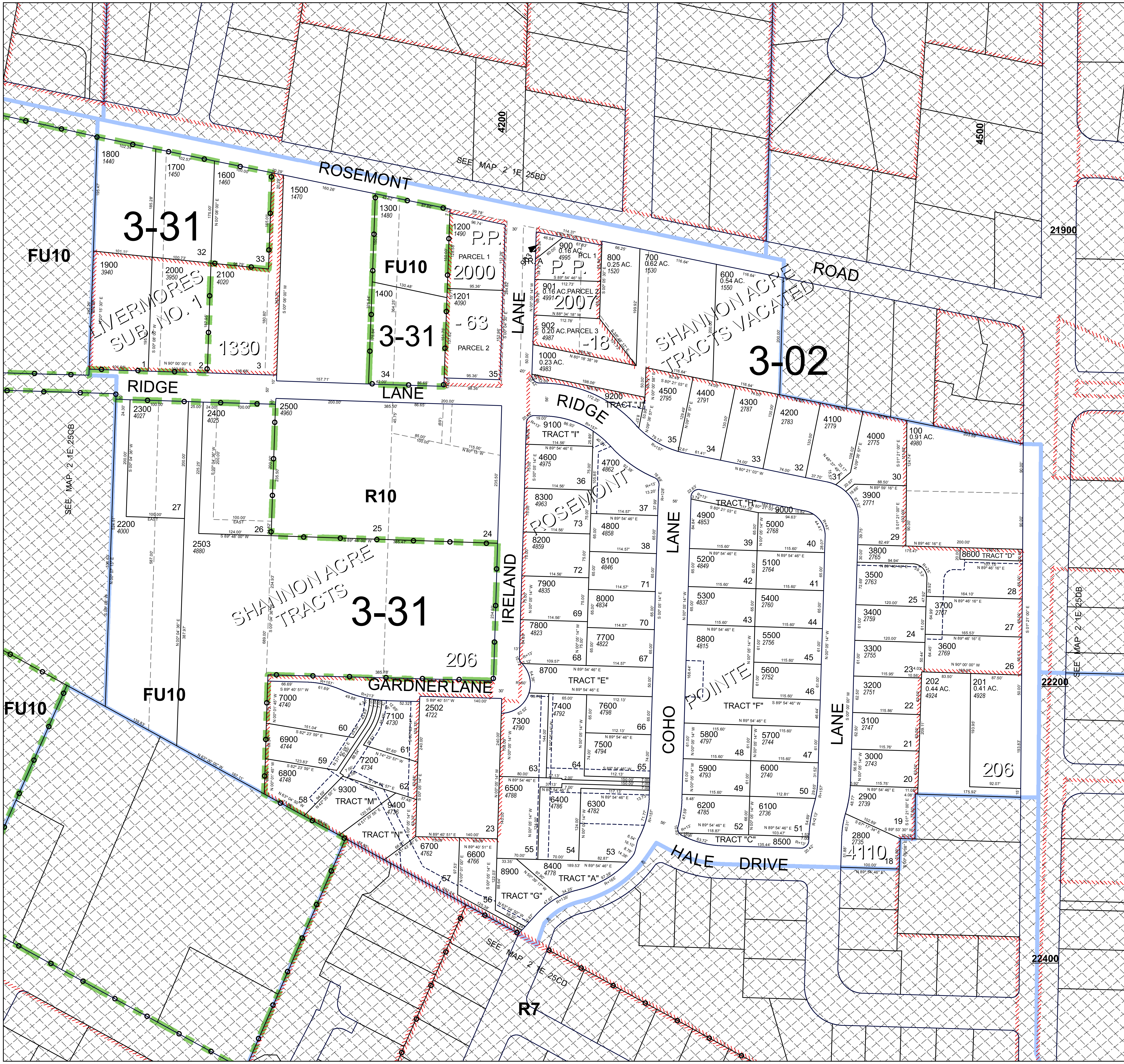
Owner Name(s)	Sale Date	Doc#	Sale Price	Deed Type	Loan Amount	Loan Type
:Lf 10 LLC	:05/22/2013	013-035237	:$350,000	:Warranty	:	:
:Piscitello Vincent & Lorraine	:	0000000000	:	:	:	:
:Foster Scott L/Cynthia J	:03/31/2005	005-028276	:$300,000	:Warranty	:$250,000	:Private
:	:		:	:	:	:
:	:		:	:	:	:
:	:		:	:	:	:


This map was prepared for assessment purpose only.
NW1/4 SE1/4 SEC. 25 T.2S. R.1E. W.M.
CLACKAMAS COUNTY
1"=100'
D.L.C.
SAMUEL W. SHANNON NO.70
2 1E 25DB
CANCELLED
2101 701
102 702
100 801
1400 300
134 401
135 106
136 1300
137 1602
21600
4300
4600
4900
SEE MAP 2 1E 25BD
SUMMIT PL.
NELCO
ESTATES
NELCO CIRCLE
NELCO CT.
SKYLINE
STREET
BRIDGE VIEW DRIVE
SEE MAP 2 1E 25AC
3-02
FIRWOOD DRIVE
DRIVE
WOODWINDS
WAKEROBIN CT.
WOODWINDS CT.
WOODSPRITE CT.
2424
2296
ROSEMONT C.R. 82 ROAD
GLORIA DRIVE
SUMMIT
PROSPECT STREET
WEST LINN HEIGHTS 412
1991-23
1998-89
21900
22100
SEE MAP 2 1E 25
SEE MAP 2 1E 25CA
SEE MAP 2 1E 25BD
2 1E 25DB
BOOK 13

2 1 E 25 CA
WEST LINN

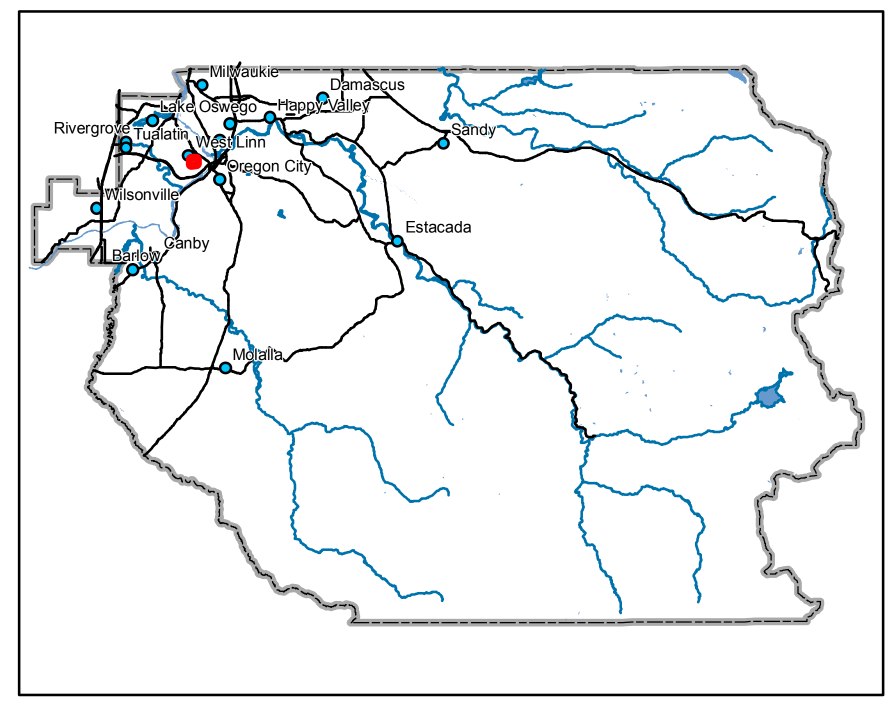
N.E.1/4 S.W.1/4 SEC.25 T.2S. R.1E. W.M.
Clackamas County
1" = 100'

D. L. C.
SAMUEL W. SHANNON NO. 70



Cancelled Taxlots
1101
300
2600
2700
200
500
1100
2501

- Parcel Boundary
- Private Road ROW
- Historical Boundary
- Railroad Centerline
- TaxCodeLines
- Map Index
- WaterLines
- Land Use Zoning
- Plats
- Water
- Corner
- Section Corner
- 1/16th Line
- Govt Lot Line
- DLC Line
- Meander Line
- PLSS Section Line
- Historic Corridor 40'
- Historic Corridor 20'



THIS MAP IS FOR ASSESSMENT PURPOSES ONLY

Feet
0 25 50 100 150 200

5/16/2012

2 1 E 25 CA
WEST LINN

SECTION 25 T.2S. R.1E. W.M.
CLACKAMAS COUNTY
1" = 400'

D.L.C.
JULIA ANN LEWIS NO. 54
D. D. TOMPKINS NO. 61,65
DANIEL BURNS NO. 68 & 69
SAMUEL W. SHANNON NO. 70

2 1E 25
& INDEX
WEST LINN

This map was prepared for assessment purpose only.

21E25 00300
City Of West Linn
22500 Salamo Rd #600
West Linn, OR 97068

21E25CA00100
Binh Nguyen
4980 Summit St
West Linn, OR 97068

21E25CA03400
Daniel Allen Hein
2759 Ridge Ln
West Linn, OR 97068

21E25CA03500
Robert & Cherie Shevlin
1960 Haverhill Way
West Linn, OR 97068

21E25CA03600
Hale
19905 Bellevue Way
West Linn, OR 97068

21E25CA03700
Christopher & Erin Sprando
2767 Ridge Ln
West Linn, OR 97068

21E25CA03800
Jeremy & Elaine Beal
2765 Ridge Ln
West Linn, OR 97068

21E25CA03900
Brian Odell
2771 Ridge Ln
West Linn, OR 97068

21E25CA04000
Dennis & Jennifer Tan
2775 Ridge Ln
West Linn, OR 97068

21E25CA04100
Timothy James & Kimberly Lippert
22751 Clark St
West Linn, OR 97068

21E25CA04200
William Jr & Nicole Weber
2783 Ridge Ln
West Linn, OR 97068

21E25CA08600
City Of West Linn
22500 Salamo Rd #600
West Linn, OR 97068

21E25DB00101
Antonia Maria Puckett
2630 Woodsprite Ct
West Linn, OR 97068

21E25DB00103
Colleen Declark
2629 Wakerobin Ct
West Linn, OR 97068

21E25DB00104
James Nord
Po Box 52
West Linn, OR 97068

21E25DB00105
Rebecca Finley
2653 Wakerobin Ct
West Linn, OR 97068

21E25DB00107
Linda Raethke
2697 Woodsprite Ct
West Linn, OR 97068

21E25DB00108
Joseph Hewett
2677 Woodsprite Ct
West Linn, OR 97068

21E25DB00109
Joel Lafollette
2657 Woodsprite Ct
West Linn, OR 97068

21E25DB00110
Barry Bergman
2640 Wakerobin Ct
West Linn, OR 97068

21E25DB00111
R Tim & Judy Allred
21310 Horton Ct
West Linn, OR 97068

21E25DB00112
Joseph & Karen Kelly
2617 Woodsprite Ct
West Linn, OR 97068

21E25DB00113
Gyung Jae Lee
2607 Woodsprite Ct
West Linn, OR 97068

21E25DB00114
Richard & Ladene Raspotnik
2610 Woodsprite Ct
West Linn, OR 97068

21E25DB00115
Brian & Kathryn Hemphill
2620 Woodsprite Ct
West Linn, OR 97068

21E25DB00116
Rosa White
2679 Gloria Dr
West Linn, OR 97068

21E25DB00117
Randy Pugsley
2669 Gloria Dr
West Linn, OR 97068

21E25DB00118
Mary Jo Bottjer-Steele
2659 Gloria Dr
West Linn, OR 97068

21E25DB00119
Richard & Susan Buchanan
2649 Gloria Dr
West Linn, OR 97068

21E25DB00120
Susan Newton
2639 Gloria Dr
West Linn, OR 97068

21E25DB00121
Harry Jr & Janet Dalgaard
2629 Gloria Dr
West Linn, OR 97068

21E25DB00122
Victoria Baldwin
917 Patricia Ct
Ojai, CA 93023

21E25DB00123
Carol Battaglia
2626 Wakerobin Ct
West Linn, OR 97068

21E25DB00124
William Co-E Johnson
5038 Woodwinds Ct
West Linn, OR 97068

21E25DB00125
Katharine Gartner
5032 Woodwinds Ct
West Linn, OR 97068

21E25DB00126
Jacob & Anne-Marie Wilson
5026 Woodwinds Ct
West Linn, OR 97068

21E25DB00127
R Dale Co-E Clark
1235 E Lucas St
La Center, WA 98629

21E25DB00128
Winn
5025 Woodwinds Ct
West Linn, OR 97068

21E25DB00129
Jonah & Teresa Cookingham
5041 Woodwinds Ct
West Linn, OR 97068

21E25DB00130
Marcus & Kara Cassar
5053 Woodwinds Ct
West Linn, OR 97068

21E25DB00131
Robert & Irina Sontag
5077 Woodwinds Ct
West Linn, OR 97068

21E25DB00138
Jauruey Chew
2661 Wakerobin Ct
West Linn, OR 97068

21E25DB00200
Michael Feuerstein
2621 Wakerobin Ct
West Linn, OR 97068

21E25DB00301
Brian & Lynn Leschorn
2606 Gloria Dr
West Linn, OR 97068

21E25DB00400
Michael Kalamars
5062 Prospect St
West Linn, OR 97068

21E25DB00600
Margaret Young
5055 Summit St
West Linn, OR 97068

21E25DB00700
Barbara Gustafson
1585 Rosemont Rd
West Linn, OR 97068

21E25DB00703
John & Jo-Ann Moss
5160 Summit St
West Linn, OR 97068

21E25DB00704
Andrea Boyd-Helm
5150 Summit St
West Linn, OR 97068

21E25DB00705
David Levine
1595 Rosemont Rd
West Linn, OR 97068

21E25DB00800
Dale & Natalie Johnson
1555 Rosemont Rd
West Linn, OR 97068

21E25DB00821
Leroy & Donna Dunn
5170 Nelco Cir
West Linn, OR 97068

21E25DB00822
Toby Daniels
5179 Nelco Cir
West Linn, OR 97068

21E25DB00823
Alice Elizabeth Burnham
5185 Nelco Cir
West Linn, OR 97068

21E25DB00824
Brent & Katherine Leonard
6420 Skyline Dr
West Linn, OR 97068

21E25DB00825
Robert Claeys
6400 Skyline Dr
West Linn, OR 97068

21E25DB00826
Frederick G A & Janet Sickert
1575 Rosemont Rd
West Linn, OR 97068

21E25DB00900
Glacier Ice LLC
Po Box 1170
Coupeville, WA 98239

21E25DB01000
Winnifred Trste Simonsen
Po Box 512
West Linn, OR 97068

21E25DB01100
Thomas Dean Larson
10639 SW 64th Dr
Portland, OR 97219

21E25DB01200
Paul Himmelright
1590 Rosemont Rd
West Linn, OR 97068

21E25DB01201
Lf LLC
5285 Meadows Rd #161
Lake Oswego, OR 97035

21E25DB01202
Dean Reed Cockel
4990 Summit St
West Linn, OR 97068

21E25DB01500
Karen & Charles McGeehan
4985 Summit St
West Linn, OR 97068

21E25DB01501
Michael Kalamaris
5062 Prospect St
West Linn, OR 97068

21E25DB01502
James & Jean Preble
Po Box 3983
Sunriver, OR 97707

21E25DB01503
Jim & Kyong Wiard
2690 Gloria Dr
West Linn, OR 97068

21E25DB01600
Jeffrey & Rebecca Wilson
2694 Gloria Dr
West Linn, OR 97068

21E25DB01601
Dean & Linda Degraw
5042 Prospect St
West Linn, OR 97068

21E25DB01700
City Of West Linn
22500 Salamo Rd #600
West Linn, OR 97068

21E25DB01800
Kelley Malcolm
4971 Summit St
West Linn, OR 97068

21E25DB01801
Paul & Heather Jones
4963 Summit St
West Linn, OR 97068

21E25DB01802
Richard & Margaret Vaughn
2752 Ridge Ln
West Linn, OR 97068

21E25DB01900
Jean Carpenter
4941 Summit St
West Linn, OR 97068

21E25DB02000
Joseph & Sara Fustolo
2600 Gloria Dr
West Linn, OR 97068

21E25DB02001
Joseph & Sara Fustolo
2600 Gloria Dr
West Linn, OR 97068

21E25DB02100
Brian & Lynn Leschron
2606 Gloria Dr
West Linn, OR 97068

21E25DB02102
Michael & Tracee Stateler
5045 Prospect St
West Linn, OR 97068

21E25DB02200
Joane Linker
5035 Prospect St
West Linn, OR 97068

PUBLIC NOTICE

OF A NEIGHBORHOOD MEETING

THIS SITE MAY BE SUBJECT TO A PROPOSED SUBDIVISION.

PLEASE CONTACT THE APPLICANT FOR MORE INFORMATION AT
THE FOLLOWING NUMBER OR FEEL FREE TO ATTEND THE
SCHEDULED NEIGHBORHOOD MEETING:

3J CONSULTING, INC. C/O ANDREW TULL
503-946-9365

NEIGHBORHOOD MEETING:

ROSEMONT NEIGHBORHOOD
ASSOCIATION
AUGUST 14, 2013 AT 7:00 PM
WILLAMETTE FIRE STATION 59
1860 WILLAMETTE FALLS DRIVE,
WEST LINN, OR 97068

Civil Engineering
Water Resources
Land Use Planning

NEIGHBORHOOD MEETING
4997 Summit Road – Rosemont II
August 14, 2013

NAME	ADDRESS	EMAIL
RANDALL JAMESON SUNSET NEIGHBORHOOD ASSN.	4723 CORNWALL ST WL	RANDALLJAMESON@ COMCAST.NET
Brian & Kathy Hemphill	2620 Woodsprite Ct.	bwhemphill@comcast.net
DEAN COCKEL	4990 Summit St.	DEANRC@ATT.NET

3J Consulting, Inc.
4780 SW Joshua Street, Tualatin, OR 97062

Ph: 503-946-9365
john.howorth@3j-consulting.com

PRELIMINARY
STORMWATER REPORT

HARPER'S TERRACE SUBDIVISION
WEST LINN, OR

October 1, 2013

Prepared For:

LF 10, LLC
5285 Meadows Road, Suite #171
Lake Oswego, OR 97035

Prepared By:
3J Consulting, Inc.
10445 SW Canyon Rd, Suite 245
Beaverton, Oregon 97005
Project No: 13123
KEF

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EXECUTIVE SUMMARY

The existing site is located on private property at 4997 Summit Street in West Linn, Oregon (See Figure 2). The property is approximately 1.0 acre and currently contains a vacant lot with several mature trees and a small patch of concrete. The proposed development will consist of subdividing the vacant lot to create four buildable lots for single family homes. The purpose of this storm water report is to describe the design of the stormwater management systems following the City of West Linn requirements.

Each individual lot will be required to treat and infiltrate all stormwater runoff up to and including the 10-year storm event, while providing the necessary detention for the 25-year storm event. An infiltration planter for each lot has been designed following the City of Portland's Presumptive Approach Calculator.

A geotechnical investigation has been conducted showing that infiltration rates on the site are between 1.0 and 2.0 in/hr at depths of 3 to 8 feet, respectively. The geotechnical report has been included in the Technical Appendix.

The purpose of this report is to describe the facilities being proposed and to show that the design follows the City of West Linn's Public Works Design Standards.

PROJECT DESCRIPTION

The existing site is located on private property at 4997 Summit Street in West Linn, Oregon (See Figure 1 and 2).

The purpose of this report is to describe the facilities being proposed and show that the design follows the City of West Linn Public Works Design Standards in effect at the time of this report.

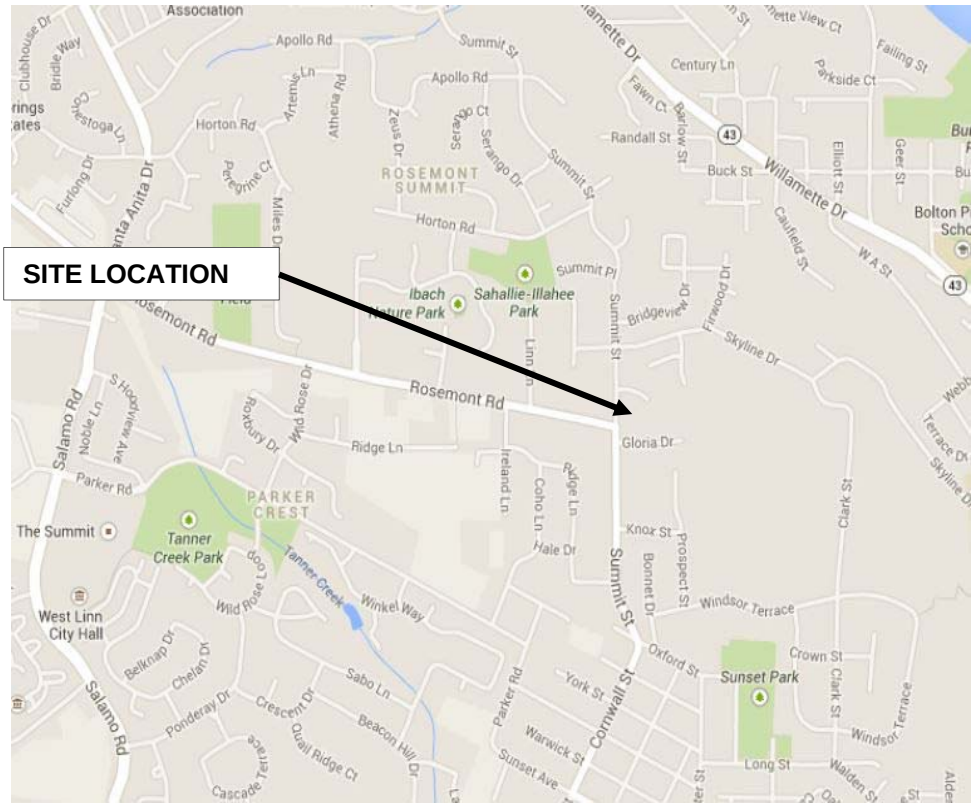


Figure 1 - Vicinity Map

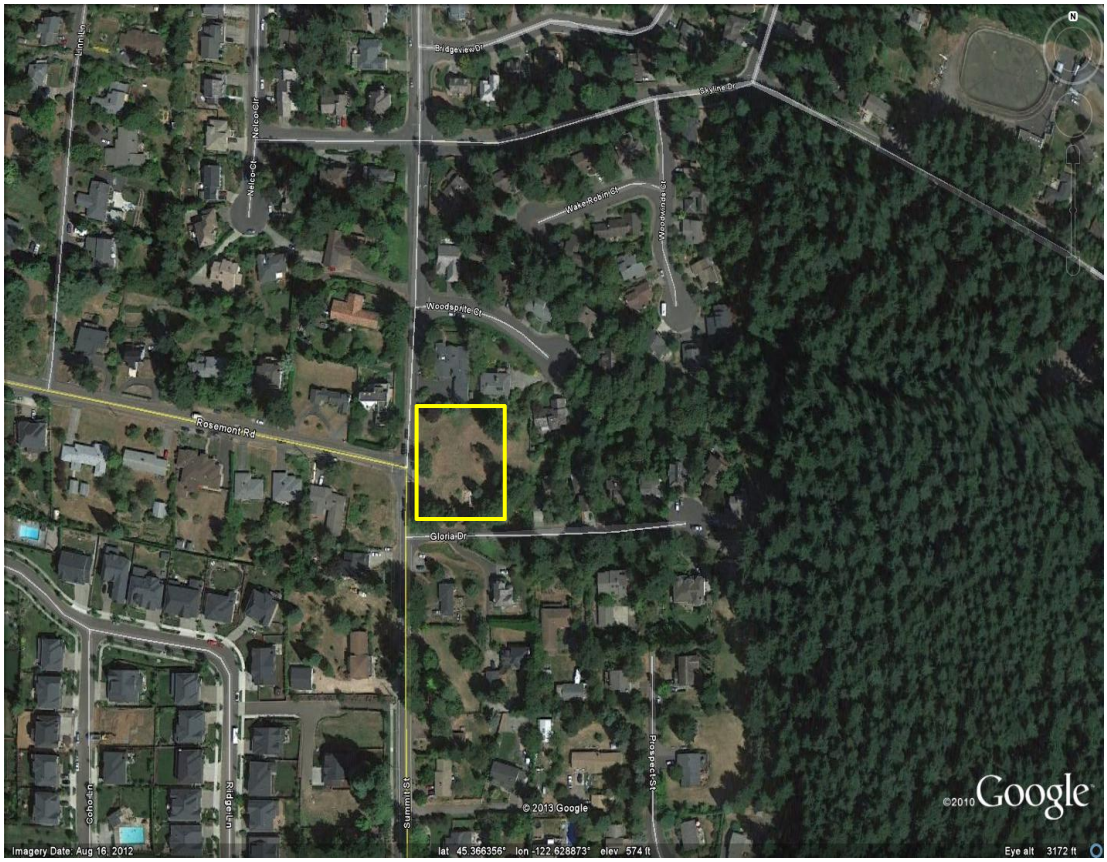


Figure 2 - Site Location

EXISTING CONDITIONS

Site
The property slopes from the west and southwest towards the east and northeast with slopes that vary considerably. The low point on the site is in the northeast corner of the site at 584 feet, while the high point is at the southwest corner at 612 feet. Currently the lot is vacant containing several mature trees and a small patch of concrete.

Climate
The site is located in Clackamas County approximately 12 miles south of downtown Portland in the West Linn foothills. Average annual rainfall recorded in this area is 47 inches.

Flood Map
The flood plain map shows that the site resides in Zone X, where no base flood elevations have been determined (See Technical Appendix: Exhibits – FIRM Panel 257 of 1175).

Site Geology
The soil type as classified by the United States Department of Agriculture Soil Survey of Clackamas County is Cornelius silt loam (See Technical Appendix: Exhibits - Hydrologic Soil Group for Clackamas County Area, Oregon). The soil on the site is classified as hydrologic group C. Group C soils generally have slow infiltration rates.

A geotechnical investigation has been conducted showing that infiltration rates on the site are between 1.0 and 2.0 in/hr at depths of 3 to 8 feet, respectively (See Technical Appendix: Geotechnical Report).

Existing Drainage

Existing Site

The existing site does not contain a stormwater management system. Stormwater runoff from the site infiltrates or sheet flows to the east and northeast towards an existing storm line in Woodsprite Court.

Basin Areas

Table 1 shows the current impervious and pervious areas for the property (See Technical Appendix: Exhibits – Existing Site Conditions).

Existing Basin Area	sq. ft.	acres
Impervious Area	566	0.01
Brush (Fair Condition)	42,804	0.98
Total Existing Basin Area	43,369	1.00

Table 1 – Existing Basin Areas

Curve Number

The major factors for determining the CN values are hydrologic soil group, cover type, treatment, hydrologic condition, and antecedent runoff condition. The curve number represents runoff potential from the ground. Tables 2-2a and 2-2c in the TR-55 manual were used to determine the appropriate curve numbers (See Technical Appendix: Exhibits – Table 2-2a and 2-2c Runoff Curve Numbers).

The existing pervious portion of the site consists of brush, trees, landscaping and grass. The pervious area was considered to be in brush fair condition (CN=70) and the impervious surface has CN=98. The proposed lots will consist of homes on fully landscaped properties. One shared driveway will be constructed consisting of pervious concrete. The proposed pervious landscape and open space area is assumed to be open space in good condition (grass covering >75% of pervious area) with a corresponding curve number of 74. The proposed pervious shared driveway is assumed to have a curve number equal to gravel (89).

Time of Concentration

The time of concentration was calculated for the existing site using the TR-55 Method. The time of concentration of 26 minutes was calculated for the existing basin (See Technical Appendix: Calculations – Time of Concentration). The time of concentration for the post-developed conditions was assumed to be 5 minutes.

POST-DEVELOPED CONDITIONS

Post-Developed Site

Each individual lot will be required to provide treatment and infiltration of all impervious stormwater runoff. A shared driveway will be constructed of a pervious material. All storm events up to and including the 25-year will be infiltrated through a low impact design approach following the City of Portland's Stormwater Water Management Manual. A 6-inch pipe will be provided in each planter to convey overflow to a proposed storm line which will be located in the shared

pervious driveway. The storm line will convey runoff to the existing storm line in Woodsprite Court.

Basin Areas
Table 2 shows the post-developed impervious and pervious areas (See Technical Appendix: Exhibits – Post-Developed Site Conditions). An impervious area of 2,500 ft^2 was assumed for each lot.

Post-Developed Basin Area	sq. ft.	acres
Lot 1		
Impervious Area	2,500	0.06
Landscaping/Open Space	7,465	0.17
Infiltration Rain Garden	275	0.01
Total Lot 1	10,240	0.24
Lot 2		
Impervious Area	2,500	0.06
Landscaping/Open Space	8,157	0.19
Infiltration Rain Garden	275	0.01
Total Lot 2	10,932	0.25
Lot 3		
Impervious Area	2,500	0.06
Landscaping/Open Space	7,630	0.18
Infiltration Rain Garden	275	0.01
Total Lot 3	10,405	0.24
Lot 4		
Impervious Area	2,500	0.06
Landscaping/Open Space	7,245	0.17
Infiltration Rain Garden	275	0.01
Total Lot 4	10,020	0.23
Shared Pervious Driveway	1,774	0.04
Total Post-Developed Area	**43,371**	**1.00**

Table 2 – Post-Developed Basin Areas

HYDROLOGIC ANALYSIS DESIGN GUIDELINES

Design Guidelines
The site is located within the jurisdiction of the City of West Linn, which follows the City of Portland's Stormwater Management Manual for the design of stormwater facilities.

Hydrograph Method
Naturally occurring rainstorms dissipate over long periods of time. An effective way of estimating storm rainfall is by using the hydrograph method. The Santa Barbara Unit Hydrograph (SBUH) method was used to develop runoff rates. The computer software XPSTORM was used to compute runoff rates and volumes.

Design Storm

The rainfall distribution to be used for this area is the design storm of 24-hour duration based on the standard Type 1A rainfall distribution. Table 3 shows total precipitation depths for the various storm events, which were used as a multiplier for the Type 1A 24-hour rainfall distribution.

Recurrence Interval (years)	Total Precipitation Depth (in.)
2	2.50
10	3.40
25	3.90
100	4.50

Table 3 - Design Storms

Basin Runoff

Table 4 shows the runoff rates for the existing and post-developed conditions (See Technical Appendix: Hydrographs –Existing and Post-Developed Runoff Hydrographs). The values for post-developed release rates were calculated using the City of Portland's Presumptive Approach Calculator (See Technical Appendix: Hydrographs – Post-Developed Release Rate from Combined Infiltration Planter). As the table shows, the release rate from the planters will be well below the runoff rate from the property.

Recurrence Interval (years)	Existing Runoff Rate (cfs)	Post-Developed Runoff Rate (cfs)	Post-Developed Release Rates from Infiltration Planters (cfs)
2	0.03	0.21	0.000
10	0.11	0.37	0.000
25	0.16	0.46	0.009
100	0.24	0.59	Not Calculated in PAC

Table 4 - Basin Runoff Rates

WATER QUALITY/QUANTITY

Water Quality Guidelines

As mentioned previously, each lot will be required to provide water quality treatment and infiltration. The City of Portland's Stormwater Management Manual provides guidance on sizing water quality facilities using their Presumptive Approach Calculator (PAC).

Water Quality/Quantity Facilities

Infiltration Planters

A maximum impervious area of 2,500 ft^2 was assumed for each lot. Table 5 shows the dimensions provided for the infiltration planter on each lot (See Technical Appendix: Presumptive Approach Calculator). A 6-inch pipe will be provided in each planter to convey overflow to a proposed storm line which will be located in the shared pervious driveway. The storm line will convey overflow runoff to the existing storm line in Gloria Drive.

Lot	Bottom Basin Area (sf)	Side Slope (H:V)	Depth (in)	Rock Storage Depth (in)
1-4	275	0:1	12	24

Table 5 – Stormwater Water Quality/Quantity Facilities

Shared Driveway
The shared driveway will be constructed of a pervious material designed to infiltrate all storm events up to and including the 100-year storm event, assuming an infiltration rate of 1 in/hr in the native soil, 4 inches of pervious material and 12 inches of rock section (See Technical Appendix: Calculations - Pervious Pavement Design). The total effective storage in the rock storage section during the 100-year storm event will be 2.08 inches.

SUMMARY

The stormwater design for the proposed for the Harper's Terrace Subdivision will meet or exceed the City of West Linn's requirements. All sizing of water quality/quantity facilities followed the City of Portland's Stormwater Management Manual.

TECHNICAL APPENDIX

Exhibits

- FIRM Panel 257 of 1175
- Hydrologic Soil Group-Clackamas County Area, Oregon
- Table 2-2a and 2-2c Runoff Curve Numbers
- Existing Site Conditions
- Post-Developed Site Conditions

Drawings-Post-Developed Site Plans to be Included in Final Storm Report

Hydrographs

- Existing Runoff Hydrograph
- Post Developed Runoff Hydrograph
- Post-Developed Release Rate from Combined Infiltration Planter

Presumptive Approach Calculator

- Lots 1-4 (4 Pages)

Calculations

- Time of Concentration
- Pervious Pavement Design

Geotechnical Report

- Geotechnical Engineering Report: The Summit Subdivision – AKA Rosemont 2, July 26, 2013

Operations and Maintenance

- Operations and Maintenance Plan for Stormwater Facilities

REFERENCES

1. City of West Linn's Public Works Design Standards Issued in 2010

2. City of Portland's Stormwater Management Manual Issued in August 2008

3. Soil Survey of Clackamas County Area. National Resource Conservation Service

4. Urban Hydrology for Small Watersheds – TR-55 Issued in June 1986 – U.S. Department of Agriculture, Natural Resources Conservation Service, Conservation Engineering Division

5. http://westlinnoregon.gov/publicworks/stormwater-fact-sheet

EXHIBITS

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 M

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0257D

FIRM

FLOOD INSURANCE RATE MAP

CLACKAMAS COUNTY, OREGON

AND INCORPORATED AREAS

PANEL 257 OF 1175

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLACKAMAS COUNTY	415588	0257	D
OREGON CITY, CITY OF	410021	0257	D
WEST LINN, CITY OF	410024	0257	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
41005C0257D

EFFECTIVE DATE
JUNE 17, 2008

Federal Emergency Management Agency

Map Scale: 1:608 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clackamas County Area, Oregon
Survey Area Data: Version 7, Aug 20, 2012

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 8, 2010—Sep 4, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Clackamas County Area, Oregon (OR610)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
23B	Cornelius silt loam, 3 to 8 percent slopes	C	0.0	1.2%
23C	Cornelius silt loam, 8 to 15 percent slopes	C	1.2	98.8%
Totals for Area of Interest			**1.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area [2/]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2c Runoff curve numbers for other agricultural lands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2/]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3/]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4/]	48	65	73
Woods—grass combination (orchard or tree farm). [5/]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6/]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4/]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.

2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.

3 *Poor*: <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.

4 Actual curve number is less than 30; use CN = 30 for runoff computations.

5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

3J CONSULTING, INC

CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING

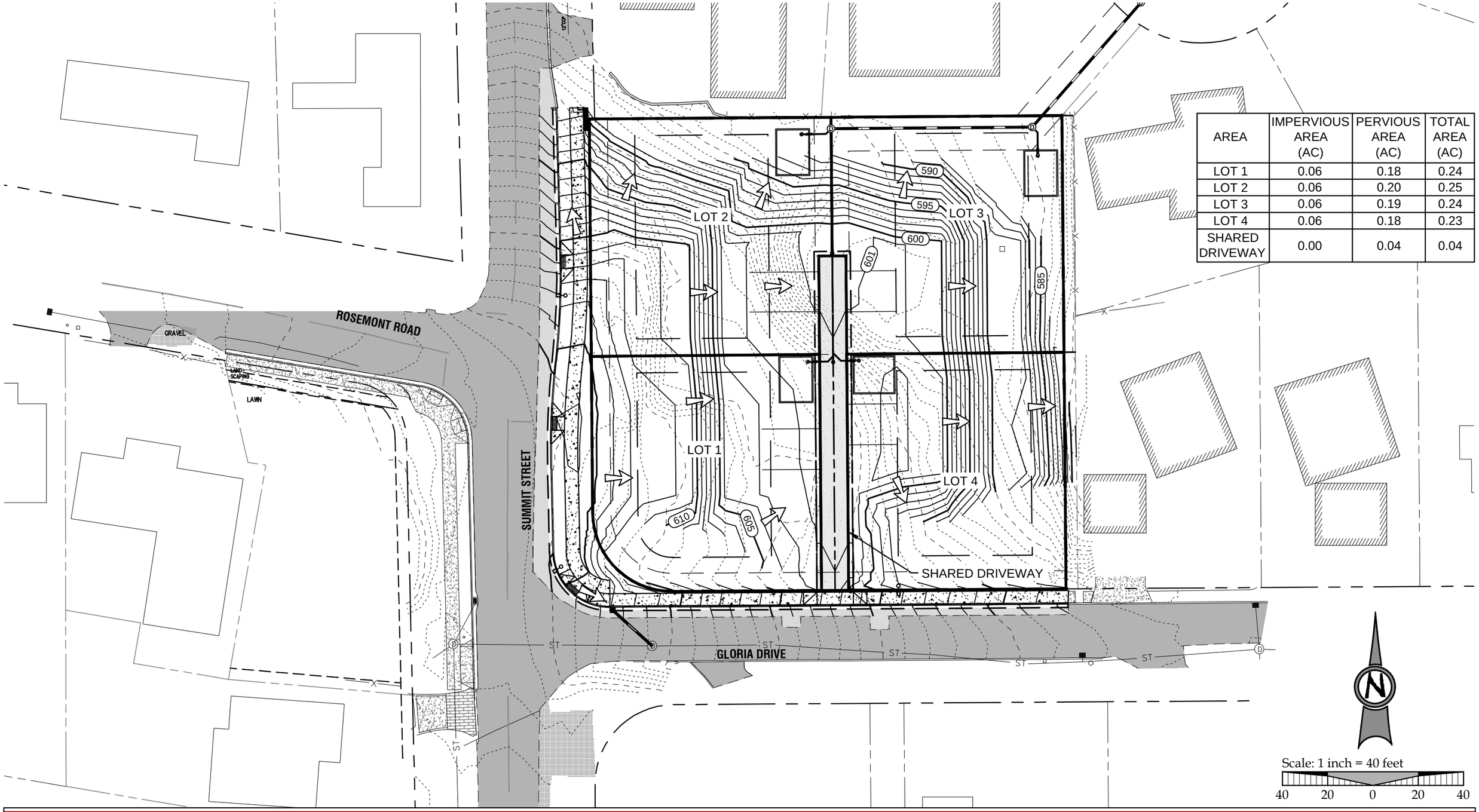
EXISTING SITE CONDITIONS
HARPER'S TERRACE SUBDIVISION

Storm Report

Exhibit 1

Date: 10/01/13

By: KEF



AREA	IMPERVIOUS AREA (AC)	PERVIOUS AREA (AC)	TOTAL AREA (AC)
LOT 1	0.06	0.18	0.24
LOT 2	0.06	0.20	0.25
LOT 3	0.06	0.19	0.24
LOT 4	0.06	0.18	0.23
SHARED DRIVEWAY	0.00	0.04	0.04

3J CONSULTING, INC

CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING

POST-DEVELOPED SITE CONDITIONS
HARPER'S TERRACE SUBDIVISION

Storm Report

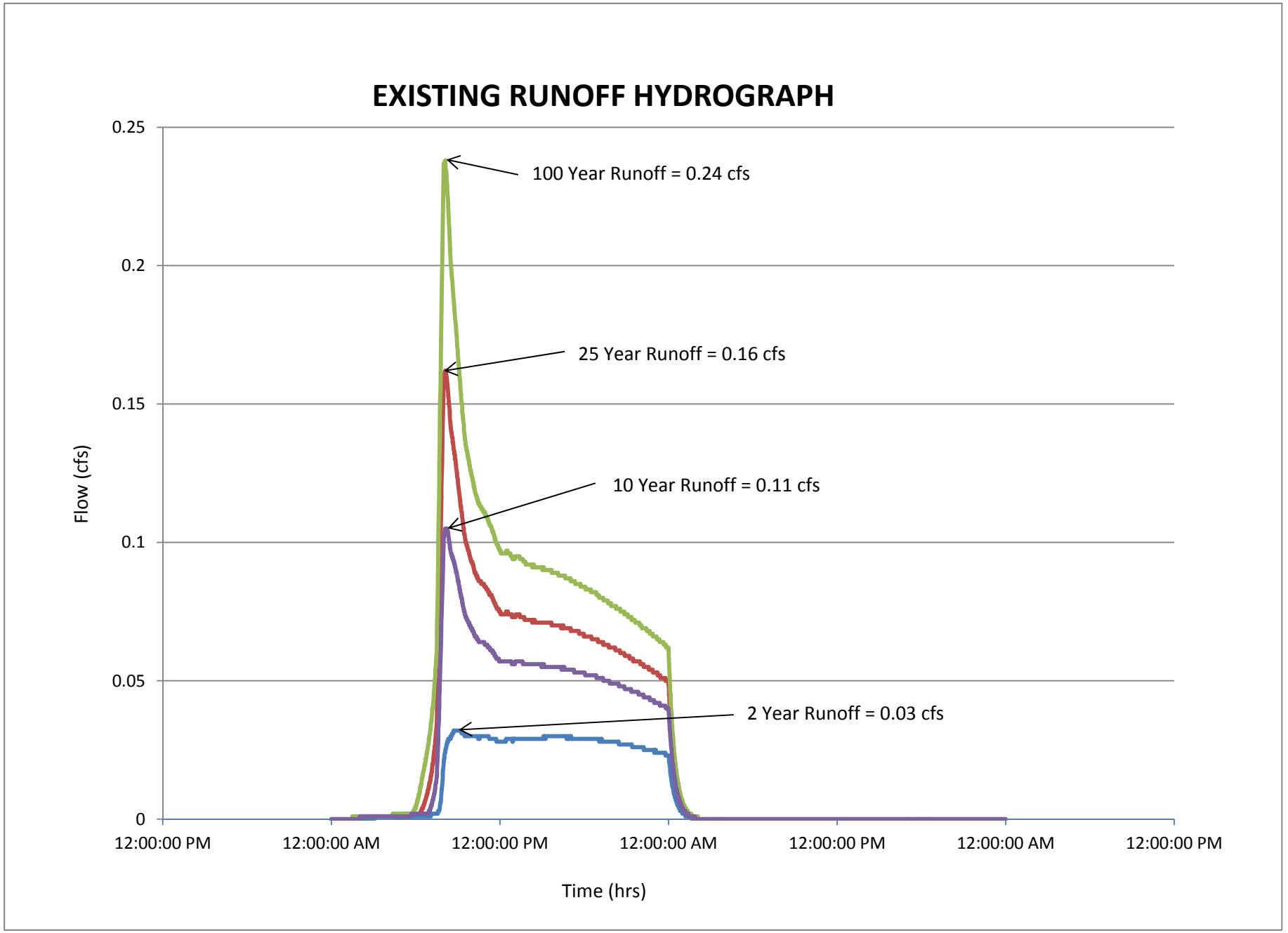
Exhibit 2

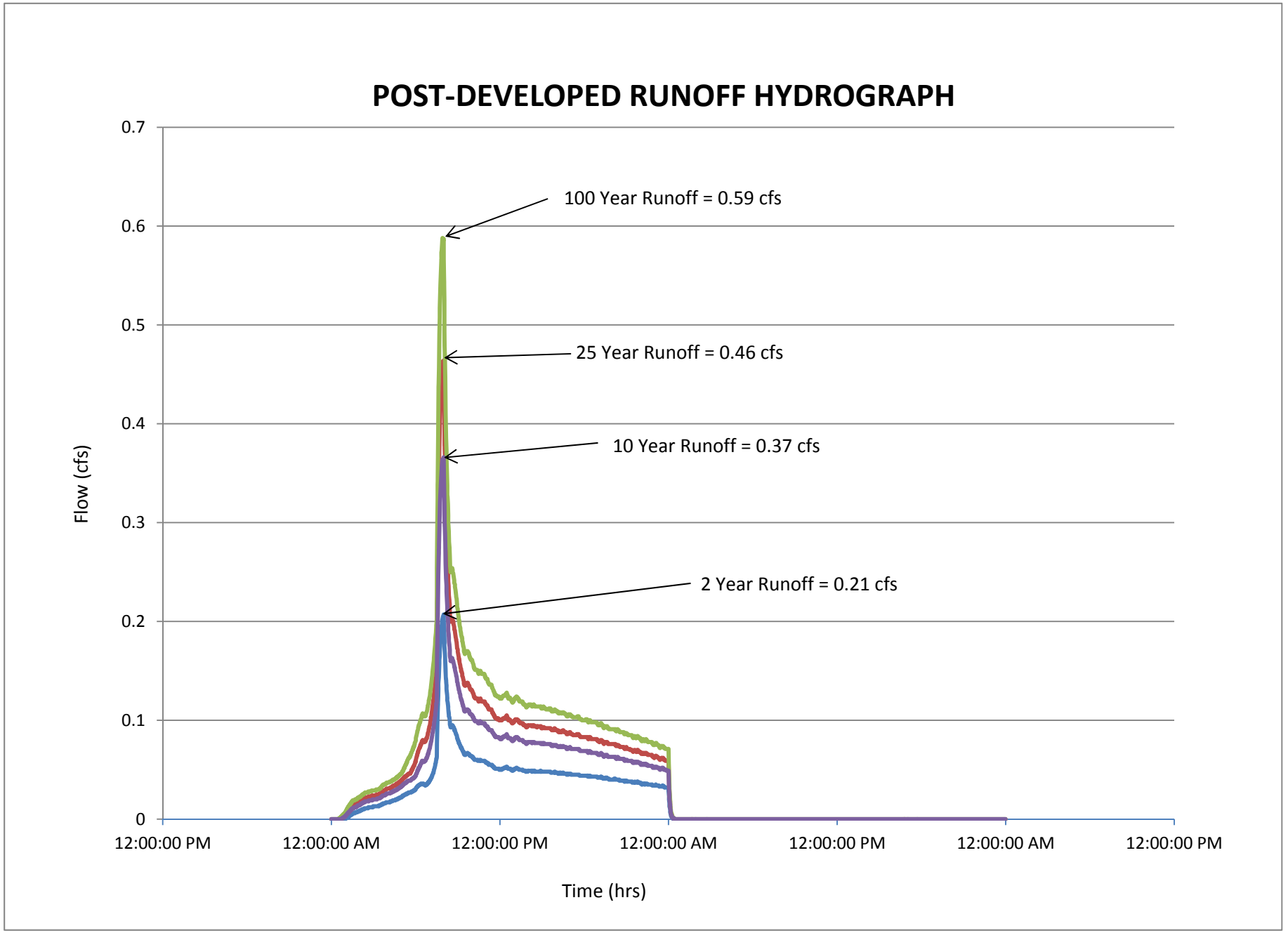
Date: 10/01/13

By: KEF

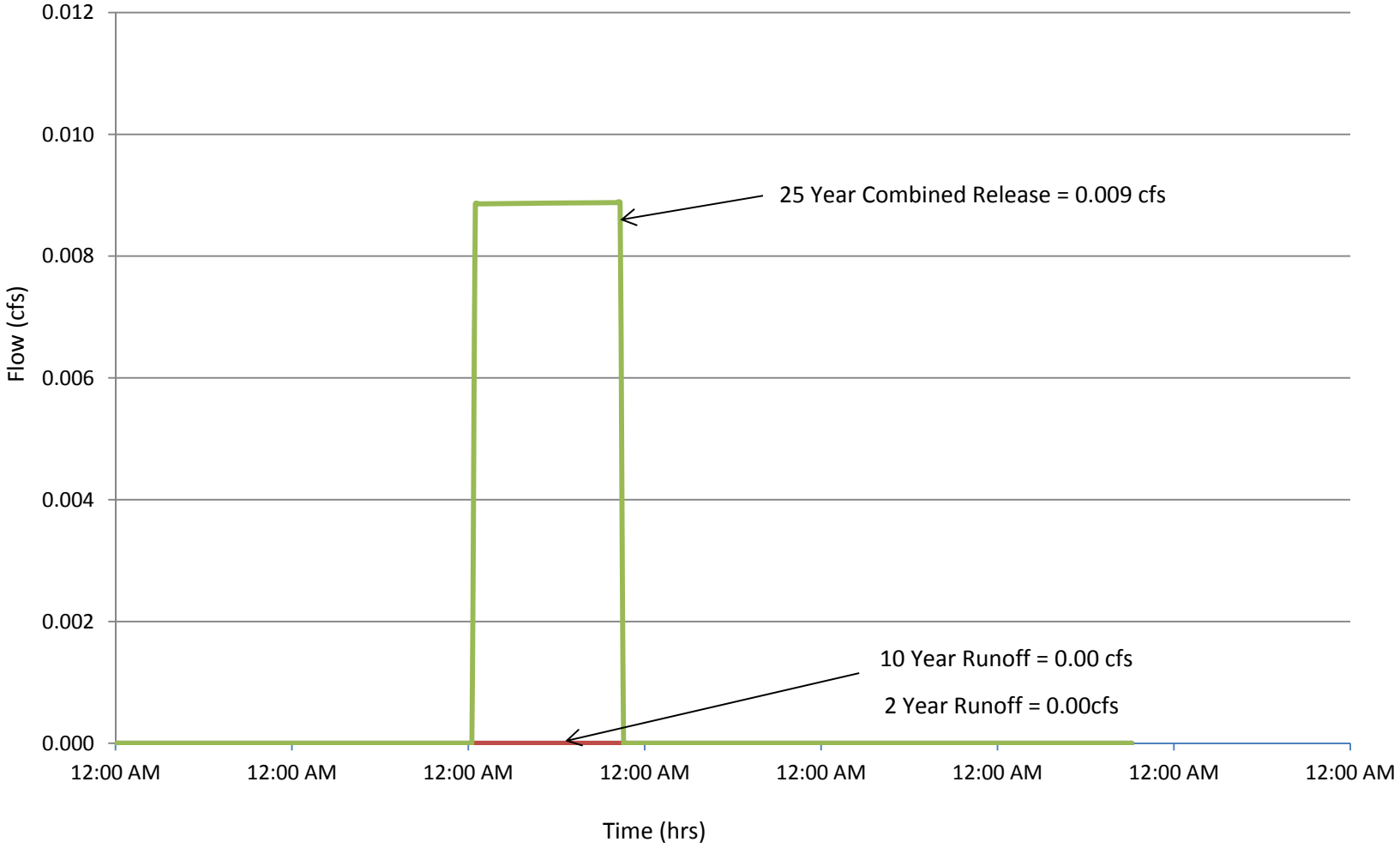
DRAWINGS
(To Be Included in Final Storm Report)

HYDROGRAPHS


EXISTING RUNOFF HYDROGRAPH
0.25
0.2
0.15
0.1
0.05
0
Flow (cfs)
100 Year Runoff = 0.24 cfs
25 Year Runoff = 0.16 cfs
10 Year Runoff = 0.11 cfs
2 Year Runoff = 0.03 cfs
12:00:00 PM
12:00:00 AM
12:00:00 PM
12:00:00 AM
12:00:00 PM
12:00:00 AM
12:00:00 PM
Time (hrs)


POST-DEVELOPED RUNOFF HYDROGRAPH
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Flow (cfs)
100 Year Runoff = 0.59 cfs
25 Year Runoff = 0.46 cfs
10 Year Runoff = 0.37 cfs
2 Year Runoff = 0.21 cfs
12:00:00 PM
12:00:00 AM
12:00:00 PM
12:00:00 AM
12:00:00 PM
12:00:00 AM
12:00:00 PM
Time (hrs)

POST-DEVELOPED RELEASE RATE
FROM COMBINED INFILTRATION PLANTER



PRESUMPTIVE APPROACH CALCULATOR

Presumptive Approach Calculator ver. 1.2

Catchment Data

Catchment ID: Lots 1-4

Project Name:	Harper's Terrace Subdivision
Project Address:	4997 Summit Street
	West Linn, OR
Designer:	Kathleen Freeman, PE
Company:	3J Consulting, Inc
Date:	10/01//13
Permit Number:	0
Run Time	10/1/2013 11:41:39 AM

Drainage Catchment Information

Catchment ID	Lots 1-4	
	Catchment Area	
Impervious Area	2,500	SF
Impervious Area	0.06	ac
Impervious Area Curve Number, CN_{imp}	98	
Time of Concentration, Tc, minutes	5	min.

Site Soils & Infiltration Testing Data

Infiltration Testing Procedure:	Open Pit Falling Head	
Native Soil Field Tested Infiltration Rate (I_{test}):	1	in/hr
Bottom of Facility Meets Required Separation From High Groundwater Per BES SWMM Section 1.4:	Yes	

Correction Factor Component

CF_{test} (ranges from 1 to 3)	2	

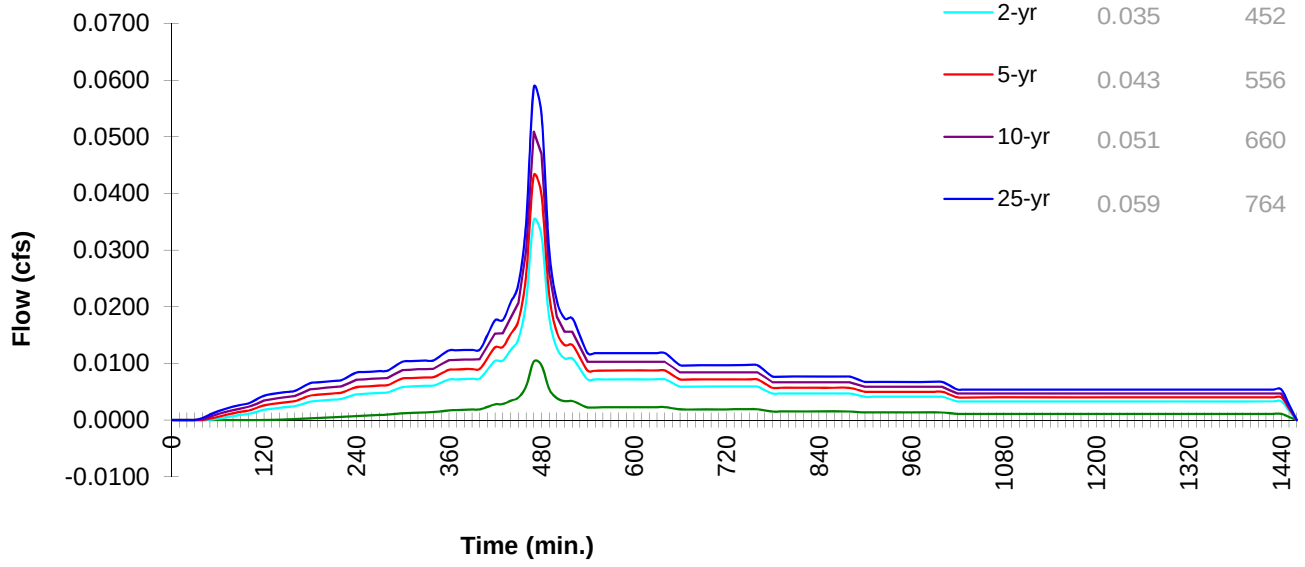
Design Infiltration Rates

I_{dsgn} for Native (I_{test} / CF_{test}):	0.50	in/hr
I_{dsgn} for Imported Growing Medium:	2.00	in/hr

Execute SBUH

SBUH Results

	Peak Rate (cfs)	Volume (cf)
PR	0.01	131
2-yr	0.035	452
5-yr	0.043	556
10-yr	0.051	660
25-yr	0.059	764



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Presumptive Approach Calculator ver. 1.2

Catchment ID: Lots 1-4

Run Time 10/1/2013 11:41:39 AM

Project Name: Harper's Terrace Subdivision **Catchment ID:** Lots 1-4 **Date:** 10/01//13

Instructions:

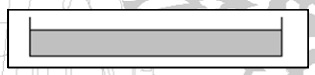
1. Identify which Stormwater Hierarchy Category the facility.
2. Select Facility Type.
3. Identify facility shape of surface facility to more accurately estimate surface volume, except for Swales and sloped planters that use the PAC Sloped Facility Worksheet to enter data.
4. Select type of facility configuration.
5. Complete data entry for all highlighted cells.

Catchment facility will meet Hierarchy Category: 1

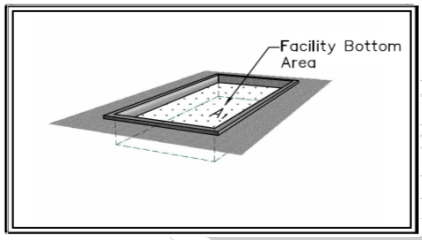
Goal Summary:

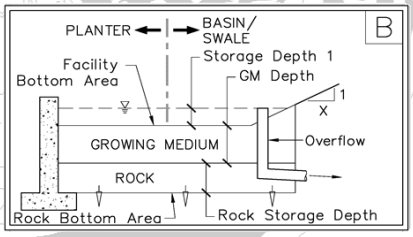
Hierarchy Category	SWMM Requirement	RESULTS box below needs to display…	
		Pollution Reduction as a	10-yr (aka disposal) as a
1	On-site infiltration with a surface infiltration facility.	PASS	PASS

Facility Type = Planter (Flat)



Facility Shape: Rectangle/Square **Facility Configuration:** B





Calculation Guide
Max. Rock Stor. Bottom Area
275 SF

DATA FOR ABOVE GRADE STORAGE COMPONENT

Facility Bottom Area =	275	sf
Bottom Width =	14.0	ft
Facility Side Slope =	0	to 1
Storage Depth 1 =	12	in
Growing Medium Depth =	18	in
Freeboard Depth =	N/A	in
Surface Capacity at Depth 1 =	275	cf
GM Design Infiltration Rate =	2.00	in/hr
Infiltration Capacity =	0.013	cfs

BELOW GRADE STORAGE

Rock Storage Bottom Area =	275	sf
Rock Storage Depth =	24	in
Rock Void Ratio =	0.3	
Rock Storage Capacity =	165	cf
Native Design Infiltration Rate =	0.50	in/hr
Infiltration Capacity =	0.003	cfs

RESULTS

		Overflow Volume			
Pollution Reduction	PASS	0 CF	0%	Surf. Cap. Used	Run PAC
			8%	Rock Cap. Used	
10-yr	PASS	0 CF	84%	Surf. Cap. Used	
			100%	Rock Cap. Used	

FACILITY FACTS

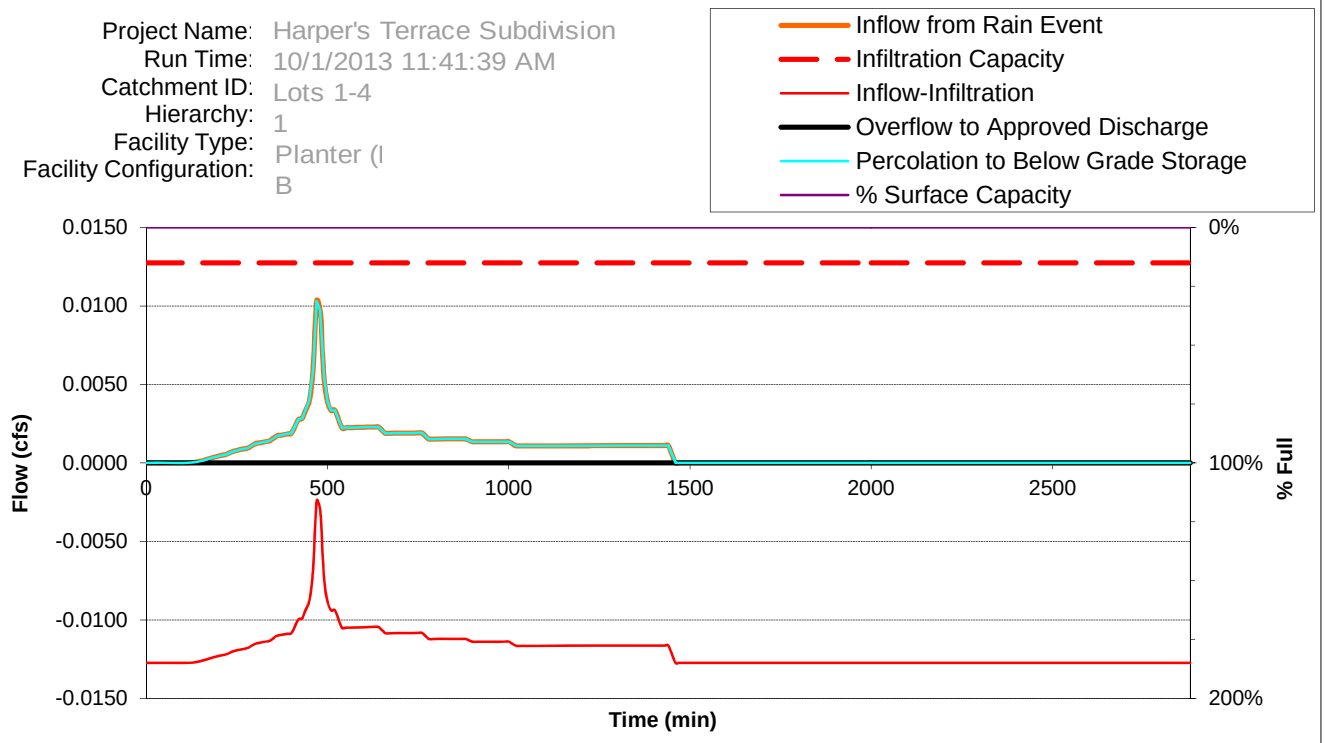
Total Facility Area Including Freeboard =	275 SF
Sizing Ratio (Total Facility Area / Catchment Area) =	0.110

BES - Presumptive Approach Calculator - Ver 1.2

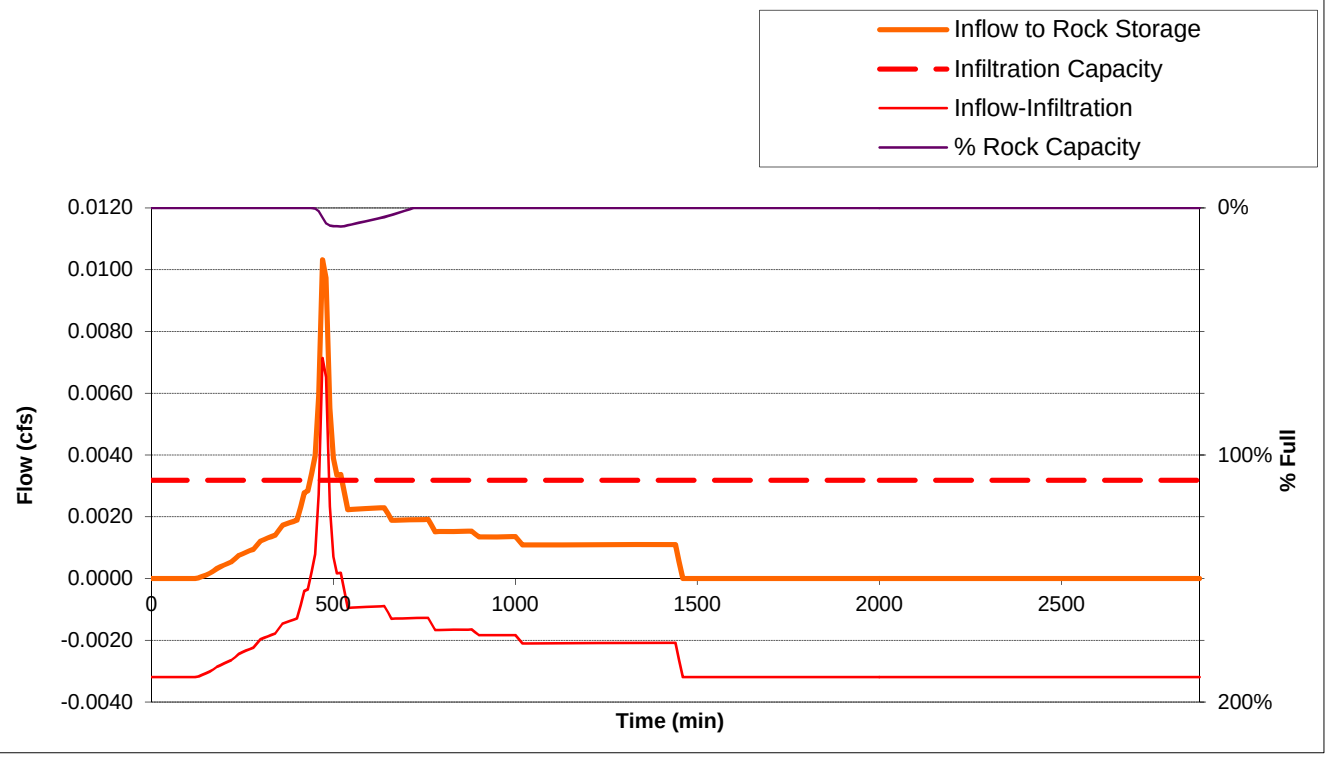
PR Con-A&B

Pollution Reduction Event
Surface Facility Modeling

Project Name: Harper's Terrace Subdivision
Run Time: 10/1/2013 11:41:39 AM
Catchment ID: Lots 1-4
Hierarchy: 1
Facility Type: Planter (I
Facility Configuration: B



Pollution Reduction Event
Below Grade Modeling

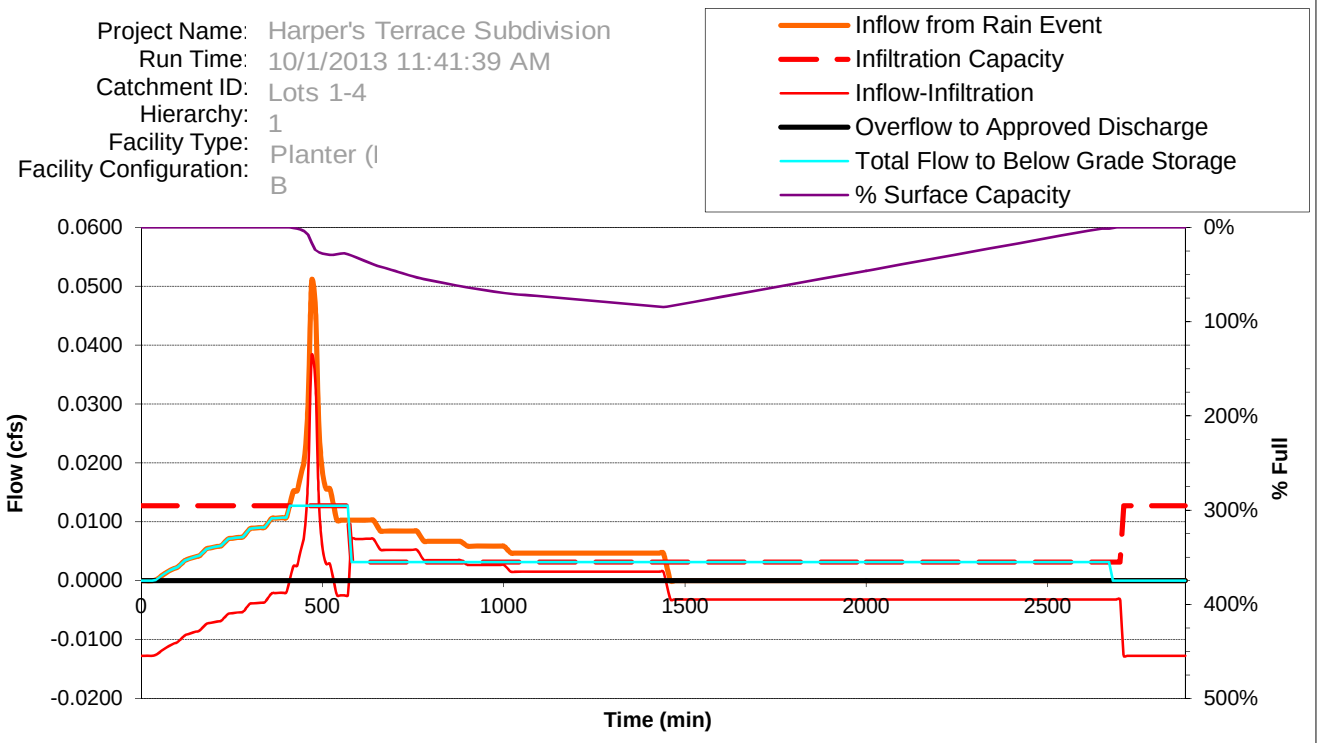


BES - Presumptive Approach Calculator - Ver 1.2

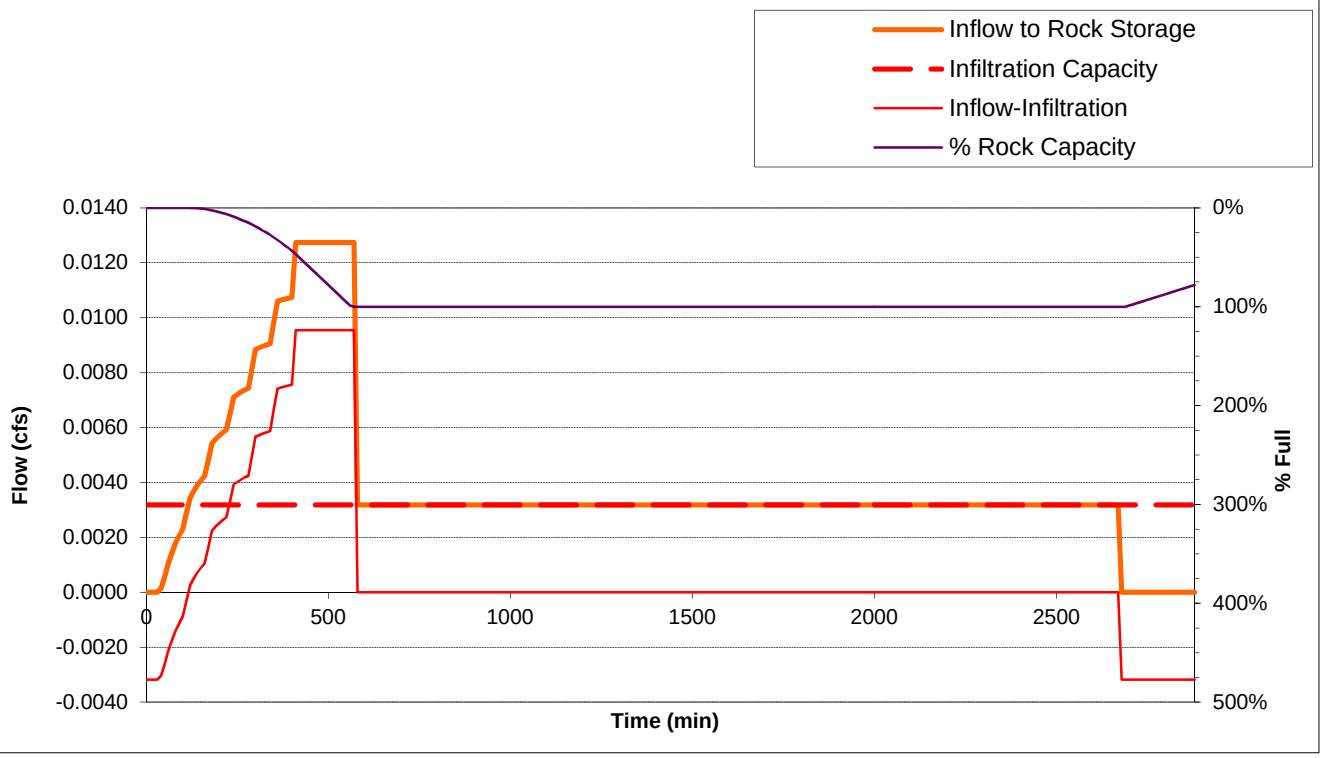
10-yr Con-A&B

10-yr Event
Surface Facility Modeling

Project Name: Harper's Terrace Subdivision
Run Time: 10/1/2013 11:41:39 AM
Catchment ID: Lots 1-4
Hierarchy: 1
Facility Type: Planter (I
Facility Configuration: B



10-yr Event
Below Grade Modeling



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CALCULATIONS

Time of Concentration

SUBJECT:	Haper's Terrace Subdivision		
PROJECT NO.	13123	**BY** KEF	**DATE** 9/24/2013

	TC1		
SHEET FLOW			
INPUT	**VALUE**	**VALUE**	**VALUE**
Surface Description	**Type 9 Woods (light_underbrush)**	**Type 10 Woods (Dense_underbrus**	**Type 10 Woods (Dense_underbrush**
Manning's "n"	**0.4**	**0.8**	**0.8**
Flow Length, L (<300 ft)	**267.8** ft	**0** ft	**0** ft
2-Yr 24 Hour Rainfall, P_2	**2.5** in	**2.5** in	**2.5** in
Land Slope, s	**0.11557** ft/ft	**0.07965** ft/ft	**0.0922** ft/ft
OUTPUT			
Travel Time	0.44 hr	0.00 hr	0.00 hr
SHALLOW CONCENTRATED FLOW			
INPUT	**VALUE**	**VALUE**	**VALUE**
Surface Description	**Unpaved**	**Unpaved**	**Paved**
Flow Length, L	**0** ft	**0** ft	**0** ft
Watercourse Slope*, s	**0.009** ft/ft	**0.01** ft/ft	**0.027** ft/ft
OUTPUT			
Average Velocity, V	1.53 ft/s	1.61 ft/s	3.34 ft/s
Travel Time	0.000 hr	0.000 hr	0.000 hr
CHANNEL FLOW			
INPUT	**VALUE**	**VALUE**	**VALUE**
Cross Sectional Flow Area, a	**7.5** ft^2	**7.5** ft^2	**15.05** ft^2
Wetted Perimeter, P_w	**11.28** ft	**11.28** ft	**7.69** ft
Channel Slope, s	**0.003** ft/ft	**0.003** ft/ft	**0.00** ft/ft
Manning's "n"	**0.24**	**0.24**	**0.24**
Flow Length, L	**0** ft	**0** ft	**0** ft
OUTPUT			
Average Velocity	0.26 ft/s	0.26 ft/s	0.53 ft/s
Hydraulic Radius, r = a / P_w	0.66 ft	0.66 ft	1.96 ft
Travel Time	0.00 hr	0.00 hr	0.00 hr
Watershed or Subarea T_c =	**0.44 hr**	**0.00 hr**	**0.00 hr**
Watershed or Subarea T_c =	**26 minutes**	**0 minutes**	**0 minutes**

PERVIOUS PAVEMENT DESIGN

Shared Driveway

PROJECT NAME	Haper's Terrace Subdivision	**BY** KEF	**DATE** 10/1/2013
PROJECT NUMBER	13126		

Pervious Concrete Catchment Area

Area To Infiltrate	1,774	sq ft
Thickness	4	in
Porosity	15	%

Effective Base Rock Storage Area

Effective Storage Area	1,774	sq ft
Thickness	11	in
Porosity	30	%

Storm Event Information

Return Period (yr)	100
24-hr precip. (in)	4.5
Location	Portland
Hydrologic Soil Group	B

Infiltration Area

Effective Infiltration Surface Area A_i	1,774	sq ft
Measured Infiltration Rate I_M	1	in/hr
Design Infiltration Rate I_D (SF=4)	0.25	in/hr
Maximum Infiltration Rate	37.0	CF/hr
Additional Gravel Base	1	in
Porosity	30	%

Storage Capacity

Storage in Concrete	0	CF
Storage in Base Rock	488	CF
Storage in Infiltration Area Rock	44	CF
Maximum Storage	532	CF

Allow storage in concrete? (Y/N)	**N**
Allow storage in base rock? (Y/N)	**Y**

Additional Infiltration Storage		Base Rock Storage		**Total Effective Storage**	
Stage (in)	1.00	Stage (in)	0.10	**Stage (in)**	**2.08**
% Used	100%	% Used	1%	**% Used**	**17%**

PERVIOUS PAVEMENT DESIGN

Shared Driveway

PROJECT NAME	Haper's Terrace Subdivision	**BY** KEF	**DATE** 10/1/2013
PROJECT NUMBER	13126		

								STORAGE INFORMATION					
					Max			Effective Add. Gravel Area		Effective Base Rock Area		Total Effective Areas	
T	% Rainfall	Precip.	Rainfall Vol. Perv.	Total Volume	Infiltrated Volume	Storage State	Inc. Vol. Runoff	Stage	Used	Stage	Used	Storage Used	Limited stage
(hr)	(%)	(in)	(CF)	(CF)	(CF)	(CF)	(CF)	(in)	%	(in)	%	%	
0	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
1	2.40	0.108	16.0	16.0	16.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
2	2.60	0.117	17.3	17.3	17.3	0	0.0	0.00	0%	0.00	0%	0%	0.00
3	3.20	0.144	21.3	21.3	21.3	0	0.0	0.00	0%	0.00	0%	0%	0.00
4	3.80	0.171	25.3	25.3	25.3	0	0.0	0.00	0%	0.00	0%	0%	0.00
5	4.44	0.200	29.5	29.5	29.5	0	0.0	0.00	0%	0.00	0%	0%	0.00
6	5.18	0.233	34.5	34.5	34.5	0	0.0	0.00	0%	0.00	0%	0%	0.00
7	6.48	0.292	43.1	43.1	37.0	6	0.0	0.14	14%	0.00	0%	1%	0.14
8	16.44	0.740	109.4	109.4	37.0	79	0.0	1.00	100%	0.07	1%	15%	1.77
9	7.58	0.341	50.4	50.4	37.0	92	0.0	1.00	100%	**0.10**	**1%**	**17%**	**2.08**
10	5.28	0.238	35.1	35.1	37.0	90	0.0	1.00	100%	0.09	1%	17%	2.03
11	4.96	0.223	33.0	33.0	37.0	86	0.0	1.00	100%	0.08	1%	16%	1.94
12	4.32	0.194	28.7	28.7	37.0	78	0.0	1.00	100%	0.07	1%	15%	1.76
13	4.02	0.181	26.7	26.7	37.0	68	0.0	1.00	100%	0.05	0%	13%	1.53
14	3.42	0.154	22.8	22.8	37.0	54	0.0	1.00	100%	0.02	0%	10%	1.21
15	3.28	0.148	21.8	21.8	37.0	38	0.0	0.87	87%	0.00	0%	7%	0.87
16	3.00	0.135	20.0	20.0	37.0	21	0.0	0.48	48%	0.00	0%	4%	0.48
17	2.80	0.126	18.6	18.6	37.0	3	0.0	0.07	7%	0.00	0%	1%	0.07
18	2.40	0.108	16.0	16.0	16.0	3	0.0	0.07	7%	0.00	0%	1%	0.07
19	2.40	0.108	16.0	16.0	16.0	3	0.0	0.07	7%	0.00	0%	1%	0.07
20	2.40	0.108	16.0	16.0	16.0	3	0.0	0.07	7%	0.00	0%	1%	0.07
21	2.40	0.108	16.0	16.0	16.0	3	0.0	0.07	7%	0.00	0%	1%	0.07
22	2.40	0.108	16.0	16.0	16.0	3	0.0	0.07	7%	0.00	0%	1%	0.07
23	2.40	0.108	16.0	16.0	16.0	3	0.0	0.07	7%	0.00	0%	1%	0.07
24	2.40	0.108	16.0	16.0	16.0	3	0.0	0.07	7%	0.00	0%	1%	0.07
25	0	0.000	0.0	0.0	3.1	0	0.0	0.00	0%	0.00	0%	0%	0.00
26	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
27	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
28	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
29	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
30	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
31	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
32	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
33	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
34	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
35	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
36	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
37	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
38	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
39	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
40	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
41	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
42	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
43	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
44	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
45	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
46	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
47	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00
48	0	0.000	0.0	0.0	0.0	0	0.0	0.00	0%	0.00	0%	0%	0.00

GEOTECHNICAL REPORT

GeoPacific Engineering, Inc.

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

July 26, 2013
GeoPacific Project No. 13-3040

John Wyland
J.T. Smith Companies
5282 Meadows Road, Suite 171
Lake Oswego, Oregon 97035

Via e-mail with hard copies mailed

Subject: **GEOTECHNICAL ENGINEERING REPORT**
THE SUMMIT SUBDIVISION - AKA ROSEMONT 2
NORTHEAST CORNER OF SUMMIT STREET AND S. GLORIA DRIVE INTERSECTION
WEST LINN, OREGON

This report presents the results of a geotechnical engineering study conducted by GeoPacific Engineering, Inc. (GeoPacific) for the above referenced project. The purpose of this study 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-4526, dated June 5, 2013, and your subsequent authorization of our agreement and *General Conditions for Geotechnical Services.*

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The site is located on the northeast side of the intersection of Summit Street and S. Gloria Drive in West Linn, Oregon (Figure 1). The area of the planned development totals approximately 40,500 square feet and is roughly rectangular-shaped. The topography on the site is sloping down to the northeast at an average grade of approximately 10 percent. However, previous grading activity on the site has created steep slopes of limited height in the northwest and central portions of the site. The previous grading activity has also created several relatively level areas, most notably the majority of the northeast quarter of the site. Vegetation on the site consists primarily of grass, brush, and small to large trees. The southeast portion of the site is densely wooded with large trees.

It is our understanding that the proposed development includes grading the site to support 4 lots for new single-family homes and associated underground utilities. We anticipate that the maximum depth of cut and height of fill will be about 5 feet or less.

REGIONAL GEOLOGIC SETTING

Regionally, the subject site lies within the Willamette Valley/Puget Sound lowland, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. A series of discontinuous faults subdivide the Willamette Valley into a mosaic of fault-bounded, structural blocks (Yeats et al., 1996). Uplifted structural blocks form bedrock highlands, while down-warped structural blocks form sedimentary basins.

The site is underlain by the Columbia River Basalt Formation (Beeson el al., 1989). The Miocene aged (about 14.5 to 16.5 million years ago) Columbia River Basalts are a thick sequence of lava flows. The basalts are composed of dense, finely crystalline rock that is commonly fractured along blocky and columnar vertical joints. Individual basalt flow units typically range from 25 to 125 feet thick and interflow zones are typically vesicular, scoriaceous, brecciated, and sometimes include sedimentary rocks.

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

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 16.6 miles southwest of the subject site. These faults are recognized in the subsurface by vertical separation of the Columbia River Basalt and offset seismic reflectors in the overlying basin sediment (Yeats et al., 1996; Werner et al., 1992). A recent geologic reconnaissance and photogeologic analysis study conducted for the Scoggins Dam site in the Tualatin Basin revealed no evidence of deformed geomorphic surfaces along the structural zone (Unruh et al., 1994). No seismicity has been recorded on the Gales Creek or Newberg Faults (the faults closest to the subject site); however, these faults are considered to be potentially active because they may connect with the seismically active Mount Angel Fault and the rupture plane of the 1993 M5.6 Scotts Mills earthquake (Werner et al. 1992; Geomatrix Consultants, 1995).

Portland Hills Fault Zone

The Portland Hills Fault Zone is a series of NW-trending faults that include the central Portland Hills Fault, the western Oatfield Fault, and the eastern East Bank Fault. These faults occur in a northwest-trending zone that varies in width between 3.5 and 5.0 miles. The combined three faults vertically displace the Columbia River Basalt by 1,130 feet and appear to control thickness changes in late Pleistocene (approx. 780,000 years) sediment (Madin, 1990). The Portland Hills Fault occurs along the Willamette River at the base of the Portland Hills, and is about 3.6 miles northeast of the site. The Oatfield Fault occurs along the western side of the Portland Hills, and is about 2.4 miles northeast of the site. The accuracy of the fault mapping is stated to be within 500 meters (Wong, et al., 2000). No historical seismicity is correlated with the mapped portion of the Portland Hills Fault Zone, but in 1991 a M3.5 earthquake occurred on a NW-trending shear plane located 1.3 miles east of the fault (Yelin, 1992). Although there is no definitive evidence of recent activity, the Portland Hills Fault Zone is assumed to be potentially active (Geomatrix Consultants, 1995).

Cascadia Subduction Zone

The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a rate of 4 cm per year (Goldfinger et al., 1996). A growing body of geologic evidence suggests that prehistoric subduction zone earthquakes have occurred (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). This evidence includes: (1) buried tidal marshes recording episodic, sudden subsidence along the coast of northern California, Oregon, and Washington, (2) burial of subsided tidal marshes by tsunami wave deposits, (3) paleoliquefaction features, and (4) geodetic uplift patterns on the Oregon coast. Radiocarbon dates on buried tidal marshes indicate a recurrence interval for major subduction zone earthquakes of 250 to 650 years with the last event occurring 300 years ago (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). The inferred seismogenic portion of the plate interface lies roughly along the Oregon Coast at depths of 20 and 40 kilometers below the ocean surface.

FIELD EXPLORATION

Subsurface conditions were explored on June 26, 2013 by excavating 6 test pits to depths of 7.5 to 11 feet below ground surface, using a John Deer 310E backhoe with a 2-foot-wide toothed bucket. The approximate test pit locations are shown on the attached site plan (Figure 2). It should be noted that exploration locations were determined 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 excavation of the test pits, a GeoPacific engineer observed and recorded soil information such as color, stratigraphy, strength, and soil moisture. Soils were classified in general accordance with the Unified Soil Classification System (USCS). Rock hardness was classified in accordance with Table 1, modified from the ODOT Rock Hardness Classification Chart. Logs of test pits are attached to this report.

Table 1. Rock Hardness Classification Chart

ODOT Rock Hardness Rating	Field Criteria	Unconfined Compressive Strength	Typical Equipment Needed For Excavation
Extremely Soft (R0)	Indented by thumbnail	<100 psi	Small excavator
Very Soft (R1)	Scratched by thumbnail, crumbled by rock hammer	100-1,000 psi	Small excavator
Soft (R2)	Not scratched by thumbnail, indented by rock hammer	1,000-4,000 psi	Medium excavator (slow digging with small excavator)
Medium Hard (R3)	Scratched or fractured by rock hammer	4,000-8,000 psi	Medium to large excavator (slow to very slow digging), typically requires chipping with hydraulic hammer or mass excavation)
Hard (R4)	Scratched or fractured w/ difficulty	8,000-16,000 psi	Slow chipping with hydraulic hammer and/or blasting
Very Hard (R5)	Not scratched or fractured after many blows, hammer rebounds	>16,000 psi	Blasting

At the completion of each test pit, the excavation was backfilled using the excavated soils, and tamped with the excavator bucket. This backfill should not be expected to behave as engineered fill and some settling and/or erosion of the ground surface may occur.

SUBSURFACE CONDITIONS

Soil and Rock

The following report sections summarize subsurface conditions anticipated at the site, based on our exploration program. On-site soils consist of topsoil, undocumented fill, buried topsoil, residual soil, and Columbia River Basalt, as described below.

Topsoil: In test pits TP-1, TP-2, and TP-4, the ground surface was directly underlain by topsoil. Topsoil generally consisted of soft, dark brown, low to highly organic SILT (OL-ML) with fine to large roots. The

total thickness of the topsoil layer ranged from 6 to 20 inches. There is the potential for some tree roots or thicker topsoil zones in forested areas of site.

Undocumented Fill: Undocumented fill was encountered in test pits TP-1, TP-3, TP-4, TP-5, and TP-6. The fill material varied in consistency from clayey SILT (ML) with occasional gravel in test pits TP-1 TP-4, and TP-6, to SILT (ML) with concrete debris and bricks in test pit TP-3, and to silty GRAVEL (GM) in test pit TP-5. The undocumented fill material generally had a soft or loose consistency, except TP-1, which had a stiff to very stiff consistency. The approximate depths of undocumented fill encountered in the test pits are summarized in Table 2. We anticipate that fill zones are concentrated in the vicinities of the steep slopes in the northwest and central portions of the site. We do not anticipate significant depths of undocumented fill material in the northeastern quarter of the site.

Buried Topsoil: In test pits TP-1, TP-4, TP-5, and TP-6, the undocumented fill material was directly underlain by buried topsoil. The buried topsoil generally consisted of soft, dark brown, moderately to highly organic SILT (OL-ML) with fine to large roots and organic debris. The total thickness of the topsoil layer ranged from 18 to 36 inches. The approximate depths to the bottom of the buried topsoil layer in feet below ground surface (bgs) are summarized in Table 2.

Table 2. Approximate Depths of Undocumented Fill and Buried Topsoil

Location	Depth of Undocumented Fill Material (feet bgs)	Depth to Bottom of Buried Topsoil Layer (feet bgs)
TP-1	7	8.5
TP-3	5	N/A
TP-4	2	3.5
TP-5	0.5	3.5
TP-6	2.5	4.5

Residual Soil: Underlying the buried topsoil in test pits TP-1, TP-4, and TP5, the topsoil in TP-2, and the undocumented fill material TP-3, very stiff clayey silt residual soil derived from the in-place weathering of the underlying Columbia River Basalt Formation was encountered. The residual soil transitioned to less weathered basalt bedrock as discussed below. The residual soil extended to a depth of 8 feet in test pit TP-4, and to a depth of 4.5 feet in TP-5. The residual soil extended beyond the maximum depth of exploration in test pits TP-1, TP-2 and TP-3.

Columbia River Basalt: Underlying the residual soil in test pits TP-4 and TP-5 and the buried topsoil in TP-6, weathered basalt bedrock materials belonging to the Columbia River Basalt Formation were encountered. The basalt encountered was typically highly weathered and ranged from extremely soft (R0) to soft (R2). The hardness generally increased with depth. Extremely soft to soft (R0-R2) basalt extended beyond the maximum depths of our explorations in test pits TP-4, TP-5, and TP-6.

Groundwater

On June 26, 2013, groundwater seepage was not encountered in the test pits. The groundwater conditions reported are for the specific date and locations indicated, and therefore may not necessarily be indicative of other times and/or locations. It is anticipated that groundwater conditions will vary depending on the time of year, rainfall, local subsurface conditions, changes in site utilization, and other factors. During periods of heavy and prolonged precipitation, shallow perched groundwater conditions often occur over fine-grained native deposits such as those beneath the site, particularly during the wet season.

INFILTRATION TESTING

On June 26, 2013, GeoPacific performed two pushed-pipe falling head infiltration tests at the approximate locations shown on Figure 1. The tests were conducted in 6-inch diameter pipes pushed into the native soil at approximate depths of 3 and 8 feet below the ground surface. The infiltration tests were performed at the bottom of test pit TP-2 and in a separate test pit excavated approximately 8 feet west of test pit TP-2. The soil encountered at the depths of the infiltration tests consisted of reddish brown clayey SILT (ML). The test holes were pre-saturated for four hours prior to performing the tests. During the tests, water levels were measured over 20 minute intervals with approximate head pressures ranging between 8 and 18 inches. Approximate test locations are shown in Figure 2. Table 3 presents a summary of our infiltration test measurement results.

Table 3. Results of Infiltration Testing

Location	Depth (feet)	Infiltration Rate (in/hr)
TP-2	3	1
TP-2	8	2

The test results indicate very low infiltration rates. The measured rates reflect vertical flow pathways only.

CONCLUSIONS AND RECOMMENDATIONS

Results of this study indicate that the proposed development is geotechnically feasible, provided that the recommendations of this report are incorporated into the design and construction phases of the project. The proposed structure may be supported on shallow foundations bearing on competent undisturbed native soils, or on engineered fill, designed and constructed as recommended in this report. In our opinion, the greatest geotechnical constraints for project development are the presence of undocumented fill underlying much of the site, which will need to be removed and replaced with property compacted engineered fill as recommended below.

Recommendations are presented below for site preparation and undocumented fill removal, engineered fill, wet weather earthwork, seismic design, structural foundations, footing drains, storm water systems, permeable pavement systems, excavation conditions and utility trench backfill, and erosion control considerations. The recommendations of this report assume the single-family structures will have raised floors and crawlspaces.

Site Preparation and Undocumented Fill Removal

Areas of proposed construction, new driveway areas, and areas to receive fill should first be cleared of vegetation and any debris, undocumented fill, and buried topsoil (where encountered). We encountered undocumented fill and buried topsoil in test pits TP-1, TP-3, TP-4, TP-5 and TP-6 to depths of up to 8.5 feet. The approximate depths of undocumented fill and buried topsoil are summarized in Table 2. Some undocumented fill material may be suitable for use as engineered fill provided it is adequately moisture conditioned prior to compacting and are free of highly organic material and debris.

Debris from clearing should be removed from the site. Organic-rich topsoil should be stripped to the relatively inorganic native soils. We anticipate that the depth of stripping will be an average of roughly 6 to 12 inches where topsoil exists over native soil. Deeper stripping will be needed in the vicinity of test pit TP-2, in forested areas, and in areas that have been tilled in the past, areas of localized fill deposits, etc. The

topsoil encountered in test pit TP-2 extended to a depth of 20 inches. The final depth of stripping removal may vary depending on local subsurface conditions and the contractor's methods, and should be determined on the basis of a site inspection after the initial stripping has been performed.

Stripped organic soil should be stockpiled only in designated areas or removed from the site and stripping operations should be observed and documented by GeoPacific. Any existing subsurface structures (tile drains, old utility lines, septic leach fields, etc.) beneath structures and pavements should be removed and the excavations backfilled with engineered fill.

In construction areas, once stripping is approved, the area should be ripped or tilled to a depth of 12 inches, moisture conditioned, and compacted in-place prior to the placement of engineered fill or crushed aggregate base for pavement (dry weather conditions). Exposed subgrade soils should be evaluated by GeoPacific. For large areas, this evaluation is normally performed by proof-rolling the exposed subgrade with a fully loaded scraper or dump truck. For smaller areas where access is restricted, and during wet weather, the subgrade should be evaluated by probing the soil with a steel probe.

Soft/loose soils identified during subgrade preparation should be compacted to a firm and unyielding condition or over-excavated and replaced with engineered fill, as described below. The depth of overexcavation, if required, should be evaluated by GeoPacific at the time of construction.

Engineered Fill

In general, we anticipate that soils from planned cuts and utility trench excavations will be suitable for use as engineered fill during dry weather conditions, provided they are adequately moisture conditioned prior to compacting and are free of highly organic material and debris. Imported fill material should be reviewed by GeoPacific 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 conventional compaction equipment. We recommend that engineered fill be compacted to at least 90 percent of the maximum dry density determined by ASTM D1557 (Modified Proctor) or equivalent. On-site soils may be wet or dry of optimum; therefore, we anticipate that moisture conditioning of native soil will be necessary for compaction operations.

Proper test frequency and earthwork documentation usually requires daily observation and testing during stripping, rough grading, and placement of engineered fill. Field density testing should generally conform to ASTM D2922 and D3017, or D1556. Engineered fill should be periodically 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 cubic yards, 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.

Wet Weather Earthwork

The on-site soils are moisture sensitive and may be difficult to handle or traverse with construction equipment during periods of wet weather. Earthwork is typically most economical when performed under dry weather conditions. Earthwork performed during the wet-weather season will probably require expensive measures such as cement treatment or imported granular material to compact fill to the recommended engineering specifications. If earthwork is to be performed or fill is to be placed in wet weather or under wet conditions when soil moisture content is difficult to control, the following recommendations should be incorporated into the contract specifications.

- Earthwork should be performed in small areas to minimize exposure to wet weather. Excavation or the removal of unsuitable soils should be followed promptly by the placement and compaction of clean engineered fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance. Under some circumstances, it may be necessary to excavate soils with a backhoe to minimize subgrade disturbance caused by equipment traffic;
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water;
- Material used as engineered fill should consist of clean, granular soil containing less than 5 percent fines. The fines should be non-plastic. Alternatively, cement treatment of on-site soils may be performed to facilitate wet weather placement;
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller, or equivalent, and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials;
- Excavation and placement of fill should be observed by the geotechnical engineer to verify that all unsuitable materials are removed and suitable compaction and site drainage is achieved; and
- Bales of straw and/or geotextile silt fences should be strategically located to control erosion.

If cement or lime treatment is used to facilitate wet weather construction, GeoPacific should be contacted to provide additional recommendations and field monitoring.

Seismic Design

Structures should be designed to resist earthquake loading in accordance with the methodology described in the 2009 International Residential Code (IRC) for One- and Two-Family Dwellings, with applicable Oregon Structural Specialty Code (OSSC) revisions. We recommend Site Class D be used for design per the OSSC, Table 1613.5.2. Design values determined for the site using the USGS (United States Geological Survey) *Earthquake Ground Motion Parameters* utility are summarized below.

Table 2. Recommended Earthquake Ground Motion Parameters (2009 IRC)

Parameter	Value
Location (Lat, Long), degrees	45.366, -122.630
Mapped Spectral Acceleration Values (MCE):	
Short Period, S_s	0.92 g
1.0 Sec Period, S_1	0.33 g
Soil Factors for Site Class D:	
F_a	1.13
F_v	1.75
Residential Site Value = 2/3 x F_a x S_s	0.69 g
Residential Seismic Design Category	D_1

Soil liquefaction is a phenomenon wherein saturated soil deposits temporarily lose strength and behave as a liquid in response to earthquake shaking. Soil liquefaction is generally limited to loose, granular soils located below the water table. Following development, on-site soils will consist predominantly of medium stiff to very stiff silt and engineered fill, which are not considered susceptible to liquefaction. Therefore, it is

our opinion that special design or construction measures are not required to mitigate the effects of liquefaction.

Structural Foundations

Based on the results of our exploration program, and assuming our recommendations for site preparation are followed, foundation subgrades should consist of native soils or engineered fill. To achieve this condition, overexcavation of the existing undocumented fill soils and buried topsoil is needed as recommended above. If overexcavation is not performed prior to house construction, the house foundations should extend through any undocumented fill soil and buried topsoil and into competent native soils.

Shallow, conventional isolated or continuous spread footings may be used to support the proposed structures, provided they are founded on competent native soils or on engineered fill placed and compacted over competent native soils. If undocumented fill is to be removed and replaced with engineered fill, the removal of undocumented fill and replacement with engineered fill should extend at a 1H:1V slope from the bottom edge of the proposed structural foundation.

We recommend a maximum allowable bearing pressure of 2,000 pounds per square foot (psf) for designing footings on native soil or engineered fill. The recommended maximum allowable bearing pressure may be increased by a factor of 1.33 for short term transient conditions such as wind and seismic loading. Exterior footings should be founded at least 18 inches below the lowest adjacent finished grade. Minimum footing widths should be determined by the project engineer/architect in accordance with applicable design codes.

Assuming construction is accomplished as recommended herein, and for the foundation loads anticipated, we estimate total settlement of spread foundations of less than about 1 inch and differential settlement between two adjacent load-bearing components supported on competent soil of less than about ½ inch. We anticipate that the majority of the estimated settlement will occur during construction, as loads are applied.

Wind, earthquakes, and unbalanced earth loads will subject the proposed structure to lateral forces. Lateral forces on a structure will be resisted by a combination of sliding resistance of its base or footing on the underlying soil and passive earth pressure against the buried portions of the structure. For use in design, a coefficient of friction of 0.5 may be assumed along the interface between the base of the footing and subgrade soils. Passive earth pressure for buried portions of structures may be calculated using an equivalent fluid weight of 390 pounds per cubic foot (pcf), assuming footings are cast against dense, natural soils or engineered fill. The recommended coefficient of friction and passive earth pressure values do not include a safety factor. The upper 12 inches of soil should be neglected in passive pressure computations unless it is protected by pavement or slabs on grade.

Footing excavations should be trimmed neat and the bottom of the excavation should be carefully prepared. Loose, wet or otherwise softened soil should be removed from the footing excavation prior to placing reinforcing steel bars. GeoPacific should observe foundation excavations prior to placing formwork and reinforcing steel, to verify that adequate bearing soils have been reached.

The above foundation recommendations are for dry weather conditions. Due to the high moisture sensitivity of on-site soils, construction during wet weather may require overexcavation of footings and backfill with compacted, crushed aggregate.

Footing and Roof Drains

To minimize the fluctuation of soil moisture content near structural foundations, we recommend that the structures be constructed with perimeter footing drains. Footing drains should consist of 4-inch minimum diameter perforated plastic pipe embedded in a minimum of 1 ft^3 per lineal foot of clean, crushed drain rock

or 1"- ¼" rounded drain rock. The drain pipe and surrounding drain rock should be wrapped in non-woven geotextile (Mirafi 140N, or approved equivalent) to minimize the potential for clogging and/or ground loss due to piping. Water collected from the footing drains should be directed into the local storm drain system or other suitable outlet. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. The footing drains should include clean-outs to allow periodic maintenance and inspection.

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.

Storm Water Management

We understand that on-site storm water systems may include shallow infiltration facilities. Deep infiltration facilities, such as dry wells, would be problematic for this site due to the presence of Columbia River Basalt underlying the site. Infiltration test results indicate that infiltration rates in the near surface residual soils are on the order of 1 inch per hour at depths of 2 to 4 feet, and 2 inches per hour at depths of 4 to 8 feet. The designer should select an appropriate infiltration value based on our test results and the location of the proposed infiltration facility. The infiltration rates provided in this report do not incorporate a factor of safety. For the design infiltration rate, the system designer should incorporate an appropriate factor of safety against slowing of the rate over time due to biological and sediment clogging.

Infiltration test methods and procedures attempt to simulate the as-built conditions of the planned disposal system. However, due to natural variations in soil properties, actual infiltration rates may vary from the measured and/or recommended design rates. All systems should be constructed such that potential overflow is discharged in a controlled manner away from structures, and all systems should include an adequate factor of safety. Infiltration rates presented in this report should not be applied to inappropriate or complex hydrological models such as a closed basin without extensive further studies. Evaluating environmental implications of stormwater disposal at this site are beyond the scope of this study.

Excavating Conditions and Utility Trench Backfill

We anticipate that on-site soils can be excavated using conventional heavy equipment to depths up to about 10 feet. Weathered basalt bedrock material was encountered in several of the test pits as discussed above, and should be anticipated in excavations. Although we were able to excavate to depths of 8 to 10 feet with moderate effort using a small backhoe, there is some potential that harder, less rippable zones of bedrock may exist on site beyond the areas of our test pits.

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 Heath Administration (OSHA) regulations (29 CFR Part 1926), or be shored. The existing native soils classify as Type B Soil and temporary excavation side slope inclinations as steep as 1H:1V may be assumed for planning purposes. This cut slope inclination is applicable to excavations above the water table only.

Shallow, perched groundwater should be anticipated in excavations and utility trenches. The depth of groundwater will likely be less during the wet weather season and greater during the dry weather season. Vibrations created by traffic and construction equipment may cause some caving and raveling of excavation walls. In such an event, lateral support for the excavation walls should be provided by the contractor to

prevent loss of ground support and possible distress to existing or previously constructed structural improvements.

PVC pipe should be installed in accordance with the procedures specified in ASTM D2321. We recommend that structural trench backfill be compacted to at least 90% of the maximum dry density obtained by Modified Proctor (ASTM D1557) 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 200-lineal-foot section of trench.

Erosion Control Considerations

During our field exploration program, we did not observe soil types that would be considered highly susceptible to erosion. In our opinion, the primary concern regarding erosion potential will occur during construction, in areas that have been stripped of vegetation. Erosion at the site during construction can be minimized by implementing the project erosion control plan, which should include judicious use of straw bales and silt fences. If used, these erosion control devices should be in place and remain in place throughout site preparation and construction.

Erosion and sedimentation of exposed soils can also be minimized by quickly re-vegetating exposed areas of soil, and by staging construction such that large areas of the project site are not denuded and exposed at the same time. Areas of exposed soil requiring immediate and/or temporary protection against exposure should be covered with either mulch or erosion control netting/blankets. Areas of exposed soil requiring permanent stabilization should be seeded with an approved grass seed mixture, or hydroseeded with an approved seed-mulch-fertilizer mixture.

UNCERTAINTIES AND LIMITATIONS

We have prepared this report for the owner and their consultants for use in design of this project only. This report should be provided in its entirety to prospective contractors for bidding and estimating purposes; however, the conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary significantly over small distances. Inconsistent conditions can occur between explorations that may not be detected by a geotechnical study. If, during future site operations, subsurface conditions are encountered which vary appreciably from those described herein, GeoPacific should be notified for review of the recommendations of this report, and revision of such if necessary.

Sufficient geotechnical monitoring, testing and consultation should be provided during construction to confirm that the conditions encountered are consistent with those indicated by explorations. Recommendations for design changes will be provided should conditions revealed during construction differ from those anticipated, and to verify that the geotechnical aspects of construction comply with the contract plans and specifications.

Within the limitations of scope, schedule and budget, GeoPacific executed these services in accordance with generally accepted professional principles and practices in the field of geotechnical engineering at the time

the report was prepared. No warranty, expressed or implied, is made. The scope of our work did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, or groundwater at this site.

We appreciate this opportunity to be of service.

Sincerely,

GEOPACIFIC ENGINEERING, INC.

REGISTERED PROFESSIONAL ENGINEER
64,422PE
OREGON
SEPTEMBER 26, 2000
SCOTT L. HARDMAN

7-26-13

EXPIRES: 06-30-20 15

Benjamin G. Anderson
Staff Engineer

Scott L. Hardman, G.E., P.E.
Principal Geotechnical Engineer

Attachments: References
Figure 1 – Vicinity Map
Figure 2 – Site Plan and Exploration Locations
Test Pit Logs (TP-1 through TP-6)

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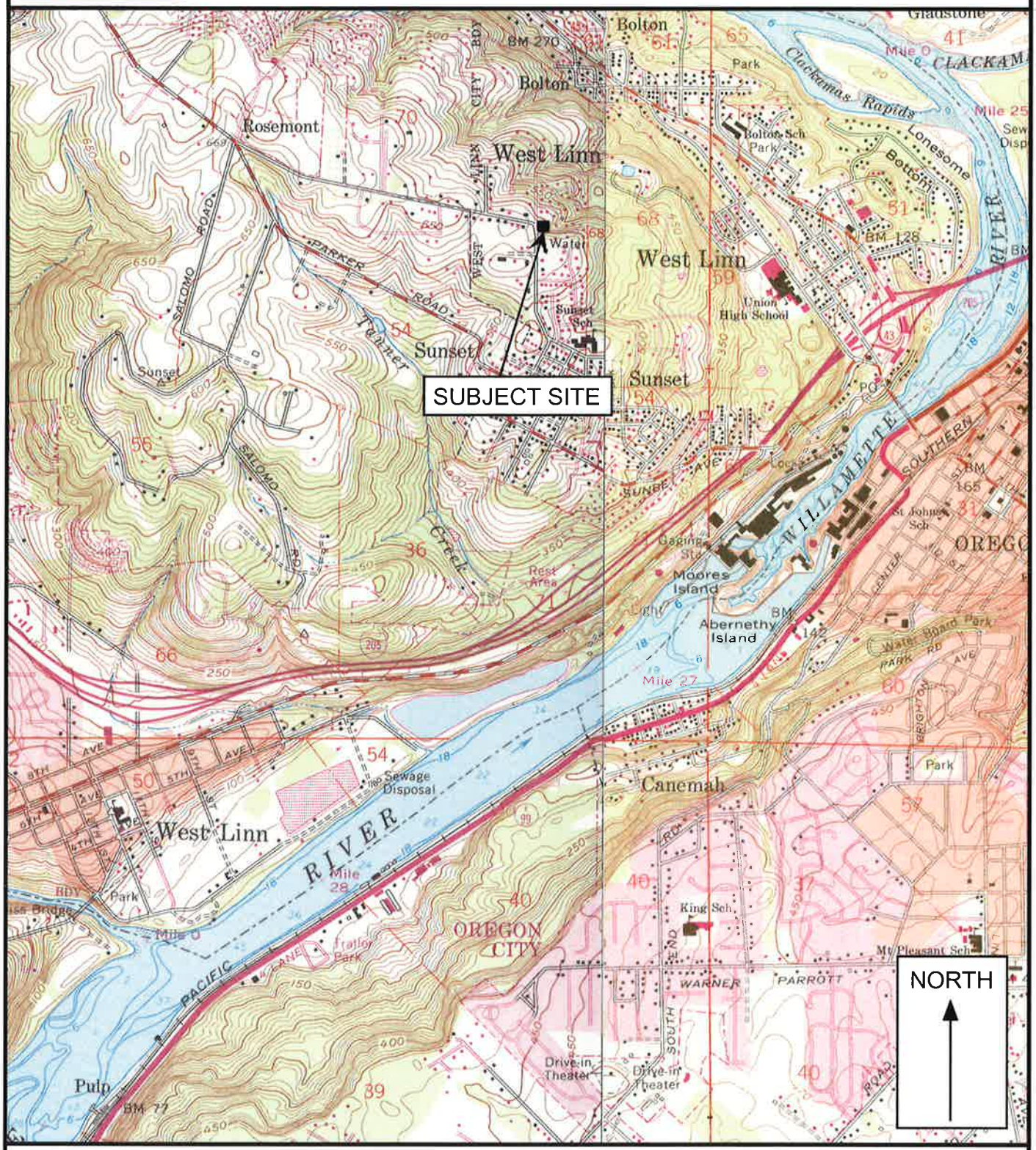
VICINITY MAP



Legend

Approximate Scale 1 in = 2,000 ft

Date: 07/24/13

Drawn by: BGA

Base maps: U.S. Geological Survey 7.5 minute Topographic Map Series, Canby, Oregon Quadrangle, 1961 (Photorevised 1985).
U.S. Geological Survey 7.5 minute Topographic Map Series, Oregon City, Oregon Quadrangle, 1961 (Photorevised 1985).

Project: The Summit Subdivision West Linn, Oregon	Project No. 13-3040	FIGURE 1

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SITE PLAN AND EXPLORATION LOCATIONS

Legend

TP-1 Test Pit Designation and Approximate Location

0 60'

APPROXIMATE SCALE 1"=60'

Date: 07/23/13
Drawn by: BGA

Project: The Summit Subdivision West Linn, Oregon	Project No. 13-3040	FIGURE 2

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TEST PIT LOG

Project: The Summit Subdivision
West Linn, Oregon

Project No. 13-3040

Test Pit No. **TP- 1**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1						10" soft, low organic SILT (OL-ML), dark brown, roots throughout, damp to moist (Topsoil)
2	2.0 3.0					Stiff, clayey SILT (ML), reddish brown, dark brown, and brown, non-homogeneous, moist (Undocumented Fill)
3	2.0 3.0					
4	2.0 >4.5					Grades to very stiff, homogenous and brown
5						
6						
7						
8						Soft to medium stiff, moderately organic SILT (ML-OL), dark brown, fine roots throughout with chunk of concrete and some gravel, moist (Buried Topsoil)
9						Stiff, clayey SILT (ML), reddish brown, moist (Residual Soil)
10						
11						Test Pit Terminated at 11 Feet Note: Groundwater Not Encountered
12						
13						
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 6/26/13
Logged By: BGA
Surface Elevation:

GeoPacific Engineering, Inc.
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Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: The Summit Subdivision
West Linn, Oregon

Project No. 13-3040

Test Pit No. **TP-2**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1						20" soft, moderately organic SILT (OL-ML), dark brown, with fine to large roots, 6 inch root mat, damp to moist (Topsoil)
2	4.0					Very stiff to hard, clayey SILT (ML), reddish brown, moist (Residual Soil)
3	>4.5					
4						
5						
6						
7						
8						
9						
10						
11						Test Pit Terminated at 8 Feet
12						
13						Note: Groundwater Not Encountered
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 6/26/13
Logged By: BGA
Surface Elevation:

GeoPacific Engineering, Inc.
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Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: The Summit Subdivision
West Linn, Oregon

Project No. 13-3040

Test Pit No. **TP-3**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1						Soft SILT (ML), with concrete debris and bricks, brown, moist (Undocumented Fill)
2						
3						
4						[ground surface elevation at toe of slope]
5						Very stiff, clayey SILT (ML), reddish brown, moist (Residual Soil)
6						
7						
8						Test Pit Terminated at 7.5 Feet
9						
10						Note: Groundwater Not Encountered
11						
12						
13						
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 6/26/13
Logged By: BGA
Surface Elevation:

GeoPacific Engineering, Inc.
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Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: The Summit Subdivision
West Linn, Oregon

Project No. 13-3040

Test Pit No. **TP-4**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1						6" soft, highly organic SILT (OL-ML), dark brown, roots throughout, damp to moist (Topsoil)
2						Soft, SILT (ML), brown, moist (Undocumented Fill)
3						Soft, moderately organic SILT (ML-OL), fine roots throughout, with organic debris, moist (Buried Topsoil)
4						Very stiff, clayey SILT (ML) to silty CLAY (CL), reddish brown, with black mineral staining, moist (Residual Soil)
5						
6						
7						Grades to hard
8						Extremely soft to very soft (R0-R1), highly weathered BASALT, trace reddish-brown matrix of silty clay to clayey silt, light gray, black staining, damp to moist (Columbia River Basalt)
9						
10						
11						Test Pit Terminated at 10.5 Feet
12						
13						Note: Groundwater Not Encountered
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 6/26/13
Logged By: BGA
Surface Elevation:

GeoPacific Engineering, Inc.
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Portland, Oregon 97224
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TEST PIT LOG

Project: The Summit Subdivision
West Linn, Oregon

Project No. 13-3040

Test Pit No. **TP-5**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
0						6" loose, silty GRAVEL, 3/4"-0 crushed aggregate, moist (Undocumented Fill)
1						Soft to medium stiff, highly organic SILT (OL-ML), dark brown, fine to large roots throughout, with organic debris, moist (Buried Topsoil)
2						
3						
4						Very stiff, clayey SILT (ML), reddish brown, moist (Residual Soil)
5						Extremely soft to very soft (R0-R1), highly weathered BASALT, trace reddish-brown matrix of silty clay to clayey silt, light gray, black staining, damp to moist (Columbia River Basalt)
6						
7						Grades to very soft to soft (R1-R2)
8						Test Pit Terminated at 8 Feet
9						
10						Note: Groundwater Not Encountered
11						
12						
13						
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 6/26/13
Logged By: BGA
Surface Elevation:

GeoPacific Engineering, Inc.
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Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: The Summit Subdivision
West Linn, Oregon

Project No. 13-3040

Test Pit No. **TP-6**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
0						6" medium dense, silty GRAVEL (GM), dry (Undocumented Fill)
1						Soft, clayey SILT (ML), with occasional gravel, reddish brown, moist (Undocumented Fill)
2						
3	1.5 2.0					Soft to medium stiff, highly organic SILT (OL-ML), dark brown, fine to medium roots throughout, with organic debris, moist (Buried Topsoil)
4						
5						Extremely soft to very soft (R0-R1), highly weathered BASALT, trace reddish-brown matrix of silty clay to clayey silt, light gray, damp to moist (Columbia River Basalt)
6						
7						Grades to very soft to soft (R1-R2), with black mineral staining, and vesicular
8						
9						
10						Test Pit Terminated at 10 Feet.
11						
12						Note: No seepage or groundwater encountered.
13						
14						
15						
16						
17						

LEGEND

Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 6/26/13
Logged By: BGA
Surface Elevation:

OPERATIONS AND MAINTENANCE

OPERATIONS AND MAINTENANCE PLAN FOR STORMWATER FACILITIES

HARPER'S TERRACE SUBDIVISION
WEST LINN, OR

August 23, 2013

Prepared For:

LF 10, LLC
5285 Meadows Road, Suite #171
Lake Oswego, OR 97035

Prepared By:
3J Consulting, Inc.
10445 SW Canyon Road, Suite 245
Beaverton, OR 97005
Project No: 13123
KEF

PURPOSE

The purpose of this Operations and Maintenance (O&M) Plan is to bring attention to the on-going needs of the storm water management facilities located at the proposed Harper's Terrace Subdivision. In order for the facilities to operate as intended and increase the environmental benefits, a high quality maintenance program is required.

This document has been prepared to provide Harper's Terrace Subdivision with a single source document that will explain the maintenance requirements of the storm water facilities. This also serves the regulatory agencies in which legal requirements have been placed on this site.

STORMWATER FACILITIES

Stormwater runoff from the onsite areas will be infiltrated either utilizing pervious pavement in the shared driveway or stormwater planters on each lot.

The stormwater planters are infiltration planters designed to treat and infiltrate all storm events up to and including the 25-year event. An overflow should be constructed to convey larger flows into the propsoed 12 inch pipe at the northeast corner of the site. The pipe will convey overflows to the storm line in Woodsprite Court.

INSPECTION/MAINTENANCE SCHEDULE

Each part of the system shall be inspected and maintained quarterly and within 48 hours after each major storm event. For this O&M plan, a major storm event is defined as 1.0 inches of rain in 24 hours or more. All components of the storm system as described above must be inspected and maintained frequently or they will cease to function effectively. The facility owner shall keep a log, recording all inspection dates, observations, and maintenance activities. Receipts shall be saved when maintenance is performed and there is a record of expense. Please see the excerpts from the City of Portland Stormwater Management Manual for Facility Maintenance Guidelines.

Vegetated Facilities

- Remove sediment when:
    - Sediment depth reaches 4 inches.
    - Sediment depth is damaging or killing vegetation
    - Sediment is preventing the facility from draining in the time specified.

Pervious Pavement Material

- Vegetation, large shrubs, and trees that limit access or interfere with porous pavement operations shall be pruned.
- Vacuum sweeping of the pervious materials shall be implemented.
- Leaves and debris shall be raked and removed biannually.
- Power wash annually or as needed.

ELEMENTS

This document contains the following information.

1. Site Plan(s) of Storm Water Facilities (To be included in final Stormwater Report)
2. Simplified Operations and Maintenance Specifications: Planters
3. Pervious Pavement Operations and Maintenance Plan and Checklist
4. Maintenance Logs

Simplified Operations and Maintenance Specifications
PLANTERS

What To Look For	What To Do
Structural Components, including inlets and outlets/overflows, shall freely convey stormwater.	
➢ Clogged inlets or outlets	➢ Remove sediment and debris from catch basins, trench drains, curb inlets, and pipes to maintain at least 50% conveyance capacity at all times.
➢ Liner and foundation ➢ Cracked drain pipes	➢ Repair/seal cracks. Replace when repair is insufficient.
Vegetation shall cover 90% of the facility.	
➢ Dead or strained vegetation	➢ Replant per original planting plan, or substitute from SWMM **Appendix F.4** plant list. ➢ Irrigate as needed. Mulch annually. DO NOT apply fertilizers, herbicides, or pesticides.
➢ Tall or overgrown plants	➢ Prune to allow sight lines and foot traffic.
➢ Weeds	➢ Manually remove weeds. Remove all plant debris.
Growing/Filter Medium, including soil and gravels, shall sustain healthy plant cover and infiltrate within 48 hours.	
➢ Gullies	➢ Fill, lightly compact, and plant vegetation to disperse flow.
➢ Erosion	➢ Replace splash blocks or inlet gravel/rock.
➢ Ponding	➢ Stabilize soils with plantings from SWMM **Appendix F4**. ➢ Rake, till, or amend to restore infiltration rate.

Annual Maintenance Schedule
Summer. Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.
Fall. Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter. Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance.
Spring. Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch.
All seasons. Weed as necessary.

Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the City inspector.

Access: Maintain ingress/egress to design standards.

Infiltration/Flow Control: All facilities shall drain within 48 hours. Record time/date, weather, and site conditions when ponding occurs.

Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact Spill Prevention & Citizen Response at 503-823-7180 for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.

Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Multnomah County Vector Control at 503-988-3464 for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

PERVIOUS PAVEMENT

Operations and Maintenance Plan and Checklist

Pervious pavement is a permeable pavement surface that allows storm water to drain through the interconnected voids within the concrete or asphalt into a rock reservoir that will temporarily store the water until it either infiltrates into the ground or is discharged to a municipal system. The pervious pavement is designed only to accept precipitation and not storm water runoff from adjacent areas.

The facility and surrounding landscaping must be inspected for proper operations at least quarterly for the first year of service, then once every six months. The facility owner shall be responsible for keeping a log, recording all inspection dates, observations, and maintenance activities. Refer to Evolution Paving's "Pervious Concrete Pavement Owner's Manual and Maintenance Guide" for additional information on pervious concrete installations. The following checklist is provided as minimum inspections that should take place and corrective actions.

Surroundings:

Reduce sediment exposure with proper landscape design and maintenance. The frequency and type of cleaning required is determined by exposure to sediment; leaves, bark dust, or dirt. For best results, keep raised planter soil, mulch, and bark chips below the curbs, promote grassy swales to avoid runoff onto the pavement, and in general promote grading techniques that keep sediment below the pavement level. If practical, do not use woody ground cover. Don't blow or sweep woody debris onto pervious pavements.

Surface: Keep surface clean of debris, leaves, pine needles, and soil. Provide regular cleaning to remove sediment build.

Regular Maintenance:

1. Blowing - Blow pervious surface weekly or at a frequency to keep fine dust, leaves, pine needles, ground covering, etc. from being lodged into the surface. Collect and remove all blown debris to eliminate the redistribution of the material back onto the pavement.

2. Vacuuming - Vacuum parking lot surface with regenerative air truck mounted vacuum twice per year or as needed to maintain clean surface. DO NOT SWEEP

3. Flushing - Flush surface with high volume spray from water truck annually. Time flushing with vacuuming.

Cleaning and Restoration: If water is ponding on the surface or is not draining well the following steps should be taken to clean and restore the drainage characteristics of the pavement. Prior to starting, protect downstream storm drainage systems from debris and sludge from the cleaning operation. Do NOT sweep or flush sediment/debris from impervious surfaces onto the pervious concrete as this will overwhelm the pervious pavement. Always direct cleaning operations away from the pervious pavement.

1. Low Pressure Water Nozzle – Spray in a back and forth motion from the high end of the pavement towards the low end and collect all sludge and debris and properly remove from the site.

2. Area Washer – Remove heavy sediment accumulations with LandaTM 21-inch "Area Washer" attached to a separate pressure washer. Use the "Area Washer" much like a lawn mower. Sludge generated from this process should be contained and disposed as allowed by local codes.

3. Turbo Nozzle – For deep cleaning, use a LandaTM 5800 "Turbo" nozzle. This nozzle plugs into the Area Washer and uses the same pressure washer. This very powerful nozzle quickly reopens surface clogging and restores drainage. This nozzle is capable of damaging pervious pavement so always follow safety instructions and

train operators on how to avoid surface damage to the pavement by holding the tip away from the surface.
(Usually pressure washers and "area cleaners" are available to purchase or rent at local rental yards or building supply companies. The turbo nozzles are available at www.Landa.com.)

Snow & Ice: DO NOT use sand, salt, or chemicals to melt ice and snow. Utilize larger aggregate (1/4 inch or larger) without fines for providing winter weather traction. Vacuum surface once snow and ice has melted. Snow removal should be done with rubber edged snow plows if necessary.

Repair: Repair by saw cutting the pavement at an existing control joint or construction joint. The section should be cut full depth, removed, and replaced with new pervious concrete. The new pavement must be compacted and cured the same as when constructing a new pervious concrete pavement. If doweling is required use corrosion resistant materials since the pavement allows both air and water to reach the reinforcements.

Spills: Measures shall be exercised when handling substances that can contaminate storm water. A spill prevention plan shall be implemented at all non-residential sites and in areas where there is likelihood of spills from hazardous materials. However, virtually all sites, including residential and commercial, present potential danger from spills. All homes contain a wide variety of toxic materials including gasoline for lawn mowers, antifreeze for cars, solvents, pesticides, and cleaning aids that can adversely affect storm water if spilled. It is important to exercise caution when handling substances that can contaminate storm water. Releases of pollutants shall be corrected as soon as identified.

Maintenance Matrix

	Frequency	Spring	Summer	Fall	Winter	As-Needed
Blowing	*Weekly*	💧	💧	💧	💧	💧
Vacuuming	*Bi-Annually*	💧		💧		💧
Flushing	*Annually*	💧				💧
Deep Cleaning/Restoration						💧
Low Pressure Water Nozzle						💧
Area Washer						💧
Turbo Nozzle						💧
Repairs						💧
Snow and Ice						💧
Spill Prevention						💧

MAINTENANCE LOGS

Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. See Pervious Pavement Operations and Maintenance Plan and Checklist for Maintenance Log.

SAMPLE:

Month: Year: **Initial & Date**	**Vegetated Facilities, Inlets and Overflow**	**Catch Basins**	**Document if materials are removed from catch basins**
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

GeoPacific Engineering, Inc.

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

July 26, 2013
GeoPacific Project No. 13-3040

John Wyland
J.T. Smith Companies
5282 Meadows Road, Suite 171
Lake Oswego, Oregon 97035

Via e-mail with hard copies mailed

Subject: **GEOTECHNICAL ENGINEERING REPORT**
THE SUMMIT SUBDIVISION - AKA ROSEMONT 2
NORTHEAST CORNER OF SUMMIT STREET AND S. GLORIA DRIVE INTERSECTION
WEST LINN, OREGON

This report presents the results of a geotechnical engineering study conducted by GeoPacific Engineering, Inc. (GeoPacific) for the above referenced project. The purpose of this study 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-4526, dated June 5, 2013, and your subsequent authorization of our agreement and *General Conditions for Geotechnical Services.*

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The site is located on the northeast side of the intersection of Summit Street and S. Gloria Drive in West Linn, Oregon (Figure 1). The area of the planned development totals approximately 40,500 square feet and is roughly rectangular-shaped. The topography on the site is sloping down to the northeast at an average grade of approximately 10 percent. However, previous grading activity on the site has created steep slopes of limited height in the northwest and central portions of the site. The previous grading activity has also created several relatively level areas, most notably the majority of the northeast quarter of the site. Vegetation on the site consists primarily of grass, brush, and small to large trees. The southeast portion of the site is densely wooded with large trees.

It is our understanding that the proposed development includes grading the site to support 4 lots for new single-family homes and associated underground utilities. We anticipate that the maximum depth of cut and height of fill will be about 5 feet or less.

REGIONAL GEOLOGIC SETTING

Regionally, the subject site lies within the Willamette Valley/Puget Sound lowland, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. A series of discontinuous faults subdivide the Willamette Valley into a mosaic of fault-bounded, structural blocks (Yeats et al., 1996). Uplifted structural blocks form bedrock highlands, while down-warped structural blocks form sedimentary basins.

The site is underlain by the Columbia River Basalt Formation (Beeson el al., 1989). The Miocene aged (about 14.5 to 16.5 million years ago) Columbia River Basalts are a thick sequence of lava flows. The basalts are composed of dense, finely crystalline rock that is commonly fractured along blocky and columnar vertical joints. Individual basalt flow units typically range from 25 to 125 feet thick and interflow zones are typically vesicular, scoriaceous, brecciated, and sometimes include sedimentary rocks.

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

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 16.6 miles southwest of the subject site. These faults are recognized in the subsurface by vertical separation of the Columbia River Basalt and offset seismic reflectors in the overlying basin sediment (Yeats et al., 1996; Werner et al., 1992). A recent geologic reconnaissance and photogeologic analysis study conducted for the Scoggins Dam site in the Tualatin Basin revealed no evidence of deformed geomorphic surfaces along the structural zone (Unruh et al., 1994). No seismicity has been recorded on the Gales Creek or Newberg Faults (the faults closest to the subject site); however, these faults are considered to be potentially active because they may connect with the seismically active Mount Angel Fault and the rupture plane of the 1993 M5.6 Scotts Mills earthquake (Werner et al. 1992; Geomatrix Consultants, 1995).

Portland Hills Fault Zone

The Portland Hills Fault Zone is a series of NW-trending faults that include the central Portland Hills Fault, the western Oatfield Fault, and the eastern East Bank Fault. These faults occur in a northwest-trending zone that varies in width between 3.5 and 5.0 miles. The combined three faults vertically displace the Columbia River Basalt by 1,130 feet and appear to control thickness changes in late Pleistocene (approx. 780,000 years) sediment (Madin, 1990). The Portland Hills Fault occurs along the Willamette River at the base of the Portland Hills, and is about 3.6 miles northeast of the site. The Oatfield Fault occurs along the western side of the Portland Hills, and is about 2.4 miles northeast of the site. The accuracy of the fault mapping is stated to be within 500 meters (Wong, et al., 2000). No historical seismicity is correlated with the mapped portion of the Portland Hills Fault Zone, but in 1991 a M3.5 earthquake occurred on a NW-trending shear plane located 1.3 miles east of the fault (Yelin, 1992). Although there is no definitive evidence of recent activity, the Portland Hills Fault Zone is assumed to be potentially active (Geomatrix Consultants, 1995).

Cascadia Subduction Zone

The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a rate of 4 cm per year (Goldfinger et al., 1996). A growing body of geologic evidence suggests that prehistoric subduction zone earthquakes have occurred (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). This evidence includes: (1) buried tidal marshes recording episodic, sudden subsidence along the coast of northern California, Oregon, and Washington, (2) burial of subsided tidal marshes by tsunami wave deposits, (3) paleoliquefaction features, and (4) geodetic uplift patterns on the Oregon coast. Radiocarbon dates on buried tidal marshes indicate a recurrence interval for major subduction zone earthquakes of 250 to 650 years with the last event occurring 300 years ago (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). The inferred seismogenic portion of the plate interface lies roughly along the Oregon Coast at depths of 20 and 40 kilometers below the ocean surface.

FIELD EXPLORATION

Subsurface conditions were explored on June 26, 2013 by excavating 6 test pits to depths of 7.5 to 11 feet below ground surface, using a John Deer 310E backhoe with a 2-foot-wide toothed bucket. The approximate test pit locations are shown on the attached site plan (Figure 2). It should be noted that exploration locations were determined 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 excavation of the test pits, a GeoPacific engineer observed and recorded soil information such as color, stratigraphy, strength, and soil moisture. Soils were classified in general accordance with the Unified Soil Classification System (USCS). Rock hardness was classified in accordance with Table 1, modified from the ODOT Rock Hardness Classification Chart. Logs of test pits are attached to this report.

Table 1. Rock Hardness Classification Chart

ODOT Rock Hardness Rating	Field Criteria	Unconfined Compressive Strength	Typical Equipment Needed For Excavation
Extremely Soft (R0)	Indented by thumbnail	<100 psi	Small excavator
Very Soft (R1)	Scratched by thumbnail, crumbled by rock hammer	100-1,000 psi	Small excavator
Soft (R2)	Not scratched by thumbnail, indented by rock hammer	1,000-4,000 psi	Medium excavator (slow digging with small excavator)
Medium Hard (R3)	Scratched or fractured by rock hammer	4,000-8,000 psi	Medium to large excavator (slow to very slow digging), typically requires chipping with hydraulic hammer or mass excavation)
Hard (R4)	Scratched or fractured w/ difficulty	8,000-16,000 psi	Slow chipping with hydraulic hammer and/or blasting
Very Hard (R5)	Not scratched or fractured after many blows, hammer rebounds	>16,000 psi	Blasting

At the completion of each test pit, the excavation was backfilled using the excavated soils, and tamped with the excavator bucket. This backfill should not be expected to behave as engineered fill and some settling and/or erosion of the ground surface may occur.

SUBSURFACE CONDITIONS

Soil and Rock

The following report sections summarize subsurface conditions anticipated at the site, based on our exploration program. On-site soils consist of topsoil, undocumented fill, buried topsoil, residual soil, and Columbia River Basalt, as described below.

Topsoil: In test pits TP-1, TP-2, and TP-4, the ground surface was directly underlain by topsoil. Topsoil generally consisted of soft, dark brown, low to highly organic SILT (OL-ML) with fine to large roots. The

total thickness of the topsoil layer ranged from 6 to 20 inches. There is the potential for some tree roots or thicker topsoil zones in forested areas of site.

Undocumented Fill: Undocumented fill was encountered in test pits TP-1, TP-3, TP-4, TP-5, and TP-6. The fill material varied in consistency from clayey SILT (ML) with occasional gravel in test pits TP-1 TP-4, and TP-6, to SILT (ML) with concrete debris and bricks in test pit TP-3, and to silty GRAVEL (GM) in test pit TP-5. The undocumented fill material generally had a soft or loose consistency, except TP-1, which had a stiff to very stiff consistency. The approximate depths of undocumented fill encountered in the test pits are summarized in Table 2. We anticipate that fill zones are concentrated in the vicinities of the steep slopes in the northwest and central portions of the site. We do not anticipate significant depths of undocumented fill material in the northeastern quarter of the site.

Buried Topsoil: In test pits TP-1, TP-4, TP-5, and TP-6, the undocumented fill material was directly underlain by buried topsoil. The buried topsoil generally consisted of soft, dark brown, moderately to highly organic SILT (OL-ML) with fine to large roots and organic debris. The total thickness of the topsoil layer ranged from 18 to 36 inches. The approximate depths to the bottom of the buried topsoil layer in feet below ground surface (bgs) are summarized in Table 2.

Table 2. Approximate Depths of Undocumented Fill and Buried Topsoil

Location	Depth of Undocumented Fill Material (feet bgs)	Depth to Bottom of Buried Topsoil Layer (feet bgs)
TP-1	7	8.5
TP-3	5	N/A
TP-4	2	3.5
TP-5	0.5	3.5
TP-6	2.5	4.5

Residual Soil: Underlying the buried topsoil in test pits TP-1, TP-4, and TP5, the topsoil in TP-2, and the undocumented fill material TP-3, very stiff clayey silt residual soil derived from the in-place weathering of the underlying Columbia River Basalt Formation was encountered. The residual soil transitioned to less weathered basalt bedrock as discussed below. The residual soil extended to a depth of 8 feet in test pit TP-4, and to a depth of 4.5 feet in TP-5. The residual soil extended beyond the maximum depth of exploration in test pits TP-1, TP-2 and TP-3.

Columbia River Basalt: Underlying the residual soil in test pits TP-4 and TP-5 and the buried topsoil in TP-6, weathered basalt bedrock materials belonging to the Columbia River Basalt Formation were encountered. The basalt encountered was typically highly weathered and ranged from extremely soft (R0) to soft (R2). The hardness generally increased with depth. Extremely soft to soft (R0-R2) basalt extended beyond the maximum depths of our explorations in test pits TP-4, TP-5, and TP-6.

Groundwater

On June 26, 2013, groundwater seepage was not encountered in the test pits. The groundwater conditions reported are for the specific date and locations indicated, and therefore may not necessarily be indicative of other times and/or locations. It is anticipated that groundwater conditions will vary depending on the time of year, rainfall, local subsurface conditions, changes in site utilization, and other factors. During periods of heavy and prolonged precipitation, shallow perched groundwater conditions often occur over fine-grained native deposits such as those beneath the site, particularly during the wet season.

INFILTRATION TESTING

On June 26, 2013, GeoPacific performed two pushed-pipe falling head infiltration tests at the approximate locations shown on Figure 1. The tests were conducted in 6-inch diameter pipes pushed into the native soil at approximate depths of 3 and 8 feet below the ground surface. The infiltration tests were performed at the bottom of test pit TP-2 and in a separate test pit excavated approximately 8 feet west of test pit TP-2. The soil encountered at the depths of the infiltration tests consisted of reddish brown clayey SILT (ML). The test holes were pre-saturated for four hours prior to performing the tests. During the tests, water levels were measured over 20 minute intervals with approximate head pressures ranging between 8 and 18 inches. Approximate test locations are shown in Figure 2. Table 3 presents a summary of our infiltration test measurement results.

Table 3. Results of Infiltration Testing

Location	Depth (feet)	Infiltration Rate (in/hr)
TP-2	3	1
TP-2	8	2

The test results indicate very low infiltration rates. The measured rates reflect vertical flow pathways only.

CONCLUSIONS AND RECOMMENDATIONS

Results of this study indicate that the proposed development is geotechnically feasible, provided that the recommendations of this report are incorporated into the design and construction phases of the project. The proposed structure may be supported on shallow foundations bearing on competent undisturbed native soils, or on engineered fill, designed and constructed as recommended in this report. In our opinion, the greatest geotechnical constraints for project development are the presence of undocumented fill underlying much of the site, which will need to be removed and replaced with property compacted engineered fill as recommended below.

Recommendations are presented below for site preparation and undocumented fill removal, engineered fill, wet weather earthwork, seismic design, structural foundations, footing drains, storm water systems, permeable pavement systems, excavation conditions and utility trench backfill, and erosion control considerations. The recommendations of this report assume the single-family structures will have raised floors and crawlspaces.

Site Preparation and Undocumented Fill Removal

Areas of proposed construction, new driveway areas, and areas to receive fill should first be cleared of vegetation and any debris, undocumented fill, and buried topsoil (where encountered). We encountered undocumented fill and buried topsoil in test pits TP-1, TP-3, TP-4, TP-5 and TP-6 to depths of up to 8.5 feet. The approximate depths of undocumented fill and buried topsoil are summarized in Table 2. Some undocumented fill material may be suitable for use as engineered fill provided it is adequately moisture conditioned prior to compacting and are free of highly organic material and debris.

Debris from clearing should be removed from the site. Organic-rich topsoil should be stripped to the relatively inorganic native soils. We anticipate that the depth of stripping will be an average of roughly 6 to 12 inches where topsoil exists over native soil. Deeper stripping will be needed in the vicinity of test pit TP-2, in forested areas, and in areas that have been tilled in the past, areas of localized fill deposits, etc. The

topsoil encountered in test pit TP-2 extended to a depth of 20 inches. The final depth of stripping removal may vary depending on local subsurface conditions and the contractor's methods, and should be determined on the basis of a site inspection after the initial stripping has been performed.

Stripped organic soil should be stockpiled only in designated areas or removed from the site and stripping operations should be observed and documented by GeoPacific. Any existing subsurface structures (tile drains, old utility lines, septic leach fields, etc.) beneath structures and pavements should be removed and the excavations backfilled with engineered fill.

In construction areas, once stripping is approved, the area should be ripped or tilled to a depth of 12 inches, moisture conditioned, and compacted in-place prior to the placement of engineered fill or crushed aggregate base for pavement (dry weather conditions). Exposed subgrade soils should be evaluated by GeoPacific. For large areas, this evaluation is normally performed by proof-rolling the exposed subgrade with a fully loaded scraper or dump truck. For smaller areas where access is restricted, and during wet weather, the subgrade should be evaluated by probing the soil with a steel probe.

Soft/loose soils identified during subgrade preparation should be compacted to a firm and unyielding condition or over-excavated and replaced with engineered fill, as described below. The depth of overexcavation, if required, should be evaluated by GeoPacific at the time of construction.

Engineered Fill

In general, we anticipate that soils from planned cuts and utility trench excavations will be suitable for use as engineered fill during dry weather conditions, provided they are adequately moisture conditioned prior to compacting and are free of highly organic material and debris. Imported fill material should be reviewed by GeoPacific 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 conventional compaction equipment. We recommend that engineered fill be compacted to at least 90 percent of the maximum dry density determined by ASTM D1557 (Modified Proctor) or equivalent. On-site soils may be wet or dry of optimum; therefore, we anticipate that moisture conditioning of native soil will be necessary for compaction operations.

Proper test frequency and earthwork documentation usually requires daily observation and testing during stripping, rough grading, and placement of engineered fill. Field density testing should generally conform to ASTM D2922 and D3017, or D1556. Engineered fill should be periodically 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 cubic yards, 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.

Wet Weather Earthwork

The on-site soils are moisture sensitive and may be difficult to handle or traverse with construction equipment during periods of wet weather. Earthwork is typically most economical when performed under dry weather conditions. Earthwork performed during the wet-weather season will probably require expensive measures such as cement treatment or imported granular material to compact fill to the recommended engineering specifications. If earthwork is to be performed or fill is to be placed in wet weather or under wet conditions when soil moisture content is difficult to control, the following recommendations should be incorporated into the contract specifications.

- Earthwork should be performed in small areas to minimize exposure to wet weather. Excavation or the removal of unsuitable soils should be followed promptly by the placement and compaction of clean engineered fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance. Under some circumstances, it may be necessary to excavate soils with a backhoe to minimize subgrade disturbance caused by equipment traffic;
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water;
- Material used as engineered fill should consist of clean, granular soil containing less than 5 percent fines. The fines should be non-plastic. Alternatively, cement treatment of on-site soils may be performed to facilitate wet weather placement;
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller, or equivalent, and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials;
- Excavation and placement of fill should be observed by the geotechnical engineer to verify that all unsuitable materials are removed and suitable compaction and site drainage is achieved; and
- Bales of straw and/or geotextile silt fences should be strategically located to control erosion.

If cement or lime treatment is used to facilitate wet weather construction, GeoPacific should be contacted to provide additional recommendations and field monitoring.

Seismic Design

Structures should be designed to resist earthquake loading in accordance with the methodology described in the 2009 International Residential Code (IRC) for One- and Two-Family Dwellings, with applicable Oregon Structural Specialty Code (OSSC) revisions. We recommend Site Class D be used for design per the OSSC, Table 1613.5.2. Design values determined for the site using the USGS (United States Geological Survey) *Earthquake Ground Motion Parameters* utility are summarized below.

Table 2. Recommended Earthquake Ground Motion Parameters (2009 IRC)

Parameter	Value
Location (Lat, Long), degrees	45.366, -122.630
Mapped Spectral Acceleration Values (MCE):	
Short Period, S_s	0.92 g
1.0 Sec Period, S_1	0.33 g
Soil Factors for Site Class D:	
F_a	1.13
F_v	1.75
Residential Site Value = 2/3 x F_a x S_s	0.69 g
Residential Seismic Design Category	D_1

Soil liquefaction is a phenomenon wherein saturated soil deposits temporarily lose strength and behave as a liquid in response to earthquake shaking. Soil liquefaction is generally limited to loose, granular soils located below the water table. Following development, on-site soils will consist predominantly of medium stiff to very stiff silt and engineered fill, which are not considered susceptible to liquefaction. Therefore, it is

our opinion that special design or construction measures are not required to mitigate the effects of liquefaction.

Structural Foundations

Based on the results of our exploration program, and assuming our recommendations for site preparation are followed, foundation subgrades should consist of native soils or engineered fill. To achieve this condition, overexcavation of the existing undocumented fill soils and buried topsoil is needed as recommended above. If overexcavation is not performed prior to house construction, the house foundations should extend through any undocumented fill soil and buried topsoil and into competent native soils.

Shallow, conventional isolated or continuous spread footings may be used to support the proposed structures, provided they are founded on competent native soils or on engineered fill placed and compacted over competent native soils. If undocumented fill is to be removed and replaced with engineered fill, the removal of undocumented fill and replacement with engineered fill should extend at a 1H:1V slope from the bottom edge of the proposed structural foundation.

We recommend a maximum allowable bearing pressure of 2,000 pounds per square foot (psf) for designing footings on native soil or engineered fill. The recommended maximum allowable bearing pressure may be increased by a factor of 1.33 for short term transient conditions such as wind and seismic loading. Exterior footings should be founded at least 18 inches below the lowest adjacent finished grade. Minimum footing widths should be determined by the project engineer/architect in accordance with applicable design codes.

Assuming construction is accomplished as recommended herein, and for the foundation loads anticipated, we estimate total settlement of spread foundations of less than about 1 inch and differential settlement between two adjacent load-bearing components supported on competent soil of less than about ½ inch. We anticipate that the majority of the estimated settlement will occur during construction, as loads are applied.

Wind, earthquakes, and unbalanced earth loads will subject the proposed structure to lateral forces. Lateral forces on a structure will be resisted by a combination of sliding resistance of its base or footing on the underlying soil and passive earth pressure against the buried portions of the structure. For use in design, a coefficient of friction of 0.5 may be assumed along the interface between the base of the footing and subgrade soils. Passive earth pressure for buried portions of structures may be calculated using an equivalent fluid weight of 390 pounds per cubic foot (pcf), assuming footings are cast against dense, natural soils or engineered fill. The recommended coefficient of friction and passive earth pressure values do not include a safety factor. The upper 12 inches of soil should be neglected in passive pressure computations unless it is protected by pavement or slabs on grade.

Footing excavations should be trimmed neat and the bottom of the excavation should be carefully prepared. Loose, wet or otherwise softened soil should be removed from the footing excavation prior to placing reinforcing steel bars. GeoPacific should observe foundation excavations prior to placing formwork and reinforcing steel, to verify that adequate bearing soils have been reached.

The above foundation recommendations are for dry weather conditions. Due to the high moisture sensitivity of on-site soils, construction during wet weather may require overexcavation of footings and backfill with compacted, crushed aggregate.

Footing and Roof Drains

To minimize the fluctuation of soil moisture content near structural foundations, we recommend that the structures be constructed with perimeter footing drains. Footing drains should consist of 4-inch minimum diameter perforated plastic pipe embedded in a minimum of 1 ft^3 per lineal foot of clean, crushed drain rock

or 1"- ¼" rounded drain rock. The drain pipe and surrounding drain rock should be wrapped in non-woven geotextile (Mirafi 140N, or approved equivalent) to minimize the potential for clogging and/or ground loss due to piping. Water collected from the footing drains should be directed into the local storm drain system or other suitable outlet. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. The footing drains should include clean-outs to allow periodic maintenance and inspection.

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.

Storm Water Management

We understand that on-site storm water systems may include shallow infiltration facilities. Deep infiltration facilities, such as dry wells, would be problematic for this site due to the presence of Columbia River Basalt underlying the site. Infiltration test results indicate that infiltration rates in the near surface residual soils are on the order of 1 inch per hour at depths of 2 to 4 feet, and 2 inches per hour at depths of 4 to 8 feet. The designer should select an appropriate infiltration value based on our test results and the location of the proposed infiltration facility. The infiltration rates provided in this report do not incorporate a factor of safety. For the design infiltration rate, the system designer should incorporate an appropriate factor of safety against slowing of the rate over time due to biological and sediment clogging.

Infiltration test methods and procedures attempt to simulate the as-built conditions of the planned disposal system. However, due to natural variations in soil properties, actual infiltration rates may vary from the measured and/or recommended design rates. All systems should be constructed such that potential overflow is discharged in a controlled manner away from structures, and all systems should include an adequate factor of safety. Infiltration rates presented in this report should not be applied to inappropriate or complex hydrological models such as a closed basin without extensive further studies. Evaluating environmental implications of stormwater disposal at this site are beyond the scope of this study.

Excavating Conditions and Utility Trench Backfill

We anticipate that on-site soils can be excavated using conventional heavy equipment to depths up to about 10 feet. Weathered basalt bedrock material was encountered in several of the test pits as discussed above, and should be anticipated in excavations. Although we were able to excavate to depths of 8 to 10 feet with moderate effort using a small backhoe, there is some potential that harder, less rippable zones of bedrock may exist on site beyond the areas of our test pits.

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 Heath Administration (OSHA) regulations (29 CFR Part 1926), or be shored. The existing native soils classify as Type B Soil and temporary excavation side slope inclinations as steep as 1H:1V may be assumed for planning purposes. This cut slope inclination is applicable to excavations above the water table only.

Shallow, perched groundwater should be anticipated in excavations and utility trenches. The depth of groundwater will likely be less during the wet weather season and greater during the dry weather season. Vibrations created by traffic and construction equipment may cause some caving and raveling of excavation walls. In such an event, lateral support for the excavation walls should be provided by the contractor to

prevent loss of ground support and possible distress to existing or previously constructed structural improvements.

PVC pipe should be installed in accordance with the procedures specified in ASTM D2321. We recommend that structural trench backfill be compacted to at least 90% of the maximum dry density obtained by Modified Proctor (ASTM D1557) 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 200-lineal-foot section of trench.

Erosion Control Considerations

During our field exploration program, we did not observe soil types that would be considered highly susceptible to erosion. In our opinion, the primary concern regarding erosion potential will occur during construction, in areas that have been stripped of vegetation. Erosion at the site during construction can be minimized by implementing the project erosion control plan, which should include judicious use of straw bales and silt fences. If used, these erosion control devices should be in place and remain in place throughout site preparation and construction.

Erosion and sedimentation of exposed soils can also be minimized by quickly re-vegetating exposed areas of soil, and by staging construction such that large areas of the project site are not denuded and exposed at the same time. Areas of exposed soil requiring immediate and/or temporary protection against exposure should be covered with either mulch or erosion control netting/blankets. Areas of exposed soil requiring permanent stabilization should be seeded with an approved grass seed mixture, or hydroseeded with an approved seed-mulch-fertilizer mixture.

UNCERTAINTIES AND LIMITATIONS

We have prepared this report for the owner and their consultants for use in design of this project only. This report should be provided in its entirety to prospective contractors for bidding and estimating purposes; however, the conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary significantly over small distances. Inconsistent conditions can occur between explorations that may not be detected by a geotechnical study. If, during future site operations, subsurface conditions are encountered which vary appreciably from those described herein, GeoPacific should be notified for review of the recommendations of this report, and revision of such if necessary.

Sufficient geotechnical monitoring, testing and consultation should be provided during construction to confirm that the conditions encountered are consistent with those indicated by explorations. Recommendations for design changes will be provided should conditions revealed during construction differ from those anticipated, and to verify that the geotechnical aspects of construction comply with the contract plans and specifications.

Within the limitations of scope, schedule and budget, GeoPacific executed these services in accordance with generally accepted professional principles and practices in the field of geotechnical engineering at the time

the report was prepared. No warranty, expressed or implied, is made. The scope of our work did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, or groundwater at this site.

We appreciate this opportunity to be of service.

Sincerely,

GEOPACIFIC ENGINEERING, INC.

REGISTERED PROFESSIONAL ENGINEER
64,422PE
OREGON
SEPTEMBER 26, 2000
SCOTT L. HARDMAN

7-26-13

EXPIRES: 06-30-20 15

Benjamin G. Anderson
Staff Engineer

Scott L. Hardman, G.E., P.E.
Principal Geotechnical Engineer

Attachments: References
Figure 1 – Vicinity Map
Figure 2 – Site Plan and Exploration Locations
Test Pit Logs (TP-1 through TP-6)

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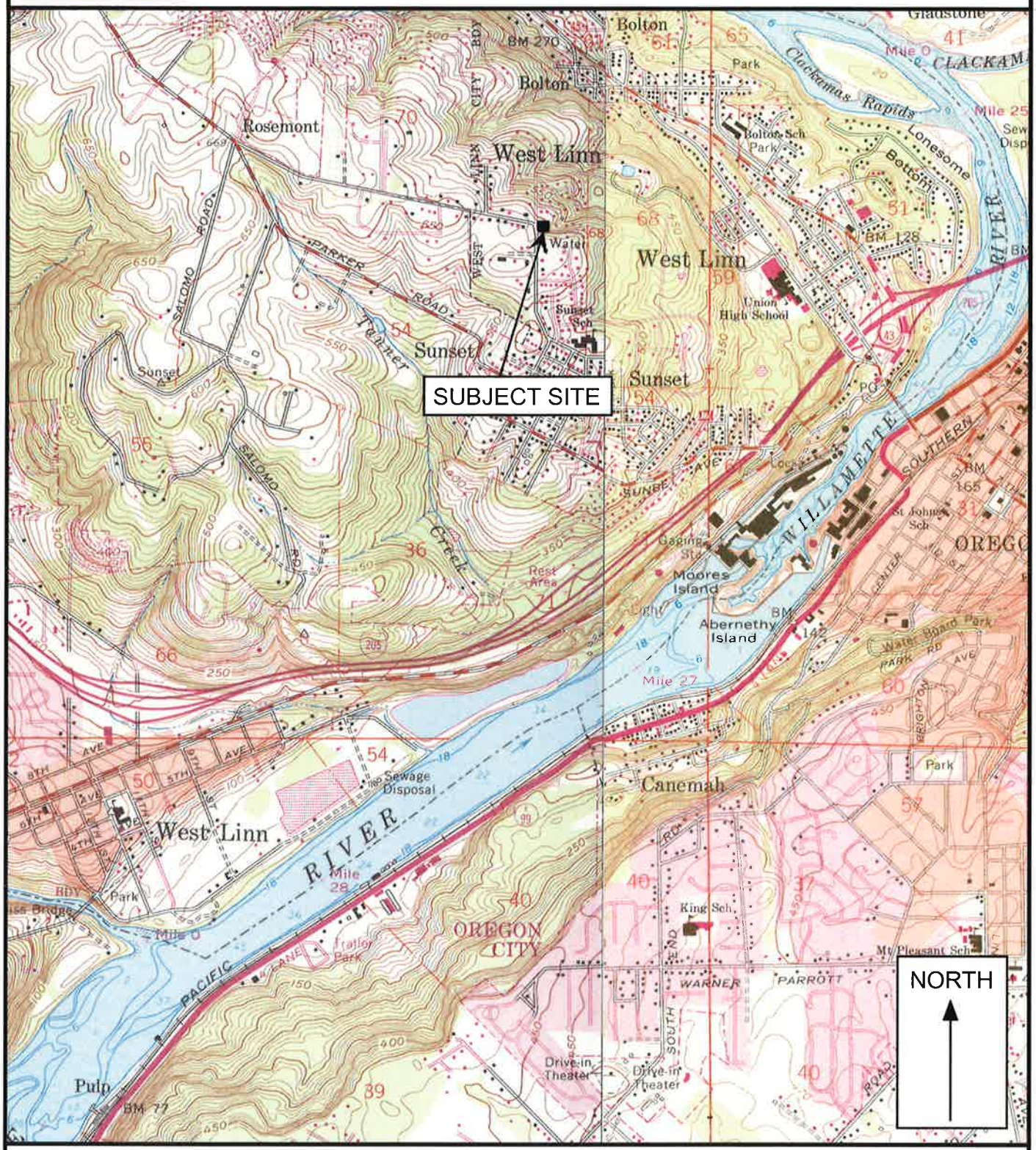
VICINITY MAP



Legend

Approximate Scale 1 in = 2,000 ft

Date: 07/24/13

Drawn by: BGA

Base maps: U.S. Geological Survey 7.5 minute Topographic Map Series, Canby, Oregon Quadrangle, 1961 (Photorevised 1985).
U.S. Geological Survey 7.5 minute Topographic Map Series, Oregon City, Oregon Quadrangle, 1961 (Photorevised 1985).

Project: The Summit Subdivision West Linn, Oregon	Project No. 13-3040	FIGURE 1

GeoPacific Engineering, Inc.
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SITE PLAN AND EXPLORATION LOCATIONS

Legend

TP-1 Test Pit Designation and Approximate Location

0 60'

APPROXIMATE SCALE 1"=60'

Date: 07/23/13
Drawn by: BGA

Project: The Summit Subdivision West Linn, Oregon	Project No. 13-3040	FIGURE 2

GeoPacific Engineering, Inc.
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TEST PIT LOG

Project: The Summit Subdivision
West Linn, Oregon

Project No. 13-3040

Test Pit No. **TP- 1**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1						10" soft, low organic SILT (OL-ML), dark brown, roots throughout, damp to moist (Topsoil)
2	2.0 3.0					Stiff, clayey SILT (ML), reddish brown, dark brown, and brown, non-homogeneous, moist (Undocumented Fill)
3	2.0 3.0					
4	2.0 >4.5					Grades to very stiff, homogenous and brown
5						
6						
7						
8						Soft to medium stiff, moderately organic SILT (ML-OL), dark brown, fine roots throughout with chunk of concrete and some gravel, moist (Buried Topsoil)
9						Stiff, clayey SILT (ML), reddish brown, moist (Residual Soil)
10						
11						Test Pit Terminated at 11 Feet Note: Groundwater Not Encountered
12						
13						
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 6/26/13
Logged By: BGA
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: The Summit Subdivision
West Linn, Oregon

Project No. 13-3040

Test Pit No. **TP-2**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1						20" soft, moderately organic SILT (OL-ML), dark brown, with fine to large roots, 6 inch root mat, damp to moist (Topsoil)
2	4.0					Very stiff to hard, clayey SILT (ML), reddish brown, moist (Residual Soil)
3	>4.5					
4						
5						
6						
7						
8						
9						
10						
11						Test Pit Terminated at 8 Feet
12						
13						Note: Groundwater Not Encountered
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 6/26/13
Logged By: BGA
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: The Summit Subdivision
West Linn, Oregon

Project No. 13-3040

Test Pit No. **TP-3**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1						Soft SILT (ML), with concrete debris and bricks, brown, moist (Undocumented Fill)
2						
3						
4						[ground surface elevation at toe of slope]
5						Very stiff, clayey SILT (ML), reddish brown, moist (Residual Soil)
6						
7						
8						Test Pit Terminated at 7.5 Feet
9						
10						Note: Groundwater Not Encountered
11						
12						
13						
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 6/26/13
Logged By: BGA
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: The Summit Subdivision
West Linn, Oregon

Project No. 13-3040

Test Pit No. **TP-4**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1						6" soft, highly organic SILT (OL-ML), dark brown, roots throughout, damp to moist (Topsoil)
2						Soft, SILT (ML), brown, moist (Undocumented Fill)
3						Soft, moderately organic SILT (ML-OL), fine roots throughout, with organic debris, moist (Buried Topsoil)
4						Very stiff, clayey SILT (ML) to silty CLAY (CL), reddish brown, with black mineral staining, moist (Residual Soil)
5						
6						
7						Grades to hard
8						Extremely soft to very soft (R0-R1), highly weathered BASALT, trace reddish-brown matrix of silty clay to clayey silt, light gray, black staining, damp to moist (Columbia River Basalt)
9						
10						
11						Test Pit Terminated at 10.5 Feet
12						
13						Note: Groundwater Not Encountered
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 6/26/13
Logged By: BGA
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: The Summit Subdivision
West Linn, Oregon

Project No. 13-3040

Test Pit No. **TP-5**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
0						6" loose, silty GRAVEL, 3/4"-0 crushed aggregate, moist (Undocumented Fill)
1						Soft to medium stiff, highly organic SILT (OL-ML), dark brown, fine to large roots throughout, with organic debris, moist (Buried Topsoil)
2						
3						
4						Very stiff, clayey SILT (ML), reddish brown, moist (Residual Soil)
5						Extremely soft to very soft (R0-R1), highly weathered BASALT, trace reddish-brown matrix of silty clay to clayey silt, light gray, black staining, damp to moist (Columbia River Basalt)
6						
7						Grades to very soft to soft (R1-R2)
8						Test Pit Terminated at 8 Feet
9						
10						Note: Groundwater Not Encountered
11						
12						
13						
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 6/26/13
Logged By: BGA
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: The Summit Subdivision
West Linn, Oregon

Project No. 13-3040

Test Pit No. **TP-6**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
0						6" medium dense, silty GRAVEL (GM), dry (Undocumented Fill)
1						Soft, clayey SILT (ML), with occasional gravel, reddish brown, moist (Undocumented Fill)
2						
3	1.5 2.0					Soft to medium stiff, highly organic SILT (OL-ML), dark brown, fine to medium roots throughout, with organic debris, moist (Buried Topsoil)
4						
5						Extremely soft to very soft (R0-R1), highly weathered BASALT, trace reddish-brown matrix of silty clay to clayey silt, light gray, damp to moist (Columbia River Basalt)
6						
7						Grades to very soft to soft (R1-R2), with black mineral staining, and vesicular
8						
9						
10						Test Pit Terminated at 10 Feet.
11						
12						Note: No seepage or groundwater encountered.
13						
14						
15						
16						
17						

LEGEND

Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 6/26/13
Logged By: BGA
Surface Elevation:

ARBORIST REPORT TO BE SUBMITTED UNDER ANOTHER COVER

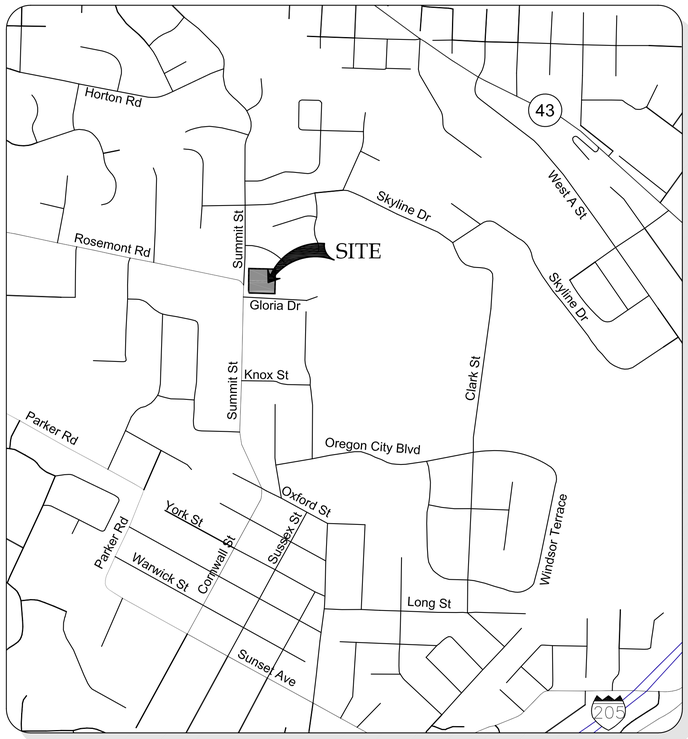
LAND USE DOCUMENTS

FOR

HARPER'S TERRACE SUBDIVISION

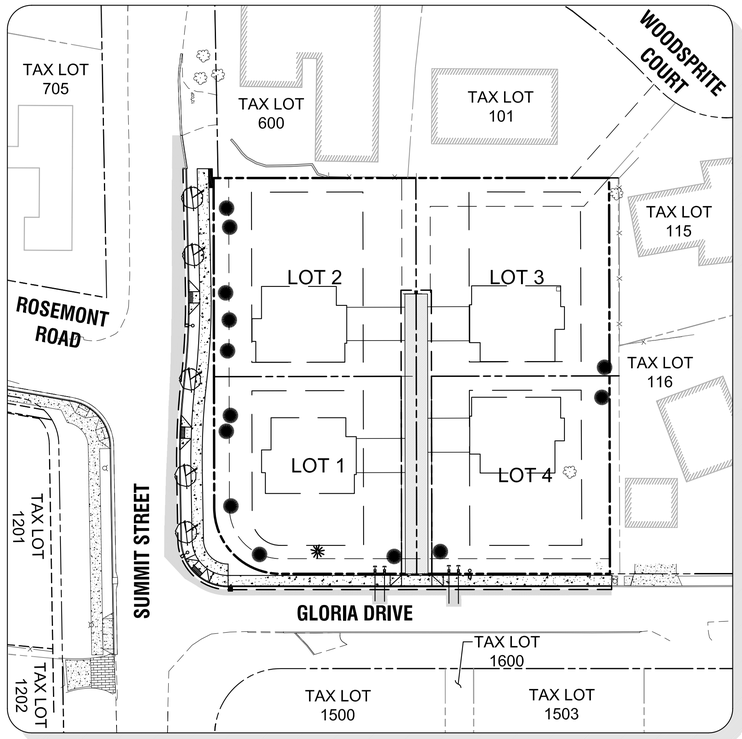
PREPARED FOR

LF 10, LLC



VICINITY MAP

NOT TO SCALE



SITE MAP

Scale: 1 inch = 80 feet

80 40 0 40 80

TAX LOT 500 LOCATED IN THE NW 1/4 & SE 1/4 OF
SECTION 25, T.2S., R.1E., W.M.
CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON

PROJECT TEAM

OWNER/APPLICANT
LF 10, LLC
C/O: J.T. SMITH COMPANIES
5285 MEADOWS ROAD, SUITE #171
LAKE OSWEGO, OR 97035
CONTACT: JOHN WYLAND
jwyland@jtsmithco.com

CIVIL ENGINEER
3J CONSULTING, INC.
10445 SW CANYON ROAD, SUITE 245
BEAVERTON, OR 97005
CONTACT: BRIAN FEENEY
PHONE: (503) 946-9365
brian.feeney@3j-consulting.com

PLANNING CONSULTANT
3J CONSULTING, INC
10445 SW CANYON ROAD, SUITE 245
BEAVERTON, OR 97005
CONTACT: ANDREW TULL
PHONE: 503-946-9365
EMAIL: andrew.tull@3j-consulting.com

GEOTECHNICAL CONSULTANT
GEOPACIFIC ENGINEERING, INC.
14835 SW 72ND AVENUE
PORTLAND, OR 97224
CONTACT: SCOTT HARDMAN
PHONE: (503) 625-4455
shardman@geopacificeng.com

LAND SURVEYOR
COMPASS SURVEYING
4107 SE INTERNATIONAL WAY, SUITE 705
MILWAUKIE, OR 97222
CONTACT: DON DEVLAEMINCK, PLS
PHONE: 503-653-9093
dond@compass-engineering.com

SITE INFORMATION

SITE ADDRESS
4997 SUMMIT STREET
WEST LINN, OR 97068

TAX LOT
2S1E25DB 500

FLOOD HAZARD
MAP NUMBER: 41005C0257D ZONE X (UNSHADED)

JURISDICTION
CITY OF WEST LINN

ZONING
R-10

UTILITIES & SERVICES

WATER, STORM, SEWER
CITY OF WEST LINN

POWER
PGE
CONTACT: MIKE HIEB
503-570-4412

GAS
NORTHWEST NATURAL
503-706-0159: DAN

CABLE
COMCAST
503-793-9981: KEN

TELEPHONE
CENTURY LINK
CONTACT: THERESA COLEMAN
503-242-3952

FIRE
TUALATIN VALLEY FIRE & RESCUE

POLICE, SCHOOLS, ROADS, PARKS
CITY OF WEST LINN

SHEET INDEX

CHECK SET

#	REVISION SUMMARY	BY	DATE
			10/01/13

COVER SHEET
HARPER'S TERRACE SUBDIVISION
LF 10, LLC
WEST LINN, OR

J.T. SMITH companies

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 15, 2002
BRIAN K. FEENEY
PRELIMINARY
EXPIRES: 12-31-13

3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
10445 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

3J JOB ID #	13123
LAND USE #	____
TAX LOT #	2S1E25DB 500
DESIGNED BY	CLF
CHECKED BY	BKF

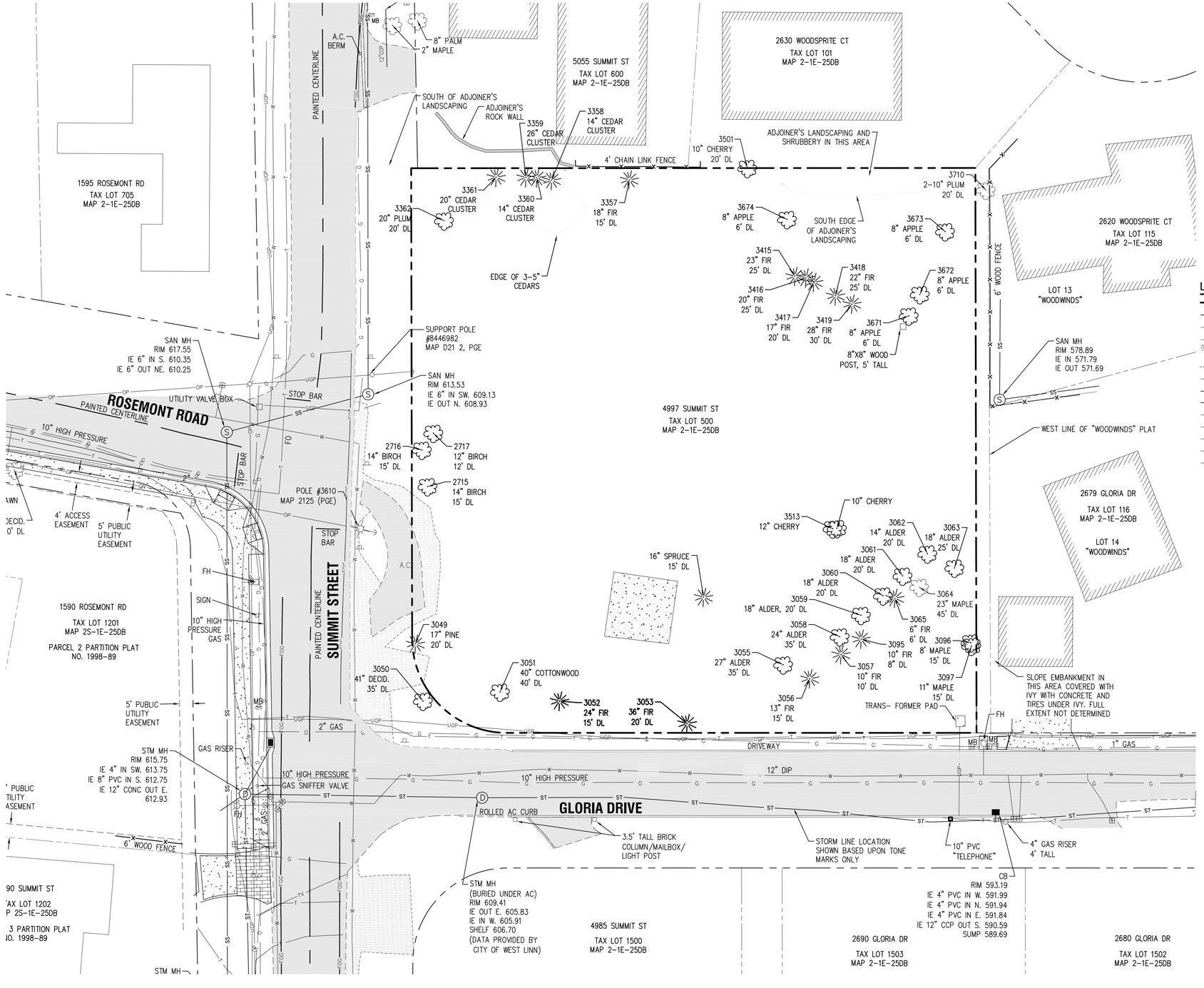
SHEET TITLE
COVER SHEET

SHEET NUMBER
C0.0

TAX LOT 500 LOCATED IN THE NW 1/4 & SE 1/4 OF SECTION 25, T.2S., R.1E., W.M.
CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON

EXISTING CONDITIONS PLAN

THIS PLAN IS INTENDED FOR USE AS AN EXISTING CONDITIONS PLAN SHOWING THE CONDITIONS OF THE SITE PRIOR TO CONSTRUCTION. INFORMATION SHOWN ON THIS PLAN WAS DEVELOPED FROM THE TOPOGRAPHIC SURVEY, AERIAL PHOTOS, AND SITE OBSERVATIONS BY THE ENGINEER. NOT ALL SURFACE FEATURES OR UTILITIES MAY BE SHOWN. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION TO DETERMINE WORK SPECIFIC DETAILS. TOPOGRAPHIC INFORMATION PROVIDED BY COMPASS ENGINEERING DATED APRIL, 2013.



LEGEND

BOUNDARY LINE	CURB
RIGHT-OF-WAY	ASPHALT
CENTERLINE	SIDEWALK
LOT LINE	GRAVEL
BUILDING	EXISTING TREES
1 FT CONTOUR	LIGHT POLE
5 FT CONTOUR	TRAFFIC SIGN
SANITARY SEWER	WATER VALVE
STORM SEWER	WATER METER
WATER LINE	SPRINKLER VALVE
GAS LINE	FIRE HYDRANT
UNDERGROUND POWER	STORM MANHOLE
UNDERGROUND PHONE LINE	SANITARY MANHOLE
OVERHEAD POWER	

NOTES

1. UTILITY INFORMATION SHOWN ON THIS MAP IS BASED UPON OBSERVED FEATURES, RECORD DATA AND TONE MARKS PROVIDED BY PUBLIC UTILITY LOCATION SERVICES. NO WARRANTIES ARE MADE REGARDING THE ACCURACY OR COMPLETENESS OF THE UTILITY INFORMATION SHOWN. ADDITIONAL UTILITIES MAY EXIST. INTERESTED PARTIES ARE HEREBY ADVISED THAT UTILITY LOCATIONS SHOULD BE VERIFIED PRIOR TO DESIGN OR CONSTRUCTION OF ANY CRITICAL ITEMS.

2. BASIS OF ELEVATIONS: NAVD '88.

3. VERTICAL DATUM: NAVD '88 UTILIZING GPS POSITIONING TIED TO THE ORGN WITH REAL TIME CORRECTORS REFERENCED TO NAD '83 (2011).

4. TOPOGRAPHIC FEATURES SHOWN ON THIS MAP WERE LOCATED USING STANDARD PRECISION TOPOGRAPHIC MAPPING PROCEDURES. THIRD PARTY USERS OF DATA FROM THIS MAP PROVIDED VIA AUTOCAD DRAWING FILES OR DATA EXCHANGE FILES SHOULD NOT RELY ON ANY AUTOCAD GENERATED INFORMATION WHICH IS BEYOND THE LIMITS OF PRECISION OF THIS MAP. THIRD PARTIES USING DATA FROM THIS MAP IN AN AUTOCAD FORMAT SHOULD VERIFY ANY ELEMENTS REQUIRING PRECISE LOCATIONS PRIOR TO COMMENCEMENT OF ANY CRITICAL DESIGN OR CONSTRUCTION. CONTACT COMPASS ENGINEERING FOR FURTHER INFORMATION. FURTHERMORE, COMPASS ENGINEERING WILL NOT BE RESPONSIBLE NOR HELD LIABLE FOR ANY DESIGN OR CONSTRUCTION RELATED PROBLEMS THAT ARISE OUT OF THIRD PARTY USAGE OF THIS MAP (IN AUTOCAD OR OTHER FORMAT) FOR ANY PURPOSE OTHER THAN SPECIFICALLY STATED HEREIN. THIS STATEMENT IS AN OFFICIAL PART OF THIS MAP.

Scale: 1 inch = 20 feet
20 10 0 10 20

CHECK SET

#	REVISION SUMMARY	BY	DATE
			10/01/13

EXISTING CONDITIONS
HARPER'S TERRACE SUBDIVISION
LF 10, LLC
WEST LINN, OR

J.T. SMITH companies

REGISTERED PROFESSIONAL ENGINEER 58041 OREGON JULY 15, 2005 BRIAN K. FEENEY
PRELIMINARY
EXPIRES: 12-31-13

3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
10445 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

3J JOB ID #	13123
LAND USE #	____
TAX LOT #	2S1E25DB 500
DESIGNED BY	CLF
CHECKED BY	BKF

SHEET TITLE
EXISTING

SHEET NUMBER
C1.0

TAX LOT 500 LOCATED IN THE NW 1/4 & SE 1/4 OF SECTION 25, T.2S., R.1E., W.M.
CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON

LEGEND

- BOUNDARY LINE
- RIGHT-OF-WAY
- CENTERLINE
- LOT LINE
- BUILDING
- EXISTING EDGE OF WETLAND
- CREEK CENTERLINE
- SANITARY SEWER
- STORM SEWER
- WATER LINE
- GAS LINE
- UNDERGROUND POWER
- UNDERGROUND PHONE LINE
- OVERHEAD POWER
- CURB
- SAWCUT LINE
- ASPHALT
- SIDEWALK/CONCRETE
- GRAVEL
- EXISTING TREES
- LIGHT POLE
- TRAFFIC SIGN
- WATER VALVE
- WATER METER
- SPRINKLER VALVE
- FIRE HYDRANT
- EXISTING TREE TO BE REMOVED

CONSTRUCTION KEY NOTES

1. DEMOLISH AND REMOVE EXISTING CONCRETE BUILDING PAD. DEBRIS AND REFUSE TO BE DISPOSED OFF-SITE AT AN APPROVED LOCATION
2. REMOVE EXISTING TREE/LANDSCAPING NECESSARY TO INSTALL IMPROVEMENTS, SEE SHEET C2.0. ALL EXISTING TREE STUMPS TO BE REMOVED AND DISPOSED OF OFF-SITE
3. REMOVE EXISTING GRAVEL SHOULDER/DRIVEWAY. DISPOSE OF RUBBLE AND REFUSE OFF-SITE.
4. SAWCUT EXISTING ASPHALT PAVEMENT
5. REMOVE EXISTING ASPHALT SURFACING AND BASE ROCK. DISPOSE OF RUBBLE AND REFUSE OFF SITE.
6. PROTECT EXISTING FENCING TO REMAIN.
7. REMOVE AND REPLACE EXISTING STREET SIGNS
8. PROTECT EXISTING TREE TO REMAIN (TYPICAL), SEE SHEET C1.2.
9. RELOCATE EXISTING SUPPORT POLE
10. RELOCATE EXISTING POWER POLE. CONTRACTOR TO COORDINATE WITH PGE.
11. REMOVE EXISTING CONCRETE CURB. DISPOSE OF RUBBLE AND REFUSE OFF-SITE.
12. RELOCATE EXISTING MAILBOX.

GENERAL DEMOLITION NOTES

1. DEMOLITION NOTES ARE FOR CLARIFICATION ONLY AND ARE SHOWN FOR THE CONTRACTOR'S BENEFIT. THESE NOTES ARE NOT INTENDED TO BE COMPREHENSIVE. THE CONTRACTOR SHALL REMOVE OR RELOCATE ALL EXISTING ON-SITE IMPROVEMENTS NECESSARY TO ACCOMMODATE THE PROPOSED CONSTRUCTION.
2. ALL EXISTING PROPERTY UTILITY SERVICES TO BE TERMINATED AND CAPPED AT THE RIGHT OF WAY PRIOR TO DEMOLISHING ANY EXISTING BUILDINGS.
3. CONTRACTOR IS TO REMOVE ALL EXISTING SURFACE IMPROVEMENTS AND DEBRIS WITHIN THE LIMITS OF WORK UNLESS OTHERWISE NOTED. ALL DEBRIS FOUND ON SITE SHALL BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE STATE CODES.
4. CONTRACTOR TO PROTECT EXISTING FEATURES WHICH ARE TO REMAIN.
5. CONTRACTOR SHALL ADJUST ALL EXISTING MANHOLE RIMS, DRAINAGE STRUCTURES, VALVE BOXES, VAULT LIDS AND UTILITY ACCESS STRUCTURES TO FINISH GRADE WITHIN AREAS AFFECTED BY PROPOSED CONSTRUCTION.
6. CONSTRUCTION AND DEMOLITION ACTIVITIES SHALL BE PHASED IN SUCH A MANNER AS TO ENSURE THAT PUBLIC ACCESS ROADS ARE NOT BLOCKED AND REMAIN OPERATIONAL.
7. SEE TREE PROTECTION AND REMOVAL PLAN (SHEET C1.2) FOR ALL TREE REMOVAL INFORMATION.

Scale: 1 inch = 20 feet (20 10 0 10 20)

Know what's **below.** **Call** before you dig.

CHECK SET	REVISION SUMMARY	BY	DATE
			10/01/13

DEMOLITION PLAN
HARPER'S TERRACE SUBDIVISION
LF 10, LLC
WEST LINN, OR

J.T. SMITH companies

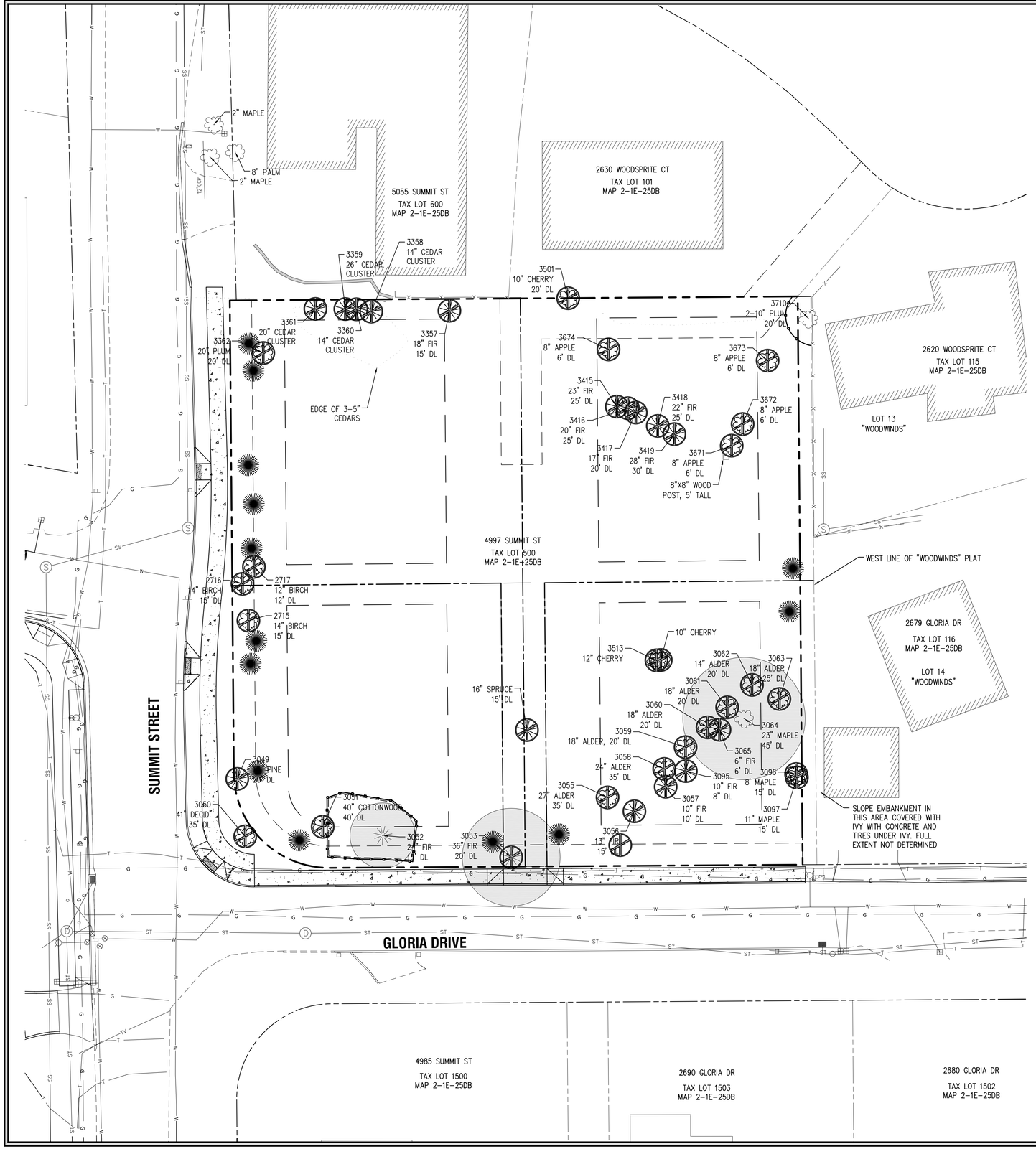
REGISTERED PROFESSIONAL ENGINEER 58010 OREGON JANUARY 15, 2005 BRIAN K. FEENEY
PRELIMINARY
EXPIRES: 12-31-13

3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
10345 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

3J JOB ID #	13123
LAND USE #	____
TAX LOT #	2S1E25DB 500
DESIGNED BY	CLF
CHECKED BY	BKF

SHEET TITLE
DEMOLITION

SHEET NUMBER
C1.1



TREE INVENTORY

SURVEY POINT NUMBER	TREE SPECIES	NOMINAL CALIPER SIZE (INCHES)	PROPOSED ACTION	SIGNIFICANT DESIGNATION	REMOVE DUE TO CONDITION
2715	EUROPEAN WHITE BIRCH	14	REMOVE	NO	INVASIVE SPECIES
2716	EUROPEAN WHITE BIRCH	14	REMOVE	NO	INVASIVE SPECIES
2717	EUROPEAN WHITE BIRCH	12	REMOVE	NO	INVASIVE SPECIES
3049	LODGE POLE PINE	17	REMOVE	NO	MECHANICAL DAMAGE
3050	PRINCESS TREE	41	REMOVE FROM ROW	NO	INVASIVE SPECIES
3051	BLACK COTTONWOOD	40	REMOVE	NO	BROKEN TOP, DECAY
3052	DOUGLAS FIR	24	SAVE	NO	NO MAJOR DEFECTS
3053	DOUGLAS FIR	36	REMOVE	NO	NO MAJOR DEFECTS
3054	SPRUCE	16	REMOVE	NO	POOR STEM STRUCTURE
3055	RED ALDER	27	REMOVE	NO	FORKED TOP BRANCH DECAY
3056	GRAND FIR	13	REMOVE	NO	FORKED TOP BRANCH DECAY
3057	GRAND FIR	10	REMOVE	NO	DEAD BRANCHES POOR CROWN
3058	RED ALDER	24	REMOVE	NO	BROKEN TOP, MULTI NEW TOPS
3059	RED ALDER	18	REMOVE	NO	12 DEG. LEAN
3060	RED ALDER	18	REMOVE	NO	BASAL, STEM DECAY
3061	RED ALDER	18	REMOVE	NO	BASAL, STEM DECAY
3062	RED ALDER	14	REMOVE	NO	MECH. DAMAGE, DECAY
3063	RED ALDER	18	REMOVE	NO	OVER-GROWN IVY
3064	BIGLEAF MAPLE	23	SAVE IF POSSIBLE	NO	8 DEG. LEAN, DECAY
3065	DOUGLAS FIR	6	REMOVE	NO	OVER-TOPPED, SUPPRESSED
3095	GRAND FIR	10	REMOVE	NO	SMALL CROWN, DECAY
3096	BIGLEAF MAPLE	8	REMOVE	NO	POOR CONDITION
3097	BIGLEAF MAPLE	11	REMOVE	NO	POOR CONDITION
3357	NOBLE FIR	18	REMOVE	NO	SUSPECT INFESTATION
3358	PORT-ORFORD-CEDAR	14	REMOVE	NO	VERY POOR STRUCT.
3359	PORT-ORFORD-CEDAR	14	REMOVE	NO	VERY POOR STRUCT.
3360	PORT-ORFORD-CEDAR	26	REMOVE	NO	VERY POOR STRUCT.
3361	PORT-ORFORD-CEDAR	20	REMOVE	NO	VERY POOR STRUCT.
3362	PLUM	20	REMOVE	NO	DECAY IN JUNCTURE, NOT MAINTAINED
3415	DOUGLAS FIR	23	REMOVE	NO	TOPPED IN PAST, POOR STRUCT.
3416	DOUGLAS FIR	20	REMOVE	NO	TOPPED IN PAST, POOR STRUCT.
3417	DOUGLAS FIR	28	REMOVE	NO	TOPPED IN PAST, POOR STRUCT.
3418	DOUGLAS FIR	17	REMOVE	NO	CODOM STEMS, HISTORY OF FAILURE
3419	DOUGLAS FIR	22	REMOVE	NO	BROKEN TOP, DECAY IN JUNCTURE
3501	SWEET CHERRY	10	REMOVE	NO	INVASIVE SPECIES
3513	SWEET CHERRY	10,12	REMOVE	NO	INVASIVE SPECIES
3671	APPLE	8	REMOVE	NO	DECAY
3672	APPLE	8	REMOVE	NO	DECAY
3673	APPLE	8	REMOVE	NO	DECAY
3674	APPLE	8	REMOVE	NO	DECAY
3710	PLUM	2*10	PROTECT ADJACENT TREE	NO	PROTECTION FENCING AT PROPERTY LINE

GENERAL TREE INVENTORY STATISTICS

TOTAL TREE INVENTORY:	41 ea
TOTAL TREES RETAINED:	4 ea
TOTAL TREES REMOVED:	37 ea
TREES REMOVED DUE TO CONDITION:	34 ea
TOTAL TREE CALIPER INCHES:	738 inches
TOTAL CALIPER INCHES RETAINED:	103 inches
TOTAL CALIPER INCHES REMOVED:	635 inches

SIGNIFICANT TREE STATISTICS

SIGNIFICANT TREE INVENTORY:	3 ea
SIGNIFICANT TREES RETAINED:	2 ea
SIGNIFICANT TREES REMOVED:	1 ea
SIGNIFICANT TREE CALIPER INCHES:	83 inches
SIGNIFICANT CALIPER INCHES RETAINED:	47 inches
SIGNIFICANT CALIPER INCHES REMOVED:	36 inches
SIGNIFICANT TREE CANOPY COVERAGE:	3,061 Sq. Ft.
SIGNIFICANT TREE CANOPY RETAINED:	2,043 Sq. Ft.
SIGNIFICANT TREE CANOPY RETENTION:	67%
PRESERVATION EASEMENT AREA PROVIDED:	612 Sq. Ft.

LEGEND

- EXISTING SIGNIFICANT DECIDUOUS TREE
- EXISTING SIGNIFICANT CONIFEROUS TREE
- TREE POINT, TYPE, CALIPER AND DRIP LINE

2091
41"CHERRY
20' DL

- SIGNIFICANT TREE CANOPY
- TREE TO BE REMOVED
- TREE PROTECTION FENCING
- TREE PRESERVATION EASEMENT

Scale: 1 inch = 20 feet

20 10 0 10 20

CHECK SET

#	REVISION SUMMARY	BY	DATE

10/01/13

TREE PROTECTION AND REMOVAL PLAN

HARPER'S TERRACE SUBDIVISION

LF 10, LLC
WEST LINN, OR

J.T. SMITH companies

REGISTERED PROFESSIONAL ENGINEER
5800
OREGON
SEP. 15, 2005
BRIAN K. FEENEY
PRELIMINARY
EXPIRES: 12-31-13

3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
10445 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

3J JOB ID #	13123
LAND USE #	____
TAX LOT #	2S1E25DB 500
DESIGNED BY	CLF
CHECKED BY	BKF

SHEET TITLE
TREE PLAN

SHEET NUMBER
C1.2

TAX LOT 900, LOCATED IN THE SW 1/4 OF SECTION 35, T.2S., R.1E., W.M. 23451 SALAMO ROAD WEST LINN, CLACKAMAS COUNTY, OREGON

1595 ROSEMONT RD
TAX LOT 705
MAP 2–1E–25DB

5055 SUMMIT ST
TAX LOT 600
MAP 2–1E–25DB

2630 WOODSPRITE CT
TAX LOT 101
MAP 2–1E–25DB

2620 WOODSPRITE CT
TAX LOT 115
MAP 2–1E–25DB

LOT 13
"WOODWINDS"

4997 SUMMIT ST
TAX LOT 500
MAP 2–1E–25DB

2679 GLORIA DR
TAX LOT 116
MAP 2–1E–25DB

LOT 14
"WOODWINDS"

1590 ROSEMONT RD
TAX LOT 1201
MAP 2S–1E–25DB
PARCEL 2 PARTITION PLAT NO. 1998–89

4985 SUMMIT ST
TAX LOT 1500
MAP 2–1E–25DB

2690 GLORIA DR
TAX LOT 1503
MAP 2–1E–25DB

2680 GLORIA DR
TAX LOT 1502
MAP 2–1E–25DB

ROSEMONT ROAD
PAINTED CENTERLINE

SUMMIT STREET
PAINTED CENTERLINE

GLORIA DRIVE

PAINTED CENTERLINE

A.C. BERM

STOP BAR

4' ACCESS EASEMENT

5' PUBLIC UTILITY EASEMENT

SIGN

DRIVEWAY

ROLLED AC CURB

3.5' TALL BRICK COLUMN/MAILBOX/ LIGHT POST

10" PVC "TELEPHONE"

WEST LINE OF "WOODWINDS" PLAT

SLOPE EMBANKMENT IN THIS AREA COVERED WITH IVY WITH CONCRETE AND TIRES UNDER IVY. FULL EXTENT NOT DETERMINED

EDGE OF 3–5" CEDARS

8"X8" WOOD POST, 5' TALL

2716 14" BIRCH 15' DL
2717 12" BIRCH 12' DL
2715 14" BIRCH 15' DL
3049 17" PINE 20' DL
3050 41" DECID. 35' DL
3051 40" COTTONWOOD 40' DL
3052 24" FIR 15' DL
3053 36" FIR 20' DL
3056 13" FIR 15' DL
3057 10" FIR 10' DL
3058 24" ALDER 35' DL
3059 18" ALDER 20' DL
3060 18" ALDER 20' DL
3061 18" ALDER 20' DL
3062 14" ALDER 20' DL
3063 18" ALDER 25' DL
3065 6" FIR 6' DL
3095 10" FIR 8' DL
3096 8" MAPLE 15' DL
3097 11" MAPLE 15' DL
3513 12" CHERRY
10" CHERRY
16" SPRUCE 15' DL
3055 27" ALDER 35' DL
3358 14" CEDAR CLUSTER
3359 26" CEDAR CLUSTER
3360 14" CEDAR CLUSTER
3361 20" CEDAR CLUSTER
3362 18" PLUM 20' DL
3357 18" FIR 15' DL
3415 FIR 25' DL
3416 20" FIR 25' DL
3417 17" FIR 20' DL
3418 22" FIR 25' DL
3419 28" FIR 30' DL
3671 8" APPLE 6' DL
3672 8" APPLE 6' DL
3673 8" APPLE 6' DL
3674 8" APPLE 6' DL

Scale: 1 inch = 20 feet
20 10 0 10 20

LEGEND

- BOUNDARY LINE
- 197 1 FOOT CONTOUR
- 200 5 FOOT CONTOUR
- EXISTING TREES
- RUNOFF FLOW DIRECTION

SITE SLOPE ANALYSIS TABLE

Minimum Slope	Maximum Slope	Area (sf)	%	Color
0%	10%	39,301	42.9	
10.1%	15%	18,838	20.5	
15.1%	20%	13,945	15.2	
20.1%	25%	7,465	8.1	
>25%	--	12,139	13.3	

CHECK SET

#	REVISION SUMMARY	BY	DATE
			10/01/13

SLOPE ANALYSIS PLAN
HARPER'S TERRACE SUBDIVISION
LF 10, LLC
WEST LINN, OR

J.T. SMITH companies

REGISTERED PROFESSIONAL ENGINEER 58011 OREGON JULY 15, 2005 BRIAN K. FEENEY
PRELIMINARY
EXPIRES: 12–31–13

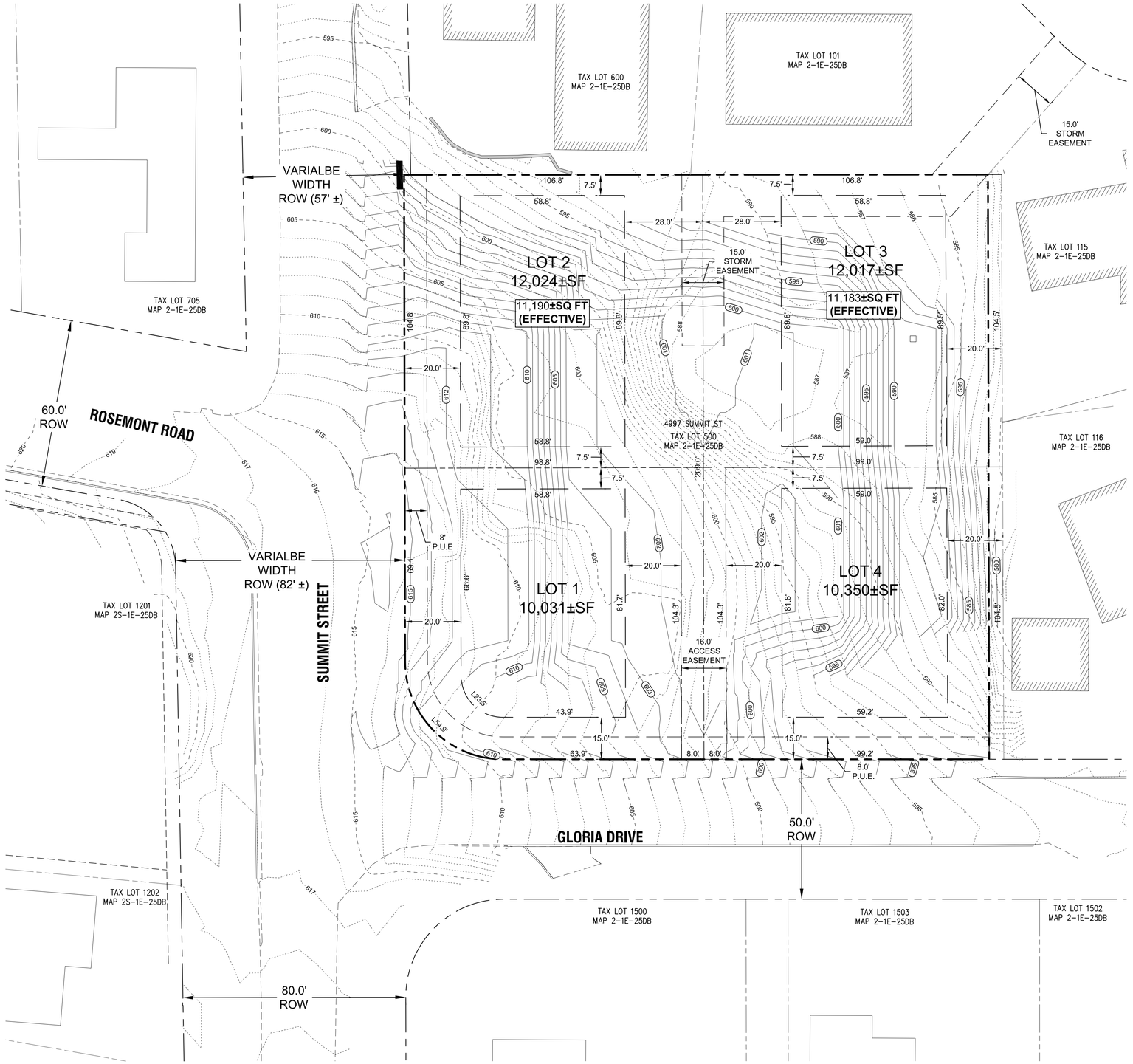
3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
10445 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-8365

3J JOB ID #	13123
LAND USE #	____
TAX LOT #	2S1E25DB 500
DESIGNED BY	CLF
CHECKED BY	BKF

SHEET TITLE
SLOPE ANALYSIS

SHEET NUMBER
C1.3

TAX LOT 500 LOCATED IN THE NW 1/4 & SE 1/4 OF
SECTION 25, T.2S., R.1E., W.M.
CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON



Scale: 1 inch = 20 feet
20 10 0 10 20

LEGEND

- BOUNDARY LINE
- EXISITNG RIGHT-OF-WAY
- EXISTING LOT LINE
- EXISTING CURB
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE

SITE STATISTICS	
SITE ADDRESS	4997 SUMMIT STREET WEST LINN, OR 97068
TAXLOT	2S1E25DB 500
JURISDICTION	CITY OF WEST LINN
GROSS SITE AREA	1.02 ACRES
PROPERTY ZONING	R-10
FLOOD HAZARD MAP NUMBER	41005C0257D ZONE X (UNSHADED)

SUBDIVISION STATISTICS	
RIGHT OF WAY DEDICATION	3,132 SF
MINIMUM ALLOWABLE EFFECTIVE LOT SIZE	10,000 SF
MINIMUM LOT DENSITY	3.2 UNITS
MAXIMUM LOT DENSITY	4.58 UNITS
PROPOSED LOT DENSITY	4.21 UNITS/ NET ACRE
MINIMUM LOT DENSITY (PER R-10 ZONING)	3.05 UNITS/ NET ACRE
MAXIMUM LOT DENSITY (PER R-10 ZONING)	4.35 UNITS/ NET ACRE
SETBACKS:	
FRONT	20 FEET
SIDE	7.5 FEET
REAR	20 FEET
STREET SIDE	15 FEET
MAX. HEIGHT	35 FEET

PROJECT TEAM

OWNER/APPLICANT
LF 10, LLC
C/O: J.T. SMITH COMPANIES
5285 MEADOWS ROAD, SUITE #171
LAKE OSWEGO, OR 97035
CONTACT: JOHN WYLAND
jwyland@jtsmithco.com

CIVIL ENGINEER
3J CONSULTING, INC.
10445 SW CANYON ROAD, SUITE 245
BEAVERTON, OR 97005
CONTACT: BRIAN FEENEY
PHONE: (503) 946-9365
brian.feeney@3j-consulting.com

PLANNING CONSULTANT
3J CONSULTING, INC
10445 SW CANYON ROAD, SUITE 245
BEAVERTON, OR 97005
CONTACT: ANDREW TULL
PHONE: 503-946-9365
EMAIL: andrew.tull@3j-consulting.com

GEOTECHNICAL CONSULTANT
GEOPACIFIC ENGINEERING, INC.
14835 SW 72ND AVENUE
PORTLAND, OR 97224
CONTACT: SCOTT HARDMAN
PHONE: (503) 625-4455
shardman@geopacificeng.com

LAND SURVEYOR
COMPASS SURVEYING
4107 SE INTERNATIONAL WAY, SUITE 705
MILWAUKIE, OR 97222
CONTACT: DON DEVLAEMINCK, PLS
PHONE: 503-653-9093
dond@compass-engineering.com

CHECK SET

#	REVISION SUMMARY	BY	DATE
			10/01/13

TENTATIVE SUBDIVISION PLAT
HARPER'S TERRACE SUBDIVISION
LF 10, LLC
WEST LINN, OR

J.T. SMITH companies

REGISTERED PROFESSIONAL ENGINEER
58088
OREGON
JULY 15, 2003
BRIAN K. FEENEY
PRELIMINARY
EXPIRES: 12-31-13

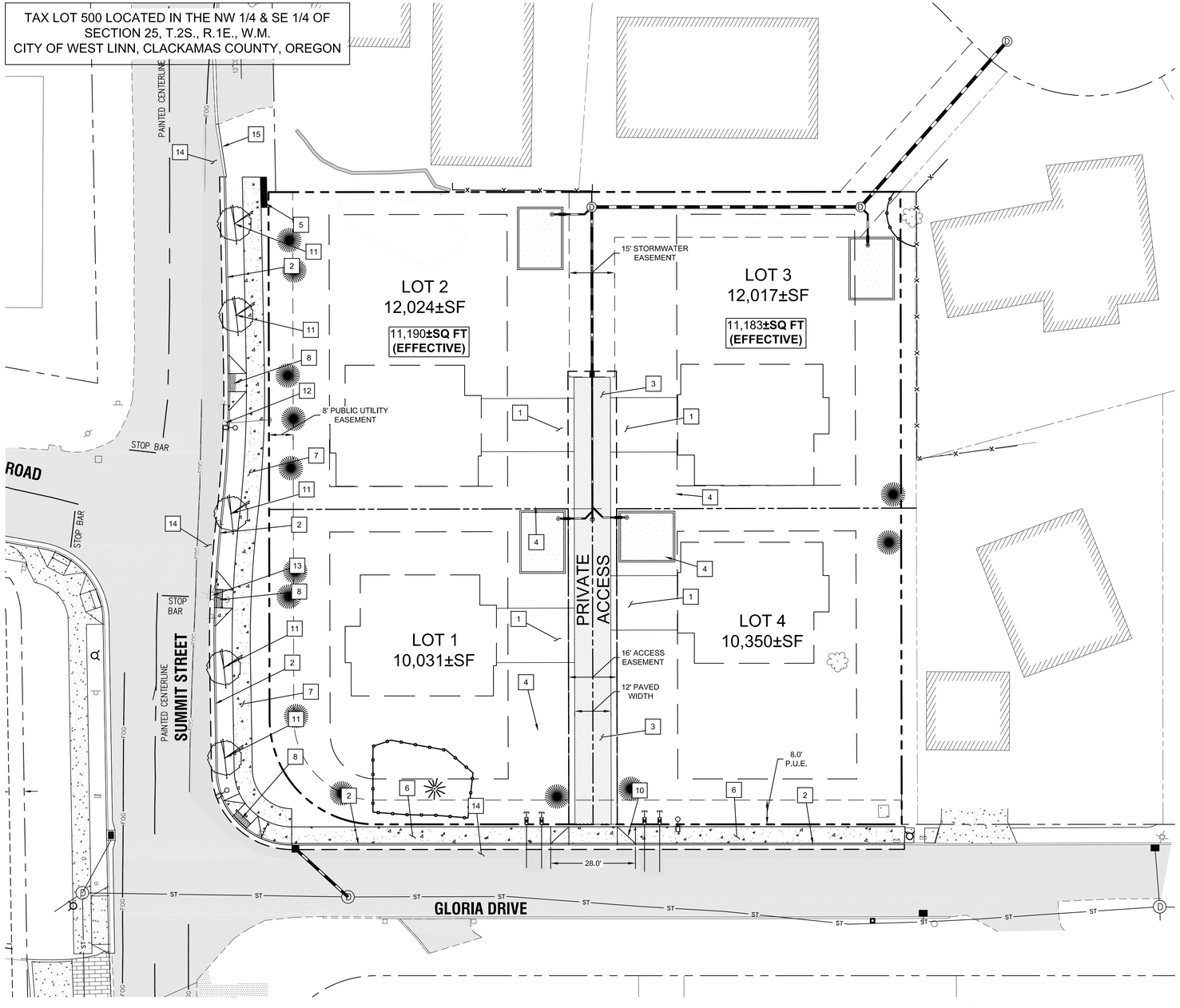
3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
10445 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

3J JOB ID #	13123
LAND USE #	____
TAX LOT #	2S1E25DB 500
DESIGNED BY	CLF
CHECKED BY	BKF

SHEET TITLE
SUBDIVISION PLAT

SHEET NUMBER
C2.0

TAX LOT 500 LOCATED IN THE NW 1/4 & SE 1/4 OF SECTION 25, T.2S., R.1E., W.M.
CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON

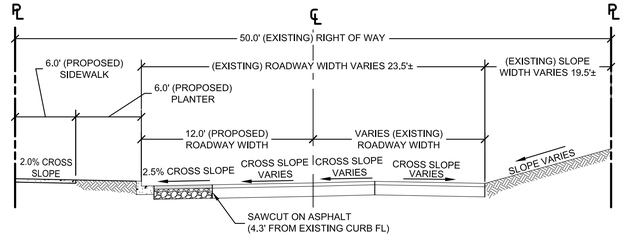


LEGEND

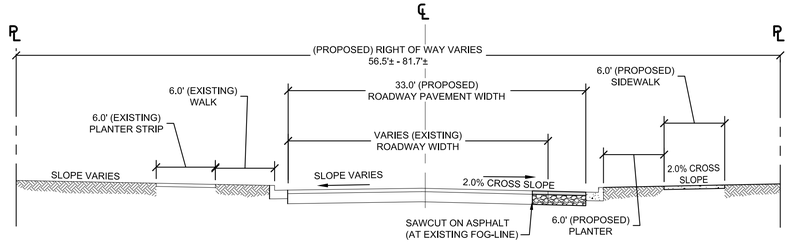
- BOUNDARY LINE
- RIGHT-OF-WAY
- EXISTING CENTERLINE
- EXISTING EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CURB AND GUTTER
- EXISTING EDGE OF WETLAND
- EXISTING EDGE OF CREEK
- EXISTING TREES TO REMAIN
- EXISTING ASPHALT
- EXISTING SIDEWALK
- EXISTING LIGHT POLE
- EXISTING TRAFFIC SIGN
- EXISTING FIRE HYDRANT
- PROPOSED LOT LINE
- PROPOSED BUILDING SETBACK
- PROPOSED CURB AND GUTTER
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- PROPOSED PERVIOUS CONCRETE
- PROPOSED RAIN GARDEN
- PROPOSED RETAINING WALL
- PROPOSED STREET FRONTAGE TREE
- PROPOSED ACCESS / UTILITY EASEMENT
- PERMANENTLY STABILIZE APPROX. 440 SF OF DISTURBED AREA WITHIN STRUCTURAL SETBACK

CONSTRUCTION KEY NOTES

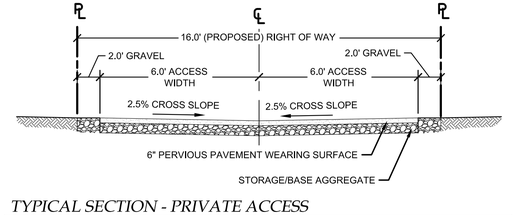
1. PROPOSED LOT ACCESS LOCATION
2. CONSTRUCT STANDARD CURB AND GUTTER PER CITY OF WEST LINN STANDARD DETAIL WL-501 (TYPICAL CURBS).
3. PROPOSED PERVIOUS PAVEMENT ACCESS / DRIVEWAY. SEE "PRIVATE ACCESS" TYPICAL SECTION DETAIL THIS SHEET.
4. CONSTRUCT RAIN GARDEN FOR STORM WATER MANAGEMENT. SEE C3.0 FOR UTILITY CONNECTIONS.
5. CONSTRUCT 10 LF OF MODULAR BLOCK WALL FOR GRADE RETENTION. MAXIMUM 3 FT EXPOSED WALL HEIGHT (NON-STRUCTURAL).
6. CONSTRUCT 6 FT WIDE CURB TIGHT SIDEWALK PER CITY OF WEST LINN STANDARD DETAIL WL-508 (CONCRETE SIDEWALK CROSS SECTION).
7. CONSTRUCT 6 FT WIDE DETACHED SIDEWALK PER CITY OF WEST LINN STANDARD DETAIL WL-508 (CONCRETE SIDEWALK CROSS SECTION).
8. CONSTRUCT CURB RAMP PER CITY OF WEST LINN STANDARD DETAIL WL-506A (PARALLEL CURB RAMP).
9. CONSTRUCT CURB RAMP PER CITY OF WEST LINN STANDARD DETAIL WL-507A (SINGLE CURB RAMP).
10. CONSTRUCT SINGLE RESIDENTIAL DRIVEWAY ACCESS TO GLORIA DRIVE (28FT) PER CITY OF WEST LINN STANDARD DETAIL WL-503B (RESIDENTIAL DRIVEWAY WITH SIDEWALK ADJACENT TO CURB).
11. INSTALL STREET TREE AT LOCATION SHOWN.
12. RELOCATE EXISTING SUPPORT POLE TO ADJACENT PROPOSED LANDSCAPE STRIP. COORDINATE WITH PGE.
13. RELOCATE EXISTING POWER POLE TO ADJACENT PROPOSED LANDSCAPE STRIP. COORDINATE WITH PGE.
14. INSTALL NEW PAVEMENT.
15. INSTALL 8" WIDE BY 4" TALL ASPHALT PAVEMENT BERM FROM END OF PROPOSED CONCRETE CURB AND GUTTER, AND CONNECT TO EXISTING PAVEMENT BERM.



TYPICAL SECTION - GLORIA DRIVE IMPROVEMENTS
SCALE: N.T.S



TYPICAL SECTION - SUMMIT STREET
SCALE: N.T.S



TYPICAL SECTION - PRIVATE ACCESS
SCALE: N.T.S

811 Know what's **below.** **Call** before you dig.

Scale: 1 inch = 20 feet
20 10 0 10 20

CHECK SET	REVISION SUMMARY	BY	DATE
			10/01/13

SITE PLAN
HARPER'S TERRACE SUBDIVISION
LF 10, LLC
WEST LINN, OR

J.T. SMITH companies

REGISTERED PROFESSIONAL ENGINEER 58041 OREGON JULY 15, 2005 BRIAN K. FEENEY
PRELIMINARY
EXPIRES: 12-31-13

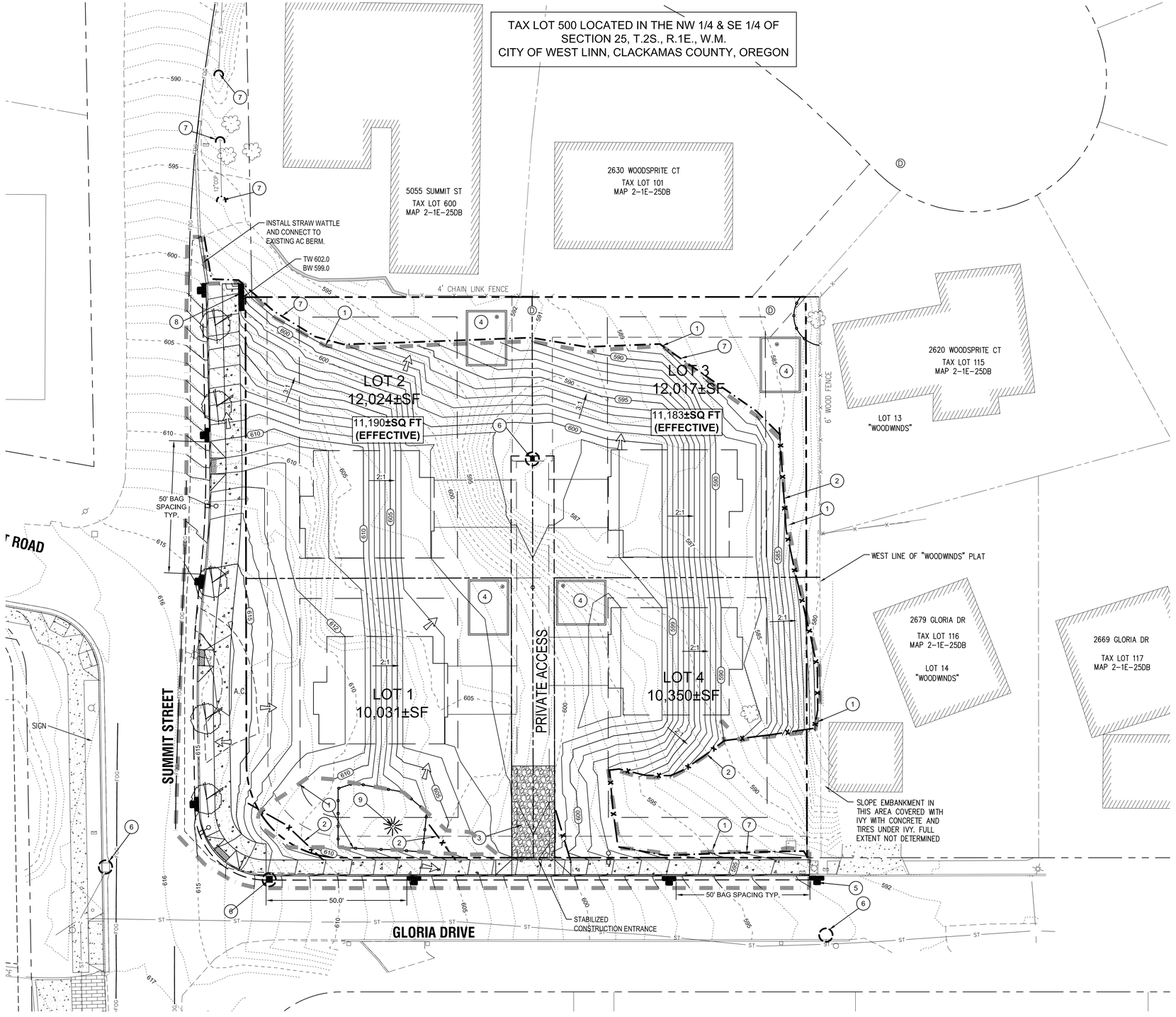
3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
10445 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

3J JOB ID #	13123
LAND USE #	____
TAX LOT #	2S1E25DB 500
DESIGNED BY	CLF
CHECKED BY	BKF

SHEET TITLE
SITE PLAN

SHEET NUMBER
C2.1

TAX LOT 500 LOCATED IN THE NW 1/4 & SE 1/4 OF
SECTION 25, T.2S., R.1E., W.M.
CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON



LEGEND

- BOUNDARY LINE
- EXISTING RIGHT-OF-WAY
- EXISTING CENTERLINE
- EXISTING EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CURB AND GUTTER
- EXISTING SIDEWALK
- EXISTING TREES TO REMAIN
- EXISTING 1FT CONTOUR
- EXISTING 5FT INDEX CONTOUR
- PROPOSED LOT LINE
- PROPOSED CURB AND GUTTER
- PROPOSED CONCRETE
- PROPOSED RETAINING WALL
- PROPOSED STREET FRONTAGE TREE
- PROPOSED 1FT CONTOUR
- PROPOSED 5FT INDEX CONTOUR
- EROSION CONTROL: SILT FENCING (BLACK)
- EROSION CONTROL: FESCUE STRAW WATTLE
- EROSION CONTROL: BIO BAG CHECK DAM
- EROSION CONTROL: CONSTRUCTION ENTRANCE
- LIMITS OF GRADING/DISTURBANCE
- SURFACE RUN-OFF FLOW ARROW
- EROSION CONTROL: INLET PROTECTION
- TREE PROTECTION FENCING

SITE GRADING INFORMATION	
NEAT LINE CUT	364 CY
NEAT LINE FILL	4700 CY
MAXIMUM PROPOSED SLOPE	2:1 (H:V)
TOTAL AREA OF DISTURBANCE	0.97 ACRES

GRADING KEY NOTES

1	PLACE TREE PROTECTION FENCING AT LIMITS OF GRADING AND CONSTRUCTION WHERE SHOWN
2	PLACE SILT FENCING AT LIMITS OF GRADING AND CONSTRUCTION WHERE SHOWN
3	STABILIZED CONSTRUCTION ENTRANCE & SHARED DRIVEWAY
4	WALLED STORM WATER PLANTER, FOR INDIVIDUAL LOT RUNOFF CONTROL AND TREATMENT
5	PLACE BIO-BAG CHECK DAM FOR SEDIMENT CONTROL ADJACENT TO ALL NEW CONCRETE WORK WITHIN RIGHT OF WAY
6	INSTALL INLET PROTECT
7	INSTALL STRAW WATTLE
8	INSTALL CAST IN PLACE CONCRETE RETAINING WALL. HEIGHT AS NOTED.
9	ALL GRADING AND DISTURBANCE ACTIVITIES ADJACENT TO TREES THAT ARE TO REMAIN, SHALL BE COMPLETED UNDER SUPERVISION AND DIRECTION BY THE PROJECT ARBORIST AND THE CITY OF WEST LINN.

GRADING GENERAL NOTES:

1. ALL GRADING ACTIVITIES SHALL CONFORM TO THE UNIFORM BUILDING CODE AND THE OREGON SPECIALTY CODE AMENDMENTS, INCLUDING APPENDIX J.
2. ALL PROPOSED WATTLES, CHECK DAMS AND SILT FENCING SHALL BE MOVED WHILE CONSTRUCTION PROGRESSES IN ORDER MAINTAIN PROPER EROSION CONTROL PREVENTION.
3. ALL PROPOSED WATTLES, CHECK DAMS AND SILT FENCING SHALL BE INSTALLED AT GRADING EXTENTS, AND OR AT 50' INTERVALS, UNLESS NOTED OTHERWISE ON PLANS.

Scale: 1 inch = 20 feet
20 10 0 10 20

Know what's **below.**
Call before you dig.

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10/01/13
REVISION SUMMARY | BY | DATE
#

GRADING AND EROSION CONTROL PLAN
HARPER'S TERRACE SUBDIVISION
LF 10, LLC
WEST LINN, OR

J.T. SMITH companies

REGISTERED PROFESSIONAL ENGINEER
580
OREGON
JULY 15, 2003
BRIAN K. FEENEY
PRELIMINARY
EXPIRES: 12-31-13

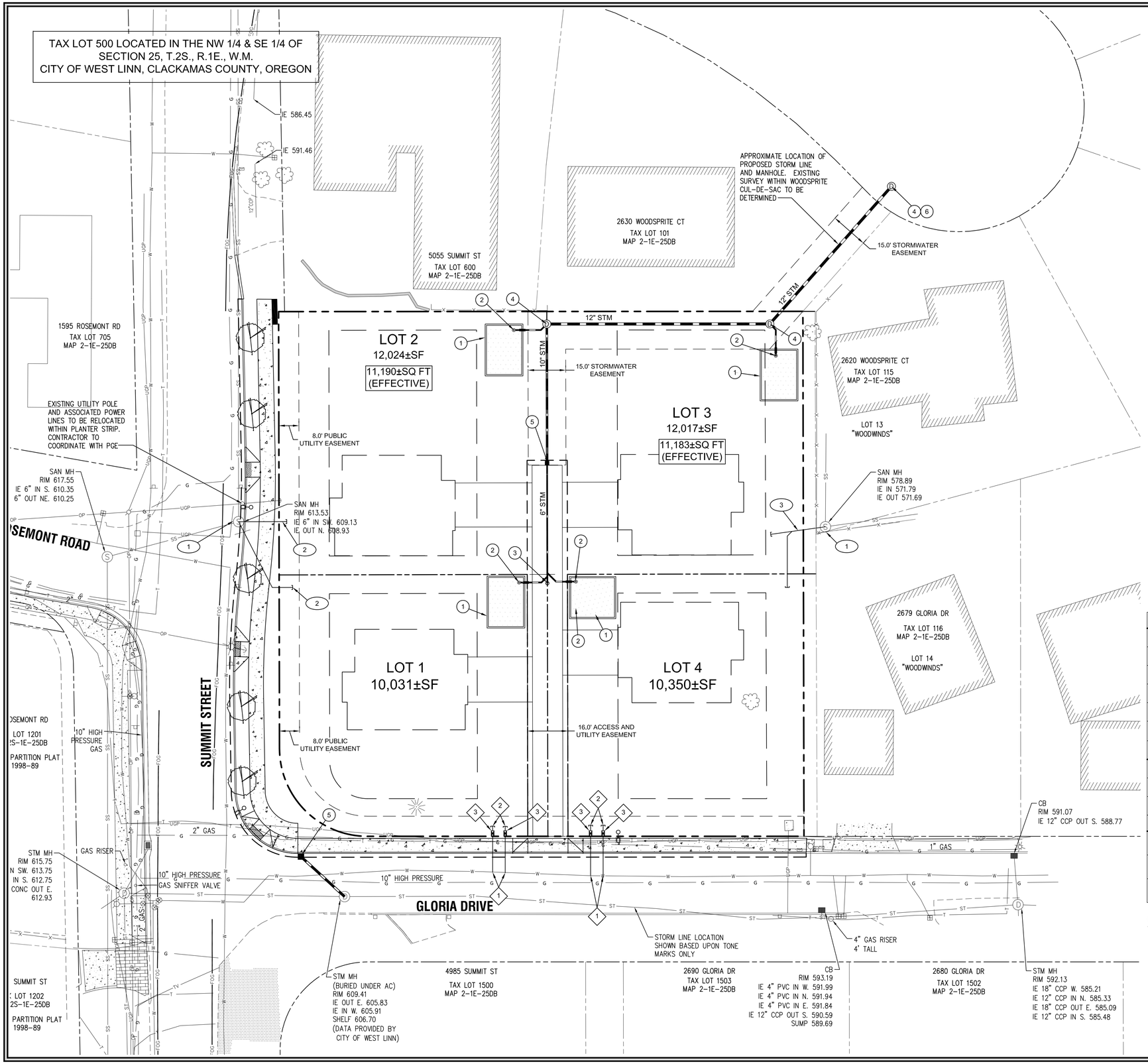
3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
10445 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

3J JOB ID #	13123
LAND USE #	____
TAX LOT #	2S1E25DB 500
DESIGNED BY	CLF
CHECKED BY	BKF

SHEET TITLE
GRADING / ESCP

SHEET NUMBER
C2.2

TAX LOT 500 LOCATED IN THE NW 1/4 & SE 1/4 OF SECTION 25, T.2S., R.1E., W.M.
CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON



Scale: 1 inch = 20 feet
20 10 0 10 20

LEGEND

- BOUNDARY LINE
- EXISITNG RIGHT-OF-WAY
- EXISTING CENTERLINE
- EXISTING LOT LINE
- EXISTING CURB
- EXISTING SIDEWALK
- EXISTING LIGHT POLE
- EXISTING TRAFFIC SIGN
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE
- EXISTING CATCHBASIN
- EXISTING TREES TO REMAIN
- PROPOSED RIGHT-OF-WAY
- PROPOSED LOT LINE
- PROPOSED CURB
- PROPOSED SIDEWALK
- PROPOSED SETBACK LINE
- STORM DRAIN LINE AND MANHOLE
- DOMESTIC WATER SERVICE & METER
- STORM SEWER LATERAL AS NOTED
- SANITARY SEWER LATERAL AS NOTED
- PROPOSED CLEAN-OUT
- STORM SEWER CURB INLET
- PROPOSED STREET LIGHT
- PROPOSED RETAINING WALL
- UTILITY/ACCESS EASEMENT
- TREE PRESERVATION EASEMENT
- PROPOSED STREET FRONTAGE TREE
- PROPOSED RAIN GARDEN

STORM SEWER CONSTRUCTION NOTES

1	STORMWATER INFILTRATION PLANTER FOR MANAGEMENT OF FUTURE PROPERTY IMPROVEMENTS.
2	ROUTE WATER QUALITY PLANTER OVERFLOWS TO PROPOSED STORMWATER LINE
3	INSTALL 6" CLEAN OUT AS SPECIFIED.
4	CONSTRUCT STANDARD 48" STORM SEWER MANHOLE.
5	CONSTRUCT CURB INLET WITH 10" STORM LINE.
6	CONSTRUCT 12" STORM LINE FROM PROPOSED 48" MANHOLE TO EXISTING STORM SYSTEM WITHIN CUL-DE-SAC.

SANITARY SEWER CONSTRUCTION NOTES

1	CONNECT TO EXISTING SANITARY SEWER MANHOLE. CONTRACTOR TO COORDINATE WITH CITY OF WEST LINN PUBLIC WORKS.
2	PROVIDE 4" SANITARY SEWER LATERALS FOR LOTS #1 AND #2 AT LOCATIONS SHOWN. EXTEND SERVICE LATERAL 3' BEYOND PUE.
3	PROVIDE 4" SANITARY SEWER LATERALS FOR LOTS #3 AND #4 AT LOCATIONS SHOWN. EXTEND SERVICE LATERAL 3' BEYOND PUE.

WATER CONSTRUCTION NOTES

1	CONNECT TO EXISTING CITY WATER MAIN. CONTRACTOR TO COORDINATE WITH CITY OF WEST LINN PUBLIC WORKS.
2	PROVIDE 1" WATER SERVICE LINE TO LOCATION SHOWN.
3	INSTALL SINGLE WATER METER FOR INDIVIDUAL LOT SERVICE. EXTEND 1" SERVICE LATERAL 3' BEYOND PUE.

GENERAL SITE NOTES

1. WATER QUALITY TREATMENT AND STORM WATER QUANTITY ATTENUATION FOR FUTURE HOMES TO BE HANDLED INDIVIDUALLY ON A PER LOT BASIS.
2. ALL OVERHEAD UTILITIES TO BE ROUTED UNDERGROUND ALONG PROJECT FRONTAGE.
3. EXISTING TOPOGRAPHY WITHIN WOODSPRITE COURT IS YET TO BE DETERMINED. PROPOSED STORM CONNECTION IS APPROXIMATE, AND EXISTING UTILITY TIE-IN LOCATIONS TO BE DETERMINED IN THE FUTURE.

Know what's **below.** **Call** before you dig.

CHECK SET

#	REVISION SUMMARY	BY	DATE
			10/01/13

COMPOSITE UTILITY PLAN
HARPER'S TERRACE SUBDIVISION
LF 10, LLC
WEST LINN, OR

J.T. SMITH companies

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 15, 2005
BRIAN K. FEENEY
PRELIMINARY
EXPIRES: 12-31-13

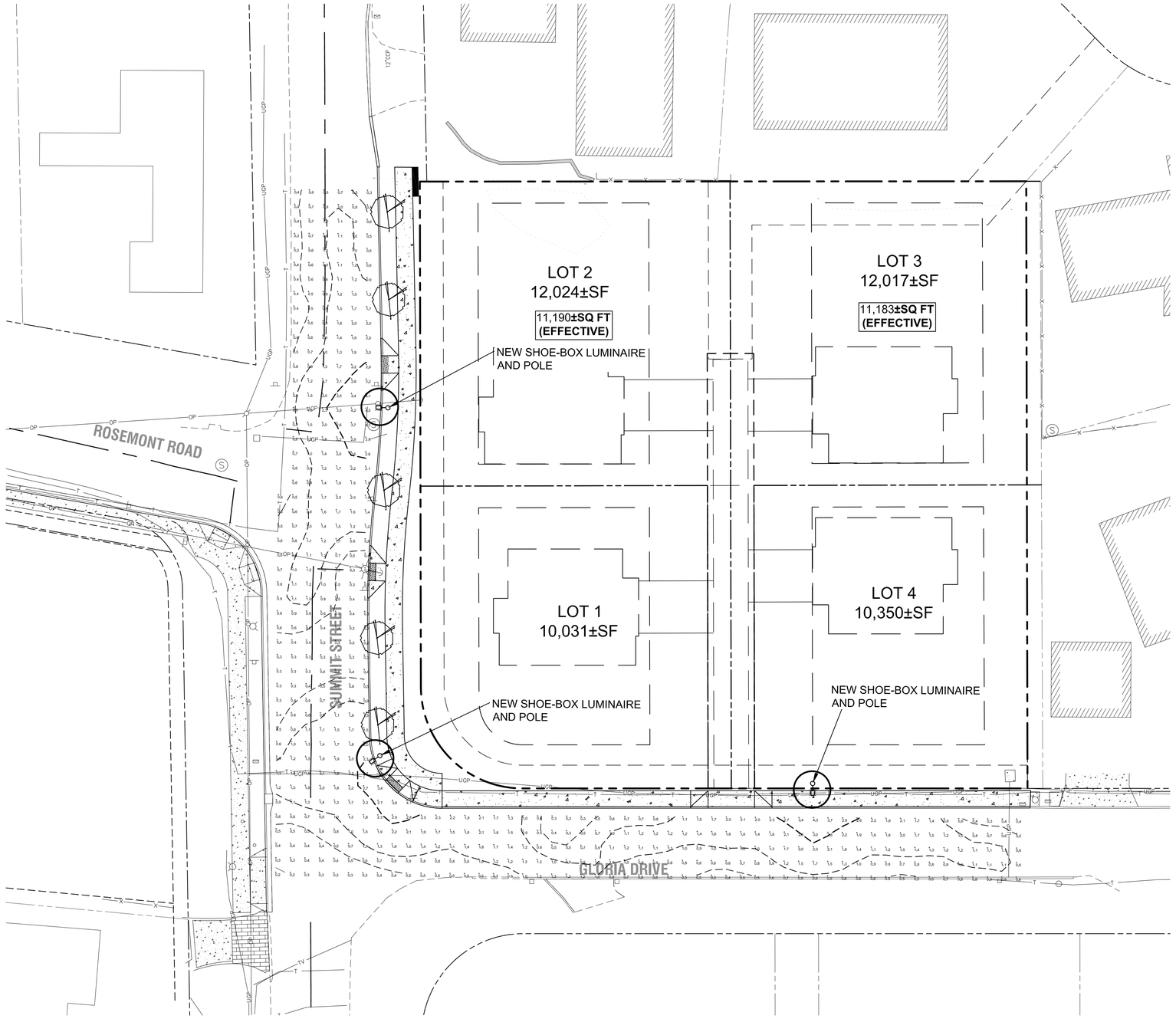
3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
10445 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

3J JOB ID #	13123
LAND USE #	____
TAX LOT #	2S1E25DB 500
DESIGNED BY	CLF
CHECKED BY	BKF

SHEET TITLE
UTILTIY PLAN

SHEET NUMBER
C3.0

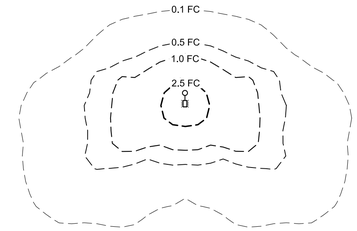
TAX LOT 500 LOCATED IN THE NW 1/4 & SE 1/4 OF
SECTION 25, T.2S., R.1E., W.M.
CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON



Scale: 1 inch = 20 feet
20 10 0 10 20

LEGEND

- SUBDIVISION BOUNDARY LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY LINE
- PROPOSED LOT LINE
- 0.7 FC - ILLUMINATION ANALYSIS POINT (FC)
- FOOT CANDLE UNIT



STREET LIGHTING STATISTICS

ROAD CLASSIFICATION (SUMMIT ST)	COLLECTOR
ROAD CLASSIFICATION (GLORIA DR)	LOCAL
EXISTING LIGHT(S) INCLUDED	0
MAX. ILLUMINATION	4.5FC
MIN. ILLUMINATION	0.2FC
AVERAGE ILLUMINATION	1.15FC
UNIFORMITY (AVG/MIN)	5.75

CHECK SET

#	REVISION SUMMARY	BY	DATE
			10/01/13

STREET LIGHTING PLAN
HARPER'S TERRACE SUBDIVISION
LF 10, LLC
WEST LINN, OR

J.T. SMITH companies

REGISTERED PROFESSIONAL ENGINEER
58041
OREGON
JULY 15, 2005
BRIAN K. FEENEY
PRELIMINARY
EXPIRES: 12-31-13

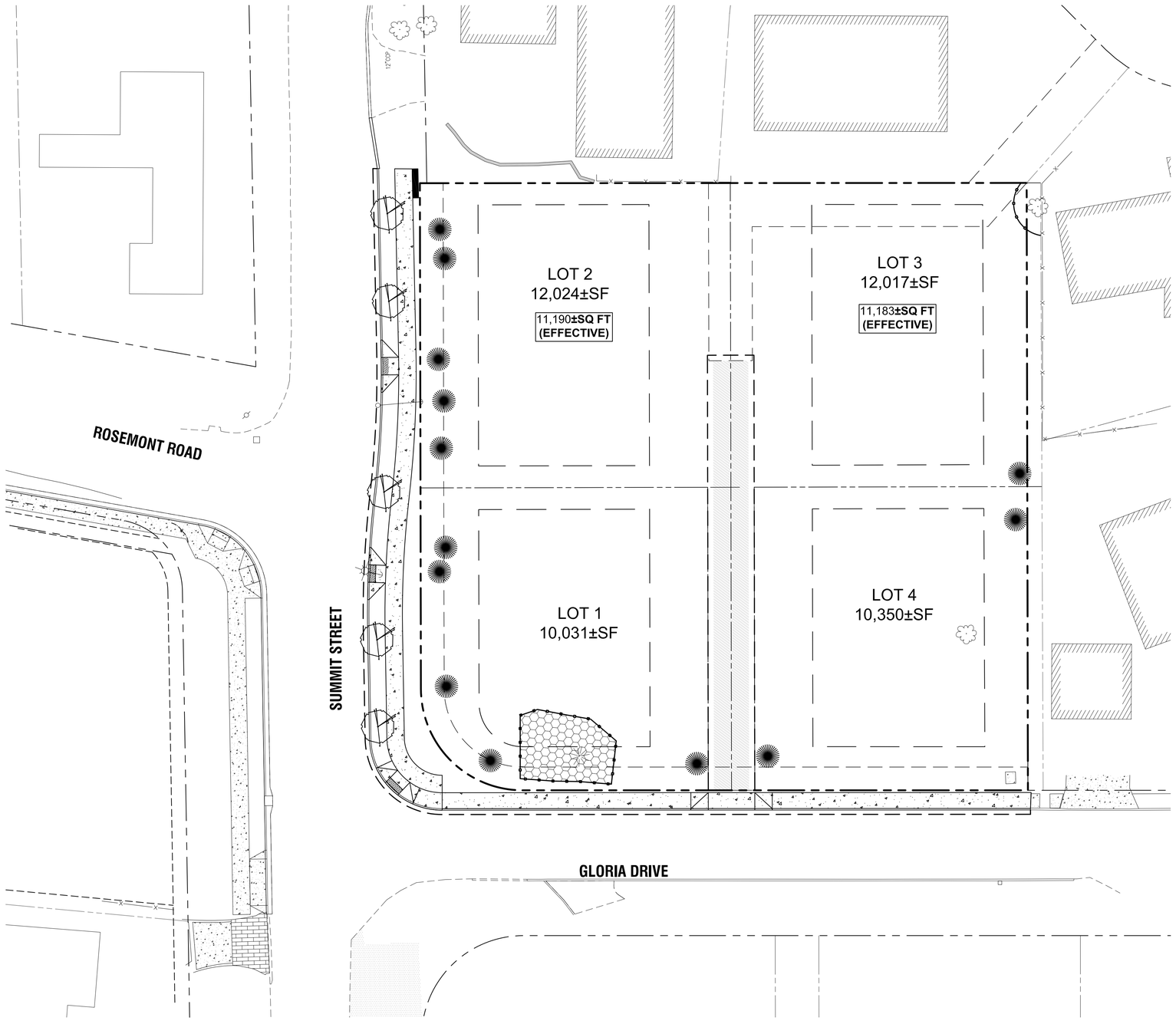
3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
10445 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

3J JOB ID #	13123
LAND USE #	____
TAX LOT #	2S1E25DB 500
DESIGNED BY	CLF
CHECKED BY	BKF

SHEET TITLE
LIGHTING PLAN

SHEET NUMBER
C3.1

TAX LOT 500 LOCATED IN THE NW 1/4 & SE 1/4 OF
SECTION 25, T.2S., R.1E., W.M.
CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON



Scale: 1 inch = 20 feet
20 10 0 10 20

LEGEND

- SUBDIVISION BOUNDARY LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY LINE
- PROPOSED RIGHT OF WAY
- PROPOSED LOT LINE
- PROPOSED EASEMENT
- PROPOSED SETBACK LINE
- TREE PROTECTION FENCING
- PROPOSED ASPHALT PAVING
- PROPOSED CONCRETE PAVING
- PROPOSED TREE PRESERVATION EASEMENT

PLANT MATERIALS SCHEDULE

COMMON NAME	BOTANICAL NAME	SIZE	SPACING	QUANTITY
SCARLET OAK	QUERCUS COCCINIA	2" CAL.	22' MIN	5
WESTERN RED CEDAR	THUJA PLICATA	2" CAL.	12' MIN	13

TOTAL PROPOSED TREE COUNT: 18
TOTAL MITIGATION REQURIEMENT: 36" (CALIPER MEASUREMENT)

GENERAL LANDSCAPING NOTES

1. LANDSCAPE PLANTING SHALL CONFIRM TO THE STANDARDS ESTABLISHED UNDER THE WEST LINN STANDARDS FOR LANDSCAPE PLANTING
2. ALL PLANT BEDS SHALL HAVE A 3" DEPTH OF BARK MULCH
3. ALL PLANT MATERIAL DELIVERED TO THIS SITE SHALL MEET THE AMERICAN NURSERYMAN'S ASSOCIATION STANDARDS.
4. CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ALL PLANT MATERIAL SUBSTITUTIONS FROM THE CIVIL ENGINEER PRIOR TO INSTALLATION. PLANT SUBSTITUTIONS WITHOUT PRIOR WRITTEN APPROVAL THAT DO NOT COMPLY WITH THE DRAWINGS AND SPECIFICATIONS MAY BE REJECTED BY THE LANDSCAPE ARCHITECT AT NO COST TO THE OWNER. THESE ITEMS MAY BE REQUIRED TO BE REPLACED WITH PLANT MATERIALS THAT ARE IN COMPLIANCE WITH THESE DRAWINGS.

CHECK SET

#	REVISION SUMMARY	BY	DATE
			10/01/13

MITIGATION PLANTING PLAN
HARPER'S TERRACE SUBDIVISION
LF 10, LLC
WEST LINN, OR

J.T. SMITH companies

REGISTERED PROFESSIONAL ENGINEER
5801
OREGON
JANUARY 15, 2003
BRIAN K. FEENEY
PRELIMINARY
EXPIRES: 12-31-13

3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
10445 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

3J JOB ID #	13123
LAND USE #	____
TAX LOT #	2S1E25DB 500
DESIGNED BY	CLF
CHECKED BY	BKF

SHEET TITLE
MITIGATION PLAN

SHEET NUMBER
L1.0