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	PROJECT NO(S).	
NON-REFUNDABLE FEE(S)	REFUNDABLE DEPOSIT(S)	TOTAL

Type of Review (Please check all that apply):

- ☐ Annexation (ANX)
- ☐ Appeal and Review (AP) *
- ☐ Conditional Use (CUP)
- ☐ Design Review (DR)
- ☐ Easement Vacation
- ☐ Extraterritorial Ext. of Utilities
- ☐ Final Plat or Plan (FP)
- ☐ Flood Management Area
- ☐ Hillside Protection & Erosion Control
- ☐ Historic Review
- ☐ Legislative Plan or Change
- ☐ Lot Line Adjustment (LLA) */**
- ☒ Minor Partition (MIP) (Preliminary Plat or Plan)
- ☐ Non-Conforming Lots, Uses & Structures
- ☐ 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: 23451 SALAMO ROAD, WEST LINN

Assessor's Map No.: 21E35AC
Tax Lot(s): 00900
Total Land Area: 0.66 Acres

Brief Description of Proposal: APPLICANT PROPOSES A 3 LOT PARTITION

Applicant Name: (please print) JT SMITH COMPANIES — 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) ~~JT SMITH COMPANIES~~ – LFG, 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

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: 5/20/13
Owner's signature *(required)* — Date: 5/20/13

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Appendixes

GENERAL INFORMATION

Property Owner and Applicant:	JT Smith Companies John Wyland, Director of Land Development 5285 Meadows Road, Suite #171 Lake Oswego, OR 97035 Phone: 503-209-7555 Email: jwyland@jtsmithco.com
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

SITE INFORMATION

Tax Lot ID:	2S1E35AC00900
Address:	23451 Salamo Road
Size:	0.67 acres
Zoning Designation:	R-7
Neighborhood/Area:	Savanna Oaks
Comprehensive Plan:	Low Density Residential (LDR)
Existing Use:	Single family residential
Street Functional Classifications:	Salamo Road is a minor arterial street and Remington Drive is a local street.
Surrounding Zoning:	This property is surrounded on all sides by R-7 zoning.

INTRODUCTION

APPLICANT'S REQUEST

The Applicant seeks approval of an application for Minor Partition for the development of three residential lots. The Applicant also seeks approval of a Water Resource Area (WRA) Permit. There is an existing home on the property proposed for demolition as part of this development. This narrative describes the proposed partition of the site and documents compliance with the relevant sections of the City of West Linn's Community Development Code ("CDC").

PROPOSED SITE IMPROVEMENTS

The project site consists of a total of 0.67 acres. The property is located west of the intersection of Salamo Road and Remington Drive. Salamo Creek and wetland buffer are adjacent to the property on the north and west side.

The intent of this subdivision is to provide three buildable lots, each exceeding 7,000 square feet in size, for development with single-family homes, a use permitted outright in the R-7 zone.

TRAFFIC AND PARKING

The applicant proposes to realign the existing driveway on Remington Drive to provide access to all 3 lots. A 20-foot wide access easement is proposed. No access is proposed to Salamo Road, a minor arterial. The lot sizes provide ample opportunity for on-site, off-street parking.

A traffic report is not being submitted with this application as it is not warranted for the creation of two additional residential lots.

APPLICABLE CRITERIA

The following sections of West Linn's Code 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, with absolute certainty, that the proposed development has satisfied the approval criteria for Minor Partition and Water Resource Area Permit Approval.

DIVISION 2. ZONING PROVISIONS
CHAPTER 11. SINGLE-FAMILY RESIDENTIAL DETACHED, R-7

11.030 PERMITTED USES
The following are uses permitted outright in this zoning district

1. **Single-family detached residential unit.**

Applicant's Draft Finding: The proposed use in this R-7 zone is single-family detached housing, a use permitted outright in this zone.

The requirements of this section have been satisfied.

11.070 DIMENSIONAL REQUIREMENTS, USES PERMITTED OUTRIGHT AND USES PERMITTED UNDER PRESCRIBED CONDITIONS
Except as may be otherwise provided by the provisions of this code, the following are the requirements for uses within this zone:

1. **The minimum lot size shall be 7,000 square feet for a single-family detached unit.**

Applicant's Draft Finding: The sizes of the 3 proposed lots are 7,000 square feet, 8,795 square feet and 13,272 square feet. All exceed the 7,000 square foot minimum.

The requirements of this section have been satisfied.

2. **The minimum front lot line length or the minimum lot width at the front lot line shall be 35 feet.**

Applicant's Draft Finding: The front lot lines (adjacent to Salamo Road) will be 63 feet, 60 feet and 82 feet in width once the partition is recorded. All 3 exceed the 35 foot minimum requirement.

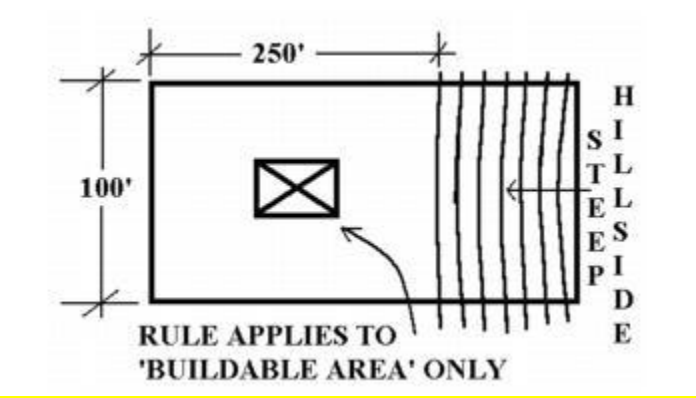
The requirements of this section have been satisfied.

3. **The average minimum lot width shall be 50 feet.**

Applicant's Draft Finding: The average width of Lot 1 is 60 feet, average width of Lot 2 is 55 feet and the average width of Lot 3 is 79 feet. The average minimum lot widths for all lots will exceed the 50 foot minimum.

The requirements of this section have been satisfied.

4. The lot depth comprising non-Type I and II lands shall be less than two and one-half times the width, and more than an average depth of 90 feet. (See diagram below.)



Applicant's Draft Finding: Lots 2 and 3 include the wetland buffer of Salamo Creek, classified as Type II land. Once the wetland buffer is removed, the average depth of Lot 2 is 131 feet. With an average width of 55 feet, 137.5 feet would be the maximum depth permitted. Removal of the wetland buffer from Lot 3 results in an average lot depth of 108 feet. The average width of 79 feet permits a 197.5 foot deep lot. The average depth of Lot 1, which does not contain the wetland buffer, is 103 feet and the average width is 60 feet. Each average lot depth, exclusive of Type II lands, exceeds 90 feet and is less than two-and-one-half times the width of the lot.

The requirements of this section have been satisfied.

5. The minimum yard dimensions or minimum building setback area from the lot line shall be:

a. For the front yard, 20 feet; except for steeply sloped lots where the provisions of CDC 41.010 shall apply; and as specified in CDC 26.040(D) for the Willamette Historic District.

b. For an interior side yard, seven and one-half feet; except as specified in CDC 26.040(D) for the Willamette Historic District.

c. For a side yard abutting a street, 15 feet.

d. For a rear yard, 20 feet.

Applicant's Draft Finding: All minimum yard dimensions and setbacks will be met per this requirement. This will be further verified at time of building permit submittal.

The requirements of this section have been satisfied.

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

7. The maximum lot coverage shall be 35 percent.

8. The minimum width of an accessway to a lot which does not abut a street or a flag lot shall be 15 feet.

9. The floor area ratio shall be 0.45. Type I and II lands shall not be counted toward lot area when determining allowable floor area ratio, except that a minimum floor area ratio of 0.30 shall be allowed regardless of the classification of lands within the property. That 30 percent shall be based upon the entire property including Type I and II lands. Existing residences in excess of this standard may be replaced to their prior dimensions when damaged without the requirement that the homeowner obtain a non-conforming structures permit under Chapter 66 CDC.

Applicant's Draft Finding: The height, lot coverage and floor area ratio of the homes to be built on the lots will meet these standards. This will be verified with building permit review. All lots abut a street.

The requirements of this section have been satisfied.

DIVISION 3. SUPPLEMENTAL PROVISIONS AND EXCEPTIONS

CHAPTER 32. WATER RESOURCE AREA PROTECTION

32.050 APPROVAL CRITERIA

No application for development on property containing a water resource area shall be approved unless the decision-making authority finds that the following standards have been satisfied, or can be satisfied by conditions of approval.

A. Proposed development submittals shall identify all water resource areas on the project site. The most currently adopted Surface Water Management Plan shall be used as the basis for determining existence of drainageways. The exact location of drainageways identified in the Surface Water Management Plan, and drainageway classification (e.g., open channel vs. enclosed storm drains), may have to be verified in the field by the City Engineer. The Local Wetlands Inventory shall be used as the basis for determining existence of wetlands. The exact location of wetlands identified in the Local Wetlands Inventory on the subject property shall be verified in a wetlands delineation analysis prepared for the applicant by a certified wetlands specialist. The Riparian Corridor Inventory shall be used as the basis for determining existence of riparian corridors.

Applicant's Finding: Salamo Creek, the wetland, and wetland buffer are identified on the submitted plans. The included wetlands delineation analysis identifies the location of the wetlands.

The requirements of this section have been satisfied.

B. Proposed developments shall be so designed as to maintain the existing natural drainageways and utilize them as the primary method of stormwater conveyance through the project site unless the most recently adopted West Linn Surface Water Management Plan calls for alternate configurations

(culverts, piping, etc.). Proposed development shall, particularly in the case of subdivisions, facilitate reasonable access to the drainageway for maintenance purposes.

Applicant's Finding: The development has been designed so as to maintain the existing natural drainageway of Salamo Creek. The drainageway is accessed via the Salamo Road and is adjacent to existing City open space.

The requirements of this section have been satisfied.

C. Development shall be conducted in a manner that will minimize adverse impact on water resource areas. Alternatives which avoid all adverse environmental impacts associated with the proposed action shall be considered first. For unavoidable adverse environmental impacts, alternatives that reduce or minimize these impacts shall be selected. If any portion of the water quality resource area is proposed to be permanently disturbed, the applicant shall prepare a mitigation plan as specified in CDC 32.070 designed to restore disturbed areas, either existing prior to development or disturbed as a result of the development project, to a healthy natural state.

Applicant's Finding: The applicant is proposing to preserve the Water Resource Area and avoid all adverse environmental impacts associated with the proposed partition.

The requirements of this section have been satisfied.

D. Water resource areas shall be protected from development or encroachment by dedicating the land title deed to the City for public open space purposes if either: (1) a finding can be made that the dedication is roughly proportional to the impact of the development; or (2) the applicant chooses to dedicate these areas. Otherwise, these areas shall be preserved through a protective easement. Protective or conservation easements are not preferred because water resource areas protected by easements have been shown to be harder to manage and, thus, more susceptible to disturbance and damage. Required 15-foot-wide structural setback areas do not require preservation by easement or dedication.

Applicant's Finding: Dedication of the large swath of land encompassed by the wetland buffer would not be roughly proportional to the addition of the two lots of the partition. The water resource area contained within the wetland buffer will be preserved through a protective easement that will be recorded with the deeds of Lots 2 and 3 and will be on the final recorded plat.

The requirements of this section have been satisfied.

E. The protected water resource area shall include the drainage channel, creek, wetlands, and the required setback and transition area. The setback and transition area shall be determined using Table 32-1.

Applicant's Finding: The slope adjacent to Salamo Creek is less than 25% and, as such, a 50-foot wetland buffer is provided beginning at the identified edge of the wetland. Additionally, a 15-

foot structural setback is proposed from the edge of the 50-foot wetland buffer. This buffer and setback is consistent with the standards identified in Table 32-1.

The requirements of this section have been satisfied.

F. Roads, driveways, utilities, or passive use recreation facilities may be built in and across water resource areas when no other practical alternative exists. Construction shall minimize impacts. Construction to the minimum dimensional standards for roads is required. Full mitigation and revegetation is required, with the applicant to submit a mitigation plan pursuant to CDC 32.070 and a revegetation plan pursuant to CDC 32.080. The maximum disturbance width for utility corridors is as follows:

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

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

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

Applicant's Finding: A very small portion of the driveway for Lot 3 may encroach into the 15-foot structural setback. Construction will be done so as to minimize impacts and meet the minimum dimensional standards. The proposed design places the driveway on the buildable portion of the lot to the greatest extent possible while still meeting minimum dimensional standards.

The requirements of this section have been satisfied.

G. Prior to construction, the water resource area shall be protected with an anchored chain link fence (or approved equivalent) at its perimeter and shall remain undisturbed except as specifically allowed by an approved water resource area permit. Such fencing shall be maintained until construction is complete. The water resource area shall be identified with City-approved permanent markers at all boundary direction changes and at 30- to 50-foot intervals that clearly delineate the extent of the protected area.

Applicant's Finding: Fencing will be provided prior to construction consistent with these standards.

The requirements of this section have been satisfied.

H. Paved trails, walkways, or bike paths shall be located at least 15 feet from the edge of a protected water feature except for approved crossings. All trails, walkways, and bike paths shall be constructed so as to minimize disturbance to existing native vegetation. All trails, walkways, and bike paths shall be constructed with a permeable material and utilize low impact development (LID) construction practices.

Applicant's Finding: No trails, walkways or bike paths are proposed within the water resource area.

The requirements of this section have been satisfied.

I. Sound engineering principles regarding downstream impacts, soil stabilization, erosion control, and adequacy of improvements to accommodate the intended drainage through the drainage basin shall be used. Storm drainage shall not be diverted from its natural watercourse. Inter-basin transfers of storm drainage shall not be permitted.

Applicant's Finding: Sound engineering principles will be used and storm drainage will not be diverted from its natural watercourse.

The requirements of this section have been satisfied.

J. Appropriate erosion control measures based on Chapter 31 CDC requirements shall be established throughout all phases of construction.

Applicant's Finding: All appropriate erosion control measures will be established and maintained throughout all phases of construction.

The requirements of this section have been satisfied.

K. Vegetative improvements to areas within the water resource area may be required if the site is found to be in an unhealthy or disturbed state, or if portions of the site within the water resource area are disturbed during the development process. "Unhealthy or disturbed" includes those sites that have a combination of native trees, shrubs, and groundcover on less than 80 percent of the water resource area and less than 50 percent tree canopy coverage in the water resource area. Vegetative improvements will be documented by submitting a revegetation plan meeting CDC 32.080 criteria that will result in the water resource area having a combination of native trees, shrubs, and groundcover on more than 80 percent of its area, and more than 50 percent tree canopy coverage in its area. Where any existing vegetation is proposed to be permanently removed, or the original land contours disturbed, a mitigation plan meeting CDC 32.070 criteria shall also be submitted. Interim erosion control measures such as mulching shall be used to avoid erosion on bare areas. Upon approval of the mitigation plan, the applicant is responsible for implementing the plan during the next available planting season.

Applicant's Finding: The water resource area is in a healthy state and no disturbances are proposed during development.

The requirements of this section have been satisfied.

L. Structural setback area. Where a structural setback area is specifically required, development projects shall keep all foundation walls and footings at least 15 feet from the edge of the water resource area transition and setback area if this area is located in the front or rear yard of the lot, and seven and one-half feet from the edge of the water resource area transition and setback area if this area is located in the side yard of the lot. Structural elements may not be built on or cantilever over the setback area. Roof overhangs of up to three feet are permitted in the setback. Decks are permitted within the structural setback area.

Applicant's Finding: The water resource area (wetland buffer) is located along the proposed front yards of the lots, and therefore a 15-foot setback area is required and proposed.

The requirements of this section have been satisfied.

M. Stormwater treatment facilities may only encroach a maximum of 25 feet into the outside boundary of the water resource area; and the area of encroachment must be replaced by adding an equal area to the water quality resource area on the subject property. Facilities that infiltrate stormwater on site, including the associated piping, may be placed at any point within the water resource area outside of the actual drainage course so long as the forest canopy and the areas within 10 feet of the driplines of significant trees are not disturbed. Only native vegetation may be planted in these facilities.

Applicant's Finding: Individual rain gardens are proposed on each of the 3 lots and no stormwater treatment facility encroachment in the water resource area is proposed.

The requirements of this section have been satisfied.

N. As part of any proposed land division or Class II design review application, any covered or piped drainageways identified on the Surface Water Quality Management Plan Map shall be opened, unless the City Engineer determines that such opening would negatively impact the affected storm drainage system and the water quality within that affected storm drainage system in a manner that could not be reasonably mitigated by the project's site design. The design of the reopened channel and associated transition area shall be considered on an individualized basis, based upon the following factors:

1. **The ability of the reopened storm channel to safely carry storm drainage through the area.**
2. **Continuity with natural contours on adjacent properties.**
3. **Continuity of vegetation and habitat values on adjacent properties.**
4. **Erosion control.**
5. **Creation of filters to enhance water quality.**
6. **Provision of water temperature conducive to fish habitat.**
7. **Consideration of habitat and water quality goals of the most recently adopted West Linn Surface Water Management Plan.**
8. **Consistency with required site mitigation plans, if such plans are needed.**

The maximum required setback under any circumstance shall be the setback required as if the drainageway were already open.

Applicant's Finding: No covered or piped drainageways are part of this development site.

The requirements of this section have been satisfied.

O. The decision-making authority may approve a reduction in applicable front yard setbacks abutting a public street to a minimum of 15 feet and a reduction in applicable side yard setbacks

abutting a public street to seven and one-half feet if the applicant demonstrates that the reduction is necessary to create a building envelope on an existing or proposed lot of at least 5,000 square feet.

Applicant's Finding: The applicant is proposing 20-foot front yard setbacks along Salamo Road.

The requirements of this section have been satisfied.

P. Storm drainage channels not identified on the Surface Water Management Plan Map, but identified through the development review process, shall be subject to the same setbacks as equivalent mapped storm drainage channels. (Ord. 1545, 2007)

Applicant's Finding: The only storm drainage channel identified through development review is Salamo Creek, identified on the Surface Water Management Plan and subject to the setbacks and protections of the Water Resource Area standards.

The requirements of this section have been satisfied.

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 of on-site rain gardens meets non-point source pollution control standards, as shown in the storm drainage analysis 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: As discussed above in the Water Resource Area section, no stormwater detention or treatment facilities are proposed 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: Metro's Native Plant List will be utilized for the stormwater infiltration planters on each lot.

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.

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: Metro's Native Plant List will be utilized for planting within the stormwater infiltration planters on each lot.

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: The clear vision area at the intersection of Salamo Road and Remington Drive includes a mature oak tree with branches greater than 8 feet from the ground. All other clear vision areas will be maintained according to these standrads. Additionally, the intersection of the private driveway accessing the lots and Remington Drive will meet the requirements for accessways less than 24 feet in width.

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 partition 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. The oak tree at the intersection of Salamo Road and Remington Drive is located within the City's right-of-way. While not located on site, this tree would probably be considered to be significant and as such, has been proposed for retention. The vast majority of the other trees on the site will also be preserved, particularly those within the existing tree easement, per the included tree plan and arborist report.

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 several street trees by the City and the City will 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: No changes are proposed in width to the public street right-of way. A planting strip exists along Remington Drive. A curb-tight sidewalk is proposed along Salamo Drive. This development is not multi-family, commercial or public.

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: No topping or trimming of street trees is proposed.

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 yard area surrounding the 3 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 No heritage trees were identified on this site.

Finding:

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 majority of the trees which fall within the existing tree easement and the 50-foot wetland buffer/water resource area will be preserved. Additionally, the significant oak tree at the street intersection will be preserved. In accordance with the recommendations of the project team's arborist's report, three of the existing, mature Douglas Firs within the easement should be removed due to the presence of disease and decay. These trees will be replaced with new plantings, as directed by the project's arborist.

Protection of trees within the easement and buffer areas will be accomplished via the retention of the existing tree preservation easement. The existing easement currently covers 25 percent of the site therefore the minimum required 20 percent set-a-side for significant tree preservation has been exceeded.

The density minimum of 70% of that allowed within the R-7 zone is met with the three-lot proposal. All other development is proposed so as to minimize impacts to trees and resource protection areas.

The requirements of this section have been satisfied.

DIVISION 8. LAND DIVISION

CHAPTER 85. GENERAL PROVISIONS

Section 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. <u>Streets</u>.

1. <u>General</u>. 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 and any adopted updated plans.

An applicant may submit a written request for a waiver of abutting street improvements if the Transportation System Plan 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 propose a fee amount that will be reviewed by the City Manager or the Manager's designee. The City Manager or the Manager's designee will revise the proposed fee as necessary and establish the amount to be paid on a case-by-case basis. The applicant shall pay an in-lieu fee for improvements to the nearest street identified by the City Manager or Manager's designee as necessary and appropriate. The amount of the in-lieu fee shall be roughly proportional to the impact of the development on the street system as determined in subsection (A)(22) of this section.

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: No streets are proposed with this partition application. All 3 lots are adjacent to existing public streets.

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. 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 widths of the existing streets meet the standards set forth in this section and, as such, no right-of-way dedication is proposed or necessary.

The requirements of this section have been satisfied.

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

Applicant's Finding: As stated above, existing streets meet the street width standards based on their classification (Salamo- minor arterial and Remington- local).

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: Street widths have been determined and constructed adjacent to this development.

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 street alignment is proposed with this partition application.

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: Adjacent land on Salamo Road is open space, owned by the City. Adjacent land on Remington has access to Remington, a local street.

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 streets or intersections are proposed with this partition application.

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: As discussed above, the existing streets meet the right-of-way requirements.

The requirements of this section have been satisfied.

11. Cul-de-sacs. Cul-de-sacs are not allowed except as required by topography, slope, site limitations, and lot shapes. Cul-de-sacs shall have maximum lengths of 400 feet and serve no more than 12 dwelling units, unless by variance per Chapter 75 CDC. All cul-de-sacs 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: No cul-de-sacs are proposed with this partition.

The requirements of this section have been satisfied.

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

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: No changes are proposed to grades or curves of any streets.

The requirements of this section have been satisfied.

14. <u>Access to local streets</u>. 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: This property sits at the existing intersection of a local street and a minor arterial. Access to the property is proposed from the local street.

The requirements of this section have been satisfied.

15. <u>Alleys</u>. 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 partition.

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 existing sidewalk along Remington Drive meets City standards. The applicant proposes to install a 6-foot sidewalk along Salamo Drive.

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: A planter strips has been installed along Remington Drive.

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 3 lots will have access to Remington Drive, a public street, either directly or via an access easement.

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 entryway treatments to the partition 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: Street improvements are proposed with this application proportionate to the construction of two new lots. Off-site improvements are not necessary or proportionate to mitigate impacts from this 3-lot partition.

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 and very limited due to Salamo Creek to the west and north. There is no opportunity for connection through this site due to this natural feature.

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: Block lengths are approximately 600 feet in the north and west direction adjacent to this property. Block length is determined by the existence of Salamo Road to the east, Remington Drive to the south and Salamo Creek to the west and north.

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-7 standards are as follows:

Lot Size (Detached Dwelling Units)	**7,000 square feet**
Front Lot Line Length/Minimum Lot Width at Front Lot Line	**35 feet**
Average Minimum Lot Width	**50 feet**
Lot Depth	**> 2.5x Width and < Avg Depth of 90 feet (non-Type I or II)**

Applicant's Finding: All proposed lots exceed 7,000 square feet in size to accommodate single-family detached dwelling units. All 3 proposed lots exceed the minimum requirements for

front lot line length, lot width and lot depth. The lot arrangement proposed keeps the homes as far from the water resource area as possible.

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: Access to all 3 lots is proposed via one driveway on Remington Drive meeting all provisions of Chapter 48.

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: The lines of the proposed lots run at right angles to Salamo Road.

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: All three proposed lots have frontage on Salamo Road and, therefore, no flag lots are proposed.

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 partition, ranging in size from 7,000 square feet to 13,272 square feet, are not large enough for future division in the R-7 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: The existing sidewalk adjacent to this site on Remington Drive and the proposed sidewalk adjacent to this site on Salamo Road will provide pedestrian access adjacent to the site.

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 Finding: The subject property is located in the Horton water pressure zone. There is an 8"DI water main located in Remington Drive for connection. There are already 3 existing water meters installed for service to this property. This plan is consistent with the adopted Comprehensive Water System Plan.

The requirements of this section have been satisfied.

G. <u>Sewer</u>.

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: There is an existing 8"sanitary sewer main in Remington Drive for connection. There are already three sewer laterals installed and ready for service along the frontage of this property.

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: Stormwater infiltration planters are proposed for each lot at time of construction of the homes. The proposed stormwater treatment and detention is designed to meet city standards, as detailed in the submitted storm drainage analysis 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. An existing 8' public utility easement along both frontages of this property will be maintained.

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 provisions of Chapter 32 are addressed previously in this narrative.

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 exist on Remington Drive and on the property along Salamo Road.

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 with 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 improvements that are roughly proportional to the development of a 3-lot partition. 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 proposed partition meets the density requirement even though a land division of three or fewer lots is exempt from this standard.

The R-7 zone permits a maximum density of 6.2 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 is 0.67 acres. At 6.2 dwelling units per net acre, the maximum number of dwelling units on this site is 4.154. The proposed 3 dwelling units would be 72 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-7 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. The site contains and existing tree protection easement which was originally intended to provide protection for a series of Douglas Firs on the property. The applicant's arborist has collaborated with the City's Arborist and has prepared an arborist's report as an addendum to this application. The arborist report details the condition and classification of the trees located on the property. The proposed plans have been designed to reflect the Arborist's recommendations for the protection of existing significant trees.

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.

CHAPTER 92. REQUIRED IMPROVEMENTS

92.010 PUBLIC IMPROVEMENTS FOR ALL DEVELOPMENT

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

A. Streets within subdivisions.

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

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.

92.020 IMPROVEMENTS IN PARTITIONS

The same improvements shall be installed to serve each lot of a partition as are required of a subdivision. However, if the approval authority finds that the nature of development in the vicinity of the partition makes installation of some improvements unreasonable, at the written request of the applicant those improvements may be waived. If the street improvement requirements are waived, the applicant shall pay an in-lieu fee for off-site street improvements, pursuant to the provisions of CDC 85.200(A)(1).

In lieu of accepting an improvement, the Planning Director may recommend to the City Council that the improvement be installed in the area under special assessment financing or other facility extension policies of the City. (Ord. 1192, 1987; Ord. 1287, 1990; Ord. 1442, 1999; Ord. 1544, 2007)

Applicant's Finding: The applicant proposes installation of a 6-foot sidewalk along the site's frontage on Salamo Road and limited sidewalk improvements on Remington Drive. The Applicant is also installing ADA ramps at the intersection of Salamo and Remington. As part of the improvements, the development will remove two street trees along Remington but these trees will be replaced.

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. Who may apply.

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 April 4, 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.

SUMMARY AND CONCLUSION

Based upon the materials submitted herein, the Applicant respectfully requests that the City's Planning Director approve this Partition and Water Resource Area Permit application.

City of West Linn

PRE-APPLICATION CONFERENCE MEETING

Notes

April 4, 2013

SUBJECT: Three lot minor partition at 23451 Salamo Road

ATTENDEES: Applicants: Jeff Smith, John Wyland, Brian Feeney, Andrew Tull
Staff: Peter Spir (Planning Department), Khoi Le (Engineering Division)
Neighborhood representatives: Ed Schwarz and David Rittenhouse, Savanna Oaks N.A.

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. <u>These comments are PRELIMINARY in nature</u>. Please contact the Planning Department with any questions regarding approval criteria, submittal requirements, or any other planning-related items. Please note disclaimer statement below.

General Overview

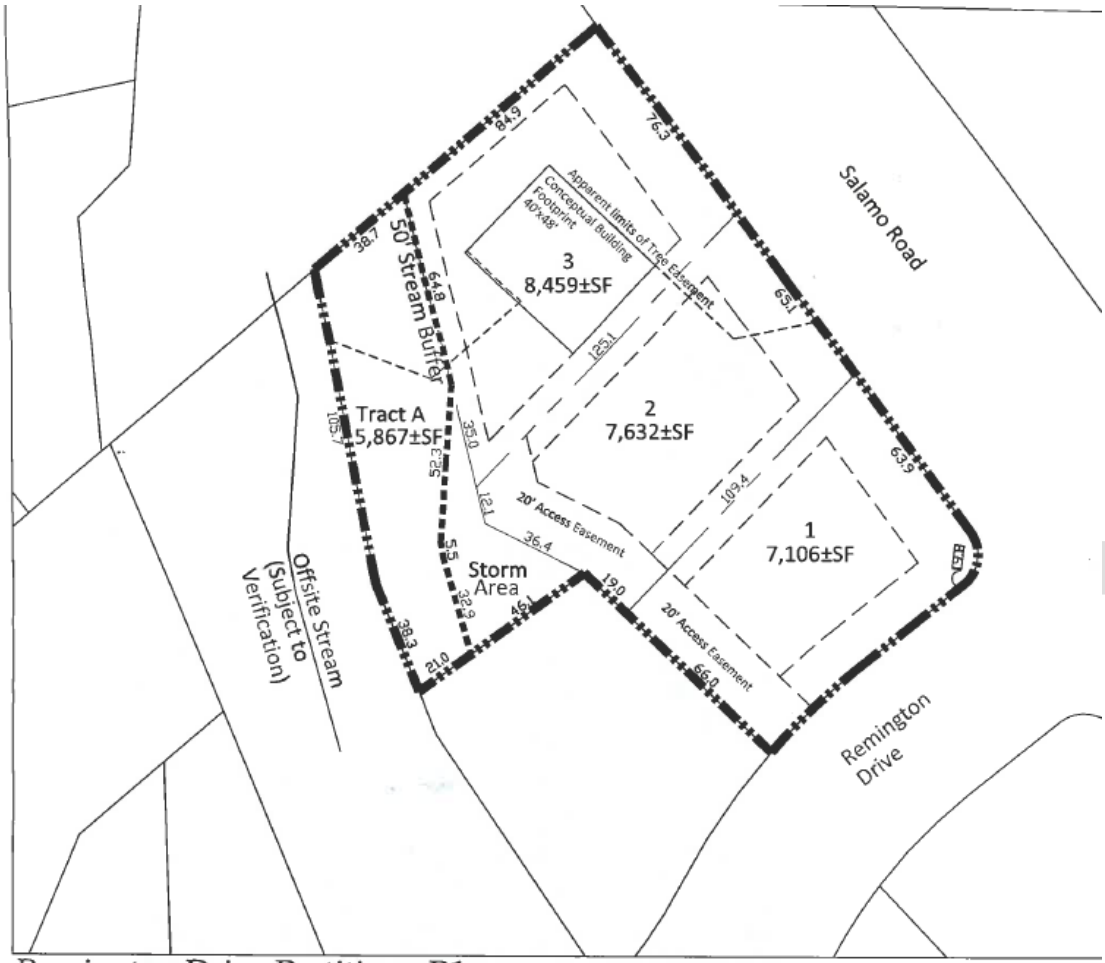
The site address is 23451 Salamo Road in the Savanna Oaks neighborhood. The tax lot number is 21E 35A tax lot 900 and comprises 29,067 square feet. The zoning is R-7 (single family residential/ 7,000 square foot minimum lot size). The applicant is proposing three lots ranging from 7,106 to 8,459 square feet. The property is flanked by Salamo Road to the east, Remington Drive to the south, a single family home to the west as well as Salamo Creek and wetland within a City owned open space along the north and west border.

The notable physical characteristics of the site include a varied and extensive collection of trees, many of them seemingly significant. Douglas Fir trees dominate the north portion of the property while an Oak tree is located near the intersection of the two streets. A creek and a wetland, with the associated water resource area (WRA) transitions and setbacks, will also greatly influence the use of the property. An overgrown laburnum hedge crowds the Salamo Road right of way (ROW).

A single family home is located on the property along with a large accessory building. The property has sidewalks, planter strip and full street improvements along Remington Drive and no sidewalks or planter strip adjacent to Salamo Road.

Specific Proposal

Three lots are proposed for this minor partition. The lots are arranged to maximize their setback from the WRA and show deference to the trees on the north side. Per the R-7 zoning, all lots are over 7,000 square feet in size. According to the applicant's drawings, a storm water treatment and detention pond is proposed within the WRA. (Subsequent discussions at the pre-application conference indicated that individual rain gardens would be installed so as to remove the pond from the WRA.) Access will be via a new curb cut that will replace an existing one on Remington Drive. The interior driveway will extend north towards the rearmost lot. It has yet to be determined if the driveway is in the WRA.



Surrounding Land Uses and Zoning

To the east of the property, across Salamo Road, are single family homes. To the north and west is a City owned open space that hosts a creek, wetland and native riparian vegetation. Also to the west is a single family home fronting on Remington Drive. To the south, across Remington Drive, are single family homes.

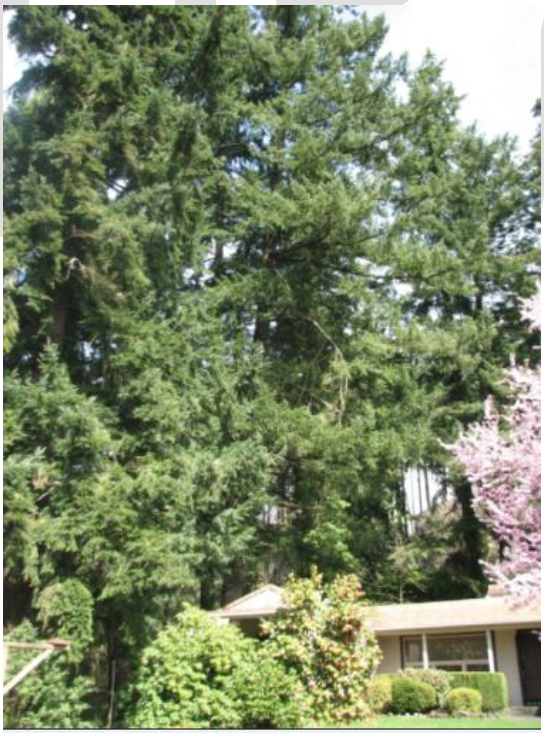
Table 1: Surrounding Land Use and Zoning

DIRECTION FROM SITE	LAND USE	ZONING
North	City owned Open Space and creek	R-7
East	Single family residential	R-7
South	Single family residential	R-7
West	City owned Open Space and creek / Single family residential	R-7

Site Analysis

Slopes

The land is relatively flat with a gradual 2-5% slope down towards Salamo Creek and the associated wetlands shown on the map below in brown. The graded slopes adjacent to Salamo Road rise about six feet at the north end of the property and transition to match grade by the intersection of Remington Drive. No geotechnical report is required.



Trees and Vegetation

The north part of the property is dominated by an extensive collection of Douglas Fir trees plus at least one attractive Oak tree at the street corner. The interior of the site has a number of smaller ornamental trees. The dominant ground cover is grass. An

overgrown Laburnum hedge along the Salamo Road frontage is a familiar feature of the site. Vegetation along the off-site creek and wetland is a mix of riparian native and non-native vegetation.

Section 55.100(B)(2) provides for significant tree preservation and can require that up to 20 percent of the non-type I and II lands be set aside for their protection. Significant trees on Type I and II lands are given complete protection. Trees within the WRA (drainageway) boundary are therefore to be saved 100%. The code makes accommodation for the removal of trees in anticipated street alignments (see 55.100(B)(2) exemptions) but the applicant should anticipate being required to mitigate for their loss on an inch by inch basis exclusive of normal street tree requirements. The mitigation can be on or off-site, or can be satisfied by a fee-in-lieu payment, if the Parks

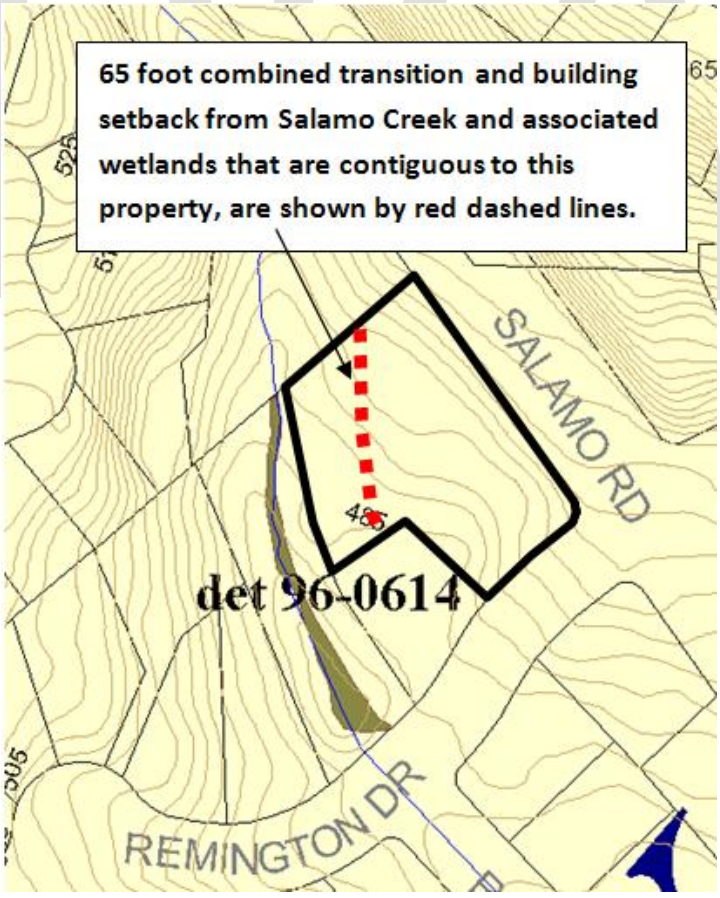
Department agrees to this. Significant trees in the WRA (on Type I and II lands) cannot count towards the fulfillment of the maximum 20 percent set aside for significant trees on non-Type I and II lands.

The applicant's arborist should contact City Arborist Mike Perkins (503-723-2554 or mperkins@westlinnoregon.gov) once the preliminary tree inventory is complete to verify which trees are significant. (Preliminary discussions with Mike Perkins indicate that the Oak tree on the street corner is significant and needs to be saved.)

An existing tree conservation easement required in 2000 is noted on the applicant's partition submittal. That area may be modified in the platting process if it turns out that it does not effectively encompass significant trees or that it may not satisfy the 20% significant tree set aside.

Streams (Water Resource Areas (WRAs))

Salamo Creek runs along the north and west of the property within a City owned open space tract. A wetland exists to the west of the property in that same tract.



(Wetland is shown in olive drab)

Because the slopes adjacent to the stream and wetland are in the 0-25% category there is a 50 foot transition area plus a 7.5-15 foot structural setback depending on whether the side or the rear/front of the house faces the stream or wetland. The transition and setback are measured from the stream edge or, in the case of wetlands, from their delineated border. A wetland delineation by a qualified wetland specialist or biologist is required. The delineation will need to be marked/flagged in the field and mapped. A WRA permit will be required.

Salamo Creek

Although the applicant is keeping most of the improvements out if the WRA, staff notes that the applicant proposes to construct a storm water treatment area in the WRA transition and setback. Section 55.100 (M) must be addressed:

"Stormwater treatment facilities may only encroach a maximum of 25 feet into the outside boundary of the water resource area; and the area of encroachment must be replaced by adding an equal area to the water quality resource area on the subject property. Facilities that infiltrate stormwater on site, including the associated piping, may be placed at any point within the water resource area outside of the actual drainage course so long as the forest canopy and the areas within 10 feet of the driplines of significant trees are not disturbed. Only native vegetation may be planted in these facilities."

The applicant has stated that they will install individual rain gardens to avoid the conflict with the WRA standards. Also, depending on the results of the delineation, the access

driveway may be in the WRA. It has to meet the 7.5 foot structural setback of Chapter 32 (based on the definition of a structure in Chapter 2). Having said that, section 32.050(F) makes accommodation for driveways:

F. Roads, driveways, utilities, or passive use recreation facilities may be built in and across water resource areas when no other practical alternative exists. Construction shall minimize impacts. Construction to the minimum dimensional standards for roads is required. Full mitigation and revegetation is required, with the applicant to submit a mitigation plan pursuant to CDC 32.070 and a revegetation plan pursuant to CDC 32.080.

The required mitigation for the driveway and storm treatment could occupy a significant part of the site. Off site mitigation is an option. Typically, the Parks Department allows for enhancement of riparian areas adjacent to Fields Bridge or Willamette Parks.

Partition of Property and Lot Layout

The three lots will be arranged from south to north along the east edge of the site to keep the homes as far from the WRA as possible. This arrangement agrees with the WRA approval criteria which calls for maximum separation between the WRA and

development. Access to the homes will be via ashared 20 foot wide driveway and use the existing curb cut on Remington Drive. All lots will meet the R-7 minimum lot size as well as the dimensional requirements of the zone.

The applicant shall must provide the necessary calculations to demonstrate that the development is attaining at least 70 percent of the maximum allowable denisty of the R-7 zone.

Expected Development Pattern/Street Connectivity

This parcel is in the midst of a fully developed area with no development potential on adjoining or nearby lots. No street connectivity is required. This application can make a positive contribution to pedestrian access along Salamo Road by providing a sidewalk for that frontage.

Traffic Impact Analysis (TIA)

Subsection 85.170(B) (2) (c) (1) lists the circumstances that require a traffic impact analysis (TIA).

> *c. When required. A Traffic Impact Analysis may be required to be submitted to the City with a land use application, when the following conditions apply:*
>
> *1) The development application involves one or more of the following actions:*
>
> *(A) A change in zoning or a plan amendment designation; or*
>
> *(B) Any proposed development or land use action that ODOT states may have operational or safety concerns along a State highway; and*
>
> *(C) The development shall cause one or more of the following effects, which can be determined by field counts, site observation, traffic impact analysis or study, field measurements, crash history, Institute of Transportation Engineers Trip Generation manual; and information and studies provided by the local reviewing jurisdiction and/or ODOT:*
>
> *(1) An increase in site traffic volume generation by 250 average daily trips (ADT) or more (or as required by the City Engineer); or*
>
> *(2) An increase in use of adjacent streets by vehicles exceeding the 20,000-pound gross vehicle weights by 10 vehicles or more per day; or*

(3) The location of the access driveway does not meet minimum intersection sight distance requirements, or is located where vehicles entering or leaving the property are restricted, or such vehicles queue or hesitate on the State highway, creating a safety hazard; or

(4) The location of the access driveway does not meet the access spacing standard of the roadway on which the driveway is located; or

(5) A change in internal traffic patterns that may cause safety problems, such as backup onto the highway or traffic crashes in the approach area.

The proposal does not meet any of the criteria that trigger a TIA. There will be no new or additional points of access to Remington Drive in that as the existing one will be closed and replaced by one to the southwest. The trip generation of two new lots (excluding the trip generation of the existing single family home) will not exceed 250 trips per day. Per the Institute of Traffic Engineers (ITE) tables, single family homes are expected to generate 9-10 trips per weekday meaning that this subdivision would produce 20 weekday trips. The PM peak hour (5-6 PM) trip generation of 1.01 per home will yield 2.02 trips.

No traffic studies will be required.

The required separation between the driveway curb cut and the Salamo Road and Remington Drive intersection is 35 feet per the CDC and 50 feet per the TSP so the new driveway location exceeds that with 72 feet.

Insert: Engineering Notes

Property Address: 3090 Remington – West Linn, OR 97068

I. TRANSPORTATION

SALAMO ROAD

	EXISTING CONDITIONS	POTENTIAL POST DEVELOPMENT CONDITIONS
Classification	Minor Arterial	Minor Arterial
Zone	R-10	R-10
Right of Way Width	78’	72’
Full Pavement Width	32’ Half Street	24’ Half Street
Bike Lane	Yes	6’
Curb and Gutter	Yes	Curb and Gutter
Planter Strip	None	5.5’ Planter
Sidewalk	None	6’ Sidewalk
Street Light	Yes – On the Opposite Side	Yes – Cobra Head
Utility Pole	1 overhead anchor pole.	Remove existing pole. New services to be placed underground.
Street Tree	None along the frontage.	Yes

ADA Ramps	Yes	None
Post Speed	25 MPH	25 MPH
Stripe	Yes	Yes

A. MINIMUM REQUIRED IMPROVEMENTS

1. Dedication: None.

2. Provide 6' sidewalk and ADA ramp.

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 to mach adjacent development.
   - Bulb: Flat lens 150 watts maximum

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

5. In case the access road is determined to be a private road the driveway approach shall be designed with the following requirements:
   Driveway Approach: 36' maximum width including wings. See WL-504A, 504B, and 505 for technical and construction specifications. Driveway approach serving 3 lots or more should be designed in accordance with Commercial Driveway Design Guidelines and Standards. Intersection of new driveway to existing roadway should be design in accordance with Public Works Standards Section 5.0015 Intersections.

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

7. Reference: Renaissance Height 3 As-Built, Partition Plat 2000-119

REMINGTON DRIVE

	EXISTING CONDITIONS	POTENTIAL POST DEVELOPMENT CONDITIONS
Classification	Local	Local
Zone	R-10	R-10
Right of Way Width	56'	56'
Full Pavement Width	29'	32'
Bike Lane	None	None

Curb and Gutter	Yes	Curb and Gutter
Planter Strip	None	5.5' Planter
Sidewalk	Yes	6' Sidewalk
Street Light	On the opposite side	Yes – Shoebox
Utility Pole	1 overhead anchor pole.	New services to be placed underground
Street Tree	Yes	Yes
ADA Ramps	None	Yes
Post Speed	25 MPH	25 MPH
Stripe	None	None

B. MINIMUM REQUIRED IMPROVEMENTS

1. Dedication: None.

2. Provide a minimum 16' 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. All new and existing overhead utilities along the development must be placed underground.

4. Reference: Renaissance Height 3 As-Built.

C. CITY TRANSPORTATION MASTER PLAN

PEDESTRIAN MASTER PLAN

Salamo Road is indicated in the City Pedestrian Master Plan as one of the roadways with sidewalk deficient. Sidewalk project along Salamo Road from 10th Street to Weatherhill Road is identified as project number 38, 72 and 73 with medium level of priority on Pedestrian Master Plan Project list (See TSP page 5-7 and 5-8). 6' sidewalk along the project frontage will be included as part of the street improvement requirements.

BICYCLE MASTER PLAN

Salamo Road is indicated in the City Bicycle Master Plan as one of the roadways with bike lane deficiency. Salamo Road bike lane improvement between Blankenship to Barrington Drive is listed as project number 2 in Bicycle Master Plan.

MOTOR VEHICLE MASTER PLAN

The closest intersection analyzed was Salamo Road and Rosemont Road.

Existing Operations Conditions

Intersection	LOS	Average Delay (sec)	Volume/ Capacity (v/c)	Measure of Effectiveness Administrative		MOE Met?
				Agency	Maximum	
Salamo/Rosemont	E	38.3	>1	City	LOS D	No

City anticipates installing a traffic signal at this intersection in calendar year 2014.

D. 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 on Remington Drive for connection. There is a drainage way located close by the northwest corner of the property for possible point of disposal.
2. As-Built: Renaissance Height 3.

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.

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 on Remington Drive for connection. There are already 3 sewer lateral installed ready for service along the frontage of this property.

2. As-Built: Renaissance Height 3.

B. 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: Horton
2. Overflow Elevation: 730 Upper Elevation: 620 Lower Elevation: 475
3. Sub pressure zone serves customer at ground elevation as low as 340.

B. RESERVOIR AND PUMP STATION

1. Reservoir: Horton is located at the intersection of Horton Rd and Santa Anita Dr. The reservoir usable capacity is approximate 1.5 million gallon. The reservoir is filled by Bolton Pump Station. Horton Reservoir also supplies water to Rosemont Reservoir through Horton Pump Station.
2. Pump Station: Horton Pump Station consists of 4 pumps. Two can pump 900 gpm and two can pump 1,300 gpm with total capacity of 4,400 gpm and a nominal capacity of 3,100 gpm. There is an emergency standby diesel generator onsite in case power failure.

C. EXISTING POPULATION AND PROJECTED POPULATION AT SATURATION

1. Existing Population: 6,192
2. Projected Population at Saturation: 7,843

D. WATER DEMAND AT SATURATION

Average Day Demand	Maximum Day Demand	Peak Hour Demand (mgd)

(mgd)	(mgd)	
1.1	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 in good conditions.

F. HORTON 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	**3.1**	**0.5**	**3.6**	**4.3**	**1.3**	**(0.7)**	**1.3**
2015	**3.2**	**0.5**	**3.7**	**4.3**	**1.3**	**(0.6)**	**1.4**
2030	**3.6**	**0.5**	**4.1**	**4.3**	**1.3**	**(0.2)**	**1.7**
Saturation	**3.8**	**0.5**	**4.3**	**4.3**	**1.3**	**0**	**1.8**

1. The table above indicates that there is a surplus in supply capacity during a normal condition.

G. HORTON 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**	**1.1**	**0**	**1.3**	**1.1**	**0.2**
2015	**0**	**1.1**	**0**	**1.4**	**1.1**	**0.3**
2030	**0**	**1.1**	**0**	**1.7**	**1.1**	**0.6**
Saturation	**0**	**1.1**	**0**	**1.8**	**1.1**	**0.7**

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

H. HORTON PRESSURE ZONE MASTER PROJECT LIST

Number	Location	Ex. Diameter (inches)	Proposed Diameter (inches)	Priority	Length (ft)	SDC Allocation	Unit Cost ($/lf)	Estimated Project Cost ($)

29	Weatherhill Rd. from Salamo Rd to S Bland Cir. and then South		8	4	2,312	100%	125	$289,000
31	Sussex St. south of Sunset Ave.	4	8	5	248	0%	125	$31,000
32	From River View Ave. to Falls View Dr.	4	8	5	213	0%	125	$26,625
39	Clark St. south of Skyline	6	8	5	425	0%	125	$53,125
42	North of Linn Ln.	6	8	5	369	0%	125	$46,125
43	Parkview Ter. And Rosepark Dr.	6	8	5	765	0%	125	$95,625
47	Apollo Rd. west of Athena Rd.	6	8	5	385	0%	125	$48,125
48	Palomino Wy. from Saddle Ct. to Palomino Cir.	6	8	4	246	100%	125	$30,750

1. The table above indicates that there is no improvement required along the proposed project frontage.

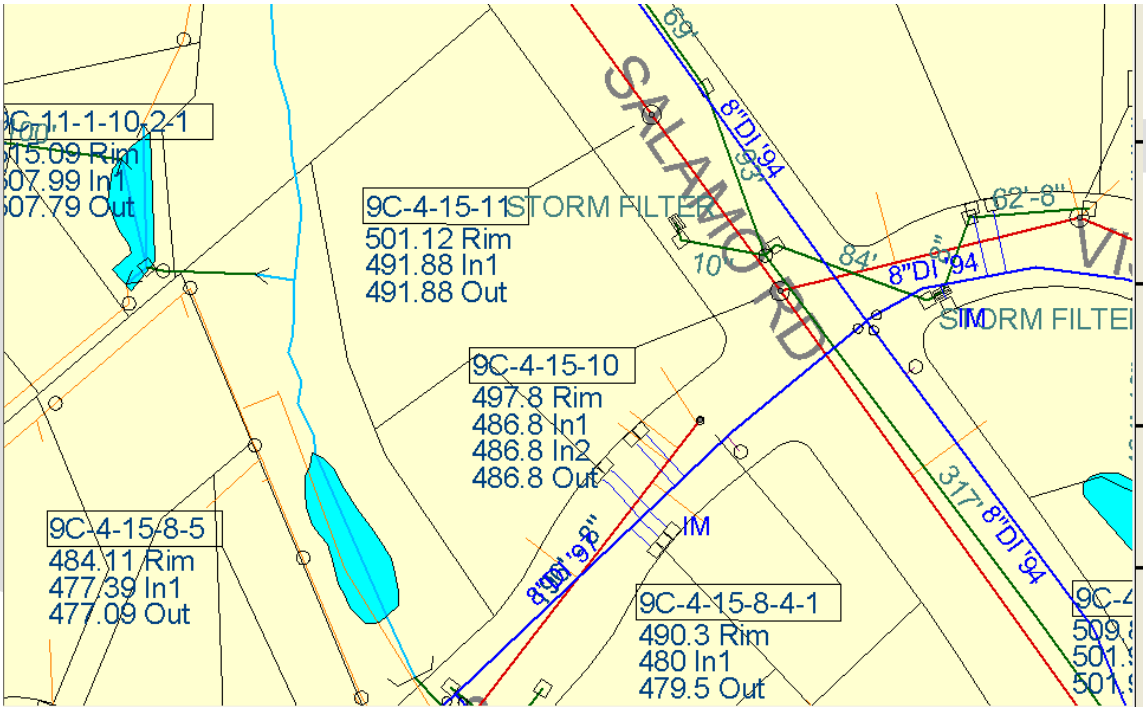
I. EXISTING CONDITIONS

1. There is 8" DI Water main located on Remington Drive for connection. There are already 3 existing water meters installed for service of this property.

2. As-Built: Renaissance Height 3.

J. WATER SDC EFFECTIVE JULY 1ST 2012

Unit	Meter Size	Factor	Reimbursement	Improvement	Administrative	Total
Per Factor of 1		1.00	$571	$6,793	$191	$7,555
5/8" Meter	1		$571	$6,793	$191	$7,555



Process

A minor partition and WRA approval is required. No neighborhood meeting is required per 99.038. If you do want to meet with the neighborhood association, the property is within the Savanna Oaks neighborhood. Contact Ed Schwarz, President of the Savanna Oaks Neighborhood Association, at savannaoaksNA@westlinnoregon.gov

Follow 85.150-170 strictly and completely regarding submittal requirements (including plans, maps, etc.). Submittal requirements may be waived but the applicant must first identify the specific submittal requirement and request, in writing, 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. Waivers may also be subsequently overruled by the decision making body.

The approval criteria of 85.200 shall be responded to in a narrative.

The submittal requirements for a WRA permit are found in 32.040 and the approval criteria are in 32.050. Development of lots that are partially within the WRA may take advantage of the hardship provisions of 32.090(B).

Submit the application to the Planning Department with a signed application form. The deposit for a partition is $2,800. The final plat fee is $1,500. There is also a $500 fee for final site inspection. The WRA deposit fee is $2,600 plus a re-vegetation/mitigation inspection fee of $250.

PLEASE NOTE that the deposits are initial deposits, 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.

Once the submittal is deemed complete, the staff will schedule a hearing with the Planning Commission. Staff will send out public notice of the Planning Commission hearing at least 20 days before it occurs. The Planning Commission's decision may be appealed to City Council by the applicant or anyone with standing.

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

Pre-application notes are void after 18 months and 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.

Pre-app2013/Pre-app April 5 2013-Pre-app notes Salamo MIP

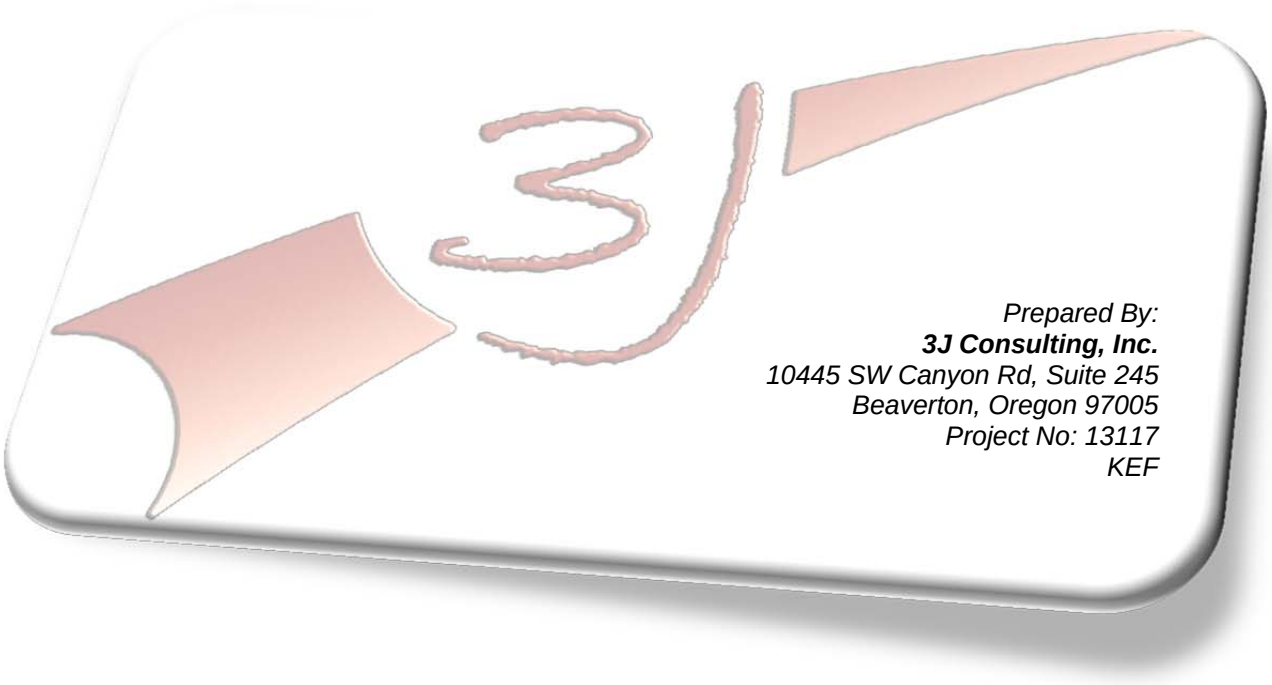
STORMWATER REPORT

BENJAMIN HEIGHTS PARTITION
WEST LINN, OR

May 27, 2013

Prepared For:

JT Smith Companies
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: 13117
KEF

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EXECUTIVE SUMMARY

The existing site is located on private property at 23451 Salamo Road in West Linn, Oregon (See Figure 2). The property is approximately 0.67 acres and currently contains a single family home, large accessory building, an asphalt driveway and surrounding concrete walkways. The proposed development will consist of pursuing a partition to create three 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 0.2 in/hr at depths of 1 to 3 feet and 2.0 in/hr at depths of 3 to 5 feet. 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 23451 Salamo Road 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.

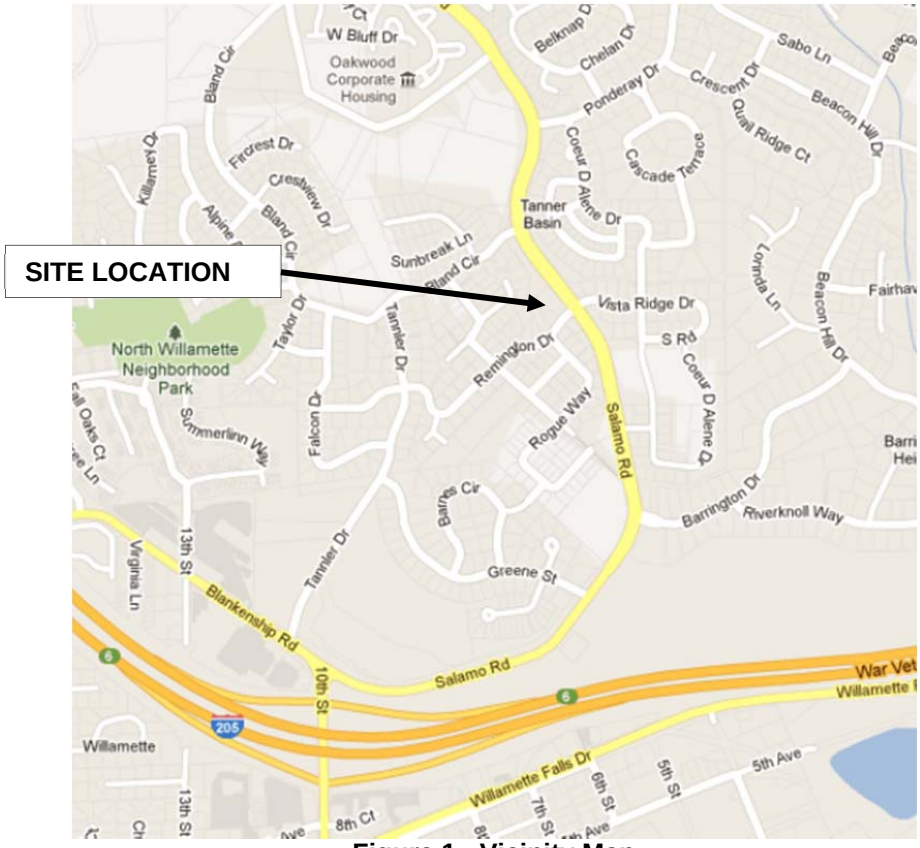


Figure 1 - Vicinity Map

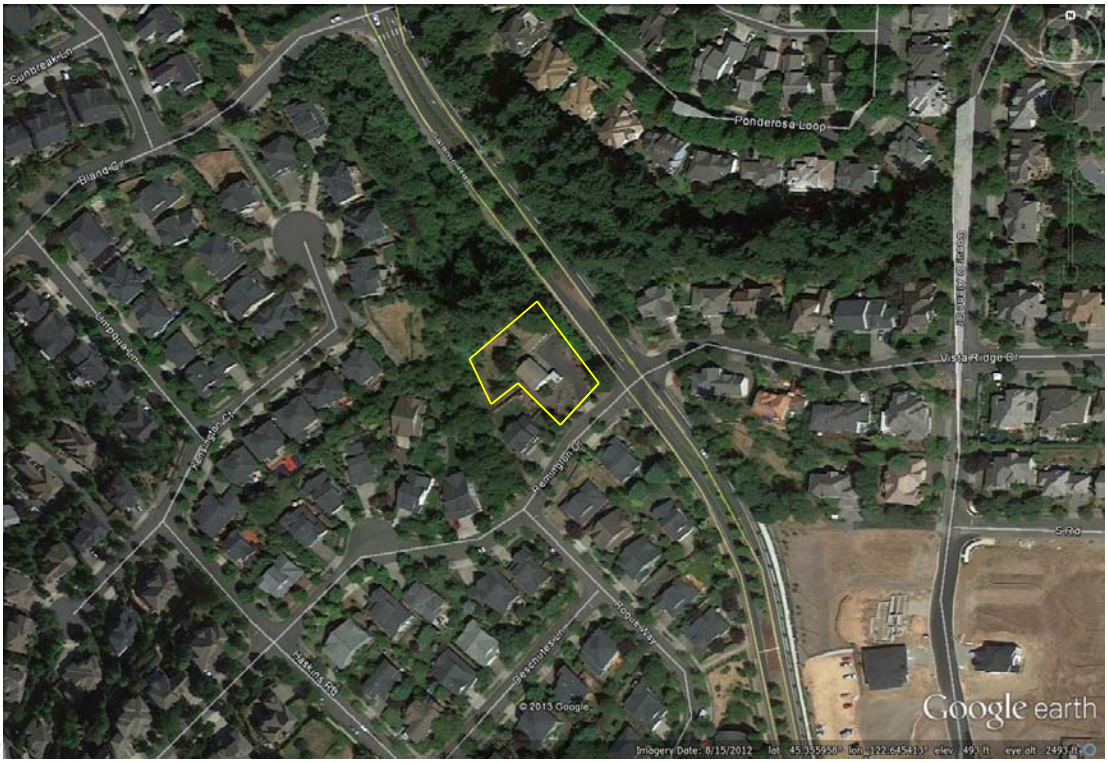


Figure 2 - Site Location

EXISTING CONDITIONS

Site

The property slopes from northeast towards the southwest at approximately 6.6 percent. Elevations range from a maximum of 502 feet on the northeast side of the property to a minimum of 486 feet in the southwestern corner. Currently the property contains a single family home, large accessory building, an asphalt driveway and surrounding concrete walkways.

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 types as classified by the United States Department of Agriculture Soil Survey of Clackamas County are identified in Table 1 (See Technical Appendix: Exhibits - Hydrologic Soil Group for Clackamas County Area, Oregon).

Soil Type	Hydrologic Group
Cornelius Silt Loam	C
Delena Silt Loam	C/D

Table 1 - Soil Characteristics

The majority of the soil on the site is classified as hydrologic group C/D. Group C/D soils generally have slow infiltration rates.

A geotechnical investigation has been conducted showing that infiltration rates on the site are between 0.2 in/hr at depths of 1 to 3 feet and 2.0 in/hr at depths of 3 to 5 feet (See Technical Appendix: Geotechnical Reports).

Existing Drainage

Existing Site

The existing site does not contain a stormwater management system. Stormwater runoff from the site infiltrates or sheet flows southwest into Salamo Creek and associated wetlands.

Basin Areas

Table 2 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	7,651	0.18
Brush (Fair Condition)	21,415	0.49
Total Existing Basin Area	29,067	0.67

Table 2 – 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 31 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 stormwater. 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 an outfall into Salamo Creek.

Basin Areas
Table 3 shows the post-developed impervious and pervious areas (See Technical Appendix: Exhibits – Post-Developed Site Conditions).

Post-Developed Basin Area	sq. ft.	acres
Lot 1		
Impervious Area	2,500	0.06
Shared Pervious Driveway	1,371	0.03
Landscaping/Open Space	2,884	0.07
Infiltration Rain Garden	245	0.01
Total Lot 1	7,000	0.16
Lot 2		
Impervious Area	2,500	0.06
Shared Pervious Driveway	1,395	0.03
Landscaping/Open Space	2,860	0.07
Infiltration Rain Garden	245	0.01
Total Lot 2	7,000	0.16
Lot 3		
Impervious Area	2,000	0.05
Shared Pervious Driveway	1,141	0.03
Landscaping/Open Space	5,873	0.13
Infiltration Rain Garden	185	0.00
Total Lot 3	9,199	0.21
Buffer: Open Space (Good Condition)	5,837	0.13
Total Post-Developed Area	**29,037**	**0.67**

Table 3 – 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 4 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 4 - Design Storms

Basin Runoff

Table 5 shows the runoff rates for the existing post-developed conditions (See Technical Appendix: Hydrographs – Hydrograph Report: Existing and Post-Developed). 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	0.08	0.11	0.00
10	0.15	0.21	0.00
25	0.19	0.27	0.02
100	0.24	0.34	Not Calculated in PAC

Table 5 - 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 lots 1 and 2, and 2,000 ft^2 was assumed for lot 3. Table 6 shows the dimensions provided for the infiltration planters on each lot (See Technical Appendix: Presumptive Approach Calculator). An overflow structure will be constructed to convey high flow events to Salamo Road via a 6 inch storm pipe.

Lot	Bottom Basin Area (sf)	Side Slope (H:V)	Depth (in)	Rock Storage Depth (in)
1	245	0:1	12	18
2	245	0:1	12	18
3	185	0:1	12	18

Table 6 – 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 2 in/hr in the native soil, 4 inches of pervious material and 12 inches of rock section (See Technical Appendix: Calculations - Pervious Pavement Design).

SUMMARY

The stormwater design for the proposed for the Benjamin Heights Partition 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 1-2 (4 Pages)
- Lot 3 (4 Pages)

Calculations

- Time of Concentration
- Pervious Pavement Design

Geotechnical Reports

- Geotechnical Engineering Report: Remington Drive Partition

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

MET

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


122° 38' 46"
122° 38' 41"
45° 21' 23"
45° 21' 19"
527720
527730
527740
527750
527760
527770
527780
527790
527800
527810
5022610
5022600
5022590
5022580
5022570
5022560
5022550
5022540
5022530
5022520
5022510
5022500
5022490
23C
30C
Salamo Rd
Salamo Rd
Remington Dr
Map Scale: 1:617 if printed on A size (8.5" x 11") sheet.
N
Meters
0 5 10 20 30
Feet
0 20 40 80 120

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

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

MAP INFORMATION

Map Scale: 1:617 if printed on A size (8.5" × 11") sheet.

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

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

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

Date(s) aerial images were photographed: 8/3/2005

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

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
23C	Cornelius silt loam, 8 to 15 percent slopes	C	0.1	14.3%
30C	Delena silt loam, 3 to 12 percent slopes	C/D	0.8	85.7%
Totals for Area of Interest			**0.9**	**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 $I_a = 0.2S$.

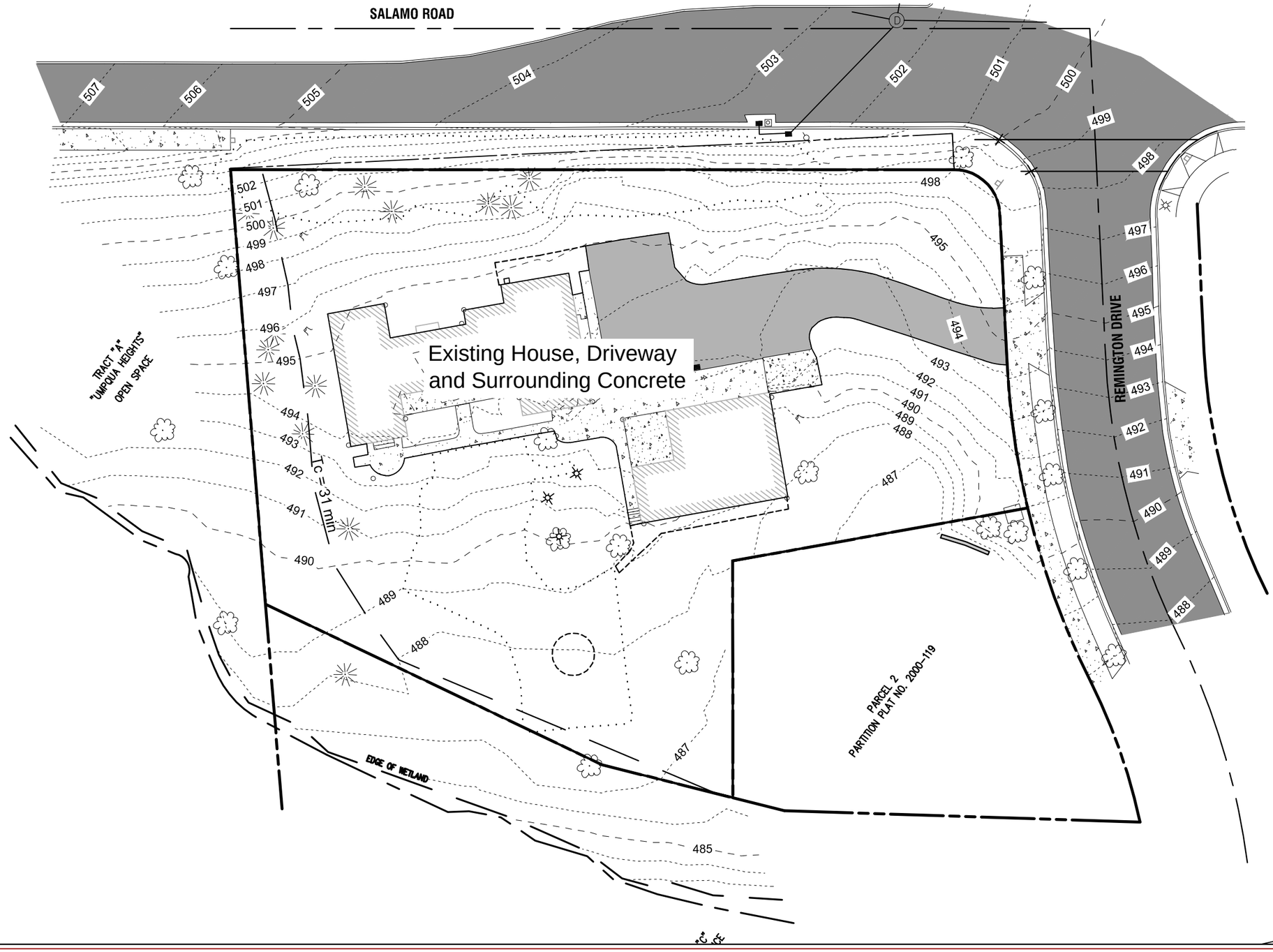
2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.

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

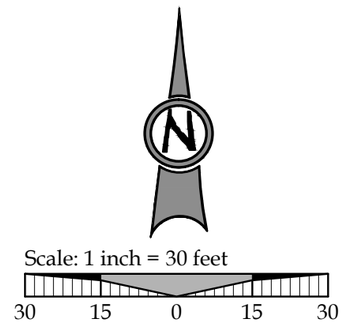
4 Actual curve number is less than 30; use CN = 30 for runoff computations.

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.



Existing Site
Area = 0.667 AC
Impervious Area = 0.176 AC
Pervious Area = 0.491 AC



3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING

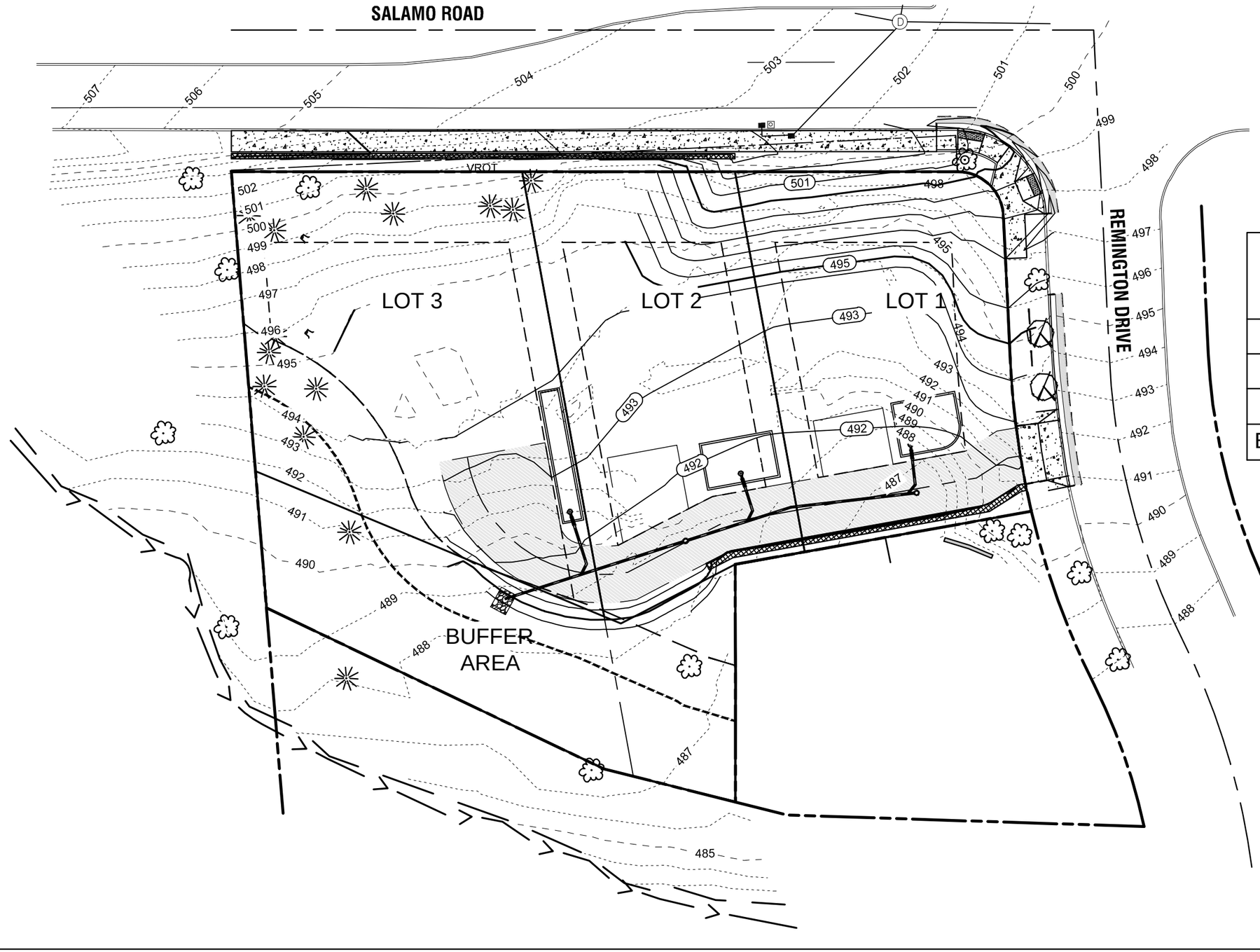
EXISTING SITE CONDITIONS
BENJAMIN HEIGHTS PARTITION

Storm Report

Exhibit 1

Date: 05/27/13

By: KEF



AREA	Impervious Area (ac)	Pervious Area (ac)	Total Area (ac)
LOT 1	0.057	0.104	0.161
LOT 2	0.057	0.104	0.161
LOT 3	0.046	0.165	0.211
BUFFER	0.000	0.134	0.134

3J CONSULTING, INC

CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING

POST-DEVELOPED SITE CONDITIONS
BENJAMIN HEIGHTS PARTITION

Storm Report

Exhibit 2

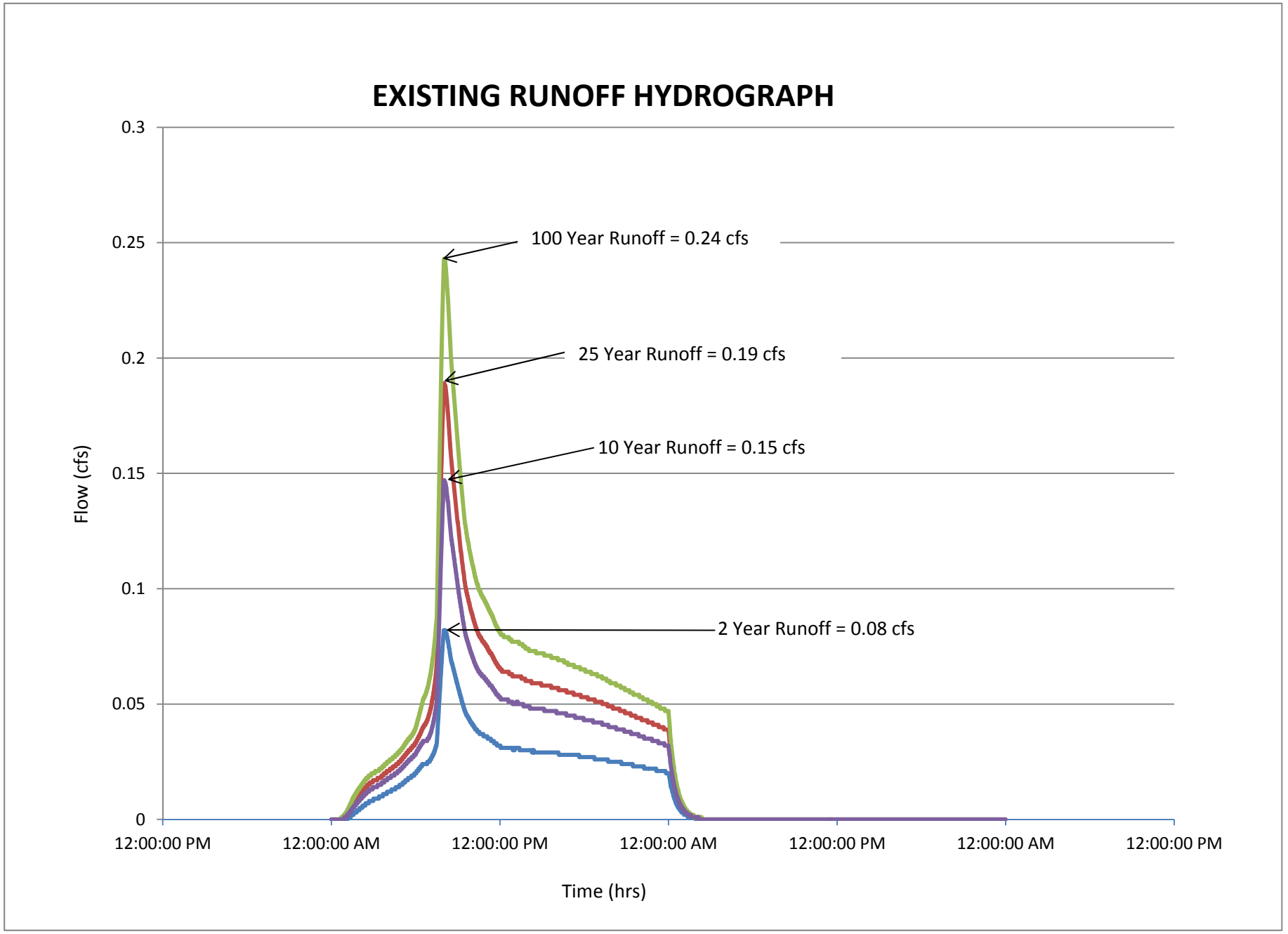
Date: 05/27/13

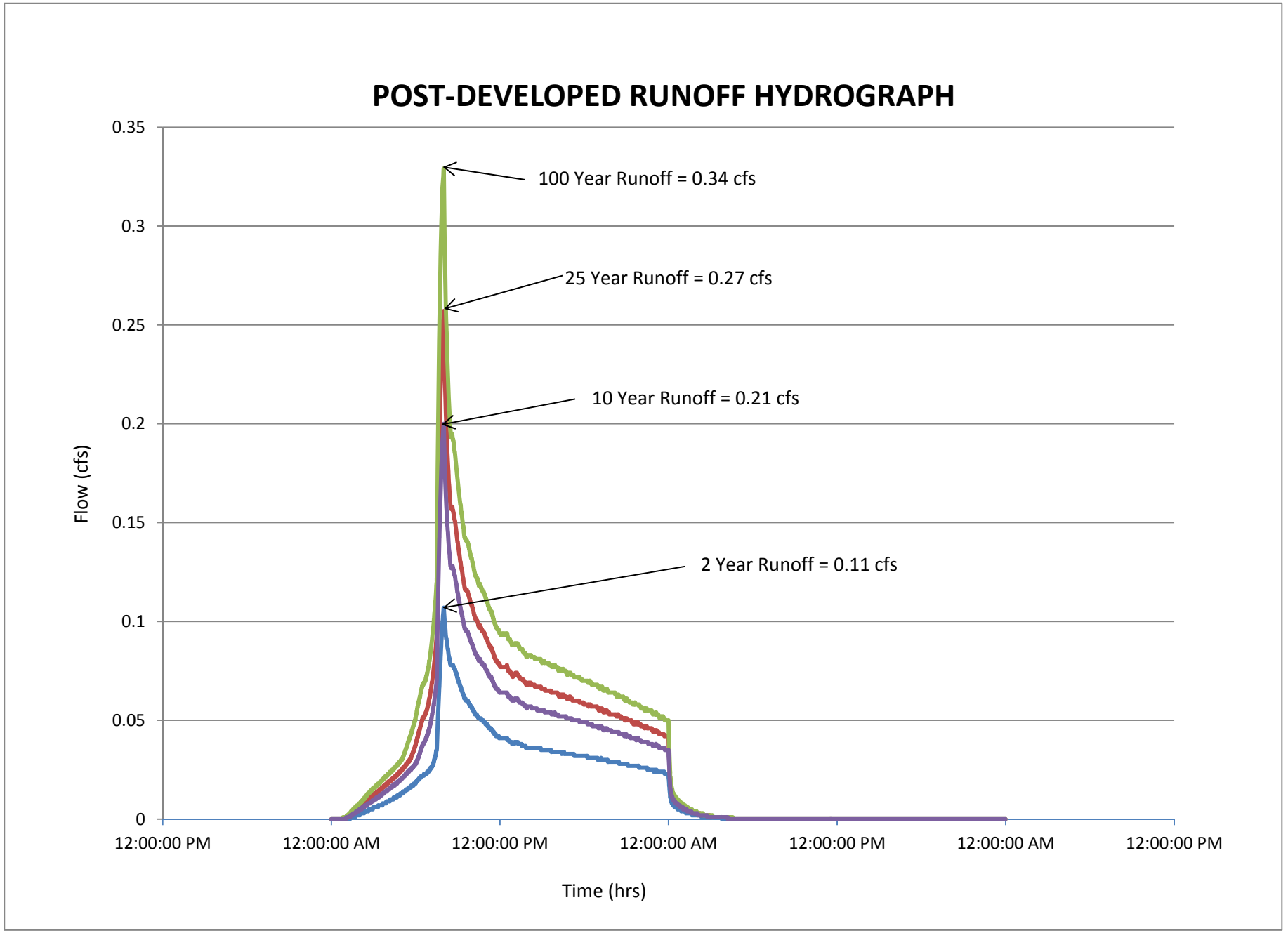
By: KEF

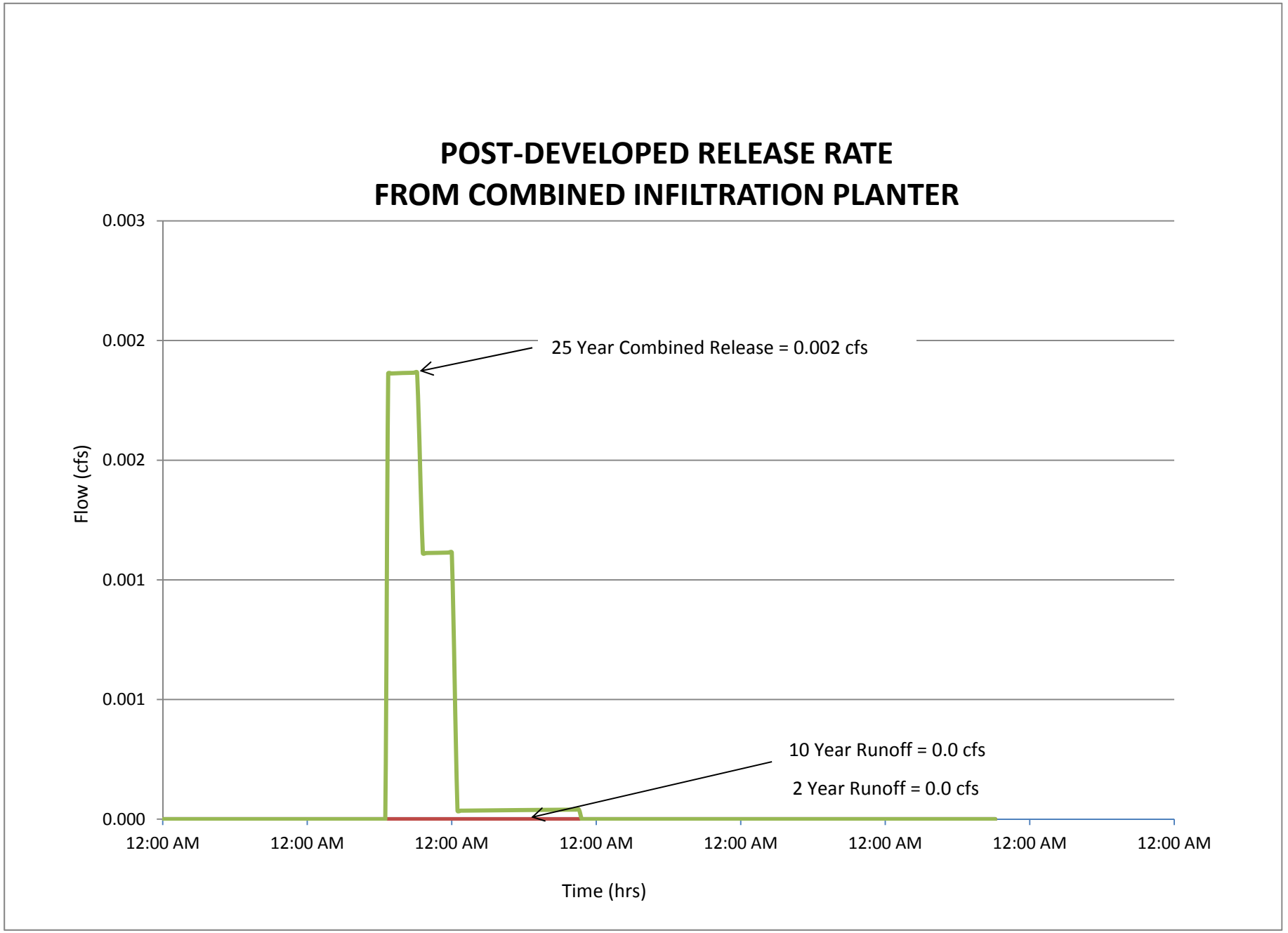
DRAWINGS

To be included in Final Storm Report

HYDROGRAPHS


EXISTING RUNOFF HYDROGRAPH
0.3
0.25
0.2
0.15
0.1
0.05
0
Flow (cfs)
100 Year Runoff = 0.24 cfs
25 Year Runoff = 0.19 cfs
10 Year Runoff = 0.15 cfs
2 Year Runoff = 0.08 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
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Flow (cfs)
100 Year Runoff = 0.34 cfs
25 Year Runoff = 0.27 cfs
10 Year Runoff = 0.21 cfs
2 Year Runoff = 0.11 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
0.003
0.002
0.002
0.001
0.001
0.000
Flow (cfs)
25 Year Combined Release = 0.002 cfs
10 Year Runoff = 0.0 cfs
2 Year Runoff = 0.0 cfs
12:00 AM
12:00 AM
12:00 AM
12:00 AM
12:00 AM
12:00 AM
12:00 AM
12:00 AM
Time (hrs)

PRESUMPTIVE APPROACH CALCULATOR

Presumptive Approach Calculator ver. 1.2

Catchment Data

Catchment ID:	**Lots 1 & 2**
Project Name:	**Benjamin Heights**
Date:	**05/27/13**
Project Address:	**23451 Salamo Rd**
Permit Number:	**0**
	West Linn, OR
Run Time	5/16/2013 3:32:13 PM
Designer:	**Kathleen Freeman, PE**
Company:	**3J Consulting, Inc**

Drainage Catchment Information

Catchment ID	Lots 1 & 2	
	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.

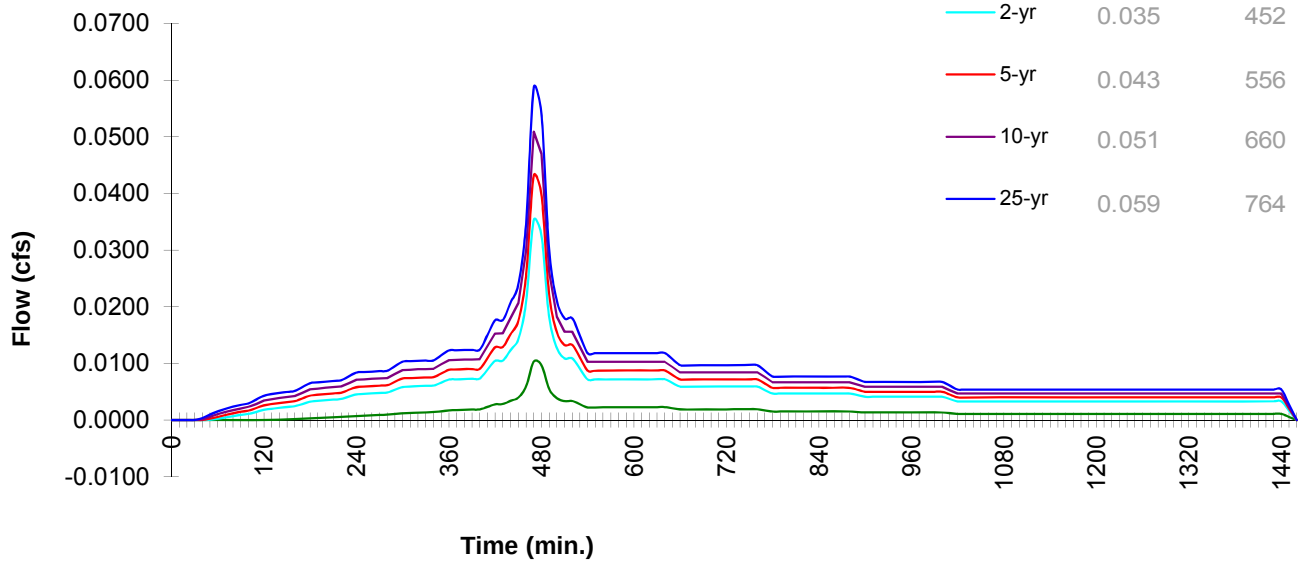
Site Soils & Infiltration Testing Data

Infiltration Testing Procedure:	Open Pit Falling Head	
Native Soil Field Tested Infiltration Rate (I_{test}):	2	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}):	1.00	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



Printed: 5/16/2013 3:33 PM

Presumptive Approach Calculator ver. 1.2

Catchment ID: Lots 1 & 2

Run Time 5/16/2013 3:32:13 PM

Project Name: Benjamin Heights **Catchment ID:** Lots 1 & 2 **Date:** 5/27/2013

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.

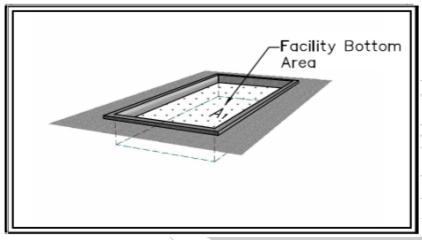
Catchment facility will meet Hierarchy Category: **1**

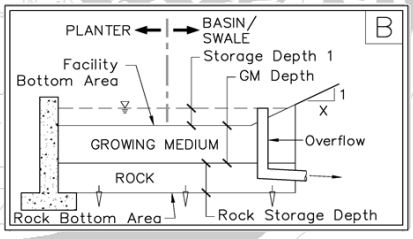
Goal Summary:

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
245 SF

DATA FOR ABOVE GRADE STORAGE COMPONENT

Facility Bottom Area =	245	sf
Bottom Width =	20.0	ft
Facility Side Slope =	0	to 1
Storage Depth 1 =	10	in
Growing Medium Depth =	18	in
Freeboard Depth =	N/A	in
Surface Capacity at Depth 1 =	204	cf
GM Design Infiltration Rate =	2.00	in/hr
Infiltration Capacity =	0.011	cfs

BELOW GRADE STORAGE

Rock Storage Bottom Area =	245	sf
Rock Storage Depth =	18	in
Rock Void Ratio =	0.3	
Rock Storage Capacity =	110	cf
Native Design Infiltration Rate =	1.00	in/hr
Infiltration Capacity =	0.006	cfs

RESULTS

		Overflow Volume			
Pollution Reduction	PASS	0 CF	0%	Surf. Cap. Used	Run PAC
			5%	Rock Cap. Used	
10-yr	PASS	0 CF	59%	Surf. Cap. Used	
			100%	Rock Cap. Used	

FACILITY FACTS

Total Facility Area Including Freeboard =	245 SF
Sizing Ratio (Total Facility Area / Catchment Area) =	0.098

Current data has been exported:

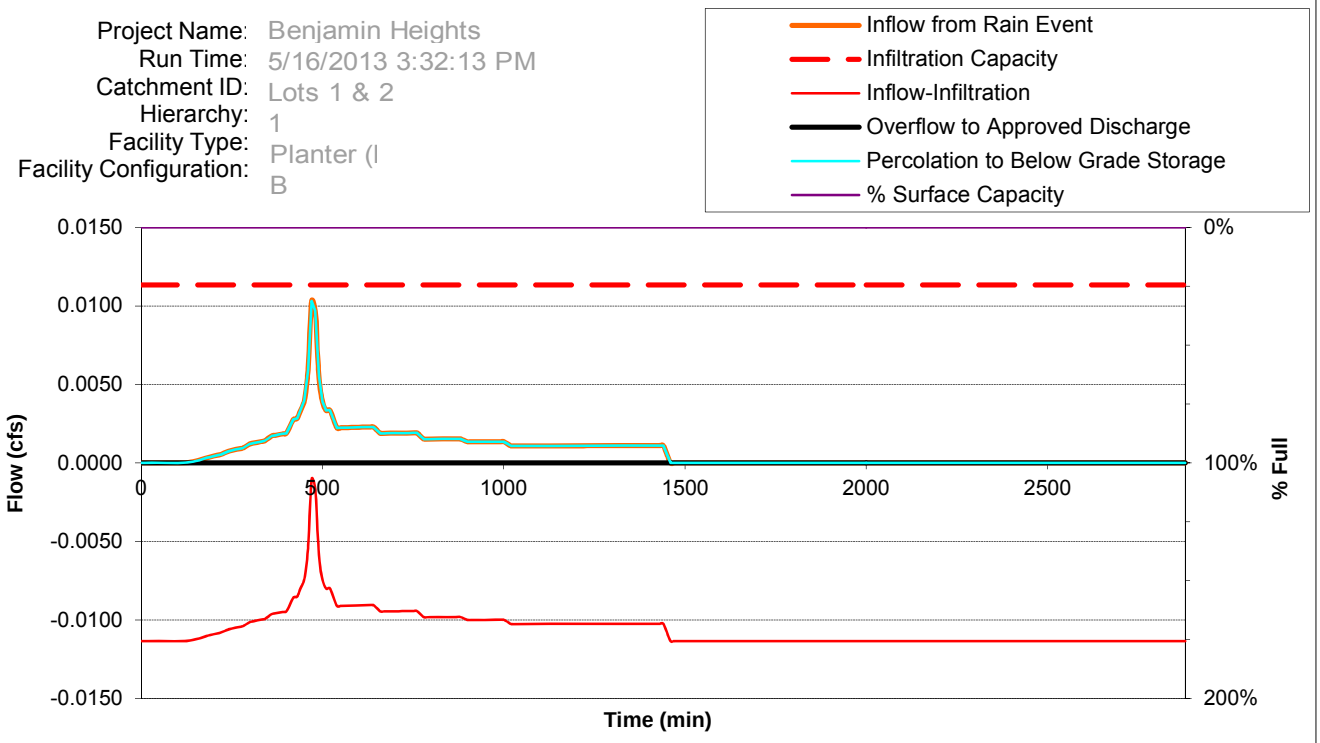
Lots 1&2.xls 5/16/2013 3:32:53 PM

BES - Presumptive Approach Calculator - Ver 1.2

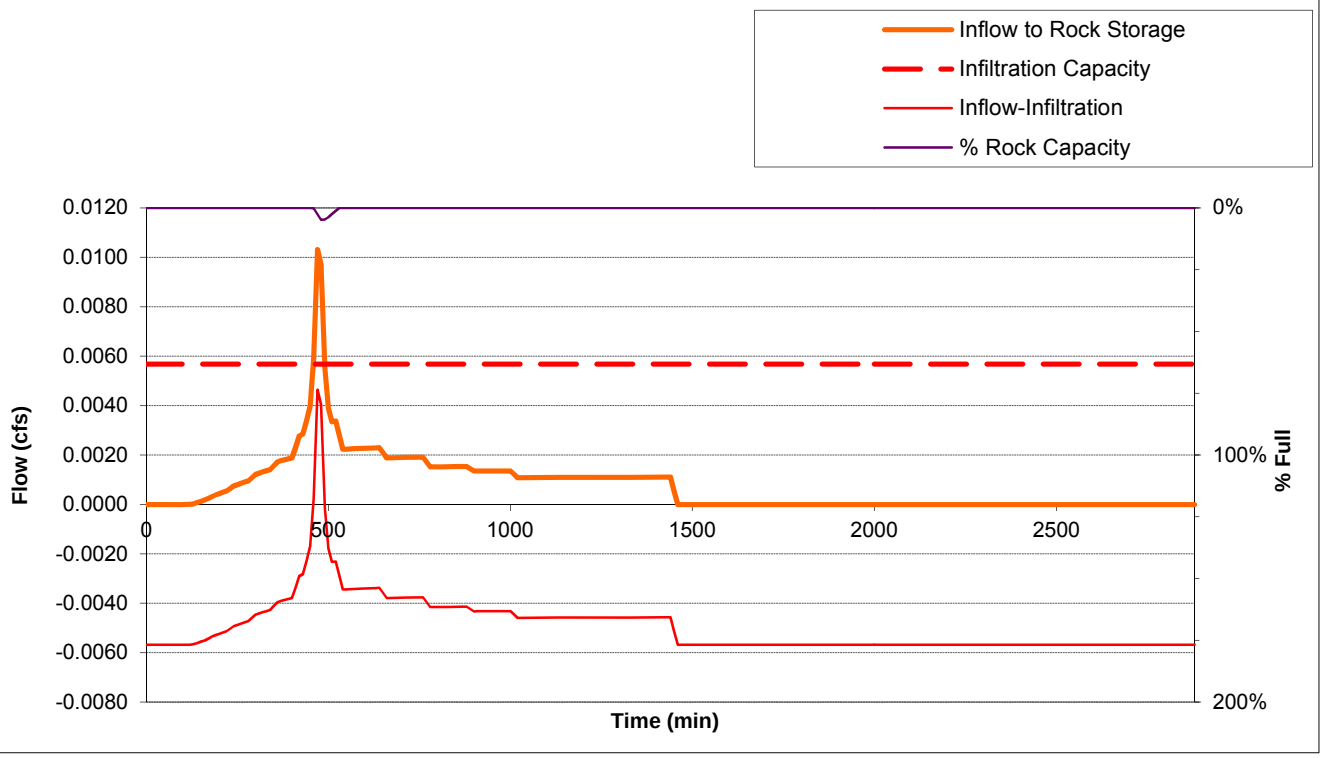
PR Con-A&B

Pollution Reduction Event
Surface Facility Modeling

Project Name: Benjamin Heights
Run Time: 5/16/2013 3:32:13 PM
Catchment ID: Lots 1 & 2
Hierarchy: 1
Facility Type: Planter (I
Facility Configuration: B



Pollution Reduction Event
Below Grade Modeling



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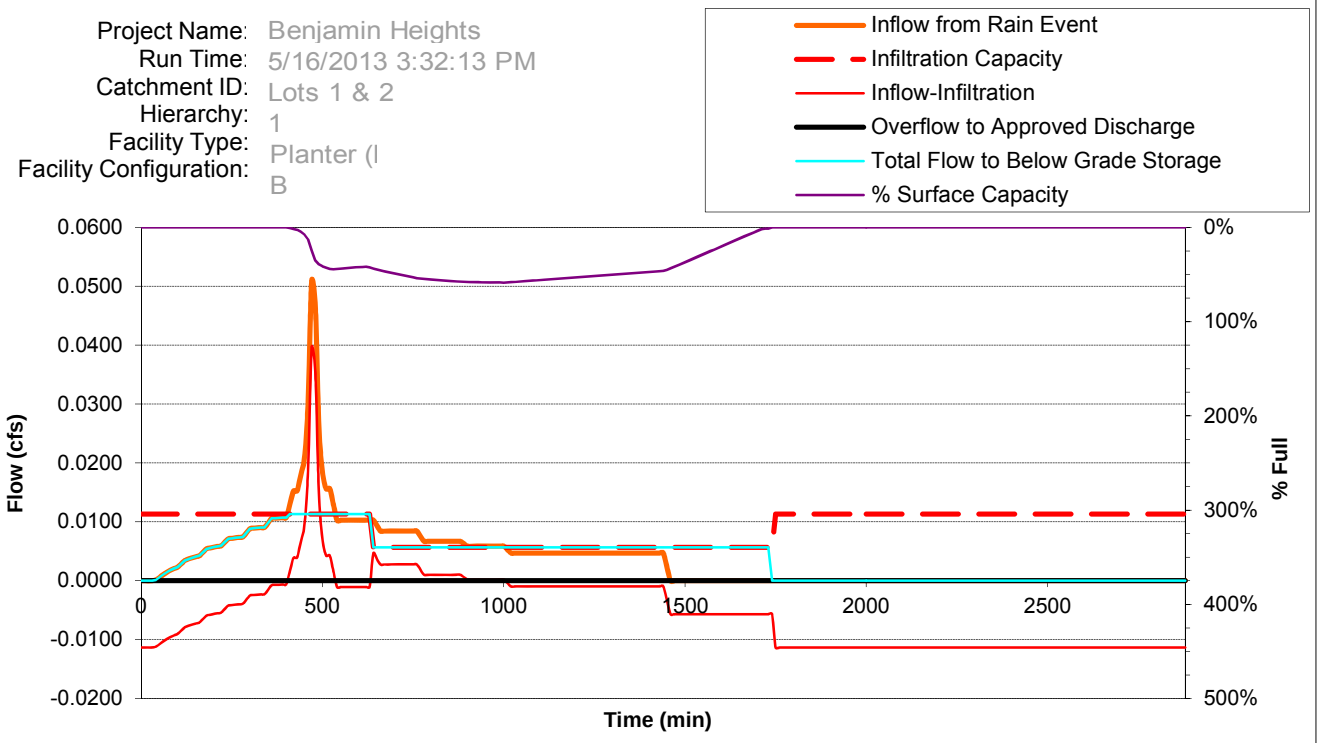
BES - Presumptive Approach Calculator - Ver 1.2

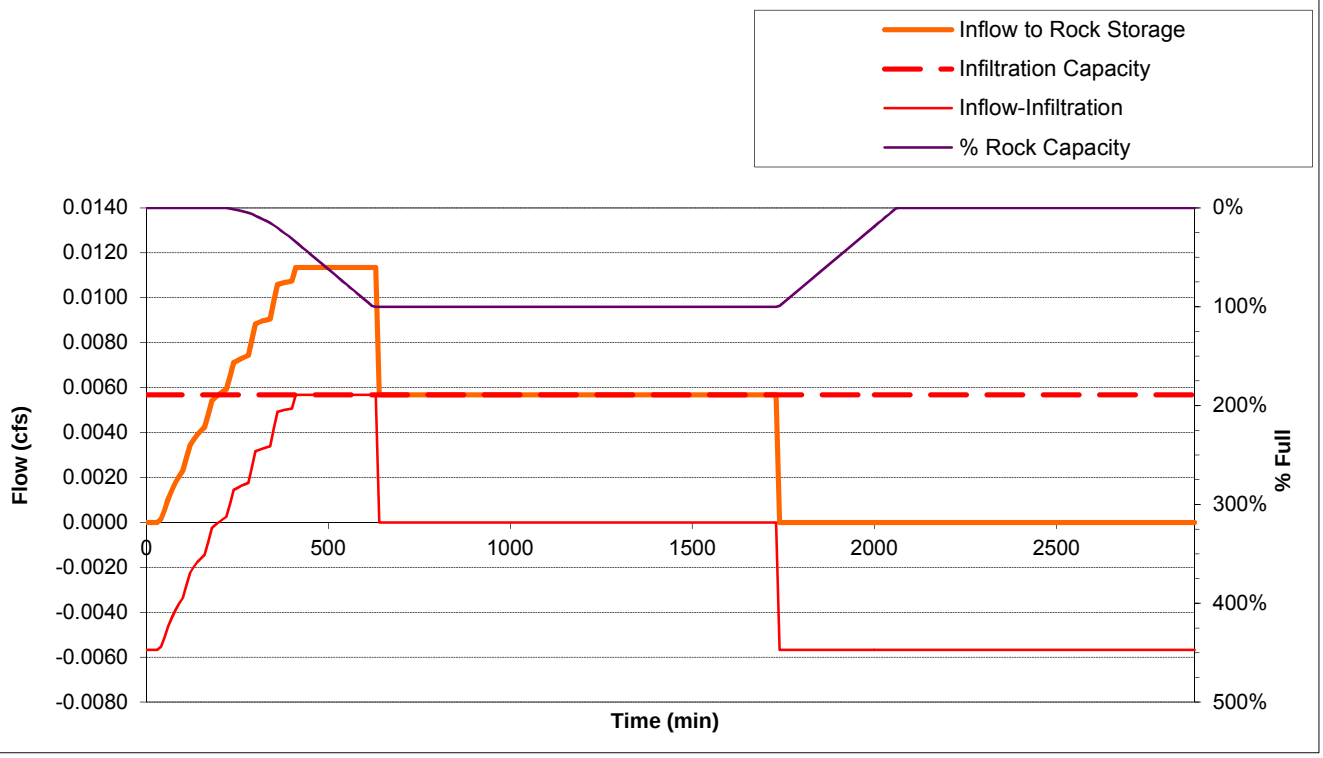
10-yr Con-A&B

10-yr Event
Surface Facility Modeling

Project Name: Benjamin Heights
Run Time: 5/16/2013 3:32:13 PM
Catchment ID: Lots 1 & 2
Hierarchy: 1
Facility Type: Planter (I
Facility Configuration: B



10-yr Event
Below Grade Modeling



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Presumptive Approach Calculator ver. 1.2

Catchment Data

Catchment ID:	**Lot 3**
Project Name:	**Benjamin Heights**
Date:	**05/27/13**
Project Address:	**23451 Salamo Rd**
Permit Number:	**0**
	West Linn, OR
Run Time	5/16/2013 3:38:28 PM
Designer:	**Kathleen Freeman, PE**
Company:	**3J Consulting, Inc**

Drainage Catchment Information

Catchment ID	Lot 3	
	Catchment Area	
Impervious Area	2,000	SF
Impervious Area	0.05	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}):	2	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	

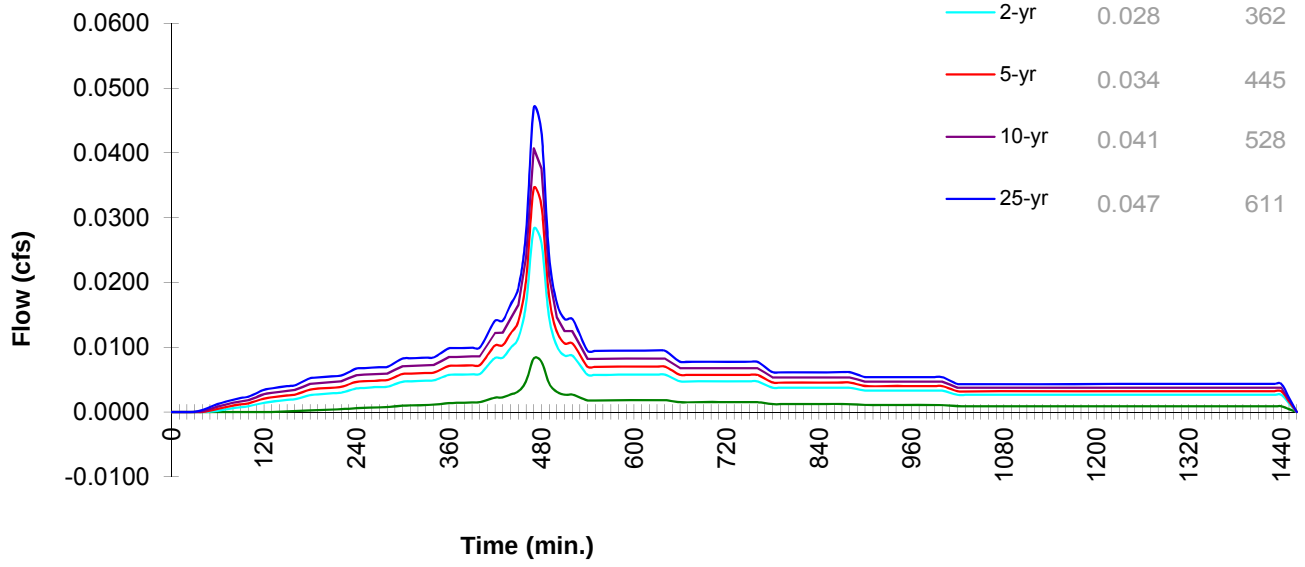
Design Infiltration Rates

I_{dsgn} for Native (I_{test} / CF_{test}):	1.00	in/hr
I_{dsgn} for Imported Growing Medium:	2.00	in/hr

Execute SBUH

SBUH Results

	Peak Rate (cfs)	Volume (cf)
PR	0.008	105
2-yr	0.028	362
5-yr	0.034	445
10-yr	0.041	528
25-yr	0.047	611



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Presumptive Approach Calculator ver. 1.2

Catchment ID: Lot 3

Run Time 5/16/2013 3:38:28 PM

Project Name: Benjamin Heights **Catchment ID:** Lot 3 **Date:** 5/27/2013

Instructions:

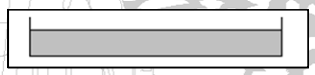
1. Identify which Stormwater Hierarchy Category the facility.
2. Select Facility Type.
3. Identify facility shape of surface facility to more accurately estimate surface volume, except for Swales and sloped planters that use the PAC Sloped Facility Worksheet to enter data.
4. Select type of facility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

Catchment facility will meet Hierarchy Category: 1

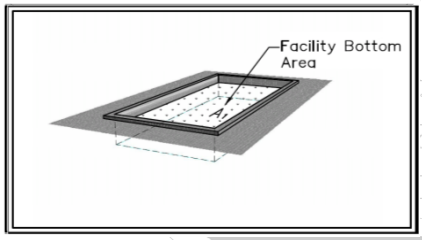
Goal Summary:

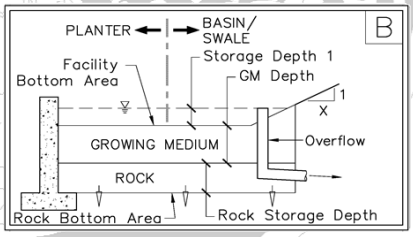
Hierarchy Category	SWMM Requirement	RESULTS box below needs to display…	
		Pollution Reduction as a	10-yr (aka disposal) as a
1	On-site infiltration with a surface infiltration facility.	PASS	PASS

Facility Type = Planter (Flat)



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





Calculation Guide
Max. Rock Stor. Bottom Area
185 SF

DATA FOR ABOVE GRADE STORAGE COMPONENT

Facility Bottom Area =	185	sf
Bottom Width =	20.0	ft
Facility Side Slope =	0	to 1
Storage Depth 1 =	10	in
Growing Medium Depth =	18	in
Freeboard Depth =	N/A	in
Surface Capacity at Depth 1 =	154	cf
GM Design Infiltration Rate =	2.00	in/hr
Infiltration Capacity =	0.009	cfs

BELOW GRADE STORAGE

Rock Storage Bottom Area =	185	sf
Rock Storage Depth =	18	in
Rock Void Ratio =	0.3	
Rock Storage Capacity =	83	cf
Native Design Infiltration Rate =	1.00	in/hr
Infiltration Capacity =	0.004	cfs

RESULTS

		Overflow Volume			
Pollution Reduction	PASS	0 CF	0%	Surf. Cap. Used	Run PAC
			6%	Rock Cap. Used	
10-yr	PASS	0 CF	73%	Surf. Cap. Used	
			100%	Rock Cap. Used	

FACILITY FACTS

Total Facility Area Including Freeboard =	185 SF
Sizing Ratio (Total Facility Area / Catchment Area) =	0.093

Current data has been exported:

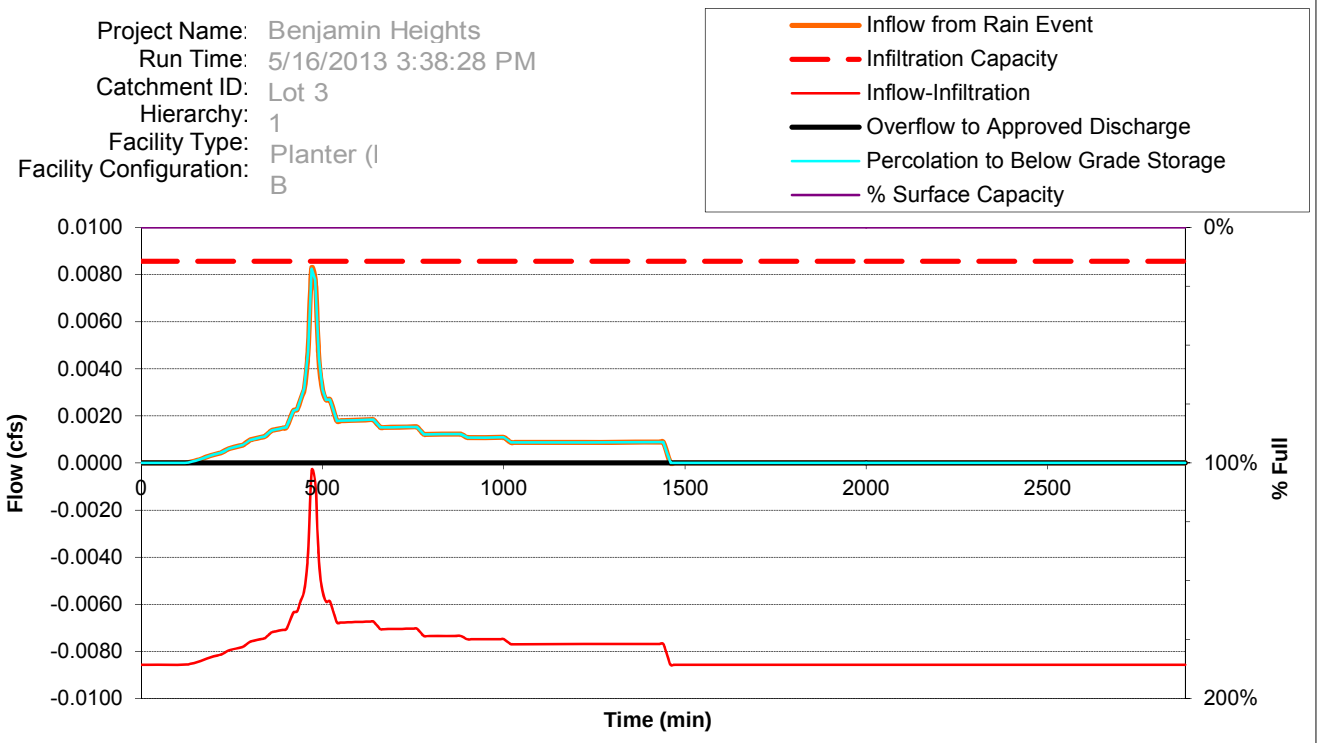
Lot 3.xls 5/16/2013 3:39:09 PM

BES - Presumptive Approach Calculator - Ver 1.2

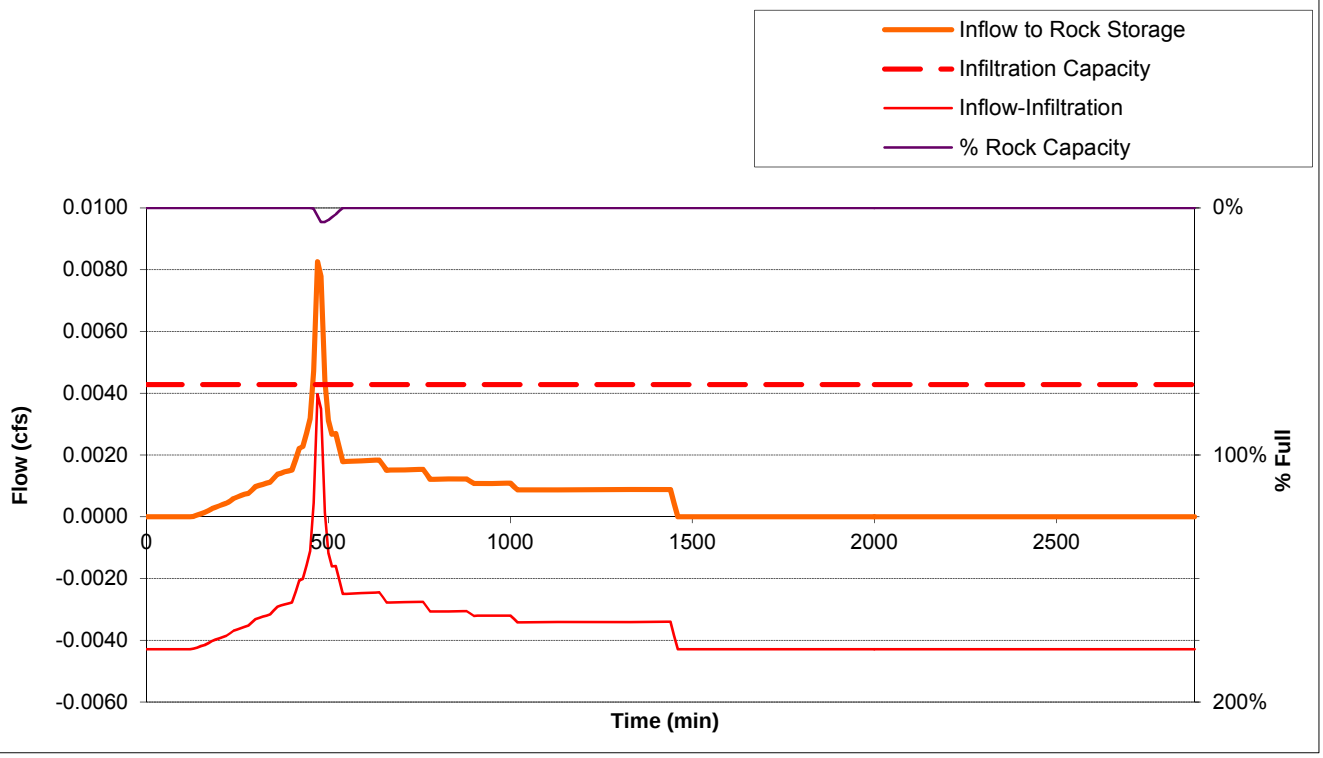
PR Con-A&B

Pollution Reduction Event
Surface Facility Modeling

Project Name: Benjamin Heights
Run Time: 5/16/2013 3:38:28 PM
Catchment ID: Lot 3
Hierarchy: 1
Facility Type: Planter (I
Facility Configuration: B



Pollution Reduction Event
Below Grade Modeling



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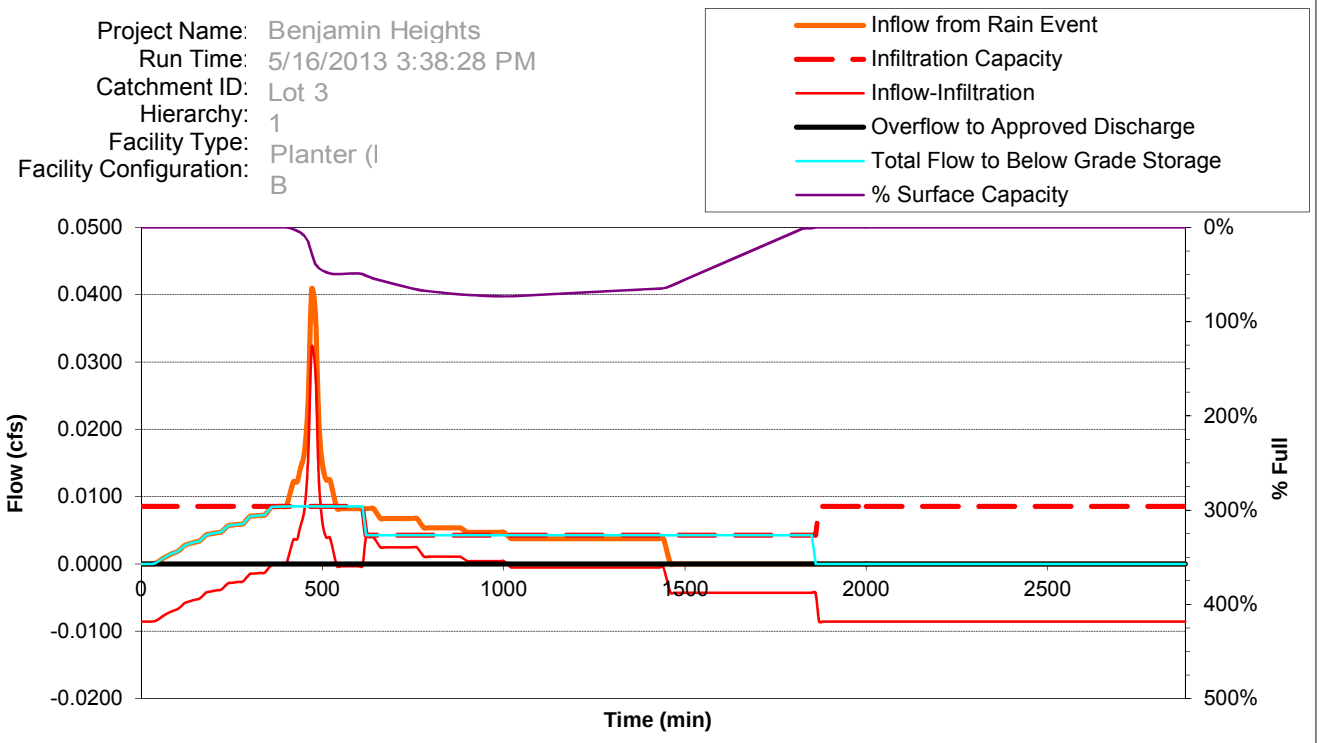
BES - Presumptive Approach Calculator - Ver 1.2

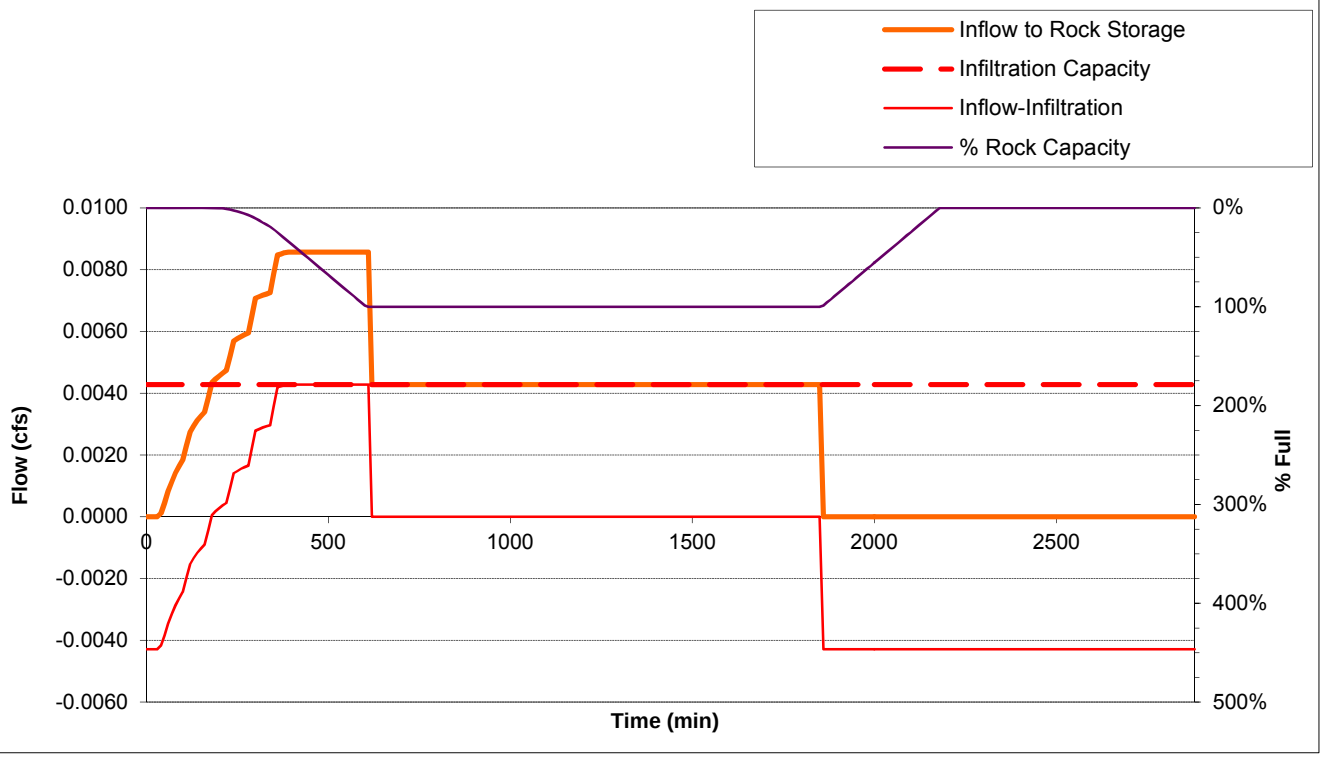
10-yr Con-A&B

10-yr Event
Surface Facility Modeling

Project Name: Benjamin Heights
Run Time: 5/16/2013 3:38:28 PM
Catchment ID: Lot 3
Hierarchy: 1
Facility Type: Planter (I
Facility Configuration: B



10-yr Event
Below Grade Modeling



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CALCULATIONS

Time of Concentration

SUBJECT:	Benjamin Heights Partition		
PROJECT NO.	13117	**BY** KEF	**DATE** 5/27/2013

	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)	243.44 ft	0 ft	0 ft
2-Yr 24 Hour Rainfall, P_2	2.5 in	2.5 in	2.5 in
Land Slope, s	0.06611 ft/ft	0.07965 ft/ft	0.0922 ft/ft
OUTPUT			
Travel Time	0.51 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 =	**0.51 hr**	**0.00 hr**	**0.00 hr**
Watershed or Subarea T_c =	**31 minutes**	**0 minutes**	**0 minutes**

PERVIOUS PAVEMENT DESIGN

Shared Driveway

PROJECT NAME	Benjamin Partition	**BY** KEF	**DATE** 5/27/2013
PROJECT NUMBER	13117		

Pervious Concrete Catchment Area

Area To Infiltrate	3,907	sq ft
Thickness	4	in
Porosity	15	%

Effective Base Rock Storage Area

Effective Storage Area	3,907	sq ft
Thickness	11	in
Porosity	30	%

Storm Event Information

Return Period (yr)	100
24-hr precip. (in)	4.4
Location	Portland
Hydrologic Soil Group	B

Infiltration Area

Effective Infiltration Surface Area A_i	3,907	sq ft
Measured Infiltration Rate I_M	2	in/hr
Design Infiltration Rate I_D (SF=4)	0.5	in/hr
Maximum Infiltration Rate	162.8	CF/hr
Additional Gravel Base	1	in
Porosity	30	%

Storage Capacity

Storage in Concrete	0	CF
Storage in Base Rock	1,074	CF
Storage in Infiltration Area Rock	98	CF
Maximum Storage	1,172	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)	0.74	Stage (in)	0.00	**Stage (in)**	**0.74**
% Used	74%	% Used	0%	**% Used**	**6%**

PERVIOUS PAVEMENT DESIGN

Shared Driveway

PROJECT NAME	Benjamin Partition	**BY** KEF	**DATE** 5/27/2013
PROJECT NUMBER	13117		

								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	0.106	34.4	34.4	34.4	0	0.0	0.00	0%	0.00	0%	0%	0.00
2	2.60	0.114	37.2	37.2	37.2	0	0.0	0.00	0%	0.00	0%	0%	0.00
3	3.20	0.141	45.8	45.8	45.8	0	0.0	0.00	0%	0.00	0%	0%	0.00
4	3.80	0.167	54.4	54.4	54.4	0	0.0	0.00	0%	0.00	0%	0%	0.00
5	4.44	0.195	63.6	63.6	63.6	0	0.0	0.00	0%	0.00	0%	0%	0.00
6	5.18	0.228	74.2	74.2	74.2	0	0.0	0.00	0%	0.00	0%	0%	0.00
7	6.48	0.285	92.8	92.8	92.8	0	0.0	0.00	0%	0.00	0%	0%	0.00
8	16.44	0.723	235.5	235.5	162.8	73	0.0	**0.74**	74%	0.00	0%	**6%**	**0.74**
9	7.58	0.334	108.6	108.6	162.8	19	0.0	0.19	19%	0.00	0%	2%	0.19
10	5.28	0.232	75.6	75.6	75.6	19	0.0	0.19	19%	0.00	0%	2%	0.19
11	4.96	0.218	71.1	71.1	71.1	19	0.0	0.19	19%	0.00	0%	2%	0.19
12	4.32	0.190	61.9	61.9	61.9	19	0.0	0.19	19%	0.00	0%	2%	0.19
13	4.02	0.177	57.6	57.6	57.6	19	0.0	0.19	19%	0.00	0%	2%	0.19
14	3.42	0.150	49.0	49.0	49.0	19	0.0	0.19	19%	0.00	0%	2%	0.19
15	3.28	0.144	47.0	47.0	47.0	19	0.0	0.19	19%	0.00	0%	2%	0.19
16	3.00	0.132	43.0	43.0	43.0	19	0.0	0.19	19%	0.00	0%	2%	0.19
17	2.80	0.123	40.1	40.1	40.1	19	0.0	0.19	19%	0.00	0%	2%	0.19
18	2.40	0.106	34.4	34.4	34.4	19	0.0	0.19	19%	0.00	0%	2%	0.19
19	2.40	0.106	34.4	34.4	34.4	19	0.0	0.19	19%	0.00	0%	2%	0.19
20	2.40	0.106	34.4	34.4	34.4	19	0.0	0.19	19%	0.00	0%	2%	0.19
21	2.40	0.106	34.4	34.4	34.4	19	0.0	0.19	19%	0.00	0%	2%	0.19
22	2.40	0.106	34.4	34.4	34.4	19	0.0	0.19	19%	0.00	0%	2%	0.19
23	2.40	0.106	34.4	34.4	34.4	19	0.0	0.19	19%	0.00	0%	2%	0.19
24	2.40	0.106	34.4	34.4	34.4	19	0.0	0.19	19%	0.00	0%	2%	0.19
25	0	0.000	0.0	0.0	18.5	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 REPORTS

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

April 30, 2013
GeoPacific Project No. 13-2968

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

Copy: Brian Feeney (brian.feeney@3j-consulting.com)

Via e-mail with hard copies mailed

Subject: **GEOTECHNICAL ENGINEERING REPORT**
REMINGTON DRIVE PARTITION
NORTHWEST CORNER OF SALAMO ROAD AND REMINGTON DRIVE
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 P-4458, dated April 3, 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 northwest corner of the intersection of Salamo Road and Remington Drive in West Linn, Oregon (Figure 1). The area of the planned development totals approximately 0.66 acres. A single family residence is present in the central portion of the site. The topography on the site is sloping down to the west at grades of approximately 10 percent or less. Vegetation on the site consists primarily of grass, brush, and small to large trees. The large trees are concentrated on the north side of the property.

It is our understanding that the proposed development includes grading the site to support lots for new single-family homes and associated underground utilities. The current site plan (Figure 2) shows a total of 3 lots and one tract. The existing residence is to be demolished and removed from the site. 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.

Underlying the Columbia River Basalt Formation is the Skamania Volcanics Formation. The Oligocene aged (about 37 to 26 million years ago) Samania Volcanics extend to depth of several thousand feet and form the crystalline basement of the basin (Schlicker 1963).

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 17.3 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.

FIELD EXPLORATION

Subsurface conditions were explored on April 13, 2013 by excavating 3 test pits to depths of 4.5 to 10 feet below the 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.

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, residual soil, and Columbia River Basalt materials, as described below.

Topsoil: In test pits TP-1 and TP-2, the ground surface was directly underlain by topsoil consisting of dark brown, moderately organic SILT (OL-ML) with fine roots throughout. Topsoil thickness in test pits ranged from about 6 to 10 inches. There is the potential for some tree roots or thicker topsoil zones in forested areas on site.

Undocumented Fill: In test pit TP-3, the ground surface was directly underlain by undocumented fill material. The fill generally consisted of loose silty GRAVEL (GM), with organic debris. The fill extended to a depth of 3 feet at test pit TP-3.

Residual Soil: Underlying the topsoil in test pits TP-1 and TP-2 and the undocumented fill in test pit TP-3, the test pits encountered stiff clayey silt residual soil derived from the in-place weathering of the underlying Columbia River Basalt Formation. The residual soil transitioned to less weathered basalt bedrock as discussed below. Where encountered, the residual soil extended to approximately 5.5 to 8.5 feet below ground surface. Residual soil extended beyond the maximum depth of exploration (4.5 feet) in test pit TP-2.

Columbia River Basalt: Underlying the residual soil, test pits encountered weathered basalt bedrock materials belonging to the Columbia River Basalt Formation. The basalt encountered was typically highly weathered and ranged from extremely soft (R0) to medium hard (R3). The hardness increased with depth. The explorations resulted in practical refusal on medium hard (R3) basalt in test pit TP-3 at a depth of 7.5 to 9 feet, using a John Deer 310E backhoe with 2-foot-wide toothed bucket. Soft (R2) basalt extended beyond the maximum depth of exploration (10 feet) in test pit TP-1.

Groundwater

On April 13, 2013, groundwater was encountered at a depth of 9 feet in test pit TP-1. Regional geologic maps indicate relatively shallow groundwater conditions exist in the project vicinity, which can rise to within 1.5 feet of the ground surface (Schlicker 1963). A small stream was observed running along the north and west perimeter of the property.

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 April 13, 2013, GeoPacific performed two pushed pipe falling head infiltration tests at the approximate locations shown on Figure 2. The tests were conducted in 6-inch diameter pipes pushed into the native soil at approximate depths of 2 and 4.5 feet below the ground surface. The infiltration tests were performed at or near the locations of test pits TP-2 and TP-3. The soil encountered at the depth of the infiltration tests consisted of reddish brown clayey SILT (ML) residual soil.

The test holes were pre-saturated for 4 hours prior to performing the tests. During the tests, water levels were measured over 30 minute intervals with approximate head pressures ranging between 4 and 12 inches until three successive measurements showing a consistent infiltration rate were achieved. Approximate test locations are shown in Figure 2. Table 2 presents a summary of our infiltration test measurement results.

Table 2. Results of Infiltration Testing

Location	Depth (feet)	Infiltration Rate (in/hr)
TP-2	4.5	2
TP-3	2	0.2

The test results indicate 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. In our opinion, the greatest geotechnical constraints for project development are the presence of undocumented fill and medium hard rock underlying much of the site. The proposed structures may be supported on shallow foundations bearing on competent undisturbed native soils, or engineered fill, designed and constructed as recommended in this report.

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, erosion control considerations, and asphalt pavement sections. The recommendations of this report assume the single-family structures will have raised floors and crawlspaces.

Site Preparation and Undocumented Fill Removal

Within the areas to receive fill, proposed building footprints, or other settlement-sensitive areas, undocumented fill, buried topsoil, vegetation, and debris should be completely removed and replaced with engineered fill. Debris from clearing should be removed from the site. Undocumented fill was encountered to a depth of about 3 feet in test pit TP-3.

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 8 inches over most of the site. Deeper stripping will be needed in areas that have been tilled in the past, areas of localized fill deposits, etc. 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 Building Code (IBC) with applicable 2010 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 3. Recommended Earthquake Ground Motion Parameters (2009 IBC / 2010 OSSC)

Parameter	Value
Location (Lat, Long), degrees	45.356, -122.645
Mapped Spectral Acceleration Values (MCE, Site Class D):	
Short Period, S_s	0.911 g
1.0 Sec Period, S_1	0.326 g
Soil Factors for Site Class D:	
F_a	1.136
F_v	1.748
$SD_s = 2/3 \times F_a \times S_s$	0.690 g
$SD_1 = 2/3 \times F_v \times S_1$	0.380 g

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 our understanding of the proposed project and the results of our exploration program, and assuming our recommendations for site preparation are followed, medium stiff to stiff native soil or engineered fill soils should be encountered at or near the foundation level of the proposed structures.

Shallow, conventional isolated or continuous spread footings may be used to support the proposed structures, provided they are founded on competent native soils. We recommend a maximum allowable bearing pressure of 2,000 pounds per square foot (psf) for designing footings on native soil near existing grade. 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 pervious pavement and/or shallow infiltration facilities. Infiltration test results indicate that infiltration rates in the near surface residual soils are on the order of 0.2 inches per hour at depths of 1 to 3 feet, and 2 inches per hour at depths of 3 to 5 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 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.

Permeable Pavement Design Recommendations

We understand that permeable pavements may be incorporated in project design. We recommend pervious Portland cement concrete (PCC), or manufactured permeable paver blocks such as Anchor Holland Permeable with integrated spacer gaps (or similar). Pervious asphalt pavement is not recommended due to its tendency for raveling and insufficient durability. A typical detail for permeable pavement sections is attached to this report.

For use in sizing calculations, we recommend an ultimate infiltration rate of 1 inch per hour be used for the near surface silt soils. For the design infiltration rate, the system designer/builder should incorporate an appropriate factor of safety against slowing of the rate over time due to biological and sediment clogging. Stormwater exceeding soil infiltration and/or soil storage capacities will need to be directed to a suitable discharge location. We suggest the pervious pavement designer assume a void ratio of 30 percent for the crushed rock / reservoir course. The crushed rock / reservoir course material should consist of Open-Graded Aggregate per ODOT Standard Specifications Section 02630.11. Care should be taken to avoid overcompaction of the subgrade soils and reservoir course, which could limit the void ratio of these materials and reduce the functionality as a pervious pavement.

We do not recommend a density specification for the crushed rock / reservoir course material beneath pervious pavements, due to concerns about overcompaction as discussed above. During placement of the base rock / reservoir course material, visual observations should be made to verify the material has been compacted to a relatively firm and unyielding condition.

We assume that the private driveway will accommodate primarily passenger vehicles and light trucks. Consequently, our design was formulated using design methods prescribed by AASHTO for light-duty roads.

Table 4 presents our recommended minimum section for construction of a permeable paver private driveway section in dry-weather conditions. The driveway should be constructed on firm, unyielding subgrade soil. The edges of permeable pavement sections should be retained by concrete curbs extending to subgrade below the base of the section, or as specified by the project civil engineer.

Table 4. Recommended Permeable Paver Section for Dry-Weather Construction

Material Layer	Minimum Thickness (in.)
Pervious PCC / Manufactured Paver Blocks	4 inches / 3.125 inches
Open Graded Crushed Aggregate (washed) 1"- 1/10" ODOT Table 02630-2	1 inch
Open Graded Crushed Aggregate (washed) (2" – ¾ " diameter)	11 inches (see Note)
Non-woven Geotextile Filter Fabric (Mirafi 160N or Equivalent)	-
Unyielding Native Subgrade Soil	-

Note: Thickness of reservoir section may need to be increased by the storm water system designer, due to storm water detention or other requirements.

Subgrade strength be verified visually by GeoPacific prior to section placement; soft areas may need to be stabilized or overexcavated prior to pavement section construction. Overexcavations should be backfilled using additional crushed drain rock.

If pavement areas are to be constructed during wet weather, GeoPacific should review the subgrade and proposed construction methods immediately prior to the placement of base course so that specific recommendations can be provided. Wet-weather construction is likely to require additional crushed aggregate base course thickness.

Excavating Conditions and Utility Trench Backfill

Subsurface test pit exploration indicates that soft (R2) to medium hard (R3) basalt underlies the site at shallow depths. We expect utility trenches less than about 7.5 feet below existing grade can be excavated in the soft basalt using conventional large trackhoe equipment. Practical refusal on medium hard (R3) basalt bedrock was reached in test pit TP-3 at a depth of 7.5 feet, with the medium-sized backhoe used in our exploration. Medium hard Columbia River Basalt typically contains clay seams and fractures, and can be excavated employing a rock bucket and ripper tooth. Some use of pneumatic rock breaker attachments may be necessary, particularly in deeper utility trench excavations.

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.

Asphalt Pavement Sections

We understand that asphalt pavements may be incorporated in project design. Table 5 presents recommended minimum pavement sections for on-site public streets under dry weather construction conditions. For on-site streets, a subgrade soil R-value of 15 was assumed for design purposes. The recommended pavement sections were formulated using the Crushed Base Equivalent method and assuming a Traffic Index of 4 for on-site streets. The Traffic Index is generally appropriate for minor residential streets and cul-de-sacs. The project engineer or architect should review the assumed traffic indices to evaluate their suitability for this project. Changes in anticipated traffic levels will affect the corresponding pavement section.

Table 5. Recommended Minimum Dry Weather Pavement Section

Material Layer	Minimum Thickness (inches)	Compaction Standard
Asphaltic Concrete (AC)	3	92% of Rice Density (top lift) 91% of Rice Density (lower lifts) AASHTO T-209
Crushed Aggregate Base ¾"-0 (leveling course)	2	95% of Modified Proctor ASTM D1557
Crushed Aggregate Base 1½"-0	8	95% of Modified Proctor ASTM D1557
Recommended Subgrade	12	90% of Modified Proctor or approved native

In new pavement areas, native soil subgrade in pavement areas should be ripped or tilled to a minimum depth of 12 inches, moisture conditioned, and recompacted in-place to at least 90 percent of ASTM D1557 (Modified Proctor) or equivalent. In order to verify subgrade strength, we recommend proof-rolling directly on subgrade with a loaded dump truck during dry weather and on top of base course in wet weather. Soft areas that pump, rut, or weave should be stabilized prior to paving. If pavement areas are to be constructed during wet weather, GeoPacific should review subgrade at the time of construction so that condition specific recommendations can be provided. Wet weather pavement construction is likely to require soil amendment or geotextile fabric and an increase in base course thickness.

During placement of pavement section materials, density testing should be performed to verify compliance with project specifications. Generally, one subgrade, one base course, and one AC compaction test is performed for every 100 to 200 linear feet of paving.

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.

April 30, 2013
GeoPacific Project No. 13-2968

We appreciate this opportunity to be of service.

Sincerely,

GEOPACIFIC ENGINEERING, INC.

EXPIRES: 06-30-2013

Benjamin G. Anderson
Staff Engineer

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

Attachments: References
Figure 1 – Vicinity Map
Figure 2 – Site and Exploration Plan
Pervious Pavement (SW-110) Typical Detail
Test Pit Logs (TP-1 through TP-3)

REFERENCES

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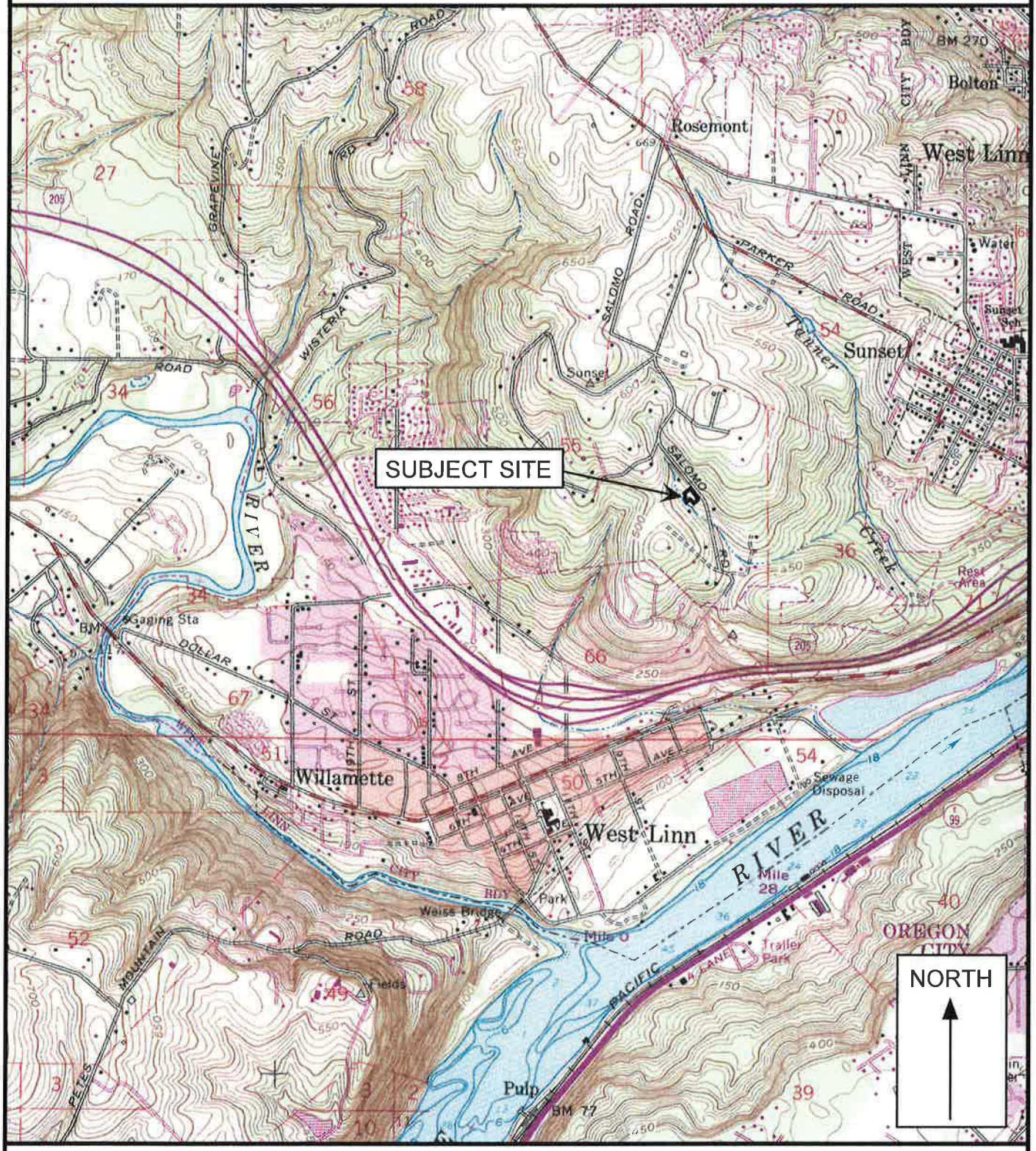
GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

VICINITY MAP



Legend

Approximate Scale 1 in = 2,000 ft

Date: 04/27/13
Drawn by: BGA

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

Project: Remington Drive Partition West Linn, Oregon	Project No. 13-2968	FIGURE 1

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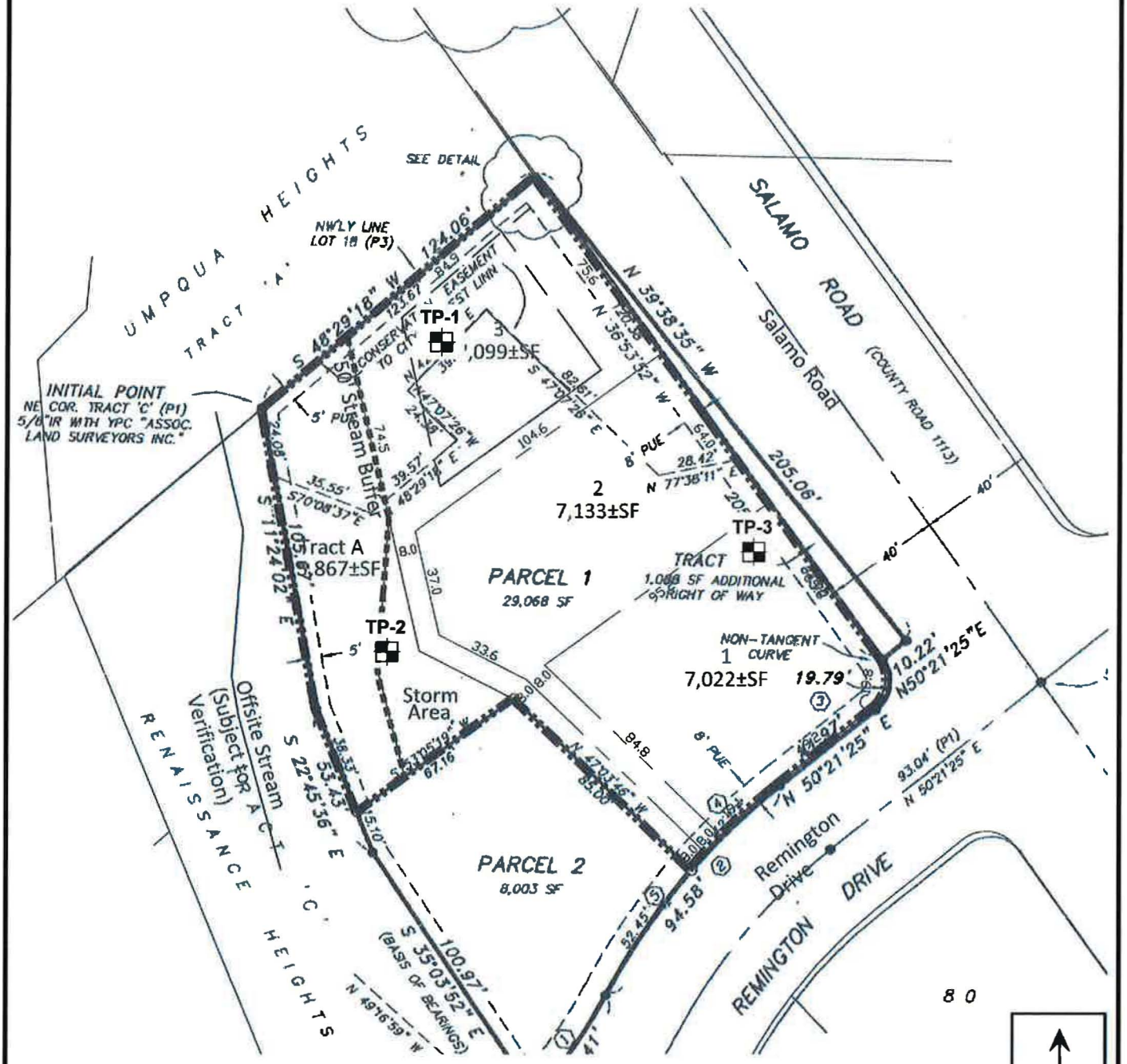
SITE PLAN AND EXPLORATION LOCATIONS



Legend

TP-1
Test Pit Designation and Approximate Location

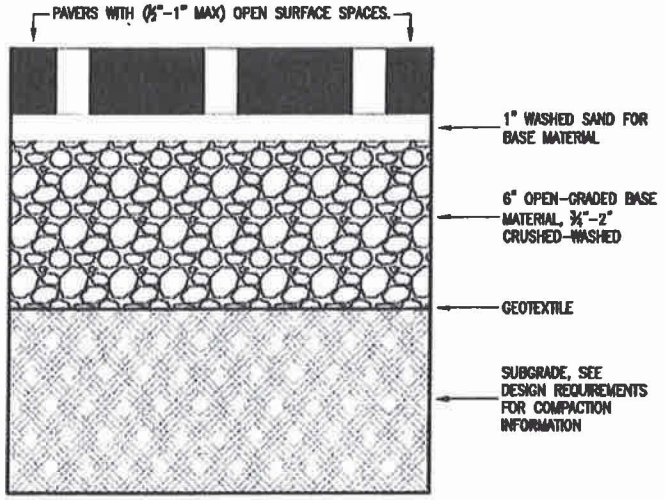
0 50'
APPROXIMATE SCALE 1"=50'

Date: 04/27/13
Drawn by: BGA

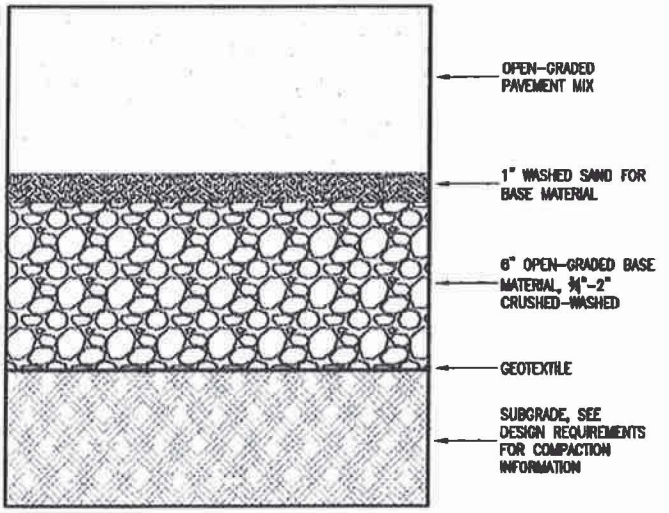
Project: Remington Drive Partition Gaston, Oregon	Project No. 13-2968	FIGURE 2

	RESIDENTIAL DRIVEWAY OR PEDESTRIAN ONLY	PRIVATE STREET, PARKING LOT, OR FIRE LANE	PUBLIC STREET
CONCRETE	4"	4"	7"
~~ASPHALT~~	~~2 ½"~~	~~3"~~	~~6"~~
PAVERS	2 ⅜"	3 ⅛"	3 ⅛"
ENGINEERING REQ'D	NO	YES	YES
COMPACTION REQ'D	NO	YES	95%

EXHIBIT 2-8
PERVIOUS PAVEMENT REQUIREMENTS FOR TOP LIFT DEPTH, ENGINEERING, AND COMPACTION.



PERMEABLE CONCRETE BLOCK OR "PAVER" SYSTEMS



PERVIOUS (OPEN GRADED) CONCRETE AND ~~ASPHALT~~ SYSTEMS

- DRAWING NOT TO SCALE -

STORMWATER MANAGEMENT MANUAL TYPICAL DETAILS

- Simplified / Presumptive / Performance Design Approach -

Pervious Pavement

Bureau of Environmental Services

NUMBER

SW-110

GeoPacific Engineering, Inc.
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TEST PIT LOG

Project: Remington Drive Partition
West Linn, Oregon

Project No. 13-2968

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						Moderately organic SILT (OL-ML), dark brown, fine roots throughout upper 6 inches, soft, moist (Topsoil)
	4.5					Stiff to hard, clayey SILT (ML), brown, moist (Residual Soil)
2	4.5					
	4.5					
3	4.5					
	4.5					
4	4.5					
5						
6						
7						
8						Grades to reddish brown with gray mottling
9						Very soft to soft (R1-R2), highly weathered BASALT, gray, moist (Columbia River Basalt)
10						Test pit terminated at 10 feet.
11						Note: Groundwater measured at 9 feet.
12						
13						
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 04/13/13
Logged By: BGA
Surface Elevation:

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Portland, Oregon 97224
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TEST PIT LOG

Project: Remington Drive Partition
West Linn, Oregon

Project No. 13-2968

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	3.0					4" moderately organic SILT (OL-ML), dark brown, fine roots throughout, soft, moist (Topsoil)
	3.5					Very stiff, clayey SILT (ML), gray, moist (Residual Soil)
2	4.0					
	3.5					Encountered drain field utilities in a portion of the test pit
3	3.5					
4						
5						Test pit terminated at 4.5 feet.
						Note: No seepage or groundwater encountered.
6						
7						
8						
9						
10						
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: 04/13/13
Logged By: BGA
Surface Elevation:

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

Project: Remington Drive Partition West Linn, Oregon	Project No. 13-2968	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						Loose, silty GRAVEL (GM), brown, with occasional fine and medium roots, moist (Undocumented Fill) Large stump encountered at 1.5 feet (about 3 feet in diameter)
2						
3						Very stiff, clayey SILT (ML), brown, moist (Residual Soil)
4	3.0 3.0					
5	3.5					
6						Very soft to soft (R1-R2), highly weathered BASALT, gray, moist (Columbia River Basalt)
7						
8						Test pit terminated at 7.5 feet due to practical refusal on medium hard to hard (R3-R4), moderately weathered BASALT, vesicular, gray and reddish brown, black staining, moist (Columbia River Basalt) Note: No seepage or groundwater encountered. Depth of refusal was 9 feet on the north side (midslope) and 7.5 feet on the south side (bottom of the slope, next to the driveway)
9						
10						
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: 04/13/13
Logged By: BGA
Surface Elevation:

OPERATIONS AND MAINTENANCE

OPERATIONS AND MAINTENANCE PLAN FOR STORMWATER FACILITIES

BENJAMIN HEIGHTS PARTITION
WEST LINN, OR

May 27, 2013

Prepared For:

JT Smith Companies
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: 13117
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 Benjamin Heights 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 Benjamin Heights 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 a 6 inch pipe under the shared driveway. The pipe will convey overflows to Salamo Creek.

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			

Walter H. Knapp & Associates, LLC
Consultants in Arboriculture, Silviculture, and Forest Ecology

May 9, 2013

Planning and Building
City of West Linn
22500 Salamo Road #1000
West Linn, Oregon 97068

Re: Arborist Report and Tree Preservation Plan for the Sunbreak Project
West Linn, Oregon
Project No.: 1325 Benjamin Heights

Please find enclosed the Arborist Report and Tree Preservation Plan for the Benjamin Heights project located at 234451 Salamo Road in West Linn, Oregon. Please contact us if you have questions or need any additional information.

Respectfully,

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

7615 SW Dunsmuir Lane, Beaverton, OR 97007
Phone: (503) 646-4349 Fax: (503) 747-4863

Walter H. Knapp & Associates, LLC
Consultants in Arboriculture, Silviculture, and Forest Ecology

Arborist Report and Tree Preservation Plan

Benjamin Heights
West Linn, Oregon

May 9, 2013

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Table of Contents

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Walter H. Knapp & Associates, LLC
Consultants in Arboriculture, Silviculture, and Forest Ecology

May 8, 2013

BENJAMIN HEIGHTS – WEST LINN, OREGON
ARBORIST REPORT AND TREE PRESERVATION PLAN

1325

Purpose

This Arborist Report and Tree Preservation Plan for the Benjamin Heights project in West Linn, Oregon, is provided pursuant to City of West Linn Community Development Code, Chapter 55, Municipal Code Sections 8.500 and 8.600, and the West Linn Tree Technical Manual. This report describes the existing trees located on the project site, as well as recommendations for tree removal, retention and protection.

Site Description

The project site is located at 23451 Salamo Road in West Linn. The site is planned for partition and development of three single family homes. Existing trees are scattered across the site, including street trees along Remington Drive, landscape trees around the existing residence, and a small grove of Douglas-fir (*Pseudotsuga menziesii*) trees located in a protected easement in the north-northwestern portion of the site. A site visit was conducted on April 24, 2013 by ISA Certified Arborist Morgan Holen (PN-6145A) in order to evaluate the existing trees in terms of species, size, condition, significance, and suitability for preservation with development. The location of individual trees is shown on site plan drawings and tree numbers correspond with the enclosed inventory data.

Tree Inventory

In all, 28 existing trees were inventoried, including nine (32%) trees located on adjacent properties that will be protected throughout construction. The remaining 19 (68%) trees are located on site and include seven different tree species, including one non-native and invasive English hawthorn (*Crataegus monogyna*). Table 1 provides a summary of the number of on-site trees by species.

Table 1. Count of On Site Trees by Species and Location – Benjamin Heights.

Common Name	Species Name	Quantity	Percent
bigleaf maple	*Acer macrophyllum*	1	5.3%
Douglas-fir	*Pseudotsuga menziesii*	13	68.4%
English hawthorn	*Crataegus monogyna*	1	5.3%
magnolia	*Magnolia* spp.	1	5.3%
Pacific dogwood	*Cornus nuttallii*	1	5.3%
plum	*Prunus* spp.	1	5.3%
redbud	*Cercis canadensis*	1	5.3%
Total		**19**	**100%**

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Significant trees will be determined by the City Arborist. Based on our evaluation of the size, type, location, health, and long term survivability of the individual trees located on site, nine (47%) on site trees were identified as potentially being classified as significant. This includes nine Douglas-firs located in the grove with no major defects noted (trees number 2091, 2092, 2093, 2436, 2496, 2497, 2499, 2501 and 2502). The enclosed tree inventory data provides a complete description of the individual trees.

Note that five additional trees located within the grove were not determined to be significant based on our evaluation. This includes trees:

- #2094, a 19-inch diameter Douglas-fir with potentially hazardous basal swelling that is suitable for retention with preservation of adjacent trees;
- #2503, a six inch diameter bigleaf maple (*Acer macrophyllum*) that is overtopped by the more dominant Douglas-firs and in poor condition with a broken top and stem decay; and
- #2433, 2434 and 2435, Douglas-firs in a tight group measuring 38-, 30-, and 43-inches in diameter respectively. As noted in the complete inventory, these trees have high risk defects that warrant removal because of hazardous condition (photos 1 and 2). Removal of these three trees should not result in negative impacts to the remainder of the grove.

Photo 1 (left) shows a heavy cone crop in the top of tree #2433 and a loss of apical dominance in tree #2435; tree #2434 is overtopped and not visible in these photos. Photo 2 (right) shows *Phellinus pini* conks at tree #2433.

Tree Plan Recommendations

We coordinated with the project team to discuss trees suitable for preservation in terms of proposed construction impacts. Of the 19 on site trees, 9 (47%) are planned for removal either for construction or because of poor or hazardous condition, and 10 (53%) are planned for retention including the nine potentially significant trees, as well as one non-significant tree (#2094, the potentially hazardous Douglas-fir with basal swelling that is sheltered within the grove area). Table 2 provides a summary of the number of non-significant and potentially significant trees by treatment recommendation.

Table 2. Number of On Site Trees by Treatment Recommendation and Significance.

Treatment	Remove	Retain	Total	Percent
Non-Significant Trees	9	1	**10**	53%
Potentially Significant Trees	0	9	**9**	47%
Total	**9**	**10**		
Percent	47%	53%	**19**	**100%**

Additionally, the nine inventoried trees located on adjacent properties will be protected during construction. Special protection is recommended for two neighboring trees, including:

- #2090, a Port-Orford-cedar (*Chamaecyparis lawsoniana*) located along the western property line near the northwest corner of the site. This species is highly susceptible to Port-Orford-cedar root disease, which is caused by the fungus *Phytophthora lateralis*. Installing silt fencing adjacent directly adjacent to the tree protection fencing will help to avoid infection during construction.
- #2607, a 28-inch diameter Oregon white oak (*Quercus garryana*) located prominently in the right-of-way at the intersection of Salamo Road and Remington Drive. The crown radius extends approximately 20-feet in all directions. A sidewalk is proposed adjacent to this tree which sits below the street grade, 7-feet west of the existing back of curb. Work will be necessary beneath the dripline of the tree and will require building up from the existing grade rather than excavating into the root zone. Any work that is necessary beneath the dripline of a protected tree should be performed under arborist supervision and with consent from the City's arborist. Surfacing beneath the dripline of protected trees, including sidewalk construction, should be performed using the modified profile provided in the next section of this report.

The Tree Plan drawing illustrates the location of trees to be removed and preserved, and the approximate location of tree protection measures.

We also recommend replanting one Douglas-fir in the vicinity of the group of three Douglas-firs planned for removal because of hazardous condition. Replanting in this area will help maintain the canopy cover in the tree grove easement over time. Douglas-fir is not tolerant of shade, so replanting more than one Douglas-fir in this location would not be sustainable; the available growing space is suitable for one Douglas-fir.

Tree Protection Standards

Trees to be protected will need special consideration to assure their protection during construction. Tree protection measures include:

Before Construction

1. **Tree Protection Zone.** The project arborist shall designate the Tree Protection Zone (TPZ) for each tree to be protected. Where feasible, the size of the TPZ shall be established at the dripline of the tree plus 10-feet. Alternatively, the TPZ shall be established at the dripline of protected trees. Where infrastructure (retaining walls, driveways, buildings, and utilities) must be installed closer to the tree(s), the TPZ may be established within the dripline area if the project arborist, in coordination with the City Arborist, determines that the tree(s) will not be unduly damaged. The location of TPZs shall be shown on construction drawings.
2. **Protection Fencing.** Protection fencing shall serve as the tree protection zone and shall be erected before demolition, grubbing, grading, or construction begins. All trees to be retained shall be protected by six-foot-high chain link fences installed at the edge of the TPZ. Protection fencing shall be secured to two-inch diameter galvanized iron posts, driven to a depth of a least two feet, placed no further than 10-feet apart. If fencing is located on pavement, posts may be supported by an appropriate grade level concrete base. Protection fencing shall remain in place until final inspection of the project permit, or in consultation with the project arborist.
3. **Signage.** An 8.5x11–inch sign stating, "WARNING: Tree Protection Zone," shall be displayed on each protection fence at all times.
4. **Special Protection for Adjacent Tree #2090.** At tree #2090, install silt fencing at the dripline plus ten-feet and then install tree protection just beyond the silt fencing, further from the tree. Do not install the silt fencing by trenching into the ground. Instead, wrap the bottom of the fencing in a straw wattle and use wooden stakes to secure the wattle to the ground surface and keep the silt fencing taut. Tree protection will be a semi-circle around the tree, stopping at the property line.
5. **Designation of Cut Trees.** Trees to be removed shall be clearly marked with construction flagging, tree-marking paint, or other methods approved in advanced by the project arborist. Trees shall be carefully removed so as to avoid either above or below ground damage to those trees to be preserved. Roots of stumps that are adjacent to retained trees shall be carefully severed prior to stump extraction.
6. **Preconstruction Conference.** The project arborist shall be on site to discuss methods of tree removal and tree protection prior to any construction.
7. **Verification of Tree Protection Measures.** Prior to commencement of construction, the project arborist will verify in writing to the City Arborist that tree protection fencing has been satisfactorily installed.

During Construction

8. **Tree Protection Zone Maintenance.** The protection fencing shall not be moved, removed, or entered by equipment except under direction of the project arborist, in coordination with the City Arborist.
9. **Storage of Material or Equipment.** The contractor shall not store materials or equipment within the TPZ.
10. **Sidewalk Construction.** Under the direction of the project arborist, a modified profile (figure 1) is recommended for surfacing beneath the dripline of protected trees in order to construct the sidewalk within the TPZ. This profile includes a layer of permeable geotextile fabric on the ground surface and building up from the natural grade to avoid excavation in the root zone as much as feasible.

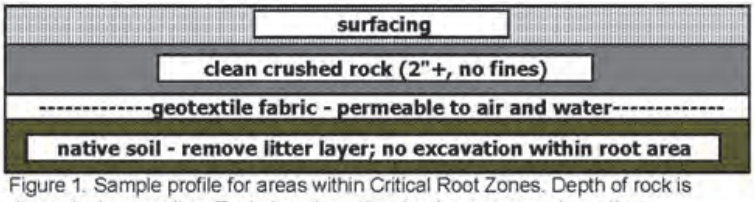


Figure 1. Sample profile for areas within Critical Root Zones. Depth of rock is dependent on grading. Technique based on best management practices.

11. **Excavation within the TPZ.**
    a. Excavation with the TPZ shall be avoided if alternatives are available.
    b. If excavation within the TPZ is unavoidable, the project arborist shall evaluate the proposed excavation to determine methods to minimize impacts to trees. This can include tunneling, hand digging or other approaches.
    c. All construction within the TPZ shall be under the on-site technical supervision of the project arborist, in coordination with the City Arborist.
12. **Tree Protection Zone.** The project arborist shall monitor construction activities and progress, and provide written reports to the developer and the City at regular intervals. Tree protection inspections will occur monthly or more frequently if needed.
13. **Quality Assurance.** The project arborist shall supervise proper execution of this plan during construction activities that could encroach on retained trees. Tree protection site inspection monitoring reports will be provided to the Client and City on a regular basis throughout construction.

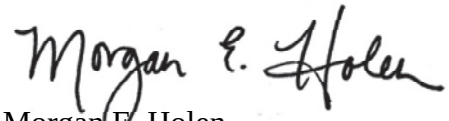
Post Construction

14. **Final Report.** After the project has been completed, the project arborist shall provide a final report to the developer and the City. The final report shall include concerns about any trees negatively impacted during construction, and describe the measures needed to maintain and protect the remaining trees for a minimum of two years after project completion.

Summary

The enclosed tree inventory provides complete data for individual trees at the Benjamin Heights project site in West Linn. The location of inventoried trees and tree protection measures shall be shown on site plan drawings. Nine trees are recommended for removal because of condition or for the purposes of construction and 10 trees are planned for preservation with protection during construction. It is the Client's responsibility to implement this plan and to monitor the construction process. The project arborist will be available during construction to help with tree related issues.

Please contact us if you have questions or need any additional information.



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

Enclosure: 1325 Benjamin Heights - Tree Data 4-24-13

1325 Benjamin Heights - Tree Data 4-24-13

Walter H. Knapp & Associates, LLC

No.	Common Name	Species Name	DBH*	C-Rad^	Defects and Comments	Sig?	Recommendation
2089	red alder	*Alnus rubra*	8	10	off-site, no major defects	n/a	protect adjacent tree
2090	Port-Orford-cedar	*Chamaecyparis lawsoniana*	5*12	10	special protection recommended	n/a	protect adjacent tree
2091	Douglas-fir	*Pseudotsuga menziesii*	41	20	dead branches, safety prune	YES	retain
2092	Douglas-fir	*Pseudotsuga menziesii*	46	25	no major defects	YES	retain
2093	Douglas-fir	*Pseudotsuga menziesii*	39	25	natural, self-correcting lean	YES	retain
2094	Douglas-fir	*Pseudotsuga menziesii*	19	10	basal swelling at 3', retain in group	no	retain
2095	bigleaf maple	*Acer macrophyllum*	4*24	40	off-site, suitable for retention in group	n/a	protect adjacent tree
2291	Pacific dogwood	*Cornus nuttallii*	3*6	12	dieback, suspect anthracnose	no	remove
2292	plum	*Prunus* spp.	4*6	25	poor structure, included bark	no	remove
2433	Douglas-fir	*Pseudotsuga menziesii*	38	30	*Phellinus pini* , heavy cone crop	no	remove
2434	Douglas-fir	*Pseudotsuga menziesii*	30	25	overtopped, not viable	no	remove
2435	Douglas-fir	*Pseudotsuga menziesii*	43	35	lose of apical dominance, thin crown	no	remove
2436	Douglas-fir	*Pseudotsuga menziesii*	29	15	no major defects	YES	retain
2496	Douglas-fir	*Pseudotsuga menziesii*	25	25	remove ivy	YES	retain
2497	Douglas-fir	*Pseudotsuga menziesii*	28	20	remove ivy	YES	retain
2498	bigleaf maple	*Acer macrophyllum*	12	25	off-site, not evaluated	n/a	protect adjacent tree
2499	Douglas-fir	*Pseudotsuga menziesii*	33	25	remove ivy, safety prune	YES	retain
2500	bigleaf maple	*Acer macrophyllum*	12	15	off-site, not evaluated	n/a	protect adjacent tree
2501	Douglas-fir	*Pseudotsuga menziesii*	29	15	dead branches, safety prune	YES	retain
2502	Douglas-fir	*Pseudotsuga menziesii*	39	15	some bark buckling at base	YES	retain
2503	bigleaf maple	*Acer macrophyllum*	6	15	broken top, stem decay	no	remove
2589	magnolia	*Magnolia* spp.	12	15	poor structure	no	remove
2605	paper birch	*Betula papyrifera*	8	10	may need pruning for clearance	n/a	protect adjacent tree
2606	paper birch	*Betula papyrifera*	8	10	may need pruning for clearance	n/a	protect adjacent tree
2607	Oregon white oak	*Quercus garryana*	28	20	7' from curb, minor pruning needed	n/a	protect adjacent tree
2589.1	English hawthorn	*Crataegus monogyna*	3*6	20	invasive species, hazardous structure	no	remove
2589.2	magnolia	*Magnolia spp.*	10	8	off-site, poor structure, sustainable	n/a	protect adjacent tree
2589.3	redbud	*Cercis canadensis*	3*6	12	poor structure	no	remove

*DBH is tree diameter measured at breast height, 4.5-feet above the ground level (inches)

^C-RAD is the average crown radius measured in feet

Sig? asks whether or not the tree is considered significant, either Yes (significant), No (non-significant), or N/A (non-applicable, off-site tree)

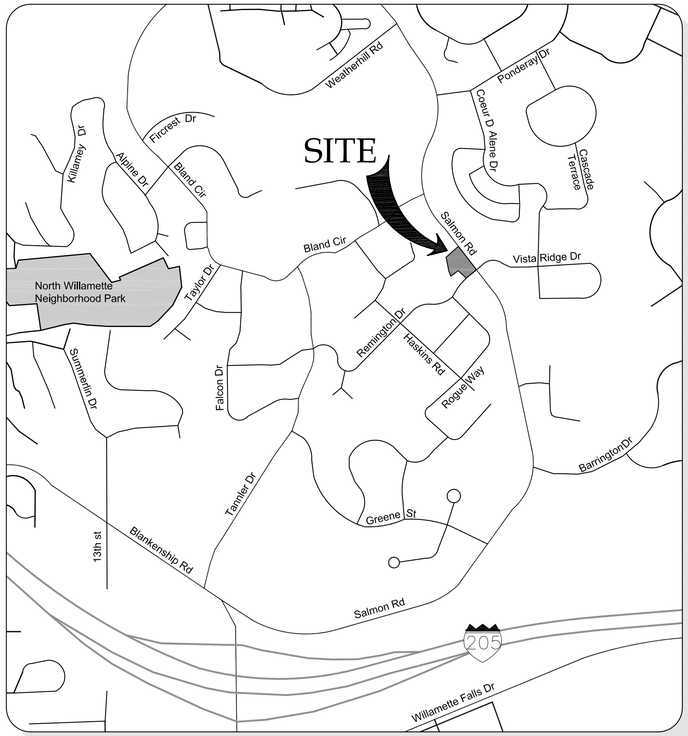
LAND USE DOCUMENTS

FOR

BENJAMIN HEIGHTS PARTITION

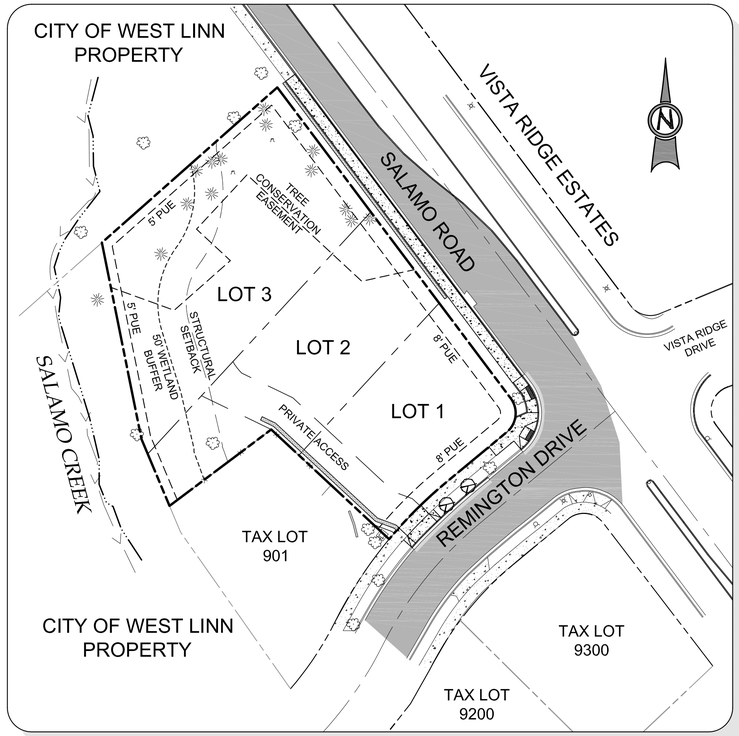
PREPARED FOR

LF 5, LLC



VICINITY MAP

NOT TO SCALE



SITE MAP

Scale: 1 inch = 80 feet

80 40 0 40 80

TAX LOT 900, LOCATED IN THE SW
1/4 OF SECTION 35, T.2S., R.1E., W.M.
CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON

PROJECT TEAM

OWNER/APPLICANT
J.T. SMITH COMPANIES
5285 MEADOWS ROAD, SUITE #171
LAKE OSWEGO, OR 97035
CONTACT: JOHN WYLAND

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

LAND SURVEYOR
COMPASS SURVEYING
4107 SE INTERNATIONAL WAY, SUITE 705
MILWAUKIE, OR 97222
CONTACT: DON DELEING, PLS
PHONE: 503-653-9093

CIVIL ENGINEER
3J CONSULTING, INC.
10445 SW CANYON ROAD, SUITE 245
BEAVERTON, OR 97005
CONTACT: BRIAN FEENEY, PE
PHONE: (503) 946-9365
brian.feeney@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

SITE INFORMATION

SITE ADDRESS
23451 SALAMO ROAD
WEST LINN, OR 97068

TAX LOT(S)
2S1E35AC 900

FLOOD HAZARD
MAP NUMBER: 41005C0257D ZONE X (UNSHADED)

JURISDICTION
CITY OF WEST LINN

ZONING
R-7

UTILITIES & SERVICES

WATER, STORM, SEWER
CITY OF WEST LINN

POWER
PGE

GAS
NORTHWEST NATURAL

CABLE
COMCAST

FIRE
TUALATIN VALLEY FIRE & RESCUE

POLICE, SCHOOLS, ROADS, PARKS
CITY OF WEST LINN

SHEET INDEX

LAND USE

#	REVISION SUMMARY	BY	DATE
			05/28/13

COVER SHEET
BENJAMIN HEIGHTS PARTITION
WEST LINN, OR
J.T. SMITH COMPANIES

3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
10445 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

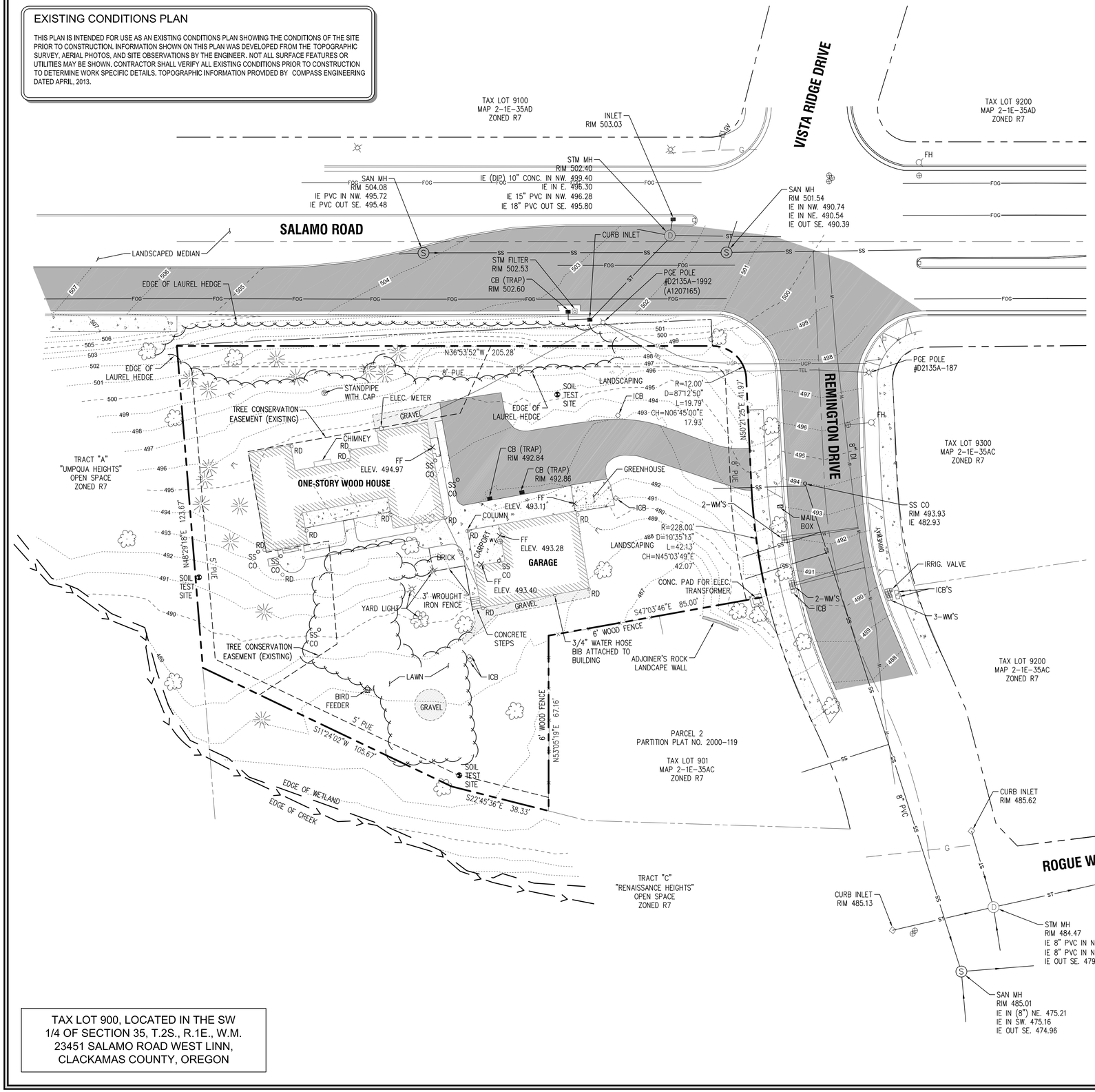
3J JOB ID #	13117
LAND USE #	____
TAX LOT #	2S1E35AC 900
DESIGNED BY	KEF/CLF
CHECKED BY	BKF

SHEET TITLE
COVER SHEET

SHEET NUMBER
C0.0

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.



Scale: 1 inch = 20 feet

20 10 0 10 20

LEGEND

BOUNDARY LINE	CURB
RIGHT-OF-WAY	ASPHALT
CENTERLINE	SIDEWALK
LOT LINE	GRAVEL
BUILDING	EXISTING TREES
EXISTING EDGE OF WETLAND	LIGHT POLE
CREEK CENTERLINE	TRAFFIC SIGN
1 FT CONTOUR	WATER VALVE
5 FT CONTOUR	WATER METER
SANITARY SEWER	SPRINKLER VALVE
STORM SEWER	FIRE HYDRANT
WATER LINE	
GAS LINE	
UNDERGROUND POWER	
UNDERGROUND PHONE LINE	
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. VERTICAL DATUM: NAVD '88 UTILIZING GPS POSITIONING TIED TO THE ORGN WITH REAL TIME CORRECTORS REFERENCED TO NAD 83(2011).
3. 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.

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

#	REVISION SUMMARY	BY	DATE
	LAND USE		05/28/13

EXISTING CONDITIONS
BENJAMIN HEIGHTS PARTITION
WEST LINN, OR
J.T. SMITH COMPANIES

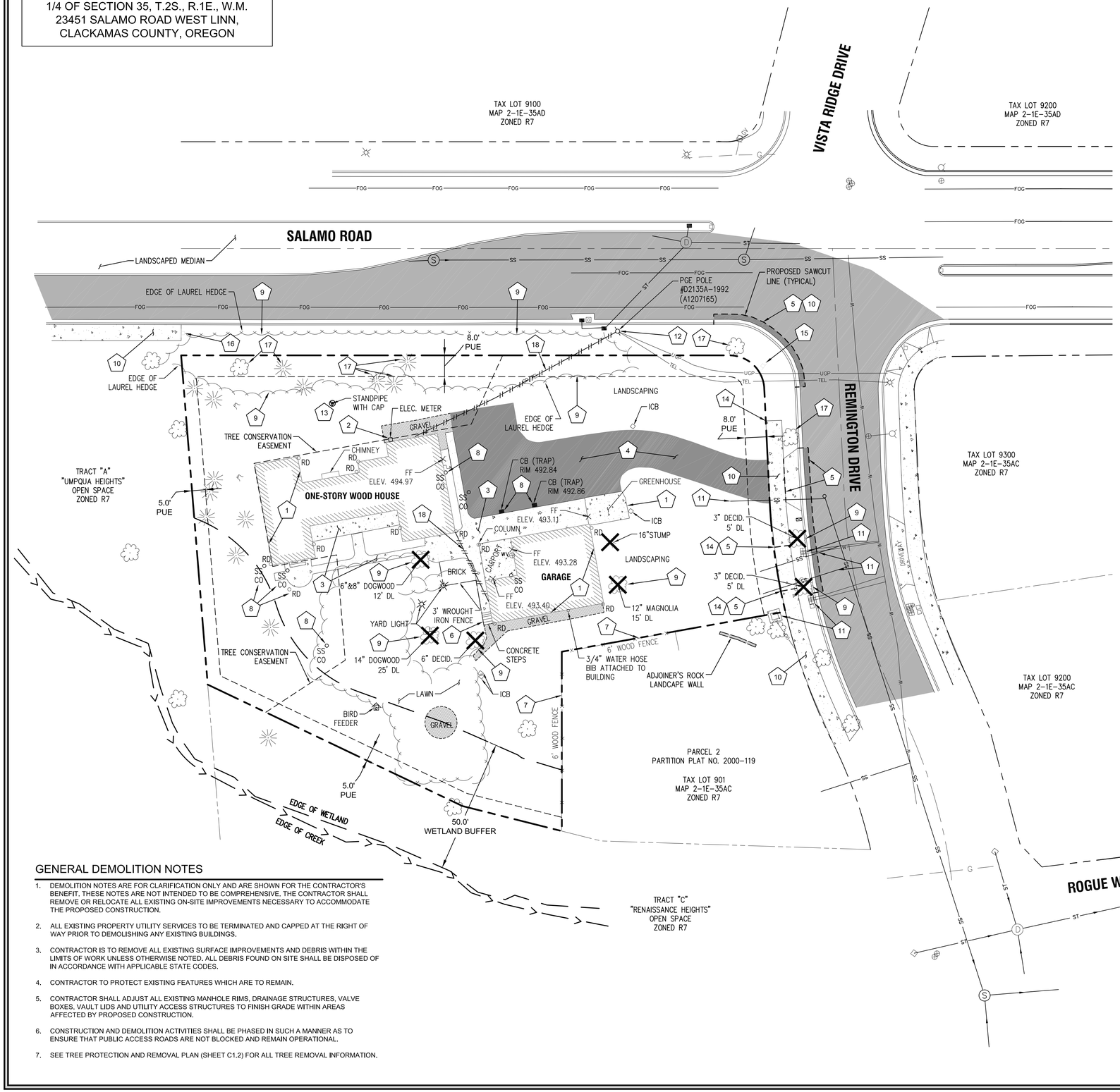
3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
10445 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

3J JOB ID #	13117
LAND USE #	____
TAX LOT #	2S1E35AC 900
DESIGNED BY	KEF/CLF
CHECKED BY	BKF

SHEET TITLE
EXISTING

SHEET NUMBER
C1.0

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



LEGEND

BOUNDARY LINE	SAWCUT LINE
RIGHT-OF-WAY	ASPHALT
CENTERLINE	SIDEWALK/CONCRETE
LOT LINE	GRAVEL
BUILDING	EXISTING TREES
EXISTING EDGE OF WETLAND	LIGHT POLE
CREEK CENTERLINE	TRAFFIC SIGN
SANITARY SEWER	WATER VALVE
STORM SEWER	WATER METER
WATER LINE	SPRINKLER VALVE
GAS LINE	FIRE HYDRANT
UNDERGROUND POWER	
UNDERGROUND PHONE LINE	
OVERHEAD POWER	
CURB	

DEMOLITION KEY

1	EXISTING BUILDING AND FOUNDATION TO BE DEMOLISHED. DEBRIS AND REFUSE TO BE DISPOSED OFF-SITE AT AN APPROVED LOCATION
2	EXISTING POWER METER TO BE DISCONNECTED AND RETURNED TO POWER COMPANY. CAP SERVICE LINES AND REMOVE ALL CONDUITS AND WIRING WITHIN PROPERTY.
3	REMOVE EXISTING CONCRETE AND BASE ROCK. DISPOSE OF RUBBLE AND REFUSE OFF-SITE.
4	REMOVE EXISTING ASPHALT DRIVEWAY AND BASE ROCK. DISPOSE OF RUBBLE AND REFUSE OFF-SITE.
5	SAWCUT EXISTING ASPHALT/CONCRETE PAVEMENT AS SHOWN. SAWCUT LIP OF GUTTER TO FULL DEPTH TO LIMIT DAMAGE OF ADJACENT STREET SURFACE DURING REMOVAL
6	REMOVE EXISTING FENCING AND DISPOSE OF OFF-SITE.
7	PROTECT EXISTING FENCING TO REMAIN.
8	REMOVE EXISTING STORM AND SEWER LINES AND STRUCTURES AND DISPOSE OF OFF-SITE (TYPICAL FOR ALL).
9	REMOVE EXISTING TREE/LANDSCAPING NECESSARY TO INSTALL IMPROVEMENTS, SEE SHEET C2.0.
10	PROTECT EXISTING PAVEMENT/SIDEWALK TO REMAIN, SEE SHEET C2.0.
11	PROTECT EXISTING UTILITIES TO REMAIN.
12	PGE TO REMOVE EXISTING POWER POLE AND SERVICE DROP. CONTRACTOR TO COORDINATE WITH PORTLAND GENERAL ELECTRIC.
13	REMOVE EXISTING PROPANE TANK AND GAS LINE. CONTRACTOR TO COORDINATE WITH NW NATURAL GAS.
14	DEMOLISH EXISTING CONCRETE/SIDEWALK TO NEAREST JOINT. SAWCUT NEW JOINT IF PROPOSED IMPROVEMENTS ARE TO MATCH EXISTING, SEE SHEET C2.0.
15	REMOVE EXISTING ADDRESS SIGN AND DISPOSE OF REFUSE OFF-SITE.
16	REMOVE EXISTING SIDEWALK BARRICADE AND DISPOSE OF REFUSE OFF-SITE.
17	PROTECT EXISTING TREE TO REMAIN (TYPICAL), SEE SHEET C1.2.
18	REMOVE EXISTING UTILITY AND DISPOSE OF OFF-SITE.

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.

Know what's below. Call before you dig.

LAND USE	#	REVISION SUMMARY	BY	DATE
				05/28/13

DEMOLITION PLAN

BENJAMIN HEIGHTS PARTITION

WEST LINN, OR

J.T. SMITH COMPANIES

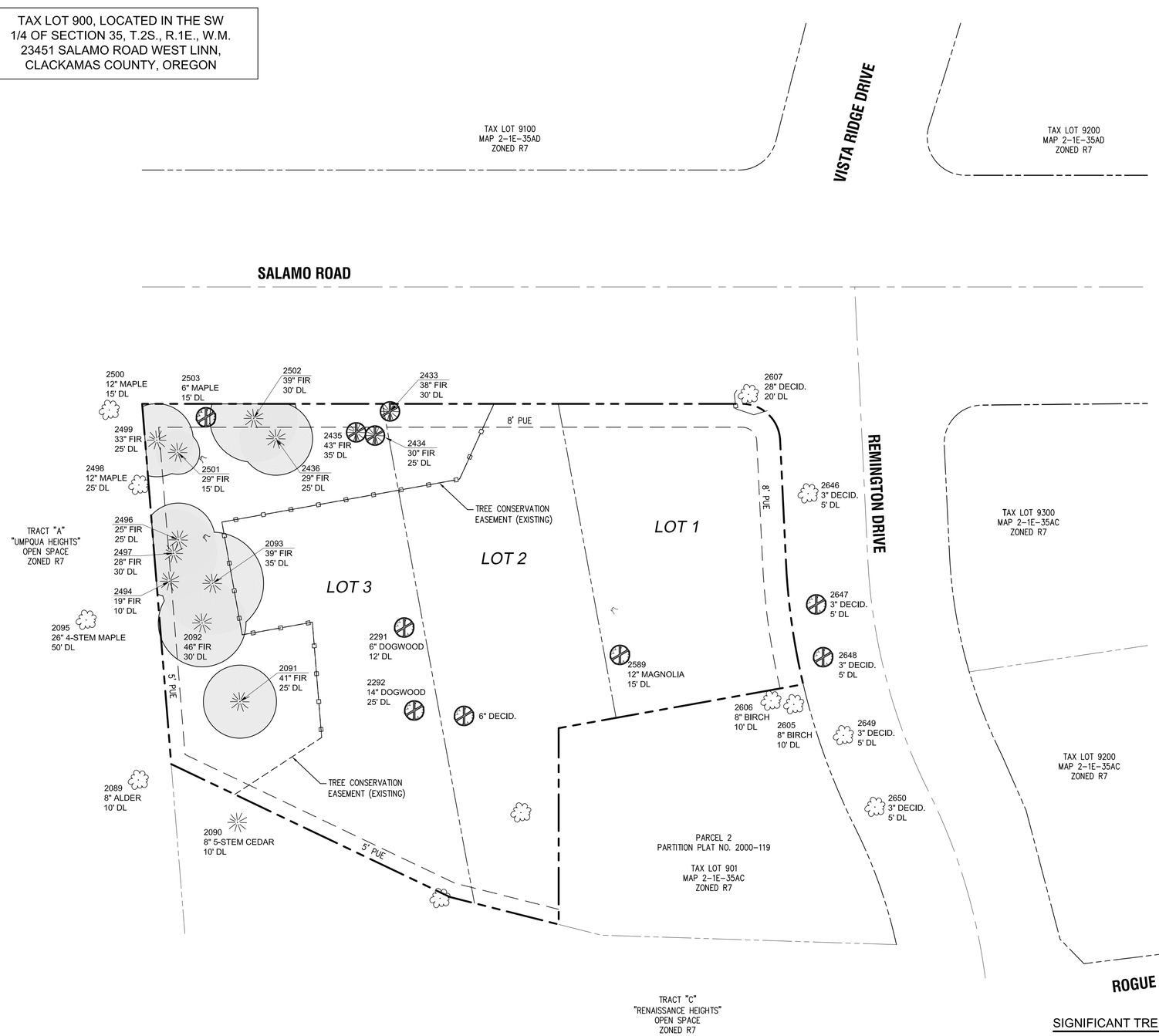
3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
10445 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

3J JOB ID #	13117
LAND USE #	____
TAX LOT #	2S1E35AC 900
DESIGNED BY	KEF/CLF
CHECKED BY	BKF

SHEET TITLE
DEMOLITION

SHEET NUMBER
C1.1

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



Scale: 1 inch = 20 feet

20 10 0 10 20

LEGEND

- EXISTING SIGNIFICANT DECIDUOUS TREE
- EXISTING SIGNIFICANT CONIFEROUS TREE
- 2091 41" CHERRY 20' DL — TREE POINT, TYPE, CALIPER AND DRIP LINE
- SIGNIFICANT TREE CANOPY TO REMAIN
- TREE TO BE REMOVED
- TREE PROTECTION FENCING
- TREE PRESERVATION EASEMENT
- GRADING & CONSTRUCTION LIMITS

TREE INVENTORY

SURVEY POINT NUMBER	TREE SPECIES	NOMINAL CALIPER SIZE (INCHES)	PROPOSED ACTION	SIGNIFICANT DESIGNATION	REMOVE DUE TO CONDITION
2089	RED ALDER	8	PROTECT		
2090	PORT-ORFORD CEDAR	12	PROTECT		
2091	DOUGLAS FIR	41	PROTECT	SIGNIFICANT	
2092	DOUGLAS FIR	46	PROTECT	SIGNIFICANT	
2093	DOUGLAS FIR	39	PROTECT	SIGNIFICANT	
2094	DOUGLAS FIR	19	PROTECT		
2095	BIGLEAF MAPLE	24	PROTECT		
2291	PACIFIC DOGWOOD	6	REMOVE		DIEBACK
2292	PLUM	6	REMOVE		POOR STRUCTURE
2433	DOUGLAS FIR	38	REMOVE		HEAVY CONE CROP
2434	DOUGLAS FIR	30	REMOVE		NOT VIABLE
2435	DOUGLAS FIR	43	REMOVE		THIN CROWN
2436	DOUGLAS FIR	29	PROTECT	SIGNIFICANT	
2496	DOUGLAS FIR	25	PROTECT	SIGNIFICANT	
2497	DOUGLAS FIR	28	PROTECT	SIGNIFICANT	
2498	BIGLEAF MAPLE	12	PROTECT		
2499	DOUGLAS FIR	33	PROTECT	SIGNIFICANT	
2500	BIGLEAF MAPLE	12	PROTECT		
2501	DOUGLAS FIR	29	PROTECT		
2502	DOUGLAS FIR	39	PROTECT		
2503	BIGLEAF MAPLE	6	REMOVE		STEM DECAY
2589	MAGNOLIA	12	REMOVE		POOR STRUCTURE
2605	PAPER BIRCH	8	PROTECT		
2606	PAPER BIRCH	8	PROTECT		
2607	OREGON WHITE OAK	28	PROTECT		
2589.10	ENGLISH HAWTHORN	6	REMOVE		HAZARDOUS
2589.20	MAGNOLIA	10	PROTECT		
2589.30	REDBUD	6	REMOVE		POOR STRUCTURE
2647	DECIDUOUS	3	REMOVE		CONSTRUCTION
2648	DECIDUOUS	3	REMOVE		CONSTRUCTION

SIGNIFICANT TREE STATISTICS

SIGNIFICANT TREE INVENTORY:	9 ea
SIGNIFICANT TREES RETAINED:	9 ea
SIGNIFICANT TREES REMOVED:	0 ea
SIGNIFICANT TREE CALIPER INCHES:	36 inches
SIGNIFICANT CALIPER INCHES RETAINED:	309 inches
SIGNIFICANT CALIPER INCHES REMOVED:	0 inches
SIGNIFICANT TREE CANOPY COVERAGE:	4,654 Sq. Ft.
SIGNIFICANT TREE CANOPY RETAINED:	4,654 Sq. Ft.
SIGNIFICANT TREE CANOPY RETENTION:	100%
PRESERVATION EASEMENT AREA PROVIDED:	7,377 Sq. Ft.

GENERAL TREE INVENTORY STATISTICS

TOTAL TREE INVENTORY:	28 ea
TOTAL TREES RETAINED:	19 ea
TOTAL TREES REMOVED:	10 ea
TREES REMOVED DUE TO CONDITION:	8 ea
TOTAL TREE CALIPER INCHES:	609 inches
TOTAL CALIPER INCHES RETAINED:	450 inches
TOTAL CALIPER INCHES REMOVED:	159 inches

LAND USE

#	REVISION SUMMARY	BY	DATE
			05/28/13

TREE PROTECTION AND REMOVAL PLAN

BENJAMIN HEIGHTS PARTITION

WEST LINN, OR

J.T. SMITH COMPANIES

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 #	13117
LAND USE #	____
TAX LOT #	2S1E35AC 900
DESIGNED BY	KEF/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

TAX LOT 9100
MAP 2-1E-35AD
ZONED R7

VISTA RIDGE DRIVE

TAX LOT 9200
MAP 2-1E-35AD
ZONED R7

SALAMO ROAD

REMINGTON DRIVE

DRIVEWAY

ONE-STORY WOOD HOUSE

GARAGE

TRACT "A"
"UMPQUA HEIGHTS"
OPEN SPACE
ZONED R7

TAX LOT 9300
MAP 2-1E-35AC
ZONED R7

PARCEL 2
PARTITION PLAT NO. 2000-119

TAX LOT 901
MAP 2-1E-35AC
ZONED R7

TAX LOT 9200
MAP 2-1E-35AC
ZONED R7

EDGE OF CREEK

TRACT "C"
"RENAISSANCE HEIGHTS"
OPEN SPACE
ZONED R7

ROGUE WAY

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%	33,150	
11%	20%	14,372	
21%	30%	3,457	
31%	40%	1,507	
> 40%	--	1,951	

LAND USE

#	REVISION SUMMARY	BY	DATE
			05/28/13

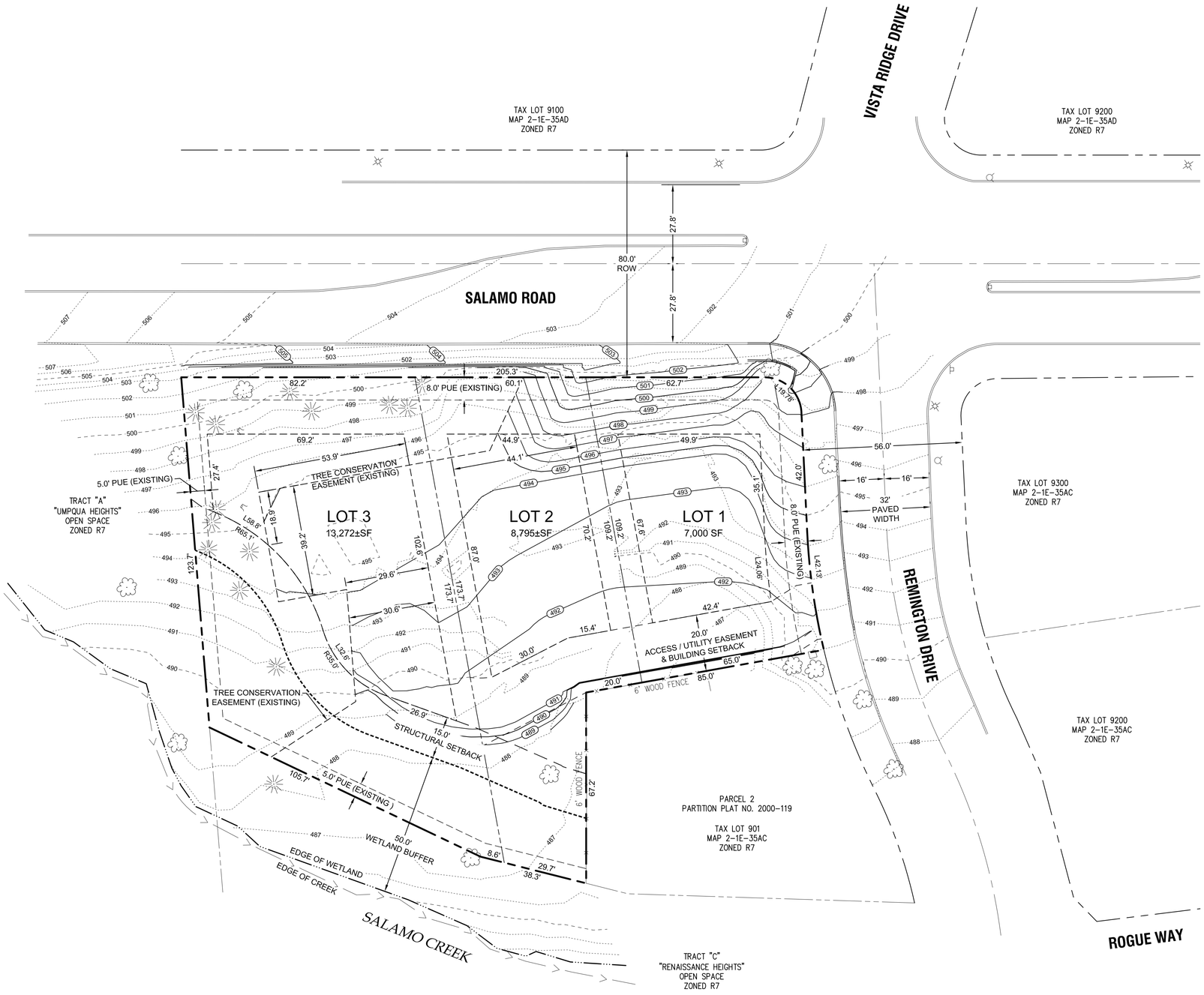
SLOPE ANALYSIS PLAN
BENJAMIN HEIGHTS PARTITION
WEST LINN, OR
J.T. SMITH COMPANIES

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 #	13117
LAND USE #	____
TAX LOT #	2S1E35AC 900
DESIGNED BY	KEF/CLF
CHECKED BY	BKF

SHEET TITLE
SLOPE ANALYSIS

SHEET NUMBER
C1.3



Scale: 1 inch =20 feet

20 10 0 10 20

LEGEND

- BOUNDARY LINE
- EXISTING RIGHT-OF-WAY
- EXISTING CENTERLINE
- EXISTING LOT LINE
- EXISTING CURB
- 197 EXISTING 1 FT CONTOUR
- 200 EXISTING 5 FT CONTOUR
- EXISTING 50' WETLAND BUFFER
- EXISTING TREES
- EXISTING LIGHT POLE
- EXISTING TRAFFIC SIGN
- PROPOSED LOT LINE
- PROPOSED 20 FT ACCESS / UTILITY EASEMENT
- PROPOSED CURB
- PROPOSED ACCESS/DRIVEWAY BOUNDARY
- PROPOSED BUILDING SETBACK LINE
- STRUCTURAL SETBACK LINE
- 207 PROPOSED 1 FT CONTOUR
- 208 PROPOSED 5 FT INDEX CONTOUR

SITE STATISTICS	
SITE ADDRESS	23451 SALAMO ROAD WEST LINN, OREGON
TAXLOT	2S1E35AC 00900
JURISDICTION	CITY OF WEST LINN
GROSS SITE AREA	0.67 ACRES
PROPERTY ZONING	R-7
FLOOD HAZARD MAP NUMBER	41005C0257D ZONE X (UNSHADED)

PARTITION STATISTICS	
RIGHT OF WAY DEDICATION	N/A
MINIMUM ALLOWABLE EFFECTIVE LOT SIZE	7,000 SF
MINIMUM LOT DENSITY	2.91 UNITS
MAXIMUM LOT DENSITY	4.15 UNITS
PROPOSED LOT DENSITY	4.48 UNITS/ACRE
MINIMUM LOT DENSITY (PER R-7 ZONING)	4.34 UNITS/ACRE
MAXIMUM LOT DENSITY (PER R-7 ZONING)	6.20 UNITS/ACRE
SETBACKS:	
FRONT	20 FEET
SIDE	7.5 FEET
REAR	20 FEET
STREET SIDE	15 FEET
MAX. HEIGHT	35 FEET

PROJECT TEAM

OWNER/APPLICANT
JT SMITH COMPANIES
5285 MEADOWS ROAD, SUITE #171
LAKE OSWEGO, OR 97035
CONTACT: JOHN WYLAND

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

LAND SURVEYOR
COMPASS SURVEYING
4107 SE INTERNATIONAL WAY, SUITE 705
MILWAUKIE, OR 97222
CONTACT: DON DELEING, PLS
PHONE: 503-653-9093

CIVIL ENGINEER
3J CONSULTING, INC.
10445 SW CANYON ROAD, SUITE 245
BEAVERTON, OR 97005
CONTACT: JOHN HOWORTH
PHONE: (503) 946-9365
john.howorth@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

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

#	REVISION SUMMARY	BY	DATE
	LAND USE		05/28/13

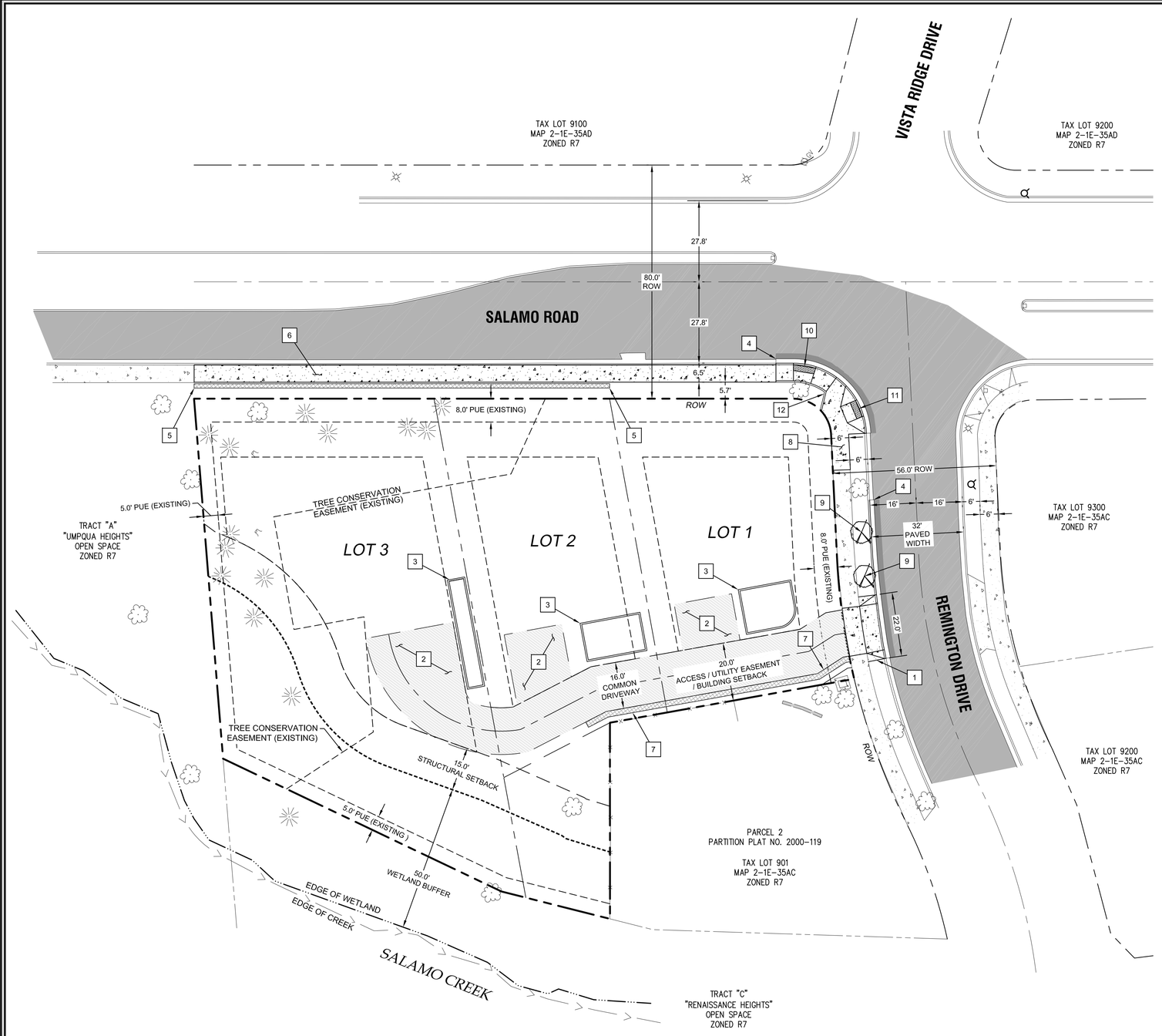
TENTATIVE PLAT
BENJAMIN HEIGHTS PARTITION
WEST LINN, OR
J.T. SMITH COMPANIES

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 #	13117
LAND USE #	____
TAX LOT #	2S1E35AC 900
DESIGNED BY	KEF/CLF
CHECKED BY	BKF

SHEET TITLE
TENTATIVE PLAT

SHEET NUMBER
C2.0



Scale: 1 inch = 20 feet

20 10 0 10 20

LEGEND

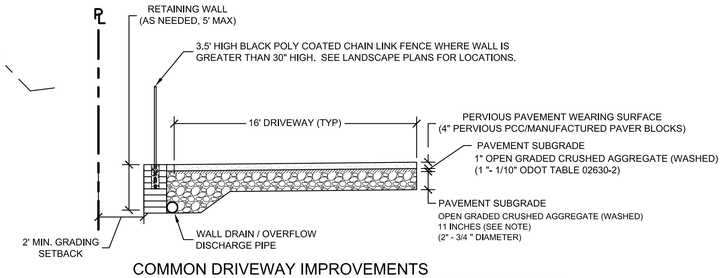
- BOUNDARY LINE
- RIGHT-OF-WAY
- EXISTING CENTERLINE
- EXISTING EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CURB AND GUTTER
- EXISTING EDGE OF WETLAND
- EXISTING EDGE OF CREEK
- EXISTING TREES TO REMAIN
- EXISTING ASPHALT
- EXISTING SIDEWALK
- EXISTING LIGHT POLE
- EXISTING TRAFFIC SIGN
- EXISTING FIRE 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

CONSTRUCTION KEY NOTES

	CONSTRUCT SINGLE DRIVEWAY ACCESS TO REMINGTON DRIVE (22 FT) PER CITY OF WEST LINN STANDARD DETAIL WL-504A (COMMERCIAL DRIVEWAY WITH SIDEWALK AWAY FROM CURB).
	PROPOSED PERVIOUS PAVEMENT ACCESS / DRIVEWAY. SEE "COMMON DRIVEWAY IMPROVEMENTS" DETAIL THIS SHEET.
	CONSTRUCT RAIN GARDEN FOR STORM WATER MANAGEMENT. SEE C3.0 FOR UTILITY CONNECTIONS.
	CONSTRUCT STANDARD CURB AND GUTTER PER CITY OF WEST LINN STANDARD DETAIL WL-501 (TYPICAL CURBS).
	CONSTRUCT 142 LF OF MODULAR BLOCK WALL FOR GRADE RETENTION. MAXIMUM 3 FT EXPOSED WALL HEIGHT (NON-STRUCTURAL).
	CONSTRUCT 6 FT WIDE CURB TIGHT SIDEWALK PER CITY OF WEST LINN STANDARD DETAIL WL-508 (CONCRETE SIDEWALK CROSS SECTION).
	CONSTRUCT 94 LF OF MODULAR BLOCK WALL FOR GRADE RETENTION. MAXIMUM 5 FT EXPOSED WALL HEIGHT (STRUCTURAL).
	CONSTRUCT 6 FT WIDE DETACHED SIDEWALK PER CITY OF WEST LINN STANDARD DETAIL WL-508 (CONCRETE SIDEWALK CROSS SECTION).
	INSTALL STREET TREE AT LOCATION SHOWN. SEE L1.0 FOR ADDITIONAL INFORMATION.
	CONSTRUCT CURB RAMP PER CITY OF WEST LINN STANDARD DETAIL WL-506C (PARALLEL CURB RAMP CURB TIGHT).
	CONSTRUCT CURB RAMP PER CITY OF WEST LINN STANDARD DETAIL WL-507A (SINGLE CURB RAMP).
	CONSTRUCT MONOLITHIC CURB AND SIDEWALK IN THE TRANSITION OF 6 FT SIDEWALK TO CURB TIGHT AROUND PROTECTED TREE #2607. ALL WORK WITHIN THE DRIPLINE OF PROTECTED TREES SHALL BE PERFORMED UNDER THE SUPERVISION OF THE PROJECT ARBORIST.

GENERAL SITE NOTES

1. WATER QUALITY TREATMENT AND STORM WATER QUANTITY ATTENUATION FOR FUTURE HOMES TO BE HANDLED INDIVIDUALLY ON A PER LOT BASIS.



COMMON DRIVEWAY IMPROVEMENTS

SCALE: N.T.S

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

LAND USE

#	REVISION SUMMARY	BY	DATE
			05/28/13

SITE PLAN

BENJAMIN HEIGHTS PARTITION

WEST LINN, OR

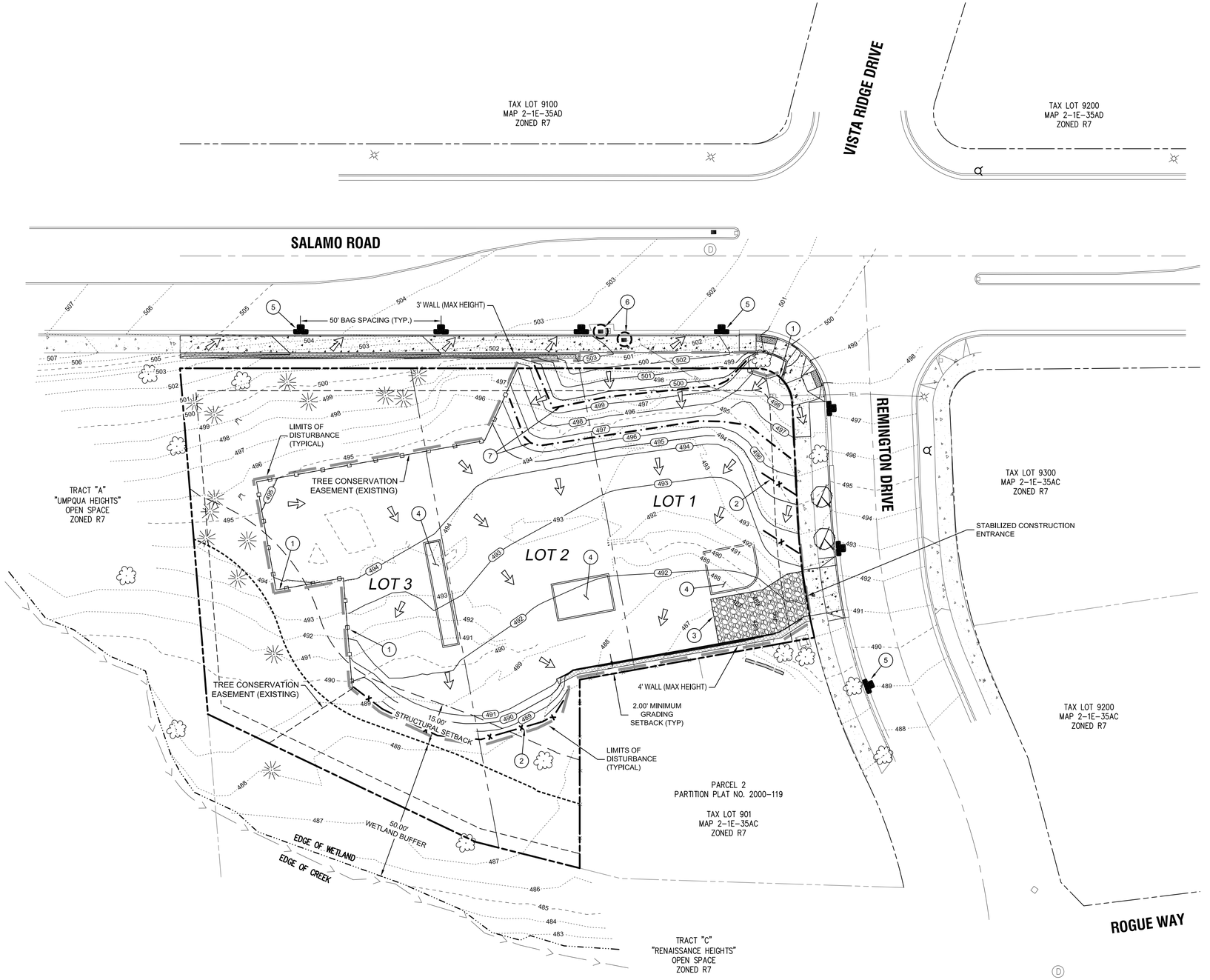
J.T. SMITH COMPANIES

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 #	13117
LAND USE #	____
TAX LOT #	2S1E35AC 900
DESIGNED BY	KEF/CLF
CHECKED BY	BKF

SHEET TITLE
SITE PLAN

SHEET NUMBER
C2.1



Scale: 1 inch = 20 feet

20 10 0 10 20

LEGEND

- BOUNDARY LINE
- RIGHT-OF-WAY
- EXISTING CENTERLINE
- EXISTING EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CURB AND GUTTER
- EXISTING SIDEWALK
- EXISTING LIGHT POLE
- EXISTING TRAFFIC SIGN
- EXISTING FIRE HYDRANT
- EXISTING TREES TO REMAIN
- 207 EXISTING 1FT CONTOUR
- 208 EXISTING 5FT INDEX CONTOUR
- PROPOSED LOT LINE
- PROPOSED CURB AND GUTTER
- PROPOSED CONCRETE
- PROPOSED RAIN GARDEN
- PROPOSED RETAINING WALL
- PROPOSED STREET FRONTAGE TREE
- 207 PROPOSED 1FT CONTOUR
- 208 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	45 CY
NEAT LINE FILL	850 CY
MAXIMUM PROPOSED SLOPE	2:1 (H:V)
TOTAL AREA OF DISTURBANCE	0.35 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

811 Know what's below. Call before you dig.

LAND USE

#	REVISION SUMMARY	BY	DATE
			05/28/13

GRADING AND EROSION CONTROL PLAN

BENJAMIN HEIGHTS PARTITION

WEST LINN, OR

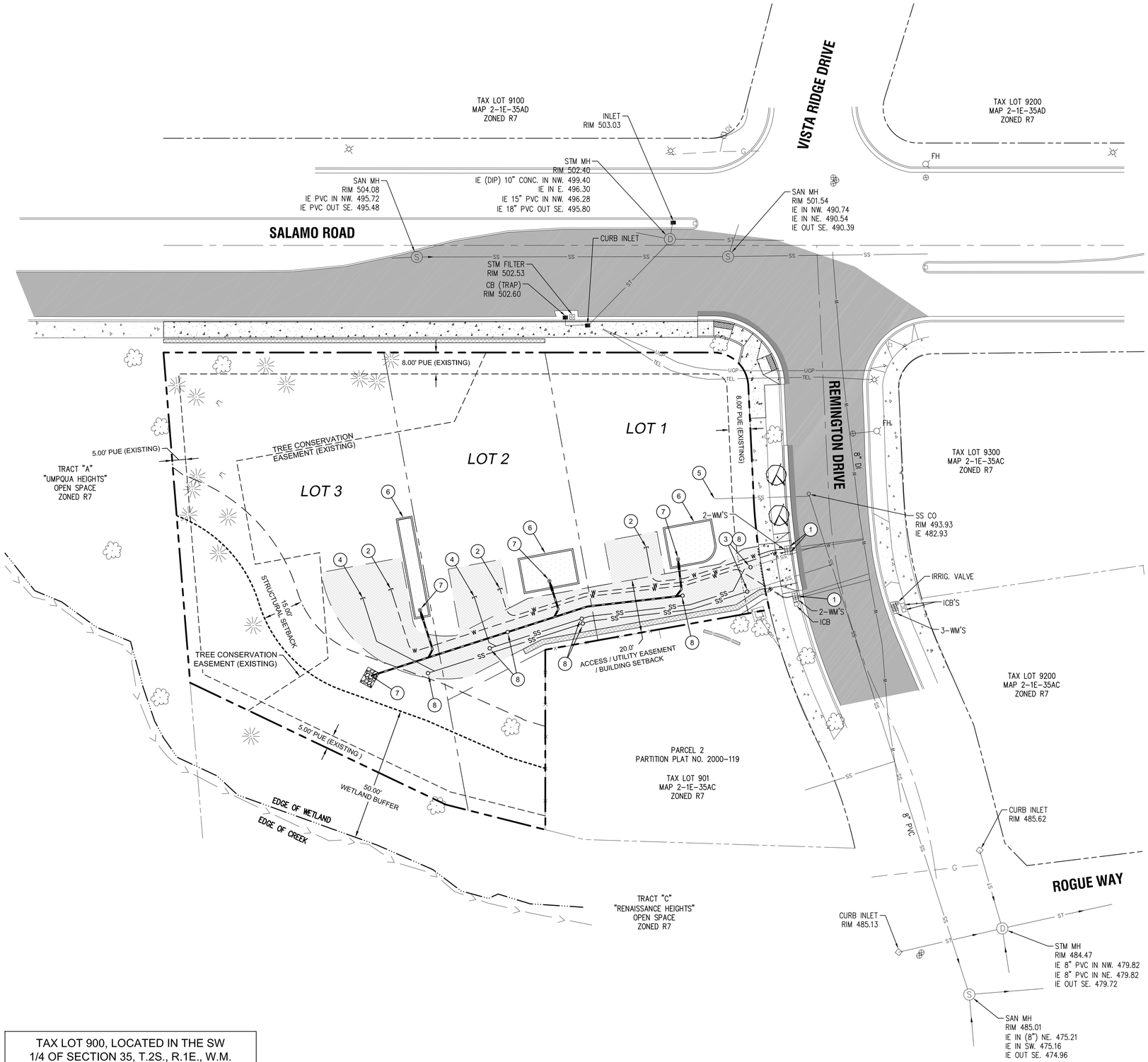
J.T. SMITH COMPANIES

3J CONSULTING, INC
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
10445 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-0885

3J JOB ID #	13117
LAND USE #	____
TAX LOT #	2S1E35AC 900
DESIGNED BY	KEF/CLF
CHECKED BY	BKF

SHEET TITLE
GRADING / ESCP

SHEET NUMBER
C2.2



Scale: 1 inch = 20 feet

20 10 0 10 20

LEGEND

- BOUNDARY LINE
- RIGHT-OF-WAY
- EXISTING CENTERLINE
- EXISTING EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CURB AND GUTTER
- EXISTING SANITARY SEWER LINE
- EXISTING WATER LINE
- EXISTING STORM LINE
- EXISTING GAS LINE
- EXISTING UNDERGROUND POWER
- EXISTING ASPHALT
- 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 LOT LINE
- PROPOSED CURB AND GUTTER
- PROPOSED STORM LINE
- PROPOSED SANITARY LINE
- PROPOSED WATER LINE
- PROPOSED CLEAN-OUT
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- PROPOSED PERVIOUS CONCRETE
- PROPOSED RAIN GARDEN
- PROPOSED RETAINING WALL
- PROPOSED STREET FRONTAGE TREE

CONSTRUCTION KEY NOTES

1	CONNECT TO EXISTING WATER SERVICE. CONTRACTOR TO COORDINATE WITH CITY OF WEST LINN PUBLIC WORKS.
2	PROVIDE 1" WATER SERVICE LINE TO LOCATION SHOWN.
3	CONNECT TO EXISTING 4" SANITARY SEWER LATERAL. CONTRACTOR TO COORDINATE WITH CITY OF WEST LINN PUBLIC WORKS.
4	PROVIDE 4" SANITARY SEWER LATERALS FOR LOTS #2 AND #3 AT LOCATIONS SHOWN.
5	EXISTING 4" SANITARY SEWER LATERAL FOR LOT #1.
6	STORMWATER INFILTRATION PLANTER FOR MANAGEMENT OF FUTURE PROPERTY IMPROVEMENTS.
7	ROUTE WATER QUALITY PLANTER OVERFLOWS TO RIP-RAP OUTFALL PAD.
8	INSTALL STANDARD CLEAN-OUT

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

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

811 Know what's **below.** **Call** before you dig.

#	REVISION SUMMARY	BY	DATE
	LAND USE		05/28/13

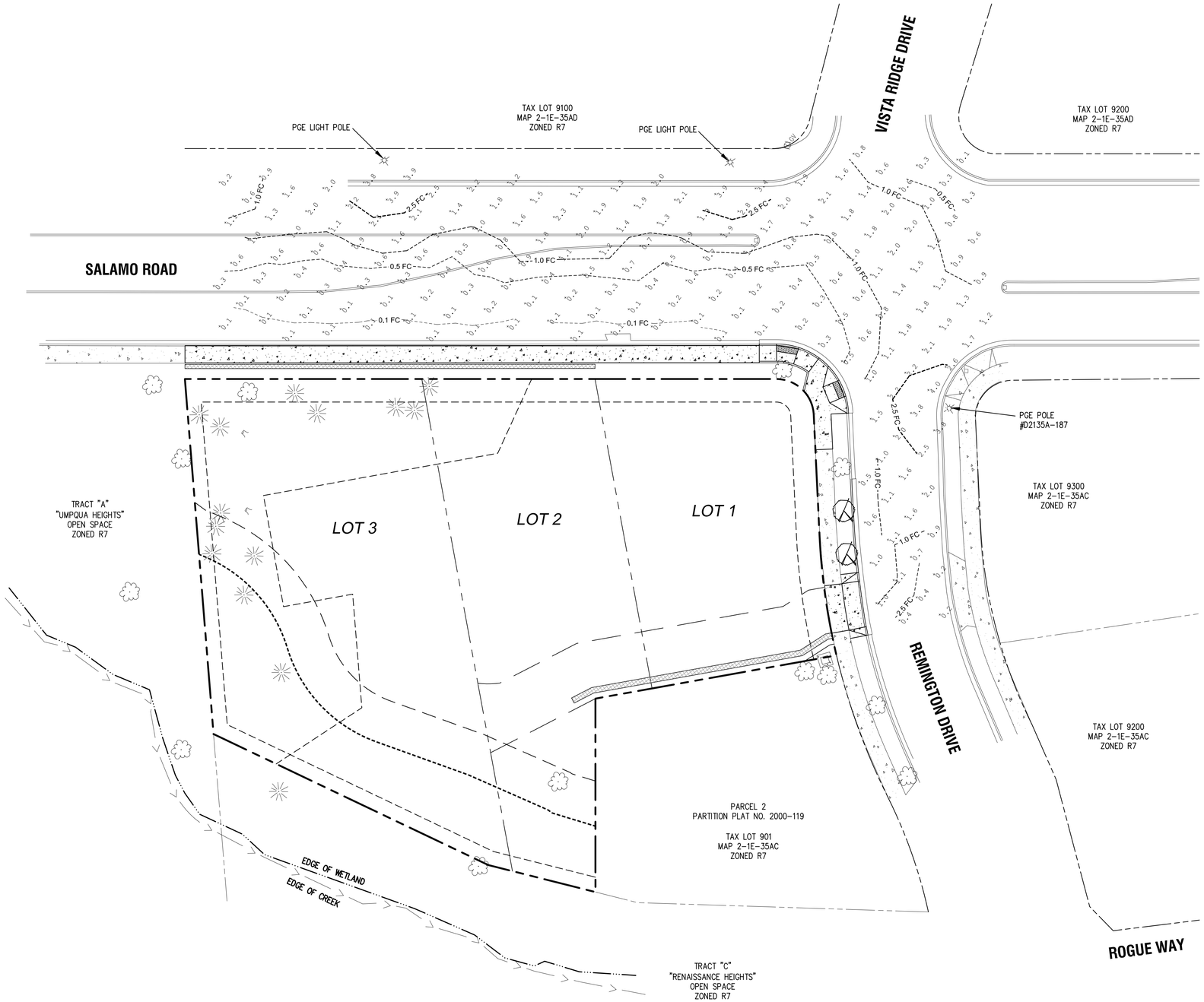
COMPOSITE UTILITY PLAN
BENJAMIN HEIGHTS PARTITION
WEST LINN, OR
J.T. SMITH COMPANIES

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 #	13117
LAND USE #	____
TAX LOT #	2S1E35AC 900
DESIGNED BY	KEF/CLF
CHECKED BY	BKF

SHEET TITLE
UTILTIY PLAN

SHEET NUMBER
C3.0

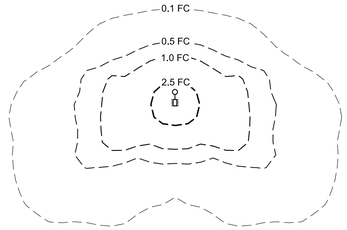


Scale: 1 inch = 20 feet

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 (SALAMO)	MINOR ARTERIAL
ROAD CLASSIFICATION (REMINGTON)	LOCAL
EXISTING LIGHT(S) INCLUDED	3
MAX. ILLUMINATION	4.0FC
MIN. ILLUMINATION	0.1FC
AVERAGE ILLUMINATION	1.06FC
UNIFORMITY (AVG/MIN)	10.6

#	REVISION SUMMARY	BY	DATE
	LAND USE		05/28/13

STREET LIGHTING PLAN

BENJAMIN HEIGHTS PARTITION

WEST LINN, OR

J.T. SMITH COMPANIES

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LAND USE PLANNING
10445 SW CANYON ROAD SUITE 245, BEAVERTON, OR 97005
PHONE & FAX: (503) 946-8365

3J JOB ID #	13117
LAND USE #	____
TAX LOT #	2S1E35AC 900
DESIGNED BY	KEF/CLF
CHECKED BY	BKF

SHEET TITLE
LIGHTING PLAN

SHEET NUMBER
C3.1