CITY OF West Linn
22500 Salamo Road
West Linn, OR 97068

STAFF REPORT
FOR THE PLANNING COMMISSION

FILE NUMBER:	SUB-20-01
HEARING DATE:	October 7, 2020
REQUEST:	6-lot Subdivision at 4096 Cornwall Street
APPROVAL CRITERIA:	Community Development Code (CDC) Chapter 11, Single-Family Residential, R-10; Chapter 48, Access, Egress and Circulation; Chapter 85 Land Division General Provisions; Chapter 92, Required Improvements.
STAFF REPORT PREPARED BY:	Jennifer Arnold, Associate Planner

Planning Manager Initials DSW

Development Review Engineer's Initials AP

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GENERAL INFORMATION

APPLICANT/ OWNER:	Icon Construction and Development 1980 Willamette Falls Drive, Suite 200 West Linn, OR 97068
CONSULTANT:	Rick Givins 18680 Sunblaze Drive Oregon City, OR 97045
SITE LOCATION:	4096 Cornwall Street West Linn, OR 97068
LEGAL DESCRIPTION:	Tax lots 6300 Assessor's Map 21E 36BA
SITE SIZE:	94,525.2 square feet (2.17 acres)
ZONING:	R-10, Single-Family Residential (10,000 square foot minimum lot size for single family detached homes)
COMP PLAN DESIGNATION:	Low-Density Residential
120-DAY PERIOD:	This application became complete on April 22, 2020. The 120-day maximum application-processing period would normally end on August 20, 2020, but the applicant has granted a 60 day extension making the application-processing period end on October 19, 2020.
PUBLIC NOTICE:	Public notice was mailed to the all neighborhood associations and affected property owners on September 16, 2020. The property was posted with a notice sign on September 24, 2020. The notice was published in the West Linn Tidings on September 24, 2020. The notice requirements of CDC Chapter 99 have been met. In addition, the application was posted on the City's website.

EXECUTIVE SUMMARY

Site Conditions: The proposed development site is located at 4096 Cornwall Street and currently occupied with a single-family dwelling to be removed. The property is approximately 2.17 acres. The subject property has 40 significant trees identified by the applicant and verified by the City Arborist. Of those 40 significant trees the applicant proposes to retain 13 trees or 32.5%. The property slopes to the south to a maximum of 20+ percent.

Project Description: The applicant seeks approval of an application for a 6-lot Subdivision on the 2.17 acre site. All lots will exceed 10,000 square feet in size per the underlying R-10 zone. The applicant has submitted two road alignments but Staff required the Applicant to choose one plan or submit additional applications. The Applicant has expressed preference to the "Tentative Plan" also referred to as Plan A in some supporting documents. The applicant also indicates this is the Neighborhood Association preference expressed at the required neighborhood meeting (per CDC 99.030). The applicant also submitted "Plan B" (also referred to as the Alternative Plan), which is included as Exhibit PC-3. This plan design was recommended by Staff based on an approved street connection in the 2016 Transportation System Plan (TSP). The TSP shows Landis Street connecting with Cornwall Street per Figure 12 and Table 17: Local Street Connections by Priority (See Exhibit PC-4).

The applicable approval criteria include:

- Chapter 11, Single-Family Residential, R-10;
- Chapter 48, Access, Egress and Circulation;
- Chapter 85, Land Division General Provisions;
- Chapter 92, Required Improvements.

Public comments:

No Public Comments were submitted prior to the publication of the Staff Report

RECOMMENDATION

Staff recommends the following Conditions of Approval if the Planning Commission moves to approve this application SUB-20-01, based on: 1) the findings submitted by the applicant, which are incorporated by this reference, 2) supplementary staff findings included in the Addendum below, and 3) the addition of Conditions of Approval below. With these findings, the applicable approval criteria are met. The conditions are as follows:

1. **Site Plan. With the exception of modifications required by these conditions, the final plat shall conform to the submitted and approved plans.**

2. **<u>Engineering Standards</u>. All public improvements and facilities including street improvements, utilities, grading, onsite storm water design, driveway placement and construction, pavement mitigation, street lighting, street trees, easements, and easement locations are subject to the City Engineer's review, modification, and approval per the City adopted Public Works standards. All improvements must be designed, constructed, and completed prior to final plat approval. The Director of Public Works may allow a waiver of improvements as allowed by Code. (See Staff Findings: 18, 19, 31 – 33, 52, 53, 57, 63, 64, 65, & 69)**

3. **<u>Public Utilities.</u> The applicant shall upgrade the water main in Cornwall Street to serve this proposed subdivision. The applicant shall extend the sanitary sewer mains to the north property lines in Landis Street and the unimproved Cornwall right-of-way to allow for future connection. All utilities shall be located within the public right-of-way or within recorded utility easements along property lines, as approved by the City Engineer. (See Staff Findings: 42 & 60)**

4. **<u>Shared Access.</u> The shared access shown on the Tentative Plan shall be widened to meet Public Works Standards for a future local street meeting the 28-foot local street standard. Lots 5 and 6 shall take access from the street. Per CDC 48.030(I) the proposed gate shall be removed from the Tentative Plan. A half-street plus travel lane for the local street shall be constructed to the City Engineering Standards and approved by the City Engineer prior to final plat approval. The applicant shall name the street and display the name on the surface of the plat prior to final plat approval. The applicant shall dedicate 32 feet of right-of-way for these improvements. (See Staff Findings: 4, 5, 8, 9, 11, 13, 14, 17, 18, 24, 25, 26, 29, 30-33, 36, 39, 47, 53, 55, 56, 61 & 63)**

5. **<u>Tree Protection.</u> The applicant shall coordinate with the City's Arborist to obtain any necessary tree permits for the significant trees proposed to be removed. The applicant must also get approval from the City's Arborist that the tree protection is correctly in place. Mitigation of removed trees due to right-of-way improvements and grading shall be approved by the City Arborist prior to approval of the final plat.**

6. **<u>Public Utility Easement.</u> The applicant shall record, on the face of the plat, an eight-foot wide Public Utility Easement per Engineering Standards on all street frontages. (See Staff Finding: 45)**

7. **<u>Pedestrian Trail.</u> A pedestrian trail shall be constructed in the Cornwall Street right-of-way south of the shared drive and Cornwall Street intersection. The trail shall connect with the existing pedestrian trail to the south.**

8. **<u>Stormwater Analysis.</u> Further analysis of stormwater management shall be reviewed and approved by the City Engineer prior to the issuance of a Public Works public improvement permit. (See Staff Finding: 44)**

9. **<u>Fee in lieu.</u> The applicant shall initiate vacate the unimproved right-of-way along Cornwall or submit an application for a fee in lieu for the cost to actually construct the improvements to the Public Works/Engineering Department and get approval by the City Engineer prior to approval of the Public Works public improvement permit. (See Staff Findings: 24, 35 & 61)**

10. **<u>Building Sites.</u> All building sites exceeding 25% slopes (Proposed Lots 3, 4, 5 & 6) shall require geotechnical conformation stating the proposed lots are buildable prior to the final plat approval. Additional analysis at the time of a building permit application as it relates to Type I and Type II lands may be required by the City's Building Official. (See Staff Finding: 41)**

11. **Reserve Strip. No reserve strips are necessary at the end of the Landis Street extension or associated with the public street construction associated with Condition of Approval 4.**

ADDENDUM

PLANNING COMMISSION STAFF REPORT

October 7, 2020

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

CHAPTER 11

SINGLE-FAMILY RESIDENTIAL DETACHED, R-10

11.030 PERMITTED USES

The following are uses permitted outright in this zoning district:

1. Single-family detached residential unit.

Staff Finding 1: The subdivision application will create six lots to accommodate one "*single family detached residential unit*" on each lot. Single family detached residential units are permitted uses. The criteria is met.

(…)

5. Utilities, minor.

Staff Finding 2: The West Linn Planning Director has determined that stormwater water quality/quantity facilities that are part of a development proposal are minor utilities. Community Development Code Chapter 99.060.A(3) gives this authority. The determination is based on: 1. The City's Clean Water Act permits require the installation of appropriate stormwater facilities as part of development; 2. The City has historically interpreted stormwater facilities as a minor utility and permitted in all zones in the City; and 3. The legislative intent that can be traced through the definition amendments of major and minor utilities. The differences between major and minor utilities were more clearly stated in the past by the identification of impact from the "use". This legislative intent clearly identifies stormwater facilities as minor utilities. Therefore, the stormwater facility is permitted and the criteria are met.

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

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

1. The minimum lot size shall be 10,000 square feet for a single-family detached unit.

Staff Finding 3: The subdivision application will create six lots and per the Tentative Plan, all lots exceed the minimum lot size of 10,000 sf. (see table below). The applicant proposes single-family houses only.

Proposed Lot Number	Lot Size	Front Lot Line Width	Average Lot Width
Lot 1	13,555 sq. ft.	Approx. 200 ft.	Approx. 95 ft.
Lot 2	10,019 sq. ft.	Approx. 103 ft.	Approx. 106 ft.
Lot 3	10,479 sq. ft.	Approx. 83 ft.	Approx. 92 ft.
Lot 4	15,020 sq. ft.	Approx. 87 ft.	Approx. 75.8 ft.
Lot 5 (Flag Lot)	12,570 sq. ft.	Approx. 10 ft.	Approx. 60.8 ft.
Lot 6 (Flag Lot)	13,514 sq. ft.	Approx. 15 ft.	Approx. 65 ft.

The criteria are met.

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

Staff Finding 4: See table in Staff Finding 3. In the Applicant's proposed Tentative Plan, Lots 5 and 6 are flag lots. The total width for the shared access of Lots 5 and 6 is 25 feet. The shared private driveway connection does not meet required street connectivity standards of the Community Development Code nor the Transportation System Plan. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street, which eliminates the need for a reciprocal access easement. Also per Condition of Approval 4, Lots 5 and 6 shall take access directly onto the public street. All other lots meet this minimum lot frontage for a standard lot. Subject to the approval of proposed Conditions of Approval, the criteria are met.

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

Staff Finding 5: See table in Staff Finding 3. The applicant's proposed Tentative Plan proposes all lots exceed this requirement. The criteria are met.

5. *Except as specified in CDC 25.070(C) (1) through (4) for the Willamette Historic District, the minimum yard dimensions or minimum building setback area from the lot line shall be:*

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

6. *The maximum building height shall be 35 feet, except for steeply sloped lots in which case the provisions of Chapter 41 CDC shall apply.*
7. *The maximum lot coverage shall be 35 percent. (…)*
9. *The floor area ratio shall be 0.45. (...)*

Staff Finding 6: At the time of building permit application to construct homes on the lots, the front, side and rear setbacks, building height, lot coverage, FAR and sidewall transition requirements will be reviewed for compliance. The criteria are met.

CHAPTER 48, ACCESS CONTROL

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

Staff Finding 7: No Traffic Impact Analysis (TIA) is required since none of the criteria of 85.170(B)(2) are met. For example, an Average Daily Trip count (ADT) of 250 is required before a TIA is needed. The addition of five new homes should only generate an ADT of 47.85 based on the Institute of Traffic Engineers (ITE) trip generation tables which project 9.4 ADT for each single family home. This criteria are met.

The applicant submitted a Street Connection Analysis technical memorandum (found in Exhibit PC-5) to illustrate the expected impact to local traffic if Landis Street is connected to Cornwall Street.

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

Staff Finding 8: No existing curb cuts or other vehicle access points are required to be closed. No frontage streets are required. No traffic control devices are required to ensure safe access. No parking areas are proposed. The applicant proposes recording a reciprocal access easement for the shared private driveway connection from Landis Street to Cornwall Street, which serves Lots 5 and 6. The shared private driveway connection does not meet required street connectivity standards of the Community Development Code nor the Transportation System Plan. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street, which eliminates the need for a reciprocal access easement. Also per Condition of Approval 4, Lots 5 and 6 shall take access directly onto the public street. Subject to the approval of proposed Conditions of Approval, the criteria are met.

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

a) Option 1. Access is from an existing or proposed alley or mid-block lane. If a property has access to an alley or lane, direct access to a public street is not permitted.
b) Option 2. Access is from a private street or driveway connected to an adjoining property that has direct access to a public street (i.e., "shared driveway"). A public access easement covering the driveway shall be recorded in this case to assure access to the closest public street for all users of the private street/drive.
c) Option 3. Access is from a public street adjacent to the development lot or parcel. If practicable, the owner/developer may be required to close or consolidate an existing access point as a condition of approving a new access. Street accesses shall comply with the access spacing standards in subsection (B) (6) of this section.

Staff Finding 9: The applicant proposes access to all lots by use of Options 2 and 3 in the Tentative Plan. All access points will be made directly onto a public street (Landis Street extension). The applicant is proposing a shared driveway for proposed Lots 5 and 6 (Lots 5 and 6 are flag lots). The applicant proposes recording a reciprocal access easement for the shared private driveway connection from Landis Street to Cornwall Street, which serves Lots 5 and 6. The shared private driveway connection does not meet required street connectivity standards of the Community Development Code nor the Transportation System Plan. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street, which eliminates the need for a reciprocal access easement. Also per Condition of Approval 4, Lots 5 and 6 shall take access directly onto the dedicated public street. Subject to the approval of the proposed Conditions of Approval, the criteria are met.

4. Subdivisions fronting onto an arterial street.
(…)
5. Double-frontage lots.
(…)

Staff Finding 10: The subdivision proposal does not front onto an arterial street, as Landis Street and Cornwall Street are local streets. There are no proposed double frontage lots on the proposed tentative plan. The criteria are met.

6. Access spacing.
(…)
7. Number of access points.
(...)
8. Shared driveways.
(...)

Staff Finding 11: One access point to a public street is proposed for each lot. Proposed Lots 5 and 6 have a proposed shared driveway shown on the Applicant's Tentative Plan. The applicant proposes recording a reciprocal access easement for the shared private driveway connection from Landis Street to Cornwall Street, which serves Lots 5 and 6. The shared private driveway connection does not meet required street connectivity standards of the

Community Development Code nor the Transportation System Plan. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street, which eliminates the need for a reciprocal access easement. Also per Condition of Approval 4, Lots 5 and 6 shall take access directly onto the dedicated public street. The criteria are met.

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

Staff Finding 12: Landis and Cornwall Streets are classified as Local Streets. The proposal does not front an Arterial Street. The criteria are met.

2. Street standards. Public and private streets shall also conform to Chapter 92 CDC, Required Improvements, and to any other applicable sections of the West Linn Community Development Code and approved TSP.
3. Exception. Exceptions to the above standards may be granted when blocks are divided by one or more pathway(s), in conformance with the provisions of CDC 85.200(C), Pedestrian and Bicycle Trails, or cases where extreme topographic (e.g., slope, creek, wetlands, etc.) conditions or compelling functional limitations preclude implementation, not just inconveniences or design challenges.

Staff Finding 13: Please see Staff Findings 52 to 69 for conformance with CDC Chapter 92. The applicant proposes a shared private driveway connection from Landis Street to Cornwall Street, which serves Lots 5 and 6. The shared private driveway connection does not meet required street connectivity standards of CDC Chapter 85.200(B) nor planned connectivity projects of the West Linn Transportation System Plan. The TSP identifies three recommended connectivity projects in this area. Project LSC-16 (pages 74-76) in the TSP is planned to connect Landis Street to Cornwall Street as a Local Street. The proposal can meet this requirement by dedicating the required 25-feet of flag poles (proposed Lots 5 and 6) as a public street and constructing half-street improvements per condition of approval 4. Project LSC-21 (pages 74-76) in the TSP is planned to connect Landis Street north to planned Project LSC-19 (pages 74-76). The applicant proposal conforms to allow the future connection planned with Project LSC-21 by the proposed termination of Landis Street to the north property line of the subject property. No exceptions were requested. To meet connectivity standards of the West Linn Community Development Code and adopted TSP, the applicant shall dedicate 32-feet of public right-of-way to replace the proposed flag poles of Lots 5 and 6 and construct improvements per the Public Works Standards for a public street per Condition of Approval 4. Subject to the Conditions of Approval, the criteria is met.

48.030 MINIMUM VEHICULAR REQUIREMENTS FOR RESIDENTIAL USES

A. Direct individual access from single-family dwellings and duplex lots to an arterial street (…)

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

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

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

Staff Finding 14: Landis Street and Cornwall Street are both classified as local streets. No proposed homes will be placed more than 150 feet from public right of way. As shown in the Tentative Plan, Lots 5 and 6 are flag lots but both homes can be located within 150 feet of public right-of-way. Per Condition of Approval 4, the shared access to Lots 5 and 6 shall be a public street and where Lots 5 and 6 take direct access. All other access will be via individual driveways and all access ways will be reviewed for compliance with engineering standards at the time a site development permit is applied for. Subject to the Conditions of Approval, the criteria are met.

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

Staff Finding 15: At the time of building permit application to construct homes on the lots, maximum driveway grade will be reviewed for compliance. This criteria are met.

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

Staff Finding 16: At the time of building permit application to construct homes on the lots, minimum distance between garage door and back of sidewalk will be reviewed. The criteria are met.

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

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

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

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

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

Staff Finding 17: The applicant has proposed a turnaround at the end of the Landis Street extension shown in the Tentative Plan. The Tentative Plan also shows a turnaround at the end of Cornwall Street that uses a gated emergency access easement in front of lot 6. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street and eliminates the need for a turnaround at the end of Cornwall Street. Also per Condition of Approval 4, Lots 5 and 6 shall take access directly onto the dedicated public street.

D. Access to five or more single-family homes shall be by a street built to full construction code standards. All streets shall be public. This full street provision may only be waived by variance.
E. Access and/or service drives for multi-family dwellings shall be fully improved with hard surface pavement:
(...)
F. Where on-site maneuvering and/or access drives are necessary to accommodate required parking, in no case shall said maneuvering and/or access drives be less than that required in Chapters 46 and 48 CDC.
G. The number of driveways or curb cuts shall be minimized on arterials or collectors. Consolidation or joint use of existing driveways shall be required when feasible.
H. In order to facilitate through traffic and improve neighborhood connections, it may be necessary to construct a public street through a multi-family site.
I. Gated accessways to residential development other than a single-family home are prohibited.

Staff Finding 18: The applicant proposal is for single-family homes and no arterial roadways are proposed with this application. In the Applicant's proposed Tentative Plan, an emergency access easement is shown to connect the extension of Landis Street to Cornwall Street. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street and not gated. Also per Condition of Approval 4, Lots 5 and 6 shall take access directly onto the dedicated public street. All driveways and curb cuts shall meet the engineering standards of Condition of Approval Number 2. These criteria are met.

48.060 WIDTH AND LOCATION OF CURB CUTS AND ACCESS SEPARATION REQUIREMENTS
A. Minimum curb cut width shall be 16 feet.
B. Maximum curb cut width shall be 36 feet, except along Highway 43 in which case the maximum curb cut shall be 40 feet. For emergency service providers, including fire stations, the maximum shall be 50 feet.
C. No curb cuts shall be allowed any closer to an intersecting street right-of-way line than the following:
1. On an arterial when intersected by another arterial, 150 feet.
(…)
6. On a local street when intersecting any other street, 35 feet.

Staff Finding 19: All driveways and curb cuts shall meet the engineering standards of Condition of Approval Number 2. Subject to the Conditions of Approval, the criteria are met.

D. There shall be a minimum distance between any two adjacent curb cuts on the same side of a public street, except for one-way entrances and exits, as follows:
1. On an arterial street, 150 feet.
2. On a collector street, 75 feet.
3. Between any two curb cuts on the same lot or parcel on a local street, 30 feet.
E. A rolled curb may be installed in lieu of curb cuts and access separation requirements.

Staff Finding 20: The proposal does not include more than one curb cut on the same lot. The applicant does not propose a rolled curb. The criteria are met.

F. Curb cuts shall be kept to the minimum, particularly on Highway 43. Consolidation of driveways is preferred. The standard on Highway 43 is one curb cut per business if consolidation of driveways is not possible.

Staff Finding 21: The applicant proposes to provide access via the extension of Landis Street and one curb cut lot. Landis Street is classified as a local street and not located on or near Highway 43. The criteria are met.

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

Staff Finding 22: At the time of building permit application to construct homes on the lots, adequate line of sight will be reviewed for compliance with engineering standards. The criteria are met.

55.100 APPROVAL STANDARDS – CLASS II DESIGN REVIEW
(Design Review is only applicable to significant trees as cross referenced by CDC 85.200(J)(9))

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.
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. (…)
Non-residential and residential projects on Type I and II lands shall protect all heritage trees and all significant trees and tree clusters by limiting development in the protected area. (…)

Staff Finding 23: There are no heritage trees on the subject property as verified by the City Arborist. The subject property contains 40 significant trees as verified by the City Arborist. The subject property has 11,891 sq. ft. of property located within Type I lands and of that 1,370 sq. ft. is within the propose Landis Street extension. 11,108 sq. ft. of the site is within Type II lands and of that 499 sq. ft. is within the area of the proposed Landis Street extension. The remainder of the property is within Type III and IV lands (75.8% of the property). The applicant indicates that five of the significant trees are located on Type I or Type II lands outside of the right-of-way associated with the Landis Street extension, but must be removed due to the significant amount of grading associated with the Street extension. Per Condition of Approval 5 tree mitigation for these five removed trees is required. An additional 13 significant trees must be removed to extend Landis Street as those trees are within the right-of-way area. The applicant has proposed to retain a total of 13 of the 40 significant trees on site (32.5%) as verified by the City Arborist. The criteria is met.

CHAPTER 85, GENERAL PROVISIONS (LAND DIVISION)

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

A. Streets.

1. General. The location, width and grade of streets shall be considered in their relation to existing and planned streets (…) 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 Public Works Director. (….)

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. (…)

Staff Finding 24: The applicant proposes a 52 foot right-of-way for the extension of Landis Street. The applicant also proposes a 25 foot shared access for the flag 'poles' of Lots 5 and 6. The shared private driveway connection does not meet required street connectivity standards of the Community Development Code nor the Transportation System Plan. The TSP

identifies three recommended connectivity projects in this area. Project LSC-16 (pages 74-76) in the TSP is planned to connect Landis Street to Cornwall Street as a Local Street. The proposal can meet this requirement by dedicating the required 25-feet of flag poles (proposed Lots 5 and 6) as a public street and constructing half-street improvements per condition of approval 4. Project LSC-21 (pages 74-76) in the TSP is planned to connect Landis Street north to planned Project LSC-19 (pages 74-76). The applicant proposal conforms to allow the future connection planned with Project LSC-21 by the proposed termination of Landis Street to the north property line of the subject property. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street as there are no topographical challenges in this area of the property. Satisfaction of Condition of Approval 4 meets the requirement of a continuous pattern of local streets. The proposed tentative plan shows required sidewalks and planter strip along Landis Street. The lower section of Cornwall Street is currently unimproved. The applicant has proposed a pedestrian trail, connecting to the existing trail on the City owned property to the South. Per Condition of Approval 9, the Applicant is required to submit a fee in lieu for the remainder of the improvements within the unimproved Cornwall Street right-of-way or initiate the vacation process of this right-of-way. Please see Staff Findings 52 to 69 for conformance with CDC Chapter 92, Required Improvements. Subject to the approval of proposed conditions, this criteria is met.

2. Right-of-way and roadway widths.
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. (…)
4. The decision-making body shall consider the Public Works Director'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 Public Works Director of the following criteria: (…)

Staff Finding 25: See Staff Finding 23. The Applicant's Tentative Plan shows a proposed 52' right-of-way. The Tentative Plan shows a 25 foot shared accessway for Lots 5 and 6. The shared access connects the extension of Landis Street to Cornwall Street for emergency access and the applicant has proposed to gate this accessway as it is not proposed to be public right-of-way. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street and not gated. Also per Condition of Approval 4, Lots 5 and 6 shall take access directly onto the dedicated public street. Subject to the approval of proposed conditions, this criteria is met.

5. Additionally, when determining appropriate street width, the decision-making body shall consider the following criteria:

a. When a local street is the only street serving a residential area and is expected to carry more than the normal local street traffic load, the designs with two travel and one parking lane are appropriate.

b. Streets intended to serve as signed but unstriped bike routes should have the travel lane widened by two feet.

c. Collectors should have two travel lanes and may accommodate some parking. Bike routes are appropriate.

d. Arterials should have two travel lanes. On-street parking is not allowed unless part of a Street Master Plan. Bike lanes are required as directed by the Parks Master Plan and Transportation Master Plan.

Staff Finding 26: The applicant proposes a 52 foot right-of-way which accommodates two travel lanes and one parking lane for the extension of Landis Street. The Tentative Plan shows a 25 foot shared accessway for Lots 5 and 6. The shared access connects the extension of Landis Street to Cornwall Street for emergency access and the applicant has proposed to gate this accessway as it is not proposed to be public right-of-way. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street and not gated. Landis Street and Cornwall Street are both Local streets. No bike routes are proposed or required to be installed. Subject to the Conditions of Approval, the criteria is met.

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

Staff Finding 27: The applicant proposes to extend Landis Street through the subject property and stub it to the North. The applicant proposes a reserve strip on the final plat to restrict access until future development occurs. Per Condition of Approval 11, no reserve strips are necessary for this project. The criteria is met.

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.

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

Staff Finding 28: The applicant proposes to extend Landis Street to the northern property line. Landis Street is classified as a local street. The applicant has also proposed a fire turnaround at the end of Landis Street and another fire turnaround at the end of Cornwall Street. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street and eliminates the need for any TVFR turnarounds as there would be a through strip. See Exhibit PC-7 for TVFR Comments. The criteria is met.

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

unless a special intersection design is approved. 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.

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

Staff Finding 29: The applicant has proposed to extend Landis Street to the Northern property line and a shared access drive to Lots 5 and 6. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street and not gated. The connection of the Public Street and Cornwall Street intersect at a right angle. The applicant has proposed a 52 foot right-of way for the extension of Landis Street to meet the West Linn Public Works Standards. Subject to the conditions of approval, the criteria is met.

11. Cul-de-sacs.
(…)

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.

Staff Finding 30: No new or existing cul-de-sacs are proposed with this application. The applicant does not propose any new street names, but Condition of Approval 4 requires a new public street to be dedicated and meet public works standards. This new public street is required to be named on the face of the plat and shall meet the requirements of this section per Condition of Approval 4. Subject to the Conditions of Approval, the criteria are met.

13. Grades and curves. Grades and horizontal/vertical curves shall meet the West Linn Public Works Design Standards.

14. Access to local streets. Intersection of a local residential street with an arterial street may be prohibited by the decision-making authority if suitable alternatives exist for providing interconnection of proposed local residential streets with other local streets. Where a subdivision or partition abuts or contains an existing or proposed major arterial street, the decision-making authority may require marginal access streets, reverse-frontage lots with suitable depth, visual barriers, noise barriers, berms, no-access reservations along side and rear

property lines, and/or other measures necessary for adequate protection of residential properties from incompatible land uses, and to ensure separation of through traffic and local traffic.

15. Alleys. Alleys shall be provided in commercial and industrial districts unless other permanent provisions for access to off-street parking and loading facilities are made as approved by the decision-making authority. While alley intersections and sharp changes in alignment should be avoided, the corners of necessary alley intersections shall have radii of not less than 10 feet. Alleys may be provided in residential subdivisions or multi-family projects. The decision to locate alleys shall consider the relationship and impact of the alley to adjacent land uses. In determining whether it is appropriate to require alleys in a subdivision or partition, the following factors and design criteria should be considered: (…)

Staff Finding 31: No alleys are proposed with this application. The applicant proposed a gated access from Cornwall Street to Lots 5 and 6. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street and not gated. This public street will meet Cornwall at a right angle. The new public street, the Landis Street extension and Cornwall Street are and will be classified as local streets. This property does not have frontage or intersect an arterial road. All right-of-ways associated with this proposal shall meet West Linn Public Works Standards for grade per Condition of Approval 2. Subject to the Conditions of Approval, the criteria are met.

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

17. Planter strip. The planter strip is between the curb and sidewalk providing space for a grassed or landscaped area and street trees. The planter strip shall be at least 6 feet wide 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.

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

Staff Finding 32: The applicant proposes to extend Landis Street through the subject property and stub it to the Northern property boundary in the Tentative Plan. This extension will include sidewalks on both sides of the street. Sidewalks will be required on the side of the street along the proposed access way per Condition of Approval 4. When the property to the north develops in the future, the remaining sidewalk along that section will be installed. The applicant also proposes planter strips along the Landis Street extension. All streets shall be dedicated as public right-of way per Conditions of Approval 2 and 4. Subject to the conditions, the criteria is met.

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

Staff Finding 33: All lots are proposed to access a public street (Landis Street extension) via individual or shared driveways. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street and not gated. Also per Condition of Approval 4, Lots 5 and 6 shall take access directly onto the dedicated public street. See Condition of Approval Number 2. Subject to Conditions of Approval, the criteria is met.

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:

(…)

Staff Finding 34: No entryway treatments or street isles are proposed. This criteria does not apply.

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. ….

Staff Finding 35: Full street improvements are required for the extension of Landis Street. The lower section of Cornwall Street is currently unimproved. The applicant has proposed a pedestrian trail, connecting to the existing trail on the City owned property to the South. Per Condition of Approval 9, the Applicant is required to initiate the vacation process or submit a fee in lieu for the remainder of the improvements within the unimproved Cornwall Street right-of-way. For the Unimproved portion of Cornwall, the applicant shall initiate the vacation process for the right-of-way or pay the fee in lieu of those improvements (See Staff Finding 52). The fee in lieu will be based upon the actual costs associated with constructing those improvements. Subject to the conditions of approval, the criteria is met.

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

Staff Finding 36: Landis Street is proposed to be extended through the subject property and stubbed to the North in the proposed Tentative Plan. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street. This new

public street creates a new block of 206 feet long. Each proposed residential lot is proposed to be buildable. Per Condition of Approval 10, additional geotechnical requirements are required prior to final plat approval to ensure they are buildable. Subject to the conditions, the criteria are met.

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

Staff Finding 37: Please see Staff Findings 7 to 22. The criteria are met.

5. Double frontage lots and parcels.
(…)
6. Lot and parcel side lines

Staff Finding 38: The Tentative Plan does not propose any double frontage lots. Proposed lots 2 through 6 meet public right-of-way at right angles. Proposed lot 1's frontage is curved along with the Landis Street right-of-way. The criteria are met.

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

Staff Finding 39: The applicant proposes a 2 flag lots (Lots 5 and 6) on the Tentative Plan. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street and not gated. Also per Condition of Approval 4, Lots 5 and 6 shall take access directly onto the dedicated public street. This Condition of Approval eliminates the need for flag lots. The criteria are met.

8. Large lots or parcels.

Staff Finding 39: The proposed lot sizes for both the Tentative Plan and Plan B show lot sizes above the required 10,000 square feet per the R-10 zone. Although larger than 10,000 sf the proposed lots are not large enough to divide further in the R-10 zone. This criteria are met.

C. Pedestrian and bicycle trails.
(…)
D. Transit Facilities.
(…)

Staff Finding 40: The applicant proposes a pedestrian pathway in the lower section of Cornwall Street as shown on the Tentative Plan. This pathway connects to an existing trail south of the subject property. The trail does not satisfy the requirements for public improvements along Cornwall. As such, the applicant shall initiate a right-of-way vacation process for the unimproved portion of Cornwall or pay a fee in lieu of constructing the required improvements. The applicant also proposes sidewalks on both sides of the Landis Street extension per the Tentative. Per Condition of Approval 9, the Applicant is required to submit a fee in lieu for the remainder of the improvements within the unimproved Cornwall Street right-of-way or initiate the vacation process. The property is not located in close proximity of a public transit line, the City Engineer is not requiring the applicant to install any new public transit facilities, nor does the applicant propose any. The criteria are met.

E. Grading.
Grading of building sites shall conform to the following standards unless physical conditions demonstrate the propriety of other standards:
1. All cuts and fills shall comply with the excavation and grading provisions of the Uniform Building Code and the following:
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. Type I lands shall require a report submitted by an engineering geologist, and Type I and Type II lands shall require a geologic hazard report.
6. Repealed by Ord. 1635.
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.

Staff Finding 41: All grading and erosion control plans will be reviewed during engineering plan review and at the time the applicant applies for building permits. A geotechnical report was submitted with this subdivision application (see applicant's submitted Geotechnical Report dated January 7, 2016). Per Condition of Approval 10 the applicant is required to submit geotechnical conformation on building sites sloped 25% or more prior to final plat approval. Also, additional analysis may be required prior to issuance of a building permit at the discretion of the Building Official. The criteria is met.

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

Staff Finding 42: Water is available in Landis Street and Cornwall Street to serve this subdivision. The existing water line in Cornwall Street is substandard. The applicant is required per Condition of Approval 3 to upgrade the existing water line in Cornwall Street. The upgraded water line shall be connected to the new line in Landis to provide a looped system. The City has adequate water supply to serve this proposal. Subject to the Conditions of Approval, the criteria are met.

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

Staff Finding 43: The Sewer Master Plan has confirmed that there is sufficient sanitary system and sewage treatment facility capacity. In the Tentative Plan, the sewer line in the Landis Street right-of-way can only serve lot 1 due to topography. Sewer for lots 2-6 is proposed to be from a new sewer line to the south. The new sewer line will run through the rear yards of lots 2-6 and connect to an existing sewer main in the City tract at the end of Cornwall Street. The sewer shall be extended to the north property line in Landis Street and the unimproved Cornwall right-of-way for connection of future development. The applicant's submitted utility plan was prepared by a licensed Engineer and shown on sheet 1/3 titled Preliminary Street and Utility Plan. Subject to the Conditions of Approval, the criteria are met.

H. Storm detention and treatment. All proposed storm detention and treatment facilities comply with the standards for the improvement of public and private drainage systems located in the West Linn Public Works Design Standards, there will be no adverse off-site impacts caused by the development (including impacts from increased intensity of runoff downstream or constrictions causing ponding upstream), and there is sufficient factual data to support the conclusions of the submitted plan.

Staff Finding 44: The applicant has proposed storm runoff from the southern portion of Landis Street will be directed into water quality planters which have capacity to detain and improve the quality of the stormwater prior to being sent to the Tanner's Stonegate stormwater system. The applicant also proposes rain gardens on each lot for stormwater management on each residential lot.

The applicant has submitted a stormwater drainage analysis dated June, 2020 found in the applicant's submittal. The submitted analysis used the incorrect stormwater manual for reference. A final storm drainage analysis shall be submitted for review with the public improvement permit application. The size and location of stormwater facilities may vary from the submitted report due to errors in the report. Per condition of approval 8, additional analysis is required. Subject to the conditions of approval, the criteria is met.

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

Staff Finding 45: Per Condition of Approval 6, the applicant is required to record and show on the face of the plat an 8 foot public utility easement along all street frontages. Subject to the Conditions of Approval, the criteria are met.

J. Supplemental provisions.
1. Wetland and natural drainageways. (…)
2. Willamette and Tualatin Greenways.
3. Street trees.
Street trees are required as identified in the appropriate section of the municipal code and Chapter 54 CDC.
4. Lighting.
To reduce ambient light and glare, high or low pressure sodium light bulbs shall be required for all subdivision street or alley lights. The light shall be shielded so that the light is directed downwards rather than omni-directional.

Staff Finding 46: The applicant proposes to install street lighting on an as needed basis after the plat approval and an analysis of existing street lighting is complete. All lights shall be directed downward and shielded as to not disturb neighboring properties. The property does not contain any natural drainageways. The property was mapped to have contained a small portion of Habitat Conservation Area associated with the Willamette and Tualatin Greenway. This area was shown to have been mapped in error and corrected in 2017 with a previous application. The criteria are met.

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

Staff Finding 47: The applicant proposes the Landis Street extension to be dedicated to the City as public right-of-way. Per Condition of Approval 4, the shared access to Lots 5 and 6 is required to be a public street dedicated to the City. This application does not require any off-site dedications or improvements. Subject to the Conditions of Approval, the criteria are met.

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.

Staff Finding 48: The applicant proposes to underground all utilities associated with this site's development. The criteria are met.

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

Staff Finding 49: The applicant submitted density calculations on the cover sheet of each proposed layout. The Tentative Plan density calculations indicate 20,587 sq. ft. of property is within Type I or Type II lands and a total of 7 units of land could be created at 85.7% density (See sheet ½ Tentative Plan). The criteria are met.

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

Staff Finding 50: The property is zoned R-10, so this criteria does not apply.

9. Heritage trees/significant tree and tree cluster protection.
All heritage trees, as defined in the Municipal Code, shall be saved. Diseased heritage trees, as determined by the City Arborist, may be removed at his/her direction. All non-heritage trees and clusters of trees (three or more trees with overlapping dripline; however, native oaks need not have an overlapping dripline) that are considered significant by virtue of their size, type, location, health, or numbers shall be saved pursuant to CDC 55.100(B)(2). Trees are defined per

the municipal code as having a trunk six inches in diameter or 19 inches in circumference at a point five feet above the mean ground level at the base of the trunk.

Staff Finding 51: See Staff Finding 23 This criterion is met.

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:

Staff Finding 52: The applicant shall comply with the requirements and install improvements to meet the West Linn Public Works Standards. Subject to Condition of Approval Number 2, these criteria are met.

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.

Staff Finding 53: This property does not contain any wetlands or natural drainageways per any adopted City map. The applicant has proposed the Landis Street extension with a planter strip and sidewalk along both sides of the street. Per Condition of Approval 2, the applicant shall comply with all requirements and install improvements to the West Linn Public Works Standards. The Tentative Plan shows a 25 foot shared accessway for Lots 5 and 6. The shared access connects the extension of Landis Street to Cornwall Street for emergency access. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street and not gated. Also per Condition of Approval 4, Lots 5 and 6 shall take access directly onto the dedicated public street. The unimproved section of Cornwall Street cannot be constructed to full City Engineering Standards due to the topography of the site. Per condition of approval 9, the applicant is required to pay a fee in lieu or initiate the vacation process for the improvements on this unimproved section of Cornwall Street. Subject to the Conditions of Approval, these criteria are met.

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.

Staff Finding 54: The applicant has proposed to construct a pedestrian trail in the unimproved right-of-way at the end of Cornwall Street. Per the Conditions of Approval, the applicant is also required to submit an application for a fee in lieu for the remainder of the improvements that cannot be installed due to the topography. Alternatively, the applicant can initiate vacation of this unimproved section of Cornwall right-of-way (See Staff Finding 53). Subject to the conditions of approval, the criteria is met.

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.

Staff Finding 55: The applicant's Tentative Plan shows the extension of Landis Street through the subject property and stubbed to the North. The applicant proposes a 52' right-of-way for the extension of Landis Street. The Tentative Plan shows a 25 foot shared accessway for Lots 5 and 6. The shared access connects the extension of Landis Street to Cornwall Street for emergency access and the applicant has proposed to gate this accessway as it is not proposed to be public right-of-way. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street and not gated. Also per Condition of Approval 4, Lots 5 and 6 shall take access directly onto the dedicated public street. Subject to the conditions of approval, the criteria is met.

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.

Staff Finding 56: Landis Street and Cornwall Street are both designated as local streets. The Landis Street extension meets the requirements set by the Community Development Code and the City Engineering Standards for local public streets. The Tentative Plan shows a 25 foot shared accessway for Lots 5 and 6. The shared access connects the extension of Landis Street to Cornwall Street for emergency access and the applicant has proposed to gate this accessway as it is not proposed to be public right-of-way. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street and not gated. Also per Condition of Approval 4, Lots 5 and 6 shall take access directly onto the dedicated public street. The unimproved section of Cornwall Street cannot be constructed to full City Engineering Standards due to the topography of the site. Per condition of approval 9, the applicant is required to pay a fee in lieu or initiate the vacation process for the improvements on this unimproved section of Cornwall Street. Subject to the conditions of approval, the criteria is met.

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.

Staff Finding 57: The applicant shall comply with the requirements and install improvements to meet the West Linn Public Works Standards. Subject to Condition of Approval Number 2, the criteria are met.

E. Storm detention and treatment. For Type I, II and III lands (refer to definitions in Chapter 02 CDC), a registered civil engineer must prepare a storm detention and treatment plan, at a scale sufficient to evaluate all aspects of the proposal, and a statement that demonstrates:
1. The location and extent to which grading will take place indicating general contour lines, slope ratios, slope stabilization proposals, and location and height of retaining walls, if proposed.
2. All proposed storm detention and treatment facilities comply with the standards for the improvement of public and private drainage systems located in the West Linn Public Works Design Standards.
3. There will be no adverse off-site impacts, including impacts from increased intensity of runoff downstream or constrictions causing ponding upstream.
4. There is sufficient factual data to support the conclusions of the plan.
5. Per CDC 99.035, the Planning Director may require the information in subsections (E)(1), (2), (3) and (4) of this section for Type IV lands if the information is needed to properly evaluate the proposed site plan.

Staff Finding 58: The applicant has proposed storm runoff from the southern portion of Landis Street will be directed into water quality planters which have capacity to detain and improve the quality of the stormwater prior to being sent to the Tanner's Stonegate stormwater

system. The applicant also proposes rain gardens on each lot for stormwater management on each residential lot.

The applicant has submitted a stormwater drainage analysis dated June, 2020 found in the applicant's submittal. The submitted analysis used the incorrect stormwater manual for reference. A final storm drainage analysis shall be submitted for review with the public improvement permit application. The size and location of stormwater facilities may vary from the submitted report due to errors in the report. Per condition of approval 8, additional analysis is required. Subject to the conditions of approval, the criteria is met.

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 or her 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.

Staff Finding 59: The Sewer Master Plan has confirmed that there is sufficient sanitary system and sewage treatment facility capacity. In the Tentative Plan, the sewer line in the Landis Street right-of-way can only serve lot 1 due to topography. Sewer for lots 2-6 is proposed to be from a new sewer line to the south. The new sewer line will run through the rear yards of lots 2-6 and connect to an existing sewer main in the City tract at the end of Cornwall Street. The applicant's submitted utility plan was prepared by a licensed Engineer and shown on sheet 1/3 titled Preliminary Street and Utility Plan. The criteria are met.

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.

Staff Finding 60: Water is available in Landis Street and Cornwall Street to serve this subdivision. The existing water line in Cornwall Street is substandard. The applicant is required per Condition of Approval 3 to upgrade the existing water line in Cornwall Street. The upgraded water line shall be connected to the new line in Landis to provide a looped system. The City has adequate water supply to serve this proposal. Subject to the Planning Commission's approval of the proposed Conditions of Approval, the criteria are met.

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.

Staff Finding 61: The subject property does not contain any arterial roads or double frontage lots. The applicant proposes a 52 foot right-of-way for the extension of Landis Street. The applicant also proposes a 25 foot shared access for the flag 'poles' of Lots 5 and 6. The shared

private driveway connection does not meet required street connectivity standards of the Community Development Code nor the Transportation System Plan. Per Condition of Approval 4, the connection between Landis Street and Cornwall Street must be a public street as there are no topographical challenges in this area of the property. Satisfaction of Condition of Approval 4 meets the requirement of a continuous pattern of local streets. The proposed tentative plan shows required sidewalks and planter strip along Landis Street. The lower section of Cornwall Street is currently unimproved. The applicant has proposed a pedestrian trail, connecting to the existing trail on the City owned property to the South. Per Condition of Approval 9, the Applicant is required to submit a fee in lieu for the remainder of the improvements within the unimproved Cornwall Street right-of-way. The fee in lieu and trail satisfy the improvement requirements for adjacent unimproved right-of-way. Subject to the approval of proposed conditions, the criteria are met.

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.

Staff Finding 62: The subject property does not contain any identified bicycle routes (planned or proposed). This criteria does not apply.

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.

Staff Finding 63: The applicant did not propose any new street names. The proposed Tentative Plan shows Landis Street extending through the subject property and stubbed to the North. Per Condition of Approval 4, the applicant is required to dedicate the shared access to Lots 5 and 6 as a public street and name it. The street signs shall be installed to City Standards per Condition of Approval 2. Subject to the Conditions of Approval, the criteria are met.

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.

Staff Finding 64: The applicant shall comply with the requirements and install improvements to meet the West Linn Public Works Standards. Subject to Condition of Approval Number 2, the criteria are met.

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.

Staff Finding 65: The applicant shall comply with the requirements and install improvements to meet the West Linn Public Works Standards. Subject to Condition of Approval Number 2, the criteria are met.

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.

Staff Finding 66: The applicant proposes to install street lighting on an as needed basis after the plat approval and an analysis of existing street lighting is complete. All lights shall be directed downward and shielded as to not disturb neighboring properties. The criteria are met.

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.

Staff Finding 66: The applicant has proposed to underground all utilities. The criteria are met.

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.

Staff Finding 67: Curb cuts and driveway installations will be evaluated for compliance with Public Works Standards prior to issuance of a building permit. The criteria are met.

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.

Staff Finding 68: The applicant proposes to coordinate with the City Parks Department on street trees and pay the assessed fee for trees. The criteria are met.

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.

Staff Finding 69: The applicant shall comply with the requirements and install improvements to meet the West Linn Public Works Standards. Subject to Condition of Approval Number 2, the criteria are met.

PC-1 AFFIDAVIT AND NOTICE PACKET

CITY OF West Linn

AFFIDAVIT OF NOTICE
Type A

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

PROJECT
File No.: SUB-20-01 Applicant's Name: Icon Construction & Development, LLC
Development Name: 4096 Cornwall Street
Scheduled Decision Date: Planning Commission hearing on October 7, 2020

MAILED NOTICE
Notices were mailed at least 20 days prior to the decision date per Section 99.080 of the Community Development Code to:

1	Icon Construction & Development, LLC	9/16/20	*Lynn Schroder*
2	Rick Givens	9/16/20	*Lynn Schroder*
3	West Linn Wilsonville School District	9/16/20	*Lynn Schroder*
4	Property Owners within 500 feet	9/16/20	*Lynn Schroder*
5	All Neighborhood Associations	9/16/20	*Lynn Schroder*

TIDINGS
Notice was posted in the West Linn Tidings at least 10 days prior to the decision date.

9/24/20	*Lynn Schroder*

WEBSITE
Notice was posted on the City's website at least 10 days prior to the decision date.

9/15/20	*Lynn Schroder*

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

9/24/20	Jennifer Arnold

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

9/24/20	Jennifer Arnold

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

date***	Signature***

CITY OF WEST LINN PLANNING COMMISSION
PUBLIC HEARING NOTICE
FILE NO. SUB-20-01

The West Linn Planning Commission will hold a virtual public hearing on **Wednesday, October 7, 2020 at 6:30 pm** to consider a 6-lot subdivision request in the R-10 zone at 4096 Cornwall Street.

The Planning Commission will decide the application based on criteria applicable to Subdivision Review in Chapters 11: Single-Family Residential (R-10), Chapter 48: Access, Egress and Circulation, Chapter 85: Land Division General Provisions, Chapter 92: Required Improvements, and 99 of the Community Development Code (CDC).

You have been notified of this proposal because County records indicate that you own property within 500 feet of the subject property (Clackamas County Assessor's Map 2S-2E-36BA, tax lot 6300), or as otherwise required by Chapter 99: Procedures for Decision Making: Quasi-Judicial of the CDC.

The complete application is posted on the City's website, https://westlinnoregon.gov/planning/4096-cornwall-street-6-lot-subdivision-0. Alternatively, the complete application is available for inspection at no cost at City Hall, or copies can be obtained for a minimal charge. The staff report will be posted on the website and available for inspection at City Hall ten days before the hearing.

It is important to submit all testimony in response to this notice. All comments submitted for consideration of the application should relate specifically to the applicable criteria. Failure to raise an issue at the hearing or by written comment, or failure to provide sufficient specificity to respond to the issue, precludes raising the issue on appeal or before the Land Use Board of Appeals.

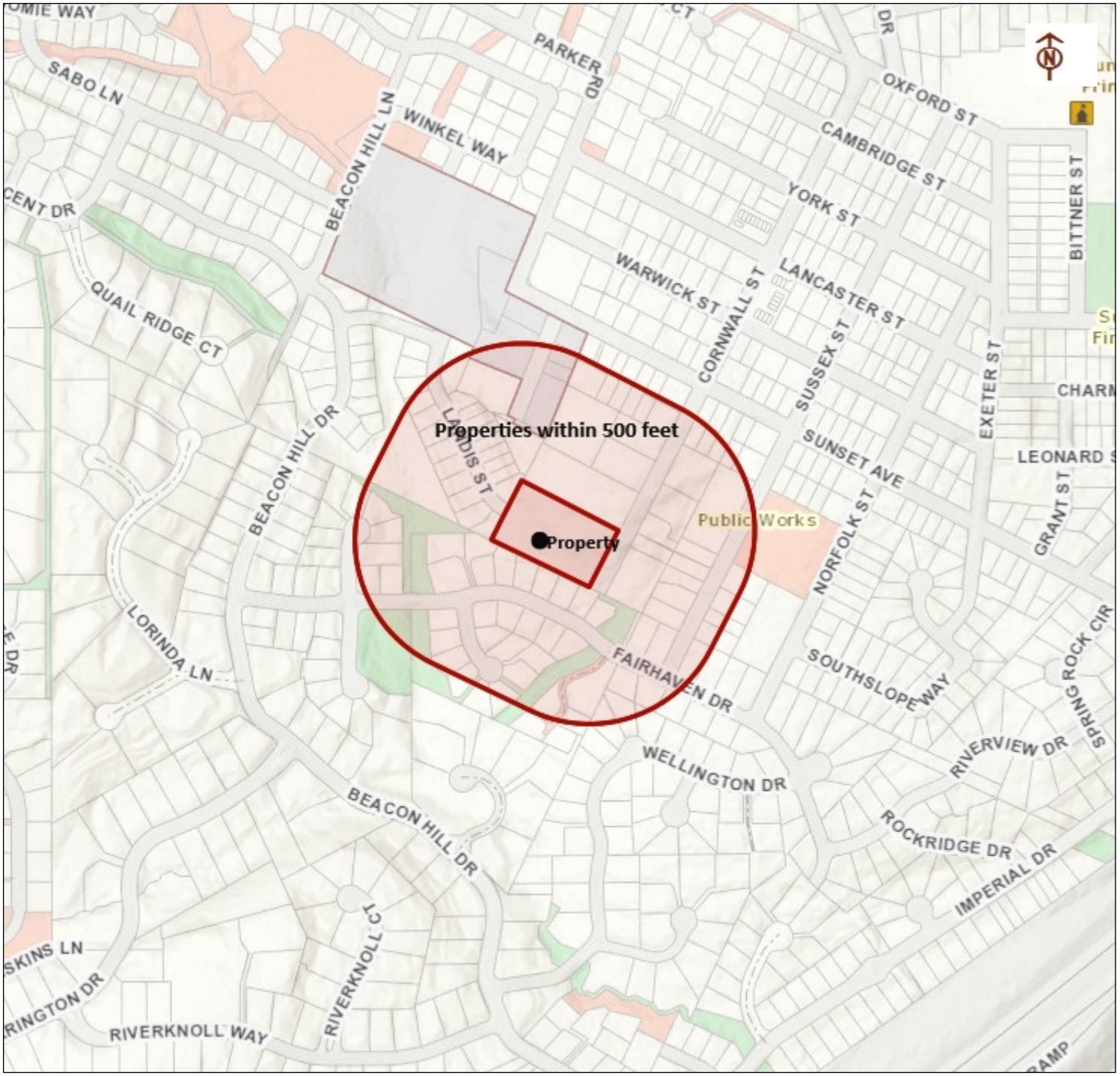
The hearing will be conducted following the rules of CDC Section 99.170. **Anyone wishing to present written testimony for consideration shall submit all material before 12:00 pm on October 7, 2020. Persons interested in party status should submit a letter outlining all concerns about the proposal by the comment deadline. Written comments should be submitted to jarnold@westlinnoregon.gov.**

To speak during the meeting, go to https://westlinnoregon.gov/citycouncil/meeting-request-speak-signup to **complete the speaker sign-up form before 12:00 pm on the day of the meeting.** Instructions on how to access the virtual meeting will be emailed before the meeting. If you do not have email access, please call 503-742-6061 for assistance 24 hours before the meeting.

The final decision will be posted on the website and available at City Hall. Persons with party status can appeal the decision by submitting an appeal application to the Planning Department within 14 days of the final decision date.

Contact Jennifer Arnold, Associate Planner, City Hall, 22500 Salamo Rd., West Linn, OR 97068, 503-742-6057 for additional information.

SUB-20-01 Properties within 500 feet

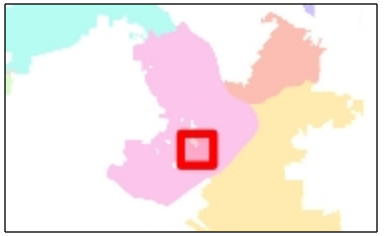


Legend

- City Limit
- Parks and Open Space
- City Owned Property

0 0.11 0.23 Miles

1: 9,028



Notes

This map was automatically generated using Geocortex Essentials.

CITY OF West Linn

COMMUNITY DEVELOPMENT

NOTICE OF UPCOMING
PLANNING COMMISSION DECISION

PROJECT # SUB-20-01
MAIL: 09/16/20 TIDINGS: 09/24/20

CITIZEN CONTACT INFORMATION

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

PC-2 COMPLETENESS LETTER

August 19, 2020

Icon Construction, LLC
ATTN: Mark Handris
1980 Willamette Falls Drive
West Linn, OR 97068

SUBJECT: SUB-20-01 application for 6-lot Subdivision at 4096 Cornwall Street

Dear Mr. Handris:

You submitted this application on January 13, 2020. Planning and Engineering staff found the application incomplete on February 12, 2020. Additional information was submitted on April 22, 2020, including a letter that satisfied ORS 227.178(2)(a), making the application **complete** on that date. The city has 120 days to exhaust all local review; that period ends August 20, 2020.

With this determination of completeness, the City withdraws the letter dated August 11, 2020 voiding the application for a violation of the 180-day rule outlined in ORS 227.178(4).

Please be aware that a determination of a complete application does not guarantee a recommendation of approval from staff for your proposal as submitted.

The public notice will be prepared and mailed for a public hearing before the West Linn Planning Commission tentatively scheduled for **October 7, 2020**.

Please contact me at 503-742-6057, or by email at jarnold@westlinnoregon.gov if you have any questions or comments.

Sincerely,

Jennifer Arnold
Associate Planner

PC-3 Plan B - Alternative Plan

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JULY 13, 2004
TOBY G. BOLDEN
60377LS

RENEWS: 31DEC21

Design by: Richard E. Givens, Planning Consultant
Survey Work by: Centerline Concepts, Inc.

Applicant/Owner:
Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406

Legal: 2-1E-36BA TL 6300

Water: City of West Linn

Sewer: City of West Linn

Contours: Centerline Concepts, Inc.

Site Area: 2.176 Acres

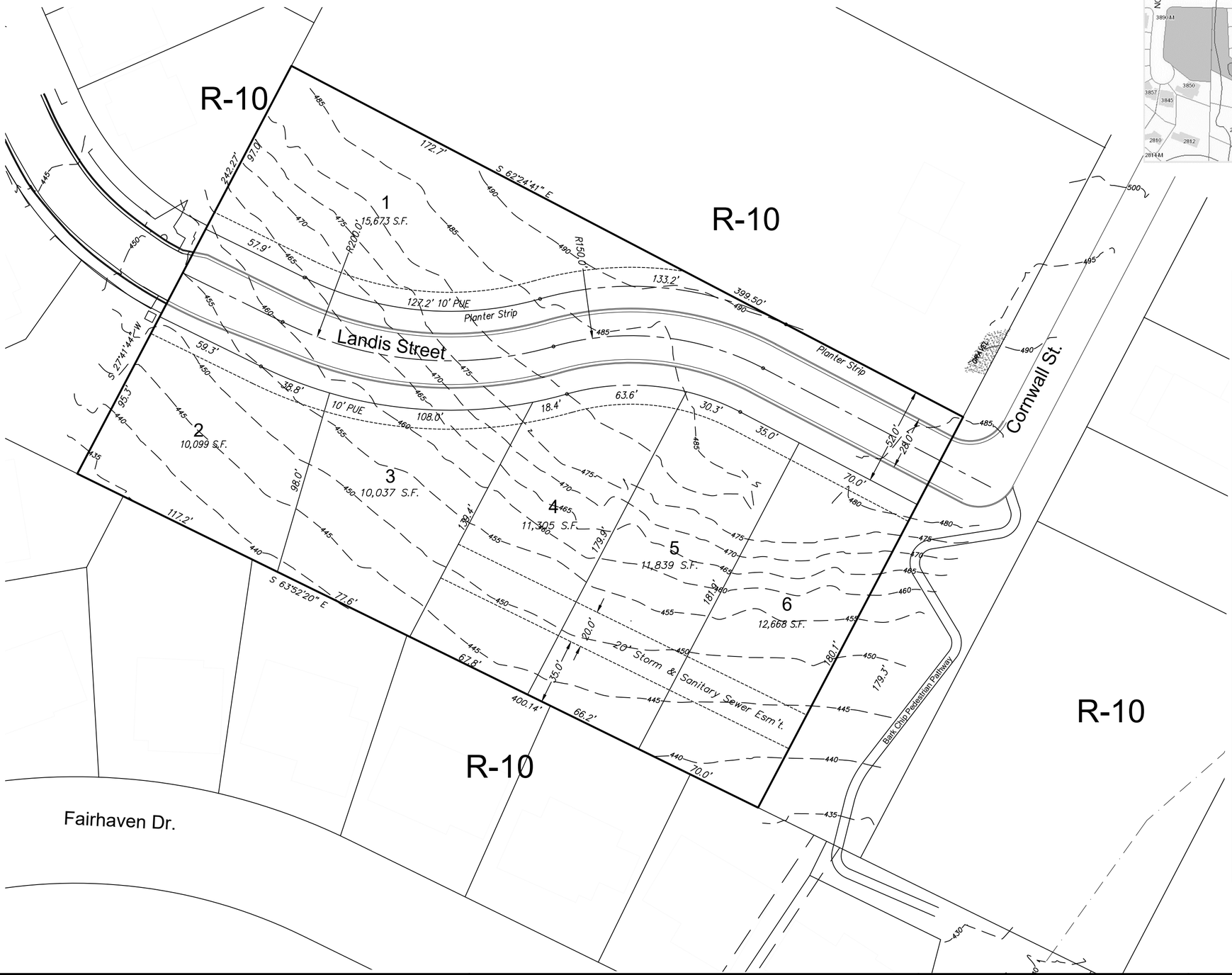
Engineer:
Theta Engineering, Inc.
PO Box 1345
Lake Oswego, OR 97035
PH: (503) 481-8822

Surveyor:
Centerline Concepts, Inc.
700 Molalla Ave.
Oregon City, OR 97045
PH: (503) 650-0188

Zoning: R-10

NORTH

Vicinity Map



Density Calculations

	Area (sq. ft.)	Allowable Density	Units @1 per 10,000 sq.ft.
Gross Site Area	94,808		
Land in a boundary street right-of-way, water course, or planned open space where density transfer is not requested:	0		
Area in street right-of-way:	17,627		
Net Site Area:	77,181		
Area within Type I or II slopes where Developed:	20,587	50%	1.03
Area within Type I or II slopes where Density Will be Transferred:	0	75%	0
Area within Water Resource Area-all development transferred.	0	50%	0
Open Space (Type III and IV Lands)	0	100%	0.00
Type III & IV Land Developed:	56,594	100%	5.7
TOTAL ALLOWED DENSITY:			6 UNITS

DESIGNED:	REG	4-15-2020	1	Revised street right-of-way at curve to match centerline.
DRAWN:	REG	6-23-2020	1	Revised street right-of-way to flatten curves.
SCALE:	1" = 30'			
DATE:	November 2019			
FILE:	15-ICN-112	DATE	NO.	REVISION

Richard E. Givens, Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045
PH: (503) 479-0097

APPLICANT: Icon Construction & Development, LLC
1969 Willamette Falls Dr., Suite 260
West Linn, OR 97068
PH: (503) 657-0406

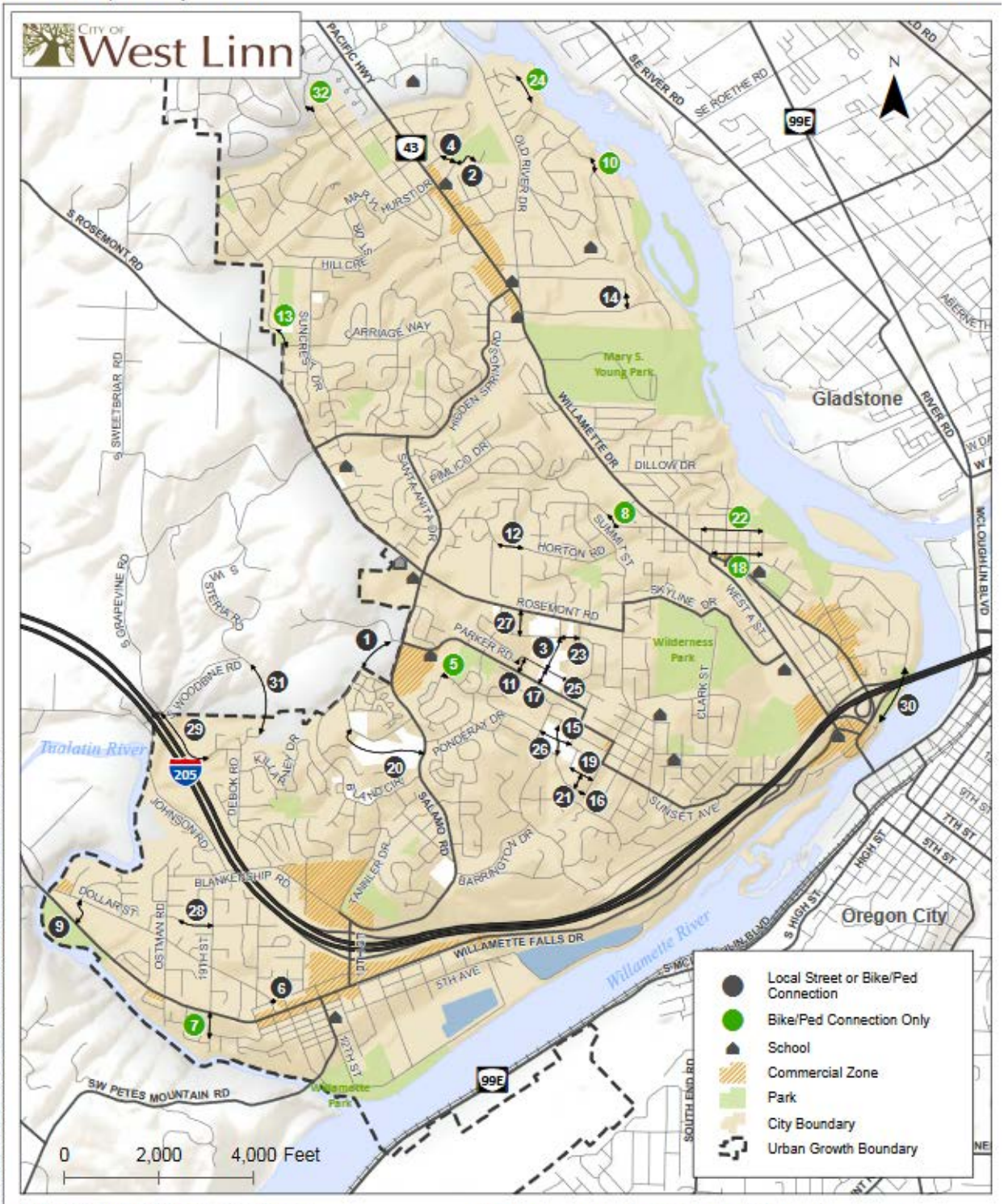
Willow Ridge
Plan B

SHEET: 1/2

PC-4 TSP TABLE 17; FIGURE 12

Table 17: Local Street Connections by Priority

Project Number	Name	Type	Priority
LSC-1	Bland Circle extension to Parker Road	Local Street	Medium
LSC-2	Fairview Way extension to Lazy River Drive	Local Street	Medium
LSC-3	Maxfield Drive extension to Ridge Lane	Local Street	Medium
LSC-4	Shady Hollow Way extension to Lazy River Drive	Local Street	Medium
LSC-5	Wild Rose Loop extension to Chelan Drive	Bike/Ped	Medium
LSC-6	8th Avenue extension from 14th Street to Dollar Street	Local Street	Low
LSC-7	19th Street extension from Willamette Falls Drive to Swift Shore Drive	Bike/Ped	Low
LSC-8	Apollo Road extension to Randall Street	Bike/Ped	Low
LSC-9	Brandon Place extension from Dollar Street to Willamette Falls Drive	Local Street	Low
LSC-10	Calaroga Court extension to Nixon Avenue	Bike/Ped	Low
LSC-11	Damon Drive extension to Roxbury Drive extension	Local Street	Low
LSC-12	Horton Road extension to Horton Road	Neighborhood Route	Low
LSC-13	Kapteyns Street to Carriage Way	Bike/Ped	Low
LSC-14	Kenthorpe Way to Mapleton Drive	Local Street	Low
LSC-15	Landis Street extension from Stonegate Lane to Winkel Way	Local Street	Low
LSC-16	Landis Street extension to Cornwall Street	Local Street	Low
LSC-17	Maxfield Drive extension to Roxbury Drive extension	Local Street	Low
LSC-18	New east-west connection from Failing Street to Irving Street	Bike/Ped	Low
LSC-19	New east-west connection from Reed Street to Cornwall Street	Local Street	Low
LSC-20	New east-west connection from Weatherhill Road to Salamo Road	Local Street	Low
LSC-21	New north-south connection from the Landis Street extension to the new east-west connection	Local Street	Low
LSC-22	Randall Street extension from Elliot Street to Irving Street/Burnside Park	Bike/Ped	Low
LSC-23	Ridge Lane extension from Ireland Lane to Ridge Lane	Local Street	Low
LSC-24	Robin View Court extension to Old River Landing	Bike/Ped	Low
LSC-25	Roxbury Drive extension to Chinook Court	Local Street	Low
LSC-26	Sabo Lane extension from Beacon Hill Lane to Sunset Avenue	Local Street	Low
LSC-27	Shannon Lane extension from Rosemont Road to Ridge Lane	Local Street	Low
LSC-28	Short Street extension from Ostman Road to 19th Street	Local Street	Low
LSC-29	Tamarisk Drive extension to Grapevine Road	Local Street	Low
LSC-30	Territorial Drive extension to River Street	Alley	Low
LSC-31	Wisteria Road extension to Wisteria Court	Local Street	Low
LSC-32	Woodhurst Place extension to Upper Midhill Drive	Bike/Ped	Low



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

Recommended Local Street Connectivity Projects West Linn, Oregon

Figure **12**

PC-5

Applicant's Submittal

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: Jennifer Arnold	PROJECT NO(S).: SUB-20-01	
NON-REFUNDABLE FEE(S): $5,100	REFUNDABLE DEPOSIT(S): —	TOTAL: $5,900

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:	Assessor's Map No.:	21E36BA
4096 Cornwall St. West Linn, OR	Tax Lot(s):	6300
	Total Land Area:	2.17 acres

Brief Description of Proposal:

Six-lot standard subdivision for the construction of single-family detached homes.

Applicant Name: (please print)	Icon Construction and Development, LLC	Phone:	(503) 657-0406
Address:	1980 Willamette Falls Drive, Suite 200	Email:	mark@iconconstruction.net
City State Zip:	West Linn, OR 97068		
Owner Name (required): (please print)		Phone:	
Address:	Same as applicant.	Email:	
City State Zip:			
Consultant Name: (please print)	Rick Givens, Planning Consultant	Phone:	503-479-0097
Address:	18680 Sunblaze Dr.	Email:	rickgivens@gmail.com
City State Zip:	Oregon City, OR 97045		

1. All application fees are non-refundable (excluding deposit). **Any overruns to deposit will result in additional billing.**
2. The owner/applicant or their representative should be present at all public hearings.
3. A denial or approval may be reversed on appeal. No permit will be in effect until the appeal period has expired.
4. **Three (3) complete hard-copy sets (single sided) of application materials must be submitted with this application. One (1) complete set of digital application materials must also be submitted on CD in PDF format. If large sets of plans are required in application please submit only two sets.**

* No CD required / ** Only one hard-copy set needed

RECEIVED JAN 13 2020 PLANNING & BUILDING CITY OF WEST LINN

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: 1/7/2020

Owner's signature ***(required)*** — Date: 1/7/2020

Willow Ridge Application Packet

List of Contents

1. Signed Land Use Application Form
2. Willow Ridge Application Narrative
3. Theta Engineering Storm Water Report
4. Ard Engineering Traffic Memorandum
5. GeoPacific Engineering, Inc. – Change in Geotechnical Engineer-of-Record Letter
6. GeoPacific Engineering, Inc. – Willow Ridge Geotechnical Report and Site Review
7. Carlson Geotechnical – Report of Geotechnical Investigation Cornwall Street Subdivision
8. Signed Expedited Land Division Form
9. Schott & Associates – Wetland Determination Report
10. Neighborhood Meeting Documents
    a. Neighborhood Meeting Notes
    b. Notice of Neighborhood Meeting
    c. Sunset Neighborhood Assoc. Contact Letter
    d. Certified Mailing Cards
    e. Certified Mail Receipts
    f. Scanned Affidavits of Posting and Notice
    g. Meeting Sign-in-Sheets
    h. Meeting Sign
    i. Public Notice Mailing Labels
11. Willow Ridge Tentative Plan & Engineering
    a. Willow Ridge Tentative Plan
    b. Willow Ridge Tree & Slopes Plan
    c. Willow Ridge Preliminary Street & Utility Plan
    d. Willow Ridge Preliminary Street Profiles Plan
    e. Willow Ridge Preliminary Grading and Erosion Control Plan
12. Plan B Alternative Plan & Engineering
    a. Plan B Site Plan
    b. Plan B Tree & Slopes Plan
    c. Plan B Preliminary Street & Utility Plan
    d. Plan B Preliminary Street Profiles Plan
    e. Plan B Preliminary Grading and Erosion Control Plan

2. Willow Ridge Application Narrative

WILLOW RIDGE

Six-Lot Subdivision Application

Icon Construction & Development, LLC

Proposal: This application requests approval of a 6-lot subdivision to be developed on property located at 4096 Cornwall St. in West Linn. The subject property is described as Tax Lot 6300 of Assessor's Map 21E36BA. The site is 2.18 acres (94,808 square feet) in area. It is presently developed with a single-family detached home. This home will be removed to allow for the construction of the extension of Landis Street to Cornwall Street and adding an emergency connection for emergency vehicles.

This application is a Limited Land Use application as defined in ORS 197.015(12)because it is a request for approval of a tentative subdivision within the Portland Metropolitan Urban Growth Boundary("UGB"). This application is subject to the requirements in ORS 197.195(1) which provides that the City apply can apply only standards incorporated into the West Linn Community development Code(the "CDC"), the City's land use regulations. Paterson v City of Bend, __Or App__(2005).

The subject property is zoned R-10. The resulting lots will be approximately a quarter acre in size, and will allow custom homes to be added to the City's housing inventory. The property is located on the west side of, and at the terminus of, the Cornwall Street right-of-way. Landis Street is stubbed to the west property line of the subject site.

There have been previous applications related to this parcel, and Applicant has worked extensively with local neighbors to ensure that this development and the end product will be in keeping with the visions and values of West Linn.

City Staff and the neighboring property owners have different preferences as far as street design. Although the criteria that would trigger/require a Traffic Impact Analysis, are not present in this application, our understanding is that safety is a priority for the Planning Commission. Applicant worked extensively with a traffic engineer to understand the impact of both designs, and is building the proposed road at a width of 28 feet. The width is wider than required by code, and will allow fire trucks and emergency vehicles access even if there is parking on both sides of the street.

During a pre-application meeting with the City, Applicant presented a street alignment plan that was preferred by the Neighborhood Association members attending the meeting, and a street alignment plan that was preferred by City Staff.

Because we made assurances to the Neighborhood Association members that the application would include their preferred street alignment, we are presenting that street alignment as the Tentative Plan. We are also submitting a site plan that we have labeled "Plan B" that provides for extension of Landis Street through to Cornwall Street, consistent with the desires of City Public Works staff.

City funds are available for off-site improvements to Cornwall Street between the subject property and Sunset resulting in a 20' wide driving surface for emergency vehicles. Plan ~~A~~ B is consistent with Public Works direction for a through connection to be made from Landis to Cornwall Street in conjunction with this subdivision, and would provide neighborhood connectivity.

The Tentative Plan provides for a temporary dead-end configuration of Landis Street at the north

property line. The adjoining neighborhoods strongly prefer this plan. Although this plan would delay connectivity until the adjacent parcels are developed (the owner has no plans to develop) the Tentative Plan is more consistent with preferred West Linn aesthetic of meandering roads that flow with the topography of the City. We have shadow platted the adjoining parcel to assure that it can eventually be developed at current zoned density, and could eventually provide neighborhood connectivity.

Applicant prefers approval of the Tentative Plan in order to better address neighborhood concerns, but is also submitting Plan B into the record for the Planning Commission's consideration.

A third potential option was suggested by City Staff. That plan had two 90 degree turns. From a slope standpoint, requiring two 90-degree bends is not feasible. The natural grade for the lower bend would drop 10 to 15 feet, which would require a major fill/retaining wall. Our traffic engineer was concerned because of the slope and tight turns that a car travelling at excessive speed could fail to navigate the curve and become airborne.

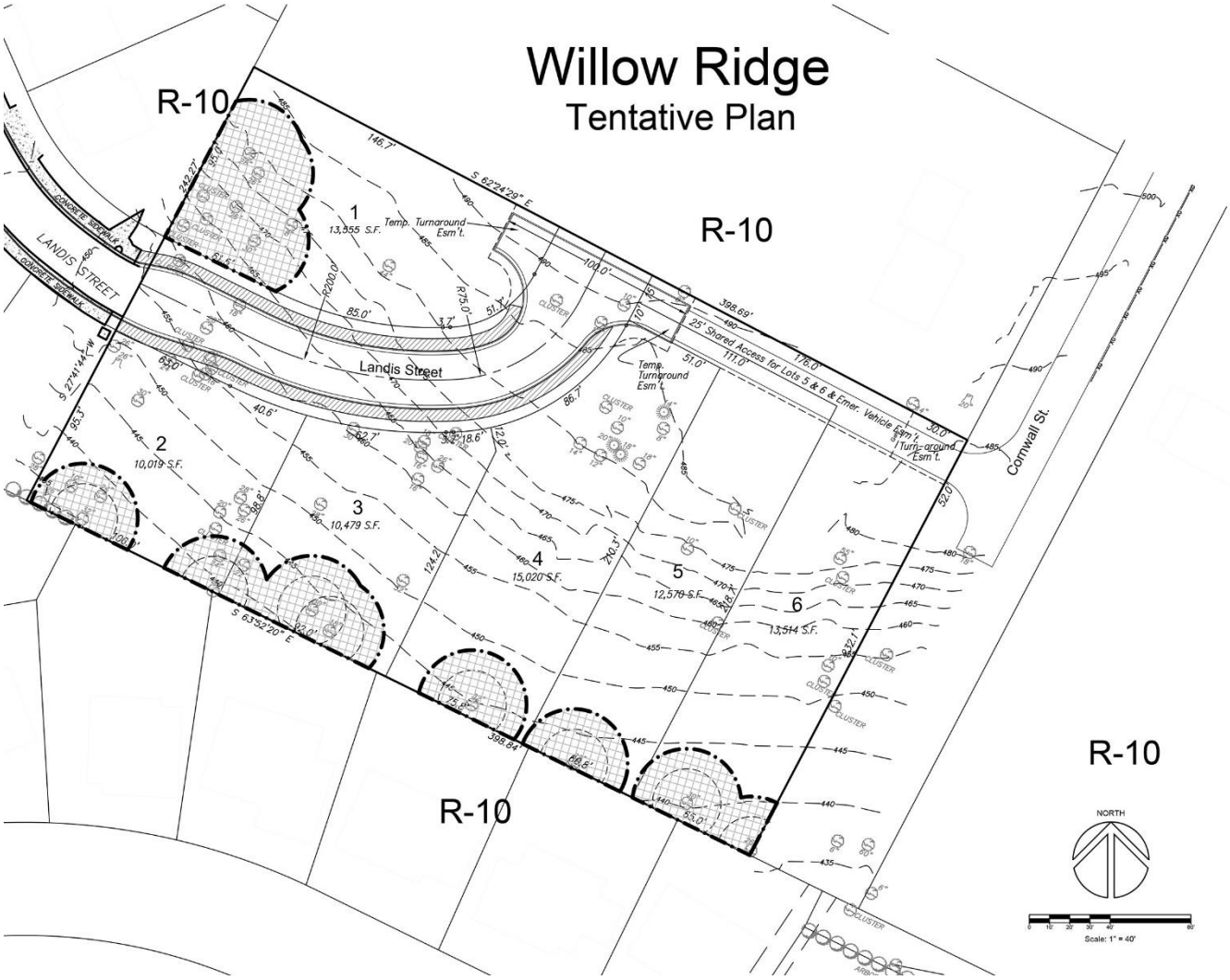
The subject property is described as Tax Lot 6300 of Assessor's Map 21E36BA. The site is 2.18 acres (94,808 square feet) in area. It is presently developed with a single-family detached home. This home will be removed to allow for the construction of the extension of Landis Street to Cornwall Street. The subject property is zoned R-10.

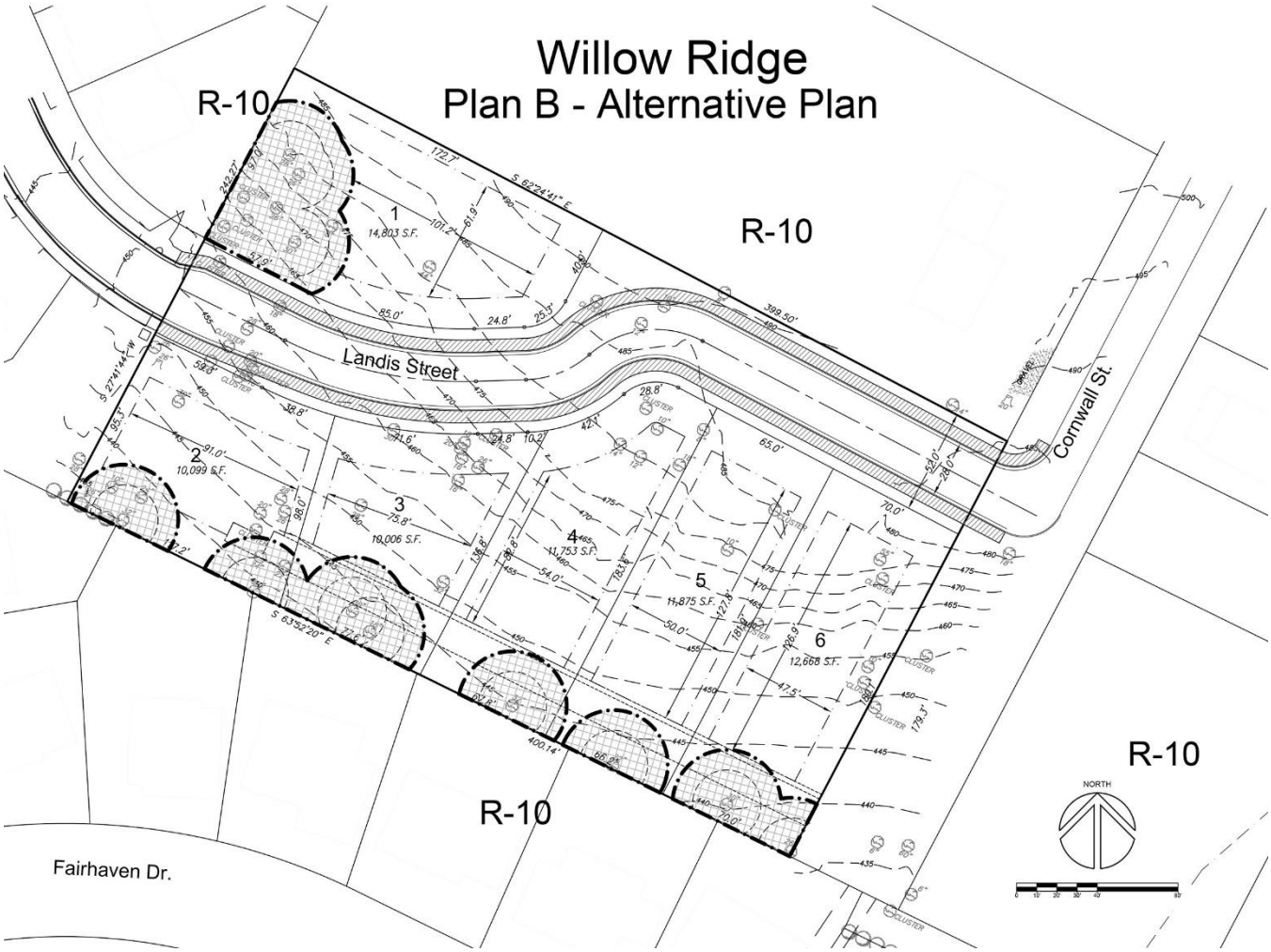
A priority *f*or Applicant, City Staff and neighboring property owners is that the mature trees on the site be preserved. Because of the trees' age, they have extensive and deep root systems, which must be protected from boring underneath them. It is also necessary to avoid construction manholes and sewer laterals in the root zone under the tree canopies. Although under normal circumstances Applicant and City Staff's preference for locating storm and sewer easements along the property lines, Applicant's Arborist has determined in this instance it is necessary to shift them North to adequately ensure that the trees are protected.

We have included proposed locations for drive*w*ays on the lots, but want to note that until we get into civil design with the various utility providers as well as PGE, we will not know the exact location of the drivewa*y*s.

Figure 1: Vicinity Map

Figure 2: Aerial Photograph


Willow Ridge
Tentative Plan
R-10
R-10
R-10
R-10
LANDIS STREET
CONCRETE SIDEWALK
Landis Street
Temp. Turnaround Esm't.
25' Shared Access for Lots 5 & 6 & Emer. Vehicle Turn-around Esm't.
Cornwall St.
1
13,555 S.F.
2
10,019 S.F.
3
10,479 S.F.
4
15,020 S.F.
5
12,570 S.F.
6
13,514 S.F.
NORTH
Scale: 1" = 40'


Willow Ridge
Plan B - Alternative Plan
R-10
R-10
R-10
R-10
Landis Street
Cornwall St.
Fairhaven Dr.
1
14,803 S.F.
2
10,099 S.F.
3
19,006 S.F.
4
11,753 S.F.
5
11,875 S.F.
6
12,668 S.F.
NORTH

The proposed development conforms to the applicable provisions of the CDC as discussed below.

DIVISION 8. LAND DIVISION

Chapter 85
GENERAL PROVISIONS

85.200 APPROVAL CRITERIA

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

A. Streets.

1. General. The location, width and grade of streets shall be considered in their relation to existing and planned streets, to the generalized or reasonable layout of streets on adjacent undeveloped lots or 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…

Comment: This application is also subject to ORS 197.3093(1) and 197.307(4). Together, these statutes provide that the City cannot apply subjective standards, procedures or conditions to an application concerning detached single-family dwellings. Warren v Washington County, __Or LUBA__(LUBA No. 2018-089, November 14, 2018), aff'd, __Or App__(2019), rev den. __Or Sup Ct_(2019)

The subject property fronts on Cornwall Street and Landis Street is stubbed to the west property line of the site. Both streets are local streets per the City's Transportation Systems Plan (TSP) and are intended to serve the immediate neighborhood. The City's TSP is not incorporated into the CDC as required by ORS 197.195(1) and may not be applied to this application. Property to the south is fully developed so there is no need for a stub street in that direction. The unbuilt right-of-way of Cornwall Street that extends to the southerly border of the subject property is too steep to allow for street construction. This right-of-way is proposed to be used for the construction of a pedestrian pathway to connect to an existing path that will provide for access through to Fairhaven Drive.

Tentative Plan: This plan is the result of neighborhood input, both at the pre-application conference and the neighborhood meeting. There was considerable opposition to making the through-connection from Cornwall Street to Landis Street until both Cornwall Street is improved, and other possible connectivity in the area is explored by the City. Although the City has plans to pave Cornwall Street to a 20-foot width, it was felt by neighbors that this was insufficient for traffic that will make use of the Landis Street connection.

There was also the desire to reduce the attractiveness of Landis Street as a through route by making the future connection more circuitous. With this in mind, this design provides for Landis Street to temporarily dead-end at the north boundary of the subject property. A temporary "T" turn-around will be provided, with appropriate temporary easements. Lots 5 and 6 will be served via flag

access strips from Landis Street. An easement will be provided for emergency vehicle use of the shared private driveway to allow for a connection through to Cornwall Street. The connection will be gated near the Cornwall Street connection point so as to prevent other undesirable through traffic. At such time as property to the north is developed, the connection to Cornwall Street can be provided.

Plan B: This plan provides for the extension of Landis Street through the site to connect with Cornwall Street. The proposed alignment of Landis Street abuts the property to the north and would allow for potential connection in the future to serve the rear portion of the adjacent property.

2. Right-of-way widths shall depend upon which classification of street is proposed. The right-of-way widths are established in the adopted TSP.

Comment: CDC 85.200.A.2 and 3 cannot apply the TSP because the TSP is not incorporated into the CDC as required by ORS 197.195(1). However, under both the Tentative Plan and Plan B, the extension of Landis Street has been designed in accordance with the right-of-way width TSP requirements for a local street.

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

Comment: CDC 85.200.A.2 and 3 cannot apply the TSP because the TSP is not incorporated into the CDC as required by ORS 197.195(1). Landis Street and Cornwall Street are designated as local streets in the TSP. For both the Tentative Plan and Plan B, the designs provide for a 52-foot-wide right-of-way. This width allows for a 28' wide paved street section, which allows for to 10-foot travel lanes and one 8-foot parking strip on one side of the street, and two sidewalks. Because of the steep terrain on the site, and to match the existing design of Landis Street to the west, curb-tight sidewalks are proposed. Providing for landscaped planters would result in excessive cuts and fills.

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.

Comment: The street section proposed in both the Tentative Plan and Plan B are consistent with City standards and are as was recommended by City Public Works staff in the pre-application conference.

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.

Comment: Both the Tentative Plan and Plan B provide for two travel lanes and one parking lane.

b. Streets intended to serve as signed but unstriped bike routes should have the travel lane widened by two feet.

Comment: No bicycle routes are planned for Landis Street.

c. Collectors should have two travel lanes and may accommodate some parking. Bike routes are appropriate.

Comment: Not applicable. Landis and Cornwall Street are local Streets.

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.

Comment: Not applicable. Landis and Cornwall Street are local Streets.

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

Comment: The Tentative Plan dead-ends at the northern border of the subject property and is intended to be extended through adjacent properties at such time as they are redeveloped in the future. A reserve strip will be provided on the final plat to restrict access until future development occurs. Plan B does not contain any stub streets so no reserve strips are warranted for that design.

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.

Comment: The Tentative Plan does not provide for any new intersections, but simply extends Landis Street along its current alignment to its temporary terminus at the northern boundary of the subject property. Plan B connects with Cornwall Street in a 90-degree intersection. Cornwall Street cannot be extended farther south because of terrain so a 90-degree bend in the pavement will be provided. No other existing intersections are found along this stretch of Cornwall Street and none are planned because of the existence of a drainageway to the west. For this reason, there is no need for consideration of alignment with other streets.

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.)

Comment: This standard is not applicable because future access to adjoining lands is not required. Properties to the west and south are fully developed. Property to the east has access to Cornwall Street. The Tentative Plan provides for Landis Street to end in a street stub to the northern property line. A temporary turn-around is provided at that location and would be removed when the road is extended with future development. Plan B provides for Landis Street to extend through to Cornwall Street. No turn-around is needed, and the street is not required to be extended to the subdivision boundary.

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.

Comment: For the Tentative Plan, no new intersections are proposed. For Plan B, the intersection of Landis Street with Cornwall Street is at a 90-degree angle.

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.

Comment: No additional right-of-way is needed along Cornwall Street as the existing 60-foot width exceeds local street standards. The extension of Landis Street in both the Tentative Plan and Plan B meet right-of-way width requirements for local streets.

11. Cul-de-sacs.

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

Comment: Neither Plan A - Tentative Plan nor Plan B propose any cul-de-sac streets so the provisions of Section 85.200(A)11 are not applicable.

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.

Comment: No new streets are proposed to no new street names are needed.

13. Grades and curves. Grades and horizontal/vertical curves shall meet the West Linn Public Works Design Standards.

Comment: As shown on the preliminary engineering plans submitted with this application, the grades and curves proposed on both the Tentative Plan and Plan B are consistent with City of West Linn Public Works Design Standards. The centerline radius of Landis Street where it bends back to connect with Cornwall Street is tighter than typically allowed, but this radius was agreed to by the City Engineer in order to allow for the connection to be made.

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

Comment: Not applicable. Neither Cornwall Street nor Landis Street is an arterial street.

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

Comment: Not applicable. No alleys are proposed.

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.

Comment: Six-foot sidewalks are provided on both sides of Landis Street.

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.

Comment: It is proposed that planter strips be eliminated due to steep cross slopes on this site. Public Works has agreed with this design in the pre-application conference.

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

Comment: Street right-of-way is proposed to be dedicated without any reservations or restrictions.

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.

Comment: All lots have access to public streets, as shown on the Tentative Plan and Plan B.

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.

Comment: No gated streets are proposed. The Tentative Plan does show a gate on the emergency vehicle easement to Cornwall Street to restrict through-traffic other than emergency vehicles. This gate is located on the flag strips that provide access to Lots 5 and 6, not on a public street.

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:

Comment: No entryway treatments or street isles are planned.

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.

The proposed development is for a total of six lots, one of which replaces an existing single-family home. Access via Landis Street is adequate for the impacts generated by the small transportation impacts of the five new dwellings. The City Engineer has indicated that there are street funds available for needed off-site paving of Cornwall Street. As a practical matter, the construction of the water line, with compacted gravel fill of the trenching, will provide for some of the cost of improving the Cornwall Street road base.

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.

Comment: The proposed development is small in size and only provides for the extension of Landis Street. It does not include new blocks.

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. Subdivisions of five or more acres that involve construction of a new street shall have block lengths of no more than 530 feet. If block lengths are greater than 530 feet, accessways on public easements or right-of-way for pedestrians and cyclists shall be provided not more than 330 feet apart. Exceptions can be granted when prevented by barriers such as topography, rail lines, freeways, pre-existing development, leases, easements or covenants that existed prior to May 1, 1995, or by requirements of Titles 3 and 13 of the UGMFP. If streets must cross water features protected pursuant to Title 3 UGMFP, provide a crossing every 800 to 1,200 feet unless habitat quality or the length of the crossing prevents a full street connection.

Comment: Not applicable. No new blocks are proposed.

3. Lot size and shape. Lot or parcel size, width, shape, and orientation shall be appropriate for the location of the subdivision or partition, 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 or parcel shall be dimensioned to contain part of an existing or proposed street. All lots or parcels shall be buildable. "Buildable" describes lots that are free of constraints such as wetlands, drainageways, etc., that would make home construction impossible. Lot or parcel 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.

Comment: All proposed lots are configured suitably for the construction of single-family detached homes, consistent with the R-10 zoning of the subject property. There are no wetlands or drainageways present on the property that could otherwise result in a lot being unbuildable. All lots exceed the minimum 10,000 sq. foot minimum lot size of the R-10 zoning district.

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

Comment: The proposed development meets the requirements of Chapter 48. Please see discussion of that chapter below in this narrative.

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

Comment: No double frontage lots are proposed in either the Tentative Plan or Plan B.

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.

Comment: Both the Tentative Plan and Plan B provide for lots that are at right angles or radial to the street rights-of-way.

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

Comment: The Tentative Plan provides for Lots 5 and 6 to share a common driveway taking access from Landis Street. Lot 6 technically has frontage on Cornwall Street, but that frontage is not buildable and cannot provide practicable access these lots. The flag lots share a common drive that is 25 feet in width, satisfying the requirements of this section. Plan B does not include any flag lots so these provisions do not apply to that design.

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

Comment: The R-10 district standards will be met by the homes to be placed on Lots 5 and 6.

b. Front yard setbacks may be based on the rear property line of the lot or 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.

Comment: It is planned for the front yard setbacks to be measured from the access easement, which is parallel to the rear yard.

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

Comment: The Tentative Plan shows lot areas for Lots 5 and 6 that are exclusive of the access strips. Both lots exceed the 10,000 sq. ft. minimum lot size of the R-10 zone.

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

Comment: Lot depth measured from the access strip to the rear yard complies with standards.

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

Comment: The proposed paved width is 16 feet, which meets this standard and provides extra room for emergency vehicle use.

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.

Comment: Access from the flag lot stem is feasible. No access from Cornwall Street is proposed due to excessive slope.

8. Large lots or parcels. In dividing tracts into large lots or parcels which, at some future time, are likely to be redivided, the approval authority may:

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

C. Pedestrian and bicycle trails.

Comment: Both the Tentative Plan and Plan B provide for a pedestrian pathway within the Cornwall Street right-of-way to provide for a connection to Fairhaven. No bicycle trails are proposed in this development. No bicycle improvements are listed on the Bicycle Master Plan.

D. Transit facilities.

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

E. Lot grading.

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

F. Water.

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.

Comment: The Preliminary Utility Plans for both designs show plans for construction of water services for the subdivision. City water is available in both Landis Street and Cornwall Street. The waterline in Cornwall Street, however, is substandard and will need to be upgraded in conjunction with the proposed development at the developer's expense. The development of this site will provide for looping of the water system between Landis Street and Cornwall Street to provide for better water flow in the system.

G. Sewer.

1. A plan prepared by a licensed engineer shall show how the proposal is consistent with the current Sanitary Sewer Master Plan and subsequent updates and amendments applicable at the time the proposal is submitted. 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.

Comment: Preliminary Utility Plans prepared by Theta Engineering are included with this application for both the Tentative Plan and Plan B. There is an existing public sewer line stubbed in Landis Street to the west boundary of the site. This sewer line can only service Lot 1 due to site slopes. Sanitary sewer service for Lots 2 through 6 must come from below. Sewer will be extended from a manhole at the southerly terminus of Cornwall Street to serve these lots. The City has plans to install sanitary sewer in Cornwall Street as a part of its improvement plans for that street. The preliminary utility plans show this offsite sewer that will be constructed at the City's expense to serve properties to the north of the subdivision site.

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

Comment: The Preliminary Utility Plans include proposed locations and invert elevations information for manholes in the proposed subdivision.

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.

Comment: Due to steep site terrain, the sewer line servicing Lots 2 through 6 must be in an easement through the rear yards of those lots in order to provide gravity sewer service. Paved access is available for maintenance vehicles from Fairhaven Street.

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

Comment: The design will provide connections to the sewer at the end of Landis Street for Lot 1 and to the existing manhole at the southerly terminus of Cornwall Street for the balance of the system.

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

Comment: Only the minimum amount of sewer line needed to serve the subdivision lots and to provide for offsite extension by the City to serve upstream Cornwall Street properties is provided.

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.

Comment: No wetlands or drainageways exist on site or on the alignment of the off-site portion of the proposed sewer line.

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.

Comment: Sewer to uphill properties on Cornwall Street is being provided by the City.

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.

Comment: The sewer system will be designed and built to agency specifications. Construction plans will be submitted for review and approval prior to final plat approval for the project.

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.

Comment: This comment will be provided by the City Engineer as a part of the staff report.

H. Storm.

Comment: The Preliminary Utility Plans for both the Tentative Plan and Plan B provide for storm sewer per City standards. A Preliminary Storm Report has been prepared by Theta Engineering. Storm water detention for the street and Parcel 1 will make use of excess capacity in the underground storm detention pipe system in Landis Street to the west of the subject property. Storm water treatment and detention for the homes to be built on Lots 2 through 5 will be provided via individual rain gardens to be placed on each lot. These rain gardens will be lined so that there is no infiltration to the soil. Treated storm water will be discharged at pre-development levels, in accordance with City standards.

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

J. Supplemental provisions.

1. Wetland and natural drainageways. Comment: There are no wetlands or natural drainageways on or abutting the subject property.

2. Willamette and Tualatin Greenways. Comment: See discussion of Chapter 48, below

3. Street trees. Comment: Street trees will be provided as required, as shown plans.

4. Lighting. Comment: Prior to final plat approval, an analysis of existing street lighting will be conducted and, if necessary, improvements made to comply with these standards. The preliminary design for streetlight placement within the subdivision is shown on the preliminary utility plan. To reduce ambient light and glare, high- or low-pressure sodium light bulbs will be provided for all streetlights within the subdivision. The lights will be shielded so that the light is directed downwards rather than omni-directional.

5. Dedications and exactions. Comment: No new dedications or exactions to service off-site properties are anticipated in conjunction with this application.

6. Underground utilities. Comment: All utilities within the development will be placed underground, as required by this section.

7. Density requirement. Comment: The density calculations submitted with this application demonstrate that the maximum density permitted on this site is 6 units. The proposed density of 6 units satisfies the minimum density standard.

8. Mix requirement. Comment: Not applicable. This requirement only applies in the R-2.1 and R-3 zones. The subject property is zoned R-10.

9. Heritage trees/significant tree and tree cluster protection. Comment: No heritage trees, as defined in the Municipal Code, are present on the site. Other existing trees are mapped on the Tree Plan, including those identified by the City Arborist as “significant”. Please see discussion of Chapter 55, below.

Chapter 48 - ACCESS, EGRESS AND CIRCULATION

48.025 ACCESS CONTROL

B. Access control standards.

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

Comment: The trip generation rate for single-family homes is approximately 10 vehicle trips per day according to Institute of Transportation Engineers data. One of these trips will occur in the am peak hour and one will occur in the pm peak hour. The proposed subdivision will add five new dwellings (additionally, the existing home on the property will be replaced with a new dwelling, which will generate the same traffic as the existing home would). A total of 50 new trips per day would be expected from this development, with 5 occurring in the am peak hour and 5 occurring in the pm peak hour. Because of the small size and limited amount of traffic to be generated by this development, a Traffic Impact Analysis is not required for this project. A traffic technical memorandum has been prepared by Ard Engineering to assess safety aspects of traffic circulation. That memorandum demonstrates that the transportation system will operate safely

following the proposed development of the site. Please refer to the Technical Memorandum for more information.

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

Comment: The only existing access to the site is a gravel driveway off of the end of Cornwall Street. That driveway will be removed and access is proposed to be provided with new driveways off of the extension of Landis Street.

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

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

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

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

Comment: All lots will take access from Landis Street.

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

Comment: Not applicable. The site does not front onto an arterial street. Local street access will be provided for all lots.

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

Comment: No double-frontage lots are proposed.

6. Access spacing.

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

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

Comment: The Tentative Plan does not propose any street intersections. The intersection of Landis with Cornwall Street, as shown on Plan B involves two local streets. There are no other intersections near the subject property so the intersection complies with these standards.

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

Comment: Each proposed lot will have one access point, as specified in this section.

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

Comment: The Tentative Plan provides for a shared access to Lots 5 and 6, as shown on the site plan. There is no need for shared accesses in Plan B as all lots front directly onto a low volume local street.

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

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

Comment: No new blocks are proposed. The Tentative Plan provides for Landis Street to stub to the north property line so that it may be extended in the future. Plan B simply completes the local street connection between Landis and Cornwall Streets.

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

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

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

Comment: No exceptions to block length are necessary.

48.030 MINIMUM VEHICULAR REQUIREMENTS FOR RESIDENTIAL USES

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

Comment: All lots will take access from the internal local street system. No arterial streets are located in this area.

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

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

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

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

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

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

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

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

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

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

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

Comment: No lots will have portions of the homes located more than 150 feet from the adjacent right-of-way.

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

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

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

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

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

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

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

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

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

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

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

Comment: Not applicable. No gated accesses to the homes are proposed. In Plan B, a gate is proposed for the emergency vehicle connection, but the access to Lots 5 and 6 from Landis Street is not gated.

Chapter 55 - DESIGN REVIEW

As required by this chapter, the applicant retained the services of an arborist (Multnomah Tree Experts) to identify the size, species, and condition of existing trees on the subject property. The trees were

surveyed and mapped by Centerline Concepts, Inc., as shown on the Existing Conditions Map submitted with this application. Subsequently, the City Arborist visited the site and determined that 38 of these trees are significant trees. These trees are shown on the Tree Preservation Plan submitted with this application. The following provisions of Chapter 55 relating to tree preservation are applicable to this proposal:

B. 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.

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

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

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

Comment: Five of the significant trees identified by the City Arborist are located on Type I or II lands outside of the street right-of-way. These trees are all on Lots 3 and 4 and fall within the fill slope of grading associated with the extension of Landis Street and must be removed. See comment on subsection 55.B.2.f, below.

b. Non-residential and residential projects on non-Type I and II lands shall set aside up to 20 percent of the area to protect trees and tree clusters that are determined to be significant, plus any heritage trees. Therefore, in the event that the City Arborist determines that a significant tree cluster exists at a development site, then up to 20 percent of the non-Type I and II lands shall be devoted to the protection of those trees, either by dedication or easement. The exact percentage is determined by establishing the driplines of the trees or tree clusters that are to be protected. In order to protect the roots which typically extend further, an additional 10-foot measurement beyond the dripline shall be added. The square footage of the area inside this "dripline plus 10 feet" measurement shall be the basis for calculating the percentage (see figure below). The City Arborist will identify which tree(s) are to be protected. Development of non-Type I

and II lands shall also require the careful layout of streets, driveways, building pads, lots, and utilities to avoid significant trees, tree clusters, heritage trees, and other natural resources pursuant to this code. Exemptions of subsections (B)(2)(c), (e), and (f) of this section shall apply. Please note that in the event that more than 20 percent of the non-Type I and II lands comprise significant trees or tree clusters, the developer shall not be required to save the excess trees, but is encouraged to do so.

Comment: Tentative Plan and Plan B both show two areas being protected: the western portion of Lot 1 and the rear yard areas of 2 to 6. A total of 40 significant trees are located on the property. The plan would retain 13 of these trees, or 32.5% of the total significant trees on the site.

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

Comment: Landis Street is stubbed to the west property line of the subject property. This street must be extended to serve this site. This extension will result in the loss of 13 trees on the property that are located within the street right-of-way or in areas that will be filled to allow for the extension of the street.

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

Comment: The density calculations for the Tentative Plan and Plan B are shown on those site plans. The maximum density for the Tentative Plan is 7 units due to the lesser amount of street dedication vs Plan B. The maximum density for Plan B is 6 units. The Tentative Plan achieves 85.7% of maximum density, while Plan B achieves 100%.

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

Comment: Not applicable. The site does not include or abut an arterial or collector street.

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

be replaced by 12 trees, each four-inch). The mix of tree sizes and types shall be approved by the City Arborist.

Comment: Trees located in the protected portions of the site will not be impacted by site grading.

Chapter 92: REQUIRED IMPROVEMENTS

92.010 PUBLIC IMPROVEMENTS FOR ALL DEVELOPMENT

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

A. Streets within subdivisions.

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

Comment: The developer proposes to construct the streets within this subdivision to full City standards.

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

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

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

Comment: As shown on the Grading Plans submitted with this requirement will be met.

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

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

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

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

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

Comment: The project engineer has prepared storm drainage plans and a storm reports for both the Tentative Plan and Plan B submitted with this application. Please refer to those documents.

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

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

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

Comment: Sanitary sewers are available to this project from an existing line in Landis Street and from the manhole at the south end of Cornwall Street. Sewer will be extended to service all lots within the development, as shown on the engineering plans submitted with this application, as required by this subsection. The City will be constructing sanitary sewer off-site in Cornwall Street prior to the planned street improvement project.

G. Water system. Water lines with valves and fire hydrants providing service to each building site in the subdivision and connecting the subdivision to City mains shall be installed. Prior to starting building construction, the design shall take into account provisions for extension beyond the subdivision and to adequately grid the City system. Hydrant spacing is to be based on accessible area served according to the City Engineer's recommendations and City standards. If required water mains will directly serve property outside the subdivision, the City may reimburse the developer an amount estimated to be the proportionate share of the cost for each connection made to the water mains by property owners outside the subdivision for a period of 10 years from the time of installation of the mains. If oversizing of water mains is required to areas outside the subdivision as a general improvement, but to which no new connections can be identified, the City may reimburse the developer that proportionate share of the cost for oversizing. The actual amount and reimbursement method shall be as determined by the City Administrator considering current or actual construction costs.

Comment: Water lines will be installed within the proposed development and will connect to existing lines in Landis St. and Cornwall St. Additionally; the developer will replace and upgrade the existing water line in Cornwall St. to City standards. Tying these lines together will improve the water system in

this area by providing looping that will aid in maintaining appropriate flows and will avoid sedimentation associated with dead-end lines.

H. Sidewalks.

1. *Sidewalks shall be installed on both sides of a public street and in any special pedestrian way within the subdivision, except that in the case of primary or secondary arterials, or special type industrial districts, or special site conditions, the Planning Commission may approve a subdivision without sidewalks if alternate pedestrian routes are available. In the case of the double-frontage lots, provision of sidewalks along the frontage not used for access shall be the responsibility of the developer. Providing front and side yard sidewalks shall be the responsibility of the land owner at the time a request for a building permit is received. Additionally, deed restrictions and CC&Rs shall reflect that sidewalks are to be installed prior to occupancy and it is the responsibility of the lot or homeowner to provide the sidewalk, except as required above for double-frontage lots.*

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

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

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

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

   Comment: Sidewalks will be installed to City specifications.

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

   Comment: Not applicable. The site does not abut an arterial or collector street.

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

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

I. 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.

Comment: No bicycle routes are called for on the local streets within this subdivision.

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.

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

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.

Comment: For the Tentative Plan, which contains a dead-end street, required signage will be provided at the terminus of Landis Street. Not applicable to Plan B as there are no dead-end streets.

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.

Comment: Not applicable. No public dedications are proposed.

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.

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

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.

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

O. 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.

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

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

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

Q. <u>Joint mailbox facilities</u> shall be provided in all residential subdivisions, with each joint mailbox serving at least two, but no more than eight, dwelling units. Joint mailbox structures shall be placed in the street right-of-way adjacent to roadway curbs. Proposed locations of joint mailboxes shall be designated on a copy of the Tentative Plan of the subdivision, and shall be approved as part of 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.

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

CHAPTER 28 - WILLAMETTE AND TUALATIN RIVER PROTECTION

This chapter is not applicable as there is no longer any Habitat Conservation Area (HCA) designated on the property. Metro's mapping of HCA's originally designated a small portion of the site as HCA as stream buffer associated with the off-site creek on the east side of Cornwall Street. As a part of a previous land use application on the property, an analysis was submitted to demonstrate that the HCA did not extend onto the property and was approved.

Conclusion:

This report and the supporting plans and reports demonstrate that both the Tentative Plan and Plan B comply with the applicable approval criteria of the Community Development Code. We ask that the Tentative Plan be approved as it is the plan that is supported by the neighborhood. If the Planning Commission determines that Landis Street must be connected to Cornwall Street at this time, then we request that Plan B be approved.

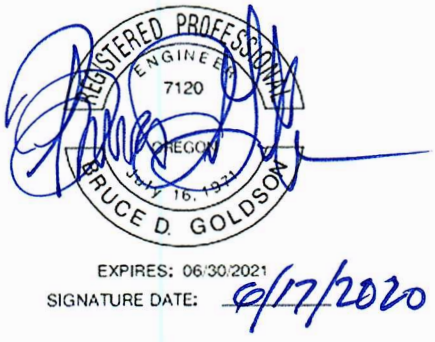
3. Theta Engineering Storm Water Report

Willow Ridge

West Linn, Oregon

DRAINAGE ANALYSIS

June, 2020



EXPIRES: 06/30/2021

SIGNATURE DATE: 6/17/2020

Prepared By:

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Theta, llc

PO Box 1345, Lake Oswego, Oregon 97035

2014-129L

INDEX

PURPOSE:

This is a proposed 6-lot development at the end of Cornwall and Landis Street. This development would connect these two roads together with the extension of Landis Street. The property slopes to the south and currently has one residential house with the remainder of the property being undeveloped. The purposes include demonstrating that a storm water system is feasible to collect storm water from the new impervious surfaces and dispose to a system and not unfavorable impact downhill residents. This report also demonstrates that the storm water system for the Tanner's Stonegate development was designed to accommodate the Willow Ridge project and to provide water quality for the extension of Landis Street into Willow Ridge. Storm water from future lots 2-6 are will not be part of the Landis Street system.

NARRATIVE ASSUMPTIONS

The Tanner's Stonegate project construction drawings show a storm sewer line to the westerly property line of the proposed Willow Ridge project. The plans also show a tentative roadway extension into the Willow Ridge property with a note *"future expansion". Within the roadway of Tanner's Stonegate there is 370 lineal feet of 60-inch reinforced concrete detention pipe with a control manhole having orifices to regulate flow. Downstream of the control manhole is a water quality facility prior to discharge into the natural drainage course. North of the Tanner's Stonegate project the extension of Landis Street is also labeled "future expansion". Inspection* of the construction plans reveal that only the houses on the easterly side of Landis Street, Landis Street, and Stonegate Lane plus to land east of the houses on Landis Street could be collected in this storm system. Detail 7/C3.2, flow control MH illustrates a water quality orifice at 3.5-inches and a flow control orifice at 4.0"

Checking in the field the water quality riser is open at the top And effectively becomes a 8-inch orifice when the volume reaches that elevation. Stains in the control manhole Indicate that the volume has never been significantly above the overflow level of the water quality riser.
The Tanner's Stonegate project provides water quality down-stream of the existing public storm system but appears to be privately maintained. Although providing additional water

quality appears redundant additional water quality can be demonstrated. A rain garden or planter is also proposed for lot 1, to be sized for the actual size of the improvements during the building permit phase. An overflow for lot 1 will be provided to the public system

The original storm report could not be found and therefore this analysis has been undertaken to determine if there is sufficient capacity in the existing detention system to accommodate the proposed Willow Ridge project. Only the new public street area, from the proposed Willow Ridge project will be directed to the Tanner's Stonegate facility.

A small portion of the proposed Landis will flow towards the intersection with Cornwall. This storm water will be captured and directed to a storm water planter for both quantity and quality. Currently this are no storm facilities on Cornwall. Improvements on Cornwall from Landis to Sunset will be a narrow strip of new AC without curbs. A roadside swale is proposed to collect and provide water quality with infiltration. Catch basins are proposed at the intersection with Landis as an overflow. The impervious roof areas on the Willow Ridge would be directed on-site lined rain gardens or planter boxes with overflow to the drainage way on the easterly side of the property.

Individual rain gardens or planters are proposed for lots 2-6, sized based on the actual impervious area during the building permit process. A preliminary impervious area of 2600 SF was used to illustrate an approximate size. An overflow connection to the public storm will be provided for each lot and directed to a natural drainage way to the south.

Regulatory

2.0013 Minimum Design Criteria

A. Storm Detention Facilities

2. Storms to be evaluated shell include to 2, 5, 10, 25, and 100-year event. Allowable post-development discharge rates for the 2, 5, 10, and 25-year events hall be that of the pre-development rate. An outfall structure such as a "V-North" weir of single of multiple orifice structure shall be designed to control the release rate for the above events. No flow control orifice smaller than 1 in. shall be allowed. If the maximum release cannot be met with all the site drainage controlled by a single 1 in. orifice, the allowable release rate provided by the 1 in. orifice will be considered adequate as approved by the City Engineer. The detention volume was calculated to be 7265 CF.

References Regulatory

1. King County Department of Public Works, Surface Water Management Division, Hydrographic Programs, Version 4.21B
2. Tanner's Stonegate construction plans by Otak (8-21-2001)
3. City of Portland Sewer & Drainage Facilities Design Manual, Chart 1
4. City of West Linn Public Works Design Standards (2010) Section two-storm Facilities Design Maual

Summary

Event	Pre flow	Post flow	With Orifices
2-year	1.38 cfs	0.83 cfs	0.64 cfs
5-year	1.83 cfs	1.23 cfs	1.23 cfs
10-year	2.05 cfs	1.43 cfs	1.42 cfs
25-year	2.43 cfs	1.78 cfs	1.78 cfs

Time of concentration

Pre $T= 0.42((nL))^{0.8}/(p)^{.5}(s)^{.4} = 0.42((.24)(167))^{.8}/(2.6)^{.5}(0.08)^{.4} = 13.7$ min.

Post $T_1= 0.42((nL))^{0.8}/(p)^{.5}(s)^{.4} = 0.42((.01)(170))^{.8}/(2.6)^{.5}(0.03)^{.4} = 1.6$ min.

$T_2 = L/60(k)(s)^{.5} = 167/(60)(42)(0.01)^{.5} = 6.6$ min & $T_3 = 233/(60)(42)90.065)^{.5} = 0.1$ min

$T_{post} = 1.6+6.6+0.1 = 8.3$ min

Areas:

The areas used are shown on the storm analysis drawing.

Tanner's Stonegate basin = 105, 995 SF + Willow ridge street = 27,470 SF for total = 133,465SF= 3.06 acres

HYDROGRAPH RESULTS (DETENTION, WATER QUALITY, INFILTRATION)

KING COUNTY DEPARTMENT OF PUBLIC WORKS
Surface Water Management Division
HYDROGRAPH PROGRAMS
Version 4.21B

1 - INFO ON THIS PROGRAM
2 - SBUHYD
3 - MODIFIED SBUHYD
4 - ROUTE
5 - ROUTE2
6 - ADDHYD
7 - BASEFLOW
8 - PLOTHYD
9 - DTATA
10 - REFAC
11 - RETURN TO DOS

ENTER OPTION:
2
SBUH/SCS METHOD FOR COMPUTING RUNOFF HYDROGRAPH
STORM OPTIONS:
1 - S.C.S. TYPE-1A
2 - 7-DAY DESIGN STORM
3 - STORM DATA FILE

SPECIFY STORM OPTION:
1
S.C.S. TYPE - 1A RAINFALL DISTRIBUTION
ENTER; FREQ(YEAR), DURATION(HOUR), PRECIP(INCHES)
25,24,3.9
Xxxxxxxxxxxxxxxxxxxxxx S.C.S.TYPE-1A DISTRIBUTION xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
XXXXXXXXXXXX 25-YEAR 24-HOUR STORM xxxx 3.90 "TOTAL PRECIP Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

---

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1
1.44,86,1.62,98,8.3
DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
3.1	1.4	81.0	1.6	98.0	8.3
PEAK-Q(CFS)	T-PEAK(HRS)		VOL(CU-FT)		
2.43	7.83		34383		

ENTER [dk:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
C:25wr
SPECIFY: C - CONTINUE, N - NEWSTORM, P -PRINT, S - STOP

C
ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1
3.06,86,0.0,98,13.7
DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
3.1	3.1	86.0	.0	98.0	13.7
PEAK-Q(CFS)	T-PEAK(HRS)		VOL(CU-FT)		
1.78	7.83		27233		

ENTER [dk:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
C:
SPECIFY: C - CONTINUE, N - NEWSTORM, P -PRINT, S – STOP
N

---

1 - S.C.S. TYPE-1A
2 - 7-DAY DESIGN STORM
3 - STORM DATA FILE
SPECIFY STORM OPTION:
1
S.C.S. TYPE - 1A RAINFALL DISTRIBUTION
ENTER; FREQ(YEAR), DURATION(HOUR), PRECIP(INCHES)
2,24,2.5
Xxxxxxxxxxxxxxxxxxxxxx S.C.S.TYPE-1A DISTRIBUTION xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
XXXXXXXXXXXX 2-YEAR 24-HOUR STORM xxxx 2.50 "TOTAL PRECIP Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

---

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1
1.44,86,1.62,98,8.3
DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
3.1	1.4	81.0	1.6	98.0	8.3
PEAK-Q(CFS)	T-PEAK(HRS)		VOL(CU-FT)		
1.38	7.83		19848		

ENTER [dk:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
C:2wr
SPECIFY: C - CONTINUE, N - NEWSTORM, P -PRINT, S - STOP

C
ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1
3.06,86,0.0,98,13.7
DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
3.1	3.1	86.0	.0	98.0	13.7
PEAK-Q(CFS)	T-PEAK(HRS)		VOL(CU-FT)		
0.83	7.83		13785		

ENTER [dk:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
C:wr2
SPECIFY: C - CONTINUE, N - NEWSTORM, P -PRINT, S – STOP
N

---

1 - S.C.S. TYPE-1A
2 - 7-DAY DESIGN STORM
3 - STORM DATA FILE
SPECIFY STORM OPTION:
1
S.C.S. TYPE - 1A RAINFALL DISTRIBUTION
ENTER; FREQ(YEAR), DURATION(HOUR), PRECIP(INCHES)
5,24,3.1
Xxxxxxxxxxxxxxxxxxxxxx S.C.S.TYPE-1A DISTRIBUTION xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
XXXXXXXXXXX 5-YEAR 24-HOUR STORM xxxx 3.10 "TOTAL PRECIP Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

---

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1
1.44,86,1.62,98,8.3
DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
3.1	1.4	81.0	1.6	98.0	8.3
PEAK-Q(CFS)	T-PEAK(HRS)		VOL(CU-FT)		
1.83	7.83		25997		

ENTER [dk:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
C:5wr
SPECIFY: C - CONTINUE, N - NEWSTORM, P -PRINT, S - STOP

C
ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1

3.06,86,0.0,98,13.7
DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
3.1	3.1	86.0	.0	98.0	13.7
PEAK-Q(CFS)	T-PEAK(HRS)		VOL(CU-FT)		
1.23	7.83		19386		

ENTER [dk:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
C:wr5
SPECIFY: C - CONTINUE, N - NEWSTORM, P -PRINT, S – STOP
N

---

1 - S.C.S. TYPE-1A
2 - 7-DAY DESIGN STORM
3 - STORM DATA FILE
SPECIFY STORM OPTION:
1
S.C.S. TYPE - 1A RAINFALL DISTRIBUTION
ENTER; FREQ(YEAR), DURATION(HOUR), PRECIP(INCHES)
10,24,3.4
Xxxxxxxxxxxxxxxxxxxxxx S.C.S.TYPE-1A DISTRIBUTION xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
XXXXXXXXXXXX 10-YEAR 24-HOUR STORM xxxx 3.40 "TOTAL PRECIP Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

---

ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1
1.44,86,62,98,8.3
DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
3.1	1.44	81.0	1.6	98.0	8.3
PEAK-Q(CFS)	T-PEAK(HRS)		VOL(CU-FT)		
2.05	7.83		29122		

ENTER [dk:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
C:10wr
SPECIFY: C - CONTINUE, N - NEWSTORM, P -PRINT, S - STOP

C
ENTER: A(PERV),CN(PERV),A(IMPERV),CN(IMPERV),TC FOR BASIN NO. 1
3.06,86,0.0,98,13.7
DATA PRINT OUT:

AREA(ACRES)	PERVIOUS		IMPERVIOUS		TC(MINUTES)
	A	CN	A	CN	
3.1	3.1	86.0	.0	98.0	13.7
PEAK-Q(CFS)	T-PEAK(HRS)		VOL(CU-FT)		
1.43	7.83		22288		

ENTER [dk:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
C:wr10
SPECIFY: C - CONTINUE, N - NEWSTORM, P -PRINT, S – STOP

s

DETENTION

KING COUNTY DEPARTMENT OF PUBLIC WORKS
Surface Water Management Division
HYDROGRAPH PROGRAMS
Version 4.21B
1 - INFO ON THIS PROGRAM
2 - SBUHYD
8 - PLOTHYD
9 - DTATA
10 - REFAC
11 - RETURN TO DOS

10
R/D FACILITY DESIGN ROUTINE
SPECIFY TYPE OF R/D FACULTY
1 - POND 4 - INFILTRATION POND
2 - TANK 5 - INFILTRATION TANK
3 -VAULT 6 - GRAVEL TRENCH/BED
2
ENTER: TANK DIAMETER (ft), EFFECTIVE STORAGE DEPTH (ft)
5,5
ENTER [d:][path]filename[.ext] OF PRIMARY DESIGN INFLOW HYDROGRAPH:
C:25post
PRELIMINARY DESIGN INFLOW PEAK = 2.43 CFS
ENTER PRIMARY DESIGN RELEASE RATE(cfs)
1.78
ENTER NUMBER OF INFLOW HYDROGRAPHS TO BE TESTED FOR PERFORMANCE (5 MAXIMUM)
3
ENTER [d:][path] filename[.ext] OF HYDROGRAPH 1:
C:10wr
ENTER TARGET RELEASE RATE (cfs)
1.43
ENTER [d:][path] filename[.ext] OF HYDROGRAPH 2:
C:5wr
ENTER TARGET RELEASE RATE (cfs)
1.23
ENTER [d:][path] filename[.ext] OF HYDROGRAPH 3:
C:2wr
ENTER TARGET RELEASE RATE (cfs)
0.83

ENTER; NUMBER OF ORIFICES, RISER-HEAD (ft), RISER-DIAMETER(in)
2,5,12
RISER OVERFLOW DEPTH FOR PRIMARY PEAK INFLOW = .41FT
SPECIFY ITERATION DISPLAY: Y - YES, N – NO
N

SPECIFY: R - REVIEW/REVISE INPUT, C – CONTINUE
C
INITIAL STORAGE VALUE FOR ITERATION PURPOSES: 11202 CU-FT
BOTTOM ORIFICE : ENTER Q-MAX (cfs)
0.4
DIA. = 2.57 INCHES
TOP ORIFICE ENTER HEIGHT(ft)
3.07
DIA. = 6.05 INCHES

PERFORMANCE:	INFLOW	TARGET-OUTFLOW	ACTUAL-OUTFLOW	PK-STAGE	STORAGE
DESIGN HYD:	2.43	1.78	1.78	4.99	4800
TEST HYD: 1	2.05	1.43	1.42	4.22	4300
TEST HYD: 2	1.83	1.23	1.23	3.87	3980
TEST HYD: 3	1.38	.83	.64	3.28	3330

WATER QUALITY LANDIS STREET

Easterly portion:

Based on the preliminary plans 9580 SF of new impervious surface has been calculated for the extension of Landis Street into the proposed Willow Ridge development. Using the City of Portland Presumptive Approach Calculator and assuming a planter box to be installed at the westerly end of the project a facility having a bottom surface are of 126 SF meets the water quality criteria. A planter box with inside dimensions of 6-feet by 21-feet has been shown of the preliminary plans.

Westerly portion:

From the high point on Landis to the intersection a total of 5531 SF flows towards the Landis/Cornwall intersection. Preliminary sizing using WES BMP sizing tool which accounts for both water quality and quantity a total of 166 SF is required.

WATER QUALITY FUTURE IMPERVIOUS ROOFS

The final sizing will be determined based on the actual impervious footprint. The proposed lined flow through planter boxes will not be used to infiltrate into the ground because of the steep slope and neighbor's concerns about added runoff. Preliminary sizing using the WES BMP sizing tool will provide water quality and quantity. A preliminary size of 78 SF results in a planter of 5X16 or 3X13.

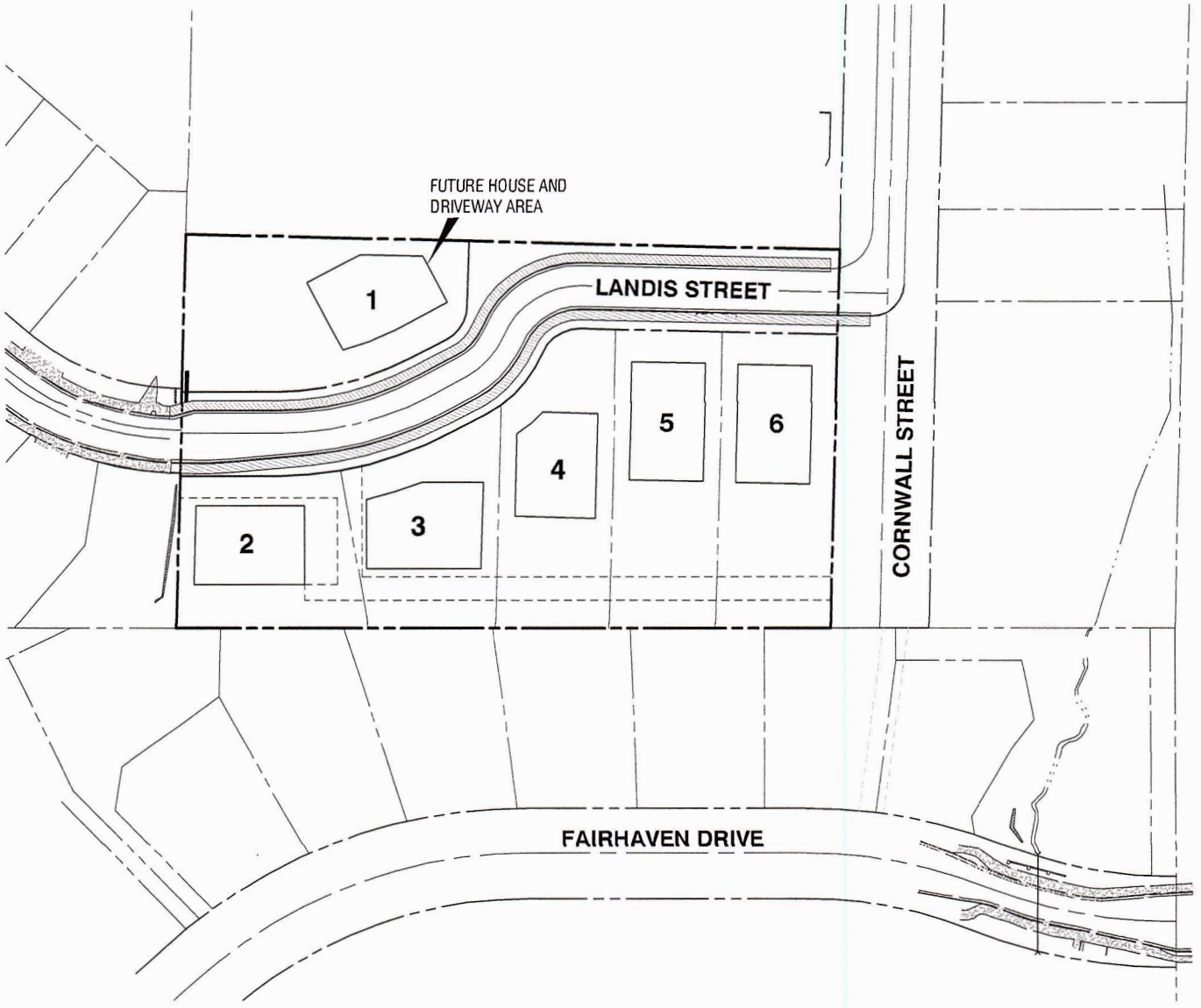
CONCLUSION

To replicate the original report would be impossible with the available information. Based on a field investigation it doesn't appear that the facility as constructed meets the City of West Linn storm water standards with the water quality riser overflow as constructed.

The above calculation indicate that there is excess capacity in the detention system to receive the Willow Ridge development, but the flow could be better controlled by raising the water

quality flow riser to the same overflow height as the flow control riser and changing the water quality orifice to 2.87-inches and the quantity orifice to 4.27-inches.

Based on the available information and these calculations the Tanner's Stonegate project has provided sufficient detention volume to accommodate the Willow Ridge development. Although redundant a new water quality facility demonstrates how independent water quality is achieved for the Willow Ridge development. The southerly part of Landis will be collected in a planter sized for both quantity and quality. Individual storm facilities for the new houses also will provide quantity and quality.



EXISTING CONDITION:
2.2 ACRES, INCLUDING 4600 S.F. OF IMPERVIOUS AREA
DISCHARGES UNCONTROLLED TO SOUTH

PROPOSED CONDITION:
27,470 S.F. OF IMPERVIOUS AREA COLLECTED AND
DIRECTED TO STORM FACILITY FOR DETENTION
(STREET AND LOT 1 HOUSE)

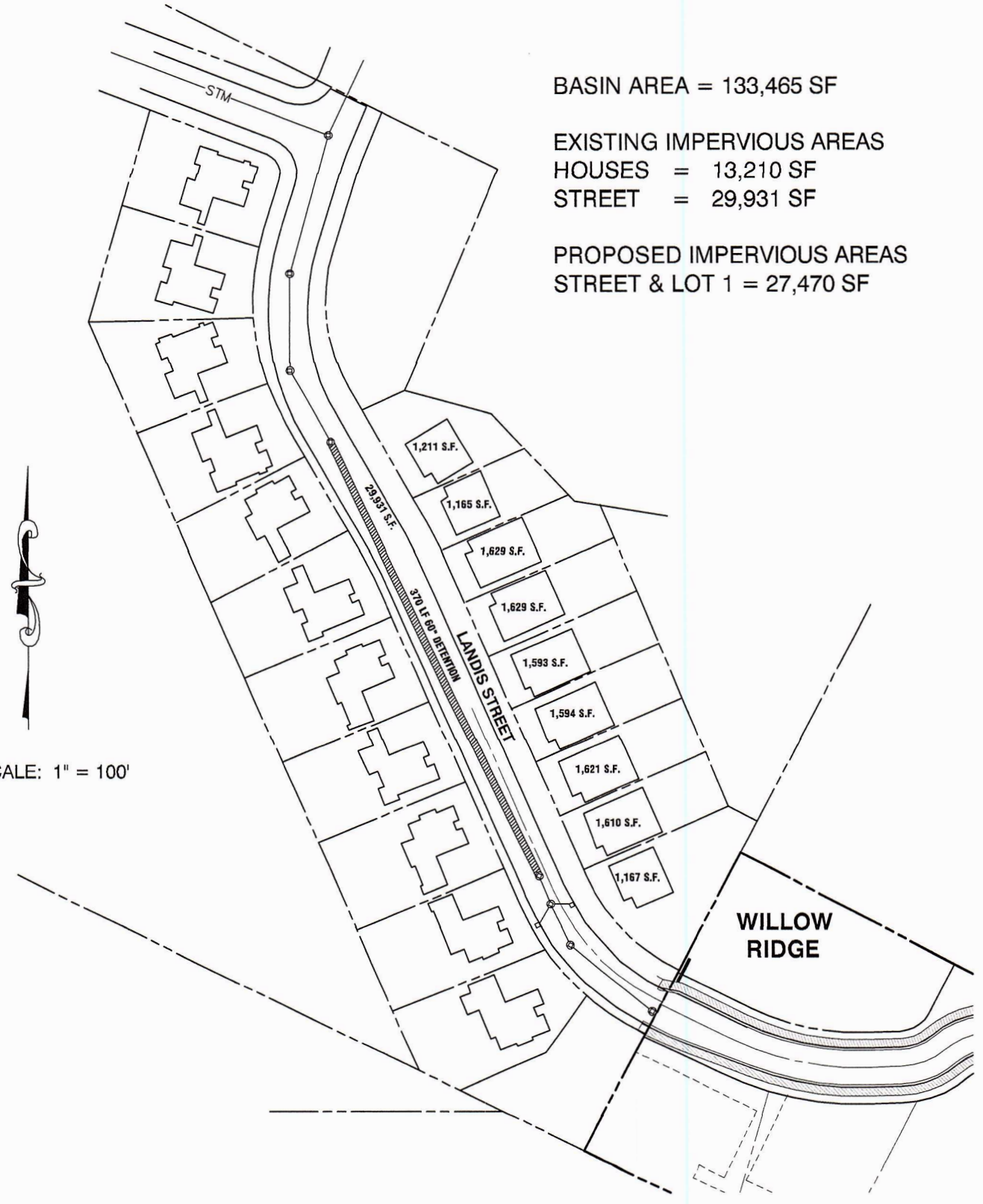
SCALE: 1" = 100'

2010-129L

GRAPHIC REPRESENTATION OF FUTURE IMPERVIOUS AREA

Theta, llc
ENGINEERING - SURVEYING - PLANNING
PO Box 1345
Lake Oswego, Oregon 97035
503/481-8822
email: thetaeng@comcast.net

Willow Ridge
4086 Cornwall Street
West Linn, Oregon



2010-129L

STORM ANALYSIS

Theta, llc
ENGINEERING - SURVEYING - PLANNING
PO Box 1345
Lake Oswego, Oregon 97035
503/481-8822
email: thetaeng@comcast.net

WILLOW RIDGE

West Linn, Oregon

Presumptive Approach Calculator ver. 1.2

Catchment Data

Catchment ID:	**A**
Project Name:	**cornwall** LANDS WP
Date:	**04/16/20**
Project Address:	**4069 Cornwell**
Permit Number:	**0**
	west linn, Oregon
Run Time	4/16/2020 5:36:05 PM
Designer:	**goldson**
Company:	**theta**

Drainage Catchment Information

Catchment ID	A	
	Catchment Area	
Impervious Area	9,480	SF
Impervious Area	0.22	ac
Impervious Area Curve Number, CN_{imp}	98	
Time of Concentration, Tc, minutes	5	min.

Site Soils & Infiltration Testing Data

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

Correction Factor Component

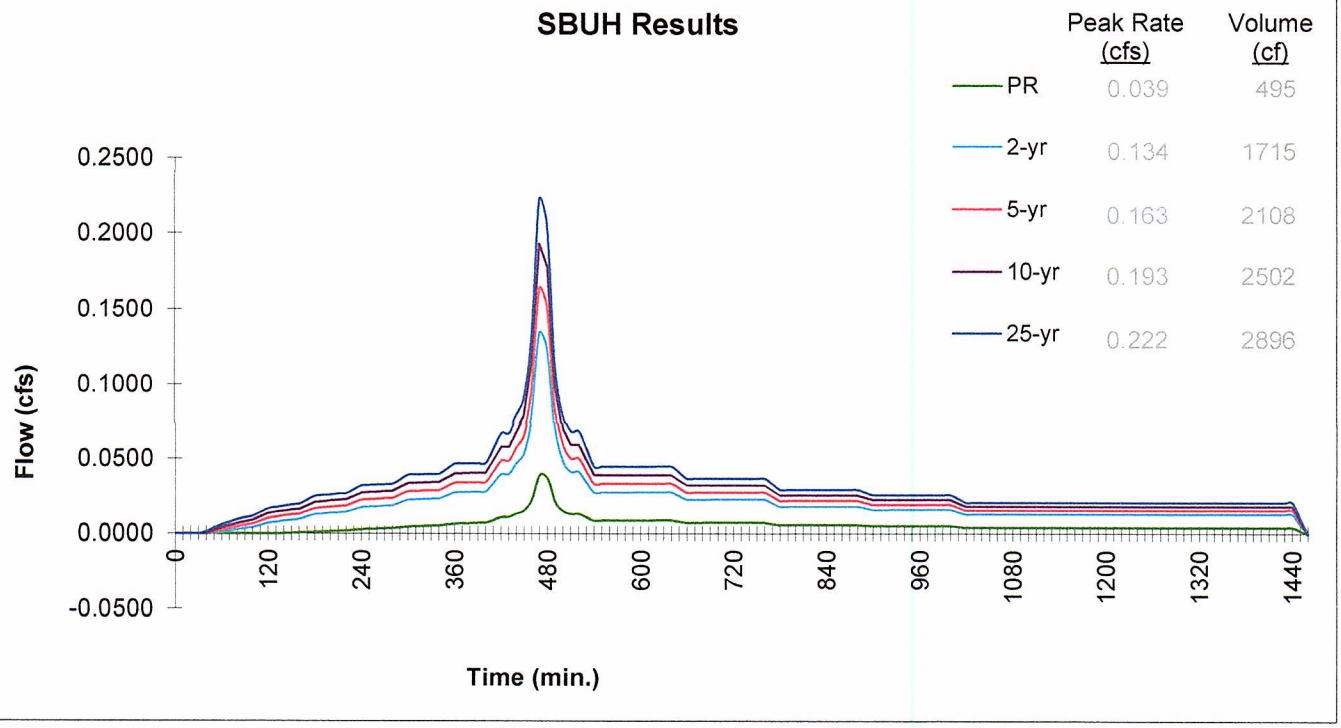
CF_{test} (ranges from 1 to 3)	2	

Design Infiltration Rates

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

Execute SBUH

SBUH Results



Printed: 4/16/2020 5:37 PM

Presumptive Approach Calculator ver. 1.2

Catchment ID: A

Run Time 4/16/2020 5:36:05 PM

Project Name: cornwall **Catchment ID:** A **Date:** 4/16/2020

Instructions:

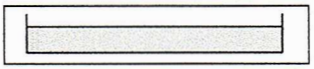
1. Identify which Stormwater Hierarchy Category the facility.
2. Select Facility Type.
3. Identify facility shape of surface facility to more accurately estimate surface volume, except for Swales and sloped planters that use the PAC Sloped Facility Worksheet to enter data.
4. Select type of facility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

Catchment facility will meet Hierarchy Category: 3

Goal Summary:

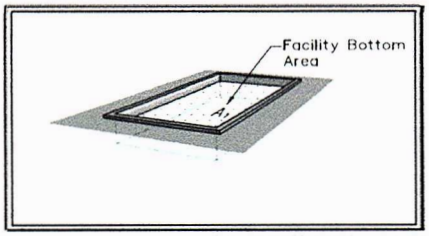
Hierarchy Category	SWMM Requirement	RESULTS box below needs to display…	
		Pollution Reduction as a	10-yr (aka disposal) as a
3	Off-site flow to drainageway, river, or storm-only pipe system.	PASS	N/A

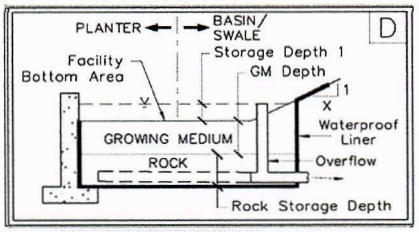
Facility Type = Planter (Flat)



Facility Shape: Rectangle/Square

Facility Configuration: D





Calculation Guide
Max. Rock Stor. Bottom Area
126 SF

DATA FOR ABOVE GRADE STORAGE COMPONENT

Facility Bottom Area =	126	sf
Bottom Width =	6.0	ft
Facility Side Slope =	0	to 1
Storage Depth 1 =	12	in
Growing Medium Depth =	18	in
Freeboard Depth =	N/A	in
Surface Capacity at Depth 1 =	126	cf
GM Design Infiltration Rate =	2.00	in/hr
Infiltration Capacity =	0.006	cfs

BELOW GRADE STORAGE

Rock Storage Capacity =		cf
Native Design Infiltration Rate =		in/hr
Infiltration Capacity =		cfs

RESULTS

Pollution Reduction: **PASS** | Overflow Volume: 0 CF | **98%** Surf. Cap. Used | Run PAC

Output File

	2-yr	5-yr	10-yr	25-yr
Peak cfs	0.134	0.163	0.193	0.222

FACILITY FACTS

Total Facility Area Including Freeboard = **126 SF**

Sizing Ratio (Total Facility Area / Catchment Area) = **0.013**

Presumptive Approach Calculator ver. 1.2

Catchment Data

Project Name:	**Willow Ridge (LOT Rain Garden)**	**Catchment ID:**	**A**
Project Address:	**4086 Cornwall St**	**Date:**	**12/18/19**
	West Linn	**Permit Number:**	
Designer:	**Goldson**	Run Time	12/18/2019 7:34:29 PM
Company:	**Theta**		

Drainage Catchment Information

Catchment ID	A	
	Catchment Area	
Impervious Area	2,600	SF
Impervious Area	0.06	ac
Impervious Area Curve Number, CN_{imp}	98	
Time of Concentration, Tc, minutes	5	min.

Site Soils & Infiltration Testing Data

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

Correction Factor Component

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

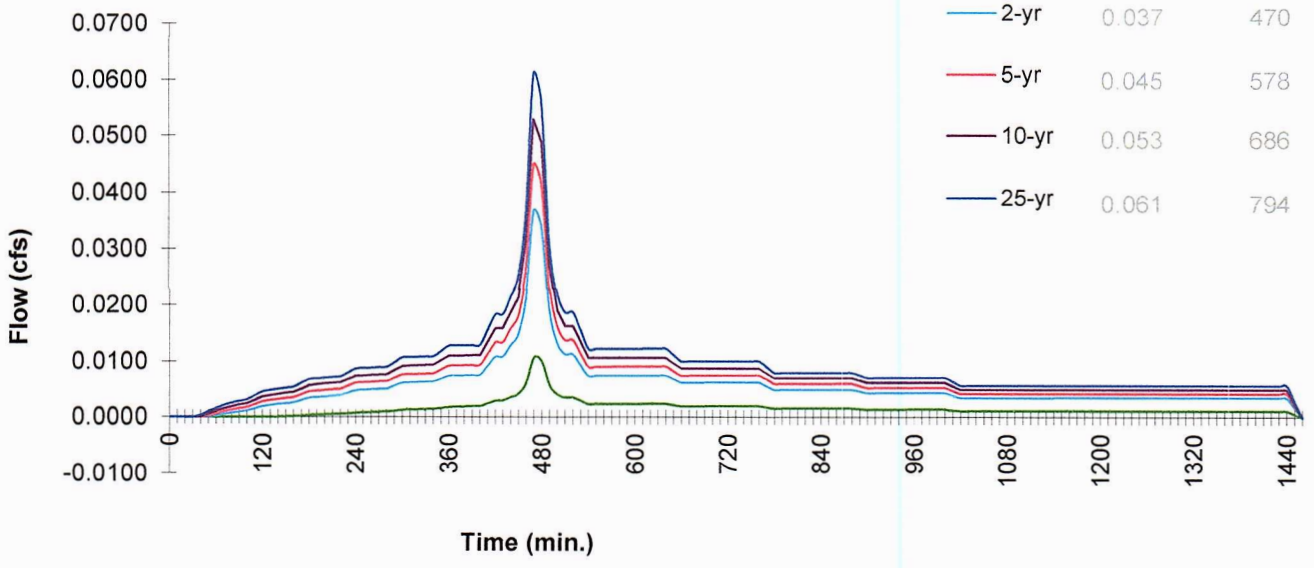
Design Infiltration Rates

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

Execute SBUH

SBUH Results

	Peak Rate (cfs)	Volume (cf)
PR	0.011	136
2-yr	0.037	470
5-yr	0.045	578
10-yr	0.053	686
25-yr	0.061	794



Printed: 12/18/2019 7:37 PM

Presumptive Approach Calculator ver. 1.2

Catchment ID: A

Run Time 12/18/2019 7:34:29 PM

Project Name: Willow Ridge **Catchment ID:** A **Date:** 12/18/2019

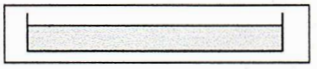
Instructions:
1. Identify which Stormwater Hierarchy Category the facility.
2. Select Facility Type.
3. Identify facility shape of surface facility to more accurately estimate surface volume, except for Swales and sloped planters that use the PAC Sloped Facility Worksheet to enter data.
4. Select type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

Catchment facility will meet Hierarchy Category: **4**

Goal Summary:

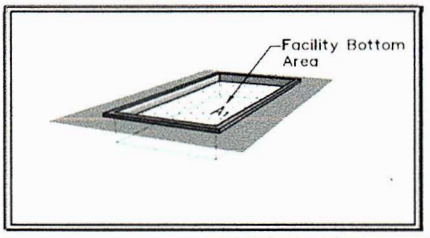
Hierarchy Category	SWMM Requirement	RESULTS box below needs to display…	
		Pollution Reduction as a	10-yr (aka disposal) as a
4	Off-site flow to a combined sewer.	PASS	N/A

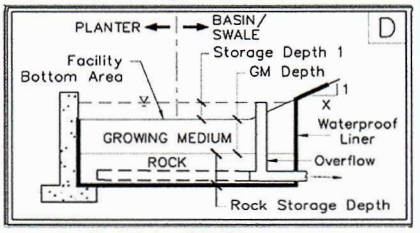
Facility Type = Planter (Flat)



Facility Shape: Rectangle/Square

Facility Configuration: D





Calculation Guide
Max. Rock Stor. Bottom Area
60 SF

DATA FOR ABOVE GRADE STORAGE COMPONENT

Facility Bottom Area =	60	sf
Bottom Width =	6.0	ft
Facility Side Slope =	0	to 1
Storage Depth 1 =	12	in
Growing Medium Depth =	18	in
Freeboard Depth =	N/A	in
Surface Capacity at Depth 1 =	60	cf
GM Design Infiltration Rate =	2.00	in/hr
Infiltration Capacity =	0.003	cfs

BELOW GRADE STORAGE

Rock Storage Capacity =		cf
Native Design Infiltration Rate =		in/hr
Infiltration Capacity =		cfs

RESULTS

		Overflow Volume		
Pollution Reduction	PASS	0 CF	27%	Surf. Cap. Used

Run PAC

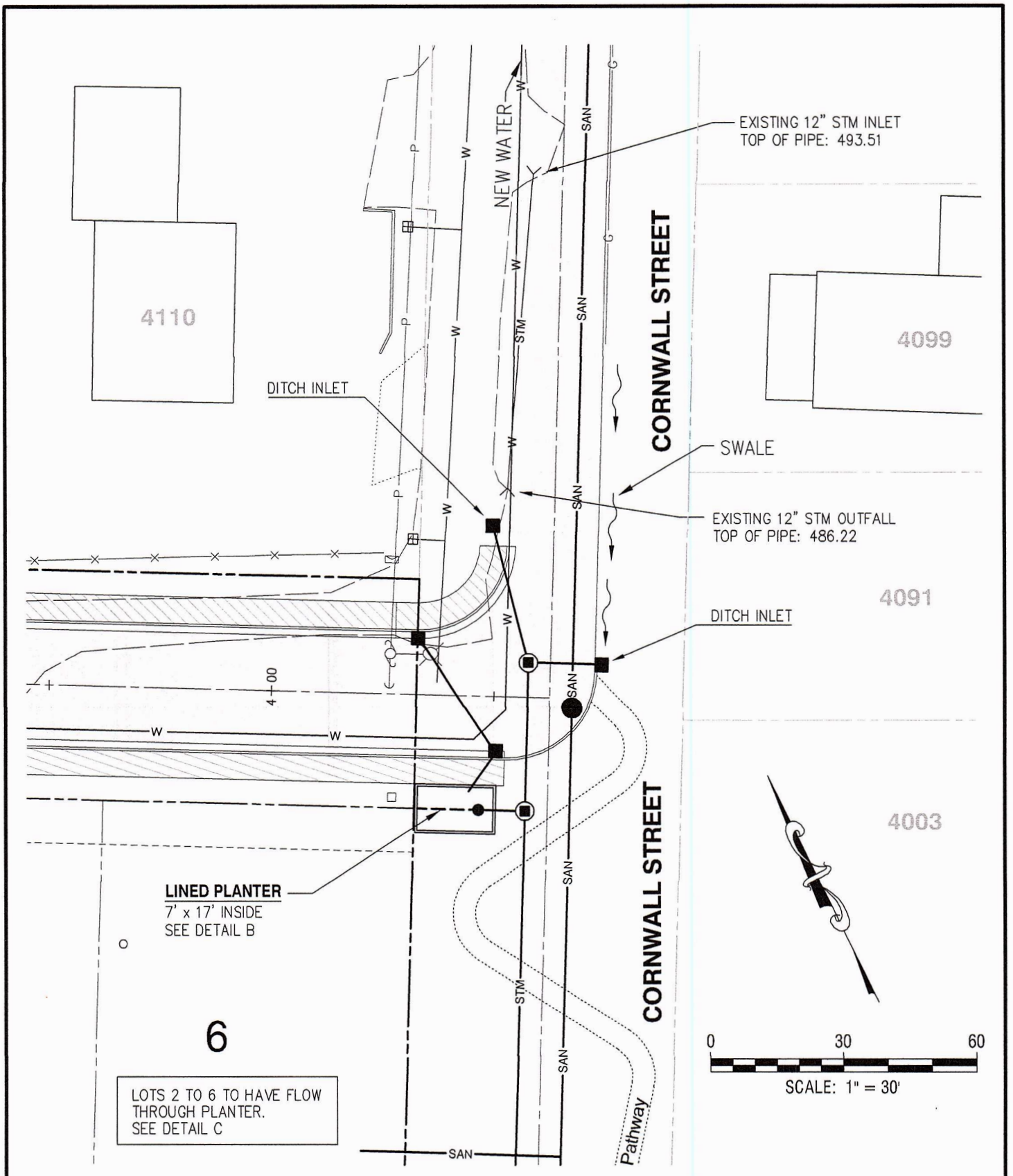
Output File

	2-yr	5-yr	10-yr	25-yr
Peak cfs	0.037	0.045	0.053	0.061

FACILITY FACTS

Total Facility Area Including Freeboard =	60 SF
Sizing Ratio (Total Facility Area / Catchment Area) =	0.023

Printed: 12/18/2019 7:37 PM

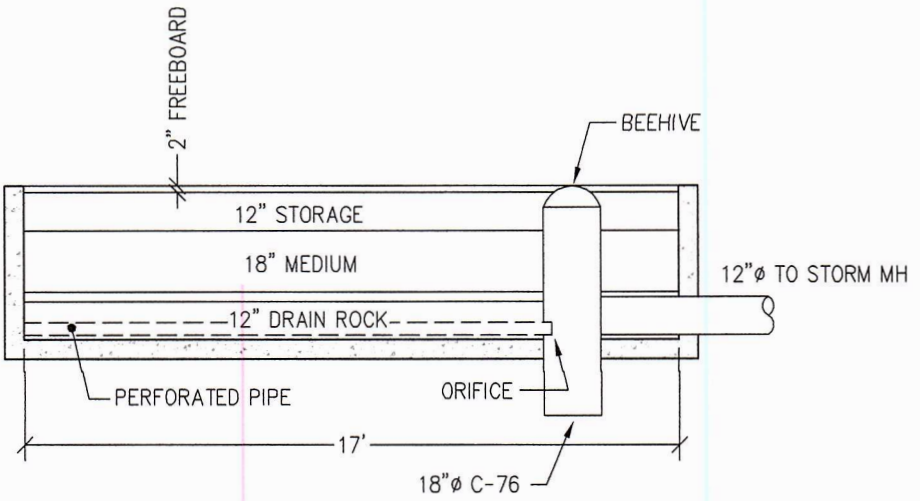


2010-129L **STORM DRAINAGE REPORT**

Theta, llc
ENGINEERING - SURVEYING - PLANNING
PO Box 1345
Lake Oswego, Oregon 97035
503-481-8822
email: thetaeng@comcast.net

Willow Ridge
West Linn, Oregon

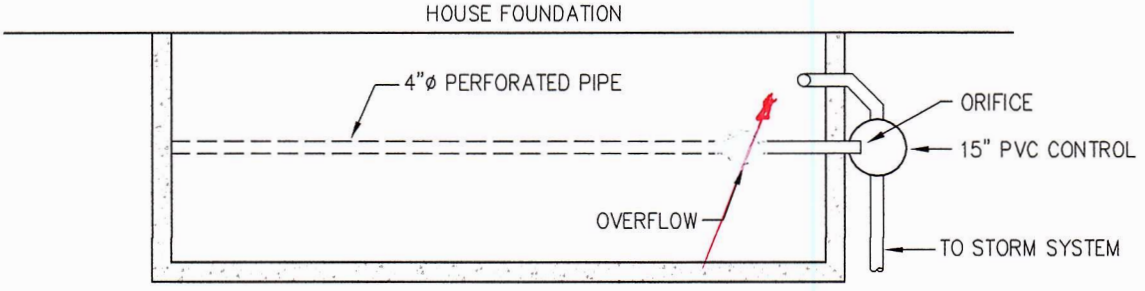
1/2



STREET SECTION WATER QUALITY AND QUANTITY PLANTER

B/1

SCALE: 1" = 5' HORIZONTAL
1" = 5' VERTICAL



RESIDENTIAL WATER QUALITY/ QUANTITY PLANTER LOTS 3–6

C/1

SCALE: 1" = 5' HORIZONTAL
1" = 5' VERTICAL

2010-129L **STORM DRAINAGE REPORT**

Theta, llc
ENGINEERING - SURVEYING - PLANNING
PO Box 1345
Lake Oswego, Oregon 97035
503-481-8822
email: thetaeng@comcast.net

Willow Ridge
West Linn, Oregon

2/2

WES BMP Sizing Report

Project Information

Project Name	Willow Ridge (House)
Project Type	SingleFamily
Location	4096 Cornwall
Stormwater Management Area	2600
Project Applicant	
Jurisdiction	OutofDistrict

Drainage Management Area

Name	Area (sq-ft)	Pre-Project Cover	Post-Project Cover	DMA Soil Type	BMP
roof single family	2,600	Grass	Roofs	D	BMP

LID Facility Sizing Details

LID ID	Design Criteria	BMP Type	Facility Soil Type	Minimum Area (sq-ft)	Planned Areas (sq-ft)	Orifice Diameter (in)
BMP	FlowControlAndTreatment	Stormwater Planter - Filtration	Lined	78.0	78.0	0.6

Pond Sizing Details

1. FCWQT = Flow control and water quality treatment, WQT = Water quality treatment only

2. Depth is measured from the bottom of the facility and includes the three feet of media (drain rock, separation layer and growing media).

3. Maximum volume of the facility. Includes the volume occupied by the media at the bottom of the facility.

4. Maximum water storage volume of the facility. Includes water storage in the three feet of soil media assuming a 40 percent porosity.

WES BMP Sizing Report

Project Information

Project Name	Cornwall -Landis
Project Type	RoadProject
Location	4096 Cornwall
Stormwater Management Area	5531
Project Applicant	
Jurisdiction	OutofDistrict

Drainage Management Area

Name	Area (sq-ft)	Pre-Project Cover	Post-Project Cover	DMA Soil Type	BMP
Landis	5,531	Grass	ConventionalConcrete	D	BMP

LID Facility Sizing Details

LID ID	Design Criteria	BMP Type	Facility Soil Type	Minimum Area (sq-ft)	Planned Areas (sq-ft)	Orifice Diameter (in)
BMP	FlowControlAndTreatment	Stormwater Planter - Filtration	Lined	165.9	166.0	0.8

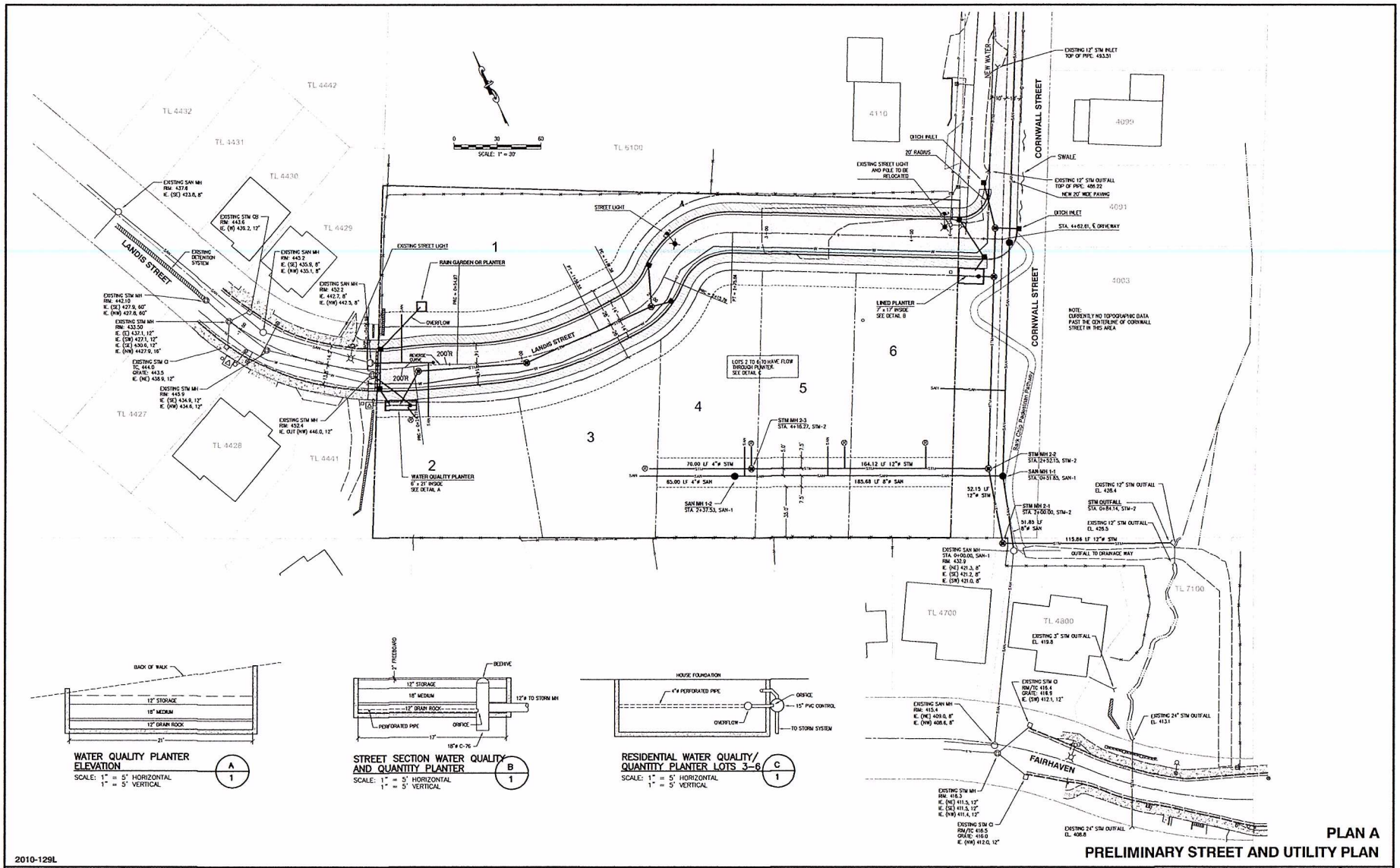
Pond Sizing Details

1. FCWQT = Flow control and water quality treatment, WQT = Water quality treatment only

2. Depth is measured from the bottom of the facility and includes the three feet of media (drain rock, separation layer and growing media).

3. Maximum volume of the facility. Includes the volume occupied by the media at the bottom of the facility.

4. Maximum water storage volume of the facility. Includes water storage in the three feet of soil media assuming a 40 percent porosity.



WATER QUALITY PLANTER ELEVATION (A/1)
SCALE: 1" = 5' HORIZONTAL
1" = 5' VERTICAL

STREET SECTION WATER QUALITY AND QUANTITY PLANTER (B/1)
SCALE: 1" = 5' HORIZONTAL
1" = 5' VERTICAL

RESIDENTIAL WATER QUALITY/ QUANTITY PLANTER LOTS 3–6 (C/1)
SCALE: 1" = 5' HORIZONTAL
1" = 5' VERTICAL

PLAN A
PRELIMINARY STREET AND UTILITY PLAN

2010-129L

DESIGNED:	BDG			
DRAWN:	BJS			
SCALE:	1" = 30'			
DATE:	July, 2017	11/02/2017	1	APPLICATION
FILE:	Cornwall Street Prelim11	DATE	NO.	REVISION

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Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, Oregon 97068
Phone: (503) 657-0406

Willow Ridge
West Linn, Oregon

SHEET: 1/4

4. ARD Engineering Traffic Memorandum

ARD ENGINEERING
21370 SW Langer Farms Pkwy
Suite 142, Sherwood, OR 97140

Technical Memorandum

To: Mark Handris, Icon Construction

From: Michael Ard, PE

Date: June 25, 2020

Re: Willow Ridge Traffic Impact Analysis

This memorandum is written to provide information regarding the potential traffic impacts associated with the proposed Willow Ridge residential development in West Linn, Oregon.

Project Description

The proposed Willow Ridge Subdivision will include six lots for single-family homes located on a 2.17-acre site between the existing eastern terminus of Landis Street and the southern terminus of Cornwall Street. Two potential street connections have been proposed.

Under the tentative site plan, Landis Street would be extended through the site to connect to the south end of Cornwall Street, with the entire connection accessible to the public.

Although the tentative plan including a public street connection is preferred by city staff, some residents have expressed a preference for not providing a public street connection through the site. Accordingly, a second "Alternative Plan" was developed for the site. Under this plan, Landis Street would be extended into the site to a hammerhead turn-around, effectively limiting public vehicular access through the site. Lots 1-4 would take access to Landis Street. A 25'-wide driveway connecting to Cornwall Street would provide access for lots 5 and 6. This driveway would also serve as an emergency vehicle access easement, which would connect to Landis Street.

This analysis will include examination of both the tentative and alternative site plans, along with relevant information regarding traffic volumes, adequacy of street widths, and the requirements of the City of West Linn's Public Works Design Standards.

Existing Conditions

Under existing conditions, Landis Street is a dead-end road serving 20 single-family homes. The street has a paved width of 28 feet, with closely spaced driveways along both sides of the roadway. Continuous curb-tight sidewalks are in place along the west side of the roadway and connecting to existing sidewalks along the south side of Stonegate Lane. Partial sidewalks are also in place along the east side of Landis Street, but are not available toward the north end of the street. Existing partial sidewalks are also in place along the north side of Stonegate Lane.

The width and design of Landis Street is typical of a queuing street, which may not fully accommodate simultaneous two-way travel at all points. Instead, where vehicles are parked along the street drivers may

need to pull to one side to allow opposing traffic to pass. This limits the effective capacity of the street to approximately 1,000 vehicles per day.

Cornwall Street is also a dead-end road serving 10 existing homes, including the existing home on the subject property. The street has a paved width of 15 to 20 feet, with no sidewalks on either side of the roadway. The narrower cross-section of Cornwall Street is even more restrictive that Landis Street. Although it can accommodate two-way travel drivers may need to carefully select where to pass to ensure adequate road width is available. Additionally, since there are no sidewalks provided pedestrians and cyclists must share the limited road width with motor vehicles. Since Cornwell Street is a relatively short dead-end roadway (approximately 600 feet) serving a very limited number of homes, travel speeds and traffic volumes would be expected to be very low, allowing pedestrians to safely share the roadway with motor vehicle traffic.

Trip Generation

The subject property is currently developed with one single-family home. Under the proposed plan, a total of 6 homes will be provided within the project site, resulting in a net increase of five homes. In order to determine the increase in traffic attributable to the proposed development, a trip generation analysis was prepared using data from the Institute of Transportation Engineer's Trip Generation Manual, 10th Edition. The data used was for land use code 210, *Single Family Detached Housing*, and is based on the number of dwelling units.

Based on the analysis, the proposed development is projected to result in a net increase of 3 trips during the morning peak hour, 5 trips during the evening peak hour, and 46 average daily trips. A summary of the trip generation calculations is provided in Table 1 below. Detailed trip generation worksheets are also provided in the attached technical appendix.

Table 1 - Trip Generation Calculation Summary

	Morning Peak Hour			Evening Peak Hour			Daily Trips		
	In	Out	Total	In	Out	Total	In	Out	Total
6 Single Family Homes	1	3	4	4	2	6	28	28	56
- 1 Existing Home	0	-1	-1	-1	0	-1	-5	-5	-10
Net New Site Trips	**1**	**2**	**3**	**3**	**2**	**5**	**23**	**23**	**46**

Based on the trip generation analysis, the traffic impacts attributable to the proposed homes will be minimal. Per the City of West Linn Public Works Design Standards Section 5.0014, a Traffic Impact Analysis will generally be required when a proposed development will generate 1,000 vehicle trips per weekday or more, or when a development's location, proposed site plan, and traffic characteristics could affect traffic safety, street capacity, or known traffic problems or deficiencies in a development's study area.

The proposed development is projected to result in less than 5 percent of the traffic volume that would trigger the need for a Traffic Impact Analysis per the city's Public Works Design Standards. However,

since the potential street connection could result in other transportation safety and operations impacts additional analysis is appropriate to determine the extent and nature of any traffic operations and safety impacts. For this additional analysis both the tentative plan and the alternative plan were separately considered.

Tentative Plan – Operational and Safety Analysis

Under the tentative site plan, Landis Street would be extended through the site, connecting to the southern end of Cornwall Street. This street connection is contemplated in the city's Transportation System Plan as project LSC-16 "Landis Street extension to Cornwall Street" and is indicated as having priority "low".

Several other local street connections are also indicated in the project vicinity, including LSC-15 (Landis Street extension from Stonegate Lane to Winkel Way), LSC-19 (New east-west connection from Reed Street to Cornwall Street), LSC-21 (New north-south connection from the Landis Street extension to the new east-west connection) and LSC-26 (Sabo Lane extension from Beacon Hill to Sunset Avenue). Each of these local street connection projects is intended to increase connectivity for pedestrians, cyclists and motor vehicles within the local street network.

The timing of the local street connection projects may be critical to maintaining safe and efficient operation of the local street network. Since the proposed Willow Ridge development would construct the Landis Street connection to Cornwall Street without the benefit of the several other local street connections anticipated in the city's Transportation System Plan, it is appropriate to examine the potential impacts of making this street connection without the support of the other street connections planned for the future.

In order to determine the likely traffic demands for the new street connection, a fastest-path analysis was conducted. "Break even" points within the existing street network were identified where the new street connection would result in equal travel times taking either the proposed new street connection or an existing travel route. For homes and destinations located closer than this break-even point, existing vehicular trips would be assumed to move to the new street connection. Where existing street connections would provide a faster travel time, traffic would not be expected to divert to the new street.

For homes located to the northeast of the subject property, diversions would be expected to occur from locations where the new street would provide the fastest travel route either to the existing commercial and institutional uses along Salamo Road or to the 10th Street area with its connections to I-205. Based on the analysis, for all locations except those on Cornwall Street south of Sunset Avenue the fastest path to the commercial and institutional uses along Salamo Road will be via Parker Road. For trips to and from 10th Street, the fastest path will be via Sussex Street, Fairhaven Drive, Beacon Hill Drive and Barrington Drive. Accordingly, no diversions of existing traffic from areas northeast of the site are projected except those associated with the 10 existing homes on Cornwall Street.

For homes located to the west of the subject property, diversions would be expected to occur from locations where the new street would provide the fastest travel route to Sunset Avenue and Summit Street, which provide connections to Highway 43 and I-205. Based on the analysis, some existing homes along Landis

Street, Beacon Hill Drive, Winkel Way, Sabo Lane and Quail Ridge Court would have a new fastest travel path following completion of the new roadway. Approximately 106 homes are projected to benefit from the new street connection.

Assuming that 30% of trips from these homes travel to and from the east, the projected impact on Cornwall Street would be the addition of approximately 320 daily trips. Adding these to the existing 100 daily trips on Cornwall Street and approximately 15 trips from the proposed Willow Ridge development will result in a total traffic volume of approximately 415 trips per day. Traffic volumes on Stonegate Lane would be projected to increase from approximately 200 trips per day to approximately 490 trips per day. Note that the net increase on Stonegate Lane is slightly lower since the 20 existing homes on Stonegate Lane would add traffic to Cornwall Street but are already present on Stonegate Lane.

The projected traffic volumes on Landis Street and Stonegate Lane are within the carrying capacity of a queuing street. However, the adjacent homes would experience a notable increase in through traffic, with traffic volumes more than doubling along the local street.

The added traffic volumes on Cornwall Street are expected to have a more significant impact than on Landis Street. Since Cornwall Street has no sidewalks and the roadway is in many areas significantly less than 20 feet wide, increasing traffic volumes will result in more friction and increased conflicts along this existing 600-foot road segment. However, city staff have indicated that in conjunction with completion of the Landis Street connection funding will be provided to widen the existing cross-section of Cornwall Street to provide a continuous width of 20 feet. This proposed road width is sufficient to accommodate simultaneous two-way travel along the street segment. When there are pedestrians or people riding bicycles within the roadway the low projected traffic volumes in conjunction with the improved 20-foot street width would allow drivers to safely maneuver around vulnerable road users in a manner similar to avoiding vehicle conflicts on a queuing street.

A more detailed discussion of the adequacy of street widths is provided in the “Street Width Analysis” section of this report on page 5.

Alternative Plan – Operational and Safety Analysis

Under the alternative site plan, Landis Street would be extended into the site to provide access to lots 1-4 but would not provide a public street connection to Cornwall Street. Cornwall Street would provide access to lots 5 and 6. The driveway serving lots 5 and 6 would extend to Landis Street with an easement allowing emergency vehicles through access between Landis Street and Cornwall Street. Notably, this access could also be designed to accommodate through pedestrian and bicycle trips in order to improve local connectivity for non-motorized travel modes while avoiding traffic increases on Cornwell Street which would result in reduced safety for pedestrians and cyclists where no sidewalks are provided. Since the existing home on the subject property takes access via Cornwall Street, the new homes will result in an increase of four new homes taking access via Landis Street and one new home taking access via Cornwall Street. Landis Street and Stonegate Lane would be projected to experience an increase of 40 trips per day (20 percent of existing

traffic volumes), and Cornwall Street would experience an increase of 10 trips per day (10 percent of existing traffic volumes).

Based on the analysis, the alternative site plan would result in much less significant impacts to the existing residential neighborhoods along Landis Street and Cornwall Street. Since an emergency vehicle connection would be maintained between Landis Street and Cornwall Street, it is likely that this limited connection could also accommodate pedestrian and bicycle traffic, thereby improving local-street connectivity for non-motorized travel modes.

Street Width Analysis

The proposed extension of Landis Street would have a paved width of 28 feet. Under the tentative site plan it would connect to Cornwall Street, which would be improved to a paved width of 20 feet. These paved widths must be capable of supporting the projected traffic loads as well as the needs of emergency vehicles (including fire apparatus).

Oregon's Transportation Planning Rule includes language in OAR 660-012-0045(7) stating "*Local governments shall establish standards for local streets and accessways that minimize pavement width and total right-of-way consistent with the operational needs of the facility. The intent of this requirement is that local governments consider and reduce excessive standards for local streets and accessways in order to reduce the cost of construction, provide for more efficient use of urban land, provide for emergency vehicle access while discouraging inappropriate traffic volumes and speeds, and which accommodate convenient pedestrian and bicycle circulation.*" In order to assist local governments with balancing the needs of safety, livability and emergency vehicle access, guidelines were created by stakeholder consensus and published as "Neighborhood Street Design Guidelines, An Oregon Guide to Reducing Street Widths". This guide provides several recommended local street cross sections that effectively minimize paved widths in conformance with the requirements of the Transportation Planning Rule while accommodating the needs of emergency vehicles. The recommended design guidelines were specifically endorsed and supported by the Office of the State Fire Marshal, the Oregon Fire Chiefs Association, the Oregon Fire Marshal's Association, the Oregon Chiefs of Police Association and the Oregon Refuse and Recycling Association, as well as ODOT, several planning associations, the Oregon Building Industry Association, 1000 Friends of Oregon, Oregon's Department of Land Conservation & Development, and Metro.

Notably, the guidelines include three recommended cross-sections for neighborhood streets. These consist of a 28-foot paved width with parking on both sides, a 24-foot paved width with parking on one side, and a 20-foot road width with no parking. The 24-foot and 28-foot cross-sections are described as "queueing streets" since vehicles may need to pull to one side to allow opposing traffic to pass, thereby limiting the effective traffic capacity of these roadways to 1,000 vehicles per day or less. Diagrams showing the recommended street cross-sections are included in the attached technical appendix.

Since the proposed site plan will utilize precisely the paved street widths recommended for neighborhood streets and the streets will carry fewer than 1,000 vehicles per day under either the tentative site plan or the

alternative site plan, the proposed street widths are adequate to accommodate the projected traffic as well as emergency vehicles.

Conclusions

Based on the detailed analysis, either the tentative site plan or the alternative site plan could be implemented while maintaining traffic volumes within acceptable levels for the affected local streets and intersections. The proposed street width for the extension of Landis Street is sufficient to accommodate the traffic volumes on the roadway as well as emergency vehicles.

Under the tentative site plan street connectivity would be improved in the site vicinity, helping balance traffic volumes on the local street network and providing a second point of emergency access for vehicles responding to both the proposed development and the existing homes along Landis Street and Cornwall Street.

Under the alternative site plan existing traffic patterns in the site vicinity would experience a negligible change in volumes, since the proposed development will generate a net increase of just 5 trips during the highest-volume hour and these trips would be split between two points of access. Accordingly, implementation of the alternative plan would result in no significant operational or safety impacts to the existing transportation system.

Since dedicated sidewalks are not currently available along Cornwall Street, it is recommended that the city consider providing a connection along the Landis Street alignment that is limited to pedestrians, cyclists and emergency vehicles. This could be accomplished using either the alternative site plan or the tentative site plan in conjunction with a temporary barrier accessible to emergency vehicles only which restricts through traffic at or near the east end of the proposed development.

It should be noted that the impact of through trips on Landis Street and Cornwall Street will be significantly reduced in the future upon completion of other local-street connections in the site vicinity. Once a new street connection is provided between the east side of Stonegate Lane and Parker Road (using portions of LSC-15 and LSC-26), this street connection will provide a faster, more efficient travel route than the Cornwall Street/Landis Street connection. For this reason, upon completion of the planned more direct connection between Stonegate Lane and Parker Road any barricades to motor vehicles could be removed from the Landis Street extension, resulting in a complete local street network in compliance with the city's Transportation System Plan. Implementation of a phased local street connection plan with limitations on connectivity in the near term would enable the vision of the city's TSP to be achieved while eliminating short-term undesirable impacts to safety and neighborhood livability.

If you have any questions regarding this analysis, please feel free to contact me at (503)537-8511 or at mike.ard@gmail.com.

Appendix

Trip Generation Calculation Worksheet

Land Use Description: Single-Family Detached Housing
ITE Land Use Code: 210
Independent Variable: Dwelling Units
Quantity: 6 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.74 trips per dwelling unit
Directional Distribution: 25% Entering 75% Exiting

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.99 trips per dwelling unit
Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic
Trip Rate: 9.44 trips per dwelling unit
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

6 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	1	3	4
PM Peak Hour	4	2	6
Weekday	28	28	56

Data Source: *Trip Generation Manual, 10th Edition* , Institute of Transportation Engineers, 2017

Trip Generation Calculation Worksheet

Land Use Description: Single-Family Detached Housing
ITE Land Use Code: 210
Independent Variable: Dwelling Units
Quantity: 1 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.74 trips per dwelling unit
Directional Distribution: 25% Entering 75% Exiting

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.99 trips per dwelling unit
Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic
Trip Rate: 9.44 trips per dwelling unit
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

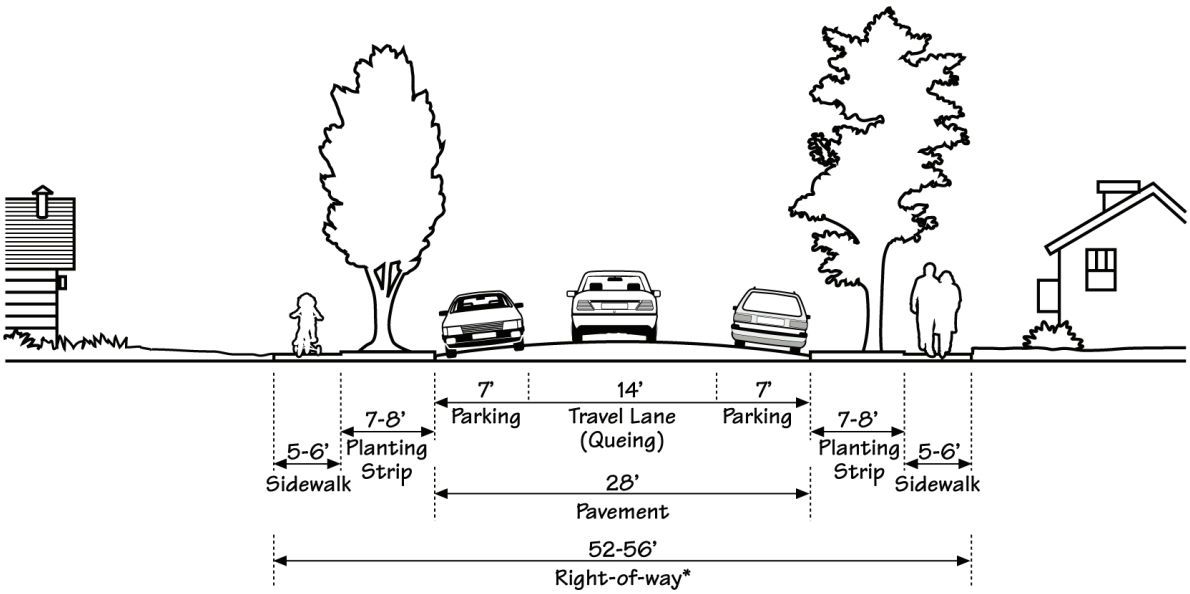
1 Dwelling Units

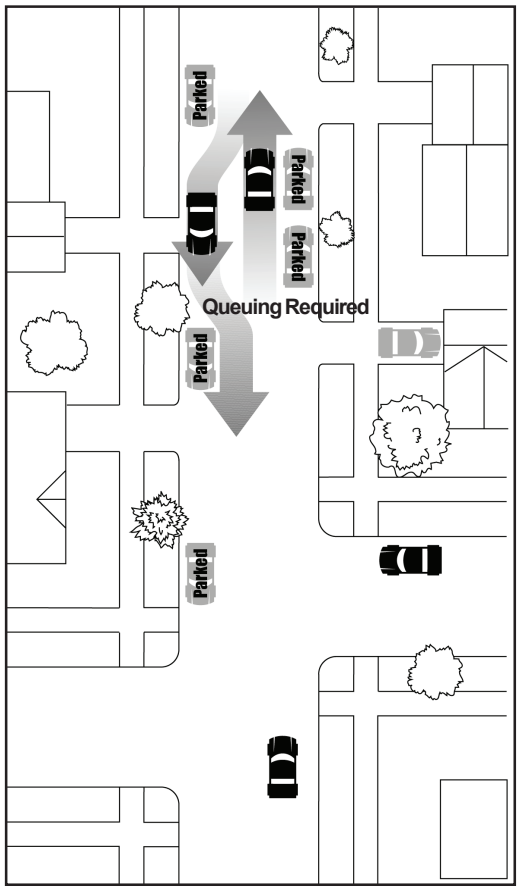
	Entering	Exiting	Total
AM Peak Hour	0	1	1
PM Peak Hour	1	0	1
Weekday	5	5	10

Data Source: *Trip Generation Manual, 10th Edition* , Institute of Transportation Engineers, 2017

Scenario 1

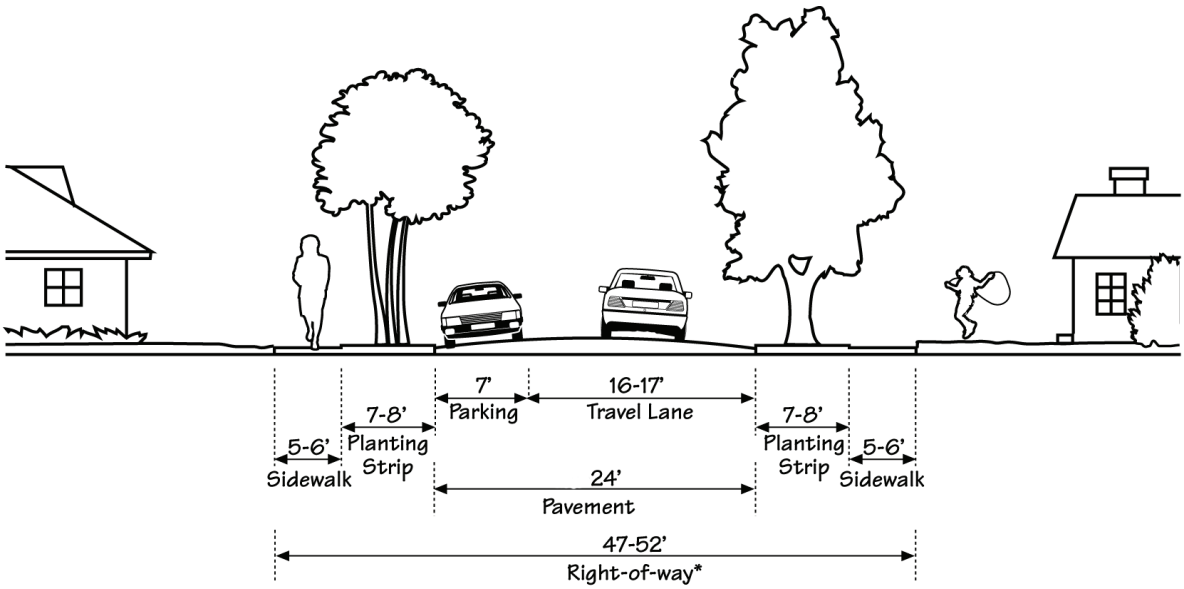
28 Ft. Streets
Parking on both sides

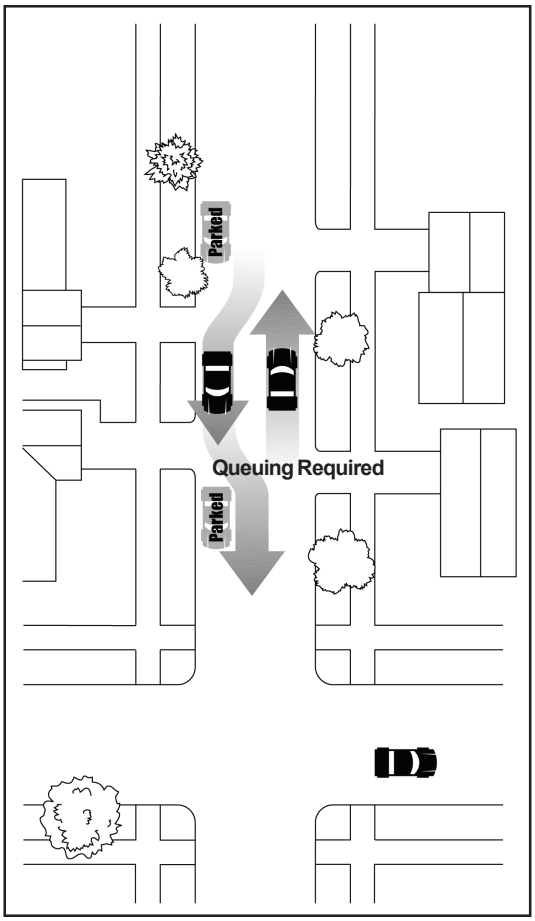




Scenario 2

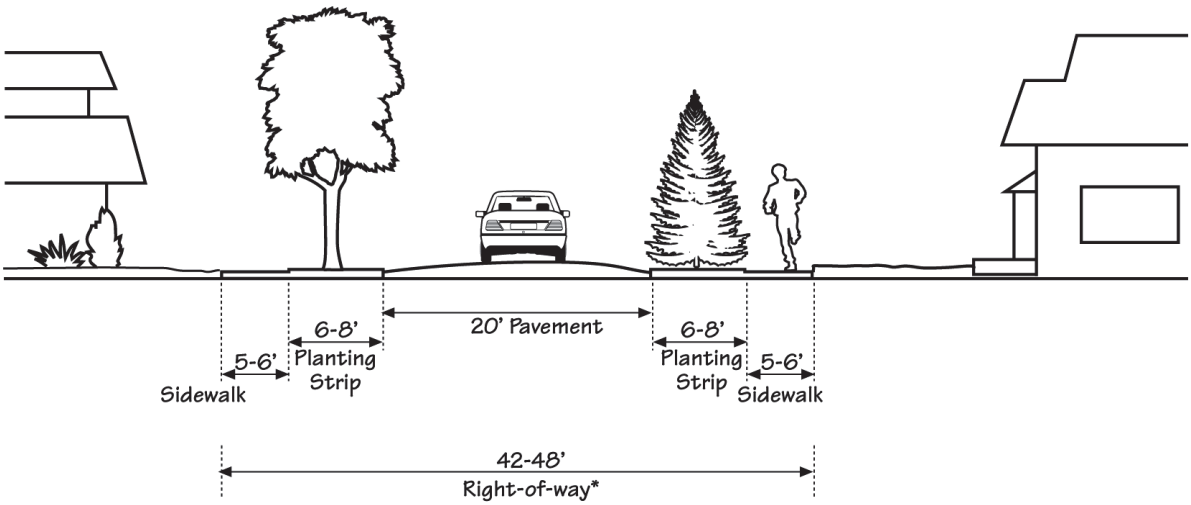
24 Ft. Streets
Parking on one side only

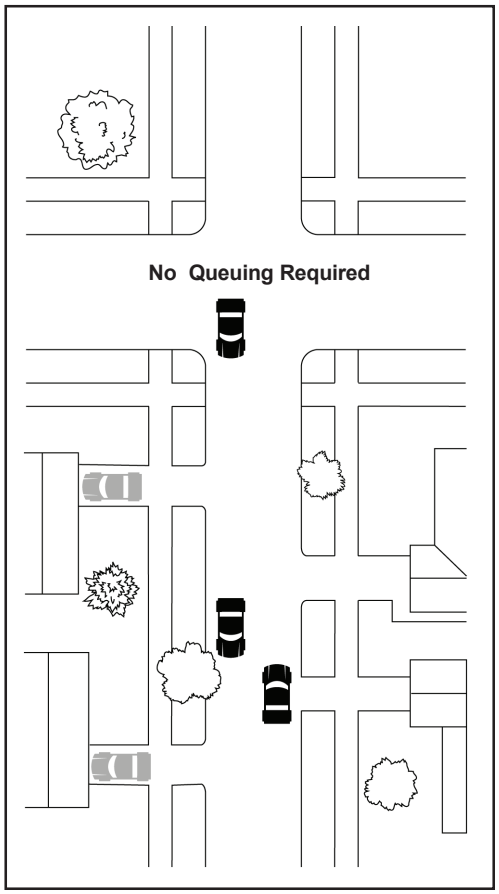




Scenario 3

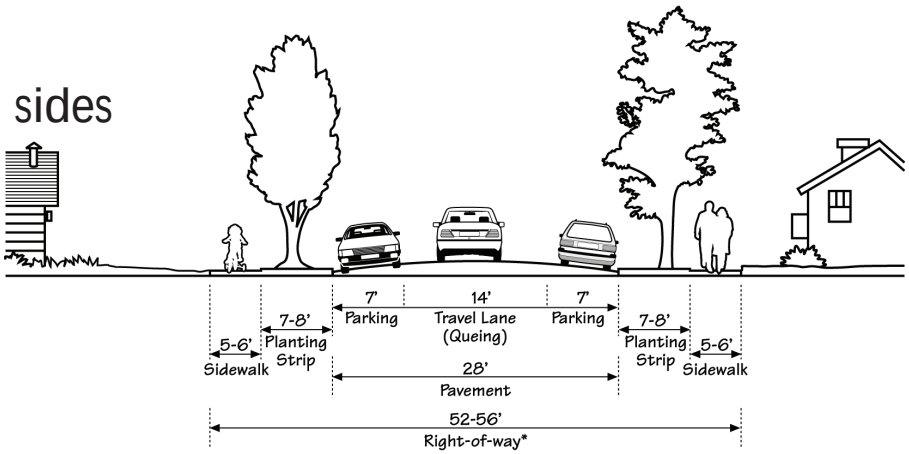
20 Ft. Streets
No parking allowed



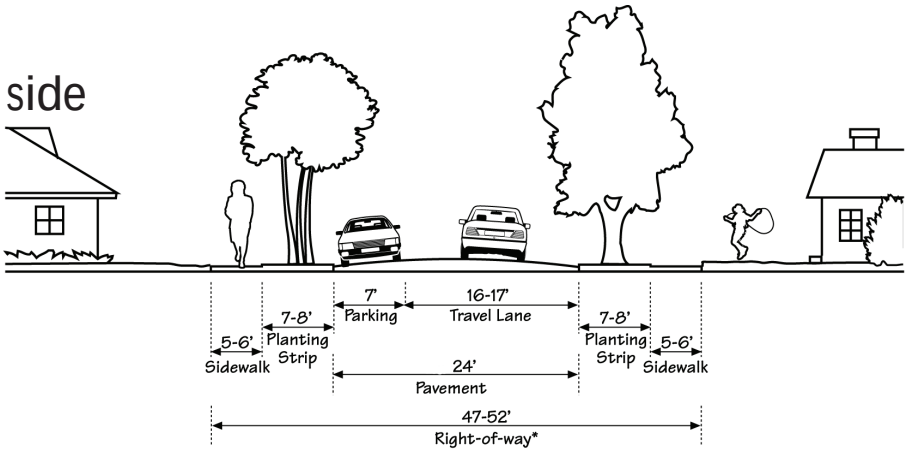


Summary of Three Potential Scenarios

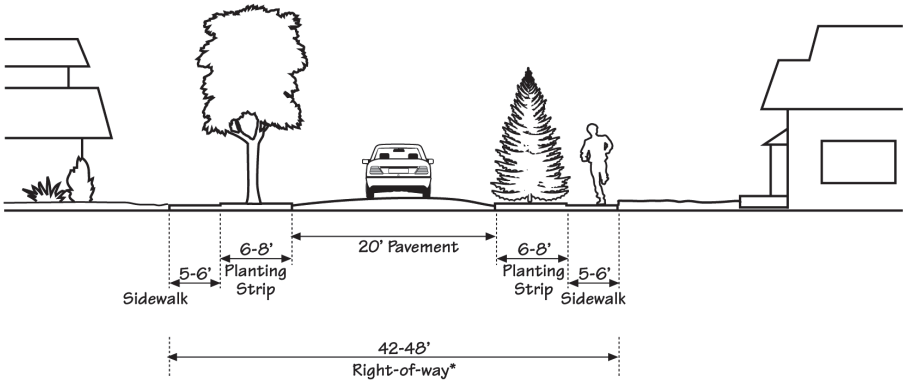
28 Ft Street
Parking on both sides



24 Ft Street
Parking on one side



20 Ft Street
No on-street parking allowed



5. GeoPacific Engineering Letter of Record

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

June 22, 2020
Project No. 19-5378

Icon Construction
1980 Willamette Falls Drive, #200
West Linn, OR 97068
Phone 503-657-0406
Email: darren@iconconstructino.net; rickgivens@gmail.com

SUBJECT: **CHANGE IN GEOTECHNICAL ENGINEER-OF-RECORD**
WILLOW RIDGE ESTATES FKA CORNWALL STREET SUBDIVISION
WEST LINN, OREGON

References: Carlson Geotechnical, *Report of Geotechnical Investigation, Cornwall Street Subdivision, 4096 Cornwall Street, West Linn, Oregon*, dated January 7, 2016.

This brief letter confirms that we are willing to assume geotechnical engineer-of-record for the above-referenced project. We have reviewed the above-referenced report and generally concur with the finding, conclusions and recommendations.

We can provide a summary of observation and testing report upon conclusion of our services. This final report will make conclusions regarding the adequacy of the earthwork and recommendations for design and construction of residential foundations.

Regarding onsite infiltration of stormwater runoff, due to the slope inclination of the lots, consistency of native materials identified in test pits and observed presence of shallow ground water seepage identified in the above referenced geotechnical report by Carlson Geotechnical, it is our opinion that onsite infiltration is not feasible and in fact, is more likely to increase runoff potential from Lots 2 through 6 due to a lack of vertical infiltration into impervious bedrock and residual soil. Stormwater runoff from new construction should be directed to the outfall shown by Theta Engineering.

Additionally, we recommend updating the information regarding seismic design from the original report. Structures should be designed to resist earthquake loading in accordance with the methodology described in the 2018 International Building Code (IBC) with applicable Oregon Structural Specialty Code (OSSC) revisions (current 2019). We recommend Site Class D be used for design per the OSSC, Table 1613.5.2 and as defined in ASCE 7, Chapter 20, Table 20.3-1. ATC (Applied Technology Council) *ASCE 7-16 Hazards by Location online Tool* website calculations are summarized in Table 1.

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Portland, Oregon 97224
Tel (503) 598-8445
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Table 1 - Recommended Earthquake Ground Motion Factors (ASCE 7-16)

Parameter	Value
Location (Lat, Long), degrees	45.3569846, -122.6330169
Probabilistic Ground Motion Values, 2% Probability of Exceedance in 50 yrs	
Site Modified Peak Ground Acceleration	0.461 g
Short Period, S_s	0.838 g
1.0 Sec Period, S_1	0.377 g
Soil Factors for Site Class D:	
F_a	1.165
F_v	1.923*
$SD_s = 2/3 \times F_a \times S_s$	0.651 g
$SD_1 = 2/3 \times F_v \times S_1$	0.483 g
Seismic Design Category	D

* F_v value reported in the above table is a straight-line interpolation of mapped spectral response acceleration at 1-second period, S_1 per Table 1613.2.3(2) of OSSC 2019 with the assumption that Exception 2 of ASCE 7-16 Chapter 11.4.8 is met per the Structural Engineer. If Exception 2 is not met, and the long-period site coefficient (F_v) is required for design, GeoPacific Engineering can be consulted to provide a site-specific procedure as per ASCE 7-16, Chapter 21.

We appreciate the opportunity to be of service.

Sincerely,

GeoPacific Engineering, Inc.

EXPIRES: 06/30/2021

James D. Imbrie, P.E.
Geotechnical Engineer

6. GeoPacific Engineering Willow Ridge Geotechnical Report and Site Review

GeoPacific Engineering, Inc.

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

December 18, 2019
Project No. 19-5378

Icon Construction
1980 Willamette Falls Drive, #200
West Linn, OR 97068
Phone 503-657-0406
Email: darren@iconconstructino.net; rickgivens@gmail.com

SUBJECT: GEOTECHNICAL REPORT AND SITE REVIEW
WILLOW RIDGE ESTATES AKA CORNWALL STREET SUBDIVISION
WEST LINN, OREGON

References: Carlson Geotechnical, Geotechnical Investigation, Cornwall Street Subdivision, 4096 Cornwall Street, West Linn, Oregon, dated January 7, 2016.

This letter presents our peer report review and site review of the proposed Willow Ridge Subdivision. We understand that the neighbors to the development have concerns regarding groundwater and site runoff to properties downslope (southwest) of the development. The development proposes a total of six lots, five of which are downslope of a new private street and an extension of Landis Street. The stormwater from Lot 1 and the street is to be taken to existing facilities and will capture water from above, thus reducing the total quantity of storm runoff to the southwest. The stormwater from Lots 2 through 5 will be taken through lined rain gardens to a storm outfall at the south corner boundary, even further reducing the storm runoff to the south.

The geotechnical study by Carlson Geotechnical performed a total of seven test pits on December 10, 2019, which was during the wet season. No groundwater was encountered in any of the test pits. Based on our review of the geotechnical investigation report, referenced above, we conclude that the proposed development is geotechnically feasible and poses no increased, but rather a much-reduced potential for uncontrolled storm runoff or adverse impacts to the neighboring properties as proposed.

Within the limitations of scope, schedule and budget, GeoPacific attempted to execute these services in accordance with generally accepted professional principles and practices in the fields of geotechnical engineering and engineering geology at the time the report was prepared. No warranty, expressed or implied, is made. The scope of our work did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, or groundwater at this site.

We appreciate this opportunity to be of service.

Sincerely,
GEOPACIFIC ENGINEERING, INC.

James D. Imbrie, G.E.
Principal Geotechnical Engineer

7. Carlson Geotechnical - Report of Geotechnical Investigation Cornwall Street

Carlson Geotechnical

A Division of Carlson Testing, Inc.
Phone: (503) 601-8250
Fax: (503) 601-8254

Bend Office **(541) 330-9155**
Eugene Office **(541) 345-0289**
Salem Office **(503) 589-1252**
Tigard Office **(503) 684-3460**

Report of
Geotechnical Investigation
Cornwall Street Subdivision
4096 Cornwall Street
West Linn, Oregon

CGT Project Number G1504283

Prepared for

Mr. Darren Gusdorf
ICON Construction & Development
1980 Willamette Falls Drive, Suite 200
West Linn, Oregon 97068

January 7, 2016

Carlson Geotechnical

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January 7, 2016

Mr. Darren Gusdorf
ICON Construction & Development
1980 Willamette Falls Drive, Suite 200
West Linn, Oregon 97068

Report of
Geotechnical Investigation
Cornwall Street Subdivision
4096 Cornwall Street
West Linn, Oregon

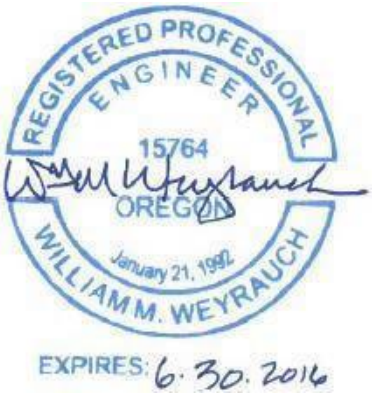
CGT Project Number G1504283

Dear Mr. Gusdorf:

Carlson Geotechnical (CGT), a division of Carlson Testing, Inc. (CTI), is pleased to submit this report summarizing our Geotechnical Investigation for the proposed Cornwall Street Subdivision project. The site is located at 4096 Cornwall Street in West Linn, Oregon. We performed our work in general accordance with CGT Proposal GP6901, dated December 3, 2015. Written authorization for our services was provided on December 3, 2015.

We appreciate the opportunity to work with you on this project. Please contact us at 503.601.8250 if you have any questions regarding this report.

Respectfully Submitted,
CARLSON GEOTECHNICAL



Kyle Smetana, EIT
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ATTACHMENTS

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1.0 INTRODUCTION

Carlson Geotechnical (CGT), a division of Carlson Testing, Inc. (CTI), is pleased to submit this report summarizing our Geotechnical Investigation for the proposed Cornwall Street Subdivision. The site is located at 4096 Cornwall Street in West Linn, Oregon, as shown on the attached Site Location, Figure 1.

1.1 Project Description

CGT developed an understanding of the proposed project based on our correspondence with ICON Construction & Development and a preliminary site plan prepared by Richard E. Givens, Planning Consultant, dated March 2015. Based on our review, we understand the project will include:

- Demolition and removal of the existing single-family residence and accessory structures.
- Partitioning the site into seven residential lots.
- Development within each lot will include construction of a single-family residence with appurtenant driveways and underground utilities. Although no lot-specific plans have been provided, we have assumed each structure will be two stories in height, wood-framed, and include daylight basements/garages. We anticipate the living space of the structures will incorporate post-and-beam floors (crawlspaces), while basements/garages will incorporate a slab-on-grade floor.
- Construction of extensions to Landis Street and Cornwall Street to provide vehicular access to the residential lots.
- Although no grading plans have been provided, we anticipate permanent grade changes at the site will include cuts and fills on the order of up to 5 feet within the new roadway.
- We understand infiltration testing is not needed as part of this assignment.

1.2 Scope of Work

The purpose of our work was to explore shallow subsurface conditions at the site in order to provide geotechnical recommendations for design and construction of the proposed development. Our scope of work included the following:

- Contact the Oregon Utilities Notification Center and subcontract a private utility locator to mark the locations of public utilities within a 20-foot radius of our explorations at the site.
- Explore subsurface conditions at the site by observing the excavation of seven test pits to depths of about 6 to 10 feet below ground surface (bgs).
- Classify the materials encountered in the explorations in accordance with American Society for Testing and Materials (ASTM) Soil Classification Method D2488 (visual-manual procedure).
- Collect representative soil samples from within the explorations in order to perform laboratory testing and to confirm our field classifications.
- Perform laboratory testing on selected samples collected during our subsurface exploration.
- Provide a technical narrative describing surface and subsurface deposits, and local geology of the site, based on the results of our explorations and published geologic mapping.
- Provide a site vicinity map and a site plan showing the locations of the explorations relative to existing site features.
- Provide logs of the explorations, including results of laboratory testing on selected soil samples.
- Provide preliminary geotechnical recommendations for site preparation and earthwork.
- Provide preliminary geotechnical engineering recommendations for design and construction of shallow spread foundations, retaining walls, floor slabs, and flexible pavements.

- Provide recommendations for the Seismic Site Class, mapped maximum considered earthquake spectral response accelerations, and site seismic coefficients.
- Provide a qualitative evaluation of seismic hazards at the site, including liquefaction potential, earthquake-induced settlement and landsliding, and surface rupture due to faulting or lateral spread.
- Provide this written report summarizing the results of our Geotechnical Investigation and preliminary recommendations for the project. This report is considered preliminary, as we have not reviewed final grading plans, finished floor elevations, and/or detailed structural information for the development. An addendum indicating that this report is final, and including supplemental recommendations, if warranted, can be issued after we have reviewed those items.

2.0 SITE INVESTIGATION

2.1 Site Geology

The site is located at the southeast end of the Tualatin Mountains. The Tualatin Mountains separate the Tualatin Valley to the west, the Portland Basin to the northeast, and the Willamette Valley to the southwest. Based on available geologic mapping of the area, the site is underlain by Columbia River Basalt. The Columbia River Basalt consists of numerous fine-grained lava flows that primarily erupted from fissures in present day eastern Washington and Oregon and western Idaho during the Miocene (23.8 to 5.3 million years ago). A thick, clay-rich residual soil often forms on the upper portion of the Columbia River Basalt from the in-place weathering of the rock. The Columbia River Basalt is several thousand feet thick in the vicinity of the site.

2.2 Site Surface Conditions

The site consists of one tax lot totaling approximately 2 acres. A single-family residence and accessory structures were located within the northeast portion of the site. The site was bordered by residential development on all sides. Landis Street and Cornwall Street terminate at the site boundaries. Vegetation on the northeastern portion of the site consists of grasses and scattered deciduous trees. The site generally descended to the south at maximum gradients up to about 2½ horizontal to 1 vertical (2½H:1V).

2.3 Field Investigation

2.3.1 Test Pits

CGT observed the excavation of seven test pits (TP-1 through TP-7) at the site on December 10, 2015, to depths of up to about 10 feet bgs. The test pits were excavated using a John Deere 50G, tracked excavator provided and operated by ICON Construction. The approximate test pit locations are shown on the attached Site Plan, Figure 2. The test pits were located in the field using approximate measurements from existing site features shown on the Site Plan. Upon completion of logging, the test pits were loosely backfilled by ICON Construction with the excavated materials.

Pocket penetrometer readings were taken within the upper 4 feet of selected test pits, where fine-grained soils were present. The pocket penetrometer is a hand-held instrument that provides an approximation of the unconfined compressive strength of cohesive, fine-grained soils. The correlation between pocket penetrometer readings and the consistency of cohesive, fine-grained soils is provided on the attached Figure 3.

2.3.2 Soil Classification & Sampling

Members of CGT's staff logged the soils observed within the explorations in general accordance with the Unified Soil Classification System (USCS) and collected representative samples of the materials encountered. An explanation of the USCS is presented on the attached Soil Classification Criteria and Terminology, Figure 4. Rock encountered within the test pits was logged in accordance with the Oregon Department of Transportation (ODOT) Soil and Rock Classification Manual[1]. An explanation of the rock classification is shown on the attached ODOT Rock Classification Criteria and Terminology, Figure 5. The soil samples were stored in sealable plastic bags and transported to our laboratory for further examination and testing. Our staff visually examined all samples returned to our laboratory in order to refine the field classifications. Logs of the explorations are presented on the attached Exploration Logs, Figures 6 through 12. Surface elevations indicated on the logs and shown on the attached Figure 2 were estimated based on the topographic contours from the MetroMap web application. Elevations shown on the logs should be considered approximate.

2.4 Laboratory Testing

Laboratory testing was performed on samples collected in the field to refine our initial field classifications and determine in-situ parameters. Results of the laboratory tests are shown on the attached Exploration Logs, Figures 6 through 12. Laboratory testing included:

- Seven moisture content determinations (ASTM D2216)
- One Atterberg limits (plasticity index) test (ASTM D4318)

2.5 Subsurface Materials

The following paragraphs provide a description of each of the subsurface materials encountered at the site.

2.5.1 Silty Sand Fill (SM FILL)

Silty sand fill was encountered at the surface of TP-1 and TP-2. This material extended to depths of about 2 feet bgs. The silty sand fill was generally brown, moist, fine- to medium-grained, contained roots (less than 3-inch diameter), and contained fine to coarse angular gravel (up to 4-inch diameter).

2.5.2 Sandy Silt Fill (SM FILL)

Sandy silt fill was encountered beneath the silty sand fill within TP-1 and extended to a depth of about 4½ feet bgs. This material was generally gray, moist, exhibited low plasticity, contained fine to coarse angular gravel, and contained brick and asphalt debris (up to 2-inch diameter).

2.5.3 Native Silty Sand (SM)

Native silty sand was encountered beneath the sandy silt fill within TP-1 and at the surface of TP-3 and TP-4. This material extended to depths up to about 8½ feet bgs. The silty sand was generally medium dense, gray to brown, damp to moist, fine- to medium-grained, and contained gravel and boulders (up to 20-inch diameter).

[1] Oregon Department of Transportation, 1987. Soil and Rock Classification Manual.

2.5.4 Native Sandy Silt (ML)

Native sandy silt was encountered at the surface of TP-5 through TP-7 and extended to depths up to about 2 feet bgs. This material was generally medium stiff to stiff, gray to brown, moist, exhibited low plasticity, contained roots (up to 3-inch diameter), and contained gravel and cobbles (up to 10-inch diameter).

2.5.5 Native Lean Clay (CL)

Native lean clay was encountered beneath the silty sand fill within TP-2, beneath the native silty sand within TP-4, and beneath the sandy silt within TP-5 through TP-7. The lean clay extended to depths up to about 5 feet bgs within TP-2and TP-4through TP-76. The lean clay was generally medium stiff to very stiff, gray-brown, moist, exhibited medium plasticity, and contained sand, gravel, and cobbles (up to 9 inches in diameter).

2.5.6 Predominantly Weathered Basalt

Predominantly weathered basalt was encountered beneath the silty sand within TP-1 and TP-3, and beneath the lean clay within TP-2 and TP-4 through TP-7. The predominantly weathered basalt extended to the full depths explored within these test pits, up to about 10 feet bgs. The weathered basalt was generally very soft (R1), red, gray, brown, tan, and moist.

2.6 Groundwater

Groundwater was not encountered within depths explored on December 10, 2015. Based on our review of available groundwater mapping provided by the United States Geological Survey[2] (USGS), groundwater in the immediate vicinity of the site is estimated to be at a depth in excess of 200 feet bgs. We anticipate groundwater levels will fluctuate due to seasonal and annual variations in precipitation, changes in site utilization, or other factors. In addition, the native sandy silt (ML), native lean clay (CL), and weathered basalt are conducive to the formation of perched water tables.

3.0 SEISMIC CONSIDERATIONS

3.1 Seismic Design

Section 1613.3.2 of the 2014 Oregon Structural Specialty Code (2014 OSSC) requires that the determination of the seismic site class be based on subsurface data in accordance with Chapter 20 of the American Society of Civil Engineers Minimum Design Loads for Buildings and Other Structures (ASCE 7). Based on the results of the explorations and review of geologic mapping, we have assigned the site as Site Class D for the subsurface conditions encountered. Earthquake ground motion parameters for the site were obtained based on the United States Geological Survey (USGS) Seismic Design Values for Buildings - Ground Motion Parameter Web Application[3]. The site Latitude 45.356965° North and Longitude 122.633618° West were input as the site location. The following table shows the recommended seismic design parameters for the site.

[2] "USGS: Estimated Depth to Ground Water and Configuration of the Water Table in the Portland, Oregon Area" http://or.water.usgs.gov/projs_dir/puz/

[3] United States Geological Survey, 2015. Seismic Design Parameters determined using:, "U.S. Seismic Design Maps Web Application - Version 3.1.0," from the USGS website *http://geohazards.usgs.gov/designmaps/us/application.php.*

Table 1 Seismic Ground Motion Values (Section 1613.5 of 2014 OSSC)

Parameter		Value
Mapped Acceleration Parameters	Spectral Acceleration, 0.2 second (S_s)	0.944g
	Spectral Acceleration, 1.0 second (S_1)	0.407g
Coefficients (Site Class D)	Site Coefficient, 0.2 sec. (F_A)	1.122
	Site Coefficient, 1.0 sec. (F_V)	1.593
Adjusted MCE Spectral Response Parameters	MCE Spectral Acceleration, 0.2 sec. (S_{MS})	1.060g
	MCE Spectral Acceleration, 1.0 sec. (S_{M1})	0.648g
Design Spectral Response Accelerations	Design Spectral Acceleration, 0.2 seconds (S_{DS})	0.706g
	Design Spectral Acceleration, 1.0 second (S_{D1})	0.432g
Seismic Design Category		D

3.2 Seismic Hazards

3.2.1 Liquefaction

In general, liquefaction occurs when deposits of loose/soft, saturated, cohesionless soils, generally sands and silts, are subjected to strong earthquake shaking. If these deposits cannot drain quickly enough, pore water pressures can increase, approaching the value of the overburden pressure. The shear strength of a cohesionless soil is directly proportional to the effective stress, which is equal to the difference between the overburden pressure and the pore water pressure. When the pore water pressure increases to the value of the overburden pressure, the shear strength of the soil approaches zero, and the soil can liquefy. The liquefied soils can undergo rapid consolidation or, if unconfined, can flow as a liquid. Structures supported by the liquefied soils can experience rapid, excessive settlement, shearing, or even catastrophic failure.

For fine-grained soils, susceptibility to liquefaction is evaluated based on penetration resistance and plasticity, among other characteristics. Criteria for identifying non-liquefiable, fine-grained soils are constantly evolving. Current practice[4] to identify non-liquefiable, fine-grained soils is based on plasticity characteristics of the soils, as follows: (1) liquid limit greater than 47 percent, (2) plasticity index greater than 20 percent, and (3) moisture content less than 85 percent of the liquid limit. The susceptibility of sands, gravels, and sand-gravel mixtures to liquefaction is typically assessed based on penetration resistance, as measured using SPTs, CPTs, or Becker Hammer Penetration tests (BPTs).

Based on the shallow depth to weathered basalt, the relative plasticity of the clay soils and the estimated depth to groundwater, the soils encountered at the site are considered non-liquefiable within the depths explored.

3.2.2 Slope Instability

Due to the relatively minimal planned changes in site grade and the generally gently-sloping topography, we conclude the risk of seismically-induced slope instability at the site is low.

[4] Seed, R.B. et al., 2003. Recent Advances in Soil Liquefaction Engineering: A Unified and Consistent Framework. Earthquake Engineering Research Center Report No. EERC 2003-06.

3.2.3 Surface Rupture

3.2.3.1 Faulting

Although the site is situated in a region of the country with known active faults and historic seismic activity, no known faults exist on or immediately adjacent to the site. Therefore, the risk of surface rupture at the site due to faulting is considered low.

3.2.3.2 Lateral Spread

Surface rupture due to lateral spread can occur on sites underlain by liquefiable soils that are located on or immediately adjacent to slopes steeper than about 3 degrees (20H:1V), and/or adjacent to a free face, such as a stream bank or the shore of an open body of water. During lateral spread, the materials overlying the liquefied soils are subject to lateral movement downslope or toward the free face. Given the lack of liquefiable soils at the site and the absence of a free face, the risk of surface rupture due to lateral spread is considered negligible.

4.0 CONCLUSIONS

Based on the results of our field explorations and analyses, the site may be developed as described in Section 1.1 of this report, provided the recommendations presented in this report are incorporated into the design and development. The primary geotechnical considerations for this project include:

- Cobbles and Boulders at Foundation/Floor Slab/Pavement Subgrade: Based on our explorations, cobbles and boulders may be encountered at design subgrade elevations for shallow foundations, floor slabs, or pavements. Structural elements placed directly on boulders and cobbles can result in uneven ground response. To minimize this potential, CGT recommends:
  - Boulders encountered during foundation, floor slab, and pavement subgrade preparation be removed in their entirety and replaced with granular structural fill.
  - Foundation subgrades should be covered with a minimum of 6 inches of angular structural fill compacted to a well-keyed condition.
- Existing Structures: Existing structures should be removed prior to redevelopment of the site.
- Moisture Sensitive Soils: The near-surface, native, silty sand (SM), native sandy silt (ML), and native lean clay (CL) are sensitive to small changes in moisture content, and can pose challenges for earthwork performed during wet weather.

5.0 PRELIMINARY RECOMMENDATIONS

The following paragraphs present specific geotechnical recommendations for design and construction of the proposed residential structures at the site. The recommendations presented in this report are based on the information provided to us, results of the field investigation, laboratory data, and professional judgment. CGT has observed only a small portion of the pertinent subsurface conditions. The recommendations are based on the assumption that the subsurface conditions do not deviate appreciably from those found during the field investigation. CGT should be consulted for further recommendations if variations and/or undesirable geotechnical conditions are encountered at the site.

This report is considered preliminary, as we have not reviewed final grading plans, finished floor elevations, and detailed structural information for the development. An addendum indicating that this report is final, and including supplemental recommendations, if warranted, can be issued after we have reviewed those items.

5.1 Site Preparation

5.1.1 Site Stripping

Existing vegetation, topsoil, and fill (SM FILL and ML FILL) should be removed from within, and for a minimum 5-foot margin around, proposed building pad and pavement areas. Based on the results of our field explorations, stripping depths at the site are anticipated to be about 2 to 4½ foot bgs where fill is present and about ½ to 1 foot bgs where fill is not present. These materials may be deeper or shallower at locations away from the completed explorations. A geotechnical representative from CGT should provide recommendations for actual stripping depths based on observations during site stripping. Stripped surface vegetation and rooted soils should be transported off-site for disposal or stockpiled for later use in landscaped areas. Stripped pavements and demolition debris should be transported off site for disposal.

5.1.2 Grubbing

Grubbing of trees should include the removal of the root mass and roots greater than ½-inch in diameter. Grubbed materials should be transported off-site for disposal. Root masses from larger trees may extend greater than 3 feet bgs. Where root masses are removed, the resulting excavation should be properly backfilled with structural fill in conformance with Section 5.4 of this report.

5.1.3 Existing Utilities & Below-Grade Structures

All existing utilities at the site should be identified prior to excavation. Abandoned utility lines beneath new residential structures, pavements, and hardscaping should be completely removed or grouted full. Soft, loose, or otherwise unsuitable soils encountered in utility trench excavations should be removed and replaced with structural fill as described in Section 5.4 of this report. No below-grade structures were encountered in our explorations. If encountered during site preparation, buried structures (i.e. footings, foundation walls, slabs-on-grade, tanks, etc.) should be completely removed and disposed of off-site except for concrete which may, alternatively, be processed for re-use as described in Section 5.4.1.1. Resulting excavations should be backfilled with structural fill as described in Section 5.4 of this report, as needed to achieve design grades.

5.1.4 Erosion Control

Erosion and sedimentation control measures should be employed in accordance with applicable City, County and State regulations regarding erosion control.

5.2 Temporary Excavations

5.2.1 Overview

Conventional earthmoving equipment in proper working condition should be capable of making necessary excavations into the on-site soils. Excavations into the basalt, if needed, may require the use of special excavation methods and/or equipment. Please contact the geotechnical engineer for further evaluation if excavation into the basalt is anticipated based on final plans.

All excavations should be in accordance with applicable OSHA and state regulations. It is the contractor's responsibility to select the excavation methods, to monitor site excavations for safety, and to provide any shoring required to protect personnel and adjacent improvements. A “competent person”, as defined by OR-OSHA, should be on site during construction in accordance with regulations presented by OR-OSHA. CGT’s current role on the project does not include review or oversight of excavation safety.

5.2.2 OSHA Soil Class

For use in the planning and construction of temporary excavations up to 8 feet in depth at the site, an OSHA soil type "C" should be used for the native, silty sand (SM), native sandy silt (ML), and native lean clay (CL). Special consideration may be required where boulders are encountered during excavation or are present within excavation sidewalls.

5.2.3 Utility Trenches

Temporary trench cuts in native soils described earlier should stand near vertical to depths of approximately 4 feet. Caving should be expected where the native soils contain boulders. Some instability may occur if groundwater seepage is encountered. If seepage undermines the stability of the trench, or if caving of the sidewalls is observed during excavation, the sidewalls should be flattened or shored. Depending on the time of year trench excavations occur, trench dewatering may be required in order to maintain dry working conditions, particularly if the invert elevations of the proposed utilities are below the groundwater level. Pumping from sumps located within the trench will likely be effective in removing water resulting from seepage. If groundwater is present at the base of utility excavations, we recommend placing trench stabilization material at the base of the excavations. Trench stabilization material should be in conformance with Section 5.4.4 of this report.

5.2.4 Excavations Near Existing Foundations

Temporary excavations near existing footings should not extend within a 1½H:1V (horizontal to vertical) plane projected out and down from the outside, bottom edge of the footings. In the event that excavation needs to extend below the referenced plane, temporary shoring of the excavation and/or underpinning of the footing may be required. The geotechnical engineer should be consulted to review proposed excavation plans for this design case to provide specific recommendations.

5.3 Wet Weather Considerations

For planning purposes, the wet season should be considered to extend from late September to late June. It is our experience that dry weather working conditions should prevail between early July and the middle of September. Notwithstanding the above, soil conditions should be evaluated in the field by the geotechnical engineer or his representative at the initial stage of site preparation to determine whether the recommendations within this section should be incorporated into construction.

5.3.1 General Considerations

The near-surface, native, silty sand (SM), native sandy silt (ML), and native lean clay (CL) encountered within our explorations are susceptible to disturbance during wet weather. Trafficability of these soils may be difficult, and significant damage to subgrade soils will likely occur, if earthwork is undertaken without proper precautions at times when the exposed soils are more than a few percentage points above optimum moisture content. For construction that occurs during the wet season, methods to limit soil disturbance should be employed. Site preparation activities may need to be accomplished using track-mounted equipment, loading removed material onto trucks supported on granular haul roads. Soils that have been disturbed during site preparation activities should be over-excavated to firm, stable subgrade, and replaced with imported granular structural fill.

5.3.2 Geotextile Separation Fabric

We recommend placing geotextile separation fabric to serve as a barrier between the fine-grained subgrade and imported fill in areas of repeated or heavy construction traffic. The geotextile fabric should be in conformance with Section 02320 of the current Oregon Department of Transportation (ODOT) Standard Specification for Construction. Please refer to Table 02320-4 of the 2015 ODOT specifications for specific requirements.

5.3.3 Granular Working Surfaces (Haul Roads & Staging Areas)

Haul roads subjected to repeated heavy, tire-mounted, construction traffic (e.g. dump trucks, concrete trucks, etc.) will require a minimum of 18 inches of imported granular material. The prepared subgrade should be covered with geotextile fabric prior to placement of the imported granular material. The imported granular material should be placed in a single lift (up to 24 inches deep) and compacted using a smooth-drum, non-vibratory roller until well-keyed.

For light staging areas, 12 inches of imported granular material should be sufficient. Additional granular material or geo-grid reinforcement may be recommended based on site conditions and/or loading at the time of construction. The imported granular material should be in conformance with Section 5.4.2 of this report and have less than 5 percent material passing the U.S. Standard No. 200 Sieve.

5.3.4 Footing Subgrade Protection

A minimum of 3 inches of imported granular material is recommended to protect fine-grained, footing subgrades from foot traffic during inclement weather. The imported granular material should be in conformance with Section 5.4.2 of this report. The maximum particle size should be limited to 1 inch. The imported granular material should be placed in one lift over the prepared, undisturbed subgrade, and compacted using non-vibratory equipment until well keyed.

5.4 Structural Fill

The geotechnical engineer should be provided the opportunity to review all materials considered for use as structural fill a minimum of five business days prior to placement. If the gradation and proctor test results are not available or are more than three months old, samples of the proposed structural fill materials should be submitted to the geotechnical engineer for testing a minimum of five business day prior to use on site.

The geotechnical engineer or his representative should be contacted to evaluate compaction of structural fill as the material is being placed. Evaluation of compaction may take the form of in-place density tests and/or proof-roll tests with suitable equipment. Compaction of structural fill should be evaluated at intervals not exceeding every 2 vertical feet as the fill is being placed.

5.4.1 On-Site Soils (General Use)

5.4.1.1 Concrete Debris

Concrete debris resulting from the demolition of existing structures (foundations, floor slabs, etc.) can be re-used as structural fill if processed/crushed into material that is fairly well graded between coarse and fine particle sizes. The processed/crushed concrete should contain no organic matter, debris, or particles larger than 4 inches in diameter. Moisture conditioning (wetting) should be expected in order to achieve adequate compaction. When used as structural fill, this material should be placed and compacted in general accordance with Section 5.4.2 of this report. Such materials should be “capped” with a minimum of 12 inches

of ¾ -inch-minus (or finer) granular fill under all structural elements (footings, and, pavements, etc.). The capping material below slabs-on-grade (base rock) should consist of material as described in Section 5.4.3.

5.4.1.2 Silty sand (SM), Sandy Silt (ML) and Lean Clay (CL)

Re-use of on-site soils with fines contents over about 5 percent as structural fill may be difficult because these soils are sensitive to small changes in moisture content and are difficult, if not impossible, to adequately compact during wet weather. We anticipate the moisture content of these soils will be higher than the optimum moisture content for satisfactory compaction. Therefore, moisture conditioning (drying) should be expected in order to achieve adequate compaction. If used as structural fill, these soils should be free of organic matter, debris, and particles larger than 4 inches. Processing of the clay should include removal of boulders in excess of 4 inches in diameter. When used as structural fill, these soils should be placed in lifts with a maximum loose thickness of about 8 inches at moisture contents within –1 and +3 percent of optimum, and compacted to not less than 93 percent of the material's maximum dry density, as determined in general accordance with ASTM D1557 (Modified Proctor). If these soils cannot be properly moisture-conditioned and processed, we recommend using imported granular material for structural fill.

5.4.2 Imported Granular Structural Fill (General Use)

Imported granular structural fill should consist of angular pit or quarry run rock, crushed rock, or crushed gravel that is fairly well graded between coarse and fine particle sizes. The granular fill should contain no organic matter, debris, or particles larger than 1½ inches, and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. The percentage of fines can be increased to 12 percent of the material passing the U.S. Standard No. 200 Sieve if placed during dry weather, and provided the fill material is moisture-conditioned, as necessary, for proper compaction. Granular fill material should be placed in lifts with a maximum loose thickness of about 12 inches, and compacted to not less than 93 percent of the material's maximum dry density, as determined in general accordance with ASTM D1557 (Modified Proctor). Proper moisture conditioning and the use of vibratory equipment will facilitate compaction of these materials.

Compaction of granular fill materials with high percentages of particle sizes in excess of 1½ inches should be evaluated by periodic proof-roll observation or continuous observation by the CGT geotechnical representative during fill placement, since it cannot be tested conventionally using a nuclear densometer. Such materials should be "capped" with a minimum of 12 inches of 1½-inch-minus (or finer) granular fill under all structural elements (footings, concrete slabs, pavements, etc.).

5.4.3 Floor Slab Base Rock

Floor slab base rock should consist of well-graded granular material (crushed rock) containing no organic matter or debris, have a maximum particle size of ¾-inch, and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. Floor slab base rock should be placed in one lift and compacted to not less than 90 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor).

5.4.4 Trench Base Stabilization Material

If groundwater is present at the base of utility excavations, stabilization material should be placed to help stabilize the base of the trench. Trench base stabilization material should consist of at least 1 foot of well-graded granular material with a maximum particle size of 4 inches and less than 5 percent material passing the U.S. Standard No. 4 Sieve. The material should be free of organic matter and other deleterious material, placed in one lift, and compacted until well-keyed.

5.4.5 Trench Backfill Material

Trench backfill for the utility pipe base and pipe zone should consist of granular material as recommended by the utility pipe manufacturer. Trench backfill above the pipe zone should consist of well-graded granular material containing no organic matter or debris, have a maximum particle size of ¾ inch, and have less than 8 percent material passing the U.S. Standard No. 200 Sieve. As a guideline, trench backfill should be placed in maximum 12-inch thick lifts. The earthwork contractor may elect to use alternative lift thicknesses based on their experience with specific equipment and fill material conditions during construction in order to achieve the required compaction. The following table presents recommended relative compaction percentages for utility trench backfill.

Table 2 Utility Trench Backfill Compaction Recommendations

Backfill Zone	Recommended Minimum Relative Compaction	
	Structural Areas[1]	Landscaping Areas
Pipe Base and Within Pipe Zone	90% ASTM D1557 or pipe manufacturer's recommendation	85% ASTM D1557 or pipe manufacturer's recommendation
Above Pipe Zone	92% ASTM D1557	88% ASTM D1557
Within 3 Feet of Design Subgrade	93% ASTM D1557	88% ASTM D1557
[1]Includes proposed residential structures, driveways, hardscaping, roadways, etc.		

5.5 Permanent Slopes

5.5.1 Overview

Permanent cut or fill slopes constructed at the site should be graded at 2H:1V or flatter. Constructed slopes should be overbuilt by a few feet depending on their size and gradient so that they can be properly compacted prior to being cut to final grade. The surface of all slopes should be protected from erosion by seeding, sodding, or other acceptable means. Adjacent on-site and off-site structures should be located at least 5 feet from the top of slopes.

5.5.2 Placement of Fill on Slopes

New fill should be placed and compacted against horizontal surfaces. Where fill is placed on existing slopes which exceed 5H:1V (horizontal to vertical), the existing slopes should be keyed and benched prior to structural fill placement in general accordance with the attached Fill Slope Detail, Figure 13. If subdrains are needed on benches, subject to the review of the CGT geotechnical representative, they should be placed as shown on the attached Fill Slope Detail, Figure 13. In order to achieve well-compacted slope faces, slopes should be overbuilt by a few feet and then trimmed back to proposed final grades. A representative from CGT should observe the benches, keyways, and associated subdrains, if needed, prior to placement of structural fill.

5.6 Shallow Spread Foundations

5.6.1 Subgrade Preparation

Satisfactory subgrade support for shallow foundations associated with the planned building addition can be obtained from the native medium dense to better, silty sand (SM), the native, medium stiff to better, sandy silt (ML), and native, medium stiff to better, lean clay (CL), or on structural fill that is properly placed and

compacted on this material during construction. These materials were encountered at depths of about 0 to 4½ feet bgs in the explorations.

Boulders encountered during foundation excavation should be removed and replaced with granular structural fill. The geotechnical engineer or his representative should be contacted to observe subgrade conditions prior to placement of forms, reinforcement steel, or granular backfill (if required). If soft, loose, or otherwise unsuitable soils are encountered, they should be over-excavated as recommended by the geotechnical representative at the time of construction. The resulting over-excavation should be brought back to grade with imported granular structural fill in conformance with Section 5.4.2 of this report. The maximum particle size of over-excavation backfill should be limited to 1½ inches and ¾ inch within 12 inches of the bottom of new structural elements, (footings, concrete slabs, pavements, etc.). All granular pads for footings should be constructed a minimum of 6 inches wider on each side of the footing for every vertical foot of over-excavation.

5.6.2 Minimum Footing Width & Embedment

Minimum footing widths should be in conformance with the most recent, Oregon Structural Specialty Code (OSSC). As a guideline, CGT recommends individual spread footings should have a minimum width of 24 inches. Similarly, for one-story, light-framed structures, we recommend continuous wall footings have a minimum width of 12 inches. For two-, three-, and four-story, light-framed structures, we recommend continuous wall footings have a minimum width of 15, 18, and 24 inches, respectively. All footings should be founded at least 18 inches below the lowest, permanent adjacent grade.

5.6.3 Bearing Pressure & Settlement

The minimum footing dimensions described above will likely govern footing sizes. Nonetheless, footings founded as recommended above, should be proportioned for a maximum allowable soil bearing pressure of 1,500 pounds per square foot (psf). This bearing pressure is a net bearing pressure, applies to the total of dead and long-term live loads, and may be increased by one-third when considering seismic or wind loads. For the recommended design bearing pressure, total settlement of footings is anticipated to be less than 1 inch. Differential settlements between adjacent columns and/or bearing walls should not exceed ½-inch. Based on the soils encountered in the explorations and soils encountered during excavation, limited (less than 1-foot) over-excavation/backfill should be anticipated in some areas in order to achieve the indicated allowable soil bearing pressure.

5.6.4 Lateral Capacity

A maximum passive (equivalent-fluid) earth pressure of 150 pounds per cubic foot (pcf) is recommended for design for footings confined by the native soils described earlier or imported granular structural fill that is properly placed and compacted during construction. The recommended earth pressure was developed using a factor of safety of 1½, which is appropriate due to the amount of movement required to develop full passive resistance. In order to develop the above capacity, the following should be understood:

1. Concrete must be poured neat in the excavation or the perimeter of the foundation must be backfilled with imported granular structural fill,
2. The adjacent grade must be level or rising away from the footing,
3. The static ground water level must remain below the base of the foundation throughout the year, and
4. Adjacent development (e.g. slabs, pavements, etc.) and/or the upper 12 inches of adjacent unpaved, structural fill areas should not be considered when calculating passive resistance.

An ultimate coefficient of friction equal to 0.45 may be used when calculating resistance to sliding for footings founded on a minimum of 6 inches of imported granular structural fill (crushed rock) that is properly placed and compacted during construction.

5.6.5 Subsurface Drainage

Recognizing the fine-grained soils encountered at this site, placement of foundation drains is recommended at the outside base elevations of perimeter continuous wall footings. Foundation drains should consist of a minimum 4-inch diameter, perforated, PVC drainpipe wrapped with a non-woven geotextile filter fabric. The drains should be backfilled with a minimum of 2 cubic feet of open graded drain rock per lineal foot of pipe. The drain rock should also be encased in a geotextile fabric in order to provide separation from the surrounding clayey soils. Foundation drains should be positively sloped and should outlet to a suitable discharge point. The geotechnical engineer or his representative should observe the drains prior to backfilling. Roof drains should not be tied into foundation drains.

5.7 Floor Slabs

5.7.1 Subgrade Preparation

Satisfactory subgrade support for floor slabs constructed on grade, supporting up to 150 psf area loading, can be obtained from native medium dense to better, silty sand (SM), the native, medium stiff to better, sandy silt (ML), and native, medium stiff to better, lean clay (CL), or on structural fill that is properly placed and compacted on this material during construction. Boulders encountered during floor slab excavation should be removed and replaced with granular structural fill. The geotechnical engineer or his representative should observe floor slab subgrade soils to evaluate surface consistencies. If soft, loose, or otherwise unsuitable soils are encountered, they should be over-excavated as recommended by the CGT geotechnical representative at the time of construction. The resulting over-excavation should be brought back to grade with imported granular structural fill as described in Section 5.4.2 of this report.

5.7.2 Crushed Rock Base

Concrete floor slabs should be supported on a minimum 6-inch thick layer of crushed rock base in conformance with Section 5.4.3 of this report. We recommend “choking” the surface of the base rock with sand just prior to concrete placement. Choking means the voids between the largest aggregate particles are filled with sand, but does not provide a layer of sand above the base rock. Choking the base rock surface reduces the lateral restraint on the bottom of the concrete during curing. Choking the base rock also reduces punctures in overlying vapor retarding membranes due to foot traffic where such membranes are used.

5.7.3 Design Considerations

For floor slabs constructed as recommended, an equivalent modulus of subgrade reaction of 75 pounds per cubic inch (pci) is recommended for the design of the floor slab. If a higher equivalent modulus of subgrade reaction value is required, this can be achieved with a thicker base rock section below the slab. For example, on this project, the use of a 12-inch thick base rock section below the slab would allow the use of an equivalent modulus of subgrade reaction value of 100 pci. Please consult the geotechnical engineer if alternative values are needed. Floor slabs constructed as recommended will likely settle less than ½-inch. For general floor slab construction, slabs should be jointed around columns and walls to permit slabs and foundations to settle differentially.

5.7.4 Subgrade Moisture Considerations

Liquid moisture and moisture vapor should be expected at the subgrade surface. The crushed rock base recommended above typically serves as a capillary break and provides protection against liquid moisture. Where moisture vapor emission through the slab must be minimized, e.g. impervious floor coverings, storage of moisture sensitive materials directly on the slab surface, etc., a vapor retarding membrane or vapor barrier below the slab should be considered. Factors such as cost, special considerations for construction, floor coverings, and end use suggest that the decision regarding a vapor retarding membrane or vapor barrier be made by the architect and owner.

If a vapor retarder or vapor barrier is placed below the slab, its location should be based on current American Concrete Institute (ACI) guidelines, ACI 302 Guide for Concrete Floor and Slab Construction. In some cases, this indicates placement of concrete directly on the vapor retarder or barrier. Please note that the placement of concrete directly on impervious membranes increases the risk of plastic shrinkage cracking and slab curling in the concrete. Construction practices to reduce or eliminate such risk, as described in ACI 302, should be employed during concrete placement.

5.8 Pavements

5.8.1 Subgrade Preparation

In general, the subgrade soils encountered should be suitable for pavement support. However, depending on final subgrade elevations, weather conditions and soils encountered at the time of construction, a contingency for limited over-excavation and replaced with imported granular structural fill in conformance with Section 5.4.2 of this report, and the use of geotextile fabric should be planned. When evaluating its suitability as a pavement subgrade, the presence of stress concentrators (large cobbles and boulders) within 12 inches of the design pavement section should also be precluded whenever possible.
Additional subgrade improvement may be required based on the subgrade conditions encountered during construction. Where silt or clay soils are exposed at the subgrade surface, geotextile fabric should be placed at the subgrade surface prior to placing the base rock section.

5.8.1.1 Dry Weather Construction
After site preparation as recommended above, but prior to placement of fill and/or base rock, the geotechnical engineer or his representative should observe a proof roll test of the exposed subgrade soils in order to identify areas of excessive yielding. Proof rolling of subgrade soils is typically conducted during dry weather conditions using a fully-loaded, 10- to 12-cubic-yard, tire-mounted, tandem-axle dump truck or equivalent weighted water truck. Areas that appear too soft and wet to support proof rolling equipment should be prepared in general accordance with the recommendations for wet weather construction presented in Section 5.3 of this report. If areas of soft soil or excessive yielding are identified, the affected material should be over-excavated to firm, stable subgrade, and replaced with imported granular structural fill in conformance with Section 5.4.2 of this report.

5.8.1.2 Wet Weather Construction
Preparation of pavement subgrade soils during wet weather should be in conformance with Section 5.3 of this report. As indicated therein, increased base rock sections and a geotextile separation fabric may be required in wet conditions.

5.8.2 Input Parameters

Design of the flexible pavement sections presented below was based on the parameters presented in the following table, procedures in the American Association of State Highway and Transportation Officials (AASHTO) 1993 "Design of Pavement Structures" manual, ODOT Pavement Design Guide 2011, and the Asphalt Pavement Association of Oregon Asphalt Pavement Design Guide. If any of the items listed need revised, please contact us and we will reassess the provided design sections.

Table 3 Input Parameters Assigned for Pavement Design

Input Parameter	Design Value[1]		Input Parameter		Design Value[1]
Pavement Design Life	20 years		Resilient Modulus[4]	Suitable Silt, Silty Sand, Lean Clay Subgrade	5,000 psi
Annual Percent Growth	0 percent			Crushed Aggregate Base	22,500 psi
Serviceability	4.2 initial, 2.5 terminal		Structural Coefficient[2]	Crushed Aggregate Base	0.08
Reliability[2]	75 percent			Asphalt	0.42
Standard Deviation[2]	0.49		Vehicle Traffic[5]	APAO Level I "Residential Driveways"	Less than 10,000 ESAL
Drainage Factor[3]	1.0			APAO Level II "Residential Streets"	Less than 50,000 ESAL

[1] If any of the above parameters are incorrect, please contact us so that we may revise our recommendations, if warranted.
[2] Value based on guidelines presented in Section 5.3 of the 2011 ODOT Pavement Design Manual for flexible pavements, local streets.
[3] Assumes good drainage away from pavement, base, and subgrade is achieved by proper crowning of subgrades.
[4] Values based on experience with similar soils prepared as recommended in this report.
[5] ESAL = Total 18-Kip equivalent single axle load. Traffic levels taken from Table 3.1 of APAO manual. If an increased traffic load is estimated, please contact us so that we may refine the traffic loading and revise our recommendations, if warranted.
[6] Suitability of subgrade at the time of construction and may require limited over-excavation as described in Section 5.8.1 of this report. A contingency for such over-excavation is recommended. Evaluation of actual requirements should be made at the time of construction based on actual subgrade soils encountered.

5.8.3 Recommended Minimum Sections

The following table presents the minimum recommended flexible pavement sections for the traffic levels indicated in the preceding table, based on the referenced AASHTO procedures.

Table 4 Recommended Minimum Pavement Sections

Material	Minimum Thickness (inches)[1]	
	APAO Level I (Residential Driveways)	APAO Level II (Residential Streets)
Asphalt Pavement (inches)	3	4
Crushed Aggregate Base (inches)[2]	12	12
Subgrade Soils	Prepared in accordance with Section 5.8.1 of this report. Silt or clay subgrade soils should be covered with geotextile fabric prior to placing base rock materials.	

[1] Subject to review of Clackamas County standard structural sections and functional classification of subject roadway.
[2] Thickness shown assumes dry weather construction. Geotextile separation fabric required regardless of weather conditions. Additional granular over-excavation/backfill (sub-base) section may be required in wet weather or otherwise unsuitable subgrade conditions. Refer to Section 5.3 and for additional discussion.

5.8.4 Asphalt & Base Course Materials

Asphalt pavement and base course material should conform to the most recent State of Oregon Standard Specifications for Highway Construction. Place aggregate base in one lift, and compact to not less than 95 percent of the material's maximum dry density, as determined in general accordance with ASTM D1557 (Modified Proctor). Asphalt pavement should be compacted to at least 91 percent of the material's theoretical maximum density, as determined in general accordance with ASTM D2041 (Rice Specific Gravity).

5.8.5 Rigid Retaining Walls

At this time, we are not aware of final grading plans and the presence or absence of retaining walls within the overall development except those that might be related to basement walls. The following preliminary recommendations are provided for preliminary design purposes and are based on the assumption that silt or clay soils will be the predominant soil retained by the basement walls.

5.8.5.1 Footings

Retaining wall footings should be designed and constructed in conformance with the recommendations presented in Section 8.5 of this report, as applicable.

5.8.5.2 Wall Drains

We recommend retaining wall drains consist of a minimum 4-inch diameter, perforated, HDPE (High Density Poly-Ethylene) drainpipe wrapped with a non-woven geotextile filter fabric. The drains should be backfilled with a minimum of 2 cubic feet of open graded drain rock per lineal foot of pipe. The drain rock should be encased in a geotextile fabric in order to provide separation from the surrounding soils. Retaining wall drains should be positively sloped and should outlet to a suitable discharge point. The geotechnical engineer or his representative should be contacted to observe the drains prior to backfilling.

5.8.5.3 Backfill

Retaining walls should be backfilled with imported granular structural fill in conformance with Section **Error! Reference source not found.** of this report and contain less than 5 percent passing the U.S. Standard No. 200 Sieve. The backfill should be compacted to a minimum of 90 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor). When placing fill behind walls, care must be taken to minimize undue lateral loads on the walls. Heavy compaction equipment should be kept at least "H" feet from the back of the walls, where "H" is the height of the wall. Light mechanical or hand tamping equipment should be used for compaction of backfill materials within "H" feet of the back of the walls.

5.8.5.4 Design Considerations

For rigid retaining walls founded, backfilled, and drained as recommended above, the following table presents parameters recommended for design.

Table 5 Design Parameters for Rigid Retaining Walls

Retaining Wall Condition	Modeled Backfill Condition	Static Equivalent Fluid Pressure (S_A)	Additional Seismic Equivalent Fluid Pressure (S_{AE})	Surcharge from Uniform Load, q, Acting on Backfill Behind Retaining Wall
Not Restrained from Rotation	Level (i = 0)	34 pcf	12 pcf	0.30*q
Restrained from Rotation	Level (i = 0)	58 pcf	6 pcf	0.50*q
Note 1. Refer to the attached Figure 14 for a graphical representation of static and seismic loading conditions. Seismic component of active thrust acts at 0.6H above the base of the wall. Note 2. Seismic (dynamic) lateral loads were computed using the Mononobe-Okabe Equation as presented in the 1997 Federal Highway Administration (FHWA) design manual.				

The above design recommendations are based on the assumptions that:

(1) the walls consist of concrete cantilevered retaining walls (β = 0 and δ = 24 degrees, see Figure 14).
(2) the walls are 10 feet or less in height.
(3) the backfill is drained and consists of imported granular structural fill (ϕ = 38 degrees).
(4) no line load, point, or area load surcharges are imposed behind the walls.
(5) the grade behind the wall is level, or sloping down and away from the wall, for a distance of 10 feet or more from the wall.
(6) the grade in front of the walls is level or sloping up for a distance of at least 5 feet from the wall.

Re-evaluation of our recommendations will be required if the retaining wall design criteria for the project vary from these assumptions.

5.9 Additional Considerations

5.9.1 Drainage

Subsurface drains should be connected to the nearest storm drain, on-site infiltration system (if selected and designed by others), or other suitable discharge point. Paved surfaces and ground near or adjacent to the buildings should be sloped to drain away from the buildings. Surface water from paved surfaces and open spaces should be collected and routed to a suitable discharge point. Surface water should not be directed into foundation drains or onto site slopes.

5.9.1 Expansive Potential

The near surface native soils consisted of silty sand (SM), sandy silt (ML), and lean clay (CL), with boulders noted in some areas. Based on experience with similar soils in the area of the site, these soils are considered to have a low susceptibility to volume change due to changes in moisture content.

6.0 RECOMMENDED ADDITIONAL SERVICES

Satisfactory earthwork, foundation, floor slab, and pavement performance depends to a large degree on the quality of construction. Sufficient observation of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. Subsurface conditions observed during construction should be compared with those encountered during subsurface explorations, and recognition of changed conditions often requires experience. We recommend that qualified

personnel visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those observed to date and anticipated in this report.

The project geotechnical engineer or their representative should provide observations and/or testing of at least the following earthwork elements during construction:

- Site Stripping & Grubbing
- Subgrade Preparation for Structural Fills, Shallow Foundations, Floor Slabs, and Pavements
- Compaction of Structural Fill and Utility Trench Backfill
- Compaction of Base Rock for Floor Slabs and Pavements

It is imperative that the owner and/or contractor request earthwork observations and testing at a frequency sufficient to allow the geotechnical engineer to provide a final letter of compliance for the earthwork activities.

7.0 LIMITATIONS

We have prepared this report for use by the owner/developer and other members of the design and construction team for the proposed development. The opinions and recommendations contained within this report are not intended to be, nor should they be construed as a warranty of subsurface conditions, but are forwarded to assist in the planning and design process.

We have made observations based on our explorations that indicate the soil conditions at only those specific locations and only to the depths penetrated. These observations do not necessarily reflect soil types, strata thickness, or water level variations that may exist between or away from our explorations. If subsurface conditions vary from those encountered in our site explorations, CGT should be alerted to the change in conditions so that we may provide additional geotechnical recommendations, if necessary. Observation by experienced geotechnical personnel should be considered an integral part of the construction process.

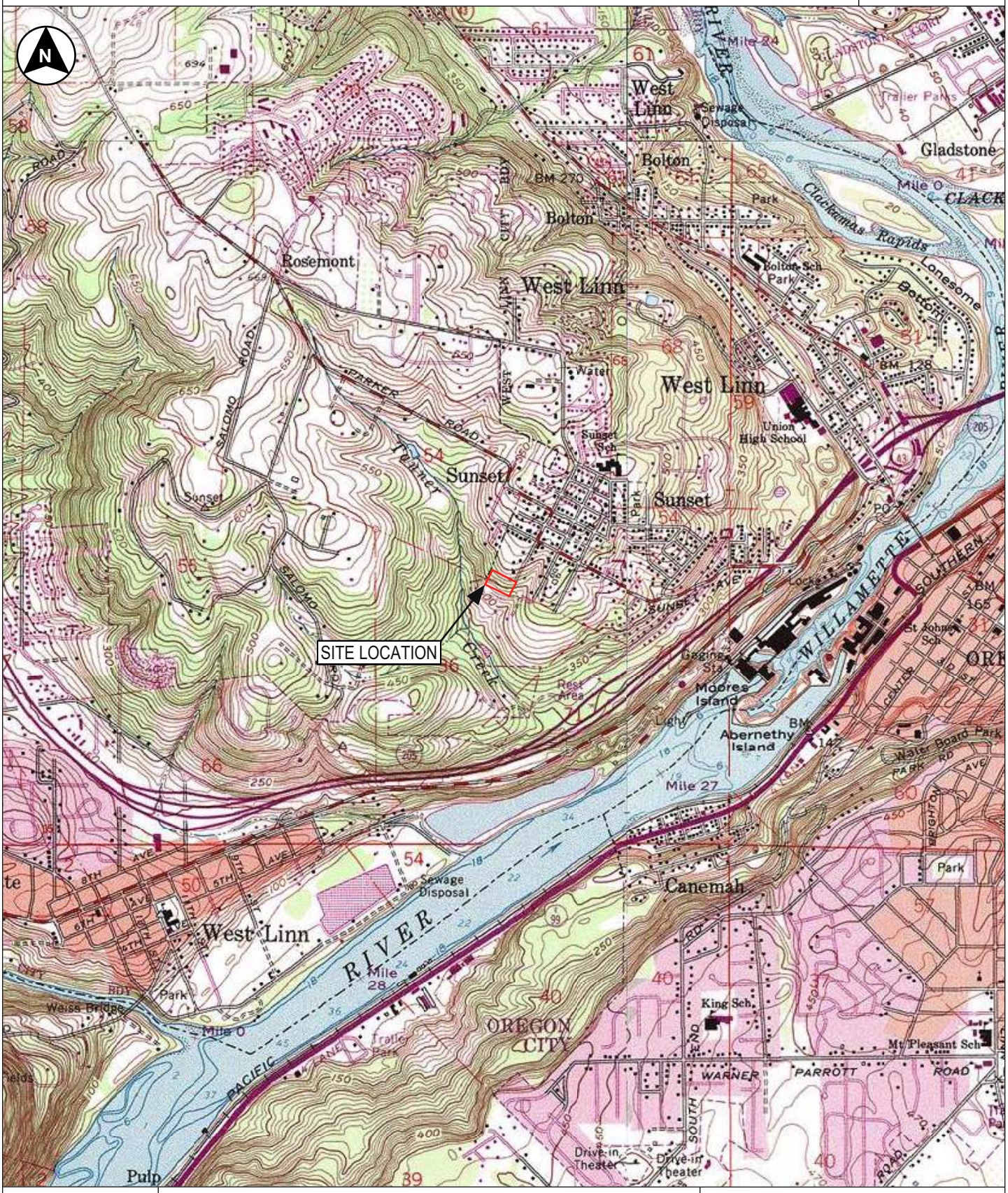
The owner/developer is responsible for ensuring that the project designers and contractors implement our recommendations. When the design has been finalized, prior to releasing bid packets to contractors, we recommend that the design drawings and specifications be reviewed by our firm to see that our recommendations have been interpreted and implemented as intended. If design changes are made, we request that we be retained to review our conclusions and recommendations and to provide a written modification or verification. Design review and construction phase testing and observation services are beyond the scope of our current assignment, but will be provided for an additional fee.

The scope of our services does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in our report for consideration in design.

Geotechnical engineering and the geologic sciences are characterized by a degree of uncertainty. Professional judgments presented in this report are based on our understanding of the proposed construction, familiarity with similar projects in the area, and on general experience. Within the limitations of scope, schedule, and budget, our services have been executed in accordance with the generally accepted practices in this area at the time this report was prepared; no warranty, expressed or implied, is made. This report is subject to review and should not be relied upon after a period of three years.

CORNWALL STREET SUBDIVISION - WEST LINN, OREGON
Project Number G1504283

FIGURE 1
Site Location



CARLSON CGT GEOTECHNICAL 503-601-8250

Map created with TOPO!™, © 2006 National Geographic Holdings
USGS 7.5 Minute Topographic Map Series, Canby, Oregon Quadrangle.

Township 2 South, Range 1 East, Section 36 Willamette Meridian

Latitude: 45.356965
Longitude: -122.633618

1 Inch = 2,000 feet

0 2000 4000

CORNWALL STREET SUBDIVISION - WEST LINN, OREGON
Project Number G1504283

FIGURE 2

Site Plan

CARLSON GT GEOTECHNICAL 503-601-8250

LEGEND

TP-1 Test pit

1 Orientation of site photographs shown on Figure 3

1 Inch = 100 Feet

0 100 200

NOTES: Drawing based on observations made while on site and site plans provided by client. All exploration locations should be considered approximate.

Photograph 1: Looking southwest towards the south margin of the site from just south of the existing residence.

Photograph 2: Looking south from the southeast towards the south-east corner of the site from just south of the existing residence.

Photograph 3: Looking northwest along the south margin of the site from within Lot 7.

Photograph 4: Looking north-northwest towards the northwest margin of the site from the proposed alignment of Landis Street.

Classification of Terms and Content

NAME: MINOR Constituents (12-50%); MAJOR Constituents (>50%); Slightly (5-12%)
Relative Density or Consistency
Color
Moisture Content
Plasticity
Trace Constituents (0-5%)
Other: Grain Shape, Approximate Gradation, Organics, Cement, Structure, Odor...
Geologic Name or Formation: Fill, Willamette Silt, Till, Alluvium, etc.

USCS Grain Size

Fines		<#200 (.075 mm)
Sand	Fine Medium Coarse	#200 - #40 (.425 mm) #40 - #10 (2 mm) #10 - #4 (4.75)
Gravel	Fine Coarse	#4 - 0.75 inch 0.75 inch - 3 inches
Cobbles		3 to 12 inches; scattered <15% est. numerous >15% est.
Boulders		> 12 inches

Relative Density or Consistency

Granular Material		Fine-Grained (cohesive) Materials				
SPT N-Value	Density	SPT N-Value	Torvane tsf Shear Strength	Pocket Pen tsf Unconfined	Consistency	Manual Penetration Test
		<2	<0.13	<0.25	Very Soft	Thumb penetrates more than 1 inch
0 - 4	Very Loose	2 - 4	0.13 - 0.25	0.25 - 0.50	Soft	Thumb penetrates about 1 inch
4 - 10	Loose	4 - 8	0.25 - 0.50	0.50 - 1.00	Medium Stiff	Thumb penetrates about ¼ inch
10 - 30	Medium Dense	8 - 15	0.50 - 1.00	1.00 - 2.00	Stiff	Thumb penetrates less than ¼ inch
30 - 50	Dense	15 - 30	1.00 - 2.00	2.00 - 4.00	Very Stiff	Readily indented by thumbnail
>50	Very Dense	>30	>2.00	>4.00	Hard	Difficult to indent by thumbnail

Moisture Content

Dry: Absence of moisture, dusty, dry to the touch
Damp: Some moisture but leaves no moisture on hand
Moist: Leaves moisture on hand
Wet: Visible free water, likely from below water table

	Plasticity	Dry Strength	Dilatancy	Toughness
ML	Non to Low	Non to Low	Slow to Rapid	Low, can't roll
CL	Low to Medium	Medium to High	None to Slow	Medium
MH	Medium to High	Low to Medium	None to Slow	Low to Medium
CH	Medium to High	High to Very High	None	High

Structure

Stratified: Alternating layers of material or color >6 mm thick
Laminated: Alternating layers < 6 mm thick
Fissured: Breaks along definite fracture planes
Slickensided: Striated, polished, or glossy fracture planes
Blocky: Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lenses: Has small pockets of different soils, note thickness
Homogeneous: Same color and appearance throughout

Unified Soil Classification Chart (Visual-Manual Procedure) (Similar to ASTM Designation D-2487)

Major Divisions			Group Symbols	Typical Names
Coarse Grained Soils: More than 50% retained on No. 200 sieve	Gravels: 50% or more *retained* on the No. 4 sieve	Clean Gravels	GW	Well-graded gravels and gravel/sand mixtures, little or no fines
			GP	Poorly-graded gravels and gravel/sand mixtures, little or no fines
		Gravels with Fines	GM	Silty gravels, gravel/sand/silt mixtures
			GC	Clayey gravels, gravel/sand/clay mixtures
	Sands: More than 50% *passing* the No. 4 sieve	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines
			SP	Poorly-graded sands and gravelly sands, little or no fines
		Sands with Fines	SM	Silty sands, sand/silt mixtures
			SC	Clayey sands, sand/clay mixtures
Fine-Grained Soils: 50% or more Passes No. 200 Sieve	Silt and Clays Low Plasticity Fines		ML	Inorganic silts, rock flour, clayey silts
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
			OL	Organic silt and organic silty clays of low plasticity
	Silt and Clays High Plasticity Fines		MH	Inorganic silts, clayey silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat, muck, and other highly organic soils

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Additional References:
ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes and
ASTM D2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)

Table 22: Scale of Relative Rock Weathering

Designation	Field Identification
Fresh	Crystals are bright. Discontinuities may show some minor surface staining. No discoloration in rock fabric.
Slightly Weathered	Rock mass is generally fresh. Discontinuities are stained and may contain clay. Some discoloration in rock fabric. Decomposition extends up to 1-inch into rock.
Moderately Weathered	Rock mass is decomposed 50% or less. Significant portions of rock show discoloration and weathering effects. Crystals are dull and show visible chemical alteration. Discontinuities are stained and may contain secondary mineral deposits.
Predominantly Weathered	Rock mass is more than 50% decomposed. Rock can be excavated with geologist's pick. All discontinuities exhibit secondary mineralization. Complete discoloration of rock fabric. Surface of core is friable and usually pitted due to washing out of highly altered minerals by drilling water.
Decomposed	Rock mass is completely decomposed. Original rock fabric may be evident. May be reduced to soil with hand pressure.

Table 23: Scale of Relative Rock Hardness

Term	Hardness Designation	Field Identification	Approximate Unconfined Compressive Strength
Extremely Soft	R0	Can be indented with difficulty by thumbnail. May be moldable or friable with finger pressure.	<100 psi
Very Soft	R1	Crumbles under firm blows with point of geology pick. Can be peeled by pocket knife. Scratched with finger nail.	100-1000 psi
Soft	R2	Can be peeled by pocket knife with difficulty. Cannot be scratched with finger nail. Shallow indention made by firm blow of geology pick.	1000-4000 psi
Medium Hard	R3	Can be scratched by knife or pick. specimen can be fractured with a single firm blow of hammer/geology pick.	4000-8000 psi
Hard	R4	Can be scratched with knife or pick only with difficulty. Several hard blows required to fracture specimen.	8000-16000 psi
Very Hard	R5	Cannot be scratched by knife or sharp pick. Specimen requires many blows of hammer to fracture or chip. Hammer rebounds after impact.	>16000 psi

Table 24: Stratification Terms

Term	Characteristics
Laminations	Thin beds (<1cm).
Fissle	Tendency to break along laminations.
Parting	Tendency to break parallel to bedding, any scale.
Foliation	Non-depositional, e.g., segregation and layering of minerals in metamorphic rock.

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FIGURE 6

Test Pit TP-1

CLIENT Icon Construction - Darren Gusdorf
PROJECT NAME Cornwall Street Subdivision
PROJECT NUMBER G1504283
PROJECT LOCATION 4096 Cornwall Street, West Linn, Oregon
DATE STARTED 12/10/15 **GROUND ELEVATION** 486 ft
ELEVATION DATUM See Figure 2
EXCAVATION CONTRACTOR Icon Construction
LOGGED BY BLN **REVIEWED BY** KJS
EQUIPMENT John Deere 50G
SEEPAGE ---
EXCAVATION METHOD Excavator
GROUNDWATER AT END ---
NOTES
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	U.S.C.S.	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ☐
					0				0.5		
		SM FILL	**SILTY SAND FILL with gravel:** Brown, moist, with roots (less than ¼-inch diameter), and with fine to coarse angular gravel (up to 1-inch diameter).			GRAB TP1-1			1		
484					2				0.5		
		ML FILL	**SANDY SILT FILL:** Gray, moist, exhibited low plasticity, and with fine to coarse angular gravel, brick and asphalt debris (up to 2-inch diameter), and roots (up to 1-inch diameter).						1		
						GRAB TP1-2			1.5		
482					4				2		
									2.5		
		SM	**SILTY SAND:** Medium dense, red-brown, damp to moist, fine- to medium-grained, with roots, and with gravel and boulders (up to 20 inch-diameter).						2.5		
480					6						
						GRAB TP1-3					20
478					8						
			PREDOMINANTLY WEATHERED BASALT: Very soft (R1), red and black, moist.			GRAB TP1-4					36
476					10						

- Test pit terminated at about 10 feet bgs.
- No groundwater or caving observed within the depth explored.
- Test pit loosely backfilled by Icon Construction with cuttings upon completion.

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FIGURE 7

Test Pit TP-2

CLIENT Icon Construction - Darren Gusdorf
PROJECT NAME Cornwall Street Subdivision
PROJECT NUMBER G1504283
PROJECT LOCATION 4096 Cornwall Street, West Linn, Oregon
DATE STARTED 12/10/15 **GROUND ELEVATION** 486 ft
ELEVATION DATUM See Figure 2
EXCAVATION CONTRACTOR Icon Construction
LOGGED BY BLN **REVIEWED BY** KJS
EQUIPMENT John Deere 50G
SEEPAGE ---
EXCAVATION METHOD Excavator
GROUNDWATER AT END ---
NOTES
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	U.S.C.S.	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ☐ 0 20 40 60 80 100
484		SM FILL	**SILTY SAND FILL with gravel:** Brown, moist, with roots (less than 3-inch diameter), and with fine to coarse angular gravel (up to 4-inch diameter).		0				0.5 0.5 1 1.5		
482		CL	**LEAN CLAY with gravel:** Medium stiff to very stiff, gray-brown, exhibited medium plasticity, with roots (less than ¼-inch diameter), and with fine to coarse gravel (up to 2-inch diameter).		2				1.5 2.5 3 4		
480			**PREDOMINANTLY WEATHERED BASALT:** Very soft (R1), red, black, gray and tan, and moist.		4	GRAB TP2-1					35
478			• Test pit terminated at about 7½ feet bgs due to practical refusal on a boulder. • No groundwater or caving observed within the depth explored. • Test pit loosely backfilled by Icon Construction with cuttings upon completion.		6	GRAB TP2-2					43
476											

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FIGURE 8

Test Pit TP-3

CLIENT Icon Construction - Darren Gusdorf
PROJECT NAME Cornwall Street Subdivision
PROJECT NUMBER G1504283
PROJECT LOCATION 4096 Cornwall Street, West Linn, Oregon
DATE STARTED 12/10/15 **GROUND ELEVATION** 486 ft
ELEVATION DATUM See Figure 2
EXCAVATION CONTRACTOR Icon Construction
LOGGED BY BLN **REVIEWED BY** KJS
EQUIPMENT John Deere 50G
SEEPAGE ---
EXCAVATION METHOD Excavator
GROUNDWATER AT END ---
NOTES
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	U.S.C.S.	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ☐ 0 20 40 60 80 100
			SILTY SAND: Medium dense, gray-brown, damp to moist, fine- to medium-grained, with roots (less than, and with cobbles (up to 8-inch diameter).		0				1		
									1.5		
		SM							2.5		
484					2				2		
									2.5		
									3.5		
			PREDOMINANTLY WEATHERED BASALT: Very soft (R1), moist, gray, red, brown, and tan						4		
482					4				4		
480					6						
478					8						
			• Test pit terminated at about 8 feet bgs due to practical refusal on basalt. • No groundwater or caving observed within the depth explored. • Test pit loosely backfilled with cuttings upon completion.								
476											

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FIGURE 9

Test Pit TP-4

CLIENT Icon Construction - Darren Gusdorf
PROJECT NAME Cornwall Street Subdivision
PROJECT NUMBER G1504283
PROJECT LOCATION 4096 Cornwall Street, West Linn, Oregon
DATE STARTED 12/10/15 **GROUND ELEVATION** 468 ft
ELEVATION DATUM See Figure 2
EXCAVATION CONTRACTOR Icon Construction
LOGGED BY BLN **REVIEWED BY** KJS
EQUIPMENT John Deere 50G
SEEPAGE ---
EXCAVATION METHOD Excavator
GROUNDWATER AT END ---
NOTES
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	U.S.C.S.	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ☐
					0				0.5		
		SM	**SILTY SAND:** Medium dense, gray-brown, damp to moist, fine- to medium-grained, with roots (less than, and with gravel and boulders (up to 20-inch diameter).						1		
466					2				1		
		CL	**LEAN CLAY with gravel:** Medium stiff to very stiff, gray-brown, exhibited medium plasticity, and with cobbles (up to 9-inch diameter). Light to moderate groundwater seepage observed at about 3 feet bgs.			GRAB TP4-1			1.5		
			PREDOMINANTLY WEATHERED BASALT: Very soft (R1), moist, gray, red, brown, and tan						1.5		22 45 31
464					4				2.5		
									3.5		
									4		
462					6						
			• Test pit terminated at about 7 feet bgs due to practical refusal on a boulder. • No caving observed within the depth explored. • Test pit loosely backfilled with cuttings upon completion.								
460											
458											

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FIGURE 10

Test Pit TP-5

CLIENT Icon Construction - Darren Gusdorf
PROJECT NAME Cornwall Street Subdivision
PROJECT NUMBER G1504283
PROJECT LOCATION 4096 Cornwall Street, West Linn, Oregon
DATE STARTED 12/10/15 **GROUND ELEVATION** 446 ft
ELEVATION DATUM See Figure 2
EXCAVATION CONTRACTOR Icon Construction
LOGGED BY BLN **REVIEWED BY** KJS
EQUIPMENT John Deere 50G
SEEPAGE ---
EXCAVATION METHOD Excavator
GROUNDWATER AT END ---
NOTES
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	U.S.C.S.	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ☐ 0 20 40 60 80 100
					0				0.5		
		ML	**SANDY SILT:** Medium stiff to stiff, gray to brown, moist, exhibited low plasticity, with fine to coarse gravel and cobbles (up to 10-inch diameter), and with roots (up to 3-inch diameter).						0.5		
									1		
444					2				2		
		CL	**LEAN CLAY with gravel:** Medium stiff to very stiff, gray-brown, exhibited medium plasticity, and with cobbles (up to 9-inch diameter).						2.5		
									3.5		
									4		
442			**PREDOMINANTLY WEATHERED BASALT:** Very soft (R1), moist, gray, red, brown, and tan		4				4		
			Moderate groundwater seepage observed at about 4 feet bgs.								
440					6						
438					8						
			• Test pit terminated at about 8 feet bgs. • No caving observed within the depth explored. • Test pit loosely backfilled with cuttings upon completion.								
436											

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FIGURE 11

Test Pit TP-6

CLIENT Icon Construction - Darren Gusdorf
PROJECT NAME Cornwall Street Subdivision
PROJECT NUMBER G1504283
PROJECT LOCATION 4096 Cornwall Street, West Linn, Oregon
DATE STARTED 12/10/15 **GROUND ELEVATION** 450 ft
ELEVATION DATUM See Figure 2
EXCAVATION CONTRACTOR Icon Construction
LOGGED BY BLN **REVIEWED BY** KJS
EQUIPMENT John Deere 50G
SEEPAGE ---
EXCAVATION METHOD Excavator
GROUNDWATER AT END ---
NOTES
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	U.S.C.S.	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ☐
		ML	**SANDY SILT:** Medium stiff to stiff, gray to brown, moist, exhibited low plasticity, with fine to coarse gravel, and with roots (up to 2-inch diameter).		0				0.5 0.5 0.5		
448		CL	**LEAN CLAY with gravel:** Medium stiff to very stiff, gray-brown, exhibited medium plasticity, and with cobbles (up to 9-inch diameter).		2	GRAB TP6-1			1.5 1.5 2.5		33
446			**PREDOMINANTLY WEATHERED BASALT:** Very soft (R1), moist, gray, red, brown, and tan Moderate groundwater seepage observed at about 4 feet bgs.		4				3 4		
444					6						30
442			• Test pit terminated at about 7 feet bgs. • No groundwater or caving observed within the depth explored. • Test pit loosely backfilled with cuttings upon completion.								
440											

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FIGURE 12

Test Pit TP-7

CLIENT Icon Construction - Darren Gusdorf
PROJECT NAME Cornwall Street Subdivision
PROJECT NUMBER G1504283
PROJECT LOCATION 4096 Cornwall Street, West Linn, Oregon
DATE STARTED 12/10/15 **GROUND ELEVATION** 460 ft
ELEVATION DATUM See Figure 2
EXCAVATION CONTRACTOR Icon Construction
LOGGED BY BLN **REVIEWED BY** KJS
EQUIPMENT John Deere 50G
SEEPAGE ---
EXCAVATION METHOD Excavator
GROUNDWATER AT END ---
NOTES
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	U.S.C.S.	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ☐ 0 20 40 60 80 100
		ML	**SANDY SILT:** Medium stiff to stiff, gray to brown, moist, exhibited low plasticity, with fine to coarse gravel, and with roots (up to 2-inch diameter).		0				0.5		
									0.5		
									0.5		
458		CL	**LEAN CLAY with gravel:** Medium stiff to very stiff, gray-brown, exhibited medium plasticity, and with cobbles (up to 9-inch diameter).		2				1		
									1.5		
									3.5		
456			**PREDOMINANTLY WEATHERED BASALT:** Very soft (R1), moist, gray, red, brown, and tan		4				4		
									4		
454					6						
			• Test pit terminated at about 6 feet bgs. • No groundwater or caving observed within the depth explored. • Test pit loosely backfilled with cuttings upon completion.								
452											
450											

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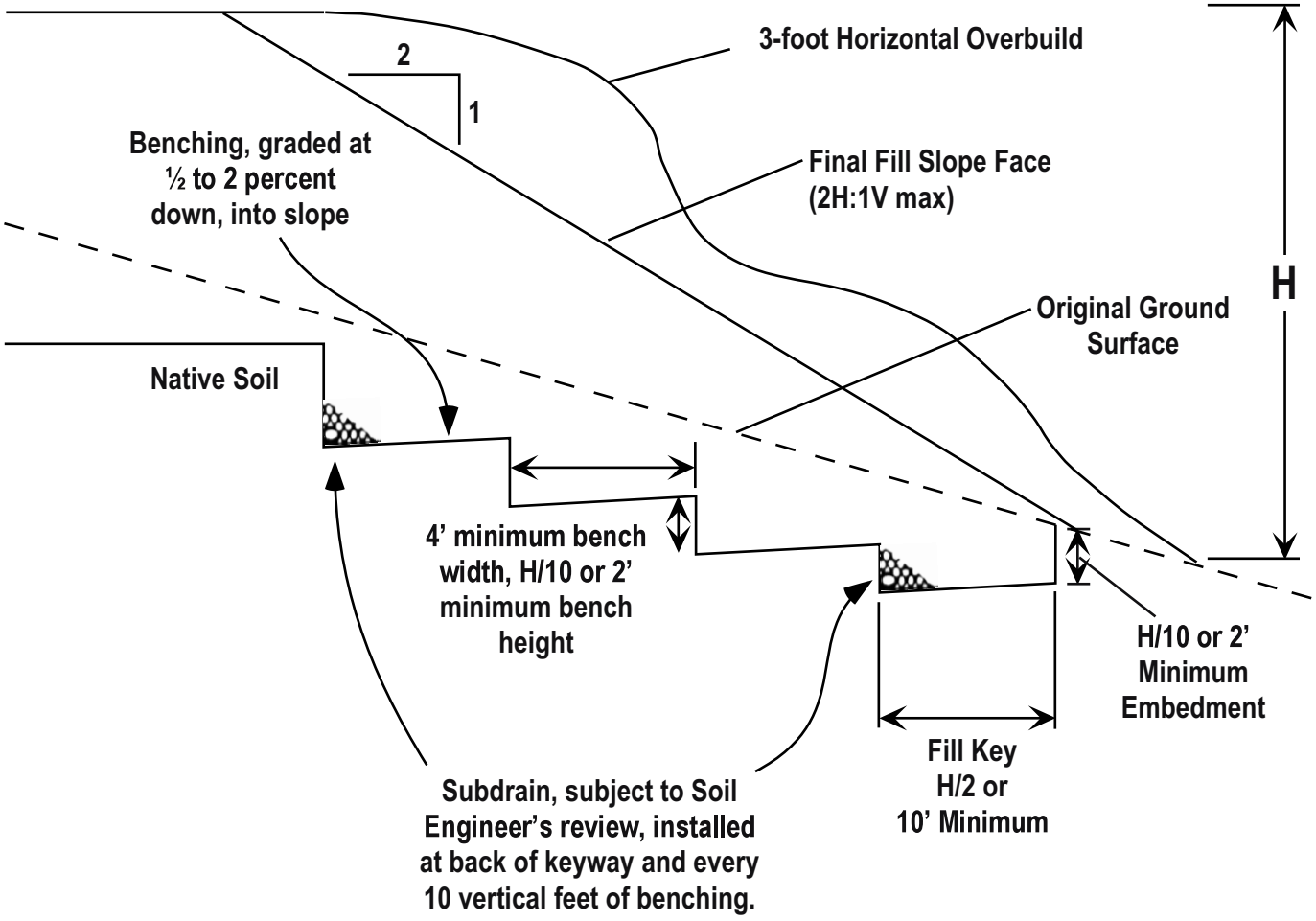
FIGURE 13
FILL SLOPE DETAIL



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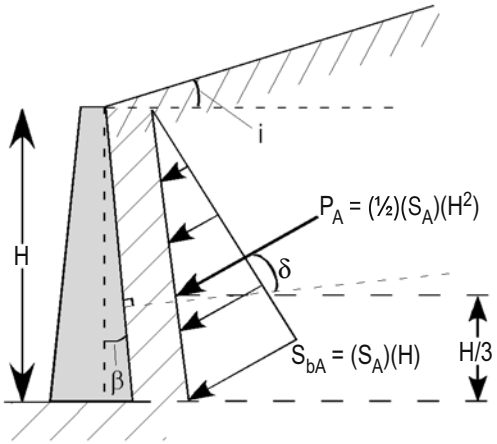
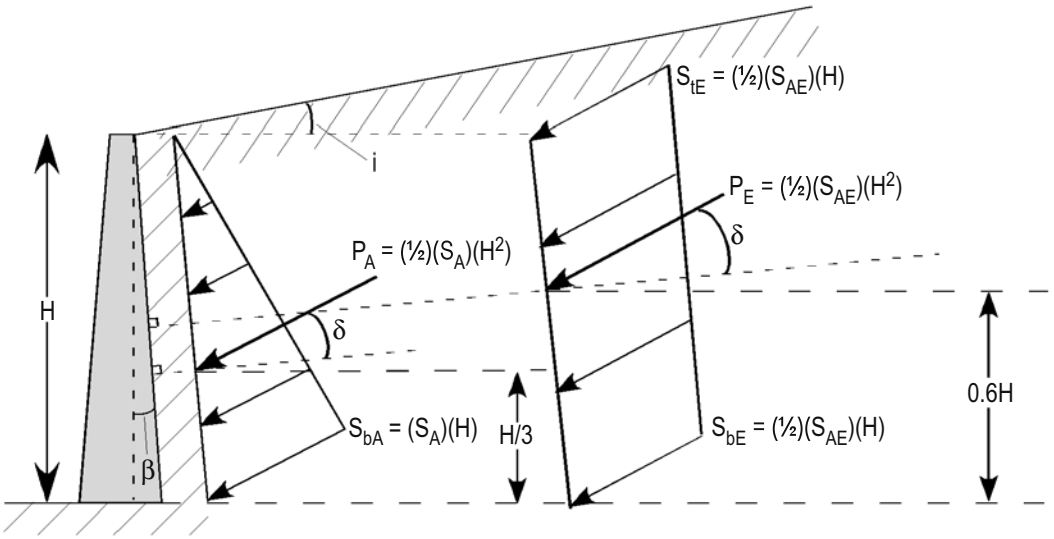
NOTE: Surfaces to receive fill with slopes steeper than 5H:1V (horizontal:vertical) should be benched and keyed as shown.

ACTIVE LATERAL PRESSURE DISTRIBUTION

STATIC LOADING CONDITIONS



SEISMIC LOADING CONDITIONS



LEGEND

P_A = Static active thrust force acting at a triangular distribution on wall (lb/ft^3)

P_E = Dynamic component of active thrust force acting at a uniform distribution on wall (lb/ft)

i = Slope of backfill (degrees)**

S_A = Active (static) component of equivalent fluid pressure (lb/ft^3)*

S_{tE} = Active earth pressure (dynamic) at the top of the wall (lb/ft^3)

S_{bA} = Active earth pressure (static) at the bottom of the wall (lb/ft^3)

ϕ = Internal angle of friction for backfill (degrees)**

δ = Angle from normal of back of wall (degrees). Based on friction developing between wall and backfill**

β = Slope of back of wall (degrees)**

S_{AE} = Dynamic component of equivalent fluid pressure (lb/ft^3)*

S_{bE} = Active earth pressure (dynamic) at bottom of the wall (lb/ft^3)*

*Refer to report text for calculated values **Refer to report text for modeled/assumed values

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Notes

1. Uniform pressure distribution of seismic loading is based on empirical evaluations [Sherif et al, 1982 and Whitman, 1990].
2. Placement of seismic resultant force at 0.6H is based on wall behavior and model test results [Whitman, 1990].

8. Signed Expedited Land Division Form

West Linn

Expedited Land Division Acknowledgement Form

All applicants for partitions and subdivisions must acknowledge, by completing this form, that they were notified about the ELD process and must indicate whether they intend to apply for an ELD or a standard subdivision or partition using the procedures set forth in the City of West Linn's Community Development Code. Applicants who do not sign this form (page 1) and subsequently submit a land division application will have the land division processed under the ELD procedures per ORS 197.365. This completed form must accompany the separate ELD or standard subdivision or partition application form.

Are you intending to apply for an Expedited Land Division?

Yes __ No X

If "**Yes**", your application must include a written description of how the proposal satisfies ORS 197.360(1).

If "**No**", it indicates your intention to use the procedure set forth in the City of West Linn Community Development Code Land Division regulations.

Applicant Name: Mark Handris for Icon Construction and Development, LLC

Applicant Signature: _____ Date: 4-15-2020

Applicant Mailing Address: Suite 200 1980 Willamette Falls Drive, West Linn, OR 97068

Owner's Name: Same as applicant

Owner's Signature: _____ Date: 4-15-2020

Owner's Mailing Address: 1980 WILLAMETTE FALLS DR. #200 WEST LINN OR 97068

Site Address: 4096 CORNWALL ST.

9. Schott & Associates - Wetland Determination Report

SCHOTT & ASSOCIATES
Ecologists & Wetlands Specialists
21018 NE Hwy 99E • P.O. Box 589 • Aurora, OR 97002 • (503) 678-6007 • FAX: (503) 678-6011

June 7, 2017

Rick Givens
Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045

Re: Willow Ridge at Cornwall Street Wetland Determination

Dear Rick Givens,

As per your request I was asked to conduct a site visit on the 2.17 acre subject property located at the street address of 4096 Cornwall Street, West Linn, Clackamas County, Oregon (T2S, R1E, Sec 36BA, TL 6300). The initial site visit was conducted on a very rainy day, making determining the area for wetlands very difficult. No wetlands were found, however a second visit was conducted with Dr. Martin Schott, Professional Wetland Scientist (PWS) to confirm no wetlands were present. Because no wetlands were identified on the property a full wetland delineation was not performed, therefore a wetland determination was conducted to document finding.

Oregon Department of State Lands provides a check list of 13 items that can be indicative of wetlands, but are not in and of themselves criteria for designation of wetlands. Only 3 actual wetland criteria are required to present in order for there to be wetlands; hydric vegetation, hydric soils and hydrology. A site visit was conducted on March 10, 2017. The *1987 Manual* and *Regional Supplement to the Corps of Engineers Delineation Manual: Western Mountains and Valleys* were used to determine presence or absence of State of Oregon wetland boundaries and the Federal jurisdictional wetlands. Schott and Associates found no wetlands present on the property, and therefore conducted an onsite determination to document findings.

The rectangular shaped subject property is situated at the terminus of Cornwall Street, west of Sussex Street and North of Fairhaven Drive. Residential houses are located on all sides of the project area. An existing house is located in the northeastern corner of the lot with associated outbuildings. The southern half of the lot is steeply sloped to the south.

The majority of the property consisted of the steep slopes in the southern half of the lot. The vegetation was dominated by Himalayan blackberry (*Rubus armeniacus*). There was a small patch of reed canary grass (*Phalaris arundinacea*) and rose (*Rosa pisocarpa*) was more prevalent at the southeastern extent of the lot where the slope levels out. A few larger trees were located on the property.

An unidentified tributary to Salamo Creek is located offsite to the east. The landscape surrounding the tributary was steeply sloped and dominated by non-native Himalayan blackberry. The tributary was approximately 170 feet off site to the southeast located at the bottom of a draw. Slopes within 50 feet of the creek were digitally measured and found to range from 16 to 28 percent.

The Natural Resource Conservation Service (NRCS) mapped two soil series on the site, Saum silt loam (3 to 8 percent slopes) and Saum silt loam (15 to 30 percent slopes). Neither soil is considered hydric.

Two sample plots were established to document conditions that would most likely identify as wetlands. Sample Plot 1 was mid slope where a small patch of reed canary grass (*Phalaris arundinacea*) was present. The soils had a 7.5YR 3/2 matrix to 11 inches in the pit. Below 11 inches the soils were a dark 7.5YR 3/1 with 7.5YR 3/6 redoximorphic features. Soils did not meet hydric soil indicators. Hydrology was present as surface flow, likely associated with recent rains and the hill slope to the north.

Sample Plot 2 was located to the southeast down slope of Sample Plot 1 within the road easement. Vegetation was dominated by Himalayan blackberry. Soils had a matrix color of 7.5YR 3/2 with no hydric indicators. No hydrology was present.

The Local Wetland Inventory (LWI) for the City of West Linn was completed in 2005 by Winterbrook Planning. The LWI does not identify any wetlands or waters within the study area boundary. Additionally, the National Wetland Inventory (NWI) does not identify any wetlands or waters within the study area.

For an area to be a wetland it has to meet all three wetland criteria; soils, hydrology, and vegetation. None of the sample plots met all three criteria.

Attached is a an aerial photograph showing the location of sample plots (Figure 1), a copy of the soils map (Figure 2), Local Wetland Inventory Map (Figure 3), ground level photographs and data forms. Please call if you have any questions or if we can be of further assistance.

Sincerely,

Jodi Reed

Figure 1. Wetland Determination Map

4096 Cornwall Street
West Linn, Clackamas County, Oregon
T2S, R1E, Sec 36BA, TL#6300
S&A#2494

Photo Point Study Area

Sample Plots

Data plots recorded by Schott & Associates, Inc. utilizing a Trimble GeoXT hand-held unit to a 3.0+/- foot accuracy.
Tax Lot boundaries provided by Clackamas County GIS.
Data files and maps are to be used for informational uses only and may not be suitable for legal, engineering or surveying purposes.
Projected Coordinate System: NAD_1983_UTM_Zone_10N

SCHOTT & ASSOCIATES, Inc.
21018 NE Hwy 99e • PO Box 589 • Aurora, Oregon 97002 p: 503.678.6007 f: 503.678.6011

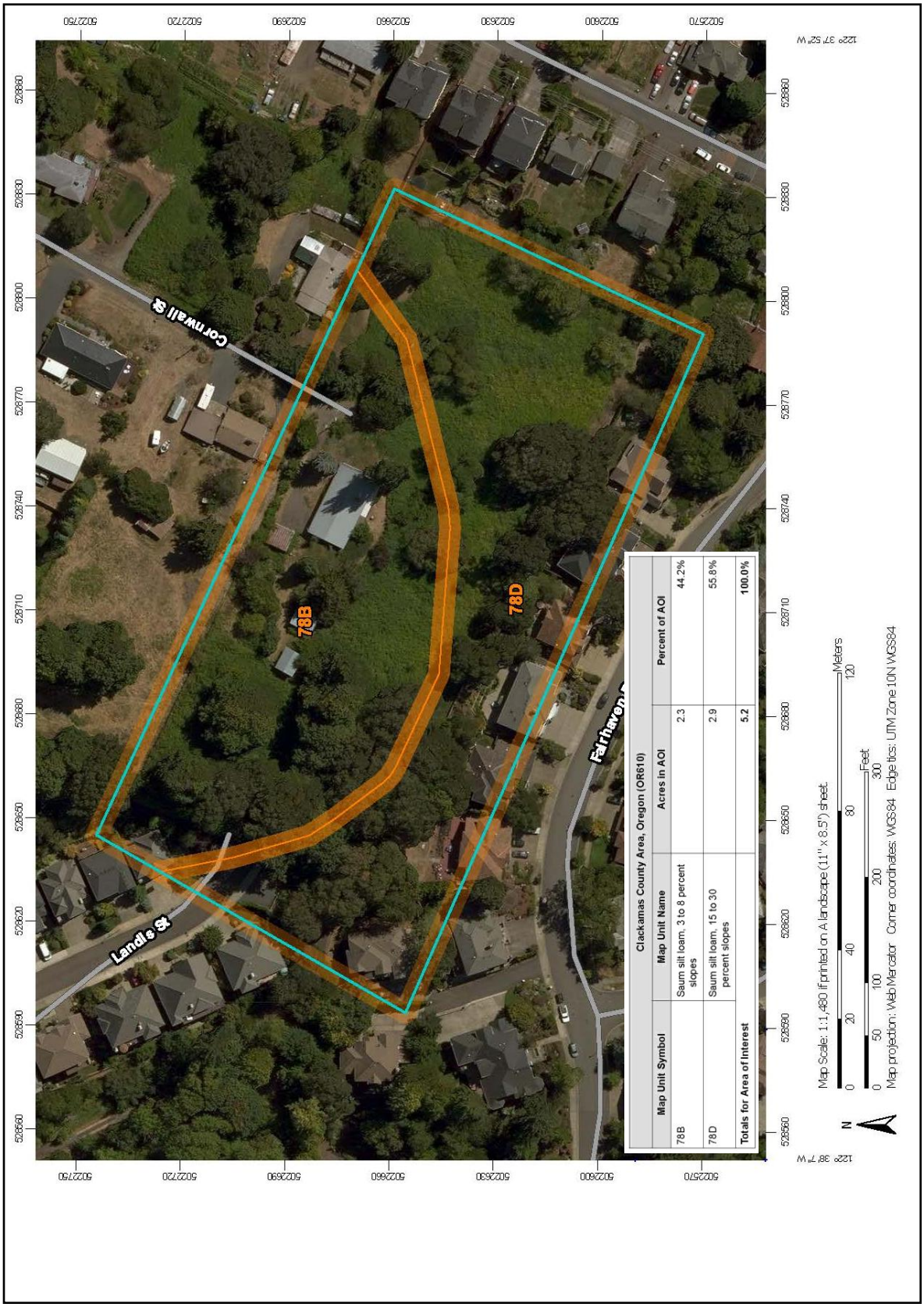

FIGURE 2. SOIL MAP
Cornwall Street
S&A# 2494

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007

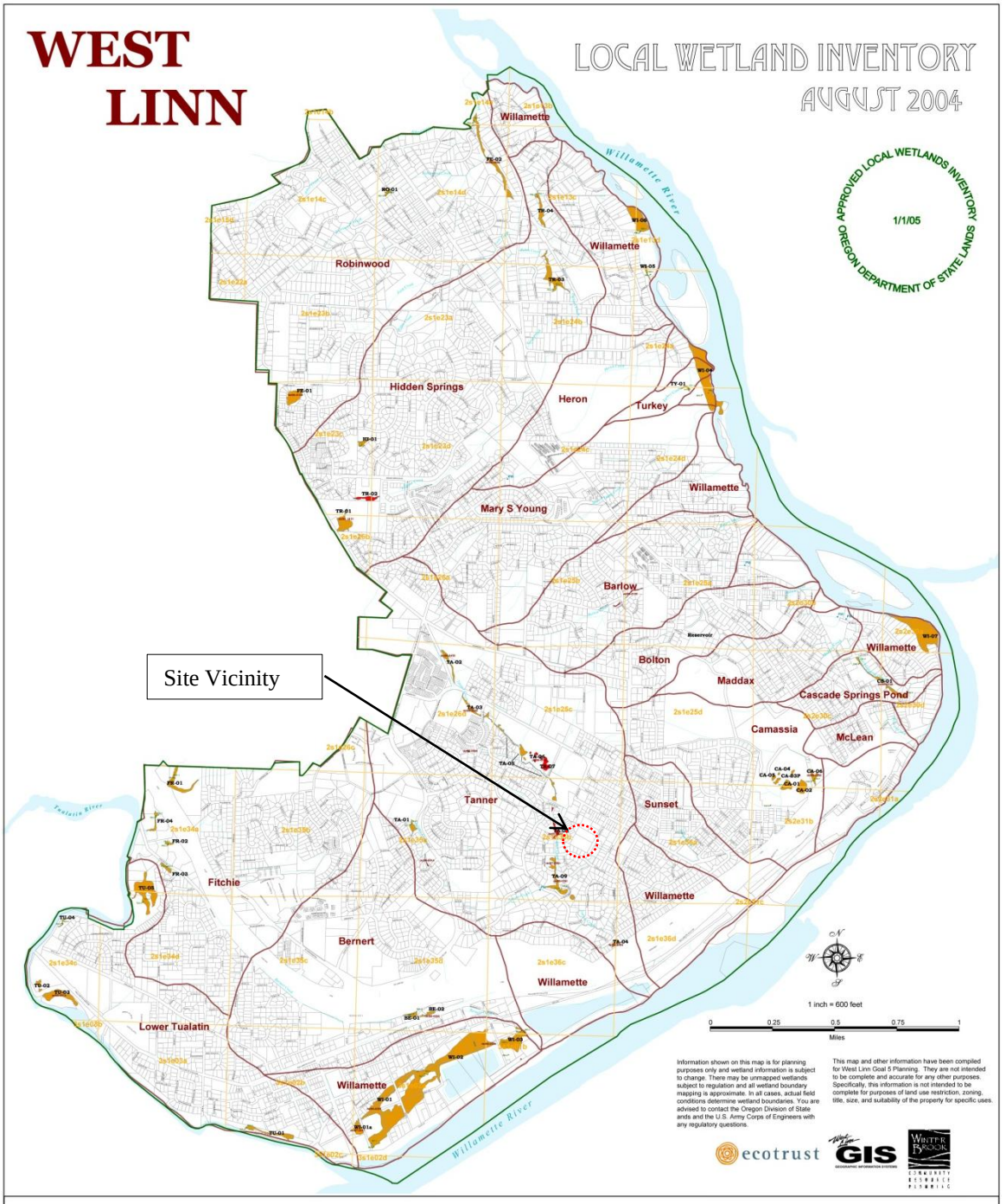

FIGURE 3. LOCAL WETLAND INVENTORY
Cornwall Street
S&A#2494

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007

Photo Point. Facing southwest.

GROUND LEVEL PHOTOGRAPHS
Cornwall Street
S&A#2494

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007

Photo Point. Facing Southwest.

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Cornwall Street | City/County: West Linn/Clackamas | Sampling Date: March 10th, 2017
Applicant/Owner: Rick Givens | State: OR | Sampling Point: 1
Investigator(s): MRS, JRR | Section, Township, Range: 36BA, T2S, R1E
Landform (hillslope, terrace, etc.): Hill slope | Local relief (concave, convex, none): Convex | Slope (%):
Subregion (LRR): A | Lat: 45.356770 | Long: -122.633111 | Datum: DD
Soil Map Unit Name: Saum silt loam (15 to 30 percent slopes) | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___ , Soil ___ , or Hydrology ___ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ Naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present?	Yes	X	No	

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks: Soils do not meet hydric soil indicators. Hydrology was present as surface flow from upslope runoff, likely from recent rainfall.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5'r)			
1. *Phalaris arundinacea*	60	X	FACW
2. *Ranunculus repens*	10		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11	7.5YR 3/2	100					SiL	
11-18	7.5YR 3/1	95	7.5YR 3/1	3/6	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): Surf

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? **Yes** **X** **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Surface flow is from upslope. Likely runoff from house and properties upslope from recent rains.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Cornwall Street | City/County: West Linn/Clackamas | Sampling Date: March 10th, 2017
Applicant/Owner: Rick Givens | State: OR | Sampling Point: 2
Investigator(s): MRS, JRR | Section, Township, Range: 36BA, T2S, R1E
Landform (hillslope, terrace, etc.): Hill slope | Local relief (concave, convex, none): Convex | Slope (%):
Subregion (LRR): A | Lat: 45.356770 | Long: -122.633111 | Datum: DD
Soil Map Unit Name: Saum silt loam (15 to 30 percent slopes) | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___ , Soil ___ , or Hydrology ___ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ Naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present?	Yes		No	X

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 15'r)			
1. *Rubus armeniacus*	80	X	FAC
2.			
3.			
4.			
5.			
	80 = Total Cover		

Herb Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		

Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	7.5YR 3/2	100					SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): _____

Water Table Present? Yes ___ No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): _____

Wetland Hydrology Present? **Yes** ___ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

10. Neighborhood Meeting Documents

Willow Ridge Subdivision

Neighborhood Meeting Notes

A neighborhood meeting regarding the proposed six-lot Willow Ridge Estates was held at 7:00 pm on September 24, 2019 at Sunset Elementary School. Richard Givens, planning consultant on the project by Icon Construction and Development, LLC, made a brief presentation explaining the proposal and showing two alternate site plans of the proposed development. The first plan showed a connection of Landis Street through to Cornwall Street, as requested by City of West Linn engineering staff. The second alternate plan showed Landis Street ending at the north property line of the project so that it can be extended in the future. The meeting was well attended by residents of the area surrounding the subject property. A number of concerns were raised by those in attendance:

1. Traffic. Residents on Cornwall Street and Landis Street, as well as people from the surrounding area, are concerned about the impact on their neighborhoods of through traffic associated if Landis Street and Cornwall Street are connected. Cornwall Street is a substandard street with narrow and rough pavement. Mr. Givens explained that the City has plans to improve the street with a 20' paved section in conjunction with the proposed development. Landis Street is improved only to a width of about 24 feet of pavement. Residents are concerned that through traffic would be unsafe and would negatively impact their neighborhood. Some statements were made that neighbors had heard that the City had plans to widen Landis Street. Mr. Givens stated that he was unaware of any such proposal, but residents should discuss this with City staff. There was a general preference for the dead-end configuration. Most neighbors felt a connection should not be made until the roads were fully improved and, preferably, when other street connections were investigated by the City in other areas. The plan for an emergency vehicle connection at the end of the dead-end was generally supported.
2. Geology. Neighbors are concerned about development of the hillside and its potential to cause landslides. There is also concern about impacts on properties along Fairhaven from underground water. Mr. Givens noted that the geology report that had been done for an earlier application on the property indicates that the slope is stable. Further, the plans for collecting and draining storm water runoff from the site to an existing detention/storm system in Landis Street and to a drainageway to the east of the project site will reduce runoff from the site and will benefit downhill properties. Neighbors expressed doubts and want a further investigation. Mr. Givens stated that additional analysis will be provided in the new application.

Notice of Neighborhood Meeting Regarding
A Proposed 7-Lot Subdivision
Located at 4096 Cornwall Street

Hello,

You are invited to attend a neighborhood meeting to discuss a proposed development in your area. Icon Construction & Development, LLC is proposing to construct a 7 Lot subdivision on property located at 4096 Cornwall Street in West Linn.

As required by the West Linn Community Development Code, prior to the submittal of an application to the City of West Linn for preliminary approval of this project, a meeting with neighbors will be held to present the conceptual plan for the project, to answer questions and for the developer to receive feedback from those in attendance. This notice of the meeting is being mailed to owners of property located within 500 feet of the boundaries of the subject property. Notice is also being mailed to officers of the Sunset and BHT Neighborhood Associations. The property is located within the Sunset Neighborhood Association boundary and is within 500 feet of the BHT Neighborhood Association boundary.

The proposed development is scheduled to be presented at the September 24th meeting of the Sunset Neighborhood Association. There may be other items on the agenda in addition to this project. Meeting time and place are:

7:00 PM, Tuesday, Sept. 24, 2019
Sunset Primary School Library
2351 Oxford St.
West Linn, Oregon

We look forward to meeting with you. If you cannot attend in person but have questions regarding the project, please feel free to contact the project planning consultant, Rick Givens. You may phone him at (503) 479-0097 or contact him via email at rickgivens@gmail.com.

Rick Givens
Planning Consultant
18680 Sunblaze Dr.
Oregon City, Oregon 97045

September 3, 2019

Mr. Legion Anders, President
Sunset Neighborhood Association
4708 Riverview Ave.
West Linn, OR 97068

Dear Mr. Anders:

I'd like to thank you for your assistance in including the proposed Willow Ridge subdivision of property located at 4096 Cornwall Street on the agenda for quarterly Sunset Neighborhood meeting. Our correspondence to date has been via email and telephone, but this letter is being sent to you to fulfill the technical requirements of Section 99.038C of the West Linn Community Development Code that we contact you via certified mail to arrange the date for the meeting. Just to confirm, the date of the quarterly Sunset NA meeting is September 24, 2019 at the Sunset Primary School library at 7:00 pm and our proposal for a 6-lot subdivision will be on the agenda. We will be sending out the required neighborhood notice letters for that time and place.

Thanks again,

Rick Givens

cc: Doug Vokes, Secretary, Sunset NA
Robert Jester, President, Barrington Heights NA

phone: 503-479-0097 | fax: 503-479-0097 | e-mail: rickgivens@gmail.com

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Legian Anders
4078 Riverview Dr.
West Linn, OR 97068

9590 9402 4569 8278 2156 87

2. Article Number *(Transfer from service label)*

7019 1120 0001 4075 3214

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Jennifer Box

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Doug Vokes
4972 Prospect St.
West Linn, OR 97068

9590 9402 4569 8278 2157 00

2. Article Number *(Transfer from service label)*

7019 1120 0001 4075 3221

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* DOUG VOKES

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Robert Jester
3475 Riverknoll Way
West Linn, OR 97068

9590 9402 4569 8278 2156 94

2. Article Number *(Transfer from service label)*

7019 1120 0001 4075 3207

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* J Jester

C. Date of Delivery 9-6-19

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

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Domestic Mail Only

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WEST LINN, OR 97068 OFFICIAL USE

Certified Mail Fee	$3.50
$	$2.80
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$ $0.00
☐ Return Receipt (electronic)	$ $0.00
☐ Certified Mail Restricted Delivery	$ $0.00
☐ Adult Signature Required	$ $0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.55
$	
Total Postage and Fees	$6.85
$	

0108 04 USPS Postmark Here SEP 3 2019 OREGON CITY OR 97045

Sent To: Doug Vokes
Street and Apt. No., or PO Box No.: 4972 Prospect St.
City, State, ZIP+4®: West Linn, OR 97068

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7019 1120 0001 4075 3214

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WEST LINN, OR 97068 OFFICIAL USE

Certified Mail Fee	$3.50
$	$2.80
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$ $0.00
☐ Return Receipt (electronic)	$ $0.00
☐ Certified Mail Restricted Delivery	$ $0.00
☐ Adult Signature Required	$ $0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.55
$	
Total Postage and Fees	$6.85
$	

0108 04 USPS Postmark Here SEP 3 2019 OREGON CITY OR 97045

Sent To: Legion Anders
Street and Apt. No., or PO Box No.: 4708 River View Ave
City, State, ZIP+4®: West Linn, OR 97068

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7019 1120 0001 4075 3207

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For delivery information, visit our website at *www.usps.com®*.

WEST LINN, OR 97068 OFFICIAL USE

Certified Mail Fee	$3.50
$	$2.80
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$ $0.00
☐ Return Receipt (electronic)	$ $0.00
☐ Certified Mail Restricted Delivery	$ $0.00
☐ Adult Signature Required	$ $0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.55
$	
Total Postage and Fees	$6.85
$	

0108 04 USPS Postmark Here SEP 3 2019 OREGON CITY OR 97045

Sent To: Robert Jester
Street and Apt. No., or PO Box No.: 3475 Riverknoll Way
City, State, ZIP+4®: West Linn, OR 97068

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

AFFIDAVIT OF POSTING

STATE OF OREGON)
) SS
COUNTY OF CLACKAMAS)

I, Richard Givens, Planning Consultant for Icon Construction and Development, LLC, in the case of Willow Ridge Subdivision, declare that on September 3, 2019, pursuant to Chapter 99.083 of the West Linn Community Development Code, posted as sign providing notice of a neighborhood meeting to discuss the proposed six-lot subdivision. The sign complied with the required 11" x 17" minimum size standard and was posted on the subject property's frontages at the terminus of Cornwall Street and of Landis Street. This sign notice was for a six-lot subdivision.

Dated this 10th day of January 2020.

Richard Givens
Signature

SUBSCRIBED AND SWORN TO before me this 10th day of January, 2020, by Jennie Engen-Lucas.

NOTARY PUBLIC FOR OREGON

My Commission Expires: March 7, 2023

OFFICIAL STAMP
JENNIE KAY ENGEN-LUCAS
NOTARY PUBLIC - OREGON
COMMISSION NO. 984960
MY COMMISSION EXPIRES MARCH 07, 2023

AFFIDAVIT OF NOTICE

STATE OF OREGON)
) SS
County of Clackamas)

I, Richard Givens, Planning Consultant for Icon Construction and Development, LLC, declare that on September 3, 2019 notice of a neighborhood meeting was provided, in the case of the Willow Ridge subdivision, pursuant to Chapter 99.083 of the West Linn Community Development Code. Notice was mailed to property owners within 500 feet of the project site, and to the Sunset and BHT neighborhood associations. This notice was for a 6-lot subdivision.

Richard Givens
RICHARD GIVENS
PLANNING CONSULTANT

1/10/2020
DATE

SUBSCRIBED AND SWORN TO before me this 10 day of January, 2020,
by Jennie K Engen-Lucas.

NOTARY PUBLIC FOR OREGON

OFFICIAL STAMP
JENNIE KAY ENGEN-LUCAS
NOTARY PUBLIC - OREGON
COMMISSION NO. 984960
MY COMMISSION EXPIRES MARCH 07, 2023

My Commission Expires: March 7, 2023

SUNSET Neighorhood Assoc.	Regular Quarterly Meeting	Attendance Sign-In Sheet
September 24th, 2019		
NAME and ADDRESS	PHONE NUMBER	EMAIL ADDRESS please print
LOGAN WULFF 4064 SUSSEX ST	503 974 9157	Pack.Fwulffs@gmail.com
Mark Yokubaitis 3760 Fairhaven Dr 97068	503 7207945	mark@yokubaitis.com
Ruth Burnett 4195 Cornwall St	503 656 4584	Oregonruth@q.com
David Burnett 4195 Cornwall St	5036564584	Oregonruth@q.com
DARREN GUSDORF	503-657-0406	DARREN@ICONCONSTRUCTION.NET
JERRY + MADONNA WINFIELD 5150 CROWN STREET	503.657.9914 971-227-3738	Keepthefaith777@comcast.NET Keepthefaithgerry@gmail.com

SUNSET Neighorhood Assoc.	Regular Quarterly Meeting	Attendance Sign-in Sheet
September 24th, 2019		
NAME and ADDRESS	PHONE NUMBER	EMAIL ADDRESS please print
Dan + Miranda Riley 3669 Landis St.		DANRILER@COMCAST.NET
Chelsea & Chris Diaz		Chelsead2864@gmail.com
SUSAN ASH 22741 Oregon City Loop		ouchycat@comcast.net
Marla Knauss 4427 Cornwall St		M.Knauss29@gmail.com

SUNSET Neighorhood Assoc.	Regular Quarterly Meeting	Attendance Sign-in Sheet
September 24th, 2019		
NAME and ADDRESS	**PHONE NUMBER**	**EMAIL ADDRESS** please print
Vic Delly 4225 Cornwall St	503 844 1966	poggs@aol.com
Rick Givens 18680 Sunblaze Dr. Or. City	503-351-8204	rickgivens@gmail.com
Christine Henry 3795 Fairhaven Dr Westlinn OR 97068	503 303 7958	christinehenry 1821@gmail.com
Amanda Callahan 2380 Long St		amanda.r.callahan@gmail.com
Pam Yokubaitis	503-656-5881	pam@yokubaitis.com
Mark Dahning	5154901604	mDNW15@gmail.com
Doug/Dorcas Vokes	✓	✓

SUNSET Neighorhood Assoc.	Regular Quarterly Meeting	Attendance Sign-in Sheet
September 24th, 2019		
NAME and ADDRESS	PHONE NUMBER	EMAIL ADDRESS please print
Barbara Dalbowth	— no changes —	
William House	503 853 8978	wmhdl@runbox.com
Randy & Kimsey Joanne Kimsey	~~503~~ 253-548-7094	Rj7680@comcast.net
Bill Dahl		dahlbu@hotmail.com
Earl & Jennifer Christman	~~503~~ 971-678-7481	JPchristman@comcast.net
Dan + Jacque Eaton	702-885-1178	djeaton4849@comcast.net
Mike Tenison	503-919-1664	tenisonmd@gmail.com

Notice of Neighborhood Meeting

Regarding A Proposed
6-Lot Subdivision for Property
Located at 4096 Cornwall Street

You are invited to attend a neighborhood meeting to discuss a proposed development on this property. The project will be presented at the Sept. 24, 2019 meeting of the Sunset Neighborhood Association. Other items may be on the agenda in addition to this one.

The applicant for this project is Icon Construction & Development, LLC. Additional information may be obtained by telephoning the project planning consultant, Rick Givens, at (503) 479-0097 or by email at rickgivens@gmail.com.

The meeting time and place are:

7:00 PM on Tuesday, Sept. 24, 2019
Sunset Primary School library
2351 Oxford St.
West Linn, Oregon

21E36AC01500
Jason Porter
4095 Sussex St
West Linn, OR 97068

21E36AC01600
Jim & Jade Milner
4051 Sussex St
West Linn, OR 97068

21E36AC01601
Jacob Bowlin
4023 Sussex St
West Linn, OR 97068

21E36AC01700
Robert & Kristina Kays
4015 Sussex St
West Linn, OR 97068

21E36BA03600
John & Susan Whitcher
4260 Reed St
West Linn, OR 97068

21E36BA03900
Carl & Angela Pitzer
4194 Reed St
West Linn, OR 97068

21E36BA04000
Clackamas County
150 Beavercreek Rd
Oregon City, OR 97045

21E36BA04100
Randall & Jeanne Kimsey
Po Box 394
West Linn, OR 97068

21E36BA08200
Nancy Parker
2790 Sunset Ave
West Linn, OR 97068

21E36BA04300
Steven Vaughn
4270 Reed St
West Linn, OR 97068

21E36BA04500
R Scott Nielsen
2794 Sunset Ave
West Linn, OR 97068

21E36BA04700
Cynthia Lee Hampton
2784 Sunset Ave
West Linn, OR 97068

21E36BA04800
James Petersen
6685 W Burnside Rd #328
Portland, OR 97210

21E36BA04900
Matthew & Allison Lorenzen
2764 Sunset Ave
West Linn, OR 97068

21E36BA05000
Jason Marc Jarmin
2750 Sunset Ave
West Linn, OR 97068

21E36BA05100
John Sramek
2738 Sunset Ave
West Linn, OR 97068

21E36BA05200
Joan Mize
2708 Sunset Ave
West Linn, OR 97068

21E36BA05300
Gary & Janet Eppelsheimer
4198 Cornwall St
West Linn, OR 97068

21E36BA05500
John Sramek
2738 Sunset Ave
West Linn, OR 97068

21E36BA05900
David Farrell
2790 Sunset Ave
West Linn, OR 97068

21E36BA06000
Michael Tenison
1185 Forest Meadows Way
Lake Oswego, OR 97034

21E36BA06100
Eugene Clark
4110 Cornwall St
West Linn, OR 97068

21E36BA06300
Icon Construction & Development LLC
1980 Willamette Falls Dr #200
West Linn, OR 97068

21E36BA06400
Charlene Imholt
4130 Cornwall St
West Linn, OR 97068

21E36BA06500
Earl Allen Christman
14995 S Blue Vista Dr
Oregon City, OR 97045

21E36BA06600
Denise McLaughlin
15424 SE Rhone Ct
Portland, OR 97236

21E36BA06800
Bruce & Elaine Mills
2660 Sunset Ave
West Linn, OR 97068

21E36BA07000
Rhett Olmstead
4228 Sussex St
West Linn, OR 97068

21E36BA07100
Ashley Miller
2650 Sunset Ave
West Linn, OR 97068

21E36BA07300
Keith Patrick Fales
2680 Sunset Ave
West Linn, OR 97068

21E36BA07400
Val & Beth Devogele
4225 Cornwall St
West Linn, OR 97068

21E36BA07500
Mark & Ruth Burnett
2805 York St
West Linn, OR 97068

21E36BA07600
Charles Pedracini
4003 Cornwall St
West Linn, OR 97068

21E36BA07601
Charles Pedracini
4091 Cornwall St
West Linn, OR 97068

21E36BA07700
Valerie Longstreet
Po Box 192
West Linn, OR 97068

21E36BA07701
Mary Eells
11035 S Forest Ridge Rd
Oregon City, OR 97045

21E36BA07800
Peter Deason
4096 Sussex St
West Linn, OR 97068

21E36BA07900
Herath & Chamila Bandara
4140 Sussex St
West Linn, OR 97068

21E36BA08000
Gordon Gefroh
Po Box 1077
Philomath, OR 97370

21E36BA08100
City Of West Linn
22500 Salamo Rd #600
West Linn, OR 97068

21E36BD00500
Alex Santoso
2091 Wellington Dr
West Linn, OR 97068

21E36BD00600
Zachary & Gina Perkins
2089 Wellington Dr
West Linn, OR 97068

21E36BD00700
Tony Hawblitzel
2083 Wellington Dr
West Linn, OR 97068

21E36BD00800
Sung Hwan Shin
2079 Wellington Dr
West Linn, OR 97068

21E36BA07602
Edward Turkisher
Po Box 264
West Linn, OR 97068

21E36AC02700
Robert & Charisse Ems
3829 Fairhaven Dr
West Linn, OR 97068

21E36AC02800
Neal & Tori Schmitt
3825 Fairhaven Dr
West Linn, OR 97068

21E36AC02900
Stephen & Linay Willams
3821 Fairhaven Dr
West Linn, OR 97068

21E36AC03000
John & Pia Snyder
3817 Fairhaven Dr
West Linn, OR 97068

21E36AC03100
Scott & Susan Ludwigsen
3818 Fairhaven Dr
West Linn, OR 97068

21E36AC03200
Bradley & Sarah Carter
3822 Fairhaven Dr
West Linn, OR 97068

21E36AC03300
Terry Morrow
3828 Fairhaven Dr
West Linn, OR 97068

21E36BA07702
Laguna Holdings LLC
22209 SW Bar None Rd
Tualatin, OR 97062

21E36BA07703
Todd & Sandra Christensen
4040 Sussex St
West Linn, OR 97068

21E36BD03900
Gary Brashear
Po Box 1816
Tualatin, OR 97062

21E36BD04000
Cameron & Leann Macmillan
3715 Fairhaven Dr
West Linn, OR 97068

21E36BD04100
Kenneth Fuchs
3725 Fairhaven Dr
West Linn, OR 97068

21E36BD04200
Jun Song
3735 Fairhaven Dr
West Linn, OR 97068

21E36BD04300
Oleg Siniaguine
3745 Fairhaven Dr
West Linn, OR 97068

21E36BD04400
Darin Tegemoller
3755 Fairhaven Dr
West Linn, OR 97068

21E36BD04500
Jeannie Lee
536 NW View Ridge Ln
Camas, WA 98607

21E36BD04600
David Corey
3775 Fairhaven Dr
West Linn, OR 97068

21E36BD04700
Robert Henderson
3785 Fairhaven Dr
West Linn, OR 97068

21E36BD04800
Christine Henry
3795 Fairhaven Dr
West Linn, OR 97068

21E36BD04900
William Gray
3810 Fairhaven Dr
West Linn, OR 97068

21E36BD05000
Philippe Henriot
1826 Barnes Cir
West Linn, OR 97068

21E36BD05200
Roger Scott & Jana Dillingham
3802 Fairhaven Dr
West Linn, OR 97068

21E36BD05300
David & Ivy Grelewicz
3806 Fairhaven Dr
West Linn, OR 97068

21E36BD05400
Jon & Angeline Sorenson
3780 Fairhaven Dr
West Linn, OR 97068

21E36BD05500
Tim Freeman
3770 Fairhaven Dr
West Linn, OR 97068

21E36BD05600
Mark Alan Yokubaitis
3760 Fairhaven Dr
West Linn, OR 97068

21E36BD05700
Jeffrey & Constance Bear
3750 Fairhaven Dr
West Linn, OR 97068

21E36BD05800
James Harrop
3730 Fairhaven Dr
West Linn, OR 97068

21E36BD05900
Ann Stein & Charles Gray
2140 Fairhaven Ct
West Linn, OR 97068

21E36BD06000
Shem & Kimberly Ogadhoh
2130 Fairhaven Ct
West Linn, OR 97068

21E36BD06100
Juan Brevis-Acuna
2120 Fairhaven Ct
West Linn, OR 97068

21E36BD06200
Joseph & Rebel Steirer
2110 Fairhaven Ct
West Linn, OR 97068

21E36BD06300
John Gill
2105 Fairhaven Ct
West Linn, OR 97068

21E36BD06400
Jeffrey Michael & Angela Parsons
2115 Fairhaven Ct
West Linn, OR 97068

21E36BD06500
Randall Wolfe
2125 Fairhaven Ct
West Linn, OR 97068

21E36BD06600
So Hin Trste Wong
2135 Fairhaven Ct
West Linn, OR 97068

21E36BD06700
Alf Barber
2145 Fairhaven Ct
West Linn, OR 97068

21E36BD06800
Eric Stotz
2155 Fairhaven Ct
West Linn, OR 97068

21E36BD06900
City Of West Linn
22500 Salamo Rd #600
West Linn, OR 97068

21E36BD07000
City Of West Linn
22500 Salamo Rd #600
West Linn, OR 97068

21E36BD07100
City Of West Linn
22500 Salamo Rd #600
West Linn, OR 97068

21E36BD07200
City Of West Linn
22500 Salamo Rd #600
West Linn, OR 97068

21E36BD07300
City Of West Linn
22500 Salamo Rd #600
West Linn, OR 97068

21E36BD07400
Tanner Creek Estates Iv LLC
4140 SW Canal Rd
Lake Oswego, OR 97035

21E36BC06000
David Schulberg
3957 Northhampton Ct
West Linn, OR 97068

21E36BC06100
Peter & Janecke Stauffer
3944 Northhampton Ct
West Linn, OR 97068

21E36BC06200
David & Shannon Johnson
3932 Northhampton Ct
West Linn, OR 97068

21E36BC06300
Richard Freeman
3920 Northhampton Ct
West Linn, OR 97068

21E36BC06400
Stephen Beyer
3918 Northhampton Ct
West Linn, OR 97068

21E36BC06500
Robert & Beth Perkins
3691 Fairhaven Dr
West Linn, OR 97068

21E36BC07700
City Of West Linn
22500 Salamo Rd #600
West Linn, OR 97068

21E36BC07800
City Of West Linn
22500 Salamo Rd #600
West Linn, OR 97068

21E36BA07801
Logan Wulff
4064 Sussex St
West Linn, OR 97068

21E36BB04420
Stephen & Michele Thornton
3612 Landis St
West Linn, OR 97068

21E36BB04421
Nancy Weinstein
3624 Landis St
West Linn, OR 97068

21E36BB04422
Jonathan & Carolyn Rogers
3636 Landis St
West Linn, OR 97068

21E36BB04423
Travis Takano
3648 Landis St
West Linn, OR 97068

21E36BB04424
Chong Lee
3652 Landis St
West Linn, OR 97068

21E36BB04425
John & Brittney Wolthuis
3664 Landis St
West Linn, OR 97068

21E36BB04426
G D Winther
3676 Landis Trust
West Linn, OR 97068

21E36BB04427
Dan Clair Eaton
3688 Landis St
West Linn, OR 97068

21E36BB04428
Richard Santee
3692 Landis St
West Linn, OR 97068

21E36BB04429
Anthony & Jamey Taylor
3699 Landis St
West Linn, OR 97068

21E36BB04430
Christopher & Chelsea Diaz
3687 Landis St
West Linn, OR 97068

21E36BB04431
Ravelle Tresvant
3675 Landis St
West Linn, OR 97068

21E36BB04432
Daniel Joseph Riler
3669 Landis St
West Linn, OR 97068

21E36BB04433
Chael Sonnen
2945 Coeur D Alene Dr
West Linn, OR 97068

21E36BB04434
Thomas Lambert
3657 Landis St
West Linn, OR 97068

21E36BB04435
Sergey Gorelov
3651 Landis St
West Linn, OR 97068

21E36BB04436
Patrick & Ashley Bennett
3649 Landis St
West Linn, OR 97068

21E36BB04437
David & Teresa Reed
3637 Landis St
West Linn, OR 97068

21E36BB04440
Tanners Stonegate Homeowners Assn
Po Box 387
Oregon City, OR 97045

21E36BB04441
Tanners Stonegate Homeowners Assn
Po Box 387
Oregon City, OR 97045

21E36BB04442
Tanners Stonegate Homeowners Assn
Po Box 387
Oregon City, OR 97045

21E36BB04443
Tanners Stonegate Homeowners Assn
Po Box 387
Oregon City, OR 97045

21E36BA04501
Sean Michael Carroll
1729 Villa Ave
Santa Barbara, CA 93101

11. Willow Ridge Tentative Plan & Engineering

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JULY 13, 2004
TOBY G. BOLDEN
60377LS

RENEWS: 31DEC21

Design by: Richard E. Givens, Planning Consultant
Survey Work by: Centerline Concepts, Inc.

Applicant/Owner:
Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406

Legal: 2-1E-36BA TL 6300

Water: City of West Linn

Sewer: City of West Linn

Contours: Centerline Concepts, Inc.

Site Area: 2.176 Acres

Engineer:
Theta Engineering, Inc.
PO Box 1345
Lake Oswego, OR 97035
PH: (503) 481-8822

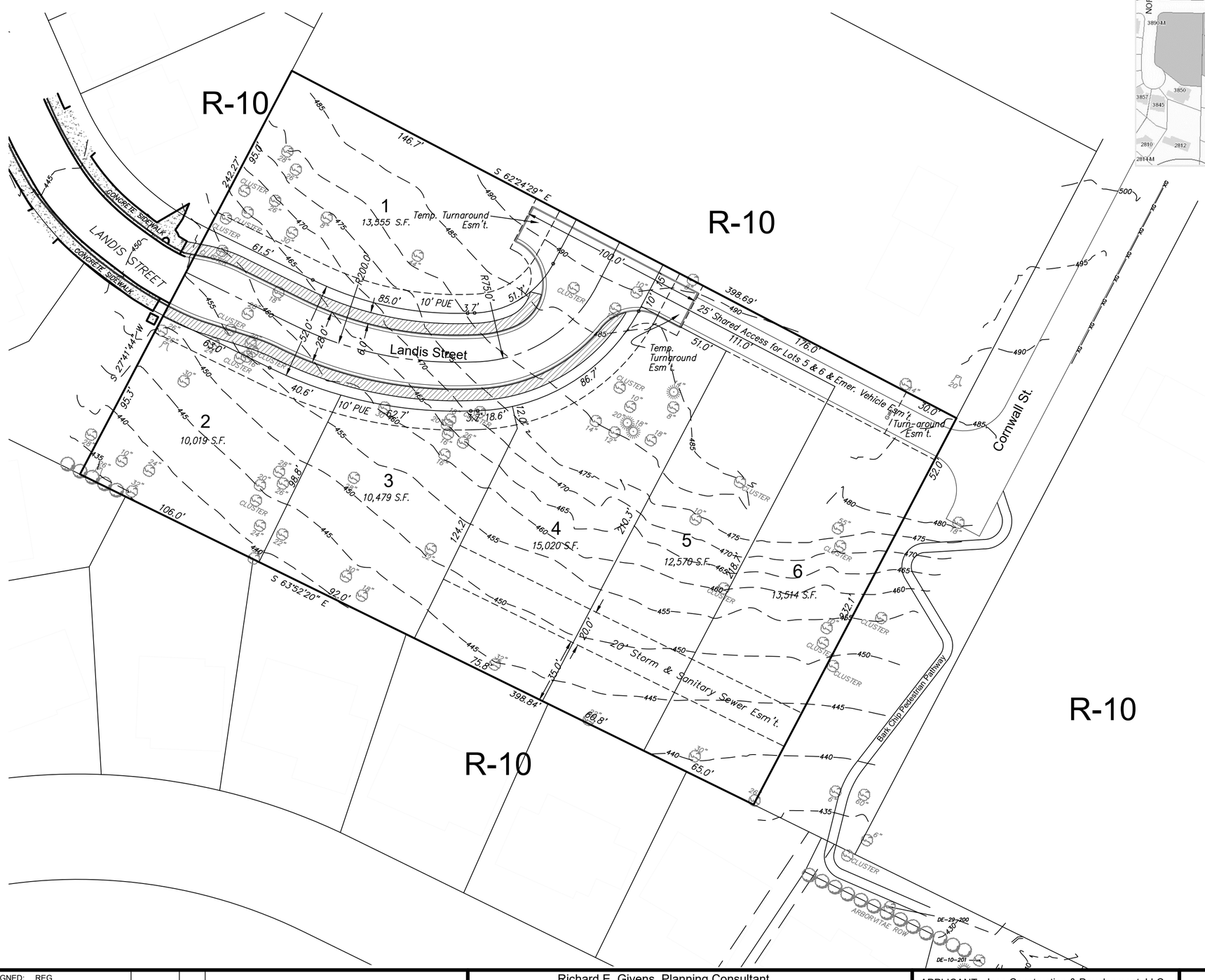
Surveyor:
Centerline Concepts, Inc.
700 Molalla Ave.
Oregon City, OR 97045
PH: (503) 650-0188

Zoning: R-10

NORTH

0 10' 20' 30' 40' 80'

Scale: 1" = 40'



Vicinity Map

Density Calculations

	Area (sq. ft.)	Allowable Density	Units @1 per 10,000 sq.ft.
Gross Site Area	94,808		
Land in a boundary street right-of-way, water course, or planned open space where density transfer is not requested:	0		
Area in street right-of-way:	14,010		
Net Site Area:	80,798		
Area within Type I or II slopes where Developed:	20,587	50%	1.03
Area within Type I or II slopes where Density Will be Transferred:	0	75%	0
Area within Water Resource Area-all development transferred.	0	50%	0
Open Space (Type III and IV Lands)	0	100%	0.00
Type III & IV Land Developed:	60,211	100%	6
TOTAL ALLOWED DENSITY:			7 UNITS

DESIGNED:	REG			
DRAWN:	REG			
SCALE:	1" = 30'			
DATE:	November 2019			
FILE:	15-ICN-112	DATE	NO.	REVISION

Richard E. Givens, Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045
PH: (503) 479-0097

APPLICANT: Icon Construction & Development, LLC
1969 Willamette Falls Dr., Suite 260
West Linn, OR 97068
PH: (503) 657-0406

Willow Ridge
Tentative Plan

SHEET: 1/2

DESIGNED:	REG	4-15-2020	1	Added tree tag ID numbers per Arborist report for trees on south line.
DRAWN:	REG			
SCALE:	1" = 30'			
DATE:	November 2019			
FILE:	15-ICN-112	DATE	NO.	REVISION

Richard E. Givens, Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045
PH: (503) 479-0097

APPLICANT:
Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406

Willow Ridge
Tentative Plan - Trees & Slopes Plan

SHEET:
2/2

WATER QUALITY PLANTER ELEVATION

SCALE: 1" = 5' HORIZONTAL
1" = 5' VERTICAL

A
1

2010-129L

TENTATIVE PLAN
PRELIMINARY STREET AND UTILITY PLAN

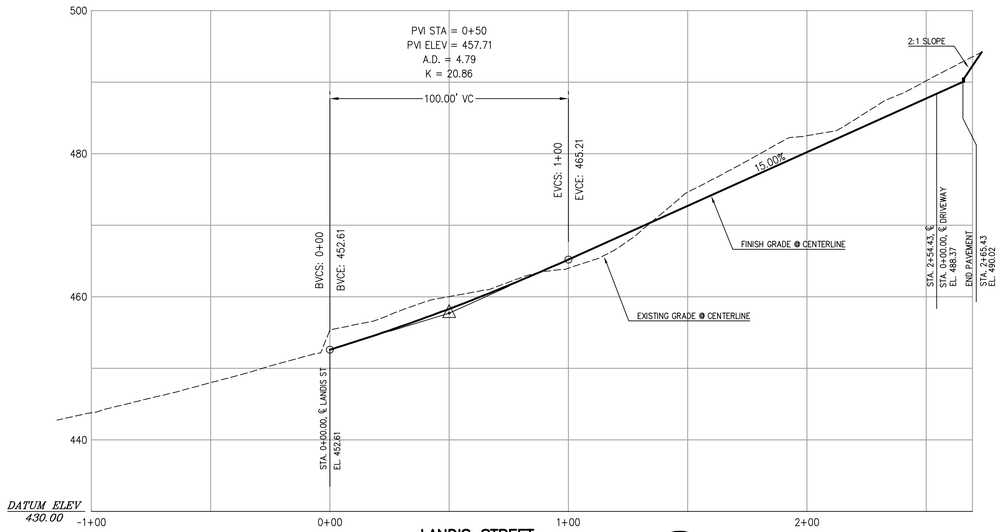
DESIGNED:	BDG			
DRAWN:	BJS			
SCALE:	1" = 30'			
DATE:	July, 2017	11/02/2017	1	APPLICATION
FILE:	Cornwall Street Prelim7	DATE	NO.	REVISION

Theta, llc
ENGINEERING - SURVEYING - PLANNING
PO Box 1345
Lake Oswego, Oregon 97035
503/481-8822
email: thetaeng@comcast.net

Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, Oregon 97068
Phone: (503) 657-0406

Willow Ridge
West Linn, Oregon

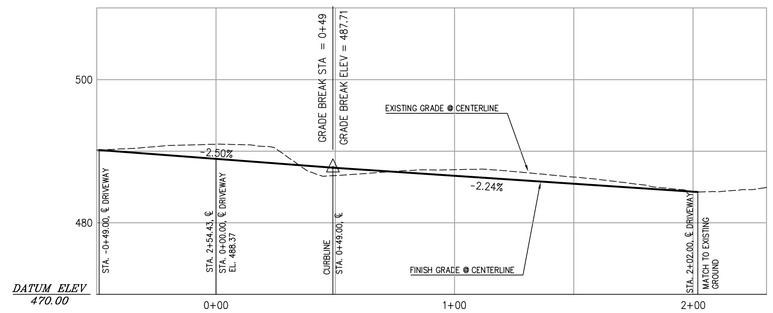
SHEET:
1/3



LANDIS STREET CENTERLINE PROFILE

1/3

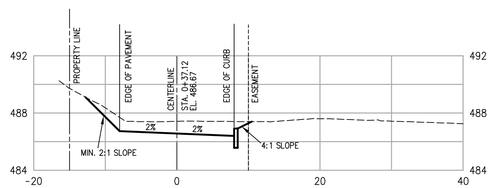
SCALE: 1" = 30' HORIZONTAL
1" = 10' VERTICAL



DRIVEWAY CENTERLINE PROFILE

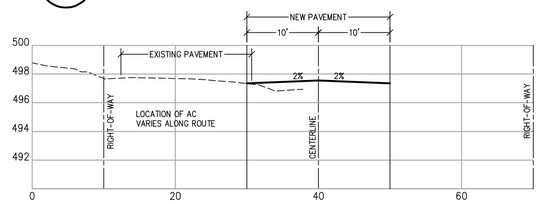
2/3

SCALE: 1" = 30' HORIZONTAL
1" = 10' VERTICAL



STREET SECTION – STA. 1+00

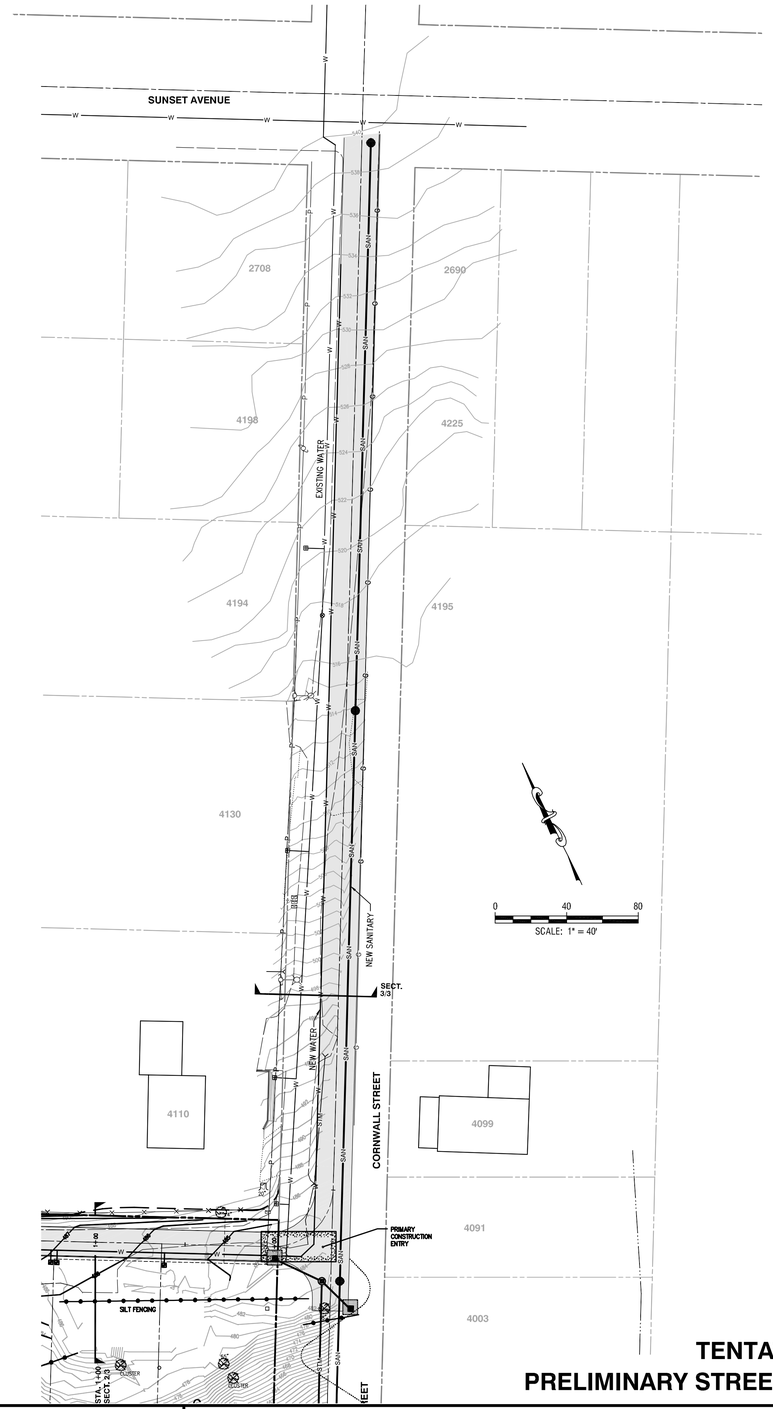
SCALE: 1" = 10' HORIZONTAL
1" = 5' VERTICAL



CORNWALL STREET STREET SECTION

3/3

SCALE: 1" = 10' HORIZONTAL
1" = 5' VERTICAL



TENTATIVE PLAN
PRELIMINARY STREET PROFILE

2010-129L

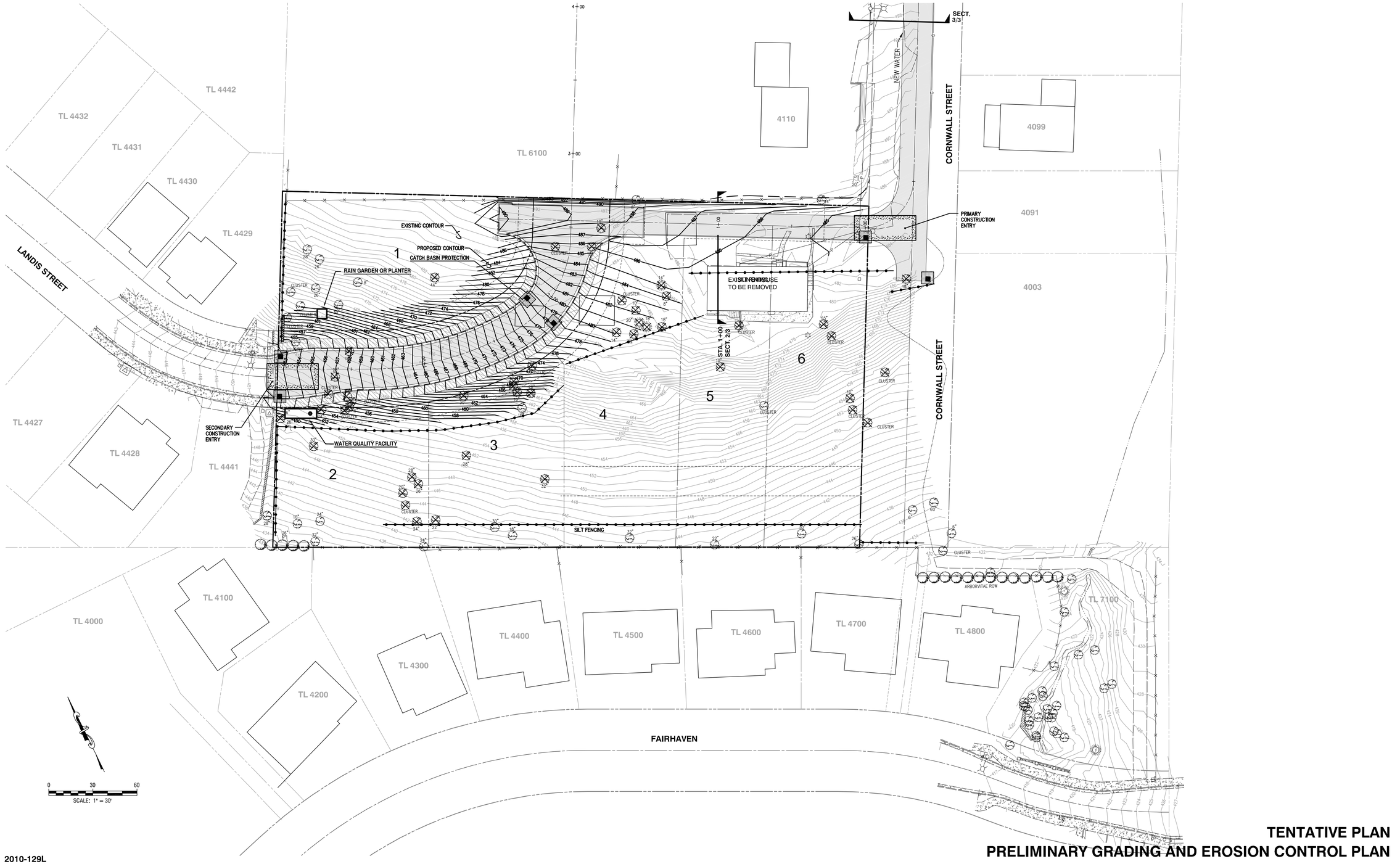
DESIGNED:	BDG			
DRAWN:	BJS			
SCALE:	1" = 30'			
DATE:	July, 2017			
FILE:	Cornwall Street Prelim7	DATE	NO.	REVISION

Theta, llc
ENGINEERING - SURVEYING - PLANNING
PO Box 1345
Lake Oswego, Oregon 97035
503/481-8822
email: thetaeng@comcast.net

Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, Oregon 97068
Phone: (503) 657-0406

Willow Ridge
West Linn, Oregon

SHEET: 2/3



TENTATIVE PLAN

PRELIMINARY GRADING AND EROSION CONTROL PLAN

2010-129L

DESIGNED:	BDG			
DRAWN:	BJS			
SCALE:	1" = 30'			
DATE:	July, 2017	11/02/2017	1	APPLICATION
FILE:	Cornwall Street Prelim7	DATE	NO.	REVISION

Theta,llc
ENGINEERING - SURVEYING - PLANNING
PO Box 1345
Lake Oswego, Oregon 97035
503/481-8822
email: thetaeng@comcast.net

Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, Oregon 97068
Phone: (503) 657-0406

Willow Ridge
West Linn, Oregon

SHEET: 3/3

EXISTING CONDITIONS MAP

TAX LOT 6300
LOCATED IN THE N.W. 1/4 SECTION 36, T.2S., R.1E., W.M.,
CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON
DECEMBER 28, 2015 SCALE 1"=30'

SURVEY NOTES:

THE DATUM FOR THIS SURVEY IS BASED UPON A STATIC GPS OBSERVATION OF LOCAL CONTROL POINTS, PROCESSED THROUGH OPUS. DATUM IS NAVD 88.

A TRIMBLE S6-SERIES ROBOTIC INSTRUMENT WAS USED TO COMPLETE A CLOSED LOOP FIELD TRAVERSE.

THE BASIS OF BEARINGS FOR THIS SURVEY IS PER MONUMENTS FOUND AND HELD PER THE PLAT OF "TANNER CREEK ESTATES", RECORDS OF CLACKAMAS COUNTY.

THE PURPOSE OF THIS SURVEY IS TO RESOLVE AND DETERMINE THE PERIMETER BOUNDARY OF THE SUBJECT PROPERTY, TO SHOW ALL PERTINENT BOUNDARY ISSUES AND ENCROACHMENTS. NO PROPERTY CORNERS WERE SET IN THIS SURVEY.

NO WARRANTIES ARE MADE AS TO MATTERS OF UNWRITTEN TITLE, SUCH AS ADVERSE POSSESSION, ESTOPPEL, ACQUIESCENCE, ETC.

FIDELITY NATIONAL TITLE COMPANY OF OREGON PRELIMINARY TITLE REPORT NUMBER 45141521844, DATED DECEMBER 10, 2015 AS PROVIDED HAS BEEN USED AND REFERENCED IN PREPARATION OF THIS MAP. PLEASE REFER TO THIS DOCUMENT FOR DESCRIPTIONS OF EXCEPTIONS TO TITLE INSURANCE.

THE UNDERGROUND UTILITIES AS SHOWN ON THIS MAP HAVE BEEN LOCATED FROM FIELD SURVEY OF ABOVE GROUND STRUCTURES AND AS MARKED BY OTHERS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FUTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. SUBSURFACE AND ENVIRONMENTAL CONDITIONS WERE NOT EXAMINED OR CONSIDERED AS A PART OF THIS SURVEY. NO STATEMENT IS MADE CONCERNING THE EXISTENCE OF UNDERGROUND OR OVERHEAD CONTAINERS OR FACILITIES THAT MAY AFFECT THE USE OR DEVELOPMENT OF THIS TRACT. THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY SURVEYOR.

LEGEND:

Some Symbols shown may not be used on map

- DECIDUOUS TREE
- EVERGREEN TREE
- STORM SEWER MANHOLE
- CATCH BASIN
- SANITARY SEWER CLEANOUT
- SANITARY SEWER MANHOLE
- WATER VALVE
- WATER METER
- FIRE HYDRANT
- GAS VALVE
- GAS METER
- BOLLARD
- SIGN
- MAILBOX
- COMMUNICATIONS PEDESTAL
- COMMUNICATIONS MANHOLE
- COMMUNICATIONS BOX
- STORM OUTFALL
- FOUND MONUMENT
- DOWN SPOUT TO STORM SYSTEM
- ELECTRIC VAULT
- GAS STUB
- RADON VENT
- UTILITY AND LIGHT POLE
- UTILITY POLE
- LIGHT POLE
- GUY WIRE
- ELECTRIC BOX
- ELECTRIC METER
- ELECTRICAL POWER PEDESTAL
- ELECTRIC RISER
- HEAT PUMP
- OVERHEAD LINE
- GAS LINE
- ELECTRICAL LINE
- COMMUNICATIONS LINE
- SANITARY SEWER LINE
- STORM DRAIN LINE
- WATER LINE
- FENCELINE
- UTILITY RISER
- DOWN SPOUT TO SPLASH GUARD/GROUND
- ELECTRIC TRANSFORMER
- SATELLITE DISH
- STUMP

GRAPHIC SCALE
30 0 15 30 60
(IN FEET)
1 INCH = 30 FT.

SIGNED ON: 05/ANIS

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JULY 13, 2004
TOBY O. BOLDEN
60377LS

RENEWS: DECEMBER 31, 2017

CENTERLINE CONCEPTS
LAND SURVEYING, INC.
729 MOLALLA AVE., SUITE 1 & 2
OREGON CITY, OREGON 97045
PHONE 503.650.0188 FAX 503.650.0189

Plotted: M: \PROJECTS\CON-CORNWALL ST-4096\dwg\ECM.dwg

12. Plan B Alternative Plan & Engineering

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JULY 13, 2004
TOBY G. BOLDEN
60377LS

RENEWS: 31DEC21

Design by: Richard E. Givens, Planning Consultant
Survey Work by: Centerline Concepts, Inc.

Applicant/Owner:
Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406

Legal: 2-1E-36BA TL 6300

Water: City of West Linn

Sewer: City of West Linn

Contours: Centerline Concepts, Inc.

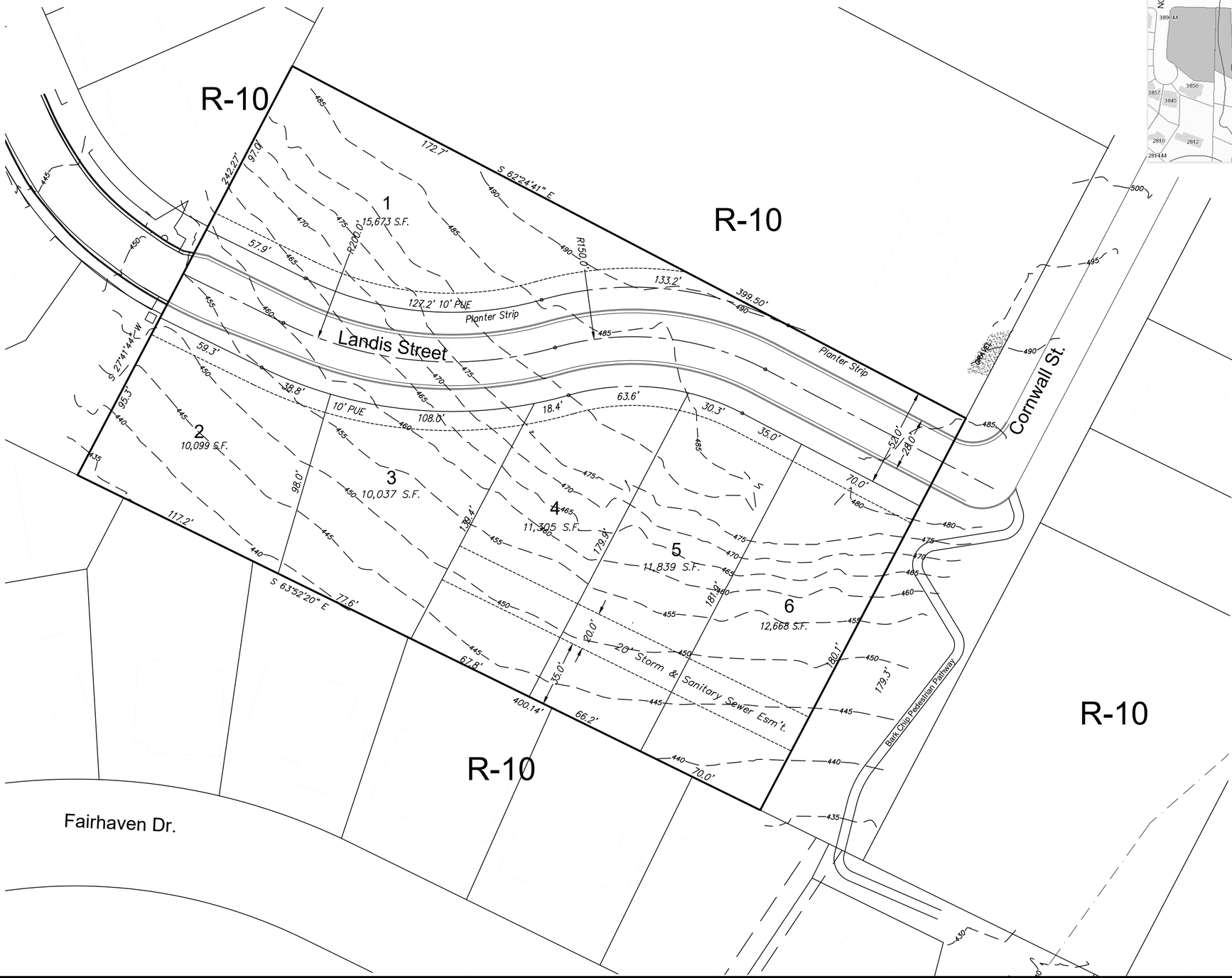
Site Area: 2.176 Acres

Engineer:
Theta Engineering, Inc.
PO Box 1345
Lake Oswego, OR 97035
PH: (503) 481-8822

Surveyor:
Centerline Concepts, Inc.
700 Molalla Ave.
Oregon City, OR 97045
PH: (503) 650-0188

Zoning: R-10

NORTH



Vicinity Map

Density Calculations

	Area (sq. ft.)	Allowable Density	Units @1 per 10,000 sq.ft.
Gross Site Area	94,808		
Land in a boundary street right-of-way, water course, or planned open space where density transfer is not requested:	0		
Area in street right-of-way:	17,627		
Net Site Area:	77,181		
Area within Type I or II slopes where Developed:	20,587	50%	1.03
Area within Type I or II slopes where Density Will be Transferred:	0	75%	0
Area within Water Resource Area-all development transferred.	0	50%	0
Open Space (Type III and IV Lands)	0	100%	0.00
Type III & IV Land Developed:	56,594	100%	5.7
TOTAL ALLOWED DENSITY:			6 UNITS

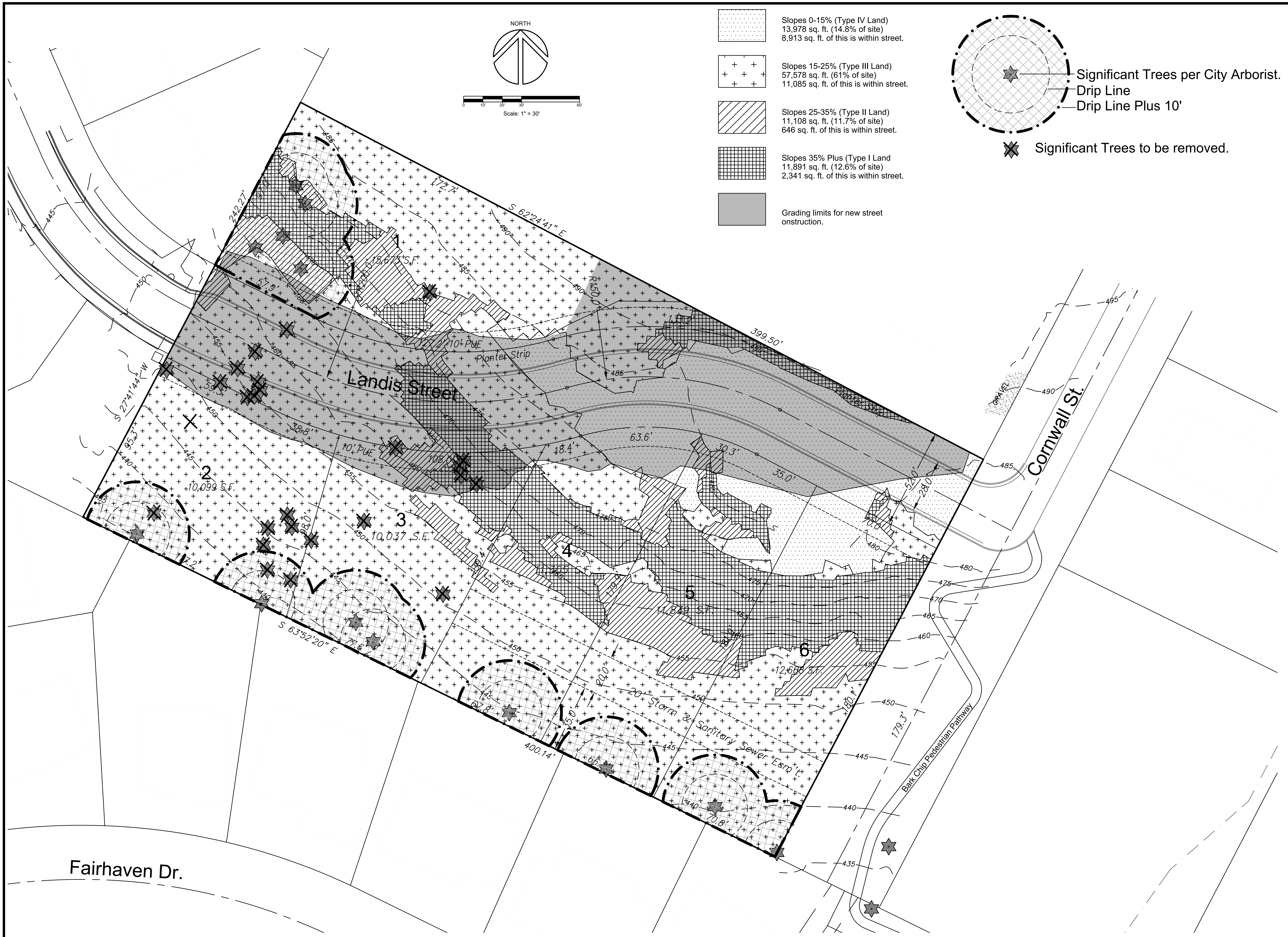
DESIGNED:	REG	4-15-2020	1	Revised street right-of-way at curve to match centerline.
DRAWN:	REG	6-23-2020	1	Revised street right-of-way to flatten curves.
SCALE:	1" = 30'			
DATE:	November 2019			
FILE:	15-ICN-112	DATE	NO.	REVISION

Richard E. Givens, Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045
PH: (503) 479-0097

APPLICANT: Icon Construction & Development, LLC
1969 Willamette Falls Dr., Suite 260
West Linn, OR 97068
PH: (503) 657-0406

Willow Ridge
Plan B

SHEET: 1/2



NORTH
Scale: 1" = 30'
Slopes 0-15% (Type IV Land)
13,978 sq. ft. (14.8% of site)
8,913 sq. ft. of this is within street.
Slopes 15-25% (Type III Land)
57,578 sq. ft. (61% of site)
11,085 sq. ft. of this is within street.
Slopes 25-35% (Type II Land)
11,108 sq. ft. (11.7% of site)
646 sq. ft. of this is within street.
Slopes 35% Plus (Type I Land
11,891 sq. ft. (12.6% of site)
2,341 sq. ft. of this is within street.
Grading limits for new street onstruction.
Significant Trees per City Arborist.
Drip Line
Drip Line Plus 10'
Significant Trees to be removed.
Landis Street
Cornwall St.
Fairhaven Dr.
Bark Chip Pedestrian Pathway
Planter Strip
10' PUE
20' Storm & Sanitary Sewer Esm't.
S 62°24'41" E
S 63°52'20" E
S 27°41'44" W
399.50'
400.14'
242.27'
1
15,675 S.F.
2
10,099 S.F.
3
10,037 S.F.
4
5
11,849 S.F.
6
12,668 S.F.
GRAVEL

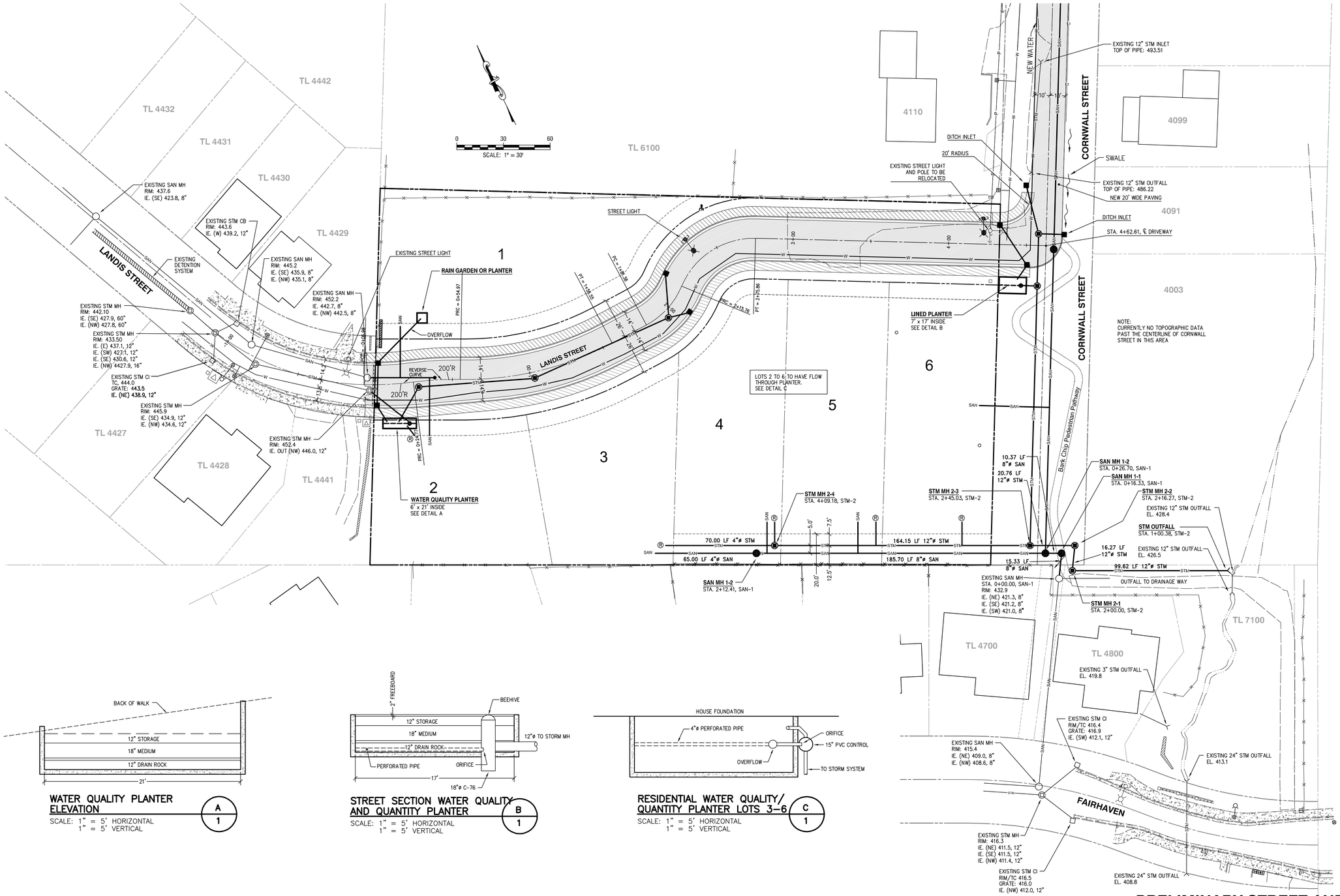
DESIGNED:	REG	4-15-2020	1	Added tree tag ID numbers per Arborist report for trees on south line.
DRAWN:	REG			
SCALE:	1" = 30'			
DATE:	November 2019			
FILE:	15-ICN-112	DATE	NO.	REVISION

Richard E. Givens, Planning Consultant
18680 Sunblaze Dr.
Oregon City, OR 97045
PH: (503) 479-0097

APPLICANT: Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, OR 97068
PH: (503) 657-0406

Willow Ridge
Plan B Trees & Slopes

2/2



WATER QUALITY PLANTER ELEVATION (A/1)

SCALE: 1" = 5' HORIZONTAL
1" = 5' VERTICAL

STREET SECTION WATER QUALITY AND QUANTITY PLANTER (B/1)

SCALE: 1" = 5' HORIZONTAL
1" = 5' VERTICAL

RESIDENTIAL WATER QUALITY/ QUANTITY PLANTER LOTS 3-6 (C/1)

SCALE: 1" = 5' HORIZONTAL
1" = 5' VERTICAL

PLAN B
PRELIMINARY STREET AND UTILITY PLAN

2010-129L

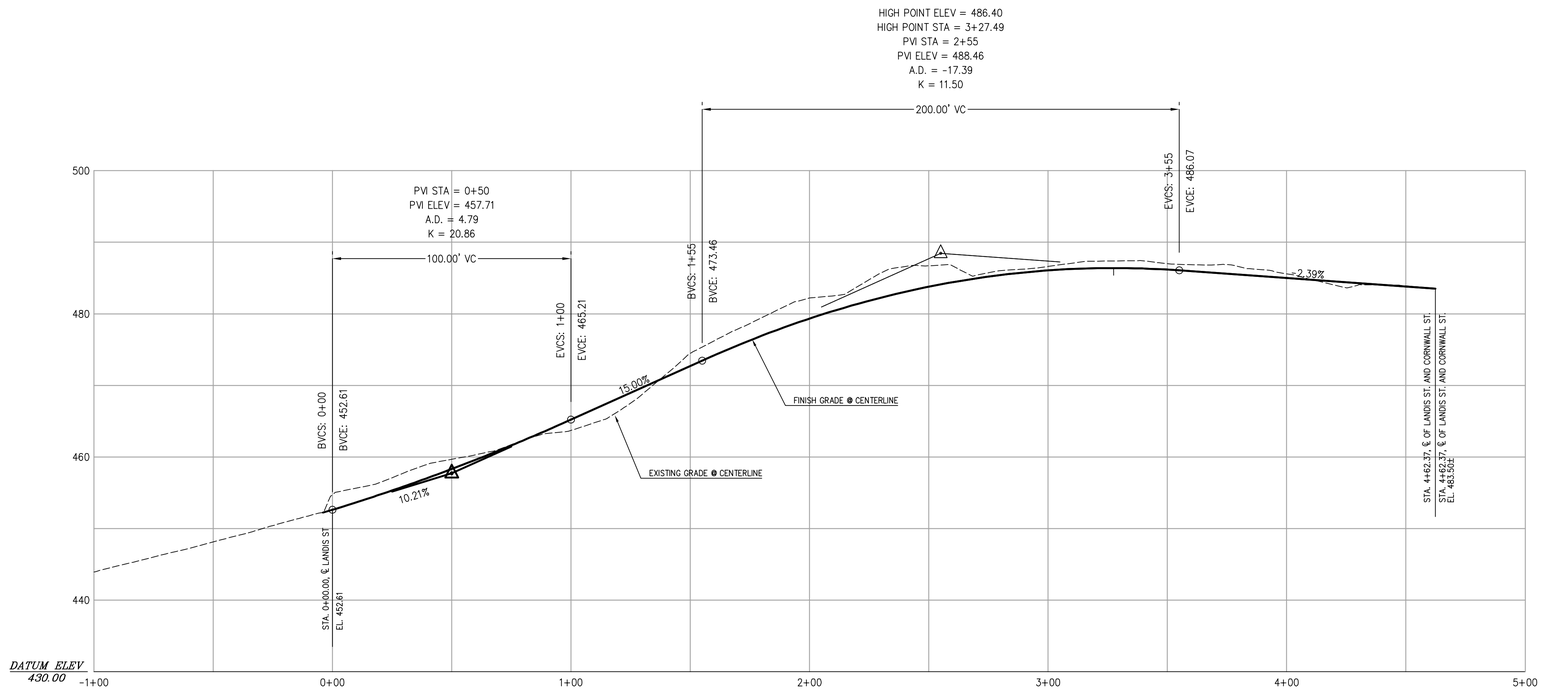
DESIGNED:	BDG			
DRAWN:	BJS			
SCALE:	1" = 30'			
DATE:	July, 2017	11/02/2017	1	APPLICATION
FILE:	Cornwall Street Prelim10	DATE	NO.	REVISION

Theta, llc
ENGINEERING - SURVEYING - PLANNING
PO Box 1345
Lake Oswego, Oregon 97035
503/481-8822
email: thetaeng@comcast.net

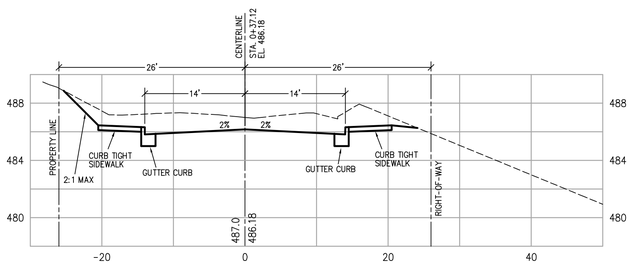
Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, Oregon 97068
Phone: (503) 657-0406

Willow Ridge
West Linn, Oregon

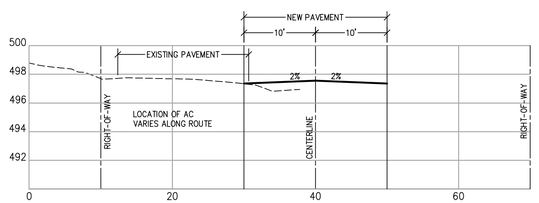
SHEET: 1/3



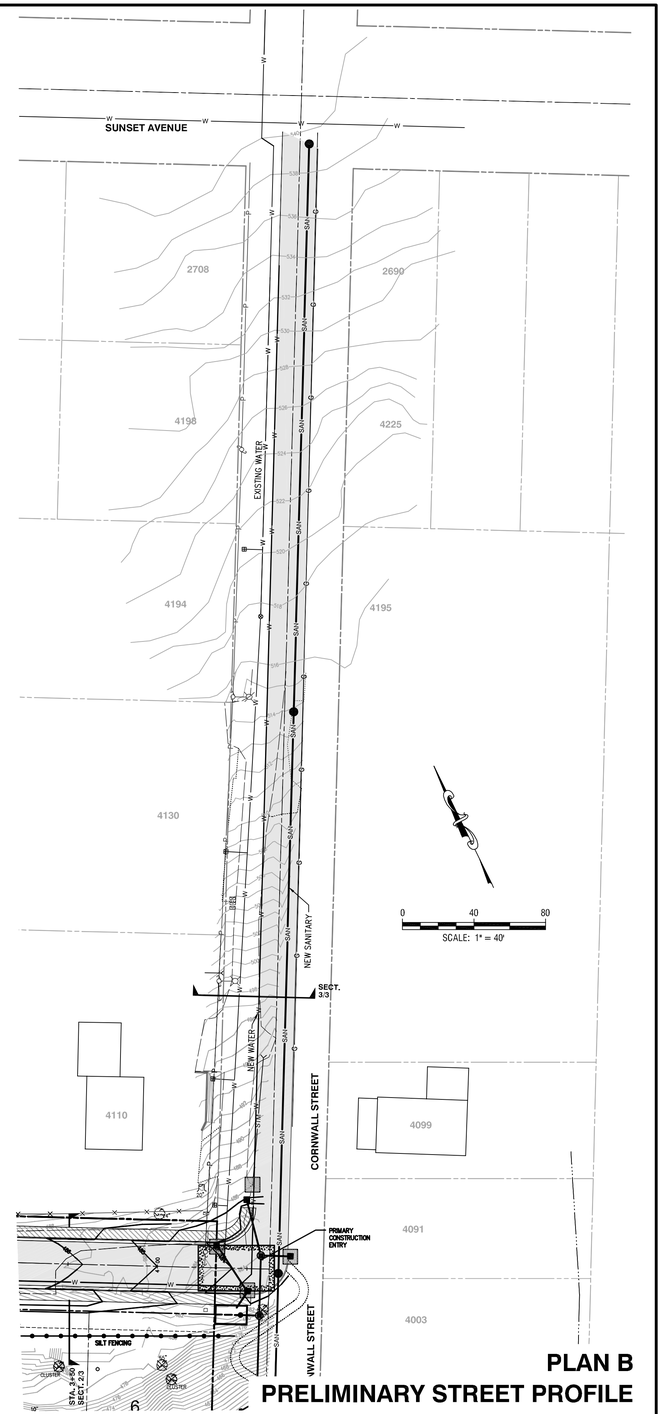
LANDIS STREET
CENTERLINE PROFILE 1/2
SCALE: 1" = 30' HORIZONTAL
1" = 10' VERTICAL



STREET SECTION STA. 3+50 2/2
SCALE: 1" = 10' HORIZONTAL
1" = 5' VERTICAL



CORNWALL STREET
STREET SECTION 3/2
SCALE: 1" = 10' HORIZONTAL
1" = 5' VERTICAL



PLAN B
PRELIMINARY STREET PROFILE

2010-129L

DESIGNED:	BDG			
DRAWN:	BJS			
SCALE:	1" = 30'			
DATE:	July, 2017			
FILE:	Cornwall Street Prelim10	DATE	NO.	REVISION

Theta, llc
ENGINEERING - SURVEYING - PLANNING
PO Box 1345
Lake Oswego, Oregon 97035
503/481-8822
email: thetaeng@comcast.net

Icon Construction & Development, LLC
1980 Willamette Falls Drive, Suite 200
West Linn, Oregon 97068
Phone: (503) 657-0406

Willow Ridge
West Linn, Oregon

SHEET: 2/3

SECT. 3/3

NEW WATER

CORNWALL STREET

CORNWALL STREET

PRIMARY CONSTRUCTION ENTRY

EXISTING CONTOUR

PROPOSED CONTOUR

CATCH BASIN PROTECTION

RAIN GARDEN OR PLANTER

EXISTING HOUSE TO BE REMOVED

SILT FENCING

STA. 3+50 SECT. 2/3

SECONDARY CONSTRUCTION ENTRY

WATER QUALITY FACILITY

SILT FENCING

Bark Chip Pedestrian Pathway

LANDIS STREET

FAIRHAVEN

ARBORVITAE ROW

CLUSTER

TL 4442
TL 4432
TL 4431
TL 4430
TL 4429
TL 4427
TL 4428
TL 4441
TL 6100
4110
4099
4091
4003
TL 7100
TL 4000
TL 4100
TL 4300
TL 4200
TL 4400
TL 4500
TL 4600
TL 4700
TL 4800

1 2 3 4 5 6

0 30 60
SCALE: 1" = 30'

PLAN B

PRELIMINARY GRADING AND EROSION CONTROL PLAN

2010-129L

DESIGNED:	BDG			
DRAWN:	BJS			
SCALE:	1" = 30'			
DATE:	July, 2017	11/02/2017	1	APPLICATION
FILE:	Cornwall Street Prelim10	DATE	NO.	REVISION

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West Linn, Oregon 97068
Phone: (503) 657-0406

Willow Ridge
West Linn, Oregon

SHEET: 3/3

PC-6

TVFR Comments

January 27, 2020

Jennifer Arnold
Associate Planner
City of West Linn
22500 Salamo Road #900
West Linn, Oregon
97068

Re: 6-Lot SUB-20-01, 4096 Cornwall Street West Linn
Tax Lot I.D: 21E36BA06300

Jennifer,

Thank you for the opportunity to review the proposed land use application surrounding the above named development project. These notes are provided in regards to the application received **Monday, January 13, 2020**. Plans A and B are acceptable so long as they meet the following conditions. There may be more or less requirements needed based upon the final project design, however, Tualatin Valley Fire & Rescue will endorse this proposal predicated on the following criteria and conditions of approval.

FIRE APPARATUS ACCESS:

1. **FIRE APPARATUS ACCESS ROAD DISTANCE FROM BUILDINGS AND FACILITIES:** Access roads shall be within 150 feet of all portions of the exterior wall of the first story of the building as measured by an approved route around the exterior of the building or facility. An approved turnaround is required if the remaining distance to an approved intersecting roadway, as measured along the fire apparatus access road, is greater than 150 feet. (OFC 503.1.1)

2. **DEAD END ROADS AND TURNAROUNDS:** Dead end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround. Diagrams can be found in the corresponding guide. http://www.tvfr.com/DocumentCenter/View/1438 (OFC 503.2.5 & D103.1)

3. **FIRE APPARATUS ACCESS ROAD WIDTH AND VERTICAL CLEARANCE:** Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20 feet (26 feet adjacent to fire hydrants (OFC D103.1)) and an unobstructed vertical clearance of not less than 13 feet 6 inches. (OFC 503.2.1)

4. **FIRE APPARATUS ACCESS ROADS FOR INDIVIDUAL ONE AND TWO FAMILY DWELLINGS AND ACCESSORY STRUCTURES:** The fire district will approve access roads of 12 feet for up to three dwelling units (Group R-3) and accessory (Group U) buildings. (OFC 503.1.1)

5. **NO PARKING SIGNS:** Where fire apparatus roadways are not of sufficient width to accommodate parked vehicles and 20 feet of unobstructed driving surface, “No Parking” signs shall be installed on one or both sides of the roadway and in turnarounds as needed. Signs shall read “NO PARKING - FIRE LANE” and shall be installed with a clear space above grade level of 7 feet. Signs shall be 12 inches wide by 18 inches high and shall have red letters on a white reflective background. (OFC D103.6)

6. **NO PARKING:** Parking on emergency access roads shall be as follows (OFC D103.6.1-2):
   1. 20-26 feet road width – no parking on either side of roadway
   2. 26-32 feet road width – parking is allowed on one side
   3. Greater than 32 feet road width – parking is not restricted

7. **FIRE APPARATUS ACCESS ROADS WITH FIRE HYDRANTS:** Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet and shall extend 20 feet before and after the point of the hydrant. (OFC D103.1)

8. **SURFACE AND LOAD CAPACITIES:** Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced as to provide all-weather driving capabilities. (OFC 503.2.3)

9. **TURNING RADIUS:** The inside turning radius and outside turning radius shall not be less than 28 feet and 48 feet respectively, measured from the same center point. (OFC 503.2.4 & D103.3)

10. **ACCESS ROAD GRADE:** Fire apparatus access roadway grades shall not exceed 15%.

11. **ANGLE OF APPROACH/GRADE FOR TURNAROUNDS:** Turnarounds shall be as flat as possible and have a maximum of 5% grade with the exception of crowning for water run-off. (OFC 503.2.7 & D103.2)

12. **ANGLE OF APPROACH/GRADE FOR INTERSECTIONS:** Intersections shall be level (maximum 5%) with the exception of crowning for water run-off. (OFC 503.2.7 & D103.2)

13. **TRAFFIC CALMING DEVICES:** Shall be prohibited on fire access routes unless approved by the Fire Marshal. (OFC 503.4.1). Traffic calming measures linked here: http://www.tvfr.com/DocumentCenter/View/1578

14. **GATES:** Gates securing fire apparatus roads shall comply with all of the following (OFC D103.5, and 503.6):
   1. Minimum unobstructed width shall be not less than 20 feet (or the required roadway surface width).
   2. Gates serving three or less single-family dwellings shall be a minimum of 12 feet in width.
   3. Gates shall be set back at minimum of 30 feet from the intersecting roadway or as approved.
   4. Electric gates shall be equipped with a means for operation by fire department personnel
   5. Electric automatic gates shall comply with ASTM F 2200 and UL 325.

FIREFIGHTING WATER SUPPLIES:

15. **FIREFIGHTING WATER SUPPLY FOR INDIVIDUAL ONE- AND TWO-FAMILY DWELLINGS:** The minimum available fire flow for one and two-family dwellings served by a municipal water supply shall be 1,000 gallons per minute. If the structure(s) is (are) 3,600 square feet or larger, the required fire flow shall be determined according to OFC Appendix B. (OFC B105.2)

16. **FIRE FLOW WATER AVAILABILITY:** Applicants shall provide documentation of a fire hydrant flow test or flow test modeling of water availability from the local water purveyor if the project includes a new structure or increase in the floor area of an existing structure. Tests shall be conducted from a fire hydrant within 400 feet for commercial projects, or 600 feet for residential development. Flow tests will be accepted if they were performed within 5 years as long as no adverse modifications have been made to the supply system. Water availability information may not be required to be submitted for every project. (OFC Appendix B)

FIRE HYDRANTS:

17. **FIRE HYDRANTS – ONE- AND TWO-FAMILY DWELLINGS & ACCESSORY STRUCTURES:** Where the most remote portion of a structure is more than 600 feet from a hydrant on a fire apparatus access road, as measured in an approved route around the exterior of the structure(s), on-site fire hydrants and mains shall be provided. (OFC 507.5.1)

18. **FIRE HYDRANT NUMBER AND DISTRIBUTION:** The minimum number and distribution of fire hydrants available to a building shall not be less than that listed in Table C 105.1. (OFC Appendix C)

19. **FIRE HYDRANT(S) PLACEMENT:** (OFC C104)
    - Existing hydrants in the area may be used to meet the required number of hydrants as approved. Hydrants that are up to 600 feet away from the nearest point of a subject building that is protected with fire sprinklers may contribute to the required number of hydrants. (OFC 507.5.1)
    - Hydrants that are separated from the subject building by railroad tracks shall not contribute to the required number of hydrants unless approved by the Fire Marshal.
    - Hydrants that are separated from the subject building by divided highways or freeways shall not contribute to the required number of hydrants. Heavily traveled collector streets may be considered when approved by the Fire Marshal.
    - Hydrants that are accessible only by a bridge shall be acceptable to contribute to the required number of hydrants only if approved by the Fire Marshal.

20. **REFLECTIVE HYDRANT MARKERS:** Fire hydrant locations shall be identified by the installation of blue reflective markers. They shall be located adjacent and to the side of the center line of the access roadway that the fire hydrant is located on. In the case that there is no center line, then assume a center line and place the reflectors accordingly. (OFC 507)

BUILDING ACCESS AND FIRE SERVICE FEATURES

21. **PREMISES IDENTIFICATION:** New and existing buildings shall have approved address numbers; building numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property, including monument signs. These numbers shall contrast with their background. Numbers shall be a minimum of 4 inches high with a minimum stroke width of 1/2 inch. (OFC 505.1)
    Provide a physical address on the new home, as well as, near the intersection of the private drive and public road visible from both approaches of [enter road intersections here]

If you have questions or need further clarification, please feel free to contact me at **(503) 259-1510.**

Sincerely,

Jason Arn

Jason Arn
Deputy Fire Marshal II

Email Jason.arn@tvfr.com

Cc: File

A full copy of the New Construction Fire Code Applications Guide for Residential Development is available at http://www.tvfr.com/DocumentCenter/View/1438