

**STAFF REPORT  
FOR THE PLANNING COMMISSION**

**FILE NUMBER:** DR-20-02

**HEARING DATE:** September 16, 2020

**REQUEST:** A Site Design Review to construct a single-story Dental and Physical Therapy Clinic in the OBC Zone

**APPROVAL CRITERIA:** Community Development Code (CDC) Chapter 21, Chapter 46, Chapter 48, Chapter 54, Chapter 55, and Chapter 99

**STAFF REPORT PREPARED BY:** Jennifer Arnold, Associate Planner

Community Development Director Initials JW Development Review Engineer's Initials: AP

**TABLE OF CONTENTS**

**STAFF ANALYSIS AND RECOMMENDATION**

GENERAL INFORMATION ..... 2

EXECUTIVE SUMMARY ..... 3

PUBLIC COMMENTS.....3

RECOMMENDATION..... 3-4

ADDENDUM/STAFF FINDINGS ..... 5-28

**EXHIBITS (Numbered separately)**

PC-1 AFFIDAVIT AND NOTICE PACKET ..... 1-5

PC-2 COMPLETENESS LETTER..... 6-7

PC-3 APPLICANT'S SUBMITTAL ..... 8-545

PC-4 PUBLIC COMMENTS.....546-547

PC-5 ODOT TRAFFIC IMPACT LETTERS .....548-552

## GENERAL INFORMATION

**APPLICANT/  
CONSULTANT:**

Lenity Architecture, Inc.  
ATTN: Same Thomas  
3150 Kettle Court SE  
Salem, OR 97301

**OWNER:**

Kim Wright, DMD, MAGD  
1554 Garden Street, STE: 104  
West Linn, OR 97068

**SITE LOCATION:**

1575 Burns Street

**LEGAL  
DESCRIPTION:**

Clackamas County Assessor's Map 2S-2E-30BD, tax lot 02501

**SITE SIZE:**

0.62 acres (27,007.2 square feet)

**ZONING:**

Office Business Center (OBC)

**COMP PLAN  
DESIGNATION:**

Commercial

**120-DAY PERIOD:**

This application became complete on August 17, 2020. The 120-day maximum application-processing period ends on December 3, 2020.

**PUBLIC NOTICE:**

Public notice was mailed to the all neighborhood associations and affected property owners on August 26, 2020. The property was posted with a notice sign on September 4, 2020. The notice was published in the West Linn Tidings on September 3, 2020. The notice requirements of CDC Chapter 99 have been met. In addition, the staff report was posted on the City's website August 25, 2020.



## EXECUTIVE SUMMARY

**Site Conditions:** The proposed development site is located at 1575 Burns Street and currently occupied with a single-family dwelling to be removed. The property is approximately 27,007 square feet. All trees are proposed to be removed due to the amount of grading required to develop the site given the steep slopes.

**Project Description:** The applicant is requesting approval for a Class II Design Review to construct a new single-story commercial building in the OBC zone. The commercial building will house dental and physical therapy clinic with no residential uses.

The land use permits include:

- Class II Design Review

**Surrounding Land Use and Zoning:** The undeveloped site is zoned Office Business Center (OBC). Adjacent zoning and land uses include:

Direction From Site	Zoning	Land Use
North	R-10	Single-family Residential
East	R-10	Single-family Residential
West	OBC	Office Business Center
South	GC	General Commercial

**Public comments:** See Exhibit PC-4 for public comments received prior to the publication of this staff report.

## RECOMMENDATION

Staff recommends approval of application DR-20-02 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 Plans.** With the exception of modifications required by these conditions, the project shall substantially conform to all submitted drawings dated 2/14/2020 and revised date 4/28/2020.
2. **Engineering Standards.** All public improvements and facilities associated with the approved site design, including but not limited to street improvements, driveway approaches, curb cuts, utilities, grading, onsite and offsite storm water, street lighting, easements, easement locations, and connections for future extension of utilities are subject to conformance with the City Municipal Code and Community Development

**Code. All improvements must be designed, constructed, and completed prior to the issuance of building permits, unless a financial guarantee in a form approved by the City Attorney for a sum approved by the City Engineer as sufficient to cover 125 percent of the cost of the improvements. (See Staff Findings 64, 65, 66, 67, 70, 73)**

- a. If funding is available, the City may partner with the applicant to upsize the water line in Hood Street and construct the half-street improvements on the Southside of Hood Street.**
- 3. Bicycle Parking. The applicant shall provide 7 bicycle parking space with three of those spaces covered, properly light, signed, and within 50 feet of the entrance. (See Staff Finding 27, 41)**
- 4. Access Drive Width. The Burns Street access drive curb-cut shall be 24 feet in width to allow for two-way traffic. (See Staff Finding 37)**

**ADDENDUM**  
**PLANNING COMMISSION STAFF REPORT**  
September 16, 2020

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

**CHAPTER 21, OFFICE BUSINESS CENTER (OBC)**

**21.030 PERMITTED USES**

*The following uses are uses permitted outright in this zone*

*(...)*

*8. Medical and dental services.*

*(...)*

*13. Utilities, minor.*

*(...)*

**Staff Finding 1: The property is in the OBC zone. The applicant proposes a single-story building to house a dental office and physical therapy clinic. Both of these proposed uses fit with the Medical and dental services uses listed in CDC 21.030. This criteria is satisfied.**

The applicant proposes to treat stormwater onsite and discharge it to a downstream existing stormwater system. The applicant has provided engineer prepared stormwater reports to show adequate downstream capacity.

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 is met.

**21.070 DIMENSIONAL REQUIREMENTS, USES PERMITTED OUTRIGHT AND USES PERMITTED UNDER PRESCRIBED CONDITIONS**

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

1. *The minimum front lot line length or the minimum lot width at the front lot line shall be 35 feet.*
2. *The average minimum lot width shall be 35 feet.*
3. *Repealed by Ord. 1622.*
4. *The yard dimensions or building setback area from the lot line shall be:*
  - a. *Interior side yard, a minimum of seven and one-half feet.*
  - b. *Side yard abutting a street, no minimum.*
  - c. *Rear yard, a minimum of 25 feet.*
  - d. *Front yard, no minimum and a 20-foot maximum. The front setback area between the street and the building line shall consist of landscaping or a combination of non-vehicular hardscape areas (covered with impervious surfaces) and landscaped areas. If there are not street trees within the public right-of-way, the front setback area shall include such trees per the requirements of the City Arborist.*
5. *The maximum lot coverage shall be 50 percent.*
6. *The maximum building height shall be two and one-half stories or 35 feet for any structure located within 50 feet of a low or medium density residential zone and three and one-half stories or 45 feet for any structure located 50 feet or more from a low or medium density residential area.*

**Staff Finding 2: Staff adopts the applicant’s findings on page 12 of the applicant’s submittal in PC Exhibit 3.**

**21.090 OTHER APPLICABLE DEVELOPMENT STANDARDS**

- A. *The following standards apply to all development including permitted uses:*
1. *Chapter 34 CDC, Accessory Structures, Accessory Dwelling Units, and Accessory Uses.*
  2. *Chapter 35 CDC, Temporary Structures and Uses.*

**Staff Finding 3: The proposed refuse area will be appropriately screened but there are no other accessory structures, temporary structures, or uses proposed in the application therefore CDC Chapters 34 and 35 do not apply.**

3. *Chapter 38 CDC, Additional Yard Area Required; Exceptions to Yard Requirements; Storage in Yards; Projections into Yards.*

**Staff Finding 4: The applicant proposes to locate the building at the property line on Burns Street. The subject property is surrounded by right-of-way frontage along Hood Street and Burns Street. The OBC zone does not require a yard when abutting a street. See Staff Finding 2. This criteria is met.**

4. *Chapter 41 CDC, Building Height Structures on Steep Lots, Exceptions.*

**Staff Finding 5:** The maximum height in the OBC zone for a sloped property is 45 feet. The applicant is proposing not to exceed this height restriction. Therefore, the criteria is met, subject to an affirmative decision of the Planning Commission.

5. *Chapter 42 CDC, Clear Vision Areas.*

**Staff Finding 6:** The subject property of this application has two 30 feet by 30 feet clear vision areas at the intersections of Burns Street/Hood Street and Burns Street/Burns Street. The applicant has proposed to maintain these clear vision areas. The applicant has also proposed 30 feet by 30 feet vision clearance triangles for the driveway entrances on Burns Street and Hood Street. This criteria is met.

6. *Chapter 44 CDC, Fences.*

**Staff Finding 7:** The applicant is not proposing any fencing on site. This criteria does not apply.

7. *Chapter 46 CDC, Off-Street Parking, Loading and Reservoir Areas.*

**Staff Finding 8:** Per CDC 46.090 the required number of parking spaces is dependent on the size of the proposed building (1 space per 250 sf of gross floor area). The applicant is proposing an approx. 6,922 sf building which would require 28 parking spaces, but due to the close proximity of public transit a 10% parking reduction is permitted, therefore the required number of parking spaces is reduced to 25 spaces. The applicant is proposing 26 spaces and two spaces to be marked as accessible parking spaces. This criteria is met.

8. *Chapter 48 CDC, Access, Egress and Circulation.*

**Staff Finding 9:** The applicant proposes 2 off-street parking areas with a minimum drive isle of 23 feet for two-way traffic. This criteria is met

## **II. CHAPTER 38, ADDITIONAL YARD AREA REQUIRED, EXCEPTIONS TO YARD REQUIREMENTS, STORAGE IN YARDS, PROJECTIONS INTO YARDS**

### **38.030 SETBACK FROM STREET CENTERLINE REQUIRED**

A. *To assure improved light, air, and sight distance and to protect the public health, safety and welfare, a setback in addition to the yard requirements of the zone may be required where the right-of-way is inadequate. A determination shall be made based on the street standards contained in CDC 85.200(A).*

B. *The minimum yard requirement shall be increased to provide for street widening in the event a yard abuts a street having a right-of-way width less than required by its functional classification on the City's Comprehensive Plan Map, and in such case the setback shall be not less than the setback required by the zone plus one-half of the projected road width as required under CDC 85.200(A); however*

C. *The minimum distance from the wall of any structure to the centerline of an abutting street shall not be less than 25 feet plus the yard required by the zone. This provision shall not apply to rights-of-way of 50 feet or greater in width.*

**Staff Finding 10:** The subject property has frontage along Burns Street and Hood Street. The applicant proposes to place the single-story commercial building near the Burns Street property line as permitted in the OBC zone. The applicant does not propose any projections into the yard areas. These criteria are met.

### **III. CHAPTER 41, BUILDING HEIGHT, STRUCTURES ON STEEP SLOPES, EXCEPTIONS**

#### *41.005 DETERMINING HEIGHT OF BUILDING*

A. *For all zoning districts, building height shall be (...)*

**Staff Finding 11:** The subject property is not located within any historic or commercial design district. The applicant is proposing a single story commercial building which does not exceed the 45 foot height restriction. This criterion is met.

### **IV. CHAPTER 42, CLEAR VISION AREAS**

#### *42.030 EXCEPTIONS*

*The following described area in Willamette shall be exempt from the provisions of this chapter. The units of land zoned General Commercial which abut Willamette Falls Drive, located between 10<sup>th</sup> and 16<sup>th</sup> Streets. (...)*

**Staff Finding 12:** The subject property has frontage along Hood Street and Burns Streets. Both intersections at Hood Street/Burns Street and Burns Street/Burns Street have a 30' by 30' vision clearance triangle. Both access drives also comply with the 30' by 30' clear vision area for private access. This criteria is met.

### **V. CHAPTER 46, OFF-STREET PARKING, LOADING AND RESERVOIR AREAS**

#### *46.060 STORAGE IN PARKING AND LOADING AREAS PROHIBITED*

*Required parking spaces shall be available for the parking of passenger automobiles of residents, customers, patrons and employees only, and the required parking spaces shall not be used for storage of vehicles or materials or for the parking of trucks connected with the business or use with the exception of small (under one-ton) delivery trucks or cars.*

**Staff Finding 13:** The applicant does not propose the storage of materials or vehicles in the parking lot that would occupy required parking spaces. This criteria is met.

#### *46.070 MAXIMUM DISTANCE ALLOWED BETWEEN PARKING AREA AND USE*

A. *Off-street parking spaces for single- and two-family dwellings shall be located on the same lot with the dwelling.*

*B. Off-street parking spaces for uses not listed in subsection A of this section shall be located not farther than 200 feet from an entryway to the building or use they are required to serve, measured in a straight line from the building, with the following exceptions:*

*(...)*

*3. Employee parking areas for carpools and vanpools shall be located closer to the entryway to the building than general employee parking.*

*(...)*

*5. All disabled parking shall be placed closest to building entrances than all other parking. Appropriate ADA curb cuts and ramps to go from the parking lot to the ADA-accessible entrance shall be provided unless exempted by ADA code.*

**Staff Finding 14: The applicant is proposing an approximately 6,922 sf building which would require 28 parking spaces, but due to the close proximity of public transit a 10% parking reduction is permitted, therefore the required number of parking spaces is reduced to 25 spaces. The applicant is proposing 26 spaces and two spaces to be marked as accessible parking spaces. The applicant has proposed two accessible spaces near and leading to the entrances of the proposed building. The lower parking lot complies with this criteria and all spaces are within 200 feet of the building. These criteria are met.**

#### *46.080 COMPUTATION OF REQUIRED PARKING SPACES AND LOADING AREA*

*A. Where several uses occupy a single structure or unit of land...*

*B. To calculate building square footage as a basis for determining how many parking spaces are needed, the area measured shall be gross floor area under the roof measured from the faces of the structure, including all habitable floors and excluding only space devoted to covered off-street parking or loading.*

*C. Where employees are specified, the employees counted are the persons who work on the premises including proprietors, executives, professional people, production, sales, and distribution employees, during the largest shift.*

*D. Fractional space requirements shall be counted as a whole space.*

*E. On-street parking along the immediate property frontage(s) may be counted toward the minimum parking requirement with approval from the City Engineer.*

*(...)*

**Staff Finding 15: Per CDC 46.090 the required number of parking spaces is dependent on the size of the proposed building (1 space per 250 sf of gross floor area). The applicant is proposing an approx. 6,922 sf building which would require 28 parking spaces, but due to the close proximity of public transit a 10% parking reduction is permitted, therefore the required number of parking spaces is reduced to 25 spaces. The applicant is proposing 26 spaces and two spaces to be marked as accessible parking spaces. This criteria is met.**

#### *46.090 MINIMUM PARKING SPACE REQUIREMENTS*

*(...)*

*C. Commercial.*

*(...)*

6. Medical/dental clinics/day surgery.

- One space for every 250 square feet of gross floor area.

**Staff Finding 16:** The applicant is proposing a mixed use commercial building with proposed uses as a dental office and physical therapy clinic. The parking requirement for the Medical/dental clinics/day surgery is one space per 250 square feet of office area (28 total required spaces). The applicant is in close proximity to public transit on HWY 43 and is permitted to take a 10% reduction in the number of parking spaces required. The required number of parking spaces for the proposed mixed use commercial building with the 10% reduction is 25 spaces and the applicant is proposing 26 spaces. The criteria is satisfied.

46.150 DESIGN AND STANDARDS

*The following standards apply to the design and improvement of areas used for vehicle parking, storage, loading, and circulation:*

A. Design Standards.

1. "One standard parking space" means a minimum for a parking stall of eight feet in width and 16 feet in length. These stalls shall be identified as "compact." To accommodate larger cars, 50 percent of the required parking spaces shall have a minimum dimension of nine feet in width and 18 feet in length (nine feet by 18 feet). When multi-family parking stalls back onto a main driveway, the stalls shall be nine feet by 20 feet. Parking for development in water resource areas may have 100 percent compact spaces.

2. Disabled parking and maneuvering spaces shall be consistent with current federal dimensional standards and subsection B of this section and placed nearest to accessible building entryways and ramps.

(...)

**Staff Finding 17:** The applicant proposes 9 parking spaces of 9 feet by 18 feet, 8 spaces of 8 feet 6 inches by 16 feet (labeled as compact spaces), 5 spaces of 9 feet by 16 feet, 1 space of 8 feet by 14 feet (labeled compact), and two spaces that meet federal ADA standards and are located nearest to accessible building entryways and ramps. 12 total spaces can accommodate standard (not compact) vehicles and 12 spaces are labeled for compact vehicles. These criteria are met.

(...)

11. Parking spaces along the boundaries of a parking lot or adjacent to interior landscaped areas or sidewalks shall be provided with a wheel stop at least four inches high located two feet back from the front of the parking stall. Such parking spaces may be provided without wheel stops if the sidewalks or landscaped areas adjacent the parking stalls are two feet wider than the minimum width.

**Staff Finding 18:** Wheel stops will be provided for all parking spaces. These criteria are met.



12. *Off-street parking and loading areas shall be drained in accordance with plans and specifications approved by the City Engineer. Storm drainage at commercial sites may also have to be collected to treat oils and other residue.*

**Staff Finding 19: The applicant identifies all stormwater from off-street parking areas and the new structure to be treated on-site then discharged to the stormwater facility downstream. The applicant submitted a stormwater report prepared by a licensed engineer. This criterion is met.**

13. *Artificial lighting on all off-street parking facilities shall be designed to deflect all light downward away from surrounding residences and so as not to create a hazard to the public use of any road or street.*

**Staff Finding 20: The applicant has proposed an illumination plan with on-site lighting that is deflected downward and away from surrounding residences and public rights-of-way. This criterion is met.**

14. *Directional arrows and traffic control devices which are placed on parking lots shall be identified.*

(...)

16. *Visitor or guest parking must be identified by painted "GUEST" or "VISITOR."*

17. *The parking area shall have less than a five percent grade. No drainage across adjacent sidewalks or walkways is allowed.*

**Staff Finding 21: No directional arrows or signage for the access drives are proposed. No visitor or guest parking spaces are proposed. The design does not propose drainage across adjacent sidewalks or walkways. These criteria are met.**

18. *Commercial, office, industrial, and public parking lots may not occupy more than 50 percent of the main lot frontage of a development site. The remaining frontage shall comprise buildings or landscaping. If over 50 percent of the lineal frontage comprises parking lot, the landscape strip between the right-of-way and parking lot shall be increased to 15 feet wide and shall include terrain variations (e.g., one-foot-high berm) plus landscaping. The defensible space of the parking lot should not be compromised.*

**Staff Finding 22: The applicant does not propose parking along the main lot frontage of Burns Street and all parking is setback from adjacent right-of-way. This criterion is met.**

19. *Areas of the parking lot improved with asphalt or concrete surfaces shall be designed into areas of 12 or less spaces through the use of defined landscaped area. Groups of 12 or less spaces are defined as:*

a. *Twelve spaces in a row, provided there are no abutting parking spaces, as in the case when the spaces are abutting the perimeter of the lot; or*

b. *Twelve spaces in a group with six spaces abutting together; or*

c. Two groups of 12 spaces abutting each other, but separated by a 15-foot-wide landscape area including a six-foot-wide walkway.  
 (...)

**Staff Finding 23:** The applicant proposal provides two parking areas that meet Criteria a. Each parking area is broken up by grade and landscaping. These criteria are met.

20. Pedestrian walkways shall be provided in parking areas having 20 or more spaces. Walkways or sidewalks shall be constructed between major buildings/activity areas... Walkways shall be constructed using a material that visually contrasts with the parking lot and driveway surface. Walkways shall be further identifiable to pedestrians and motorists by grade separation, walls, curbs, surface texture, and/or landscaping. Walkways shall be six feet wide. The arrangement and layout of the paths shall depend on functional requirements.

**Staff Finding 24:** The applicant proposes walkways along the frontage of the new building where the upper parking area is located. A walkway connects the upper and lower parking areas. The applicant also shows sidewalks along all right-of-way frontages adjacent to the subject property. This criterion is met.

(...)

B. Accessible parking standards for persons with disabilities. If any parking is provided for the public or visitors, or both, the needs of the people with disabilities shall be based upon the following standards or current applicable federal standards, whichever are more stringent:

1. Minimum number of accessible parking space requirements (see following table):

<i>MINIMUM REQUIRED NUMBER OF TOTAL PARKING SPACES</i>	<i>TOTAL NUMBER OF ACCESSIBLE SPACES</i>	<i>NUMBER OF VAN-ACCESSIBLE SPACES REQUIRED, OF TOTAL</i>	<i>SPACES SIGNED "WHEELCHAIR USE ONLY"</i>
1 – 25	1	1	–
26-50	2	1	–

**Staff Finding 25:** The proposal is required to provide a minimum of 25 parking spaces, which then requires one accessible van space. The applicant has proposed 26 spaces, one accessible van space and one standard accessible parking space for a total of 2 accessible spaces. These criteria are met.

2. *Location of parking spaces. Parking spaces for the individual with a disability that serve a particular building shall be located on the shortest possible accessible circulation route to an accessible entrance to a building. In separate parking structures or lots that do not serve a particular building, parking spaces for the persons with disabilities shall be located on the shortest possible circulation route to an accessible pedestrian entrance of the parking facility.*
3. *Accessible parking space and aisle shall meet ADA vertical and horizontal slope standards.*
4. *Where any differences exist between this section and current federal standards, those standards shall prevail over this code section.*
5. *One in every eight accessible spaces, but not less than one, shall be served by an access aisle 96 inches wide.*
6. *Van-accessible parking spaces shall have an additional sign marked "Van Accessible" mounted below the accessible parking sign. A van-accessible parking space reserved for wheelchair users shall have a sign that includes the words "Wheelchair Use Only." Van-accessible parking shall have an adjacent eight-foot-wide aisle. All other accessible stalls shall have a six-foot-wide aisle. Two vehicles may share the same aisle if it is between them. The vertical clearance of the van space shall be 96 inches*

**Staff Finding 26: The applicant proposal has located the accessible parking spot nearest the building entryway. All accessible spaces meet ADA standards. These criteria are met.**

(...)

*D. Bicycle facilities and parking.*

1. *Provisions shall be made for pedestrian and bicycle ways if such facilities are shown on an adopted plan.*
2. *Bicycle parking facilities shall either be lockable enclosures in which the bicycle is stored, or secure stationary racks which accommodate bicyclist's locks securing the frame and both wheels. The bicycle parking shall be no more than 50 feet from the entrance to the building, well-lit, observable, and properly signed.*
3. *Bicycle parking must be provided in the following amounts:*

<i>LAND USE CATEGORY</i>	<i>MINIMUM REQUIRED BICYCLE PARKING SPACES</i>	<i>MINIMUM COVERED AMOUNT</i>
<i>Doctor, Dentist Offices</i>	<i>2, or 0.5 spaces per 1,000 gross sq. ft., whichever is greater</i>	<i>25%</i>

**Staff Finding 27: The subject property does not include any planned bicycle pathways. The applicant has provided a pedestrian walkway from the lower lot to the upper parking lot and sidewalks along right-of-way frontage. The applicant is required to provide 7 bicycle parking spaces (6,922/1,000≈7) with three covered. The proposal shows 4 secure stationary racks. The applicant shall revise the site plan to show 7 secure bicycle parking spaces, including three that are covered per Condition of Approval 3. All bicycle spaces are proposed to be**

located within 50 feet from the entrance to the buildings, the spaces shall be well-lit, observable, and properly signed. Subject to the Conditions of Approval, these criteria are met.

(...)

F. (See Figures 1 and 2 below.) Minimum Standards for Parking Lot Layout

ANGLE OF PARKING	DIRECTION OF PARKING	AISLE WIDTH		DIMENSION 'A'		DIMENSION 'B'	
		STALL WIDTH		STALL WIDTH		STALL WIDTH	
		9.0'	8.0'	9.0'	8.0'	9.0'	8.0'
(...)							
90°	DRIVE-IN	23.0'	23.0'	18.0'	16.0'	9.0'	8.0'
(...)							

**Staff Finding 28:** The proposal is for the parking spaces to be drive-in at a 90 degree angle, which requires a drive aisle width of 23 feet regardless of whether the space is standard or compact. The applicant proposes a minimum 23 foot drive aisle for all parking spaces. The applicant also proposes a 24 foot drive isle width from the entrance on Hood Street which narrows down to 23 feet. This criterion is met.

**VI. 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.)

**Staff Finding 29:** The applicant submitted a trip generation memorandum prepared by licensed engineers at DKS dated March 10, 2020. ODOT was notified of this proposal and initially requested a traffic impact analysis to study the traffic impact on HWY 43, but later revised this request given the current global pandemic causing atypical traffic patterns. No traffic impact analysis is required. These criteria are met.

2. The City or other agency with access permit jurisdiction may require the closing or consolidation of existing curb cuts or other vehicle access points, recording of reciprocal access easements (i.e., for shared driveways), development of a frontage street, installation of traffic

*control devices, and/or other mitigation as a condition of granting an access permit, to ensure the safe and efficient operation of the street and highway system. Access to and from off-street parking areas shall not permit backing onto a public street.*

**Staff Finding 30: The applicant proposes access via Burns Street and Hood Street. No access points are required to be consolidated as only one exists to access the existing single-family home (proposed to be removed). No traffic control devices or mitigation is required. This criterion is met.**

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

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

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

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

**Staff Finding 31: The applicant proposes one access point to subject property via Option 3. The applicant has designed the access to meet all City standards or regulations that enhance safety and convenience for all travel modes. These criteria are met.**

*4. Subdivisions fronting onto an arterial street.*

*(...)*

*5. Double-frontage lots.*

*(...)*

**Staff Finding 32: The triple frontage subject property has frontage on Burns Street (2 frontages) and Hood Street. Hood Street and Burns Street are both classified as local streets. The applicant proposes two access points, one on Hood Street and one on Burns Street. The criteria are met.**

*6. Access spacing.*

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

*b. Private drives and other access ways are subject to the requirements of CDC [48.060](#).*

**Staff Finding 33: The proposal does not create any new intersections or non-traversable medians. CDC 48.060 is addressed in Staff Findings 39 and 40. These criteria are met.**

*7. Number of access points.*

*8. Shared driveways.*

**Staff Finding 34: The applicant proposes two access points, one on Hood Street and one on Burns Street. These criteria are met.**

*C. Street connectivity and formation of blocks required.*

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

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

**Staff Finding 35: The applicant's proposal does not create any new blocks. This criterion is met.**

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

**Staff Finding 36: The applicant proposes street improvements along Hood Street and Burns Street. These improvements include pavement widening, sidewalks, and striped on-street parking. If funding is available, the City may partner with the applicant to complete the full street improvements on Burns Street. Subject to the Conditions of Approval, this criterion is met.**

*(...)*

*48.040 MINIMUM VEHICLE REQUIREMENTS FOR NON-RESIDENTIAL USES*

*Access, egress, and circulation system for all non-residential uses shall not be less than the following:*

*A. Service drives for non-residential uses shall be fully improved with hard surface pavement:*

*1. With a minimum of 24-foot width when accommodating two-way traffic; or*

*2. With a minimum of 15-foot width when accommodating one-way traffic. Horizontal clearance shall be two and one-half feet wide on either side of the driveway.*

*3. Meet the requirements of CDC 48.030(E)(3) through (6).*

*4. Pickup window driveways may be 12 feet wide unless the Fire Chief determines additional width is required.*

**Staff Finding 37: The applicant proposes a 24 foot, two-way, access drive from Hood Street that is improved with asphalt. The applicant proposes a 23 foot two-way curb-cut access**

**drive from Burns Street, but per condition of approval 4 this curb-cut shall be 24 feet. Subject to the conditions of approval, the criteria are met.**

- B. All non-residential uses shall be served by one or more service drives as determined necessary to provide convenient and safe access to the property and designed according to CDC 48.030(A). In no case shall the design of the service drive or drives require or facilitate the backward movement or other maneuvering of a vehicle within a street, other than an alley.*
- C. All on-site maneuvering and/or access drives shall be maintained pursuant to CDC 46.130.*
- D. Gated accessways to non-residential uses are prohibited unless required for public safety or security.*

**Staff Finding 38: The subject property is not proposing any gated accessways or service drives. 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.*
- 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.**

**Staff Finding 39: The applicant proposes two new access drives resulting in a new curb cut on both Hood Street and Burns Street. Both access drives and curb cuts are 35 feet or more from the closest intersections adjacent to each access drive. Both access drives enter streets classified as local streets. These criteria is met.**

- E. A rolled curb may be installed in lieu of curb cuts and access separation requirements.*
- 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.*
- G. Adequate line of sight pursuant to engineering standards should be afforded at each driveway or accessway.*

**Staff Finding 40:** The applicant is not proposing any rolled curbs. Access to this property are from two local streets, not HWY 43. Adequate line of sight has also been provided. These criteria are met.

(...)

#### 48.080 BICYCLE AND PEDESTRIAN CIRCULATION

(...)

*c. Bicycle and pedestrian ways at commercial or industrial sites shall be provided according to the provisions of Chapter 55 CDC, Design Review.*

**Staff Finding 41:** The applicant has proposed bicycle parking onsite and subject to approval of condition of approval 3, these criteria are met.

### **VII. CHAPTER 52, SIGNS**

#### 52.210 APPROVAL STANDARDS

*All signs shall meet the following standards:*

(...)

**Staff Finding 42:** The applicant is not proposing any signs at this time. Tenants will be responsible for securing appropriate sign permits. These criteria are met.

### **VIII. CHAPTER 54, LANDSCAPING**

#### 54.010 PURPOSE

*The purpose of this chapter is to provide for the design, selection (...)*

#### 54.020 APPROVAL CRITERIA

(...)

*E. Landscaping – By type, location and amount.*

*1. Residential uses (non0single-family). (...)*

*2. Non-residential uses. A minimum of 20 percent of the gross site area shall be landscaped.*

*Parking lot landscaping may be counted in the percentage. (...)*

**Staff Finding 43:** The applicant has submitted a landscaping plan (see sheets L1.1 of the applicant's supplemental submittal). This criteria is met.

### **CHAPTER 55, DESIGN REVIEW**

#### 55.100 APPROVAL STANDARDS – CLASS II DESIGN REVIEW

*B. Relationship to the natural and physical environment.*

*1. The buildings and other site elements 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.*



**Staff Finding 44: The subject site contains no heritage trees. This criteria does not apply.**

*2. All heritage trees...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...shall be protected pursuant to the criteria of subsections (B)(2)(a) through (f) of this section...*

*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...*

**Staff Finding 45: There are no heritage trees on the site. The applicant proposes to remove all trees on site due to the significant amount of grading needed to develop the site. Sheet 01 (page 495 of the applicant's submittal PC Exhibit 3) shows the tree protection for trees near the property line or on adjacent properties. This criteria is met.**

*b. Non-residential and residential projects on non-Type I and II lands shall set aside up to 20 percent of the area to protect trees and tree clusters that are determined to be significant, plus any heritage trees...*

**Staff Finding 46: There are no heritage trees on the site. The applicant proposes to remove all trees on site due to the significant amount of grading needed to develop the site. Sheet 01 (page 495 of the applicant's submittal PC Exhibit 3) shows the tree protection for trees near the property line or on adjacent properties. This criteria is met.**

*3. The topography and natural drainage shall be preserved to the greatest degree possible.*

**Staff Finding 47: Staff adopts the applicant's findings on page 36 of PC Exhibit 3 (applicant's submittal) and see Drawing C2.0 for the Preliminary Grading & Drainage Plan. Staff finds that the criteria is met.**

*4. The structures shall not be located in areas subject to slumping and sliding. The Comprehensive Plan Background Report's Hazard Map, or updated material as available and as deemed acceptable by the Planning Director, shall be the basis for preliminary determination.*

**Staff Finding 48: Staff adopts the applicant's findings on page 37 of Exhibit PC-3 applicant's submittal. The criteria is met.**

*5. There shall be adequate distance between on-site buildings and on-site and off-site buildings on adjoining properties to provide for adequate light and air circulation and for fire protection.*

**Staff Finding 49: The property currently has a single-family home proposed to be removed and the applicant is not proposing any variances to setback requirements. The applicant has proposed the building location furthest away from the adjacent residentially zoned property. The location meets all setback requirements for the underlying zone. The criteria is met.**

6. Architecture.

a. *The proposed structure(s) scale shall be compatible with the existing structure(s) on site and on adjoining sites. Contextual design is required. Contextual design means respecting and incorporating prominent architectural styles, building lines, roof forms, rhythm of windows, building scale and massing of surrounding buildings in the proposed structure. The materials and colors shall be complementary to the surrounding buildings.*

**Staff Finding 50: Staff incorporates applicant findings (page 37 Exhibit PC-3 applicant’s submittal) relating to architecture as represented in the following applicant findings:**

**“The proposed architectural design has been developed in harmony with surrounding buildings with regard to form, colors, and materials. The proposed materials and colors, being primarily natural and earth-toned, complement nearby commercial structures. The sloped roof at the former element references the neighboring library. The existing commercial development across the corner of Burns and Hood Street has a similar material and color palette.”**

**“The proposed structure has been designed as a single-story building to provide a soft transition between the larger surrounding commercial building and the residential neighborhoods. The higher roof elements of the proposed structure have been oriented toward the corner of Hood and Burns Street to address the commercial nature of the downtown while reducing imposition into residential areas.”**

**This criteria is met.**

b. *While there has been discussion in Chapter 24 CDC about transition, it is appropriate that new buildings should architecturally transition in terms of bulk and mass to work with, or fit, adjacent existing buildings. This transition can be accomplished by selecting designs that “step down” or “step up” from small to big structures and vice versa (see figure below). Transitions may also take the form of carrying building patterns and lines (e.g., parapets, windows, etc.) from the existing building to the new one.*

c. *Contrasting architecture shall only be permitted when the design is manifestly superior to adjacent architecture in terms of creativity, design, and workmanship, and/or it is adequately separated from other buildings by distance, screening, grade variations, or is part of a development site that is large enough to set its own style of architecture.*

d. *Human scale is a term that seeks to accommodate the users of the building and the notion that buildings should be designed around the human scale (i.e., their size and the average range of their perception). Human scale shall be accommodated in all designs by, for example, multi-light windows that are broken up into numerous panes, intimately scaled entryways, and visual breaks (exaggerated eaves, indentations, ledges, parapets, awnings, engaged columns, etc.) in the facades of buildings, both vertically and horizontally.*

**Staff Finding 51: Staff incorporates applicant findings on page 38 (Exhibit PC-3 applicant's submittal) and refer to Staff Finding 22. These criteria are met.**

*e. The main front elevation of commercial and office buildings shall provide at least 60 percent windows or transparency at the pedestrian level to create more interesting streetscape and window shopping opportunities. One side elevation shall provide at least 30 percent transparency. Any additional side or rear elevation, which is visible from a collector road or greater classification, shall also have at least 30 percent transparency...*

**Staff Finding 52: The slope of the lot does not allow for pedestrian level windows along the street frontages. The applicant is proposing a dental office and physical therapy clinic in the proposed building and no retail uses. The applicant proposes 56% transparency along the Burns Street frontage (south), 57% transparency along the Burns Street frontage (east), 56% - 66% transparency along the front (north) side of the building near the entrances, and 52%-55% transparency along the Hood Street frontage.**

*f. Variations in depth and roof line are encouraged for all elevations.*

*To vary the otherwise blank wall of most rear elevations, continuous flat elevations of over 100 feet in length should be avoided by indents or variations in the wall. The use of decorative brick, masonry, or stone insets and/or designs is encouraged. Another way to vary or soften this elevation is through terrain variations such as an undulating grass area with trees to provide vertical relief.*

*g. Consideration of the micro-climate (e.g., sensitivity to wind, sun angles, shade, etc.) shall be made for building users, pedestrians, and transit users, including features like awnings.*

*h. The vision statement identified a strong commitment to developing safe and attractive pedestrian environments with broad sidewalks, canopied with trees and awnings  
(...)*

**Staff Finding 53: The applicant is proposing awnings are each building entrance to protect the building users from the elements. All building elevations are designed to be aesthetically pleasing with no 'rear elevations'. This criterion is met.**

*7. Transportation Planning Rule (TPR) compliance. The automobile shall be shifted from a dominant role, relative to other modes of transportation, by the following means:  
(...)*

*b. Multi-family projects shall be required to keep the parking at the side or rear of the buildings or behind the building line of the structure as it would appear from the right-of-way inside the multi-family project. For any garage which is located behind the building line of the structure, but still facing the front of the structure, architectural features such as patios, patio walls, trellis, porch roofs, overhangs, pergolas, etc., shall be used to downplay the visual impact of the garage, and to emphasize the rest of the house and front entry.  
(...)*

**Staff Finding 54: The applicant is proposing commercial uses in the Office Business Center zone. This criteria does not apply.**

*d. Accessways, parking lots, and internal driveways shall accommodate pedestrian circulation and access by specially textured, colored, or clearly defined footpaths at least six feet wide. Paths shall be eight feet wide when abutting parking areas or travel lanes. Paths shall be separated from parking or travel lanes by either landscaping, planters, curbs, bollards, or raised surfaces...*

*e. Paths shall provide direct routes that pedestrians will use between buildings, adjacent rights-of-way, and adjacent commercial developments. They shall be clearly identified. They shall be laid out to attract use and to discourage people from cutting through parking lots and impacting environmentally sensitive areas.*

(...)

**Staff Finding 56: See Staff Finding 27; these criteria are met.**

(...)

*h. Projects shall bring at least part of the project adjacent to or near the main street right-of-way in order to enhance the height-to-width ratio along that particular street. (The “height-to-width ratio” is an architectural term that emphasizes height or vertical dimension of buildings adjacent to streets. The higher and closer the building is, and the narrower the width of the street, the more attractive and intimate the streetscape becomes.) For every one foot in street width, the adjacent building ideally should be one to two feet higher. This ratio is considered ideal in framing and defining the streetscape.*

(...)

**Staff Finding 57: The main entrance of the building is positioned at a 45 degree angle to address the street frontages of Hood Street and Burns Street. The height of the proposed building at this corner is proposed to be approximately 30 feet and steps down as Burns Street elevation drops. These criteria are met.**

*C. Compatibility between adjoining uses, buffering, and screening.*

*1. In addition to the compatibility requirements contained in Chapter 24 CDC, buffering shall be provided between different types of land uses; for example, buffering between single-family homes and apartment blocks. However, no buffering is required between single-family homes and duplexes or single-family attached units. The following factors shall be considered in determining the adequacy of the type and extent of the buffer:*

*a. The purpose of the buffer, for example to decrease noise levels, absorb air pollution, filter dust, or to provide a visual barrier.*

*b. The size of the buffer required to achieve the purpose in terms of width and height.*

*c. The direction(s) from which buffering is needed.*

*d. The required density of the buffering.*

*e. Whether the viewer is stationary or mobile.*

**Staff Finding 58: Staff incorporates applicant findings on pages 41-42 of Exhibit PC-3 applicant's submittal. These criteria are met.**

2. *On-site screening from view from adjoining properties of such things as service areas, storage areas, and parking lots shall be provided and the following factors will be considered in determining the adequacy of the type and extent of the screening:*
  - a. *What needs to be screened?*
  - b. *The direction from which it is needed.*
  - c. *How dense the screen needs to be.*
  - d. *Whether the viewer is stationary or mobile.*
  - e. *Whether the screening needs to be year-round.*

**Staff Finding 59: The applicant proposes to enclose the refuse area which is centrally located near the parking area. General landscaping shown on Sheet L1.1 of the applicant's submittal (page 515 of PC Exhibit 3) indicates more screening from the adjacent residential properties. These criteria are met.**

3. *Rooftop air cooling and heating systems and other mechanical equipment shall be screened from view from adjoining properties.*

**Staff Finding 60: The applicant does not propose any ground level mechanical equipment. These criteria are met.**

*D. Privacy and noise.*

1. *Structures which include residential dwelling units shall provide private outdoor areas for each ground floor unit which is screened from view from adjoining units.*
2. *Residential dwelling units shall be placed on the site in areas having minimal noise exposure to the extent possible. Natural-appearing sound barriers shall be used to lessen noise impacts where noise levels exceed the noise standards contained in West Linn Municipal Code Section 5.487.*

*(...)*

**Staff Finding 61: The applicant does not propose any residential dwelling units with this development. This criteria does not apply.**

*(...)*

*G. Demarcation of public, semi-public, and private spaces. The structures and site improvements shall be designed so that public areas such as streets or public gathering places, semi-public areas, and private outdoor areas are clearly defined in order to establish persons having a right to be in the space, to provide for crime prevention, and to establish maintenance responsibility. These areas may be defined by:*

1. *A deck, patio, fence, low wall, hedge, or draping vine;*
2. *A trellis or arbor;*

3. *A change in level;*
4. *A change in the texture of the path material;*
5. *Sign; or*
6. *Landscaping.*

**Staff Finding 62: The applicant does not propose any on-site public or semi-public outdoor spaces. These criteria does not apply.**

*H. Public transit.*

*1. Provisions for public transit may be required where the site abuts an existing or planned public transit route. The required facilities shall be based on the following:*

*a. The location of other transit facilities in the area.*

*(....)*

**Staff Finding 63: The nearest public transit is located in close proximity along HWY 43, but no public transit facilities are proposed or exist on Burns Street or Hood Street. These criteria are met.**

*I. Public facilities. An application may only be approved if adequate public facilities will be available to provide service to the property prior to occupancy.*

*1. Streets. Sufficient right-of-way and slope easement shall be dedicated to accommodate all abutting streets to be improved to the City's Improvement Standards and Specifications. The City Engineer shall determine the appropriate level of street and traffic control improvements to be required, including any off-site street and traffic control improvements, based upon the transportation analysis submitted. The City Engineer's determination of developer obligation, the extent of road improvement and City's share, if any, of improvements and the timing of improvements shall be made based upon the City's systems development charge ordinance and capital improvement program, and the rough proportionality between the impact of the development and the street improvements...*

**Staff Finding 64: The applicant is proposing street improvements along Burns and Hood Streets. These improvements include street-widening, sidewalks, ADA accessible ramps, crosswalks, and street signage to meet the Engineering Standards for vehicle and pedestrian safety. If funding is available, the City may partner with the applicant to construct full street improvements (on-street parking and sidewalk on the south side) of Burns Street. Subject to the Conditions of Approval, the criteria are met.**

*2. Storm detention and treatment and geologic hazards. Per the submittals required by CDC 55.130 and 92.010(E), all proposed storm detention and treatment facilities must 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 the applicant must provide sufficient factual data to support the conclusions of the submitted plan.*

*Per the submittals required by CDC 55.130(E), the applicant must demonstrate that the proposed methods of rendering known or potential hazard sites safe for development, including proposed geotechnical remediation, are feasible and adequate to prevent landslides or other damage to property and safety. The review authority may impose conditions, including limits on type or intensity of land use, which it determines are necessary to mitigate known risks of landslides or property damage.*

**Staff Finding 65:** The applicant has submitted a Preliminary Storm Drainage Report, prepared by a licensed engineer, which complies with the West Linn Public Works Design Standards, shows no adverse off-site impacts, and provides sufficient factual data to support the conclusions of the plan. The subject property does not contain any known landslide hazards. The applicant shall comply with the requirements and install improvements to meet the West Linn Public Works Design Standards per Condition of Approval 2. Subject to the Conditions of Approval, these criteria are met.

*3. Municipal water. A registered civil engineer shall prepare a plan for the provision of water which demonstrates to the City Engineer's satisfaction the availability of sufficient volume, capacity, and pressure to serve the proposed development's domestic, commercial, and industrial fire flows. All plans will then be reviewed by the City Engineer.*

**Staff Finding 66:** Water is available in Hood Street and Burns Street to serve the proposed development. The City's Water Master Plan identifies the water line in Hood Street is in need of upsizing. Subject to available funding, the City may partner with the applicant to upsize the water line in this area. The applicant shall comply with the requirements and install improvements to meet the West Linn Public Works Design Standards per Condition of Approval 2. Subject to the Conditions of Approval, these criteria are met.

*4. Sanitary sewers. A registered civil engineer shall prepare a sewerage collection system plan which demonstrates sufficient on-site capacity to serve the proposed development. The City Engineer shall determine whether the existing City system has sufficient capacity to serve the development.*

**Staff Finding 67:** The applicant has submitted a plan prepared by a registered civil engineer. The City's public sanitary sewer system has sufficient capacity to service the proposed use. The applicant shall comply with the requirements and install improvements to meet the West Linn Public Works Design Standards per Condition of Approval 2. Subject to the Conditions of Approval, these criteria are met.

*5. Solid waste and recycling storage areas. Appropriately sized and located solid waste and recycling storage areas shall be provided. Metro standards shall be used.*

**Staff Finding 68: Solid waste storage will be stored in on the north side of the parking lot behind appropriate screening and setback off the property line, so as to not impact adjacent residential neighbors. The criteria is met.**

*J. Crime prevention and safety/defensible space.*

- 1. Windows shall be located so that areas vulnerable to crime can be surveyed by the occupants.*
- 2. Interior laundry and service areas shall be located in a way that they can be observed by others.*
- 3. Mailboxes, recycling, and solid waste facilities shall be located in lighted areas having vehicular or pedestrian traffic.*

**Staff Finding 69: Staff incorporates applicant findings on page 47 of Exhibit PC-3 applicant's submittal. The criteria is met.**

- 4. The exterior lighting levels shall be selected and the angles shall be oriented towards areas vulnerable to crime.*
- 5. Light fixtures shall be provided in areas having heavy pedestrian or vehicular traffic and in potentially dangerous areas such as parking lots, stairs, ramps, and abrupt grade changes.*
- 6. Fixtures shall be placed at a height so that light patterns overlap at a height of seven feet which is sufficient to illuminate a person. All commercial, industrial, residential, and public facility projects undergoing design review shall use low or high pressure sodium bulbs and be able to demonstrate effective shielding so that the light is directed downwards rather than omni-directional. Omni-directional lights of an ornamental nature may be used in general commercial districts only.*

*(...)*

**Staff Finding 70: See Sheet E1.1 and E1.2 (page 513-514 of PC Exhibit 3) for the lighting plan proposed by the applicant. Any additional street lighting shall meet engineering standards per Condition of Approval 2. Subject to approval of the Conditions of Approval, these criteria are met.**

*K. Provisions for persons with disabilities.*

- 1. The needs of a person with a disability shall be provided for. Accessible routes shall be provided between all buildings and accessible site facilities. The accessible route shall be the most practical direct route between accessible building entries, accessible site facilities, and the accessible entry to the site. An accessible route shall connect to the public right-of-way and to at least one on-site or adjacent transit stop (if the area is served by transit). All facilities shall conform to, or exceed, the Americans with Disabilities Act (ADA) standards, including those included in the Uniform Building Code.*

**Staff Finding 71: Staff incorporates applicant finding on page 48 of Exhibit PC-3 applicant's supplemental submittal. These criteria are met.**



L. Signs.  
(...)

**Staff Finding 72: The applicant is not proposing any signs with this application. This criteria does not apply.**

*M. 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, as practical. The design standards of Tables 1 and 2 above, and of subsection 5.487 of the West Linn Municipal Code relative to existing high ambient noise levels shall apply to this section.*

**Staff Finding 73: The subject property has overhead electrical lines along the Burns Street frontage. The applicant proposes to work with PGE to underground the utilities (see condition of approval 2). Subject to approval of the Conditions of Approval, this criteria is met.**

(...)

#### 55.125 TRANSPORTATION ANALYSIS

*Certain development proposals required that a Traffic Impact Analysis (TIA) be provided which may result in modifications to the site plan or conditions of approval to address or minimize any adverse impacts created by the proposal. The purpose, applicability and standards of this analysis are found in CDC 85.170(B)(2).*

**Staff Finding 74: The applicant submitted a trip generation memorandum prepared by licensed engineers at DKS dated March 10, 2020. ODOT was notified of this proposal and initially requested a traffic impact analysis to study the traffic impact on HWY 43, but later revised this request given the current global pandemic causing atypical traffic patterns. See Exhibit PC-5. These criteria are met.**

#### 55.170 EXCEPTIONS TO UNDERLYING ZONE, YARD, PARKING, SIGN PROVISIONS, AND LANDSCAPING PROVISIONS

A. *The Planning Director may grant an exception to the dimensional building setback or yard requirements in the applicable zone based on findings that the approval will satisfy the following criteria:*

1. *A minor exception that is not greater than 20 percent of the required setback.*

(...)

B. *The Planning Director may grant an exception to the off-street parking dimensional and minimum number of space requirements in the applicable zone so long as the following criteria are met:*

1. *The minor exception is not greater than 10 percent of the required parking;*

(...)

*C. The Planning Director may grant an exception to the sign dimensional requirements in the applicable zone when the following criteria are met:*

*1. The minor exception is not greater than 10 percent of the required applicable dimensional standard for signs;*

*(....)*

**Staff Finding 75: The applicant is not requesting any setback, parking, sign or landscape exceptions under this section. Therefore the criteria does not apply.**

**PC-1**

**AFFIDAVIT OF NOTICE PACKET**



**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.: **DR-20-02**                      Applicant's Name: **Sam Thomas, Lenity Architecture, Inc.**  
Development Name: **1575 Burns Street**  
Scheduled Decision Date: **Planning Commission Hearing September 16, 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:

- |           |                                      |                |                                      |
|-----------|--------------------------------------|----------------|--------------------------------------|
| <b>1.</b> | <b>Sam Thomas, applicant</b>         | <b>8/26/20</b> | <b>(signed)</b> <u>Lynn Schroder</u> |
| <b>2.</b> | <b>Kim Wright</b>                    | <b>8/26/20</b> | <b>(signed)</b> <u>Lynn Schroder</u> |
| <b>3.</b> | <b>Property owners with in 500ft</b> | <b>8/26/20</b> | <b>(signed)</b> <u>Lynn Schroder</u> |
| <b>4.</b> | <b>All Neighborhood Associations</b> | <b>8/26/20</b> | <b>(signed)</b> <u>Lynn Schroder</u> |

**TIDINGS**

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

**9/3/2020**                      (signed) Lynn Schroder

**WEBSITE**

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

**8/25/20**                      (signed) 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.

**9/4/20**                      (signed) \_\_\_\_\_

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

**9/4/20**                      (signed) \_\_\_\_\_

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

**DATE**                      (signed) \_\_\_\_\_

**CITY OF WEST LINN PLANNING COMMISSION  
PUBLIC HEARING NOTICE  
FILE NO. DR-20-02**

The West Linn Planning Commission will hold a virtual public hearing on **Wednesday, September 16, 2020 at 6:30 p.m.** to consider a request for a Class II Design Review to construct a new single-story commercial building in the OBC zone at 1575 Burns Street.

Criteria applicable to the requested Class II Design Review are in Chapters 21: Office Business Center, Chapter 46: Off-Street Parking, Loading and Reservoir Areas, Chapter 48: Access, Egress and Circulation, Chapter 54: Landscaping, Chapter 55: Design Review, Chapter 92: Required Improvements, and 99 of the Community Development Code (CDC). The decision by the Planning Commission to approve or deny this request will be based upon the applicable criteria. At the hearing, it is important that comments relate specifically to the applicable criteria.

You have been notified of this proposal because County records indicate that you own property within 500 feet of the subject property (Clackamas County Assessor's Map 2S-2E-30BD, tax lot 002501), or as otherwise required by Chapter 99: Procedures for Decision Making: Quasi-Judicial of the CDC.

The complete application in the above noted file is available for inspection at no cost at City Hall or via the web site at <https://westlinnoregon.gov/planning/1575-burns-street-class-ii-design-review-new-single-story-clinic-obc-zone> or copies can be obtained for a minimal charge per page. At least ten days prior to the hearing, a copy of the staff report will be available for inspection.

The hearing will be conducted in accordance with the rules of Section 99.170 of the CDC. **Anyone wishing to present written testimony for consideration on this matter shall submit all material before 12:00 pm on September 16, 2020. Persons interested in party status should submit their letter and any concerns about the proposal by the comment deadline. Written comments may be submitted to [jarnold@westlinnoregon.gov](mailto:jarnold@westlinnoregon.gov). All comments must be received before 12:00 pm on the meeting day.**

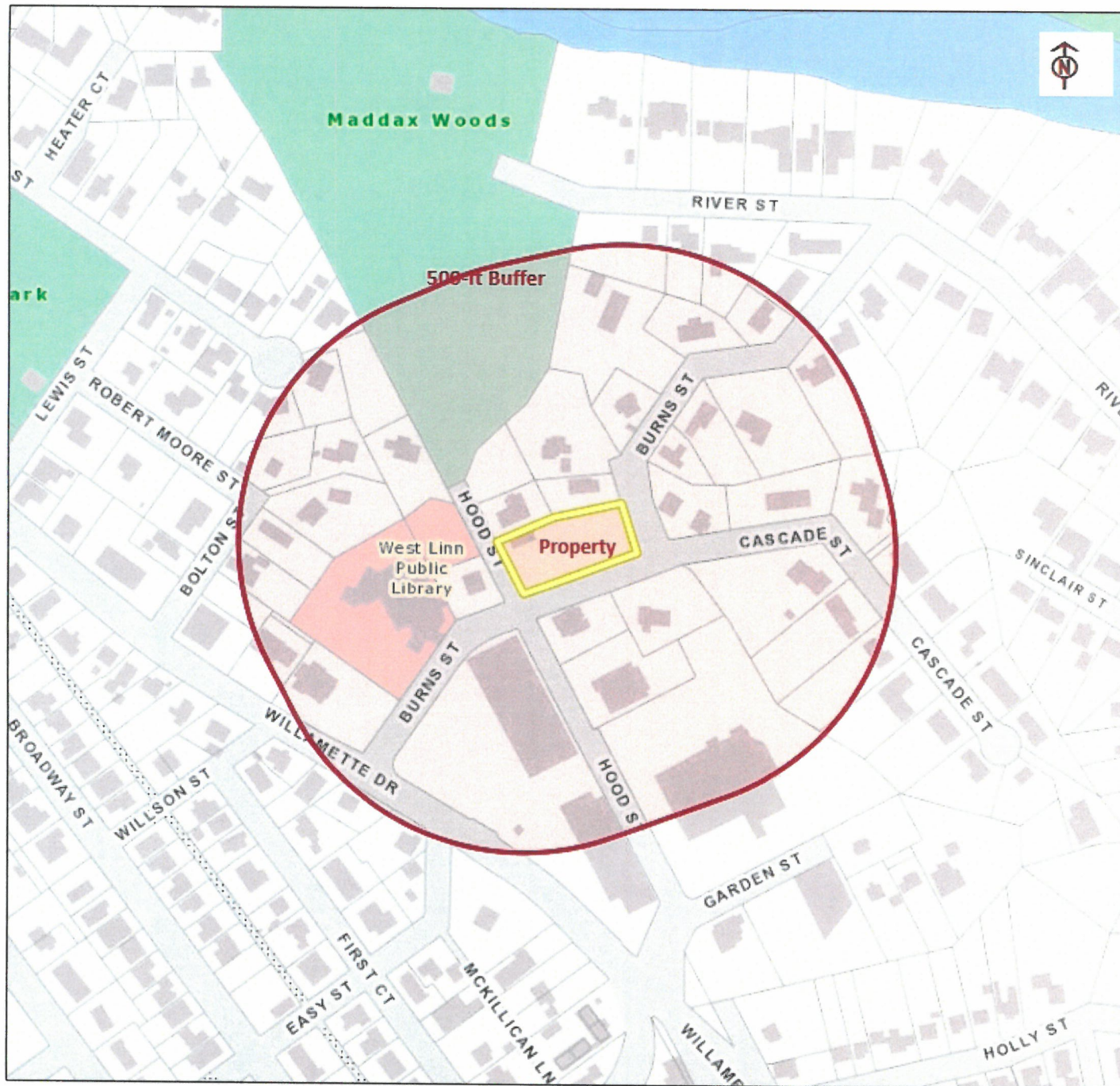
**To speak during the meeting, complete the form located at <https://westlinnoregon.gov/citycouncil/meeting-request-speak-signup> by noon the day of the meeting. Instructions on how to access the virtual meeting will then be provided by email prior to the meeting. If you do not have email access please call 503-742-6013 for assistance.**

For further information, please contact Jennifer Arnold, Associate Planner, City Hall, 22500 Salamo Rd., West Linn, OR 97068, (503) 742-6057, [jarnold@westlinnoregon.gov](mailto:jarnold@westlinnoregon.gov).

Any appeals to this decision must be filed within 14 days of the final decision date with the Planning Department. **It is important to submit all testimony in response to this notice.** Failure to raise an issue in person or by letter, or failure to provide sufficient specificity to afford the decision-maker an opportunity to respond to the issue, precludes the raising the issue at a subsequent time on appeal or before the Land Use Board of Appeals.



DR-20-02 1575 Burns Street - Properties within 500 feet



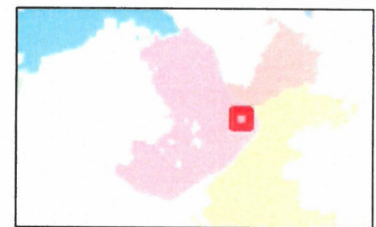
**Legend**

- City Limit
- ⋯ Unimproved ROW
- Parks and Open Space
- City Owned Property

0 0.06 0.12 Miles



1: 4,800



**Notes**

This map was automatically generated using Geocortex Essentials.



**NOTICE OF UPCOMING  
PLANNING COMMISSION DECISION**

**PROJECT # DR-20-02  
MAIL: 08/26/20 TIDINGS: 09/03/20**

**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**





## CITY OF West Linn

August 17, 2020

Lenity Architecture, Inc.  
ATTN: Sam Thomas  
3150 Kettle Court SE  
Salem, OR 97301

SUBJECT: DR-20-02 application for a new single-story dental and physical therapy clinic at 1575 Burns Street.

Dear Sam Thomas:

You submitted this application on February 18, 2020 which was deemed incomplete on March 17, 2020. After reviewing the supplemental submittals from June 11, 2020 and August 5, 2020, the Planning and Engineering Departments find that this application is now **complete**. The city has 120 days to exhaust all local review; that period ends December 3, 2020.

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

A 20-day public notice will be prepared and mailed. This notice will identify the Planning Commission hearing date.

Please contact me at 503-742-6057, or by email at [jarnold@westlinnoregon.gov](mailto:jarnold@westlinnoregon.gov) if you have any questions or comments.

Sincerely,

A handwritten signature in blue ink that reads "Jennifer Arnold".

Jennifer Arnold Associate Planner

**PC-3**

**Applicant's Submittal**

## DEVELOPMENT REVIEW APPLICATION

For Office Use Only		
STAFF CONTACT	PROJECT No(s). <span style="font-size: 1.2em; color: blue;">DR-20-02</span>	
NON-REFUNDABLE FEE(S) <span style="font-size: 1.2em; color: blue;">300</span>	REFUNDABLE DEPOSIT(S) <span style="font-size: 1.2em; color: blue;">20,000</span>	TOTAL <span style="font-size: 1.2em; color: blue;">20,300</span>

**Type of Review** (Please check all that apply):

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Annexation (ANX)<br><input type="checkbox"/> Appeal and Review (AP) *<br><input type="checkbox"/> Conditional Use (CUP)<br><input checked="" type="checkbox"/> Design Review (DR)<br><input type="checkbox"/> Easement Vacation<br><input type="checkbox"/> Extraterritorial Ext. of Utilities<br><input type="checkbox"/> Final Plat or Plan (FP)<br><input type="checkbox"/> Flood Management Area<br><input type="checkbox"/> Hillside Protection & Erosion Control | <input type="checkbox"/> Historic Review<br><input type="checkbox"/> Legislative Plan or Change<br><input type="checkbox"/> Lot Line Adjustment (LLA) */**<br><input type="checkbox"/> Minor Partition (MIP) (Preliminary Plat or Plan)<br><input type="checkbox"/> Non-Conforming Lots, Uses & Structures<br><input type="checkbox"/> Planned Unit Development (PUD)<br><input type="checkbox"/> Pre-Application Conference (PA) */**<br><input type="checkbox"/> Street Vacation | <input type="checkbox"/> Subdivision (SUB)<br><input type="checkbox"/> Temporary Uses *<br><input type="checkbox"/> Time Extension *<br><input type="checkbox"/> Variance (VAR)<br><input type="checkbox"/> Water Resource Area Protection/Single Lot (WAP)<br><input type="checkbox"/> Water Resource Area Protection/Wetland (WAP)<br><input type="checkbox"/> Willamette & Tualatin River Greenway (WRG)<br><input type="checkbox"/> 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.

<b>Site Location/Address:</b> 1575 Burns Street	Assessor's Map No.: 22E30BD
	Tax Lot(s): 2501
	Total Land Area: 27,571 sq. ft.

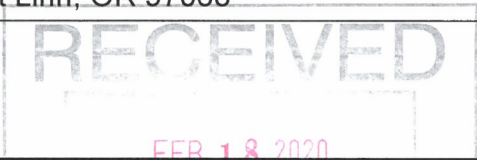
**Brief Description of Proposal:**

New single-story dental and physical therapy clinic in OBC zone

<b>Applicant Name:</b> Sam Thomas - Lenity Architecture, Inc. <small>(please print)</small>	Phone: (503) 399-1090
Address: 3150 Kettle Court SE	Email: <a href="mailto:samt@lenityarchitecture.com">samt@lenityarchitecture.com</a>
City State Zip: Salem, OR 97301	

<b>Owner Name</b> (required): Kim Wright, DMD, MAGD <small>(please print)</small>	Phone: (503) 665-9300
Address: 1554 Garden Street, Suite 104	Email: <a href="mailto:kim@advancedentalarts.com">kim@advancedentalarts.com</a>
City State Zip: West Linn, OR 97068	

<b>Consultant Name:</b> <small>(please print)</small>	Phone:
Address:	Email:
City State Zip:	



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

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

The undersigned property owner(s) hereby authorizes the filing of this application, and authorizes on site review by authorized staff. I hereby agree to comply with all code requirements applicable to my application. Acceptance of this application does not infer a complete submittal. All amendments to the Community Development Code and to other regulations adopted after the application is approved shall be enforced where applicable. Approved applications and subsequent development is not vested under the provisions in place at the time of the initial application.

	2-13-20		2-13-20
Applicant's signature	Date	Owner's signature (required)	Date

# 1575 Burns Street

Design Review Submittal – Revision 1

6/5/2020

**SHAREHOLDERS**

**Daniel Roach**  
Architect  
**Marcus Hite**  
Architect  
**Kristin Newland**

**BOARD OF DIRECTORS**

**Daniel Roach**  
Architect / President  
**Marcus Hite**  
Architect / Vice President  
**Aaron Clark**  
Architect  
**Lee Gwyn**  
Architect  
**Stephen Hockman**  
Architect  
**Robert J. Hazleton, Jr.**  
Engineer  
**Brian Lind**  
Landscape Architect

Sam Thomas  
LENITY ARCHITECTURE, INC.

## 1575 BURNS STREET DENTAL/PHYSICAL THERAPY CLINIC

### WRITTEN STATEMENT & RESPONSE TO APPLICABLE REVIEW AND DECISION CRITERIA

**Project Description:** The proposed project would demolish an existing single-family dwelling in order to construct a new medical office that would house a dental clinic and physical therapy clinic. The proposed building would contain approximately 6,922 square feet. The subject property is located at northeast corner of Hood Street and Burns Street. The subject property is currently zoned Office-Business Center (OBC). The proposed use is outright permitted. The subject site is approximately 0.63-acre in size.

#### Applicable Review and Decision Criteria

##### West Linn Community Development Code – Chapters 21, 46, 48, 54, 55, and 92.

##### 21.030 PERMITTED USES

8. Medical and dental services.

**Applicant Response:** The proposed uses, a dental clinic and physical therapy clinic, are listed as outright permitted uses according to West Linn Community Development Code (CDC) Section 21.030(8).

##### 21.070 DIMENSIONAL REQUIREMENTS, USES PERMITTED OUTRIGHT AND USES PERMITTED UNDER PRESCRIBED CONDITIONS

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

1. The minimum front lot line length or the minimum lot width at the front lot line shall be 35 feet.
2. The average minimum lot width shall be 35 feet.
3. Repealed by Ord. 1622.
4. The yard dimensions or building setback area from the lot line shall be:
  - a. Interior side yard, a minimum of seven and one-half feet.
  - b. Side yard abutting a street, no minimum.
  - c. Rear yard, a minimum of 25 feet.
  - d. Front yard, no minimum and a 20-foot maximum. The front setback area between the street and the building line shall consist of landscaping or a combination of non-vehicular hardscape areas (covered with impervious surfaces) and landscaped areas. If there are not street trees within the public right-of-way, the front setback area shall include such trees per the requirements of the City Arborist.

5. The maximum lot coverage shall be 50 percent.
  6. The maximum building height shall be two and one-half stories or 35 feet for any structure located within 50 feet of a low or medium density residential zone and three and one-half stories or 45 feet for any structure located 50 feet or more from a low or medium density residential area.
- B. The requirements of subsections (A)(1) through (4) of this section may be modified for developments under the planned unit development provisions of Chapter 24 CDC. (Ord. 1425, 1998; Ord. 1622 § 24, 2014)

**Applicant Response: The current and proposed continued lot configuration will include an approximately 130-foot front lot width, which exceeds the minimum lot width of 35 feet. The interior side yard will be approximately 8 feet. The subject property has two side yards, each abutting a street and no rear yard. The building is at the lot line at the front yard & otherwise front yard area will be landscaped. The proposed lot coverage is approximately 25.4% of the total lot area.**

The height of the proposed building ranges from 25 feet, 4 inches to approximately 39 feet due to the topography of the site. The proposed building will be a 1 story building with a large building wall on the downslope (east) side. The maximum proposed building height is approximately 39 feet at the highest point along the and the structure is more than 50 feet from a low or medium density zone.

### Chapter 38

#### **ADDITIONAL YARD AREA REQUIRED; EXCEPTIONS TO YARD REQUIREMENTS; STORAGE IN YARDS; PROJECTIONS INTO YARDS**

##### 38.020 NO YARD REQUIRED; STRUCTURE NOT ON PROPERTY LINE

In zones where a side yard or a rear yard setback is not required, a structure which is not to be built on the property line shall be set back from the property line by at least three feet, except as prescribed in CDC 58.090(C)(1). (Ord. 1675 § 36, 2018)

**Applicant Response: The proposed building will be placed at the property line adjacent to Burns Street, which is a street-abutting side yard. The front yard, interior side yard, and rear yard will be a minimum of 3 feet in width.**

##### 38.030 SETBACK FROM STREET CENTERLINE REQUIRED

A. To assure improved light, air, and sight distance and to protect the public health, safety and welfare, a setback in addition to the yard requirements of the zone may be required where the right-of-way is inadequate. A determination shall be made based on the street standards contained in CDC 85.200(A).

**Applicant Response: The proposed property setback and ultimate right-of-way was developed through preliminary communication with Public Works Staff, which includes provisions for street widening, on-street parking, and sidewalk improvements.**



B. The minimum yard requirement shall be increased to provide for street widening in the event a yard abuts a street having a right-of-way width less than required by its functional classification on the City's Comprehensive Plan Map, and in such case the setback shall be not less than the setback required by the zone plus one-half of the projected road width as required under CDC 85.200(A); however

C. The minimum distance from the wall of any structure to the centerline of an abutting street shall not be less than 25 feet plus the yard required by the zone. This provision shall not apply to rights-of-way of 50 feet or greater in width.

**Applicant Response: The minimum distance between the proposed structure and the centerlines of Hood Street and Burns Street is at least 25 feet plus the yard required by the OBC zone.**

#### 38.050 STORAGE IN FRONT YARD

Boats, trailers, campers, camper bodies, house trailers, recreation vehicles or commercial vehicles in excess of three-quarter-ton capacity shall not be stored in a required front yard in a residential zone if the location creates an obstruction to the vision of passing motorists which constitutes a potential traffic hazard.

**Applicant Response: The proposed development does not include any proposed storage of boats, trailers, campers, camper bodies, house trailers, recreation vehicles or commercial vehicles in the front yard.**

#### 38.060 PROJECTIONS INTO REQUIRED YARDS

A. Repealed by Ord. 1635.

B. Cornices, eaves, belt courses, sills, canopies, or similar architectural features may extend or project into a required yard not more than 36 inches provided the width of such side yard is not reduced to less than three feet. Projections into the side yard may not include living space such as bay windows or overhanging breakfast nooks, etc.

**Applicant Response: There will be no architectural features that project into required minimum side yards.**

C. Projections that include living space such as bay windows or overhanging breakfast nooks, etc., may extend into the front or rear yard setbacks, but no more than two feet. The footprint or foundation of the house may not encroach into the front or rear setback area.

**Applicant Response: There are no bay windows or breakfast nooks proposed for this development.**

D. Fireplace chimneys may project into a required front, side or rear yard not more than three feet, provided the width of such side yard is not reduced to less than three feet.

**Applicant Response: There are no fireplace chimneys proposed for this development.**

E. The presence of an easement within a required yard is a limitation to projections. Uncovered open porches, decks, or balconies, not more than 30 inches in height above grade and not covered by a roof or canopy, may extend or project into a required front or rear yard until the projection

reaches a utility easement or comes within five feet of the property line, whichever provides a greater distance from the property line. The uncovered deck, porch or balcony may go into side yard setback leaving at least three feet to the property line. Encroachment into a utility easement is not allowed, except as provided below:

1. Uncovered open porches, decks, or balconies may extend into an existing utility easement, provided:
  - a. A minimum vertical clearance of 12 feet is maintained between the lowest point of the deck and the ground; and
  - b. That no posts are installed within the easement.
2. These provisions do not apply in the Willamette Historic District.

**Applicant Response: To the best of our knowledge, there are no easements that encumber the proposed development site and the subject property is not located within the Willamette Historic District.**

F. Front and rear porches, covered porches, unroofed landings and stairs (over 30 inches in height) may encroach into the front or rear yard setback up to five feet. Homes on corner lots may have a front porch that wraps around to the side street side. The porch on the side street may also encroach five feet into the required street side setback area. Enclosed porches are not permitted to encroach. The roofline of the house may be extended to cover the porch but no living space shall be allowed inside the front yard setback (i.e., dormers). The Planning Director shall determine compliance with this section as provided by CDC 99.060(A)(3). These provisions do not apply in the Willamette Historic District. (Ord. 1291, 1990; Ord. 1308, 1991; Ord. 1401, 1997; Ord. 1635 § 22, 2014)

**Applicant Response: The project is not located within the Willamette Historic District. An extended Roof overhang extends into the setback & vision clearance triangle over the sidewalk approach & front entry porch facing the corner of Hood and Burns. The porch and roof are outside of the height limits for the vision clearance triangle & no enclosed occupiable space is within the setbacks. No portion of the building extends beyond the property lines.**

#### 41.005 DETERMINING HEIGHT OF BUILDING

A. For all zoning districts, building height shall be the vertical distance above a reference datum measured to the highest point of a flat roof or to the deck line of a mansard roof or to the highest gable, ridgeline or peak of a pitched or hipped roof, not including projections above roofs such as cupolas, towers, etc. The reference datum shall be selected by either of the following, whichever yields a greater height of building.

1. For relatively flat sites where there is less than a 10-foot difference in grade between the front and rear of the building, the height of the building shall be measured from grade five feet out from the exterior wall at the front of the building; or
2. For steeper lots where there is more than a 10-foot difference in grade between the front and rear of the building, the height of the building is measured from grade at a point five feet out



from the exterior wall on the lowest side (front or rear) of the building. One then measures vertically to the peak or ridgeline of the roof to determine the height.

**Applicant Response: The subject property is a relatively steep lot. There is a difference of 30 feet from the highest point along Hood Street (130 feet) to the lowest point of the site along Burns Street. The total building height using the method in 41.005 (A)(2) would be 39 feet. The proposed elevations represent the height measurement per the above criteria.**

3. Buildings on cross slopes or side slopes are measured at either the front or rear of the building using methods described in subsections (A)(1) and (2) of this definition only.

Even if the cross slope creates a tall elevation on the side, the method of determining height is not modified.

Also see CDC 41.020, Height Exceptions.

Height of building on relatively flat lot is measured from grade at front of house to peak of roof.

Height of building on steep lots where there is more than a 10-foot difference in elevation between the front and rear of the building is measured from grade at a point five feet out from the front or rear exterior wall on the lowest side of the house to the peak of the building.

Height of building with a cross slope is still measured at either the front or rear by methods described in subsection (A)(1) or (2) of this definition.

**Applicant Response: The subject property slopes from west to east approximately 30 feet. Height is measured from the finished floor on the rear exterior wall, which is the lowest side of the building, to the peak of the building. The elevations show the height measurements.**

(Ord. 1604 § 42, 2011)

#### **41.010 FRONT YARD SETBACK EXCEPTION**

If the average slope of a building site is 25 percent or greater, as measured along the planes of the proposed structure, the minimum front yard setback for the garage shall be three feet. All structures other than the garage shall meet the setback requirement of the underlying zone, or as otherwise specified in this code.

**Applicant Response: No Garage is proposed for this Project.**

When a garage is situated less than 20 feet from the front property line or less than 15 feet from a side property line facing a street, the following siting conditions shall apply:

A. Where lot width allows, the garage shall be set parallel to the street (i.e., the garage doors shall be perpendicularly oriented to the street), and at least two off-street parking spaces shall be provided as specified in Chapter 46 CDC (i.e., paved).

B. If the lot width prohibits the parallel siting required above, the garage may be sited perpendicular to the street (i.e., the garage door or doors facing directly onto the street),

provided, in addition to the sheltered parking spaces, two off-street parking spaces are provided on site. (Ord. 1226, 1988; Ord. 1276, 1990)

**Applicant Response: No Garage is proposed for this Project.**

#### **41.020 HEIGHT EXCEPTIONS**

A. If the highest grade of a building site which fronts on the downslope side of the street is greater than 10 feet above the lowest grade as measured along the planes of the proposed structure, the total building height may not exceed 45 feet as measured from the lowest grade at a point five feet downhill from the rear of the building, provided the building height does not project more than 24 feet above the average grade of the street. In the R-15, R-20, and R-40 zones the 45-foot height may be increased to 50 feet.

**Applicant Response: The proposed building will not exceed 45 feet in height.**

B. If the highest grade of a building site which fronts on the upslope side of the street is greater than 10 feet above the lowest grade, as measured along the planes of the proposed structure, the total building height shall not exceed 45 feet. In the R-15, R-20, and R-40 zones the 45-foot height may be increased to 50 feet.

Height of buildings on uphill slopes where there is more than a 10-foot difference between the rear and front elevation is measured from a point five feet downhill from the front of the building to the peak or dominant ridgeline and shall not exceed 45 feet (50 feet in the R-15, R-20 and R-40 zones).

**Applicant Response: The proposed building will not exceed 45 feet in height.**

Figure 2. Height exceptions

Height of buildings on downhill slopes where there is more than a 10-foot difference between the rear and front elevation is measured from a point five feet downhill from the rear of the building to the peak or dominant ridgeline and shall not exceed 45 feet (50 feet in the R-15, R-20 and R-40 zones). Front house height cannot be more than 24 feet above average street grade. (Ord. 1276, 1990; Ord. 1308, 1991; Ord. 1538, 2006; Ord. 1604 § 43, 2011)

**Applicant Response: The proposed building will not exceed 45 feet in height.**

#### **41.030 PROJECTIONS NOT USED FOR HUMAN HABITATION**

Projections such as chimneys, spires, domes, elevator shaft housings, towers, aerials, flag poles, and other similar objects not used for human occupancy are not subject to the building height limitations of this code. (Ord. 1604 § 44, 2011)

**Applicant Response: There are no projections on the proposed building above the roof height.**

#### **42.020 CLEAR VISION AREAS REQUIRED, USES PROHIBITED**

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

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

**Applicant Response: The subject site design includes 2 clear vision areas at the intersections at the corner of Burns Street and Hood Street & the corner of Burns and Burns that are 30 feet by 30 feet.**

**42.030 EXCEPTIONS**

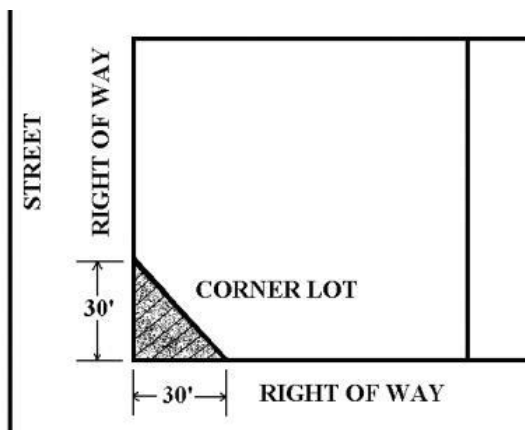
The following described area in Willamette shall be exempt from the provisions of this chapter. The units of land zoned General Commercial which abut Willamette Falls Drive, located between 10th and 16th Streets. Beginning at the intersection of Willamette Falls Drive and 11th Street on 7th Avenue to 16th Street; on 16th Street to 9th Avenue; on 9th Avenue to 14th Street to the Tualatin River; following the Tualatin River and Willamette River to 12th Street; on 12th Street to 4th Avenue; on 4th Avenue to 11th Street; on 11th Street to Willamette Falls Drive. This described area does not include the northerly side of Willamette Falls Drive. (Ord. 1636 § 29, 2014)

**Applicant Response: The subject property is not located within the area described in the criterion above.**

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

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

Clear vision area for corner lots and driveways 24 feet or more in width:



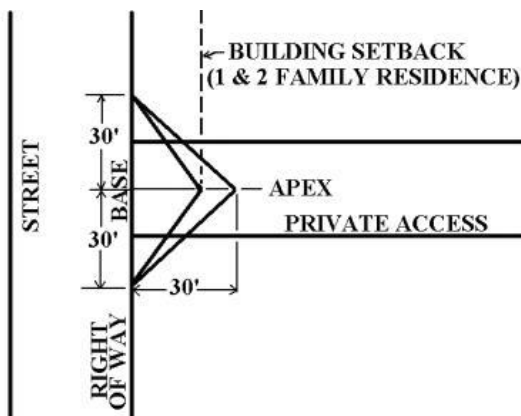
**Applicant Response: The subject site is adjacent to two street intersections at Hood & Burns and at Burns & Burns. 30' x 30' vision clearance triangles are provided at both intersections in**

accordance with 42.040. The site includes two private driveways to access the off-street parking areas on Hood Street and Burns Street. The driveway intersection with Hood Street is approximately 24 feet in width and will include clear vision areas that meet the 30 feet by 30 feet triangle requirement per 42.040.

42.050 COMPUTATION; ACCESSWAY LESS THAN 24 FEET IN WIDTH

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

Clear vision area for corner lots and driveways less than 24 feet in width:



**Applicant Response:** The Burns Street driveway intersection is approximately 23 feet in width and will include clear vision areas that meet the 30 feet by 30 feet triangle from the centerline of the driveway.

**CHAPTER 46  
OFF-STREET PARKING, LOADING AND RESERVOIR AREAS**

**46.060 STORAGE IN PARKING AND LOADING AREAS PROHIBITED**

Required parking spaces shall be available for the parking of passenger automobiles of residents, customers, patrons and employees only, and the required parking spaces shall not be used for storage of vehicles or materials or for the parking of trucks connected with the business or use with the exception of small (under one-ton) delivery trucks or cars.

**Applicant Response: The subject site parking area will not be used for storage of vehicles, materials, or large trucks.**

**46.070 MAXIMUM DISTANCE ALLOWED BETWEEN PARKING AREA AND USE**

- A. Off-street parking spaces for single- and two-family dwellings shall be located on the same lot with the dwelling.
- B. Off-street parking spaces for uses not listed in subsection A of this section shall be located not farther than 200 feet from an entryway to the building or use they are required to serve, measured in a straight line from the building, with the following exceptions:
1. Shared parking areas for commercial uses which require more than 40 parking spaces may provide for the spaces in excess of the required 40 spaces up to a distance of 300 feet from the entryway to the commercial building or use.
  2. Industrial and manufacturing uses which require in excess of 40 spaces may locate the required spaces in excess of the 40 spaces up to a distance of 300 feet from the entryway to the building.
  3. Employee parking areas for carpools and vanpools shall be located closer to the entryway to the building than general employee parking.
  4. Stacked or valet parking is allowed if an attendant is present to move vehicles. If stacked parking is used for required parking spaces, the applicant shall ensure that an attendant will always be present when the lot is in operation. The requirements for minimum or maximum spaces and all parking area development standards continue to apply for stacked parking.
  5. All disabled parking shall be placed closest to building entrances than all other parking. Appropriate ADA curb cuts and ramps to go from the parking lot to the ADA-accessible entrance shall be provided unless exempted by ADA code. (Ord. 1547, 2007)

**Applicant Response: The proposed off-street parking area consists of 26 auto parking stalls. Two ADA stalls are proposed, one near each main entrance. There are no industrial or manufacturing uses proposed. There are no proposed stacked or valet parking proposed. The two proposed ADA parking spaces are proposed to be as close to the building entrances as possible. ADA curb cuts and ramps will lead from the parking area to building entrances.**

**46.080 COMPUTATION OF REQUIRED PARKING SPACES AND LOADING AREA**

- A. Where several uses occupy a single structure or unit of land, a combination of uses is included in one business, or a combination of uses in the same or separate buildings share a common parking area as in the case of a shopping center, the total off-street parking spaces and loading area shall be the sum of the

requirements of the several uses, computed separately. For example, parking for an auto sales and repair business would be calculated using the “retail-bulky” calculation for the sales area and the “service and repair” calculation for the repair area. In another example, parking for a shopping center with a grocery store, a restaurant, and a medical office would be calculated using the “general retail store” calculation for the grocery store, the “restaurant” calculation for the restaurant, and the “medical/dental clinics” calculation for the medical office. The total number of required parking spaces may be reduced by up to 10 percent to account for cross-patronage (when a customer visits several commercial establishments during one visit to the commercial center) of adjacent businesses or services in a commercial center with five or more separate commercial establishments.

- B. To calculate building square footage as a basis for determining how many parking spaces are needed, the area measured shall be gross floor area under the roof measured from the faces of the structure, including all habitable floors and excluding only space devoted to covered off-street parking or loading.
- C. Where employees are specified, the employees counted are the persons who work on the premises including proprietors, executives, professional people, production, sales, and distribution employees, during the largest shift.
- D. Fractional space requirements shall be counted as a whole space.
- E. On-street parking along the immediate property frontage(s) may be counted toward the minimum parking requirement with approval from the City Engineer.
- F. When an office or commercial development is proposed which has yet to identify its tenants, the parking requirement shall be based upon the “office” or “general retail” categories, respectively.
- G. As permitted uses are replaced with new permitted uses within an existing commercial or business center, modification of the number of parking spaces relative to the new mix of uses is not required unless other modifications of the site which require design review approval pursuant to Chapter 55 CDC are proposed. (Ord. 1463, 2000; Ord. 1622 § 25, 2014; Ord. 1636 § 31, 2014)

**Applicant Response: The proposed uses on the property, dental and physical therapy clinic most closely fall under the parking category of “medical/dental clinics/day surgery” which requires one vehicle space for every 250 square feet of gross floor area. The proposed building would contain 6,922 square feet of gross floor area. Therefore, a minimum of 27.688 or 28 parking spaces. A reduction of 10% of the parking spaces is requested due to the proximity of transit which would then include a requirement of 25 parking spaces. The proposed development would provide 26 parking spaces, therefore exceeding the minimum parking requirement by 1 space.**

F. Maximum parking. Parking spaces (except for single-family and two-family residential uses) shall not exceed the minimum required number of spaces by more than 10 percent.

**Applicant Response: The proposed parking spaces exceed the minimum parking requirement but do not exceed more than 10% of the minimum.**

G. Parking reductions. An applicant may reduce parking up to 10 percent for development sites within one-quarter mile of a transit corridor or within a mixed-use commercial area, and up to 10 percent for commercial development sites adjacent to multi-family residential sites with the potential to accommodate more than 20 dwelling units.

**Applicant Response: The subject property is located within one-quarter mile of Willamette Drive which is a major transit corridor. The applicant is requesting a 10 percent reduction in the required number of parking spaces from 28 to 26.**

H. For office, industrial, and public uses where there are more than 20 parking spaces for employees on the site, at least 10 percent of the required employee parking spaces shall be reserved for carpool use before 9:00 a.m. on weekdays. The spaces will be the closest to the building entrance, except for any disabled parking and those signed for exclusive customer use. The carpool/vanpool spaces shall be clearly marked "Reserved – Carpool/Vanpool Before 9:00 a.m."

**Applicant Response: The subject property includes parking for a maximum of 26 vehicles, including two (2) ADA spaces.**

I. Existing developments along transit streets or near transit stops may redevelop up to 10 percent of the existing parking spaces to provide transit-oriented facilities, including bus pullouts, bus stops and shelters, park and ride stations, and other similar facilities.

**Applicant Response: The subject property is not located along a transit street and does not include existing parking spaces, therefore the criterion above does not apply.**

J. Development in water resource areas may reduce the required number of parking spaces by up to 25 percent. Adjacent improved street frontage with curb and sidewalk may also be counted towards the parking requirement at a rate of one parking space per 20 lineal feet of street frontage adjacent to the property. (Ord. 1291, 1990; Ord. 1391, 1996; Ord. 1408, 1998; Ord. 1425, 1998; Ord. 1463, 2000; Ord. 1499, 2003; Ord. 1547, 2007; Ord. 1622 § 25, 2014; Ord. 1623 § 4, 2014; Ord. 1650 § 1 (Exh. A), 2016; Ord. 1675 § 38, 2018)

**Applicant Response: Based on a review of the MapOptix GIS, the subject property is not located within a water resource area.**

## **Chapter 48**

### **ACCESS, EGRESS AND CIRCULATION**

#### **48.020 APPLICABILITY AND GENERAL PROVISIONS.**

A. The provisions of this chapter do not apply where the provisions of the Transportation System Plan or land division chapter are applicable and set forth differing standards.

**Applicant Response: For the Purposes of this Narrative The points in Chapter 48 will be addressed per city request.**

B. All lots shall have access from a public street or from a platted private street approved under the land division chapter.



**Applicant Response: The proposed development occurs on a lot with three street frontages and will have two access points from public streets.**

C. No building or other permit shall be issued until scaled plans are presented to the City and approved by the City as provided by this chapter, and show how the access, egress, and circulation requirements are to be fulfilled. Access to State or County roads may require review, approval, and permits from the appropriate authority.

**Applicant Response: A scaled site plan showing access, egress and circulation was included in our original submittal.**

D. Should the owner or occupant of a lot, parcel or building enlarge or change the use to which the lot, parcel or building is put, resulting in increasing any of the requirements of this chapter, it shall be unlawful and a violation of this code to begin or maintain such altered use until the provisions of this chapter have been met, and, if required, until the appropriate approval authority under Chapter 99 CDC has approved the change.

**Applicant Response: This letter, along with all other submitted documents, represents our efforts to satisfy all provisions of this chapter and request approval for the proposed, outright permitted use.**

E. Owners of two or more uses, structures, lots, parcels, or units of land may agree to utilize jointly the same access and egress when the combined access and egress of both uses, structures, or parcels of land satisfies the requirements as designated in this code; provided, that satisfactory legal evidence is presented to the City Attorney in the form of deeds, easements, leases, or contracts to establish joint use. Copies of said instrument shall be placed on permanent file with the City Recorder.

**Applicant Response: Only one Use is proposed on one parcel under this application.**

F. Property owners shall not be compelled to access their homes via platted stems of flag lots if other driveways and easements are available and approved by the City Engineer. (Ord. 1584, 2008; Ord. 1636 § 32, 2014)

**Applicant Response: No Stem or Flag lot is required for access to this site.**

#### 48.025 ACCESS CONTROL

A. Purpose. The following access control standards apply to public, industrial, commercial and residential developments including land divisions. Access shall be managed to maintain an adequate level of service and to maintain the functional classification of roadways as required by the West Linn Transportation System Plan.

**Applicant Response: See responses below.**

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, Transportation Impact Analysis.)

**Applicant Response: A Trip Generation Estimate has been provided and indicates no need for a full Traffic Impact Analysis.**



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.

**Applicant Response: One existing access point exists along Hood St. This will be updated to current standards. One additional access point is proposed along Burns street & has been designed by a registered Civil Engineer. Both Access points allow two way traffic and do not require backing onto a public 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” as approved by the City Engineer.

- 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.

**Applicant Response: The proposed project will be utilizing Option 3 above and all access spacing requirements will be respected. See point 6 below.**

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).

**Applicant Response: No Residential Subdivision is proposed for this project.**

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.

**Applicant Response: The project sits on a Triple-frontage lot. All Adjacent roads are classified as ‘local’ streets within a ‘commercial area’ according to the 2016 West Linn Transportation Plan as represented on the 2018 West Linn Road Index Map. Access points are provided at an existing access point on Hood Street and a proposed new access point along Burns street.**

6. Access spacing.

- a. The access spacing standards found in the adopted Transportation System Plan (TSP) shall be applicable to all newly established public street intersections and non-traversable medians. Deviation from the access spacing standards may be granted by the City Engineer if conditions are met as described in the access spacing variances section in the adopted TSP.

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

**Applicant Response: Access points are located as far as possible from the lot corner at the intersection of Burns & Hood, and 35' from the lot corner at the intersection of Hood & Cascade as required by the TSP. These locations were chosen based on the requirements of the TSP and on the necessities of the extreme topological changes on the site.**

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.

**Applicant Response: Two access points were necessitated by the extreme topological changes on the site. These access points are in conformance with Spacing requirements from adjacent intersections.**

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:

**Applicant Response: Shared driveways are not necessary, desirable, or feasible for this property. All adjacent properties have existing independent access to public roads. The provisions of this section are not applicable to this project.**

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

**Applicant Response: See above**

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

**Applicant Response: See above**

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

**Applicant Response: See above**

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:

**Applicant Response: No new land divisions or large site developments are proposed under this permit. This section is not applicable to this permit.**

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

**Applicant Response: See above**

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.

**Applicant Response: See above**

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; Ord. 1650 § 1 (Exh. A), 2016; Ord. 1675 § 40, 2018)

**Applicant Response: See above**

#### 48.030 MINIMUM VEHICULAR REQUIREMENTS FOR RESIDENTIAL USES

**Applicant Response: The provisions of this section are not applicable, as the project proposes no residential uses.**

#### 48.040 MINIMUM VEHICULAR REQUIREMENTS FOR NON-RESIDENTIAL USES

Access, egress, and circulation system for all non-residential uses shall not be less than the following:

A. Service drives for non-residential uses shall be fully improved with hard surface pavement:

**Applicant Response: All access drives, service drives, and parking will be paved in accordance with the Civil drawings provided.**

1. With a minimum of 24-foot width when accommodating two-way traffic; or

**Applicant Response: A 24' wide service drive is provided from Hood street for all services.**

2. With a minimum of 15-foot width when accommodating one-way traffic. Horizontal clearance shall be two and one-half feet wide on either side of the driveway.

**Applicant Response: No one way streets/drives are proposed for this project.**

3. Meet the requirements of CDC 48.030(E)(3) through (6).  
48030 E (copied here for clarity)
- E. Access and/or service drives for multi-family dwellings shall be fully improved with hard surface pavement:
  3. Minimum vertical clearance of 13 feet, six inches.

**Applicant Response: Vertical clearances of 13 feet will be provided.**

4. Appropriate turnaround facilities per Fire Chief's standards for emergency vehicles when the drive is over 150 feet long. Fire Department turnaround areas shall not exceed seven percent grade unless waived by the Fire Chief.

**Applicant Response: We have been in contact with Jason Arn he stated that fire should be able to access the building from Hood & Burns St. without requiring the use of the service drive. If the service drive is used for fire, at no point will the fire apparatus be required to drive more than 140' into the access drive in order to access all parts of the building.**

5. The grade shall not exceed 10 percent on average, with a maximum of 15 percent.

**Applicant Response: See the grading plan provided for all applicable grades.**

6. A minimum centerline turning radius of 45 feet for the curve.

**Applicant Response: The service drive contains no curves with radii less than 45'.**

4. Pickup window driveways may be 12 feet wide unless the Fire Chief determines additional width is required.

**Applicant Response: No pick-up windows are proposed under this permit.**

- B. All non-residential uses shall be served by one or more service drives as determined necessary to provide convenient and safe access to the property and designed according to CDC 48.030(A). In no case shall the design of the service drive or drives require or facilitate the backward movement or other maneuvering of a vehicle within a street, other than an alley.

**Applicant Response: All access and service drives are designed for two way travel and will not require backing into streets.**

- C. All on-site maneuvering and/or access drives shall be maintained pursuant to CDC 46.130.

**Applicant Response: Access and parking has been designed in accordance with CDC 46.130.**

- D. Gated accessways to non-residential uses are prohibited unless required for public safety or security. (Ord. 1408, 1998, Ord. 1463, 2000)

**Applicant Response: No gated access is currently proposed under this permit.**

#### 48.050 ONE WAY VEHICULAR ACCESS POINTS

Where a proposed parking facility plan indicates only one-way traffic flow on the site, it shall be accommodated by a specific driveway serving the facility, and the entrance drive shall be situated closest to oncoming traffic, and the exit drive shall be situated farthest from oncoming traffic.

**Applicant Response: The provisions of this section are not applicable, as the project proposes no one-way only circulation.**

48.060 WIDTH AND LOCATION OF CURB CUTS AND ACCESS SEPARATION REQUIREMENTS.

A. Minimum curb cut width shall be 16 feet.

**Applicant Response: all curb cuts will be greater than 16' in width.**

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.

**Applicant Response: No curb cuts are proposed to be over 24' in width.**

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.
2. On an arterial when intersected by a collector, 100 feet.
3. On an arterial when intersected by a local street, 100 feet.
4. On a collector when intersecting an arterial street, 100 feet.
5. On a collector when intersected by another collector or local street, 35 feet.

**Applicant Response: No arterial or collector streets are identified adjacent to the property under consideration.**

6. On a local street when intersecting any other street, 35 feet.

**Applicant Response: Two curb cuts are proposed one at approximately 82' from the R.O.W. line at the intersection of Hood and Burns, and one at 35' from the R.O.W. line at the intersection of Burns and Cascade.**

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:

**Applicant Response: No adjacent curb cuts are proposed on the same side of a public street. The nearest curb cut on an adjacent property is about 50' from the property line. There are no arterial or collector streets adjacent to the property. This response covers points 1-3 below.**

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.

**Applicant Response: See Civil drawings for curb, and curb cut design.**

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.

**Applicant Response: Only two curb cuts are proposed for this project. This is the minimum required to allow full access due to the topography of the site. Consolidation of driveways is not feasible or desirable with residential neighbors. Highway 43 is a block away.**

G. Adequate line of sight pursuant to engineering standards should be afforded at each driveway or accessway. (Ord. 1270, 1990; Ord. 1584, 2008; Ord. 1636 § 35, 2014)

**Applicant Response: Vision Clearance triangles and line of sight have been considered in curb-cut location & design.**

#### 48.070 PLANNING DIRECTOR'S AUTHORITY TO RESTRICT ACCESS APPEAL PROVISIONS

A. In order to provide for increased traffic movement on congested streets and eliminate turning movement problems, the Planning Director and the City Engineer, or his or her designee, may restrict the location of driveways on said street and require the location of driveways on adjacent streets upon the finding that the proposed access would:

1. Provide inadequate access for emergency vehicles; or
2. Cause or increase hazardous conditions to exist which would constitute a clear and present danger to the public health safety and general welfare.

B. A decision by the Planning Director may be appealed to the Planning Commission as provided by CDC 99.240(B).

**Applicant Response: The proposed project and adjacent R.O.W. improvements have been designed to reduce hazardous conditions, increase emergency access & improve both pedestrian and vehicle circulation. We do not anticipate any need to restrict driveways for this project.**

#### 48.080 BICYCLE AND PEDESTRIAN CIRCULATION

A. Within all multi-family developments (except two-family/duplex dwellings), each residential dwelling shall be connected to vehicular parking stalls, common open space, and recreation facilities by a pedestrian pathway system having a minimum width of six feet and constructed of an all-weather material. The pathway material shall be of a different color or composition from the driveway. (Bicycle routes adjacent to the travel lanes do not have to be of different color or composition.)

**Applicant Response: The proposed project does not include multifamily development.**

B. Bicycle and pedestrian ways within a subdivision shall be constructed according to the provisions in CDC 85.200(A)(3).

**Applicant Response: No subdivision is proposed under this permit.**

C. Bicycle and pedestrian ways at commercial or industrial sites shall be provided according to the provisions of Chapter 55 CDC, Design Review.

**Applicant Response: Bicycle and pedestrian ways have been designed in accordance with Chapter 55. See Ch. 55 responses below.**



## Chapter 54 LANDSCAPING

### 54.020 APPROVAL CRITERIA

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

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

**Applicant Response: No trees are proposed to be preserved on the site due to the extent of development on site.**

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

**Applicant Response: The developer will comply with the municipal code chapter on tree protection.**

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

**Applicant Response: To the best of our knowledge, there are no listed heritage trees that exist on the subject property.**

E. Landscaping – By type, location and amount.

1. Residential uses (non-single-family). A minimum of 25 percent of the gross area including parking, loading and service areas shall be landscaped, and may include the open space and recreation area requirements under CDC 55.100. Parking lot landscaping may be counted in the percentage.

**Applicant Response: No Residential Use is proposed for this project.**

2. Non-residential uses. A minimum of 20 percent of the gross site area shall be landscaped. Parking lot landscaping may be counted in the percentage.

**Applicant Response: The site landscaping of the gross site area is 28% which exceeds the minimum of 20%.**

3. All uses (residential uses (non-single-family) and non-residential uses):

- a. The landscaping shall be located in defined landscaped areas, which are uniformly distributed throughout the parking or loading area. There shall be one shade tree planted for every eight parking spaces. These trees shall be evenly distributed throughout the parking lot to provide shade. Parking lots with over 20 spaces shall have a minimum 10 percent of the interior of the parking lot devoted to landscaping. Pedestrian walkways in the landscaped areas are not to be counted in the percentage. The perimeter landscaping, explained in subsection (E)(3)(d) of this section, shall not be included in the 10 percent figure. Parking lots with 10 to 20 spaces shall have a minimum five percent of the interior of the parking lot devoted to landscaping. The perimeter landscaping, as explained above, shall not be included in the five percent. Parking lots with fewer than 10 spaces shall have the standard perimeter landscaping and at least two shade trees. Non-residential parking areas paved with a permeable parking surface may reduce the required minimum interior landscaping by one-third for the area with the permeable parking surface only.

**Applicant Response: The parking area includes a 13% landscaping area.**

- b. The landscaped areas shall not have a width of less than five feet.

**Applicant Response: No proposed landscape area has a width of less than 5 feet.**

- c. The soils, site, proposed soil amendments, and proposed irrigation system shall be appropriate for the healthy and long-term maintenance of the proposed plant species.

**Applicant Response: All landscaping & irrigation will be designed by a registered Landscape Architect to provide healthy conditions for plant maintenance.**

**The plant materials specified are suitable for this site and its soil type. Soil preparation specifications will be provided for all building area planters while slope areas shall remain undisturbed. Plants installed on the slopes will be “pocket-planted” with prepared backfill mixture containing compost and fertilizer. An automatic irrigation system utilizing SMART Technology will be installed to establish the newly planted landscape and for long-term sustainment.**

- d. A parking, loading, or service area which abuts a street shall be set back from the right-of-way line by perimeter landscaping in the form of a landscaped strip at least 10 feet in width. When a parking, loading, or service area or driveway is contiguous to an adjoining lot or parcel, there shall be an intervening five-foot-wide landscape strip. The landscaped area shall contain:

**Applicant Response: All Parking Loading, or service areas are set back 10’ from street fronting property lines and 7.5’ from adjoining parcel property lines. All setbacks are landscaped appropriately-see below**

- 1) Street trees spaced as appropriate to the species, not to exceed 50 feet apart on the average;

**Applicant Response: Trees will be provided within the 10’ landscaping setback adjacent to parking areas to provide an aesthetically pleasing environment.**

- 2) Shrubs, not to reach a height greater than three feet, six inches, spaced no more than five feet apart on the average; or



**Applicant Response: Shrubs not exceeding three feet, six inches, spaced no more than five feet on-center will be provide in all parking setback areas.**

3) Vegetative ground cover such as grass, wildflowers, or other landscape material to cover 100 percent of the exposed ground within two growing seasons. No bark mulch shall be allowed except under the canopy of low level shrubs.

**Applicant Response: Groundcovers are included on the submitted landscape plan.**

e. If over 50 percent of the lineal frontage of the main street or arterial adjacent to the development site comprises parking lot, the landscape strip between the right-of-way and parking lot shall be increased to 15 feet in width and shall include terrain variations (e.g., one-foot-high berm) plus landscaping. This extra requirement only applies to one street frontage.

**Applicant Response: No Street Frontage is comprised of more than 50% parking lot.**

f. A parking, loading, or service area which abuts a property line shall be separated from the property line by a landscaped area at least five feet in width and which shall act as a screen and noise buffer, and the adequacy of the screen and buffer shall be determined by the criteria set forth in CDC 55.100(C) and (D), except where shared parking is approved under CDC 46.050.

**Applicant Response: All Parking Loading, or service areas are set back 10' from street fronting property lines and 7.5' from adjoining parcel property lines. All setbacks are landscaped appropriately to provide screening and noise buffering as required.**

g. All areas in a parking lot not used for parking, maneuvering, or circulation shall be landscaped.

**Applicant Response: Any area onsite, not designated for buildings, parking, or vehicle/pedestrian circulation will be landscaped.**

h. The landscaping in parking areas shall not obstruct lines of sight for safe traffic operation.

**Applicant Response: Landscape islands and landscaping adjacent to driveway approaches will be designed, and plants specified to allow requisite vision clearances for safe traffic operation.**

i. Outdoor storage areas, service areas (loading docks, refuse deposits, and delivery areas), and above-ground utility facilities shall be buffered and screened to obscure their view from adjoining properties and to reduce noise levels to acceptable levels at the property line. The adequacy of the buffer and screening shall be determined by the criteria set forth in CDC 55.100(C)(1).

**Applicant Response: The solid waste enclosure is located to both reduce its visibility (height relative to grade), and keep it as far as practicable from all adjacent structures. It is buffered by both a 6' high brick-clad enclosure wall and landscaping. Landscape buffering between neighboring residential properties to the**

north and the proposed development is achieved by a mix of fast-growing shrubs to provide a green screen and trees.

j. Crime prevention shall be considered and plant materials shall not be located in a manner which prohibits surveillance of public and semi-public areas (shared or common areas).

**Applicant Response: Security visibility to public and semi-public spaces has been considered with the specification and placement of plan materials.**

k. Irrigation facilities shall be located so that landscaped areas can be properly maintained and so that the facilities do not interfere with vehicular or pedestrian circulation.

**Applicant Response: The irrigation system will be predominantly drip irrigation, which, while operating, will largely be inconspicuous. The larger slope areas may be irrigated with overhead irrigation, which will be away from pedestrian and vehicular circulation areas. Irrigation scheduling will occur during non-business hours, typically early in the morning which is better for soil moisture absorption as well.**

l. For commercial, office, multi-family, and other sites, the developer shall select trees that possess the following characteristics:

**Applicant response: - see points 1-9 below**

1) Provide generous “spreading” canopy for shade.

**Applicant Response: See Sheet L1.1 for specific details on the trees, shrubs, grasses/perennials, and ground cover proposed. Trees were selected to provide as broad-spreading canopies as possible considering the limited site area and the tree’s proximity to the building.**

2) Roots do not break up adjacent paving.

**Applicant Response: Root barriers may be included, where appropriate, to reduce root damage to adjacent paving and curbs.**

3) Tree canopy spread starts at least six feet up from grade in, or adjacent to, parking lots, roads, or sidewalks unless the tree is columnar in nature.

**Applicant Response: All shade trees are standard form and will be branched no lower than six feet from grade.**

4) No sticky leaves or sap-dripping trees (no honey-dew excretion).

**Applicant Response: The trees specified are not known to drip excessive sap or honey-dew from insects.**

5) No seed pods or fruit-bearing trees (flowering trees are acceptable).

**Applicant Response: The trees specified do not produce fruit. the Redbud tree produces some small, flat seed pods but not in abundance. These pods do not stain paving nor are they know to create a trip or slip hazard.**

6) Disease-resistant.

**Applicant Response: The trees specified are mostly disease-resistant.**

7) Compatible with planter size.

**Applicant Response: The trees were selected specifically to be compatible with the planter size and their proximity to the building.**

8) Drought-tolerant unless irrigation is provided.

**Applicant Response: The trees are reasonably drought resistant and irrigation will be provided.**

9) Attractive foliage or form all seasons.

**Applicant Response: The plant materials will provide year-round interest including flowers through various bloom periods, fall color, numerous evergreen plants with varying foliage textures and colors.**

m. Plant materials (shrubs, ground cover, etc.) shall be selected for their appropriateness to the site, drought tolerance, year-round greenery and coverage, staggered flowering periods, and avoidance of nuisance plants (Scotch broom, etc.).

**Applicant Response: A selection of native & appropriate non-native plants have been proposed. Native plant materials comprise the majority of the planting area of the site. Non-natives were mostly used around the building and pedestrian use areas. See Sheet L1.1 for specific details on the trees, shrubs, grasses/perennials, and ground cover proposed.**

## Chapter 55 – Design Review

### 55.100 APPROVAL STANDARDS – CLASS II DESIGN REVIEW

The approval authority shall make findings with respect to the following criteria when approving, approving with conditions, or denying a Class II design review application:

A. The provisions of the following chapters shall be met:

1. Chapter 34 CDC, Accessory Structures, Accessory Dwelling Units, and Accessory Uses.

**Applicant Response: With the exception of the trash enclosure, which is addressed in more detail below, there are no proposed accessory structures, accessory dwelling units, or accessory uses proposed on site.**

2. Chapter 38 CDC, Additional Yard Area Required; Exceptions to Yard Requirements; Storage in Yards; Projections into Yards.

**Applicant Response: Yard area requirements are addressed in the responses to the standards in Chapter 38 above.**

3. Chapter 41 CDC, Building Height, Structures on Steep Lots, Exceptions.

**Applicant Response: Responses to Building Height, Structures on Steep Lots, Exceptions of Chapter 41 CDC are addressed above.**

4. Chapter 42 CDC, Clear Vision Areas.

**Applicant Response: Responses to Clear Vision Areas of Chapter 42 CDC are addressed above.**

5. Chapter 44 CDC, Fences.

**Applicant Response: The proposed project does not include new fencing on the site**

6. Chapter 46 CDC, Off-Street Parking, Loading and Reservoir Areas.

**Applicant Response: Responses to Off-Street Parking, Loading and Reservoir Areas in Chapter 46 CDC are addressed above.**

7. Chapter 48 CDC, Access, Egress and Circulation.

**Applicant Response: Responses to Off-Street Parking, Loading and Reservoir Areas in Chapter 48 CDC are addressed above.**

8. Chapter 52 CDC, Signs.

**Applicant Response: Responses to Off-Street Parking, Loading and Reservoir Areas in Chapter 52 CDC are addressed above.**

9. Chapter 54 CDC, Landscaping.

**Applicant Response: Responses to Landscaping in Chapter 54 CDC are addressed above.**

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. 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 limiting development in the protected area. The protected area includes the protected tree, its dripline, and an additional 10 feet beyond the dripline, as depicted in the figure below. 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 plus 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.

PROTECTED AREA = DRIPLINE + 10 FEET

b. Non-residential and residential projects on non-Type I and II lands shall set aside up to 20 percent of the protected areas for significant trees and tree clusters, 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 by limiting development in the protected areas. 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.

E.G., DRIPLINE + 10 FT. AREA = 2,500 SQ. FT. OR 18% OF TOTAL NON-TYPE I AND II LAND DENSITY CALCULATIONS FOR THIS PARCEL WILL BE BASED ON REMAINING NET SQ. FOOTAGE OF SITE (EXCLUDING THE 2,500 SQ. FT.)

**Applicant Response: To the best of our knowledge the existing site does not contain any heritage trees. A tree protection and preservation plan has been prepared by AKS Engineering and Forestry and is attached herein.**

- b. 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.

**Applicant Response: No new stubouts of streets are proposed.**

- c. 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.

**Applicant Response: The subject property does not include any existing stands or clusters of trees.**

- d. 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.

**Applicant Response: Based upon preliminary design discussion with Engineering Staff, the anticipated road improvements will not impact any significant or heritage trees.**

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

**Applicant Response: To the best of our knowledge, there are no identified significant trees on the subject property.**

- 3. The topography and natural drainage shall be preserved to the greatest degree possible.

**Applicant Response: The subject property contains steep slopes and has a grade difference of approximately 30 feet, sloping down from west to east. The proposed preliminary grading plan and site layout has taken into consideration the existing topography and natural drainage with goal of minimizing large retaining walls.**

4. The structures shall not be located in areas subject to slumping and sliding. The Comprehensive Plan Background Report's Hazard Map, or updated material as available and as deemed acceptable by the Planning Director, shall be the basis for preliminary determination.

**Applicant Response: To the best of our knowledge, the proposed structure is not located within slumping or sliding areas.**

5. There shall be adequate distance between on-site buildings and on-site and off-site buildings on adjoining properties to provide for adequate light and air circulation and for fire protection.

6. Architecture.

- a. The proposed structure(s) scale shall be compatible with the existing structure(s) on site and on adjoining sites. Contextual design is required. Contextual design means respecting and incorporating prominent architectural styles, building lines, roof forms, rhythm of windows, building scale and massing of surrounding buildings in the proposed structure. The materials and colors shall be complementary to the surrounding buildings.

**Applicant Response: The proposed architectural design has been developed in harmony with surrounding buildings with regard to form, colors, and materials. The proposed materials and colors, being primarily natural and earth-toned, compliment nearby commercial structures. The sloped roof at the corner element references the neighboring library. The existing commercial development across the corner of Burns and Hood Street has a similar material and color palette.**

- b. While there has been discussion in Chapter 24 CDC about transition, it is appropriate that new buildings should architecturally transition in terms of bulk and mass to work with, or fit, adjacent existing buildings. This transition can be accomplished by selecting designs that "step down" or "step up" from small to big structures and vice versa (see figure below). Transitions may also take the form of carrying building patterns and lines (e.g., parapets, windows, etc.) from the existing building to the new one.

**Applicant Response: The proposed structure has been designed as a single-story building to provide a soft transition between larger surrounding commercial buildings and the residential neighborhood. The higher roof elements of the proposed structure have been oriented toward the corner of Hood and Burns Street to address the commercial nature of the downtown while reducing imposition into residential areas.**

- c. Contrasting architecture shall only be permitted when the design is manifestly superior to adjacent architecture in terms of creativity, design, and workmanship, and/or it is adequately separated from other buildings by distance, screening, grade variations, or is part of a development site that is large enough to set its own style of architecture.

**Applicant Response: The proposed structure was designed to stand on its own as a unique architectural work while also referencing surrounding buildings in both form and materiality.**

- d. Human scale is a term that seeks to accommodate the users of the building and the notion that buildings should be designed around the human scale (i.e., their size and the average range of their perception). Human scale shall be accommodated in all designs by, for example, multi-light windows that are broken up into numerous panes, intimately scaled entryways, and visual breaks (exaggerated eaves, indentations, ledges, parapets, awnings, engaged columns, etc.) in the facades of buildings, both vertically and horizontally.



The human scale is enhanced by bringing the building and its main entrance up to the edge of the sidewalk. It creates a more dramatic and interesting streetscape and improves the “height and width” ratio referenced in this section.

**Applicant Response: The proposed building was sited near the corner of Hood Street and Burns Street to provide human scale and a pedestrian-friendly experience. Pedestrian connectivity is provided within the site at human scale with accessible paths from parking areas to building entrances.**

e. The main front elevation of commercial and office buildings shall provide at least 60 percent windows or transparency at the pedestrian level to create more interesting streetscape and window shopping opportunities. One side elevation shall provide at least 30 percent transparency. Any additional side or rear elevation, which is visible from a collector road or greater classification, shall also have at least 30 percent transparency. Transparency on other elevations is optional. The transparency is measured in lineal fashion. For example, a 100-foot-long building elevation shall have at least 60 feet (60 percent of 100 feet) in length of windows. The window height shall be, at minimum, three feet tall. The exception to transparency would be cases where demonstrated functional constraints or topography restrict that elevation from being used. When this exemption is applied to the main front elevation, the square footage of transparency that would ordinarily be required by the above formula shall be installed on the remaining elevations at pedestrian level in addition to any transparency required by a side elevation, and vice versa. The rear of the building is not required to include transparency. The transparency must be flush with the building elevation.

60 percent of lineal street facing or main elevation is windows. 30 percent of one side elevation is windows. You may transfer windows from the side to front, or vice versa.

**Applicant Response: The topography of Burns St. makes providing windows ‘at the pedestrian level’ impractical along this façade. Windows are provided at all elevations, but are focused on elevations along which, our site changes allow us to bring pedestrian surfaces up to the level of the building.**

f. Variations in depth and roof-line are encouraged for all elevations.

**Applicant Response: Variations in depth are provided both horizontally and vertically along the Burns St. frontage ,which can be experienced by pedestrians walking up or down the sidewalk along Burns street. This, along with variations in both roof type and roof height along this façade, provide interest both side to side and up & down.**

To vary the otherwise blank wall of most rear elevations, continuous flat elevations of over 100 feet in length should be avoided by indents or variations in the wall. The use of decorative brick, masonry, or stone insets and/or designs is encouraged. Another way to vary or soften this elevation is through terrain variations such as an undulating grass area with trees to provide vertical relief.

**Applicant Response: Our building is designed without ‘rear elevations’ & all elevations are designed to be aesthetically pleasing and provided with indents and variations. The topography of the site provides additional interest along the longest uninterrupted façade facing Burns St. Additionally, vining plans and material changes help to break up the length of the side elevation along Burns Street.**

g. Consideration of the micro-climate (e.g., sensitivity to wind, sun angles, shade, etc.) shall be made for building users, pedestrians, and transit users, including features like awnings.



**Applicant Response: Awnings are proposed at each building entrance to protect building users from the elements.**

h. The vision statement identified a strong commitment to developing safe and attractive pedestrian environments with broad sidewalks, canopied with trees and awnings.

**Applicant Response: The internal site pedestrian environment will include broad sidewalks, trees, and awnings over building entrances.**

i. Sidewalk cafes, kiosks, vendors, and street furniture are encouraged. However, at least a four-foot-wide pedestrian accessway must be maintained per Chapter 53 CDC, Sidewalk Use.

**Applicant Response: This project proposes no sidewalk obstructions. A 6-foot wide pedestrian accessway will be provided throughout the site. Right-of-way improvements will be constructed per City requirements and standards.**

7. Transportation. The automobile shall be shifted from a dominant role, relative to other modes of transportation, by the following means:

a. Commercial and office development shall be oriented to the street. At least one public entrance shall be located facing an arterial street; or, if the project does not front on an arterial, facing a collector street; or, if the project does not front on a collector, facing the local street with highest traffic levels. Parking lots shall be placed behind or to the side of commercial and office development. When a large and/or multi-building development is occurring on a large undeveloped tract (three plus acres), it is acceptable to focus internally; however, at least 20 percent of the main adjacent right-of-way shall have buildings contiguous to it unless waived per subsection (B)(7)(c) of this section. These buildings shall be oriented to the adjacent street and include pedestrian-oriented transparencies on those elevations.

For individual buildings on smaller individual lots, at least 30 lineal feet or 50 percent of the building must be adjacent to the right-of-way unless waived per subsection (B)(7)(c) of this section. The elevations oriented to the right-of-way must incorporate pedestrian-oriented transparency.

**Applicant Response: The proposed structure has been sited with a main entrance facing the corner of Burns Street and Hood Street. Other entrances are located along a pedestrian pathway on the north side of the building. The proposed parking areas are located behind and to the side of the building. The building is site along the corner of Burns Street and Hood Street with frontage along both streets.**

b. Multi-family projects shall be required to keep the parking at the side or rear of the buildings or behind the building line of the structure as it would appear from the right-of-way inside the multi-family project. For any garage which is located behind the building line of the structure, but still facing the front of the structure, architectural features such as patios, patio walls, trellis, porch roofs, overhangs, pergolas, etc., shall be used to downplay the visual impact of the garage, and to emphasize the rest of the house and front entry.

The parking may be positioned inside small courtyard areas around which the units are built. These courtyard spaces encourage socialization, defensible space, and can provide a central location for landscaping, particularly trees, which can provide an effective canopy and softening effect on the courtyard in only a few years. Vehicular access and driveways through these courtyard areas is permitted.

**Applicant Response: The proposed project does not include multi-family dwellings.**

c. Commercial, office, and multi-family projects shall be built as close to the adjacent main right-of-way as practical to facilitate safe pedestrian and transit access. Reduced frontages by buildings on public rights-of-way may be allowed due to extreme topographic (e.g., slope, creek, wetlands, etc.) conditions or compelling functional limitations, not just inconveniences or design challenges.

entrance from right-of-way

**Applicant Response: The proposed structure has been sited as close as permitted to prominently address the corner of the two primary streets, Hood and Burns.**

d. Accessways, parking lots, and internal driveways shall accommodate pedestrian circulation and access by specially textured, colored, or clearly defined footpaths at least six feet wide. Paths shall be eight feet wide when abutting parking areas or travel lanes. Paths shall be separated from parking or travel lanes by either landscaping, planters, curbs, bollards, or raised surfaces. Sidewalks in front of storefronts on the arterials and main store entrances on the arterials identified in CDC 85.200(A)(3) shall be 12 feet wide to accommodate pedestrians, sidewalk sales, sidewalk cafes, etc. Sidewalks in front of storefronts and main store entrances in commercial/OBC zone development on local streets and collectors shall be eight feet wide.

**Applicant Response: 6 foot or wider pedestrian access is provided throughout the site. Within the parking, vehicles are maintained at least two feet from sidewalks by wheel stops or curbs with widened sidewalks.**

e. Paths shall provide direct routes that pedestrians will use between buildings, adjacent rights-of-way, and adjacent commercial developments. They shall be clearly identified. They shall be laid out to attract use and to discourage people from cutting through parking lots and impacting environmentally sensitive areas.

**Applicant Response: The proposed parking lot design includes visible paths to the stairway from the lower parking area to the main building and cross-connection to adjacent commercial and public buildings. The parking lots have been designed with a single entrance and exit so there will be no opportunity to cut through the parking area.**

h. At least one entrance to the building shall be on the main street, or as close as possible to the main street. The entrance shall be designed to identify itself as a main point of ingress/egress.

**Applicant Response: The proposed main entrance has been oriented at a 45 degree angle to address the corner of Hood and Burns Street.**

g. Where transit service exists, or is expected to exist, there shall be a main entrance within a safe and reasonable distance of the transit stop. A pathway shall be provided to facilitate a direct connection.

**Applicant Response: To the best of our knowledge, there is no transit service or stops immediately adjacent to the proposed project.**

h. Projects shall bring at least part of the project adjacent to or near the main street right-of-way in order to enhance the height-to-width ratio along that particular street. (The "height-to-width ratio" is an architectural term that emphasizes height or vertical dimension of buildings adjacent to streets. The higher and closer the building is, and the narrower the width of the street, the more attractive and intimate the streetscape becomes.) For every one foot in street width, the adjacent building ideally should be one to two feet higher. This ratio is considered ideal in framing and defining the streetscape.

**Applicant Response: The existing street width along Hood Street is approximately 36.5'. The building height at the corner element along of Hood and Burns Street is approximately 30 feet on average above the street elevation. The building steps down as Burns drops toward the east giving a varied height above the street level.**

1:1 height to width ratio is ideal

(example only)

i. These architectural standards shall apply to public facilities such as reservoirs, water towers, treatment plants, fire stations, pump stations, power transmission facilities, etc. It is recognized that many of these facilities, due to their functional requirements, cannot readily be configured to meet these architectural standards. However, attempts shall be made to make the design sympathetic to surrounding properties by landscaping, setbacks, buffers, and all reasonable architectural means.

**Applicant Response: The proposed project is not a public facility.**

j. Parking spaces at trailheads shall be located so as to preserve the view of, and access to, the trailhead entrance from the roadway. The entrance apron to the trailhead shall be marked: "No Parking," and include design features to foster trail recognition.

**Applicant Response: The proposed project does not include any trailheads.**

C. Compatibility between adjoining uses, buffering, and screening.

**Applicant Response: Significant design consideration was applied to the proposed project to address neighboring single-family dwelling concerns regarding the proximity of parking spaces adjacent to homes, landscape buffering, and view corridors. The applicant presented the project to the Bolton Neighborhood Association on October 15, 2019 and has made efforts to design the site plan to address neighbor concerns regarding the use of native plants, parking areas being too close to residential homes and lowering the height of the building from two-stories to a single story.**

1. In addition to the compatibility requirements contained in Chapter 24 CDC, buffering shall be provided between different types of land uses; for example, buffering between single-family homes and apartment blocks. However, no buffering is required between single-family homes and duplexes or single-family attached units. The following factors shall be considered in determining the adequacy of the type and extent of the buffer:

- a. The purpose of the buffer, for example to decrease noise levels, absorb air pollution, filter dust, or to provide a visual barrier.
- b. The size of the buffer required to achieve the purpose in terms of width and height.
- c. The direction(s) from which buffering is needed.
- d. The required density of the buffering.
- e. Whether the viewer is stationary or mobile.

**Applicant Response: Landscape buffering between neighboring residential properties to the north and the proposed development is achieved by a mix of fast-growing shrubs to provide a green screen and trees.**

2. On-site screening from view from adjoining properties of such things as service areas, storage areas, and parking lots shall be provided and the following factors will be considered in determining the adequacy of the type and extent of the screening:

- a. What needs to be screened?
- b. The direction from which it is needed.
- c. How dense the screen needs to be.
- d. Whether the viewer is stationary or mobile.
- e. Whether the screening needs to be year-round.

3. Rooftop air cooling and heating systems and other mechanical equipment shall be screened from view from adjoining properties.

**Applicant Response: The proposed refuse enclosure is located in a central, unobtrusive area of the site and located as far from the neighboring residences as possible. The refuse enclosure area will include landscaping for additional screening and a solid wall which will match in material and color to primary structure.**

D. Privacy and noise.

1. Structures which include residential dwelling units shall provide private outdoor areas for each ground floor unit which is screened from view from adjoining units.

2. Residential dwelling units shall be placed on the site in areas having minimal noise exposure to the extent possible. Natural-appearing sound barriers shall be used to lessen noise impacts where noise levels exceed the noise standards contained in West Linn Municipal Code Section 5.487.

**Applicant Response: The proposed development does not include residential units.**

3. Structures or on-site activity areas which generate noise, lights, or glare shall be buffered from adjoining residential uses in accordance with the standards in subsection C of this section where applicable.

**Applicant Response: The proposed uses, a dental and physical therapy clinic, are not expected to generate, noise, light, or glare that would impact adjoining residential uses.**

4. Businesses or activities that can reasonably be expected to generate noise in excess of the noise standards contained in West Linn Municipal Code Section 5.487 shall undertake and submit appropriate noise studies and mitigate as necessary to comply with the code. (See CDC 55.110(B)(11) and 55.120(M).)

If the decision-making authority reasonably believes a proposed use may generate noise exceeding the standards specified in the municipal code, then the authority may require the applicant to supply professional

noise studies from time to time during the user's first year of operation to monitor compliance with City standards and permit requirements.

**Applicant Response: The proposed uses, a dental and physical therapy clinic, are not expected to generate noise in excess of the noise standards of the West Linn Municipal Code.**

E. Private outdoor area. This section only applies to multi-family projects.

1. In addition to the requirements of residential living, unit shall have an outdoor private area (patio, terrace, porch) of not less than 48 square feet in area;
2. The outdoor space shall be oriented towards the sun where possible; and
3. The area shall be screened or designed to provide privacy for the users of the space.
4. Where balconies are added to units, the balconies shall not be less than 48 square feet, if they are intended to be counted as private outdoor areas.

**Applicant Response: The proposed development does not include residential uses.**

F. Shared outdoor recreation areas. This section only applies to multi-family projects and projects with 10 or more duplexes or single-family attached dwellings on lots under 4,000 square feet. In those cases, shared outdoor recreation areas are calculated on the duplexes or single-family attached dwellings only. It also applies to qualifying PUDs under the provisions of CDC 24.170.

1. In addition to the requirements of subsection E of this section, usable outdoor recreation space shall be provided in residential developments for the shared or common use of all the residents in the following amounts:
  - a. Studio up to and including two-bedroom units: 200 square feet per unit.
  - b. Three or more bedroom units: 300 square feet per unit.
2. The required recreation space may be provided as follows:
  - a. It may be all outdoor space; or
  - b. It may be part outdoor space and part indoor space; for example, an outdoor tennis court and indoor recreation room; and
  - c. Where some or all of the required recreation area is indoor, such as an indoor recreation room, then these indoor areas must be readily accessible to all residents of the development subject to clearly posted restrictions as to hours of operation and such regulations necessary for the safety of minors.
  - d. In considering the requirements of this subsection F, the emphasis shall be on usable recreation space. No single area of outdoor recreational space shall encompass an area of less than 250 square feet. All common outdoor recreational space shall be clearly delineated and readily identifiable as such. Small, marginal, and incidental lots or parcels of land are not usable recreation spaces. The location of outdoor recreation space

should be integral to the overall design concept of the site and be free of hazards or constraints that would interfere with active recreation.

3. The shared space shall be readily observable to facilitate crime prevention and safety.

**Applicant Response: The proposed development does not include residential uses.**

G. Demarcation of public, semi-public, and private spaces. The structures and site improvements shall be designed so that public areas such as streets or public gathering places, semi-public areas, and private outdoor areas are clearly defined in order to establish persons having a right to be in the space, to provide for crime prevention, and to establish maintenance responsibility. These areas may be defined by:

1. A deck, patio, fence, low wall, hedge, or draping vine;
2. A trellis or arbor;
3. A change in level;
4. A change in the texture of the path material;
5. Sign; or
6. Landscaping.

Use of gates to demarcate the boundary between a public street and a private access driveway is prohibited.

**Applicant Response: The proposed development does not include any on-site public or semi-public outdoor space.**

H. Public transit.

1. Provisions for public transit may be required where the site abuts an existing or planned public transit route. The required facilities shall be based on the following:

- a. The location of other transit facilities in the area.
- b. The size and type of the proposed development.
- c. The rough proportionality between the impacts from the development and the required facility.

2. The required facilities shall be limited to such facilities as the following:

- a. A waiting shelter with a bench surrounded by a three-sided covered structure, with transparency to allow easy surveillance of approaching buses.
- b. A turnout area for loading and unloading designed per regional transit agency standards.
- c. Hard-surface paths connecting the development to the waiting and boarding areas.



- d. Regional transit agency standards shall, however, prevail if they supersede these standards.
3. The transit stop shall be located as close as possible to the main entrance to the shopping center, public or office building, or multi-family project. The entrance shall not be more than 200 feet from the transit stop with a clearly identified pedestrian link.
4. All commercial business centers (over three acres) and multi-family projects (over 40 units) may be required to provide for the relocation of transit stops to the front of the site if the existing stop is within 200 to 400 yards of the site and the exaction is roughly proportional to the impact of the development. The commercial or multi-family project may be required to provide new facilities in those cases where the nearest stop is over 400 yards away. The transit stop shall be built per subsection (H)(2) of this section.

**Applicant Response: To the best of our knowledge, the proposed development site is not along an existing or planned transit route.**

- I. Public facilities. An application may only be approved if adequate public facilities will be available to provide service to the property prior to occupancy.
  1. Streets. Sufficient right-of-way and slope easement shall be dedicated to accommodate all abutting streets to be improved to the City's Improvement Standards and Specifications. The City Engineer shall determine the appropriate level of street and traffic control improvements to be required, including any off-site street and traffic control improvements, based upon the transportation analysis submitted. The City Engineer's determination of developer obligation, the extent of road improvement and City's share, if any, of improvements and the timing of improvements shall be made based upon the City's systems development charge ordinance and capital improvement program, and the rough proportionality between the impact of the development and the street improvements.

In determining the appropriate sizing of the street in commercial, office, multi-family, and public settings, the street should be the minimum necessary to accommodate anticipated traffic load and needs and should provide substantial accommodations for pedestrians and bicyclists. Road and driveway alignment should consider and mitigate impacts on adjacent properties and in neighborhoods in terms of increased traffic loads, noise, vibrations, and glare.

The realignment or redesign of roads shall consider how the proposal meets accepted engineering standards, enhances public safety, and favorably relates to adjacent lands and land uses. Consideration should also be given to selecting an alignment or design that minimizes or avoids hazard areas and loss of significant natural features (drainageways, wetlands, heavily forested areas, etc.) unless site mitigation can clearly produce a superior landscape in terms of shape, grades, and reforestation, and is fully consistent with applicable code restrictions regarding resource areas.

Streets shall be installed per Chapter 85 CDC standards. The City Engineer has the authority to require that street widths match adjacent street widths. Sidewalks shall be installed per CDC 85.200(A)(3) for commercial and office projects, and CDC 85.200(A)(16) and 92.010(H) for residential projects, and applicable provisions of this chapter. Where streets bisect or traverse water resource areas (WRAs) the street width shall be reduced to the appropriate "constrained" cross-section width indicated in the TSP or alternate configurations which are appropriate to site conditions, minimize WRA disturbance or are consistent with an adopted transportation system plan. The street design shall also be consistent with habitat friendly provisions of CDC 32.060(I).

Based upon the City Manager's or Manager's designee's determination, 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 55.125 that are required to mitigate impacts from the proposed development. Proportionate share of the costs shall be determined by the City Manager or Manager's designee, who shall assume that the proposed development provides improvements in rough proportion to identified impacts of the development.

**Applicant Response: The proposed development will include street improvements along Hood Street and Burns Street to include street-widening, sidewalks, ADA accessible ramps, crosswalks, and street signage to meet the ultimate ROW widths and improve vehicle and pedestrian safety.**

2. Storm detention and treatment and geologic hazards. Per the submittals required by CDC 55.130 and 92.010(E), all proposed storm detention and treatment facilities must 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 the applicant must provide sufficient factual data to support the conclusions of the submitted plan.

Per the submittals required by CDC 55.130(E), the applicant must demonstrate that the proposed methods of rendering known or potential hazard sites safe for development, including proposed geotechnical remediation, are feasible and adequate to prevent landslides or other damage to property and safety. The review authority may impose conditions, including limits on type or intensity of land use, which it determines are necessary to mitigate known risks of landslides or property damage.

**Applicant Response: A stormwater report and geotechnical report are submitted with this application that provides insight to the characteristics of the proposed development site**

3. Municipal water. A registered civil engineer shall prepare a plan for the provision of water which demonstrates to the City Engineer's satisfaction the availability of sufficient volume, capacity, and pressure to serve the proposed development's domestic, commercial, and industrial fire flows. All plans will then be reviewed by the City Engineer.

**Applicant Response: See attached Civil plans detailing the water service requested.**

4. Sanitary sewers. A registered civil engineer shall prepare a sewerage collection system plan which demonstrates sufficient on-site capacity to serve the proposed development. The City Engineer shall determine whether the existing City system has sufficient capacity to serve the development.

**Applicant Response: See attached Civil plans detailing the sanitary sewer service requested.**

5. Solid waste and recycling storage areas. Appropriately sized and located solid waste and recycling storage areas shall be provided. Metro standards shall be used.

**Applicant Response: The proposed refuse/recycling area has been developed to meet Metro standards.**

J. Crime prevention and safety/defensible space.

1. Windows shall be located so that areas vulnerable to crime can be surveyed by the occupants.



**Applicant Response: Windows are provided on all facades to allow all surrounding area to be surveyed by occupants.**

2. Interior laundry and service areas shall be located in a way that they can be observed by others.

**Applicant Response: No laundry or service areas are proposed under this building shell permit.**

3. Mailboxes, recycling, and solid waste facilities shall be located in lighted areas having vehicular or pedestrian traffic.

**Applicant Response: The waste enclosure will be located within the lighted parking area and will have both vehicle and pedestrian traffic nearby.**

4. The exterior lighting levels shall be selected and the angles shall be oriented towards areas vulnerable to crime.

**Applicant Response: A photometric plan has been prepared and provided showing sufficient lighting in all areas on the site.**

5. Light fixtures shall be provided in areas having heavy pedestrian or vehicular traffic and in potentially dangerous areas such as parking lots, stairs, ramps, and abrupt grade changes.

**Applicant Response: A photometric plan has been prepared and provided showing sufficient lighting in all areas on the site.**

6. Fixtures shall be placed at a height so that light patterns overlap at a height of seven feet which is sufficient to illuminate a person. All commercial, industrial, residential, and public facility projects undergoing design review shall use low or high pressure sodium bulbs and be able to demonstrate effective shielding so that the light is directed downwards rather than omni-directional. Omni-directional lights of an ornamental nature may be used in general commercial districts only.

**Applicant Response: Site lighting has been designed by a registered engineer. See sheet E1.1, E1.2, and the attached electrical lighting cut sheets.**

6. Lines of sight shall be reasonably established so that the development site is visible to police and residents.

**Applicant Response: The proposed structure and parking areas are located at visible areas from the intersection of Burns Street and Hood Street, providing excellent sight lines for police and residents.**

8. Security fences for utilities (e.g., power transformers, pump stations, pipeline control equipment, etc.) or wireless communication facilities may be up to eight feet tall in order to protect public safety. No variances are required regardless of location.

**Applicant Response: The proposed structure and parking areas are located at visible areas from the intersection of Burns Street and Hood Street, providing excellent sight lines for police and residents.**

K. Provisions for persons with disabilities.

1. The needs of a person with a disability shall be provided for. Accessible routes shall be provided between all buildings and accessible site facilities. The accessible route shall be the most practical direct route between

accessible building entries, accessible site facilities, and the accessible entry to the site. An accessible route shall connect to the public right-of-way and to at least one on-site or adjacent transit stop (if the area is served by transit). All facilities shall conform to, or exceed, the Americans with Disabilities Act (ADA) standards, including those included in the Uniform Building Code.

**Applicant Response: The proposed site will be developed with accessible routes between parking areas and building entrances. There are no transit stops adjacent to the subject property.**

L. Signs.

1. Based on considerations of crime prevention and the needs of emergency vehicles, a system of signs for identifying the location of each residential unit, store, or industry shall be established.

buildings shall be numbered for emergency identification

2. The signs, graphics, and letter styles shall be designed to be compatible with surrounding development, to contribute to a sense of project identity, or, when appropriate, to reflect a sense of the history of the area and the architectural style.

3. The sign graphics and letter styles shall announce, inform, and designate particular areas or uses as simply and clearly as possible.

4. The signs shall not obscure vehicle driver's sight distance.

5. Signs indicating future use shall be installed on land dedicated for public facilities (e.g., parks, water reservoir, fire halls, etc.).

6. Signs and appropriate traffic control devices and markings shall be installed or painted in the driveway and parking lot areas to identify bicycle and pedestrian routes.

**Applicant Response: The exact sign details are still under development but will adhere to the criteria above.**

M. 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, as practical. The design standards of Tables 1 and 2 above, and of subsection 5.487 of the West Linn Municipal Code relative to existing high ambient noise levels shall apply to this section.

**Applicant Response: The developer will work with the local utility providers to achieve undergrounding as needed.**

N. Wireless communication facilities (WCFs). (This section only applicable to WCFs.) WCFs as defined in Chapter 57 CDC may be required to go through Class I or Class II design review. The approval criteria for Class I design review is that the visual impact of the WCF shall be minimal to the extent allowed by Chapter 57 CDC. Stealth designs shall be sufficiently camouflaged so that they are not easily seen by passersby in the public right-of-way or from any adjoining residential unit. WCFs that are classified as Class II design review must respond to all of the approval criteria of this chapter.

**Applicant Response: The proposed project does not include any plans to develop a Wireless Communication Facility.**

O. Refuse and recycling standards.

1. All commercial, industrial and multi-family developments over five units requiring Class II design review shall comply with the standards set forth in these provisions. Modifications to these provisions may be permitted if the Planning Commission determines that the changes are consistent with the purpose of these provisions and the City receives written evidence from the local franchised solid waste and recycling firm that they are in agreement with the proposed modifications.

**Applicant Response: We have been in contact with West Linn Refuse & Recycling & they have reviewed the proposed location of the refuse enclosure and take no issue with the current proposed location.**

2. Compactors, containers, and drop boxes shall be located on a level Portland cement concrete pad, a minimum of four inches thick, at ground elevation or other location compatible with the local franchise collection firm's equipment at the time of construction. The pad shall be designed to discharge surface water runoff to avoid ponding.

**Applicant Response: The pad for the refuse enclosure will be designed by a Civil engineer in accordance with the above requirements. The location has been reviewed by West Linn Refuse & Recycling.**

3. Recycling and solid waste service areas.

a. Recycling receptacles shall be designed and located to serve the collection requirements for the specific type of material.

**Applicant Response: No use is proposed that may produce waste that cannot be managed by the standard services of West Linn Refuse & Recycling. Receptacles are designed and located appropriately.**

b. The recycling area shall be located in close proximity to the garbage container areas and be accessible to the local franchised collection firm's equipment.

**Applicant Response: Recycling and Garbage containers will be located in the same enclosure.**

c. Recycling receptacles or shelters located outside a structure shall have lids and be covered by a roof constructed of water and insect-resistive material. The maintenance of enclosures, receptacles and shelters is the responsibility of the property owner.

**Applicant Response: Lidded waste & recycling receptacles will be acquired through West Linn Refuse and Recycling and will be contained within a roofed enclosure onsite.**

d. The location of the recycling area and method of storage shall be approved by the local fire marshal.

**Applicant Response: Location and method of storage are fairly standard and we foresee no unusually hazardous materials will be included in the waste stream. The fire Marshal will review our location and storage method prior to construction.**

e. Recycling and solid waste service areas shall be at ground level and/or otherwise accessible to the franchised solid waste and recycling collection firm.

**Applicant Response: The enclosure will be located at the level of the service accessway.**

f. Recycling and solid waste service areas shall be used only for purposes of storing solid waste and recyclable materials and shall not be a general storage area to store personal belongings of tenants, lessees, property management or owners of the development or premises.

**Applicant Response: No additional storage will be located within the solid waste enclosure.**

g. Recyclable material service areas shall be maintained in a clean and safe condition.

**Applicant Response: The landowner will be responsible for maintenance and sanitation of the solid waste enclosure area.**

4. Special wastes or recyclable materials.

a. Environmentally hazardous wastes defined in ORS 466.005 shall be located, prepared, stored, maintained, collected, transported, and disposed in a manner acceptable to the Oregon Department of Environmental Quality.

**Applicant Response: We foresee no unusually hazardous waste materials to be included in the waste stream of this project.**

b. Containers used to store cooking oils, grease or animal renderings for recycling or disposal shall not be located in the principal recyclable materials or solid waste storage areas. These materials shall be stored in a separate storage area designed for such purpose.

**Applicant Response: No cooking oil, or grease will be produced or stored onsite based on the proposed uses for the development.**

5. Screening and buffering.

a. Enclosures shall include a curbed landscape area at least three feet in width on the sides and rear. Landscaping shall include, at a minimum, a continuous hedge maintained at a height of 36 inches.

**Applicant Response: At least 3' of landscaping & screening is provided at the sides and rear of the enclosure & are planted with a mix of fast-growing shrubs to provide a green-screen.**

b. Placement of enclosures adjacent to residentially zoned property and along street frontages is strongly discouraged. They shall be located so as to conceal them from public view to the maximum extent possible.

**Applicant Response: The solid waste enclosure is located to both reduce its visibility (height relative to grade), and keep it as far as practicable from all adjacent structures. It is buffered by both a 6' high brick-clad enclosure wall and landscaping. Landscape buffering between neighboring residential properties to the north and the proposed development is achieved by a mix of fast-growing shrubs to provide a green screen**

c. All dumpsters and other trash containers shall be completely screened on all four sides with an enclosure that is comprised of a durable material such as masonry with a finish that is architecturally compatible with the project. Chain link fencing, with or without slats, will not be allowed.

**Applicant Response: A 6' high brick-clad enclosure with a roof is provided around waste receptacles.**

6. Litter receptacles.

a. Location. Litter receptacles may not encroach upon the minimum required walkway widths.

**Applicant Response: No litter receptacles will encroach in the walkway.**

b. Litter receptacles may not be located within public rights-of-way except as permitted through an agreement with the City in a manner acceptable to the City Attorney or his/her designee.

**Applicant Response: No litter receptacles will be located in the R.O.W.**

c. Number. The number and location of proposed litter receptacles shall be based on the type and size of the proposed uses. However, at a minimum, for non-residential uses, at least one external litter receptacle shall be provided for every 25 parking spaces for first 100 spaces, plus one receptacle for every additional 100 spaces. (Ord. 1547, 2007; Ord. 1604 § 52, 2011; Ord. 1613 § 12, 2013; amended during July 2014 supplement; Ord. 1623 § 6, 2014; Ord. 1635 § 26, 2014; Ord. 1636 § 37, 2014; Ord. 1647 § 6, 2016; Ord. 1650 § 1 (Exh. A), 2016; Ord. 1662 § 8, 2017; Ord. 1675 § 45, 2018)

**Applicant Response: Two litter receptacles will be provided, one near the primary site entrance, and one near the site stairs.**

## **CHAPTER 92 – REQUIRED IMPROVEMENTS.**

### **92.010 PUBLIC IMPROVEMENTS FOR ALL DEVELOPMENT**

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

A. Streets within subdivisions.

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

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

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

**Applicant Response: The subject property is not located in or proposing to develop a subdivision. The above criteria do not apply to this application.**

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.

**Applicant Response: Based on preliminary discussions with Engineering Staff, we do not anticipate any vacations, trails, bicycle paths, or other appropriate public ways as part of the proposed development.**

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

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

**Applicant Response: The proposed development does not include plans for the development of a subdivision. No lot configuration changes are proposed, aside from required right-of-way dedications.**

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.

**Applicant Response: The owner/developer will ensure the criterion above is met during road construction.**

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.

**Applicant Response: A detailed stormwater plan prepared by a registered civil engineer will be developed and submitted for review as part of development approvals.**

#### 99.038 NEIGHBORHOOD CONTACT REQUIRED FOR CERTAIN APPLICATIONS

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

**Applicant Response: A presentation was conducted at the October 15, 2019 Bolton Neighborhood Association regular meeting. Sam Thomas and Roland Boschmann provided an overview of the project along with drawing exhibits to showcase the proposed site plan and building design features.**

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

**Applicant Response: The primary concerns brought up at the meeting included the preference for use of native vegetation, increases in traffic and parking on Burns Street, retaining wall design, and screening for neighbors along the northern property line. The site plan and building design has been revised to be a single-story building. A number of native plants have been selected for planting per the landscape plan. Retaining walls will be minimized to the extent possible. Vegetative screening has been proposed along the northern property line to reduce the visual impact of the proposed development.**

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

**Applicant Response: A copy of the letter sent to the Bolton Neighborhood Association and neighbors within 500 feet of the site has been provided herein.**

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

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

**Applicant Response: A letter was sent to the President and Vice President of the Bolton Neighborhood Association. A presentation was conducted during the October 15, 2019 Bolton Neighborhood Association regular meeting.**

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

**Applicant Response: Two site notice signs were placed facing Hood and Burns Street on the property announcing the time, date, and location of the neighborhood meeting.**

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

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

**Applicant Response: A copy of the certified letter return receipt has been included in the application.**

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



**Applicant Response: A copy of the letter has been submitted with the application**

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

**Applicant Response: A copy of the required posted notice and affidavit of posting has been submitted with the application**

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

**Applicant Response: A summary of meeting comments have been submitted with the application.**

5. An audiotape of the meeting; and

**Applicant Response: An audio recording was captured and submitted on the USB flash drive submitted with the application.**

6. In the event that it is discovered by staff that the aforementioned procedures of this section were not followed, or that a review of the audio tape and meeting minutes show the applicant has made a material misrepresentation of the project at the neighborhood meeting, the application shall be deemed incomplete until the applicant demonstrates compliance with this section. (Ord. 1425, 1998; Ord. 1474, 2001; Ord. 1568, 2008; Ord. 1590 § 1, 2009; Ord. 1613 § 23, 2013; Ord. 1635 § 37, 2014)

**Applicant Response: The applicant has satisfied the mailing, sign notice, meeting minutes, and audio recording as listed above.**

Conclusion:

The proposed development is in conformance with West Linn Municipal Code as evidenced by the responses above.

If you have any questions, please contact me at (503) 399-1090 or [samt@lenityarchitecture.com](mailto:samt@lenityarchitecture.com)

Sincerely,



Samuel A. Thomas  
Senior Land Use Specialist



April 10, 2020

Mr. Josh Wells  
Westech Engineering, Inc.  
3841 Fairview Industrial Drive SE, Suite 100  
Salem, Oregon 97302

Dear Mr. Wells:

**Re: Supplemental Geotechnical Consultation Services, Proposed Bolton Terrace Advance Dental Arts Project, 1575 Burns Street, West Linn (Clackamas County), Oregon**

In accordance with your request, we are providing you with the following professional opinion with regard to storm water disposal at the above subject project site. As you are aware, we previously performed Geotechnical Consultation and Field Infiltration Testing Services at the site the results of which were presented in our formal report dated April 21, 2017.

Specifically, we understand that present plans are to develop the site by constructing a new commercial (Advance Dental Arts) building at the site. Based on a review of the proposed site development plan(s), we understand that the proposed new commercial building will be constructed across the upper southwesterly portion of the site. Additionally, we understand that the lower easterly portion of the site will consist of a paved parking lot. Further, we understand that the lower easterly paved parking lot will be bounded to the east by a 2H:1V cut and/or fill slope and to the west by a retaining wall. In addition to the above, we understand that storm from hard and/or impervious surfaces (i.e., roofs and pavements) is to be collected through a series of roof rain drains and parking area catch basins for possible on-site treatment and disposal.

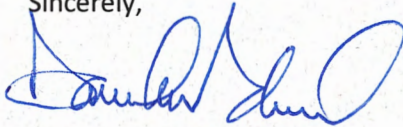
Based on the above as well as our review of a Site Stormwater and Downstream Analysis Report prepared by Westech Engineering, Inc. dated January, 2020, it is our professional opinion that the subject property is unsuitable for disposal of storm water and/or the use of a vegetated stormwater facility.

This opinion is supported by 1) the relatively low and/or poor infiltration rates measured at the site during our previous field infiltration testing and 2) the findings presented in the above subject Site Stormwater and Downstream Analysis Report. Additionally, we are of the opinion that on-site disposal of storm water may result in de-stabilization of the proposed easterly 2H:1V cut and/or fill slope and/or impacts to the proposed site retaining wall(s).

As such, it is our opinion that all storm water collected from the hard surfaces (i.e., roofs and pavements) be disposed of off-site to a suitable outfall such as the existing Cascade Springs Pond Creek drainage basin located to the southeast of the subject property.

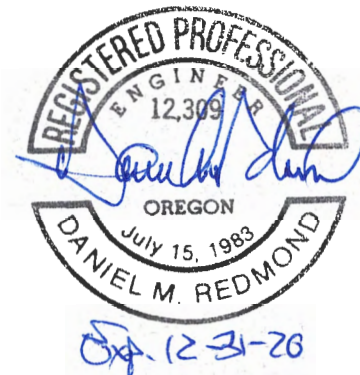
We appreciate this opportunity to be of service to you at this time and trust that the above information is suitable to your present needs. Should you have any questions regarding the above or if you require any additional information and/or assistance, please do not hesitate to call.

Sincerely,



Daniel M. Redmond, P.E., G.E.  
President/Principal Engineer

Cc: Mr. Lee Gwyn  
Lenity Architecture



# SITE STORMWATER AND DOWNSTREAM ANALYSIS REPORT

**Prepared For:**

Lenity Architecture  
3150 Kettle Ct SE  
Salem, OR 97301

**Project Location:**

Bolton Terrace  
1575 Burns Street  
West Linn, OR 97068

**Permit Number:** CO -

**Prepared By:**



Westtech Engineering, Inc.  
3841 Fairview Industrial Drive SE, Suite 100  
Salem, OR 97302  
(503) 585-2474 FAX: (503) 585-3986

# TABLE OF CONTENTS

---

<b>Chapter</b>	<b>Page</b>
<b>1 Project Overview &amp; Description .....</b>	<b>1-1</b>
1.1 Size & Location of Project .....	1-1
1.2 Brief description of project scope and proposed improvements.....	1-1
1.3 Description of Size of Watershed Draining to the Site.....	1-1
1.4 Description of the Existing Site Conditions, Trees & Native Vegetation, Constraints, Sensitive Areas & Waterways .....	1-1
1.5 Regulatory Permits Required.....	1-1
1.6 Emergency Storm Escape Routes.....	1-1
<b>2 Methodology .....</b>	<b>2-1</b>
2.1 Depth to Groundwater .....	2-1
2.2 Maximum Infiltration and Vegetative Treatment.....	2-1
2.3 Soil Information.....	2-1
2.4 Hazardous Material.....	2-1
<b>3 Analysis.....</b>	<b>3-1</b>
3.1 Methods & Software Used.....	3-1
3.2 Curve Number and Time of Concentration Calculations .....	3-1
3.3 Review of Resources & Drainage Basin .....	3-1
3.4 Inspection of Affected Area.....	3-1
3.5 Treatment & Water Quality .....	3-2
3.6 Conveyance System & Analysis of Downstream Effects.....	3-3
3.7 Summary.....	3-4

## LIST OF TABLES

---

<b>Table</b>	<b>Page</b>
Table 1   City of West Linn 24-hour Design Storms .....	3-1
Table 2   Summary of Site Peak Flows.....	3-2
Table 3   Summary of Stormwater Flow-Through Planter Sizing .....	3-2
Table 4   Summary of Facility Release Rate and Peak Water Surface Elevations.....	3-3
Table 5   Surface Filtration Test Summary – WQ Storm.....	3-3
Table 6   City of Gresham Conveyance Design Storm Sizing Criteria.....	3-3
Table 7   Summary of Cascade Springs Pond Creek During 50-year Storm .....	3-4

## APPENDICES

---

Appendix A	Basin Maps & Resources
Appendix B	NRCS Soil Report
Appendix C	HydroCAD Summaries
Appendix D	Geotechnical Report
Appendix E	Field Visit Explorations
Appendix F	Water Quality Treatment

## 1.1 SIZE & LOCATION OF PROJECT

The proposed project is located on a primarily undeveloped 27,210 square feet lot at 1575 Burns Street in West Linn, Oregon. There is currently a 1,000 square foot house on the lot that will be removed prior to construction. Refer to the Civil Drawings for more detail.

## 1.2 BRIEF DESCRIPTION OF PROJECT SCOPE AND PROPOSED IMPROVEMENTS

The project scope is to develop the full 27,210 square foot lot. The new development will include two one new commercial building and associated parking and landscaping.

## 1.3 DESCRIPTION OF SIZE OF WATERSHED DRAINING TO THE SITE

The 27,210 square foot developed site will drain to an existing 12-inch stormwater pipe located in the southeast corner of the lot. This stormwater pipe then drains into the north fork of Cascade Springs Pond Creek. No other areas drain to the developed site.

## 1.4 DESCRIPTION OF THE EXISTING SITE CONDITIONS, TREES & NATIVE VEGETATION, CONSTRAINTS, SENSITIVE AREAS & WATERWAYS

The existing site is currently undeveloped with a 1,000 square feet single family home on the lot. There are multiple trees on the site and the ground is covered with grass. The westerly portion of the lot is relatively flat, while the eastern portion is moderately sloped descending to the east. Numerous small to large sized trees exist on site.

## 1.5 REGULATORY PERMITS REQUIRED

City of West Linn permits are required. No other permits are required for this project.

## 1.6 EMERGENCY STORM ESCAPE ROUTES

Please refer to the Developed Basin Map in Appendix A for emergency overflow routes.

## 2.1 DEPTH TO GROUNDWATER

Per the Geotechnical Report in Appendix D, groundwater seepage was not encountered and is not expected during construction. See the Geotech Report in Appendix D for details.

## 2.2 MAXIMUM INFILTRATION AND VEGETATIVE TREATMENT

The proposed stormwater design will not provide detention for onsite runoff due to topography constraints. Detention is not required because Cascade Springs Pond Creek has adequate downstream capacity. During the field visit conducted on April 14, 2020, it was determined that Cascade Springs Pond Creek will not see adverse effects due to the increase in stormwater runoff, created by the site, draining into the creek. See Appendix E for details on the field explorations. A Contech stormfilter will be designed to treat the water quality storm event because the site is extremely steep and infiltration is not feasible. See the Civil Drawings for more details.

## 2.3 SOIL INFORMATION

The pre-developed project site contains hydrologic soil group C soils. Refer to the Soils Report in Appendix B for more details.

## 2.4 HAZARDOUS MATERIAL

The owner is not aware of any hazardous material contamination onsite.



## 3.1 METHODS & SOFTWARE USED

HydroCAD modeling software was used to size the stormwater facilities. The Santa Barbara Unit Hydrograph Type 1A storm was used to model the required design storms. Per the City of West Linn Design Standards the design storms used were the 1.2 inch, 24-hour (water quality storm), half the 2-year, 24-hour and the 10-year, 24-hour storm events.

**Table 1 | City of West Linn 24-hour Design Storms**

	24-Hour Rainfall Depths for West Linn, OR							
Recurrence Interval, Years	2	5	10	25	50	100	500	WQ
24-Hour Depths, Inches	2.5	3.0	3.4	3.9	4.3	4.5	5.3	1.2

*Source: City of West Linn Stormwater Management Plan*

## 3.2 CURVE NUMBER AND TIME OF CONCENTRATION CALCULATIONS

Curve numbers were derived from the NRCS runoff curve numbers contained in TR-55 *Urban Hydrology for Small Watersheds* per the City of Gresham Standards. The developed impervious area and pervious areas were assigned curve numbers of 98 and 74 respectively. The impervious areas were assigned a curve number of 98 which corresponds to paved/parking areas. The pervious areas were assigned a curve number of 74 which corresponds to amended soil coverage with C-rated soils.

Time of concentration (Tc) for the pre-developed conditions was calculated to be 17.3 minutes using the sheet flow equation. See the Pre-Developed Basin Map in Appendix A for the flow path used and refer to the HydroCAD Summaries in Appendix C for calculations. A minimum time of concentration of 5 minutes is applied to the developed basin due to the minimum time-step used by the HydroCAD modeling software.

## 3.3 REVIEW OF RESOURCES & DRAINAGE BASIN

The entire 27,210 square foot lot will drain into Cascade Springs Pond Creek. There are five sub-basins within the Cascade Springs basin. The project site is located within the CS2N1 sub-basin per the West Linn Stormwater Management Plan. For more detail and resources refer to Appendix A.

## 3.4 INSPECTION OF AFFECTED AREA

No problem areas or areas of concern were notable during the review of resources. Additionally, there were no existing or potential areas where flooding, capacity problems, channel destruction, or significant destruction of aquatic habitat identified in the inspection.

### 3.5 TREATMENT & WATER QUALITY

The site was analyzed as one (1) basin for the predeveloped and developed stormwater calculations. General basin characteristics of both pre-developed and developed conditions are listed in Table 2. For more detail refer to the Basin Maps in Appendix A and the Civil Drawings.

**Table 2 | Summary of Site Peak Flows**

Basin ID	Source (Roof/Road/ Other)	Impervious Area (sq ft)	Pervious Area (sq ft)	Design Storms			CN	Tc
				WQ (cfs)	10 Year (cfs)	100 Year (cfs)		
PD	Native	-	27,570	-	0.17	0.30	74	17.3
DEV	Paved/ Landscape	19,920	7,650	0.12	0.40	0.56	98/79 <sup>2</sup>	5.0

<sup>1</sup> PD = pre-developed site conditions (i.e., pre-developed release rates)

<sup>2</sup> The first curve number listed is for the impervious area in the basin (98), then for the pervious area (80)

Table 2 above depicts the runoff experience from developed site compared to that of the predeveloped site. The design storms analyzed were provided in the West Linn Stormwater Management Plan and consisted of the water quality, 10-year, and 100-year, 24-hour storm events.

A stormwater filtration planter is proposed to treat the water quality storm event and provide adequate capacity for the 100-year storm for the Developed Basin. Approximately 5,880 square feet of pervious area will not drain to the proposed filtration planter due to slope constraints. All the new impervious surfaces will drain to and be treated by the proposed filtration planter. Refer to Table 3 below for a summary of the filtration planter sizing.

**Table 3 | Summary of Stormwater Flow-Through Planter Sizing**

Facility ID <sup>1</sup>	Facility Elevations <sup>2</sup> (ft)		Facility Surface Area <sup>2</sup> (sf)		Required Drain Rock Surface Area (sf)	Depth of Drain Rock (in)
	Top	Bottom	Top	Bottom		
Planter	103.0	100.5	280	280	280	12

<sup>1</sup> The facility is a privately owned and maintained filtration planter.

<sup>2</sup> Top elevation is the top of the facility wall. Bottom elevation is the surface of the growing media.

The proposed Flow-Through Planter is designed to provide treatment for the water quality storm event and have capacity for the 100-year storm. Refer to Table 4 below for a summary of the release rates and water surface elevations within the planter during the water quality and 100-year storm events.

**Table 4 | Summary of Facility Release Rate and Peak Water Surface Elevations**

Facility ID	Infiltration Rate (in/hr)	WQ Storm		100-Year Storm	
		Release (cfs)	WSE <sup>1</sup> (ft)	Release (cfs)	WSE <sup>1</sup> (ft)
Planter	0.20	0.11	97.50	0.50	97.51

<sup>1</sup> WSE = Water Surface Elevation. See "Surface Test" printouts in Appendix C.

The HydroCAD modeled release rates and water surface elevations (WSE) shown in Table 4 assume free-flow through the filtration planter growing media. Release from the Flow-Through Planter can also be controlled by the filtration capacity of the growing media. To verify the entire WQ storm event is filtered through the growing media for treatment, the planter hydraulics were also modeled at the facility surface with an assumed filtration rate of 4 in/hr. The surface test was calculated using Darcy's Law of hydraulic conductivity with the groundwater elevation set 1.5 feet below the surface to represent the 1.5 feet (18 inches) of growing media thickness per COG Design Standards. See the HydroCAD analysis in Appendix F for surface test calculations.

**Table 5 | Surface Filtration Test Summary – WQ Storm**

Facility ID <sup>1</sup>	Facility Bottom Elevation (ft)	Max. Treatment Elevation <sup>2</sup>	WSE (ft)
Planter	100.50	101.50	100.68

<sup>1</sup> The facility is a privately owned and maintained rain garden

<sup>2</sup> Elevation at which water overtops the overflow orifice within the planter and is directed to flow control structure

### 3.6 CONVEYANCE SYSTEM & ANALYSIS OF DOWNSTREAM EFFECTS

Per City of West Linn Design Standards, this project is exempt from detention requirements due to adequate downstream capacity of conveyance system. However, a downstream analysis was conducted per the City of Gresham Standards to determine if Cascade Springs Pond Creek will have adequate capacity. The following table provides the COG design storm sizing criteria.

**Table 6 | City of Gresham Conveyance Design Storm Sizing Criteria**

Structure or Facility	Design Storm Recurrence Interval (years)	
Storm sewers, ditches, and outfall pipes	Draining less than 250 acres	10
	Draining greater than 250 acres	50
Creek or stream Channels	Without designated floodplain	50
	With designated floodplain	100
Culverts and bridges		100

The downstream analysis was conducted using the 50-year, 24-hour design storm per COG Design Standards for a creek with drainage area less than 50 acres.

Peak flow rates for each sub-basin within the Cascade Springs basin were provided by the West Linn Stormwater Management Plan. Additionally, peak flow rates for the junction of sub-basins were also provided. The junction node CSJ2 was selected for this analysis. The peak flow of CSJ2 was combined with the added onsite runoff for the 50-year, 24-hour storm event to determine adequate downstream capacity. Based on inspection and mapping, the creek has 1,500 feet of length, 3:1 side slopes, a width varying 10-30 feet at the bottom, slope of 1.50%, a depth of 10-30 feet, and a Manning’s number of 0.03 was used, corresponding to a typical open, earth channel, that is grassed and winding. See below for water depth in channel, calculated using Manning’s Equation.

**Table 7 | Summary of Cascade Springs Pond Creek During 50-year Storm**

Basin ID	Drainage Area (acres)	50-Year (cfs)	Water Depth in Channel (ft) <sup>a</sup>
CSJ2	55.04	31.15	1.31
DEV	0.62	0.59	0.20
<b>Total</b>	<b>55.56</b>	<b>31.74</b>	<b>1.32<sup>a</sup></b>

<sup>a</sup>Totals do not sum to the addition of the individual flows. This is due to the fact that the time of concentration per basin varies. The totals are the combination of the basin hydrographs. Refer to Link: OUT in Appendix D.

The calculations in Table 7 above display the added runoff to the Cascade Springs Pond Creek that will result from the developed project. The undetained developed 50-year event runoff peak for the site is 0.59 cfs. The developed runoff only contributes to approximately 2% of the total runoff conveyed by Cascade Springs Pond Creek. The peak water surface elevation will rise approximately a tenth of an inch with the added runoff from the developed site. Therefore, the conveyance system will provide adequate capacity for developed stormwater runoff and detention facilities are not required onsite.

### 3.7 SUMMARY

The treatment system consisting of a Flow-Through Planter has been designed to treat the water quality storm, and have capacity for the 100-year storm event. Detention was not required to be provided on site because Cascade Springs Pond Creek has adequate downstream capacity. Therefore, the project can meet the flow control and treatment requirements as set forth in the City of West Linn Stormwater Management Plan and the City of Gresham Stormwater Management Manual.

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

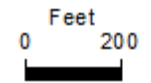
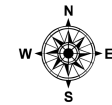
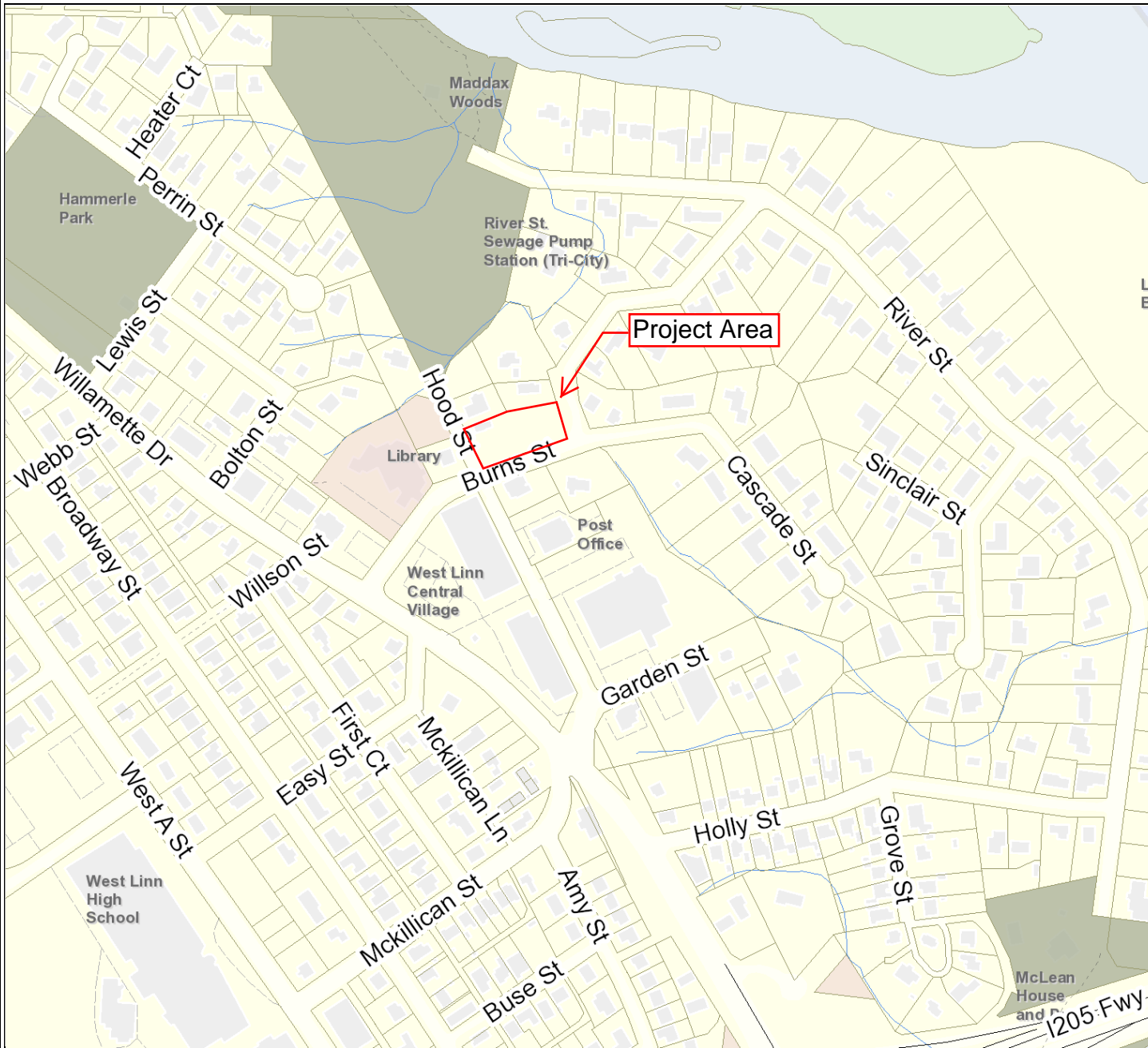
**APPENDIX A**

---

**BASIN MAPS & RESOURCES**

# BASIN & AREA MAPS

# Project Area Map



Scale 1:4,800 - 1 in = 400 ft  
Scale is based on 8-1/2 x 11 paper size



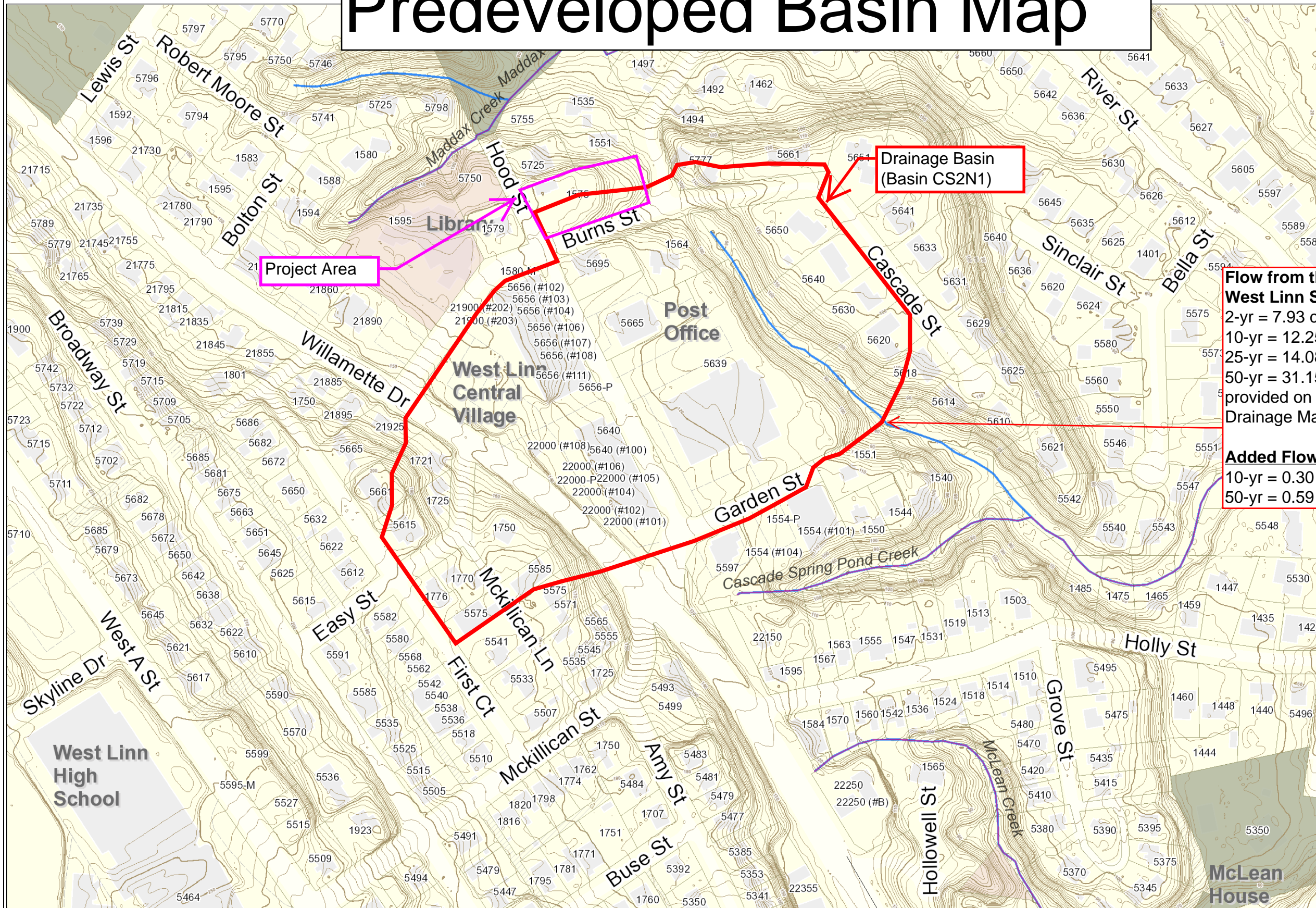
Map created by: public  
Date Created: 30-Jan-20 02:24 PM

**WEST LINN GIS**

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

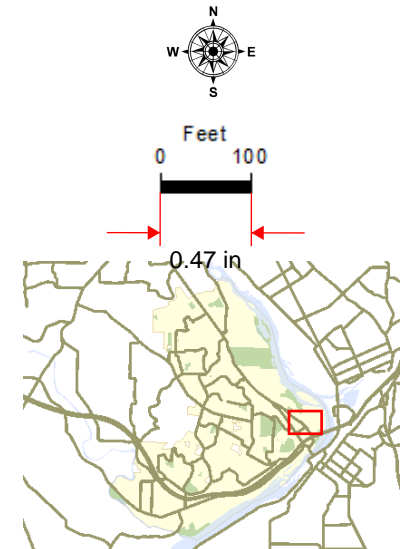


# Predeveloped Basin Map



**Flow from this node according to 2019 West Linn Storm Drainage Master Plan:**  
 2-yr = 7.93 cfs  
 10-yr = 12.25 cfs  
 25-yr = 14.08 cfs  
 50-yr = 31.15 cfs (50-yr storm value only provided on 2006 West Linn Storm Drainage Master Plan)

**Added Flow From Project:**  
 10-yr = 0.30 cfs  
 50-yr = 0.59 cfs

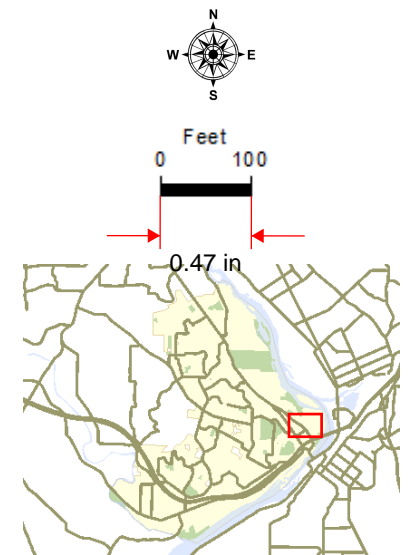


DISCLAIMER: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Map scale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

Map created by: public  
 Date Created: 29-Apr-20 02:46 PM  
**WEST LINN GIS**



# Developed Basin Map



Map created by: public  
Date Created: 29-Apr-20 02:46 PM

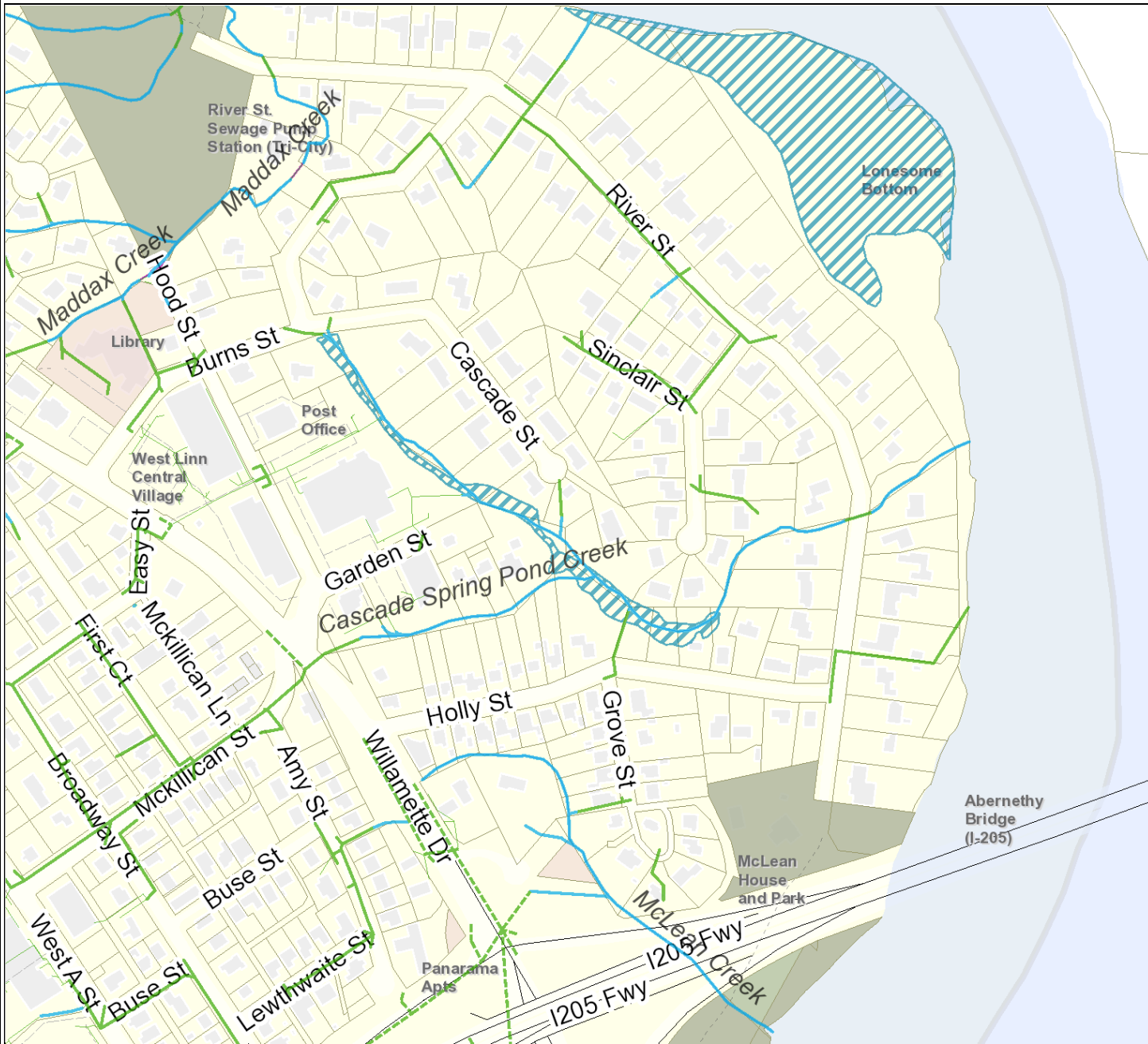
**WEST LINN GIS**

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



# WETLAND, AND HABITAT INVENTORY

# Wetland Inventory Map

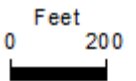
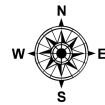


### Legend

- Storm Lines
- Storm Pipes
- - - Storm Pipes County
- - - Storm Pipes ODOT
- Ditches and Creeks
- Private Pipes

### Wetland Inventory 2005 Goal

5



Scale 1:4,800 - 1 in = 400 ft  
Scale is based on 8-1/2 x 11 paper size



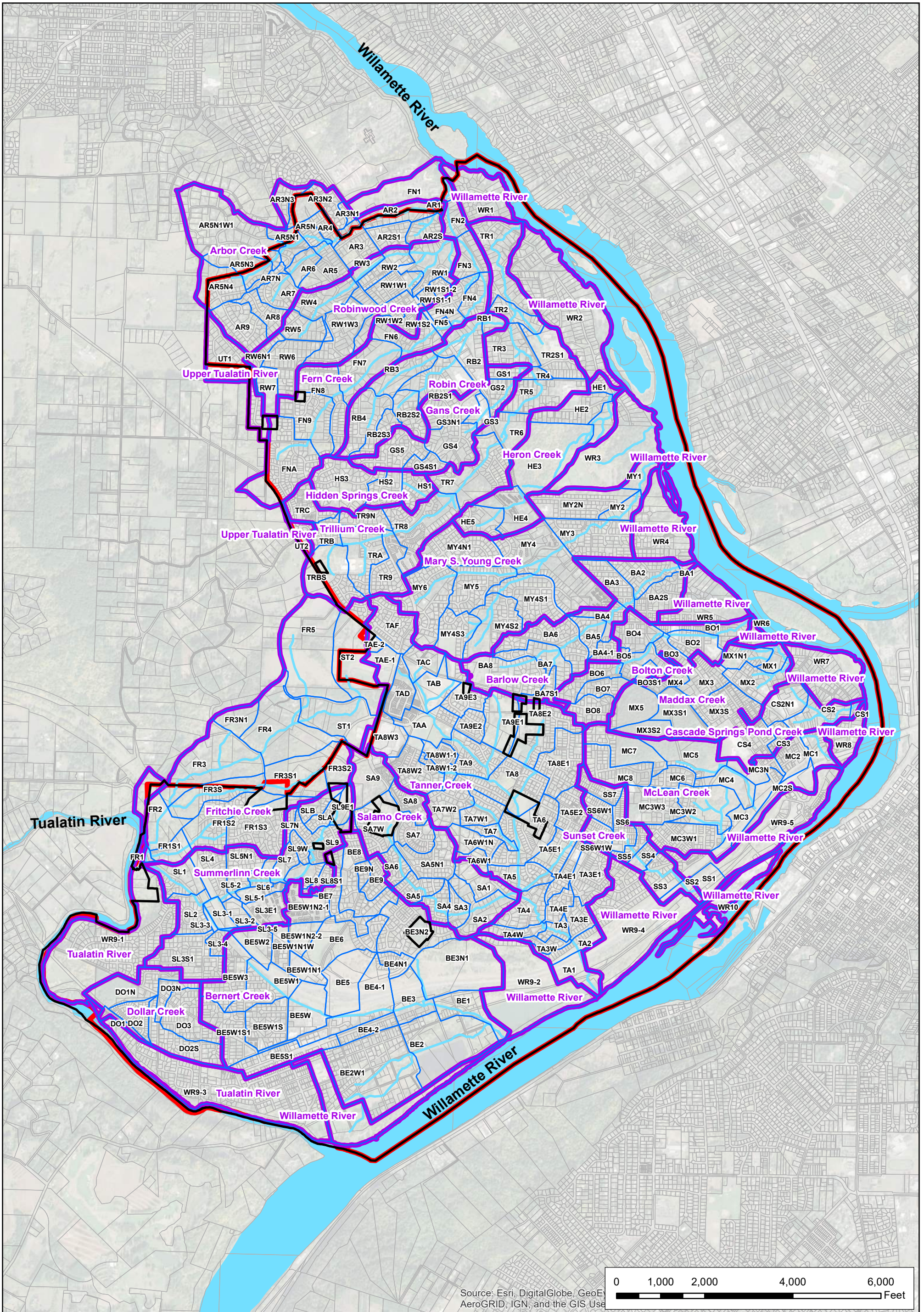
Map created by: public  
Date Created: 30-Jan-20 02:47 PM

**WEST LINN GIS**

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

# BASIN INFORMATION





1:24,000 scale



**CITY OF WEST LINN, OREGON**  
 Storm Drainage and Sanitary Master Plan 2019

Figure B-1: Stormwater Subbasins

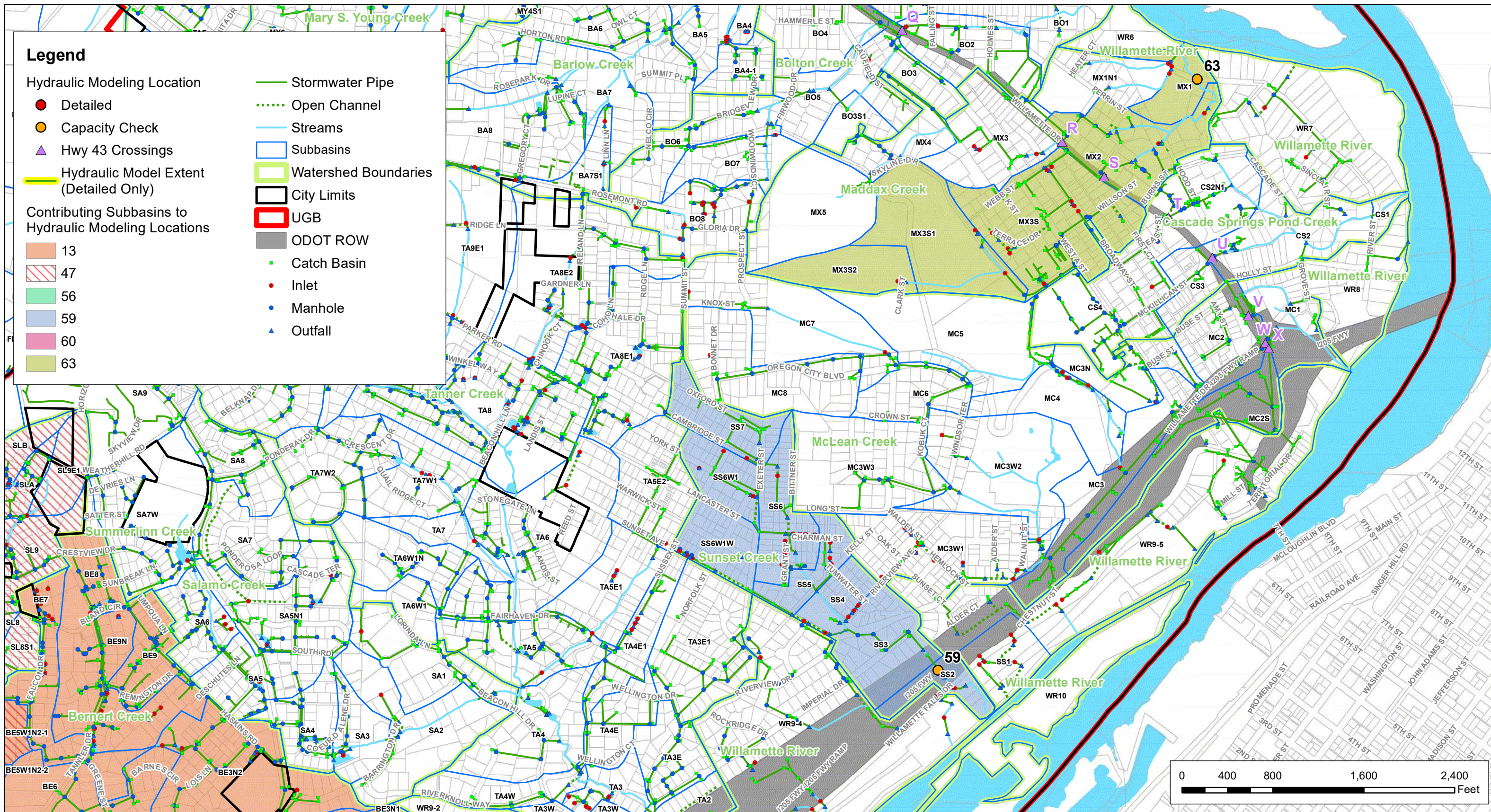
- City Boundary
- UGB
- Subbasins
- Watershed Boundaries
- Streams

Data Source: City of West Linn GIS and Metro RLIS

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

Map Publication/Print Date: November 2018 Produced by Brown and Caldwell





**Legend**

Hydraulic Modeling Location

- Detailed
- Capacity Check
- ▲ Hwy 43 Crossings
- ▬ Hydraulic Model Extent (Detailed Only)

Contributing Subbasins to Hydraulic Modeling Locations

- 13
- 47
- 56
- 59
- 60
- 63

- Stormwater Pipe
- ⋯ Open Channel
- Streams
- ▭ Subbasins
- ▭ Watershed Boundaries
- ▭ City Limits
- ▭ UGB
- ▭ ODOT ROW
- Catch Basin
- Inlet
- Manhole
- ▲ Outfall

1:9,600 scale

**CITY OF WEST LINN, OREGON**  
 Storm Drainage and Sanitary Master Plan 2019  
 Figure B-4: Hydraulic Modeling Overview (South)

Data Source: City of West Linn GIS and Metro RLIS  
 Disclaimer: This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.  
 Map Publication/Print Date: November 2018 Produced by Brown and Caldwell



**Attachment A. Table A-1: Hydrology Parameters and Model Results**

Basin ID	Area (acres)	Width (ft)	Slope (ft/ft)	Existing Impervious Percentage	Future Impervious Percentage	Existing Land Use			Future Land Use			Future Land Use			Future Land Use		
						Maximum Flow (cfs)			Maximum Flow (cfs)			Absolute Increase in Maximum			Percent Increase in Maximum Flow		
						2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr
BE5W	21.46	862.53	0.03	56.19	56.19	9.37	15.47	17.78	9.37	15.47	17.78	0.00	0.00	0.00	0.00	0.00	0.00
BE5W1	23.58	631.68	0.06	32.24	32.24	7.82	15.52	18.21	7.82	15.52	18.21	0.00	0.00	0.00	0.00	0.01	0.00
BE5W1N1	7.87	423.89	0.05	84.69	84.69	4.29	6.16	7.02	4.29	6.16	7.02	0.00	0.00	0.00	0.00	0.00	0.00
BE5W1N1W	9.50	210.81	0.05	66.69	66.69	4.27	6.82	7.84	4.27	6.82	7.84	0.00	0.00	0.00	0.00	0.00	0.00
BE5W1N2-1	15.77	363.01	0.07	34.26	48.79	5.18	10.27	12.09	6.23	10.98	12.72	1.05	0.70	0.63	20.36	6.85	5.23
BE5W1N2-2	8.98	361.75	0.15	68.66	84.98	4.73	7.03	8.01	5.02	7.13	8.11	0.29	0.10	0.10	6.18	1.39	1.21
BE5W1S	21.41	550.38	0.04	31.82	31.95	6.44	13.34	15.87	6.45	13.35	15.88	0.01	0.01	0.01	0.22	0.09	0.06
BE5W1S1	22.68	464.81	0.02	31.11	31.67	5.77	12.42	15.20	5.83	12.48	15.26	0.06	0.06	0.06	1.06	0.50	0.39
BE5W2	11.96	526.59	0.02	43.29	43.29	4.61	8.29	9.61	4.61	8.29	9.61	0.00	0.00	0.00	0.00	0.00	0.00
BE5W3	21.99	632.15	0.06	30.71	30.71	7.27	14.49	17.00	7.27	14.49	17.00	0.00	0.00	0.00	0.00	0.00	0.00
BE6	28.38	505.71	0.13	21.24	48.79	7.75	17.42	20.79	11.48	19.97	23.08	3.73	2.54	2.29	48.17	14.60	11.01
BE7	15.60	291.98	0.08	29.67	30.21	4.57	9.64	11.50	4.61	9.68	11.53	0.04	0.04	0.03	0.94	0.36	0.28
BE8	25.60	534.32	0.10	28.95	28.96	8.04	16.52	19.48	8.04	16.52	19.48	0.00	0.00	0.00	0.01	0.00	0.01
BE9	8.75	313.98	0.09	29.73	29.73	3.26	6.05	7.04	3.26	6.05	7.04	0.00	0.00	0.00	0.00	0.00	0.00
BE9N	3.60	252.10	0.11	30.00	30.00	1.60	2.65	3.05	1.60	2.65	3.05	0.00	0.00	0.00	0.00	0.00	0.00
<b>Bolton Creek</b>																	
B01	14.30	417.48	0.09	25.42	28.48	4.71	9.50	11.10	4.92	9.62	11.22	0.21	0.13	0.11	4.42	1.33	1.03
B02	14.35	520.28	0.08	36.27	37.39	5.69	10.11	11.75	5.76	10.16	11.79	0.07	0.05	0.04	1.19	0.46	0.37
B03	6.71	302.28	0.06	31.84	32.46	2.55	4.66	5.42	2.57	4.67	5.43	0.02	0.01	0.01	0.71	0.19	0.20
BO3S1	4.64	563.72	0.25	28.38	30.85	2.28	3.49	4.00	2.31	3.50	4.01	0.03	0.02	0.01	1.14	0.46	0.38
B04	15.40	454.25	0.14	31.79	33.00	5.90	10.73	12.49	5.98	10.78	12.54	0.08	0.06	0.05	1.36	0.52	0.42
B05	12.47	523.04	0.16	31.54	31.68	2.30	5.50	7.80	2.40	5.50	7.80	0.10	0.00	0.00	4.35	0.00	0.00
B06	13.53	310.87	0.10	30.00	30.00	4.44	8.90	10.44	4.44	8.90	10.44	0.00	0.00	0.00	0.00	0.00	0.00
B07	8.91	385.28	0.11	25.09	25.09	3.43	6.25	7.25	3.43	6.25	7.25	0.00	0.00	0.00	0.00	0.00	0.00
B08	13.32	457.55	0.10	30.00	30.00	4.98	9.21	10.71	4.98	9.21	10.71	0.00	0.00	0.00	0.00	0.00	0.00
<b>Cascade Springs Pond Creek</b>																	
CS1	1.77	157.47	0.06	25.36	29.99	0.76	1.29	1.49	0.79	1.31	1.50	0.03	0.02	0.01	3.28	1.24	1.01
CS2	16.54	390.84	0.05	39.60	40.74	5.60	10.79	12.71	5.69	10.86	12.77	0.09	0.07	0.06	1.57	0.61	0.47
CS2N1	16.50	482.55	0.07	65.01	65.01	7.93	12.25	14.08	7.93	12.25	14.08	0.00	0.00	0.00	0.00	0.00	0.00
CS3	5.47	282.05	0.07	41.27	41.89	2.41	4.03	4.63	2.42	4.03	4.64	0.01	0.01	0.01	0.50	0.20	0.15
CS4	20.45	499.57	0.05	32.10	32.36	6.29	12.91	15.32	6.32	12.93	15.34	0.03	0.02	0.02	0.41	0.16	0.13
<b>Dollar Creek</b>																	
DO1	3.75	119.44	0.06	30.02	30.13	1.25	2.48	2.91	1.25	2.49	2.91	0.00	0.00	0.00	0.16	0.04	0.03
DO1N	24.53	508.68	0.04	18.07	29.91	5.20	12.97	16.05	6.71	14.42	17.40	1.51	1.45	1.35	29.07	11.15	8.40
DO2	10.85	368.67	0.02	34.97	34.97	3.30	6.72	8.01	3.30	6.72	8.01	0.00	0.00	0.00	0.00	0.00	0.00
DO2S	21.52	398.94	0.02	29.97	30.26	5.06	11.04	13.68	5.09	11.07	13.71	0.03	0.03	0.03	0.59	0.29	0.23
DO3	23.72	642.92	0.01	30.00	30.00	5.89	12.83	15.75	5.89	12.83	15.75	0.00	0.00	0.00	0.00	0.00	0.00
DO3N	8.00	209.29	0.02	29.94	30.00	2.13	4.59	5.57	2.13	4.60	5.57	0.00	0.00	0.00	0.09	0.07	0.04
<b>Fern Creek</b>																	
FN1	31.74	437.01	0.05	30.00	30.00	7.98	17.36	21.27	7.98	17.36	21.27	0.00	0.00	0.00	0.00	0.00	0.00
FN2	9.27	408.46	0.05	29.52	29.52	3.33	6.33	7.35	3.33	6.33	7.35	0.00	0.00	0.00	0.00	0.00	0.00
FN3	13.99	418.88	0.04	16.37	16.37	3.27	8.03	9.75	3.27	8.03	9.75	0.00	0.00	0.00	0.00	0.00	0.00
FN4	11.60	328.13	0.03	29.67	30.00	3.26	6.97	8.37	3.28	6.99	8.38	0.02	0.02	0.02	0.58	0.24	0.18
FN4N	13.46	372.26	0.05	38.80	38.80	4.85	9.11	10.62	4.85	9.11	10.62	0.00	0.00	0.00	0.00	0.00	0.00
FN5	3.66	169.57	0.03	82.17	82.17	1.91	2.75	3.14	1.91	2.75	3.14	0.00	0.00	0.00	0.00	0.00	0.00
FN6	18.67	520.42	0.08	30.34	33.15	6.39	12.51	14.60	6.64	12.66	14.74	0.25	0.15	0.14	3.90	1.22	0.94

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX B**

---

**NRCS SOIL REPORT**

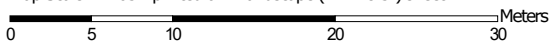


Hydrologic Soil Group—Clackamas County Area, Oregon  
(Bolton Terrace Hydrologic Map)



Soil Map may not be valid at this scale.

Map Scale: 1:465 if printed on A landscape (11" x 8.5") sheet.



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



Hydrologic Soil Group—Clackamas County Area, Oregon  
(Bolton Terrace Hydrologic Map)

### MAP LEGEND

**Area of Interest (AOI)**









 Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**





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

**Soil Rating Lines**


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

**Soil Rating Points**






-  A
-  A/D
-  B
-  B/D

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

**Water Features**

 Streams and Canals

**Transportation**

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

**Background**

 Aerial Photography

### MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Clackamas County Area, Oregon  
Survey Area Data: Version 15, Sep 10, 2019

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

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

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

## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
91B	Woodburn silt loam, 3 to 8 percent slopes	C	0.6	100.0%
<b>Totals for Area of Interest</b>			<b>0.6</b>	<b>100.0%</b>

### Description

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

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

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

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

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

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

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

### Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher

Soil Map—Clackamas County Area, Oregon  
(Bolton Terrace Soil Map)



Map Scale: 1:465 if printed on A landscape (11" x 8.5") sheet.




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




## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Clackamas County Area, Oregon

Survey Area Data: Version 15, Sep 10, 2019

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

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

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

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
91B	Woodburn silt loam, 3 to 8 percent slopes	0.6	100.0%
<b>Totals for Area of Interest</b>		<b>0.6</b>	<b>100.0%</b>

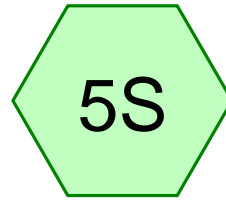
**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX C**

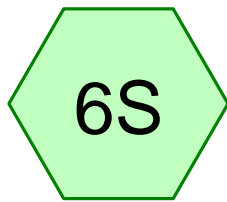
---

**HYDROCAD SUMMARIES**





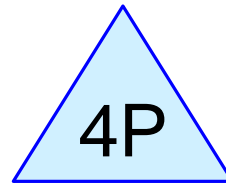
Existing Site



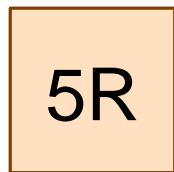
CSJ2



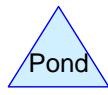
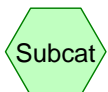
Site Developed



Infiltration



Cascade Springs Pond  
Creek



**Routing Diagram for Bolton Terrace**  
Prepared by Westech Engineering, Inc., Printed 5/7/2020  
HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 10 YR Rainfall=3.40"

Printed 5/7/2020

Page 1

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.18 cfs @ 8.03 hrs, Volume= 0.078 af, Depth= 1.49"

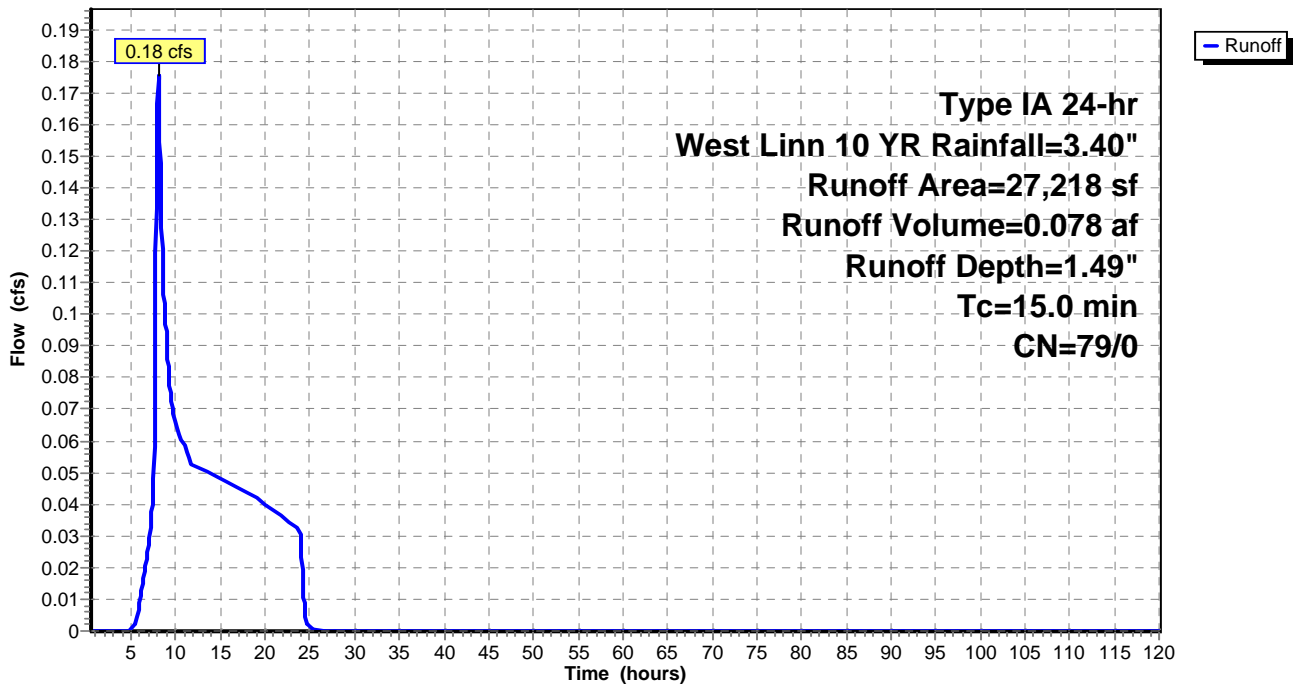
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 10 YR Rainfall=3.40"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Bolton Terrace**

Type IA 24-hr West Linn 100 YR Rainfall=4.50"

Prepared by Westech Engineering, Inc.

Printed 5/7/2020

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Page 2

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.31 cfs @ 8.02 hrs, Volume= 0.124 af, Depth= 2.38"

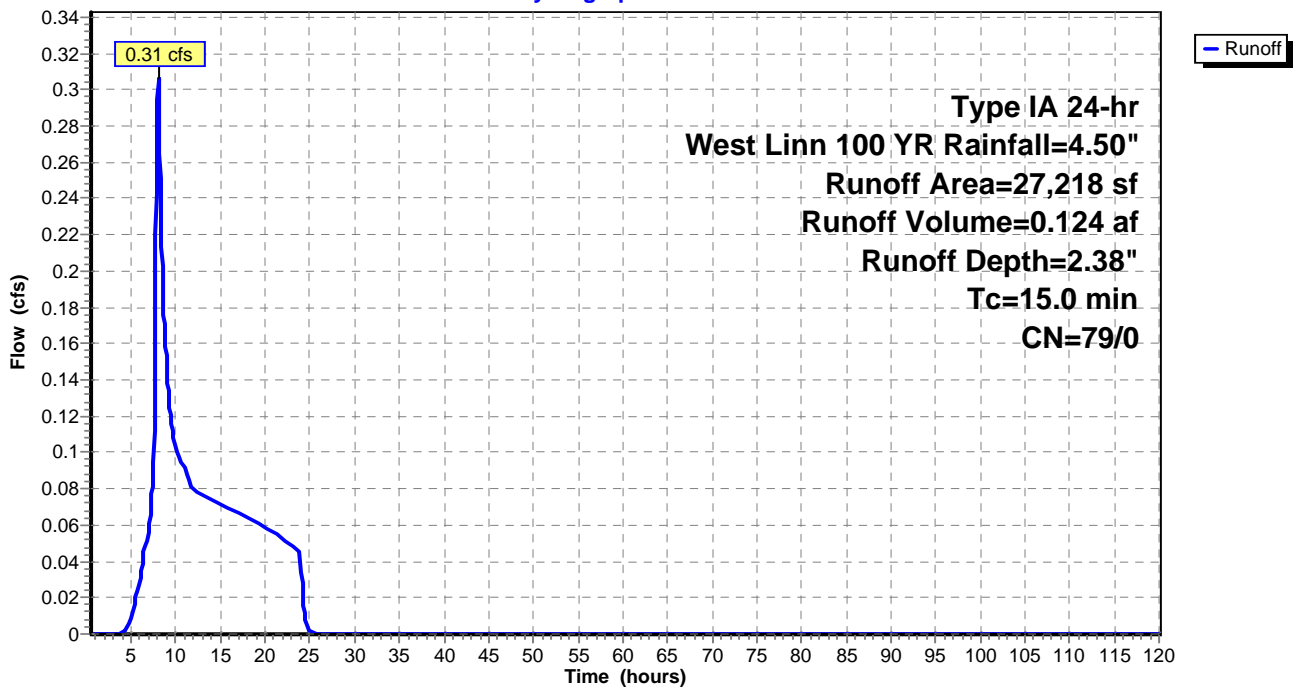
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 100 YR Rainfall=4.50"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 3

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.28 cfs @ 8.02 hrs, Volume= 0.115 af, Depth= 2.21"

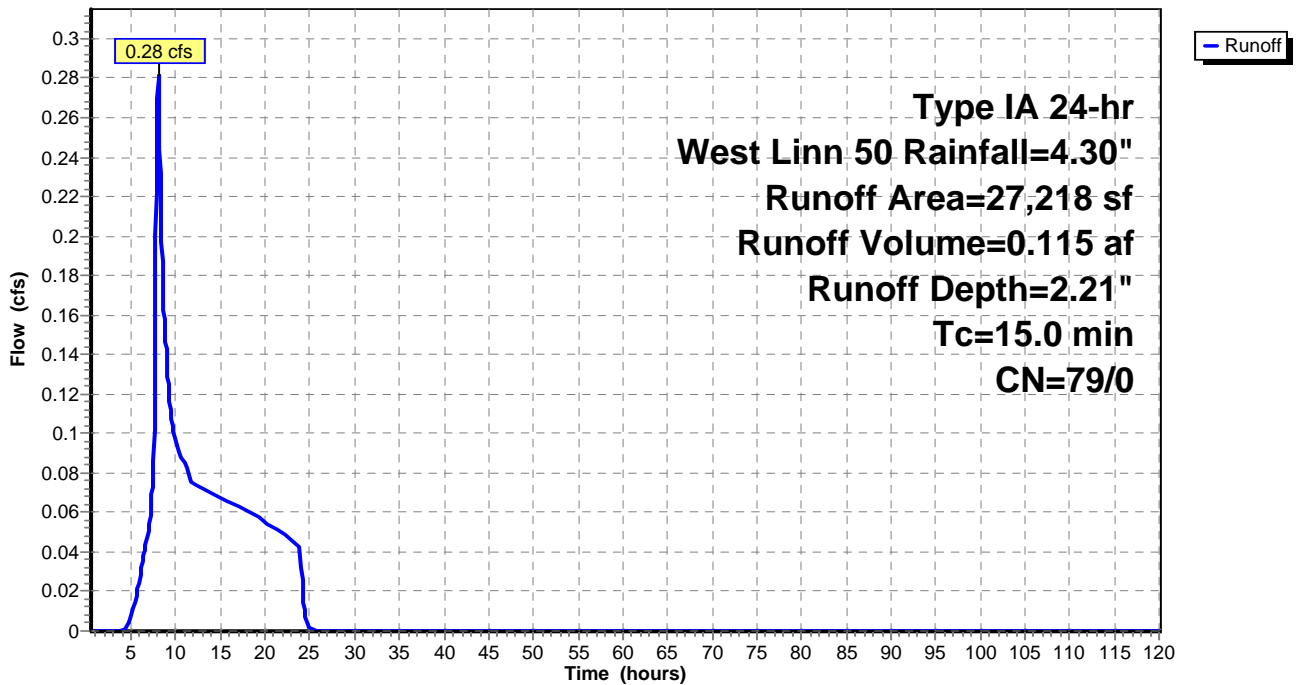
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 50 Rainfall=4.30"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn WQ Rainfall=1.20"

Printed 5/7/2020

Page 4

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.01 cfs @ 17.99 hrs, Volume= 0.007 af, Depth= 0.13"

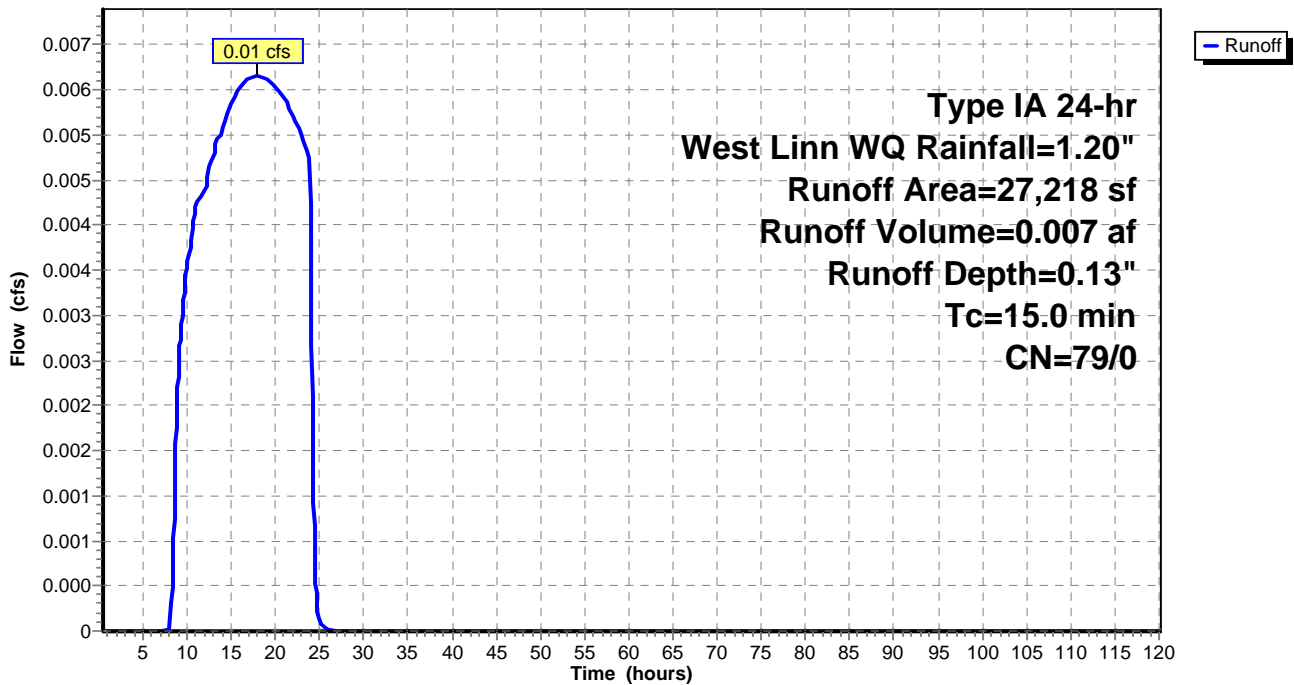
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Type IA 24-hr West Linn WQ Rainfall=1.20"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.45 cfs @ 7.91 hrs, Volume= 0.152 af, Depth= 2.92"

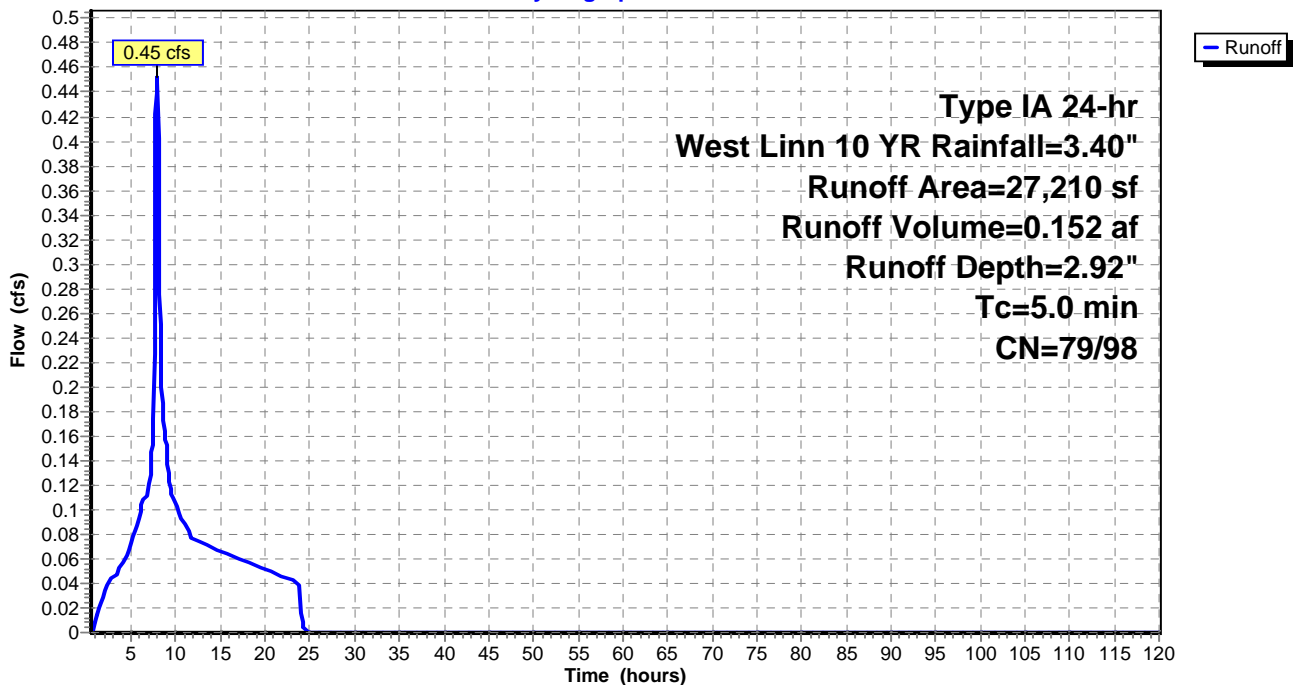
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 10 YR Rainfall=3.40"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 100 YR Rainfall=4.50"

Printed 5/7/2020

Page 2

**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.62 cfs @ 7.90 hrs, Volume= 0.207 af, Depth> 3.98"

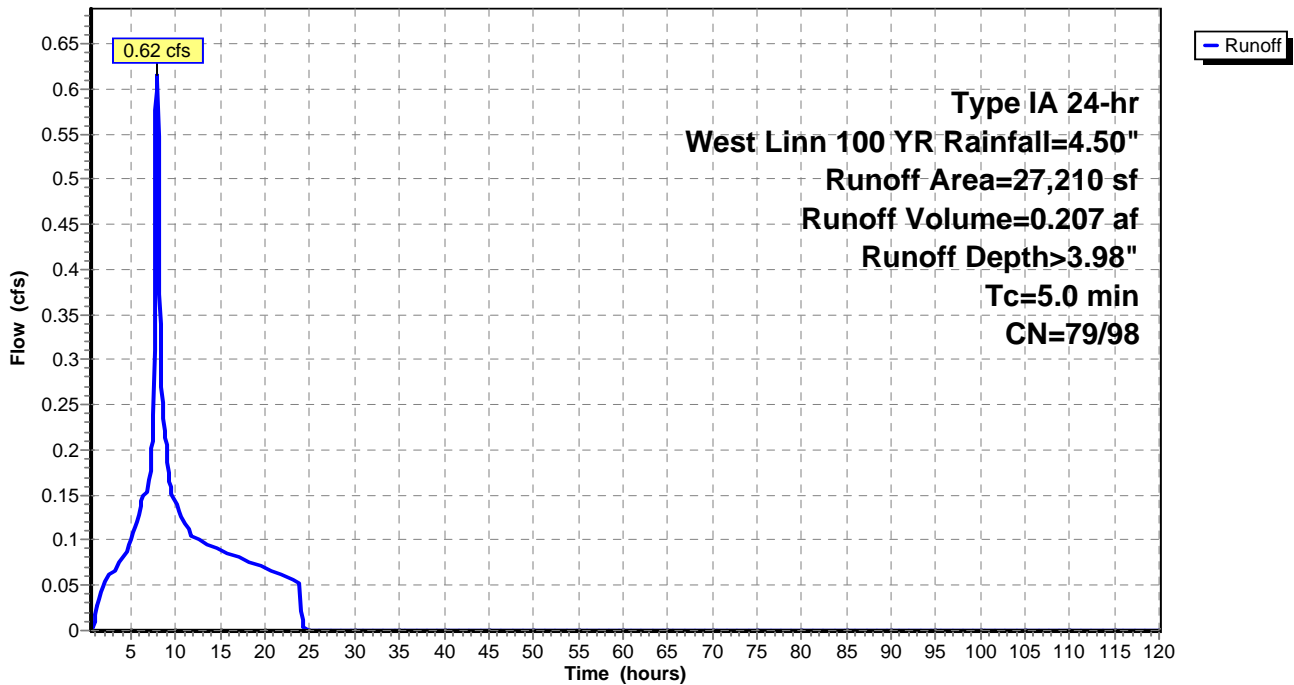
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 100 YR Rainfall=4.50"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph





**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 3

**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.59 cfs @ 7.90 hrs, Volume= 0.197 af, Depth> 3.79"

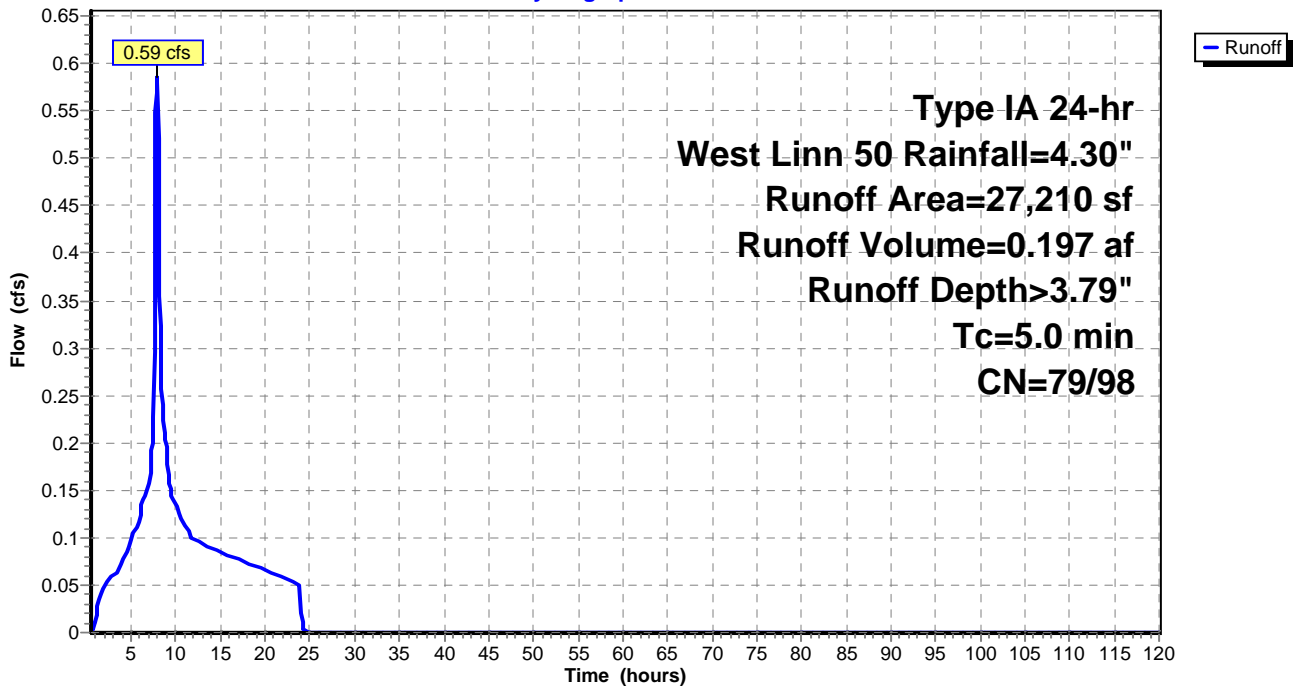
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 50 Rainfall=4.30"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph



**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.14 cfs @ 7.91 hrs, Volume= 0.045 af, Depth= 0.86"

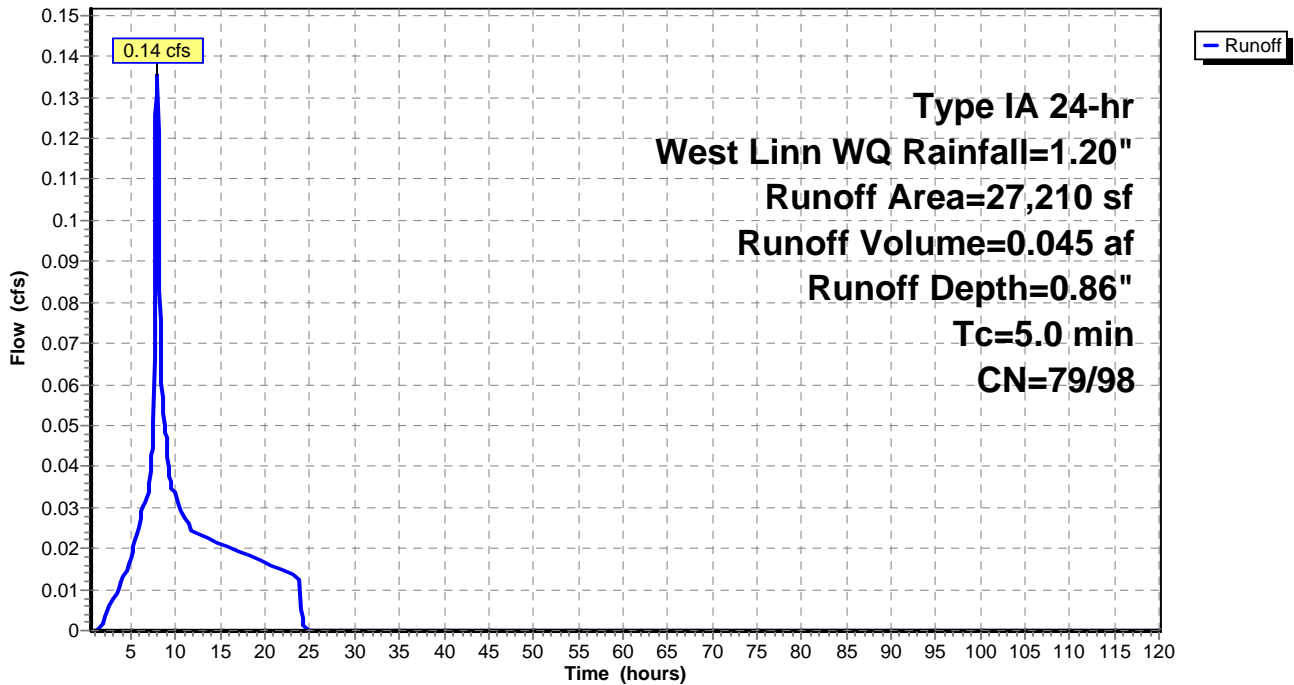
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Type IA 24-hr West Linn WQ Rainfall=1.20"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 1

**Summary for Subcatchment 6S: CSJ2**

Runoff = 31.82 cfs @ 7.98 hrs, Volume= 10.898 af, Depth= 2.38"

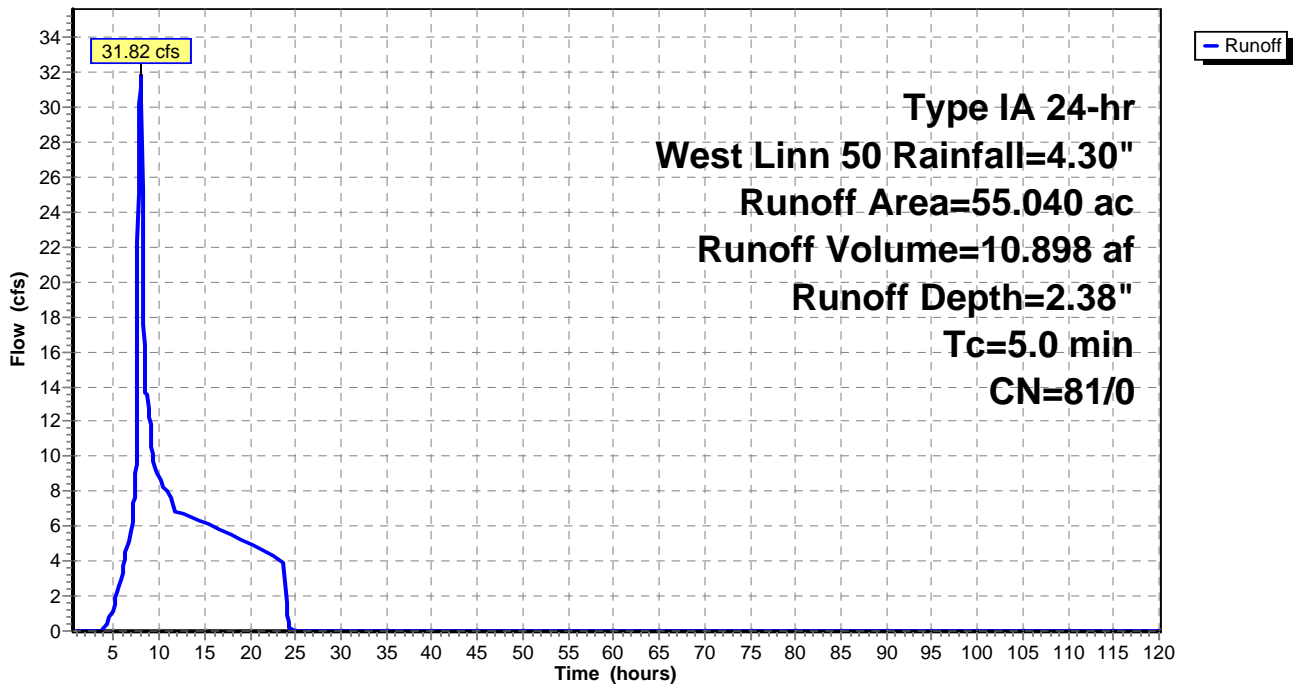
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Type IA 24-hr West Linn 50 Rainfall=4.30"

Area (ac)	CN	Description
* 55.040	81	>75% Grass cover, Good, HSG D
55.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 6S: CSJ2**

Hydrograph



# Bolton Terrace

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 1

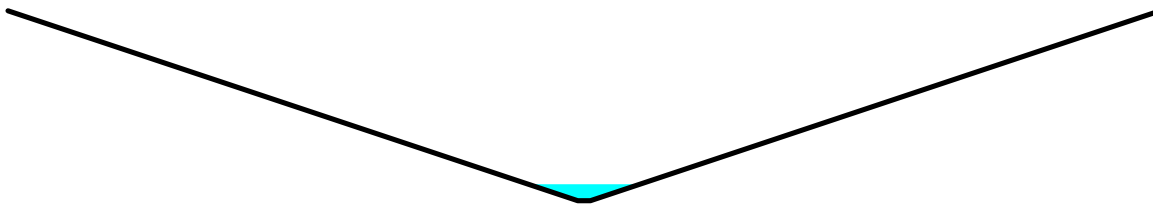
## Summary for Reach 5R: Cascade Springs Pond Creek

Inflow Area = 55.040 ac, 0.00% Impervious, Inflow Depth = 2.38" for West Linn 50 event  
Inflow = 31.82 cfs @ 7.98 hrs, Volume= 10.898 af  
Outflow = 31.04 cfs @ 8.00 hrs, Volume= 10.898 af, Atten= 2%, Lag= 1.8 min

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Max. Velocity= 4.82 fps, Min. Travel Time= 5.2 min  
Avg. Velocity = 2.94 fps, Avg. Travel Time= 8.5 min

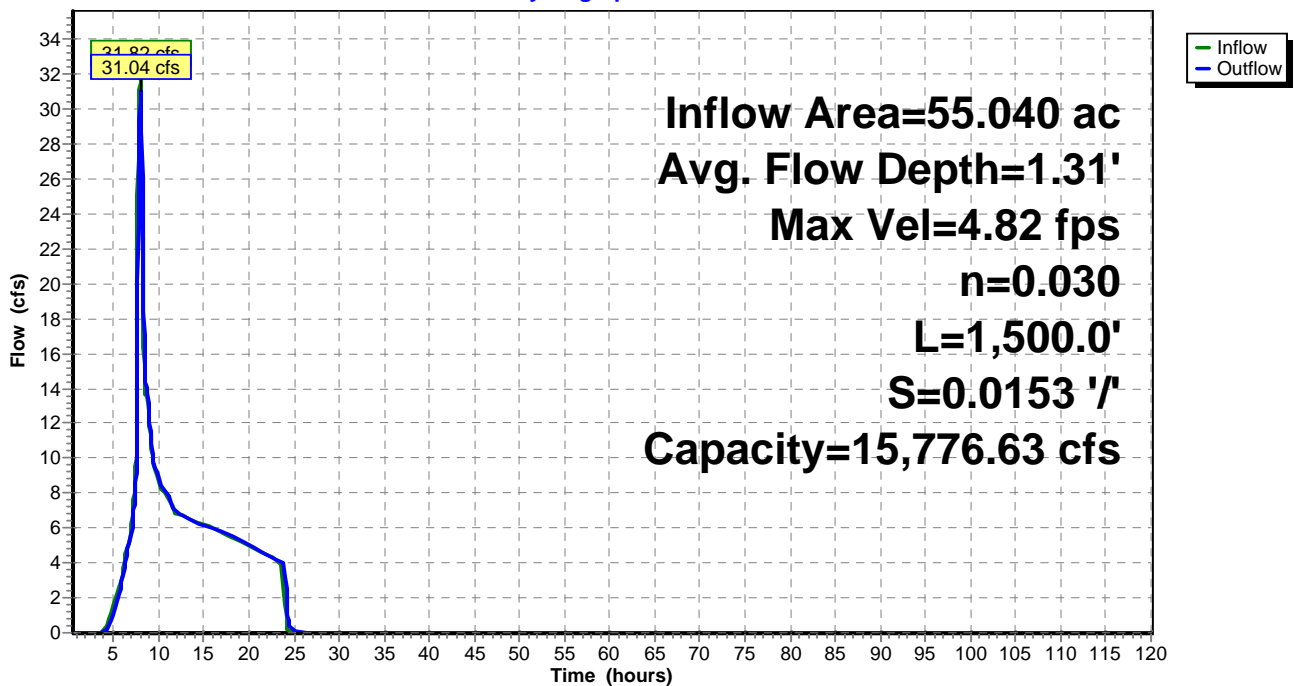
Peak Storage= 9,660 cf @ 8.00 hrs  
Average Depth at Peak Storage= 1.31'  
Bank-Full Depth= 15.00' Flow Area= 690.0 sf, Capacity= 15,776.63 cfs

1.00' x 15.00' deep channel, n= 0.030 Earth, grassed & winding  
Side Slope Z-value= 3.0 '/ Top Width= 91.00'  
Length= 1,500.0' Slope= 0.0153 '/  
Inlet Invert= 80.00', Outlet Invert= 57.00'



## Reach 5R: Cascade Springs Pond Creek

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 1

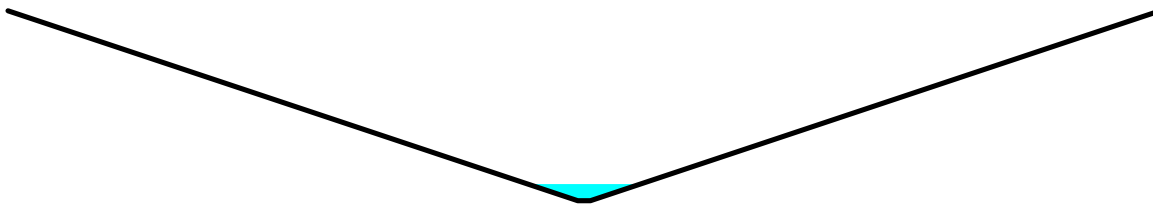
**Summary for Reach 5R: Cascade Springs Pond Creek**

Inflow Area = 55.665 ac, 0.95% Impervious, Inflow Depth = 2.39" for West Linn 50 event  
 Inflow = 32.15 cfs @ 7.97 hrs, Volume= 11.095 af  
 Outflow = 31.62 cfs @ 8.00 hrs, Volume= 11.095 af, Atten= 2%, Lag= 1.8 min

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 4.84 fps, Min. Travel Time= 5.2 min  
 Avg. Velocity = 2.76 fps, Avg. Travel Time= 9.1 min

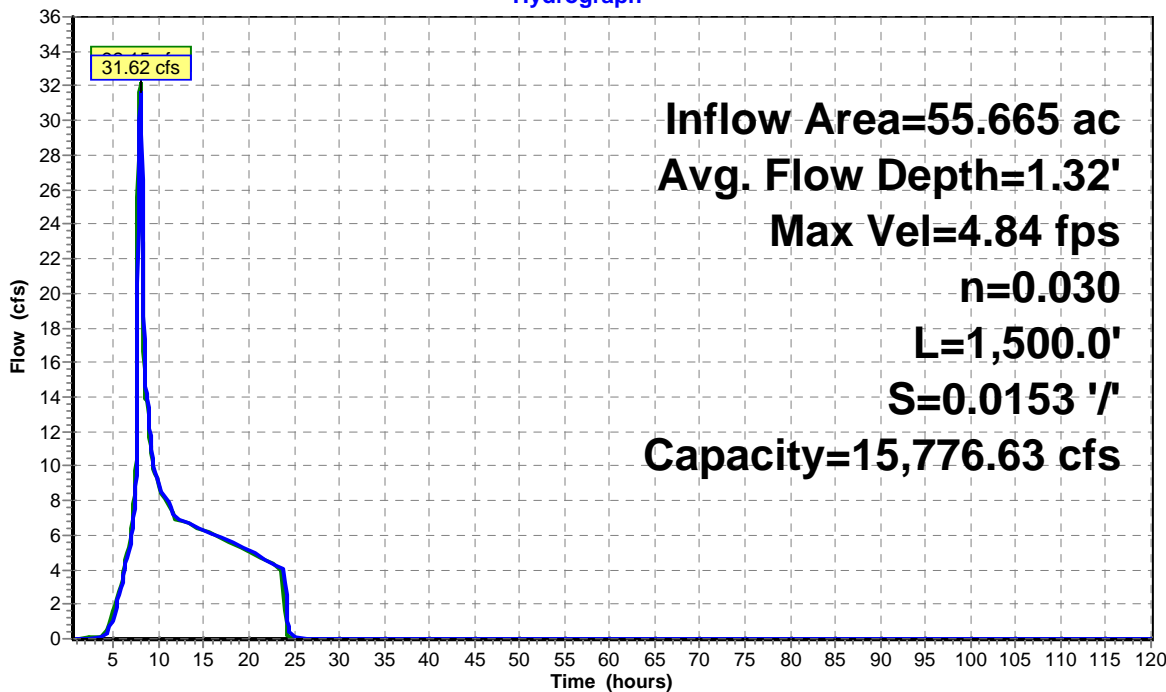
Peak Storage= 9,797 cf @ 8.00 hrs  
 Average Depth at Peak Storage= 1.32'  
 Bank-Full Depth= 15.00' Flow Area= 690.0 sf, Capacity= 15,776.63 cfs

1.00' x 15.00' deep channel, n= 0.030 Earth, grassed & winding  
 Side Slope Z-value= 3.0 '/' Top Width= 91.00'  
 Length= 1,500.0' Slope= 0.0153 '/'  
 Inlet Invert= 80.00', Outlet Invert= 57.00'



**Reach 5R: Cascade Springs Pond Creek**

Hydrograph



— Inflow  
 — Outflow

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX D**

---

**GEOTECHNICAL REPORT**





# REDMOND & ASSOCIATES

**Geotechnical Investigation**

**Proposed Commercial Building Site**

**1575 Burns Street**

**West Linn (Clackamas County), Oregon**

**for**

**Mr. Rolf Olson**

**Project No. 943.001.G  
May 20, 2005**



# REDMOND & ASSOCIATES

Project No. 943.001.G  
Page No. 1

May 20, 2005

Mr. Rolf Olson  
3453 Augusta National Drive South  
Salem, Oregon 97302

Dear Mr. Olson:

**Re: Geotechnical Investigation, Proposed Commercial Building Site, 1575 Burns Street,  
West Linn (Clackamas County), Oregon**

## INTRODUCTION

In accordance with the request of Mr. Rolf Olson, we have completed our Geotechnical Investigation at the above subject proposed commercial building site. The site, a rectangular shaped property, is located to the north of Burns Street and to the east of Hood Street in West Linn (Clackamas County), Oregon.

We understand that present plans are to develop the site by constructing a new commercial building. Although the project is still in the preliminary planning and design stages, we understand that the commercial structure will be a one- and/or two-story structure which will include a below grade parking level. Specific building materials are not presently known but are anticipated to include wood- and/or metal frame with concrete and/or masonry blocks walls. The planned commercial structure is anticipated to be supported on conventional continuous (strip) and/or individual spread (column) footings with a concrete slab-on-grade floor. Structural loading is anticipated to result in maximum dead plus live continuous footing and column footing loads on the order of about 2.0 to 4.0 kips per lineal foot (klf) and 50 to 100 kips, respectively. Other associated site improvements will include asphalt pavements for both automobile drive and parking areas, underground utility services and landscaping.

## SITE DESCRIPTION

The proposed commercial site, located within Township 2 South, Range 2 East, and Section 30 of the Willamette Meridian, is presently unimproved and consists of existing open commercial lot.

Topographically, the westerly portion of the site is characterized as relatively flat-lying terrain while the easterly portion of the site is characterized as moderately sloping terrain descending down to the east with overall topographic relief across the entire estimated at about 10 to 15 feet and is estimated lie near to Elevation 180 feet.

Vegetation across most of the site consists of a moderate growth of grass, weeds, and brush as well as numerous small to large sized trees.

### SCOPE OF WORK

The purpose of our geotechnical studies is to evaluate the overall site subsurface soil and ground water characteristics as well as any associated impacts or concerns with regard to the planned construction and development of the site. Specifically, our geotechnical investigation included the following scope of work items:

1. Site exploration by means of three (3) exploratory backhoe test pit excavations. The exploratory test pits were excavated at various locations across the site as shown on the Site Exploration Map, Figure No. 2 to depths ranging from about 8 to 11 feet beneath existing site grades. Detailed logs of the exploratory test pit excavations, presenting conditions encountered at each location explored, are presented on the Log of Test Pits, Figure No's. 5 and 6. Additionally, representative samples of the subsurface soils encountered at the site were collected at selected depths and/or intervals and returned to our laboratory for further examination and testing.
2. A laboratory testing program to assess the pertinent physical and engineering characteristics of the subsurface soils. The laboratory program consisted of tests to evaluate the natural (field) moisture content and dry density, Atterberg Limits, gradational properties and Direct Shear Strength tests. Results of the moisture content and dry density tests are shown on their respective test pit log, Figure No's. 5 and 6. Results of the Atterberg Limits, gradation and direct shear strength tests are shown graphically on Figure No's. 7 through 9.
3. Recommendations and our final written report presenting the results of our investigation. Our report includes recommendations for site preparation and grading including any overexcavation of unsuitable materials revealed by the explorations, placement and compaction of any required structural fill(s), suitability of the on-site soils for use as structural fill as well as criteria for import fill materials, and preparation of pavement and foundation areas.
4. Recommendations for foundation support and design including allowable contact bearing pressures for proportioning footings, minimum width and embedment depths, and estimates of foundation settlement as well as lateral earth pressures for below grade walls. Additionally, we have developed flexible pavement sections for automobile and/or truck traffic areas.

### SUBSURFACE CONDITIONS

Our understanding of the subsurface conditions which underlie the site was developed by means of three (3) exploratory test pits excavated on April 23, 2005 with a rubber-tired excavator at the approximate locations shown on Figure No. 2. The test pits revealed that the site is underlain by native soil deposits comprised of lacustrine and fluvial sedimentary soil deposits of Pleistocene age. Specifically, the native soil materials were comprised of very moist to wet, medium stiff to stiff, clayey, sandy silt to the maximum depth explored of about 11.0 feet beneath existing site grades. These clayey, sandy silt subgrade soils are best characterized by relatively low to moderate strength and compressibility.

Ground water was not encountered at the site during our field exploration work and is not expected to be a factor during construction. However, topsoil materials were encountered at the site and consist of about 12 to 16 inches of organic, clayey and sandy silt. All soils encountered at the site were classified in accordance with the Unified Soil Classification System (USCS) which is outlined on Figure No. 4.

### **CONCLUSIONS AND RECOMMENDATIONS**

From a geotechnical engineering and constructability standpoint, we are of the opinion that the site is suitable for the planned new commercial structure and its associated site improvements provided that the recommendations contained within this report are properly incorporated into the design and construction of the project.

The primary feature of concern at the site is the moisture sensitivity characteristics of the underlying clayey, sandy silt subgrade soil materials

In regards to the moisture sensitivity characteristics of the underlying clayey, sandy silt subgrade soils, we recommend that all foundation excavation and site grading work be performed during the drier summer months which is typically June through September.

The following sections of this report present specific recommendations for site preparation and grading as well as foundation design and construction for the commercial building project.

### **SITE PREPARATION**

In general, we recommend that all planned structural improvement areas for the commercial building and pavements be stripped and cleared of any existing site improvements, vegetation, topsoil materials, and any deleterious materials present at the time of construction. In general, we envision that about 12 to 16 inches of topsoil stripping may be required to remove existing topsoil materials. Holes resulting from the removal of any buried obstructions, such as old foundation remnants and/or boulders, should be backfilled and compacted with structural fill materials. Areas resulting in deeper stripping and removals should be evaluated at the time of construction by the Geotechnical Engineer. The stripped and cleared materials should be properly disposed of as they are generally not considered suitable for use/reuse as structural fill.

Following the stripping and clearing operations, and prior to the placement of any required structural fills and/or structural improvements, the exposed subgrade soils within the planned building and pavement areas should be inspected by the Geotechnical Engineer and possibly proof-rolled with a half-loaded dump truck. Areas found to be soft or otherwise unsuitable for support of structural loads or improvements should be scarified and recompacted or overexcavated and replaced with structural fill. During wet or inclement weather conditions, proof-rolling as recommended above will not be appropriate.

The on-site native clayey, sandy silt subgrade soils are considered suitable for use/reuse as structural fill provided that they are free of organic materials, debris, and rock fragments in excess of 8 inches in dimension. If grading is conducted during wet weather, the use of the on-site clayey, sandy silt soils may be difficult and the use of an import granular fill material may be required. In general, we recommend that a free-draining (clean) granular fill (sand & gravel) containing no more than about 5 percent fines be used during wet weather grading. Representative samples of the material(s) to be used as structural fill should be submitted to our laboratory for approval and to determine the maximum dry density and optimum moisture content for compaction.

All required structural fill materials placed within the building and pavement (structural) areas should be moistened or dried as necessary to near (within 3 percent) optimum moisture conditions and compacted by mechanical means to a minimum of 92 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Fill materials should be placed in lifts (layers) such that when compacted do not exceed about 8 inches.

#### **FOUNDATION SUPPORT**

Based on the results of our investigation, it is our opinion that the proposed commercial building structure may be supported directly on the underlying native medium stiff to stiff, clayey, sandy silt subgrade soil deposits and/or by structural fill materials with conventional continuous and individual spread footings. As such, were foundations are constructed on approved native subgrade soils and/or properly placed and compacted structural fill materials, an allowable contact bearing pressure of about 2,500 pounds per square foot (psf) is recommended for design. However, where higher allowable contact bearing pressures are required, an allowable contact bearing pressure of 3,000 psf may be used for design where the foundations are supported by a minimum of at least 12 inches of compacted crushed aggregate base rock structural fill materials. These allowable contact bearing pressures are intended for dead loads and sustained live loads and may be increased by one-third for the total of all loads including short-term wind or seismic loads.

In general, continuous strip footings should have a minimum width of at least 16 inches and be embedded at least 18 inches below the lowest adjacent finish grade (includes frost protection). Individual column footings (if required) should be embedded at least 16 inches below grade and have a minimum width of about 24 inches.

Total and differential settlements of foundations constructed as recommended above and supported directly by approved native subgrade soils or on properly placed and compacted structural fill materials are expected to be well within tolerable limits for this type of structure and should generally be less than about 1-inch and 1/2-inch, respectively.

Allowable lateral frictional resistance between the base of the footings and the clayey, sandy silt or a gravel subgrade soil can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.35 and 0.45, respectively. In addition, lateral loads may be resisted by passive pressures on footings poured "neat" against in-situ native soils or properly compacted structural fill materials. For passive earth pressure resistance we recommend that an equivalent fluid density of 300 pounds per cubic foot (pcf) be used for design.

#### **FLOOR SLAB SUPPORT**

In order to provide uniform subgrade reaction beneath concrete slab-on-grade floors, we recommend that the floor slabs be underlain by a minimum of 6 inches of free-draining (less than 5 percent passing the No. 200 sieve), well-graded, crushed rock. The crushed rock should provide a capillary break to prevent migration of moisture through the slab. Additional moisture protection can be provided by using a 6-mil visqueen vapor barrier covered with a 1-inch protective layer of sand on the top and bottom. The base course materials should be compacted to at least 95 percent of the maximum dry density obtainable by the ASTM D-1557 (AASHTO T-180) test procedures.

**BELOW GRADE/RETAINING WALLS**

Below grade walls should be designed to resist lateral earth pressures imposed by native soils and/or granular backfill materials as well as any adjacent surcharge loads. For walls which are fully restrained from rotation at the top and supporting level backfill, we recommend that at-rest earth pressures be computed on the basis of an equivalent fluid density of 50 pcf and 60 pcf for granular backfill or sandy silt soil backfill materials, respectively. However, for walls which are free to rotate at the top and retaining level backfill, we recommend that active earth pressures be computed on the basis of an equivalent fluid density of 30 pcf and 40 pcf for granular backfill and sandy silt soil backfill materials, respectively. The above recommended lateral earth pressure values assume that the wall(s) will adequately drained to prevent the buildup of hydrostatic pressures. Where wall drainage will not be present and/or where adjacent surcharge loading and/or sloping ground conditions are present, the above recommended lateral earth pressure values will be higher.

Non structural backfill materials behind retaining walls should be compacted to at least 85 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Where structural backfill materials are required, the degree of compaction should be at least 90 percent of the maximum dry density. However, special care should be taken to avoid overcompaction near the wall(s) which could result in higher lateral earth pressures than those indicated herein. In an area within about three (3) to five (5) feet behind walls, we recommend the use of light hand operated compaction equipment.

**EXCAVATIONS**

Temporary excavations within native subgrade soils of up to four (4) feet in depth are expected to remain fairly stable at near vertical inclinations. Excavations to depths of between four (4) feet to ten (10) feet should be properly braced and shored or backcut to inclinations of at least 1 to 1 (Horizontal to Vertical). Where excavations are planned to exceed ten (10) feet, this office should be consulted. Additionally, at present levels, we do not anticipate that ground water will not be a factor during construction.

**PAVEMENTS**

Flexible pavement design for the project was determined on the basis of projected traffic volume and loading conditions relative to assumed subgrade soil strength characteristics. Based on an assumed subgrade "R"-value of 35 (CBR = 4.0) and utilizing the Oregon State Highway Flexible Pavement Design Procedures, we recommend that the asphaltic concrete pavement sections for automobile parking and drive area use at the site consist of the following:

	<b><u>Asphaltic Concrete Thickness (Inches)</u></b>	<b><u>Crushed Base Rock Thickness (Inches)</u></b>
Automobile Parking Areas	2.5	8.0
Automobile Drive Areas	3.0	9.0

Note: Where heavy vehicle traffic is anticipated, we recommend that the main access drive area pavement section be increased by adding 1.0 inches of asphalt and 3.0 inches of aggregate base rock. Additionally, for wet and/or winter time construction, we recommend that a minimum of at least 12 inches of aggregate base rock be used in all pavement areas.



The above recommended pavement section(s) assume that the subgrade will be prepared as recommended herein, that the exposed subgrade soils will be properly protected from rain and construction traffic, and that the subgrade is firm and unyielding at the time of paving. Additionally, it assumes that the subgrade is graded to prevent any ponding of water which may tend to accumulate in the base course. Further, the above recommended flexible pavement section(s) assumes a design life of about 20 years.

Pavement base course materials should consist of well-graded 1 1/2-inch and/or 3/4-inch minus crushed base rock having less than 5 percent fine materials passing the No. 200 sieve. The base course and asphaltic concrete materials should conform to the requirements set forth in the latest edition of the Oregon Department of Transportation, Standard Specifications of Highway Construction. The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. The asphaltic concrete materials should be compacted to at least 91 percent of the theoretical maximum density as determined by the ASTM D-2041 (Rice Gravity) test method.

#### SEISMIC DESIGN CONSIDERATIONS

Subgrade acceleration coefficients for the project were obtained from the seismic hazard/design mapping project performed by Geomatrix Consultants. Geomatrix mapping indicates that a peak ground acceleration on bedrock soils in the area of the site are 0.19g with a return period of about 500 years. The UBC seismic zone factor (Z) for the subject site is 0.30. Additionally, the IBC soil profile for the subject site to estimate the site class is recommended at D.

#### USE OF REPORT

This report is intended for the exclusive use of the addressee and their representatives to use to design the proposed commercial building structure and its associated site improvements described herein and to prepare any construction documents. The data, analyses, and recommendations may not be appropriate for other structures or purposes. We recommend that parties contemplating other structures or purposes contact our office. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report.

#### LEVEL OF CARE

Services performed by the Geotechnical Engineer for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in the area under similar budget and time restraints. No warranty, either expressed or implied, is made.

#### CONSTRUCTION MONITORING AND TESTING

We recommend that **Redmond & Associates** be retained to provide construction monitoring and testing services during all earthwork operations. The purpose of our monitoring services would be to confirm that the site conditions which are encountered are as anticipated, provide field recommendations as necessary based on the actual conditions encountered, and document the activities of the contractor and assess his/her compliance with the project specifications and recommendations.

It is important that we meet with the grading contractor prior to any site grading work to establish a plan that will minimize costly overexcavation and site preparation work. Of primary importance will be observations made during the site preparation, structural fill placement, footing excavation and preparation, and construction of all below grade retaining walls.

We will be pleased to provide such additional assistance or information as you may require in the balance of the design phase of this project and to aid in construction control or solution of unforeseen conditions which may arise during the construction period.

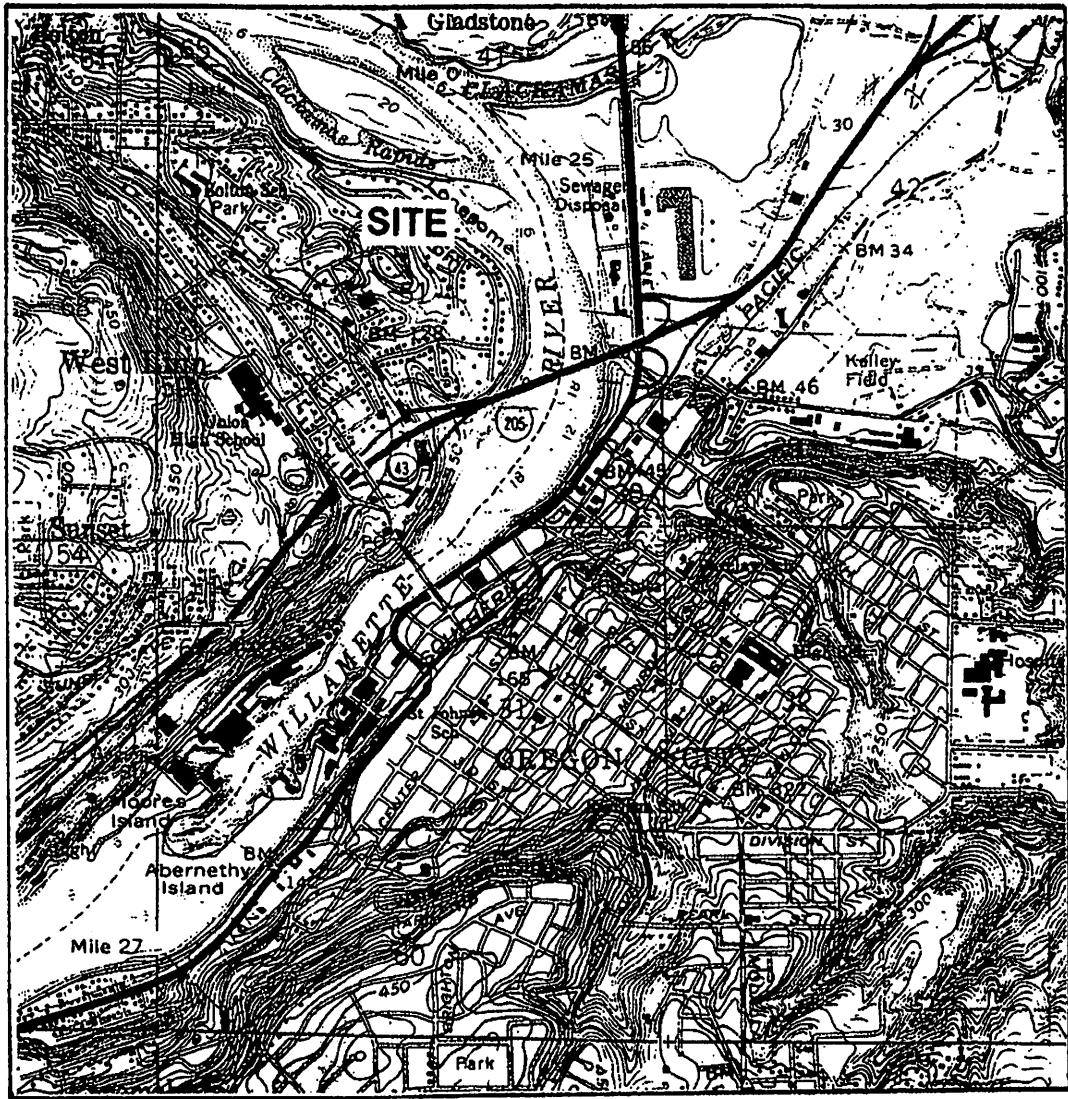
Sincerely,



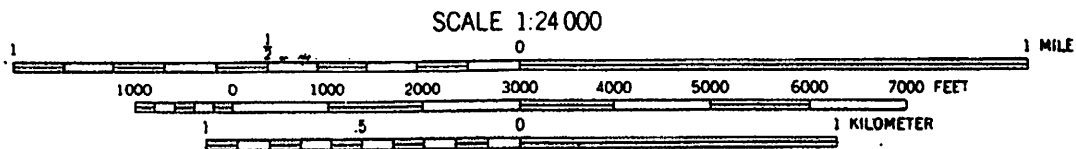
Daniel M. Redmond, P.E.  
President/Principal Geotechnical Engineer



Expires 12-31-06



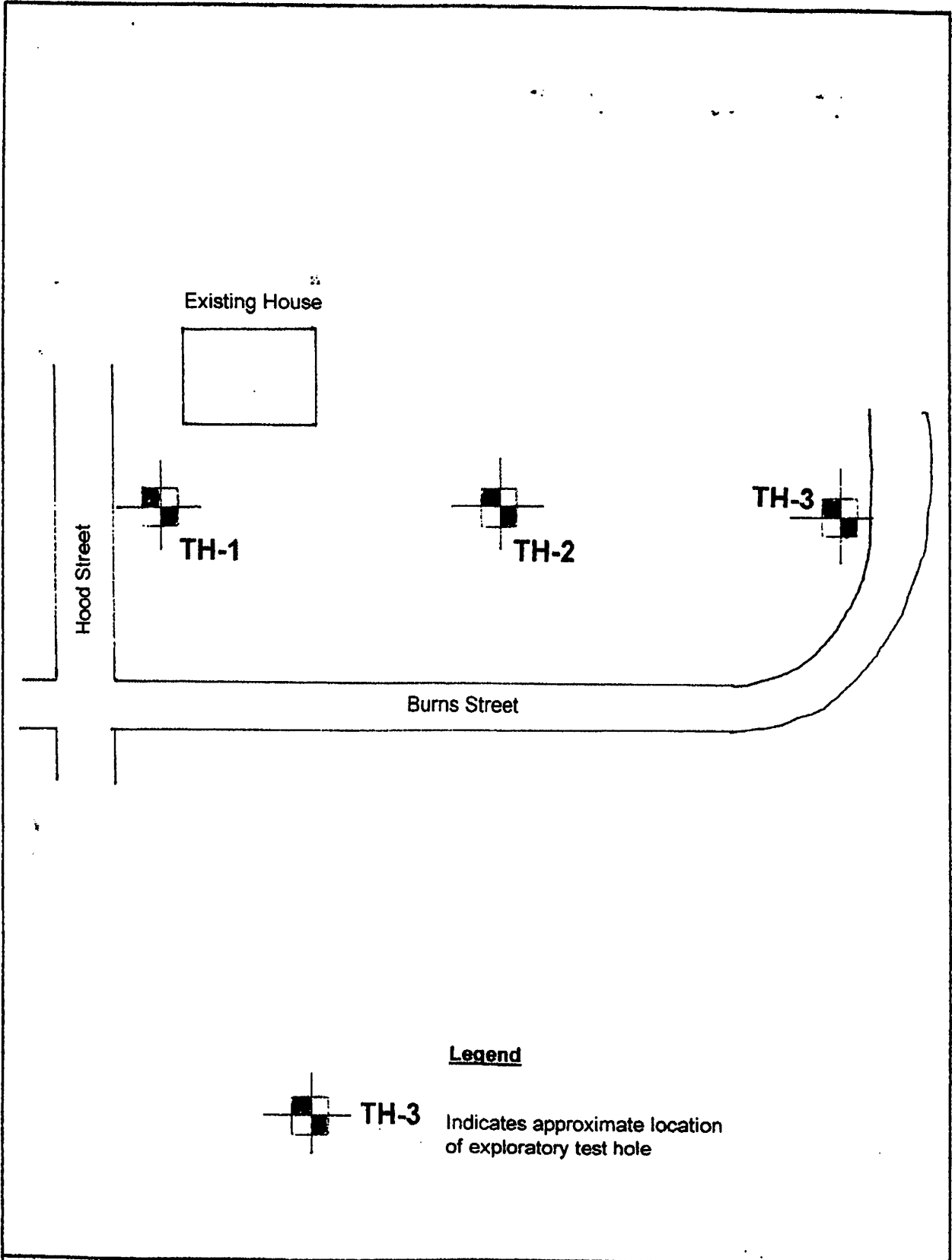
**OREGON CITY QUADRANGLE**  
**OREGON-CLACKAMAS CO.**  
**7.5 MINUTE SERIES (TOPOGRAPHIC)**  
 SE/4 OREGON CITY 15' QUADRANGLE



CONTOUR INTERVAL 10 FEET  
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

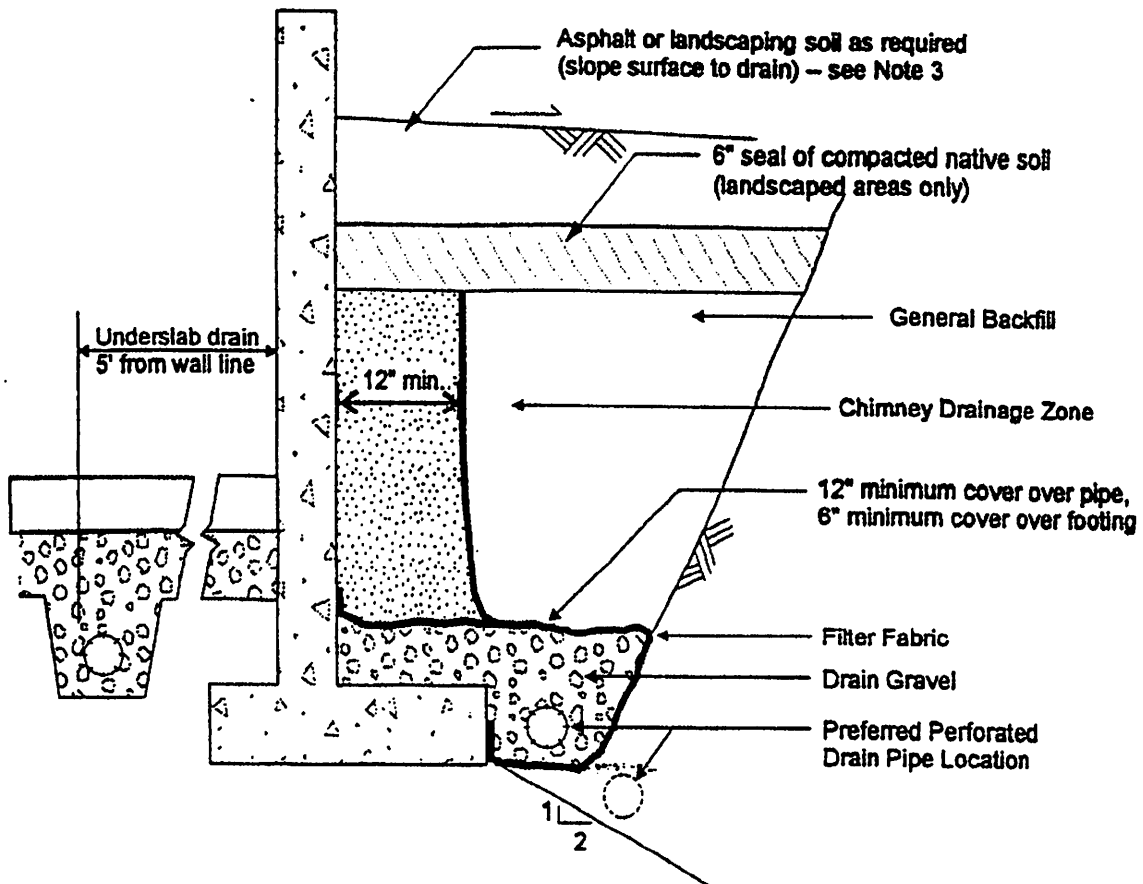
**SITE VICINITY MAP**

Project No. 943.001.G	1575 BURNS STREET	Figure No. 1
-----------------------	-------------------	--------------



**SITE EXPLORATION MAP**

Project No. 943.001.G	1575 BURNS STREET	Figure No. 2
-----------------------	-------------------	--------------



**SCHEMATIC - NOT TO SCALE**

**NOTES:**

1. Filter Fabric to be non-woven geotextile (Amoco 4545, Mirafi 140N, or equivalent)
2. Lay perforated drain pipe on minimum 0.5% gradient, widening excavation as required. Maintain pipe above 2:1 slope, as shown.
3. All-granular backfill is recommended for support of slabs, pavements, etc. (see text for structural fill).
4. Drain gravel to be clean, washed ¾" to 1½" gravel.
5. General backfill to be on-site gravels, or ¾"-0 or 1½"-0 crushed rock compacted to 92% Modified Proctor (AASHTO T-180).
6. Chimney drainage zone to be 12" wide (minimum) zone of clean washed, medium to coarse sand or drain gravel if protected with filter fabric. Alternatively, prefabricated drainage structures (Miradrain 6000 or similar) may be used.

**FOOTING/RETAINING WALL DRAIN**

Project No. 943.001.G

1575 BURNS STREET

Figure No. 3

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
			GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
		GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.	
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
		SANDS WITH FINES	SP	Poorly graded sands or gravelly sands, little or no fines.
			SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

**DEFINITION OF TERMS**

SILTS AND CLAYS	U.S. STANDARD SERIES SIEVE			CLEAR SQUARE SIEVE OPENINGS			COBBLES	BOULDERS
	200	40	10	4	3/4"	3"		
	SAND			GRAVEL				
	FINE	MEDIUM	COARSE	FINE	COARSE			

**GRAIN SIZES**

SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT <sup>1</sup>
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CLAYS AND PLASTIC SILTS	STRENGTH <sup>‡</sup>	BLOWS/FOOT <sup>‡</sup>
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

**RELATIVE DENSITY**

<sup>1</sup>Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

<sup>‡</sup>Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

**CONSISTENCY**

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • Portland, OR 97230

**KEY TO EXPLORATORY TEST PIT LOGS  
Unified Soil Classification System (ASTM D-2487)**

1575 BURNS STREET COMMERCIAL SITE  
WEST LINN, OREGON

111 PROJECT NO.	DATE
943 001 C	May 20, 2005

Figure 4



BACKHOE COMPANY: **Kavik, Inc.**

BUCKET SIZE: **24 inches**

DATE: **4/23/05**

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION	
						TEST PIT NO. <b>TH-1</b>	ELEVATION
0					ML	Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)	
	X			24.4	ML	Medium brown to olive-brown, very moist, medium stiff to stiff, clayey, sandy SILT	
5	X			27.2			
10						Total Depth - 9.0 feet No ground water encountered	

						TEST PIT NO. <b>TH-2</b>	ELEVATION
0					ML	Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)	
	X			26.1	ML	Medium brown to olive-brown, very moist, medium stiff to stiff, clayey, sandy SILT	
5	X			28.3			
10						Total Depth = 11.0 feet No ground water encountered	

**LOG OF TEST PITS**

PROJECT NO. **943.001.G**

**1575 BURNS STREET COMMERCIAL SITE**

FIGURE NO. **5**

BACKHOE COMPANY: Kavik, Inc.

BUCKET SIZE: 24 inches

DATE: 4/23/05

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION	
						TEST PIT NO.	ELEVATION
0					ML	TH-3	
	X			35.5	ML		Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)
					ML		Gray-brown, wet, soft to medium stiff, sandy, clayey SILT
5	X			32.6	ML		Medium brown to olive-brown, very moist to wet, medium stiff to stiff, clayey, sandy SILT
10							Total Depth = 8.0 feet No ground water encountered

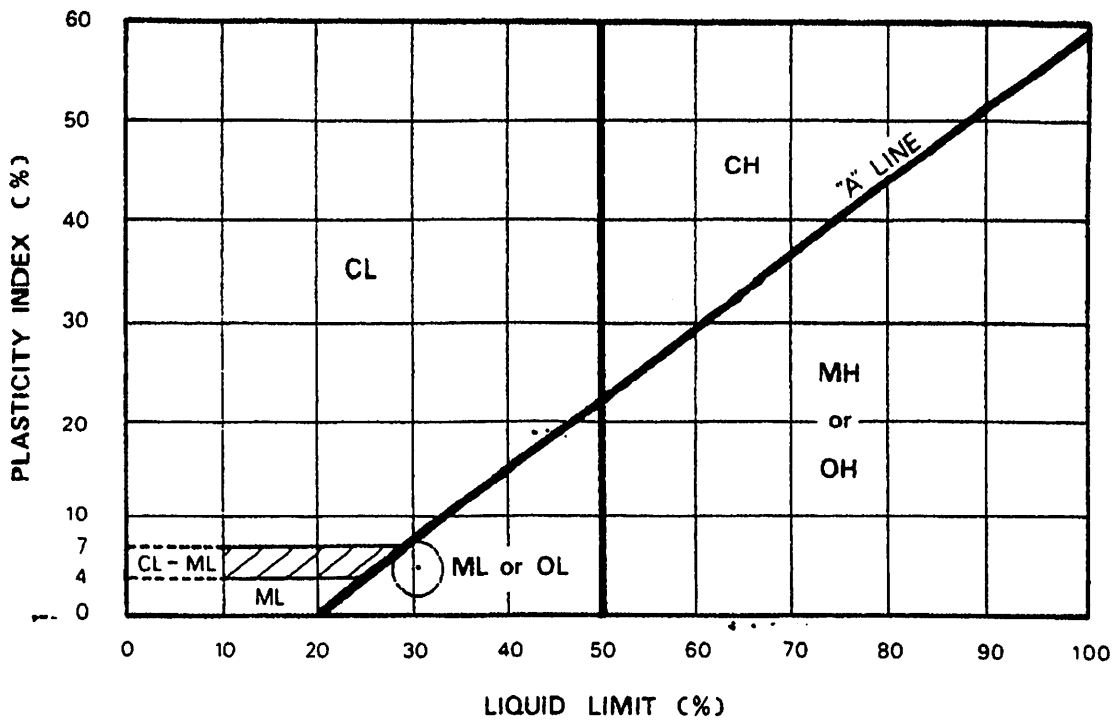
						TEST PIT NO.	ELEVATION
0							
5							
10							
15							

**LOG OF TEST PITS**

PROJECT NO. 943.001.G

1575 BURNS STREET COMMERCIAL SITE

FIGURE NO. 6



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
	TH-2	3.0	28.3	30.6	5.5	76.0		ML

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • PORTLAND, OR 97294

PLASTICITY CHART AND DATA

1575 BURNS STREET COMMERCIAL SITE  
West Linn, Oregon

PROJECT NO.

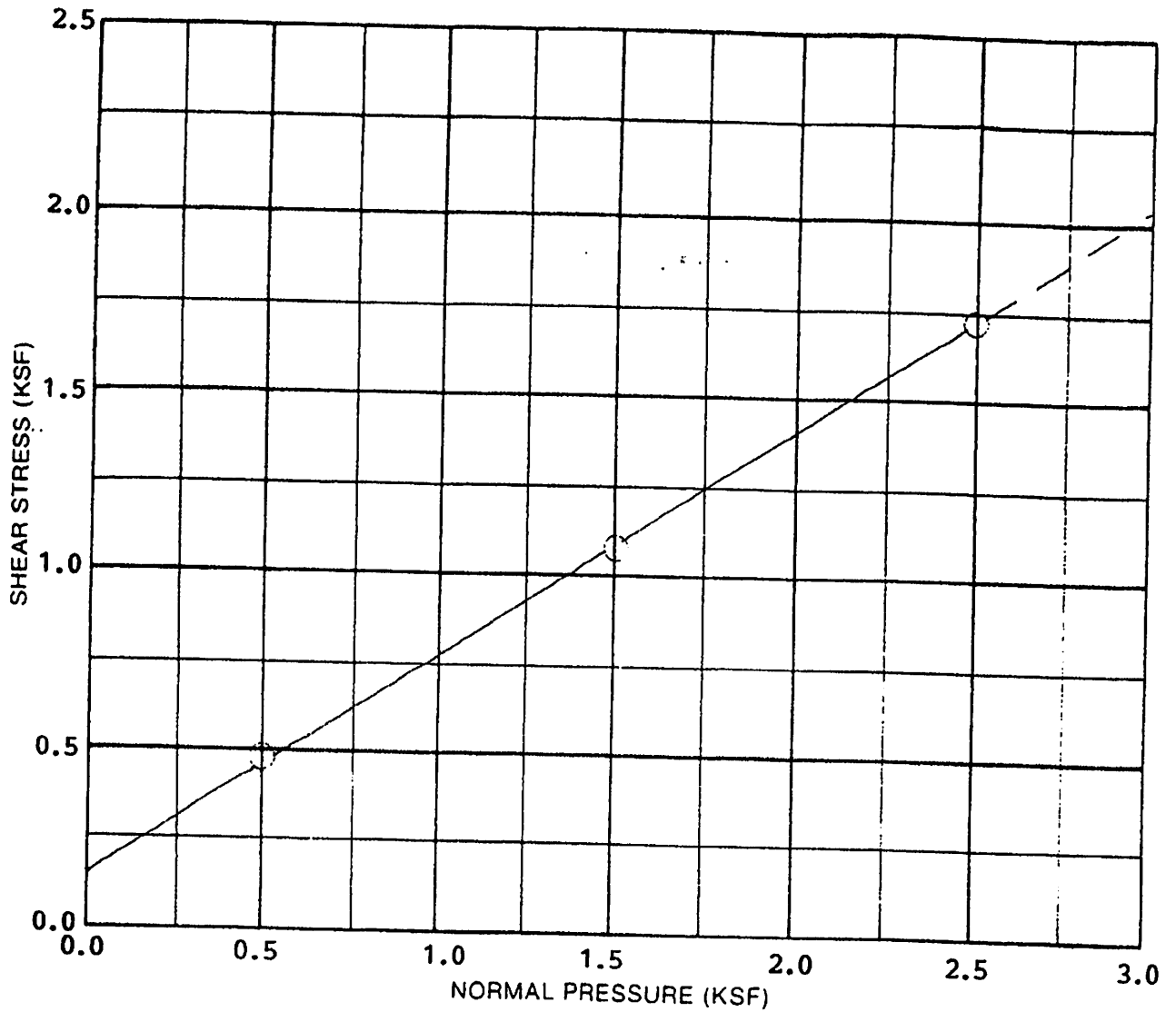
DATE

943 001 C

May 20 2005

Figure 7





SAMPLE DATA	
DESCRIPTION: <b>Medium to olive-brown, clayey, sandy SILT</b>	
BORING NO.: <b>TH-2</b>	
DEPTH (ft.): <b>3.0'</b>	ELEVATION (ft.):
TEST RESULTS	
APPARENT COHESION (C): <b>150 psf</b>	
APPARENT ANGLE OF INTERNAL FRICTION ( $\phi$ ): <b>32°</b>	

TEST DATA				
TEST NUMBER	1	2	3	4
NORMAL PRESSURE (KSF)	0.5	1.5	2.5	
SHEAR STRENGTH (KSF)	0.48	1.09	1.74	
INITIAL H <sub>2</sub> O CONTENT (%)	26.0	26.0	26.0	
FINAL H <sub>2</sub> O CONTENT (%)	25.9	24.2	22.1	
INITIAL DRY DENSITY (PCF)	91.1	91.1	91.1	
FINAL DRY DENSITY (PCF)	91.6	93.1	95.4	
STRAIN RATE: <b>0.02 inches per minute</b>				

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • Portland, OR 97294

DIRECT SHEAR TEST DATA		
1575 BURNS STREET COMMERCIAL SITE West Linn, Oregon		
PROJECT NO.	DATE	
943.001.G	May 20 2005	
		Figure 9

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX E**

---

**FIELD VISIT EXPLORATIONS**



## Field Visit Notes:

A field visit for the Bolton Terrace project located at 1575 Burns Street in West Linn, OR 97068 was conducted on April 14<sup>th</sup>, 2020. The purpose of this visit was to determine if the north fork of Cascade Springs Pond Creek had adequate downstream capacity for the added runoff produced from the developed project site.

During the field visit it was observed that at the mouth of the creek, located near the southeast corner of the project site, the creek had a width of over 30 feet and depth of 10-15 feet. The observed slope at this area was 1.50%.

It was observed, that the creek increases in width and depth further downstream. The next measurement observed was 300 feet downstream. At this point, the creek was greater than 40 feet in depth and greater than 50 feet in width at the widest point. The slope at this point was 1.65%. The width at the bottom of the creek was on average 15 feet in diameter.

These characteristics continue until 1900 feet downstream. The creek decreases to 10 feet in width and approximately 6 feet in depth. The creek then flows through a 30-inch diameter concrete pipe, flowing under River Street and into a 25-foot depth and 30-foot wide creek on the other side. This creek then flows into the Willamette River.

Through field observations, it is determined that Cascade Springs Pond Creek will have more than enough downstream capacity to convey the 0.20 feet of added runoff depth produced by the proposed developed site.

## Field Visit Pictures:

Picture 1:



From mouth of creek looking southeast

Picture 2:



From mouth of creek looking northwest

Picture 3:



From project site looking southeast

Picture 4:



300 ft downstream looking northwest



Picture 5:



300 ft downstream looking southeast

Picture 6:



1900 ft downstream looking west

Picture 7:



1900 ft downstream looking east

Picture 8:



1920ft downstream looking east

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX F**

---

**WATER QUALITY TREATMENT**

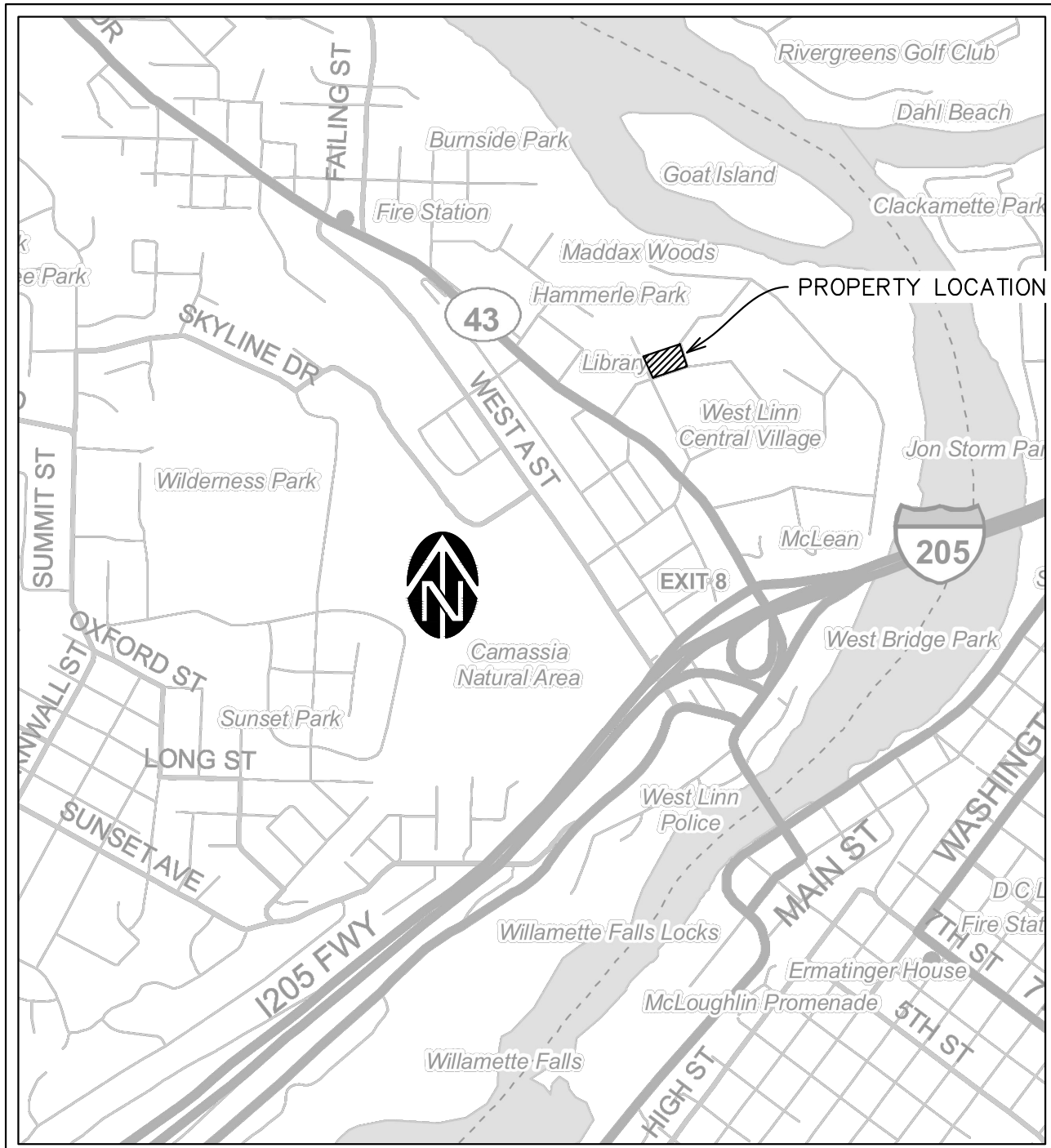
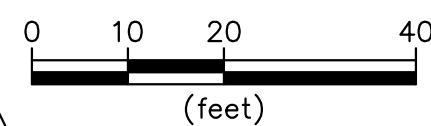


**LEGEND**

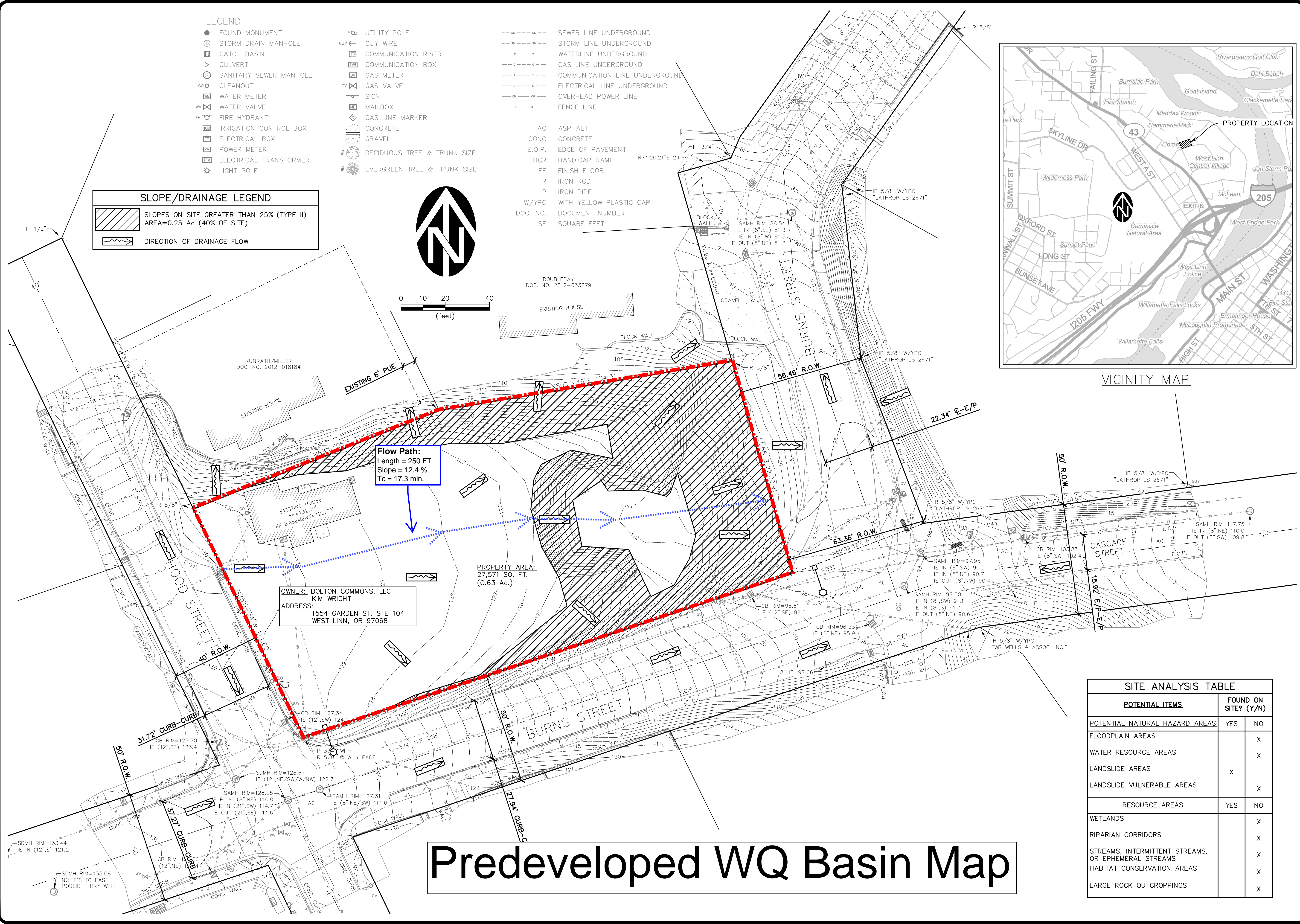
- FOUND MONUMENT
- ⊙ STORM DRAIN MANHOLE
- ▣ CATCH BASIN
- > CULVERT
- ⊙ SANITARY SEWER MANHOLE
- ∞ CLEANOUT
- ⊙ WATER METER
- ⊙ WATER VALVE
- ⊙ FIRE HYDRANT
- ⊙ IRRIGATION CONTROL BOX
- ⊙ ELECTRICAL BOX
- ⊙ POWER METER
- ⊙ ELECTRICAL TRANSFORMER
- ⊙ LIGHT POLE
- ⊙ UTILITY POLE
- GUY WIRE
- ⊙ COMMUNICATION RISER
- ⊙ COMMUNICATION BOX
- ⊙ GAS METER
- ⊙ GAS VALVE
- ⊙ SIGN
- ⊙ MAILBOX
- ⊙ GAS LINE MARKER
- ⊙ CONCRETE
- ⊙ GRAVEL
- ⊙ DECIDUOUS TREE & TRUNK SIZE
- ⊙ EVERGREEN TREE & TRUNK SIZE
- SEWER LINE UNDERGROUND
- STORM LINE UNDERGROUND
- WATERLINE UNDERGROUND
- GAS LINE UNDERGROUND
- COMMUNICATION LINE UNDERGROUND
- ELECTRICAL LINE UNDERGROUND
- OVERHEAD POWER LINE
- FENCE LINE
- AC ASPHALT
- CONC CONCRETE
- E.O.P. EDGE OF PAVEMENT
- HCR HANDICAP RAMP
- FF FINISH FLOOR
- IR IRON ROD
- IP IRON PIPE
- W/YPC WITH YELLOW PLASTIC CAP
- DOC. NO. DOCUMENT NUMBER
- SF SQUARE FEET

**SLOPE/DRAINAGE LEGEND**

- SLOPES ON SITE GREATER THAN 25% (TYPE II) AREA=0.25 Ac (40% OF SITE)
- DIRECTION OF DRAINAGE FLOW



VICINITY MAP



**Flow Path:**  
Length = 250 FT  
Slope = 12.4 %  
Tc = 17.3 min.

**OWNER:** BOLTON COMMONS, LLC  
**KIM WRIGHT**  
**ADDRESS:**  
1554 GARDEN ST. STE 104  
WEST LINN, OR 97068

**PROPERTY AREA:**  
27,571 SQ. FT.  
(0.63 Ac.)

# Predeveloped WQ Basin Map

SITE ANALYSIS TABLE		
POTENTIAL ITEMS	FOUND ON SITE? (Y/N)	
	YES	NO
<b>POTENTIAL NATURAL HAZARD AREAS</b>		
FLOODPLAIN AREAS		X
WATER RESOURCE AREAS		X
LANDSLIDE AREAS	X	
LANDSLIDE VULNERABLE AREAS		X
<b>RESOURCE AREAS</b>	YES	NO
WETLANDS		X
RIPARIAN CORRIDORS		X
STREAMS, INTERMITTENT STREAMS, OR EPHEMERAL STREAMS		X
HABITAT CONSERVATION AREAS		X
LARGE ROCK OUTCROPPINGS		X

VERIFY SCALE: 1" = 40' (AS SHOWN ON ORIGINAL DRAWING)

DSN: JW | DRN: RS | CKD: JW | DATE: 05/20/20

NO. 1 | DESCRIPTION | BY

REVISIONS

**REVIEW**

WILLIAM J. WELLS

REGISTERED PROFESSIONAL ENGINEER

NOV. 12, 2008

REG. NO. 12345

STATE OF OREGON

**WESTTECH ENGINEERING, INC.**  
CONSULTING ENGINEERS AND PLANNERS

3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
Phone: (503) 585-2474 Fax: (503) 585-3966  
E-mail: westtech@westtech-eng.com

LENITY ARCHITECTURE  
ADVANCE DENTAL ARTS

**SITE ANALYSIS PLAN**

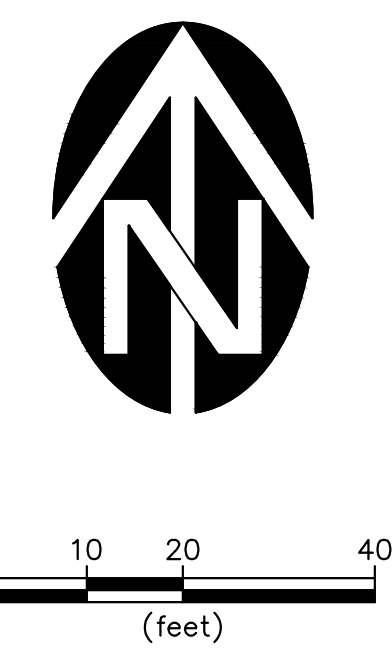
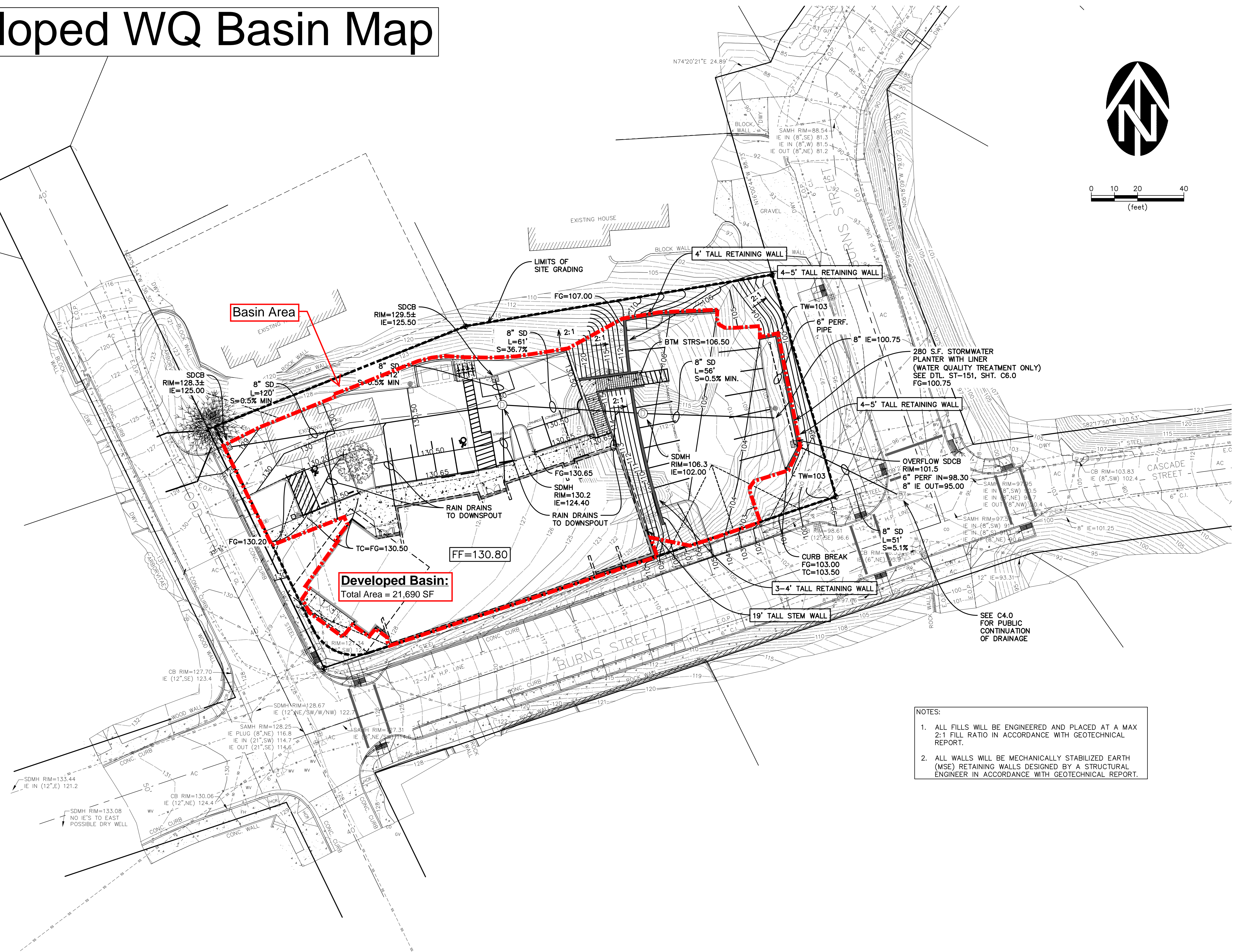
DRAWING  
**C1.0**

JOB NUMBER  
**3132.0000.0**

7/30/2020 5:25:57 PM C:\Users\jwells\Desktop\_VIE Projects\3132.0000.0\Civil\Plots\Site ANALYSIS.dwg (C1.0 tab)



# Developed WQ Basin Map



**Basin Area**

**Developed Basin:**  
Total Area = 21,690 SF

- NOTES:
1. ALL FILLS WILL BE ENGINEERED AND PLACED AT A MAX 2:1 FILL RATIO IN ACCORDANCE WITH GEOTECHNICAL REPORT.
  2. ALL WALLS WILL BE MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS DESIGNED BY A STRUCTURAL ENGINEER IN ACCORDANCE WITH GEOTECHNICAL REPORT.

NO.	DATE	DESCRIPTION	BY
1			

VERIFY SCALE  
BASE IS ONE INCH ON ORIGINAL DRAWING  
IF NOT ONE INCH ON SCALES ACCURACELY

DSN. JW  
DRN. RS  
CKD. JW  
DATE: 05/20/2020

**REVIEW**  
WILLIAM J. WELLS  
REGISTERED PROFESSIONAL ENGINEER  
REV. 12/20/2019  
REVISIONS: 6/20/2020

**WE**  
WESTTECH ENGINEERING, INC.  
CONSULTING ENGINEERS AND PLANNERS  
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
Phone: (503) 585-2474 Fax: (503) 585-3966  
E-mail: westtech@westtech-eng.com

LENITY ARCHITECTURE  
ADVANCE DENTAL ARTS

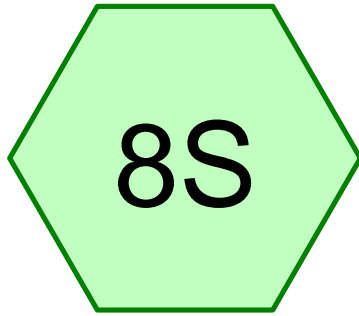
**PRELIMINARY GRADING & DRAINAGE PLAN**

DRAWING  
**C2.0**

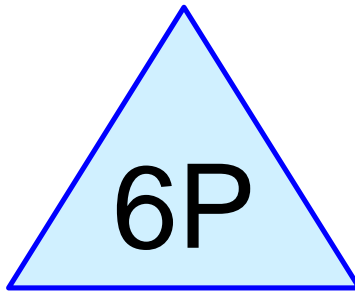
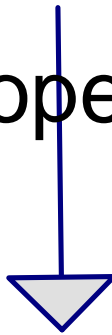
JOB NUMBER  
3132.0000.0

8/5/2020 11:20:58 AM C:\Users\ycpho\Desktop\_VIE Projects\3132.0000.0\Civil\Plots\GRADING & DRAINAGE.dwg (C2.0.tob)

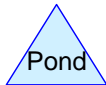
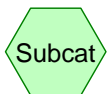




Developed Site



Filtration Planter (12"  
Drain Rock)



**Routing Diagram for Bolton Terrace**  
Prepared by Westech Engineering, Inc., Printed 8/3/2020  
HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC



**Summary for Subcatchment 8S: Developed Site**

Runoff = 0.11 cfs @ 7.91 hrs, Volume= 0.037 af, Depth= 0.91"

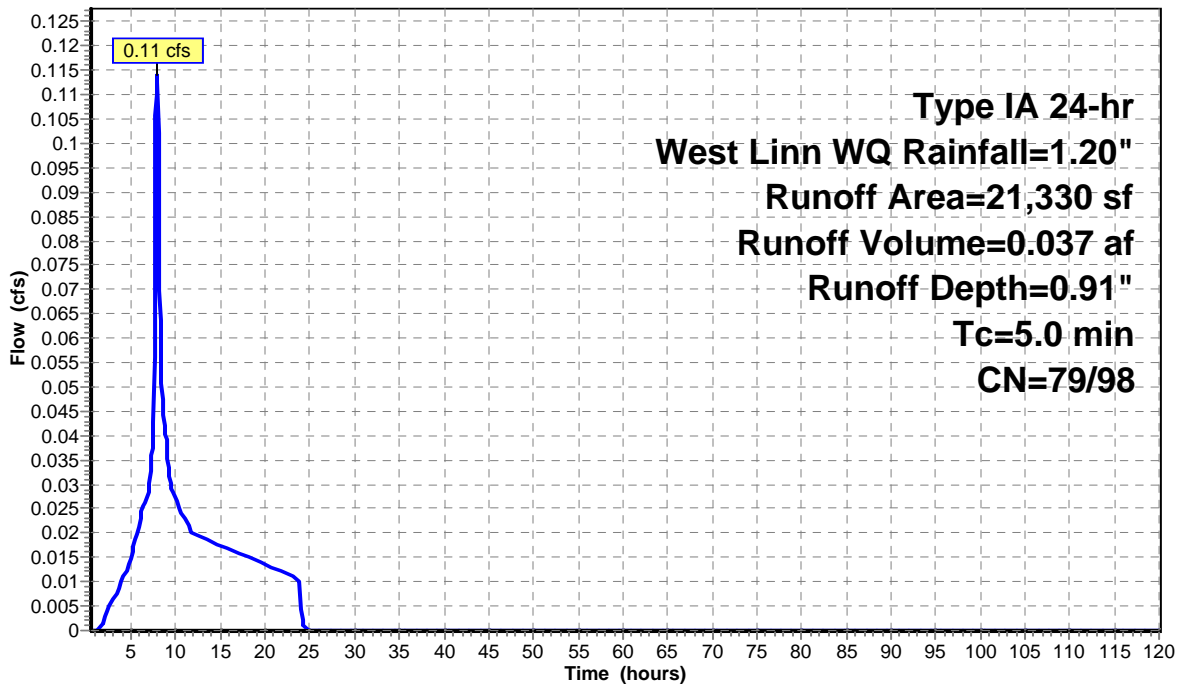
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Type IA 24-hr West Linn WQ Rainfall=1.20"

	Area (sf)	CN	Description
*	19,470	98	rooftop
	1,860	79	50-75% Grass cover, Fair, HSG C
	21,330	96	Weighted Average
	1,860		8.72% Pervious Area
	19,470		91.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 8S: Developed Site**

Hydrograph



**Bolton Terrace**

Type IA 24-hr West Linn WQ Rainfall=1.20"

Prepared by Westech Engineering, Inc.

Printed 8/3/2020

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Page 3

**Summary for Pond 6P: Filtration Planter (12" Drain Rock)**

Inflow Area = 0.490 ac, 91.28% Impervious, Inflow Depth = 0.91" for West Linn WQ event  
 Inflow = 0.11 cfs @ 7.91 hrs, Volume= 0.037 af  
 Outflow = 0.11 cfs @ 7.91 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min  
 Discarded = 0.00 cfs @ 7.91 hrs, Volume= 0.000 af  
 Primary = 0.11 cfs @ 7.91 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 97.50' @ 7.91 hrs Surf.Area= 280 sf Storage= 0 cf

Plug-Flow detention time= 0.0 min calculated for 0.037 af (100% of inflow)  
 Center-of-Mass det. time= 0.0 min ( 708.0 - 707.9 )

Volume	Invert	Avail.Storage	Storage Description	
#1	97.50'	392 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	280	0.0	0	0
98.50	280	40.0	112	112
100.00	280	0.1	0	112
101.00	280	100.0	280	392

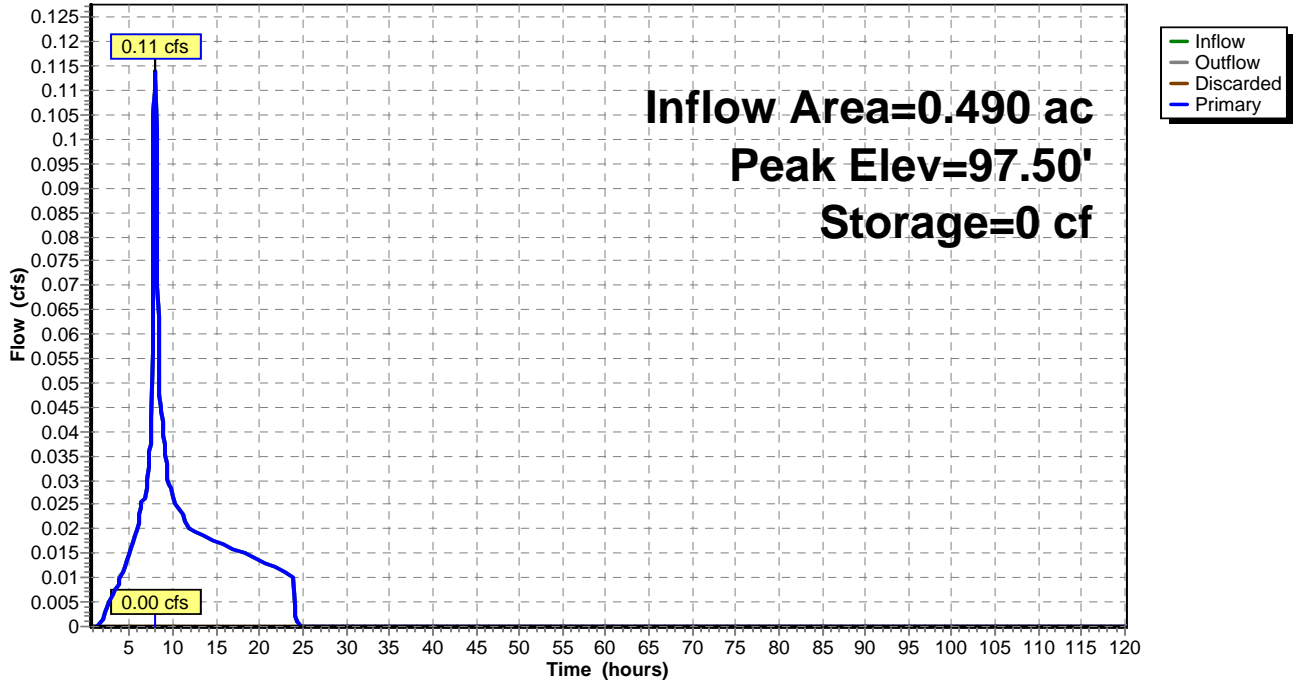
Device	Routing	Invert	Outlet Devices
#1	Discarded	97.50'	<b>0.200 in/hr Exfiltration over Surface area</b>
#2	Primary	95.00'	<b>8.0" Vert. Orifice/Grate</b> C= 0.600

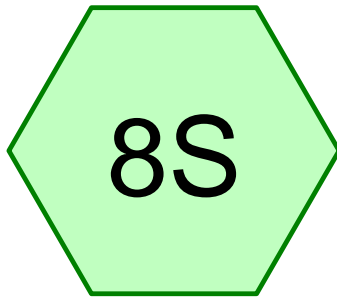
**Discarded OutFlow** Max=0.00 cfs @ 7.91 hrs HW=97.50' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

**Primary OutFlow** Max=2.47 cfs @ 7.91 hrs HW=97.50' (Free Discharge)  
 ↑2=Orifice/Grate (Orifice Controls 2.47 cfs @ 7.09 fps)

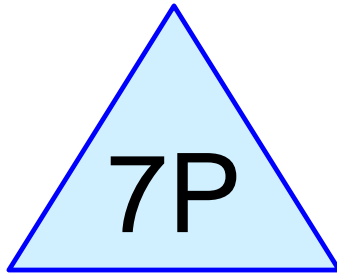
Pond 6P: Filtration Planter (12" Drain Rock)

Hydrograph

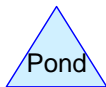
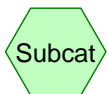




Developed Site



Filtration Planter  
(Surface Test)



**Routing Diagram for Bolton Terrace**  
Prepared by Westech Engineering, Inc., Printed 8/3/2020  
HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

**Summary for Subcatchment 8S: Developed Site**

Runoff = 0.11 cfs @ 7.91 hrs, Volume= 0.037 af, Depth= 0.91"

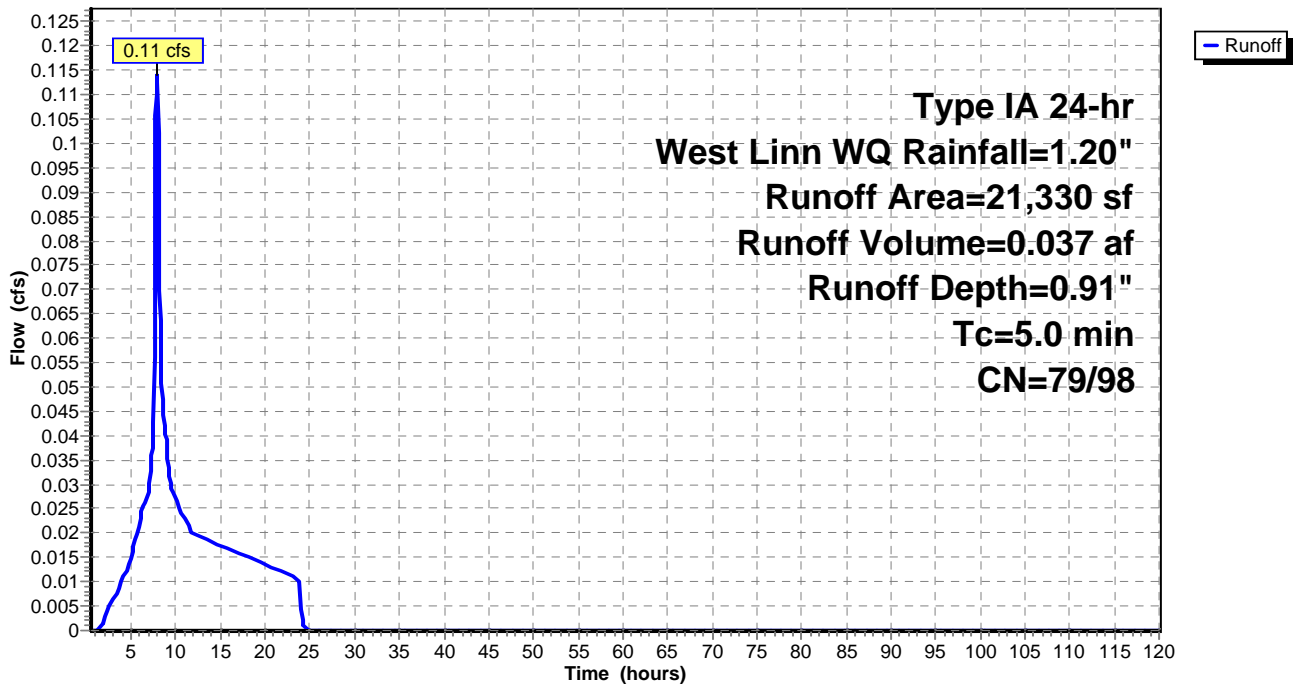
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn WQ Rainfall=1.20"

	Area (sf)	CN	Description
*	19,470	98	rooftop
	1,860	79	50-75% Grass cover, Fair, HSG C
	21,330	96	Weighted Average
	1,860		8.72% Pervious Area
	19,470		91.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 8S: Developed Site**

Hydrograph



**Bolton Terrace**

Type IA 24-hr West Linn WQ Rainfall=1.20"

Prepared by Westech Engineering, Inc.

Printed 8/3/2020

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Page 3

**Summary for Pond 7P: Filtration Planter (Surface Test)**

Inflow Area = 0.490 ac, 91.28% Impervious, Inflow Depth = 0.91" for West Linn WQ event  
 Inflow = 0.11 cfs @ 7.91 hrs, Volume= 0.037 af  
 Outflow = 0.04 cfs @ 8.78 hrs, Volume= 0.037 af, Atten= 63%, Lag= 51.8 min  
 Discarded = 0.04 cfs @ 8.78 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 100.68' @ 8.78 hrs Surf.Area= 280 sf Storage= 189 cf

Plug-Flow detention time= 26.4 min calculated for 0.037 af (100% of inflow)  
 Center-of-Mass det. time= 26.4 min ( 734.3 - 707.9 )

Volume	Invert	Avail.Storage	Storage Description			
#1	100.00'	560 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
100.00	280	0.0	0	0	280	
102.00	280	100.0	560	560	399	

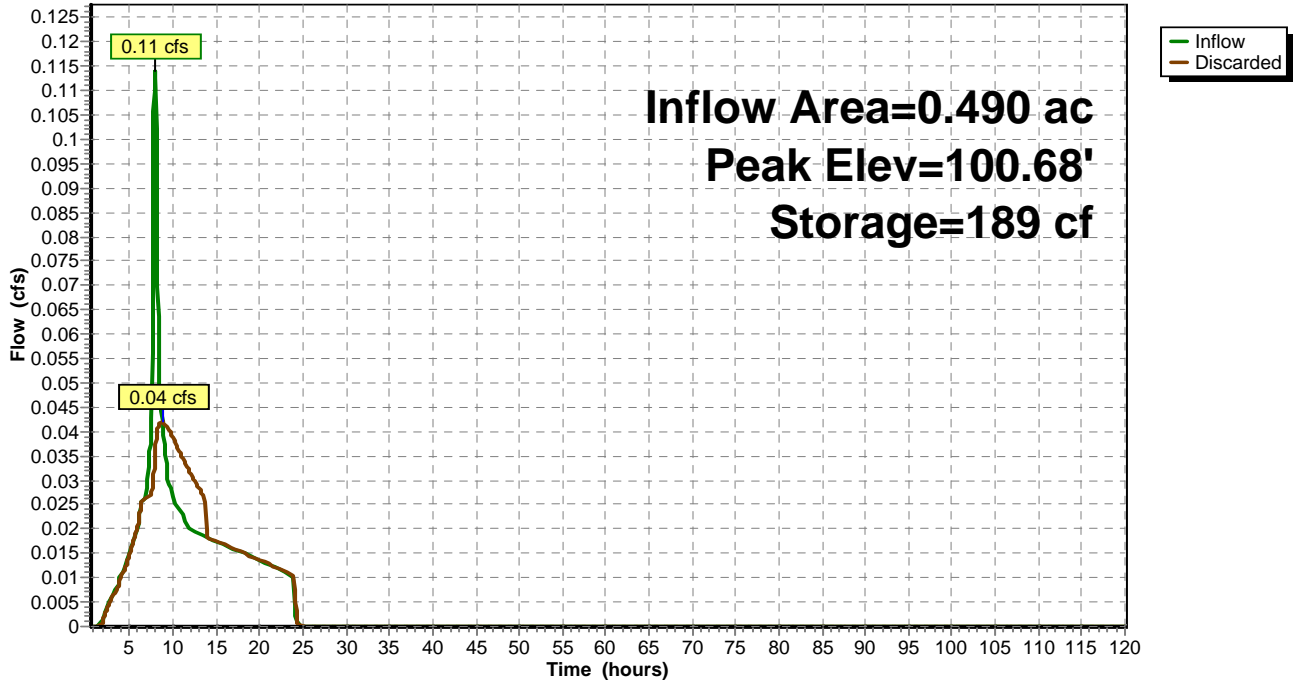
Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	<b>4.000 in/hr Exfiltration over Wetted area</b> Conductivity to Groundwater Elevation = 98.50'

**Discarded OutFlow** Max=0.04 cfs @ 8.78 hrs HW=100.68' (Free Discharge)  
 ↑1=Exfiltration ( Controls 0.04 cfs)



**Pond 7P: Filtration Planter (Surface Test)**

Hydrograph



# SITE STORMWATER AND DOWNSTREAM ANALYSIS REPORT

**Prepared For:**

Lenity Architecture  
3150 Kettle Ct SE  
Salem, OR 97301

**Project Location:**

Bolton Terrace  
1575 Burns Street  
West Linn, OR 97068

**Permit Number:** CO -

**Prepared By:**



Renews: 6/30/2020



Westech Engineering, Inc.  
3841 Fairview Industrial Drive SE, Suite 100  
Salem, OR 97302  
(503) 585-2474 FAX: (503) 585-3986

# TABLE OF CONTENTS

---

<b>Chapter</b>	<b>Page</b>
<b>1 Project Overview &amp; Description .....</b>	<b>1-1</b>
1.1 Size & Location of Project .....	1-1
1.2 Brief description of project scope and proposed improvements.....	1-1
1.3 Description of Size of Watershed Draining to the Site.....	1-1
1.4 Description of the Existing Site Conditions, Trees & Native Vegetation, Constraints, Sensitive Areas & Waterways .....	1-1
1.5 Regulatory Permits Required.....	1-1
1.6 Emergency Storm Escape Routes.....	1-1
<b>2 Methodology .....</b>	<b>2-1</b>
2.1 Depth to Groundwater .....	2-1
2.2 Maximum Infiltration and Vegetative Treatment.....	2-1
2.3 Soil Information.....	2-1
2.4 Hazardous Material.....	2-1
<b>3 Analysis.....</b>	<b>3-1</b>
3.1 Methods & Software Used.....	3-1
3.2 Curve Number and Time of Concentration Calculations .....	3-1
3.3 Review of Resources & Drainage Basin .....	3-1
3.4 Inspection of Affected Area.....	3-1
3.5 Treatment & Water Quality .....	3-2
3.6 Conveyance System & Analysis of Downstream Effects.....	3-3
3.7 Summary.....	3-4

## LIST OF TABLES

---

<b>Table</b>	<b>Page</b>
Table 1   City of West Linn 24-hour Design Storms .....	3-1
Table 2   Summary of Developed & Allowable Flow for 48-inch Manhole with Up-Flo Filter .....	3-2
Table 3   Summary of Site Peak Flows.....	3-2
Table 3   City of Gresham Conveyance Design Storm Sizing Criteria.....	3-3
Table 3   Summary of Cascade Springs Pond Creek During 50-year Storm .....	3-3

## APPENDICES

---

Appendix A	Basin Maps & Resources
Appendix B	NRCS Soil Report
Appendix C	HydroCAD Summaries
Appendix D	Geotechnical Report
Appendix E	Field Visit Explorations

## 1.1 SIZE & LOCATION OF PROJECT

The proposed project is located on a primarily undeveloped 27,210 square feet lot at 1575 Burns Street in West Linn, Oregon. There is currently a 1,000 square foot house on the lot that will be removed prior to construction. Refer to the Civil Drawings for more detail.

## 1.2 BRIEF DESCRIPTION OF PROJECT SCOPE AND PROPOSED IMPROVEMENTS

The project scope is to develop the full 27,210 square foot lot. The new development will include two one new commercial building and associated parking and landscaping.

## 1.3 DESCRIPTION OF SIZE OF WATERSHED DRAINING TO THE SITE

The 27,210 square foot developed site will drain to an existing 12-inch stormwater pipe located in the southeast corner of the lot. This stormwater pipe then drains into the north fork of Cascade Springs Pond Creek. No other areas drain to the developed site.

## 1.4 DESCRIPTION OF THE EXISTING SITE CONDITIONS, TREES & NATIVE VEGETATION, CONSTRAINTS, SENSITIVE AREAS & WATERWAYS

The existing site is currently undeveloped with a 1,000 square feet single family home on the lot. There are multiple trees on the site and the ground is covered with grass. The westerly portion of the lot is relatively flat, while the eastern portion is moderately sloped descending to the east. Numerous small to large sized trees exist on site.

## 1.5 REGULATORY PERMITS REQUIRED

City of West Linn permits are required. No other permits are required for this project.

## 1.6 EMERGENCY STORM ESCAPE ROUTES

Please refer to the Developed Basin Map in Appendix A for emergency overflow routes.

## 2.1 DEPTH TO GROUNDWATER

Per the Geotechnical Report in Appendix D, groundwater seepage was not encountered and is not expected during construction. See the Geotech Report in Appendix D for details.

## 2.2 MAXIMUM INFILTRATION AND VEGETATIVE TREATMENT

The proposed stormwater design will not provide detention for onsite runoff due to topography constraints. Detention is not required because Cascade Springs Pond Creek has adequate downstream capacity. During the field visit conducted on April 14, 2020, it was determined that Cascade Springs Pond Creek will not see adverse effects due to the increase in stormwater runoff, created by the site, draining into the creek. See Appendix E for details on the field explorations. A Contech stormfilter will be designed to treat the water quality storm event because the site is extremely steep and infiltration is not feasible. See the Civil Drawings for more details.

## 2.3 SOIL INFORMATION

The pre-developed project site contains hydrologic soil group C soils. Refer to the Soils Report in Appendix B for more details.

## 2.4 HAZARDOUS MATERIAL

The owner is not aware of any hazardous material contamination onsite.



**3.1 METHODS & SOFTWARE USED**

HydroCAD modeling software was used to size the stormwater facilities. The Santa Barbara Unit Hydrograph Type 1A storm was used to model the required design storms. Per the City of West Linn Design Standards the design storms used were the 1.2 inch, 24-hour (water quality storm), half the 2-year, 24-hour and the 10-year, 24-hour storm events.

**Table 1 | City of West Linn 24-hour Design Storms**

	24-Hour Rainfall Depths for West Linn, OR							
Recurrence Interval, Years	2	5	10	25	50	100	500	WQ
24-Hour Depths, Inches	2.5	3.0	3.4	3.9	4.3	4.5	5.3	1.2

*Source: City of West Linn Stormwater Management Plan*

**3.2 CURVE NUMBER AND TIME OF CONCENTRATION CALCULATIONS**

Curve numbers were derived from the NRCS runoff curve numbers contained in TR-55 *Urban Hydrology for Small Watersheds* per the City of Gresham Standards. The developed impervious area and pervious areas were assigned curve numbers of 98 and 79 respectively. The impervious areas were assigned a curve number of 98 which corresponds to paved/parking areas. The pervious areas were assigned a curve number of 79 which corresponds to amended soil coverage with C-rated soils.

Time of concentration (Tc) for the pre-developed conditions was calculated to be 15 minutes using the sheet flow equation. See the Pre-Developed Basin Map in Appendix A for the flow path used and refer to the HydroCAD Summaries in Appendix C for calculations. A minimum time of concentration of 5 minutes is applied to the developed basin due to the minimum time-step used by the HydroCAD modeling software.

**3.3 REVIEW OF RESOURCES & DRAINAGE BASIN**

The entire 27,210 square foot lot will drain into Cascade Springs Pond Creek. There are five sub-basins within the Cascade Springs basin. The project site is located within the CS2N1 sub-basin per the West Linn Stormwater Management Plan. For more detail and resources refer to Appendix A.

**3.4 INSPECTION OF AFFECTED AREA**

No problem areas or areas of concern were notable during the review of resources. Additionally, there were no existing or potential areas where flooding, capacity problems, channel destruction, or significant destruction of aquatic habitat identified in the inspection.

### 3.5 TREATMENT & WATER QUALITY

The proposed design uses proprietary treatment in lieu of green stormwater management. A 48-inch manhole with a Contech StormFilter is proposed to treat the water quality storm event and provide adequate capacity for the 100-year storm event.

**Table 2 | Summary of Developed & Allowable Flow for 48-inch Manhole with Up-Flo Filter**

Design Storm	Developed Site Flow (cfs)	Allowable Flow (cfs)
WQ Event	0.14	0.15 <sup>1</sup>
Overflow 100-Year	0.63	1.00

<sup>1</sup>Allowable release rate for Contech StormFilter with 3 filter modules

Table 2 above displays that a 48-inch Manhole equipped with a Contech StormFilter with 3 filter cartridges will provide treatment for the water quality event and have capacity for the 100-year storm.

**Table 3 | Summary of Site Peak Flows**

Basin ID	Source (Roof/Road/Other)	Impervious Area (sq ft)	Pervious Area (sq ft)	Design Storms			CN	Tc
				WQ (cfs)	10 Year (cfs)	100 Year (cfs)		
PD	Native	-	27,210	-	0.15	0.29	79	15
DEV	Paved/Landscape	22,510	4,700	0.14	0.45	0.62	98/79 <sup>2</sup>	5.0

<sup>1</sup> PD = pre-developed site conditions (i.e., pre-developed release rates)

<sup>2</sup> The first curve number listed is for the impervious area in the basin (98), then for the pervious area (80)

Table 3 above depicts the runoff experience from developed site compared to that of the predeveloped site. The design storms analyzed were provided in the West Linn Stormwater Management Plan and consisted of the water quality, 10-year, and 100-year, 24-hour storm events.

The proposed Contech Stormfilter system is designed to provide treatment for the water quality storm event and have adequate capacity for the 100-year, 24-hour storm event.

### 3.6 CONVEYANCE SYSTEM & ANALYSIS OF DOWNSTREAM EFFECTS

Per City of West Linn Design Standards, this project is exempt from detention requirements due to adequate downstream capacity of conveyance system. However, a downstream analysis was conducted per the City of Gresham Standards to determine if Cascade Springs Pond Creek will have adequate capacity. The following table provides the COG design storm sizing criteria.

**Table 3 | City of Gresham Conveyance Design Storm Sizing Criteria**

Structure or Facility	Design Storm Recurrence Interval (years)	
Storm sewers, ditches, and outfall pipes	Draining less than 250 acres	10
	Draining greater than 250 acres	50
Creek or stream Channels	Without designated floodplain	50
	With designated floodplain	100
Culverts and bridges	100	

The downstream analysis was conducted using the 50-year, 24-hour design storm per COG Design Standards for a creek with drainage area less than 50 acres.

Peak flow rates for each sub-basin within the Cascade Springs basin were provided by the West Linn Stormwater Management Plan. Additionally, peak flow rates for the junction of sub-basins were also provided. The junction node CSJ2 was selected for this analysis. The peak flow of CSJ2 was combined with the added onsite runoff for the 50-year, 24-hour storm event to determine adequate downstream capacity. Based on inspection and mapping, the creek has 1,500 feet of length, 3:1 side slopes, a width varying 10-30 feet at the bottom, slope of 1.50%, a depth of 10-30 feet, and a Manning’s number of 0.03 was used, corresponding to a typical open, earth channel, that is grassed and winding. See below for water depth in channel, calculated using Manning’s Equation.

**Table 3 | Summary of Cascade Springs Pond Creek During 50-year Storm**

Basin ID	Drainage Area (acres)	50-Year (cfs)	Water Depth in Channel (ft) <sup>a</sup>
CSJ2	55.04	31.15	1.31
DEV	0.62	0.59	0.20
<b>Total</b>	<b>55.56</b>	<b>31.74</b>	<b>1.32<sup>a</sup></b>

<sup>a</sup>Totals do not sum to the addition of the individual flows. This is due to the fact that the time of concentration per basin varies. The totals are the combination of the basin hydrographs. Refer to Link: OUT in Appendix D.

The calculations in Table 3 above display the added runoff to the Cascade Springs Pond Creek that will result from the developed project. The undetained developed 50-year event runoff peak for the site is 0.59 cfs. The developed runoff only contributes to approximately 2% of the total runoff conveyed by Cascade Springs Pond Creek. The peak water surface elevation will rise approximately a tenth of an inch with the added runoff from the developed site. Therefore, the conveyance system will provide adequate capacity for developed stormwater runoff and detention facilities are not required onsite.

### 3.7 SUMMARY

The stormwater system consisting of a 48-inch manhole with a Contech StormFilter with 3 stormfilter cartridges has been designed to treat the water quality storm, and have capacity for the 100-year storm event. Detention was not required to be provided on site because Cascade Springs Pond Creek has adequate downstream capacity. Therefore, the project can meet the flow control and treatment requirements as set forth in the City of West Linn Stormwater Management Plan and the City of Gresham Stormwater Management Manual.

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX A**

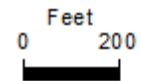
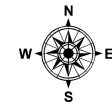
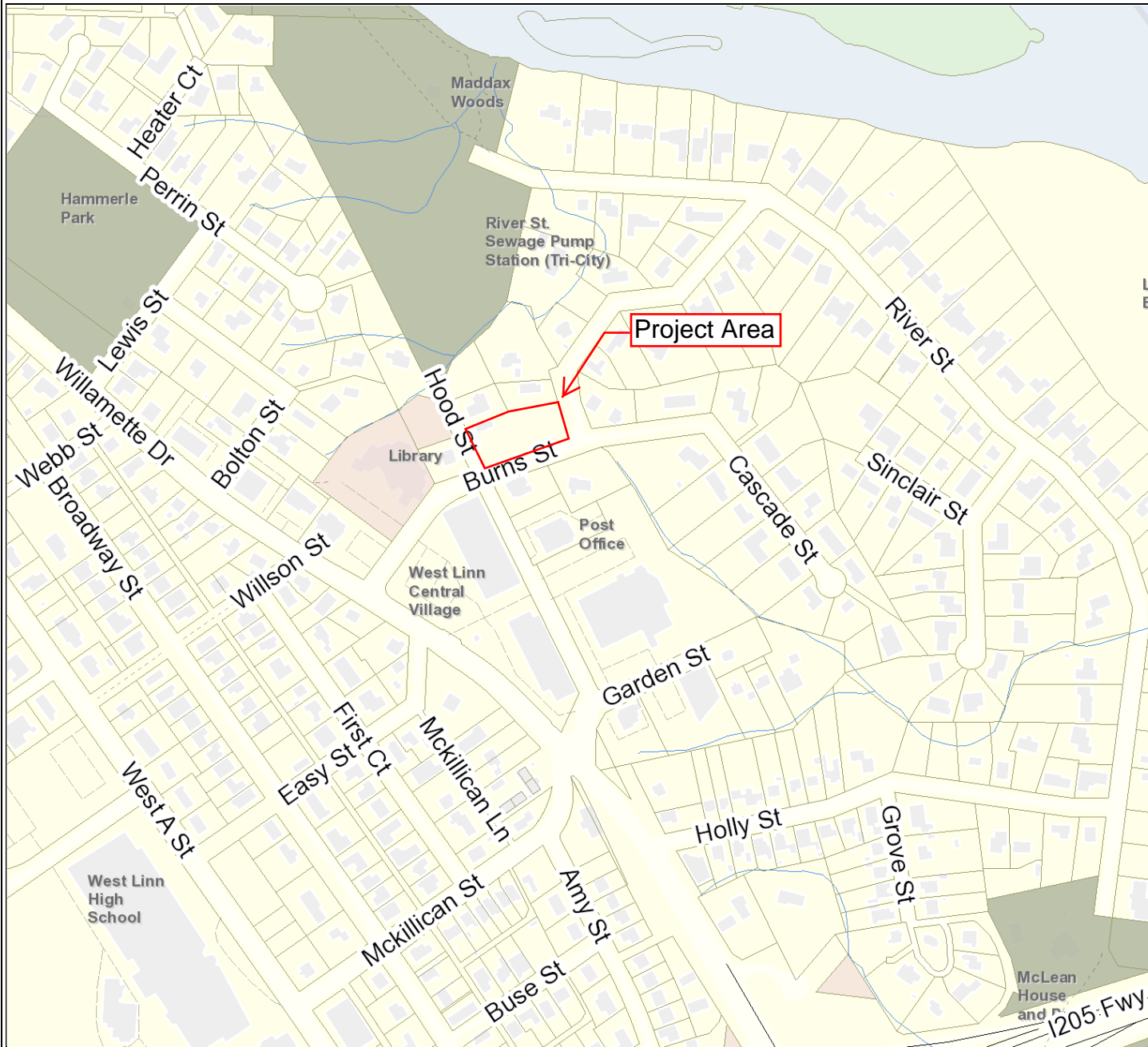
---

**BASIN MAPS & RESOURCES**

# BASIN & AREA MAPS



# Project Area Map



Scale 1:4,800 - 1 in = 400 ft  
Scale is based on 8-1/2 x 11 paper size



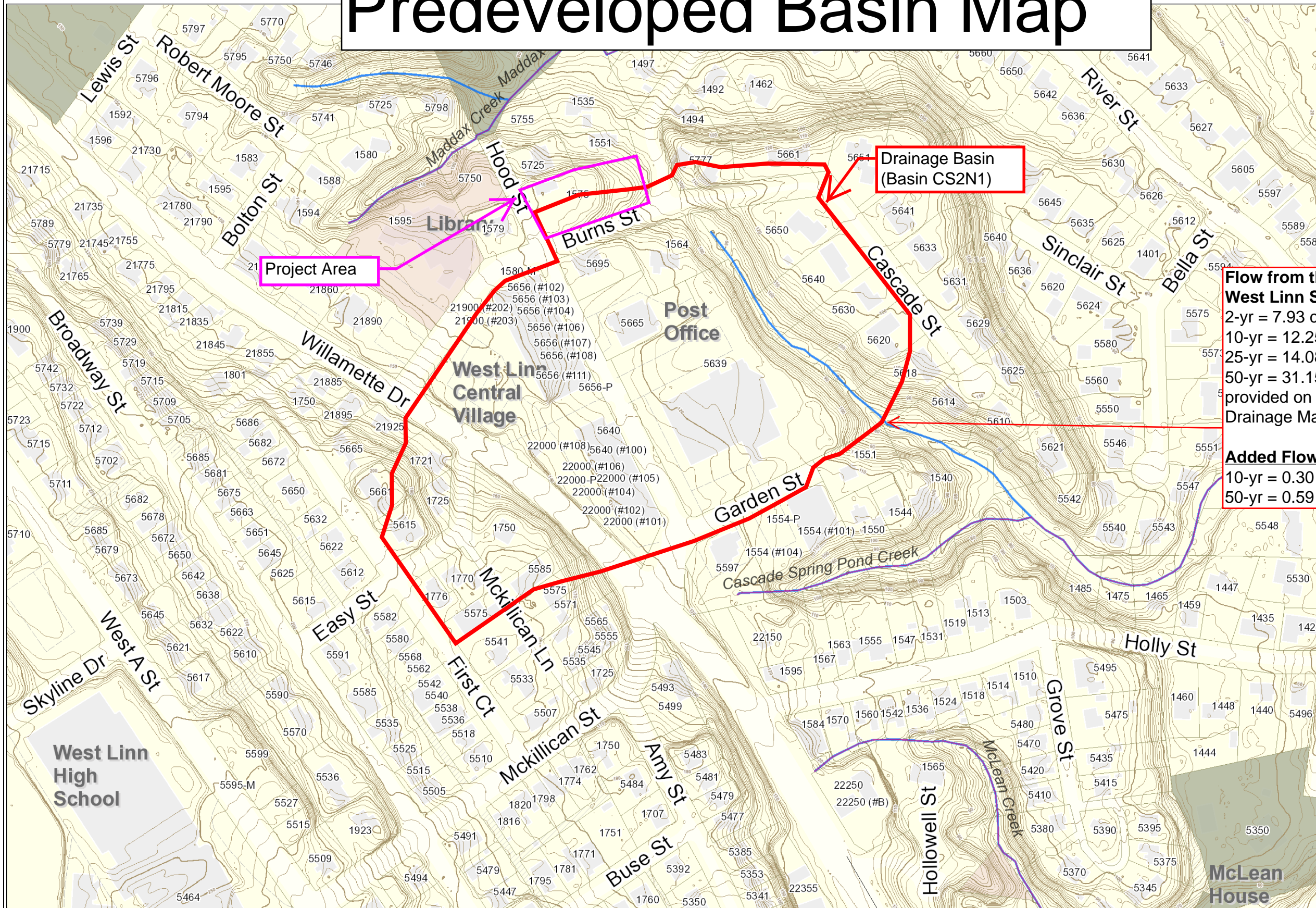
Map created by: public  
Date Created: 30-Jan-20 02:24 PM

**WEST LINN GIS**

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

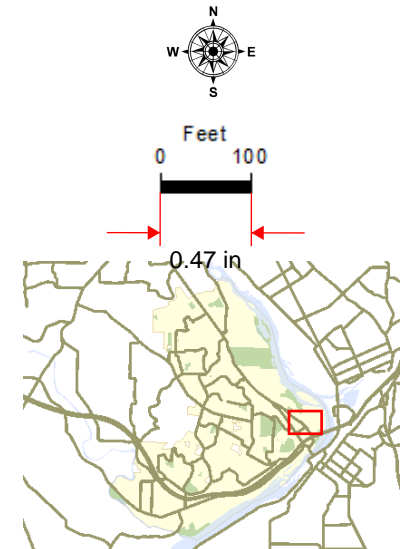


# Predeveloped Basin Map



**Flow from this node according to 2019 West Linn Storm Drainage Master Plan:**  
 2-yr = 7.93 cfs  
 10-yr = 12.25 cfs  
 25-yr = 14.08 cfs  
 50-yr = 31.15 cfs (50-yr storm value only provided on 2006 West Linn Storm Drainage Master Plan)

**Added Flow From Project:**  
 10-yr = 0.30 cfs  
 50-yr = 0.59 cfs

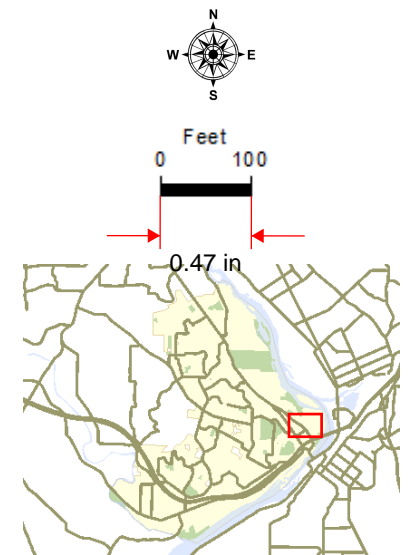


DISCLAIMER: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Map scale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

Map created by: public  
 Date Created: 29-Apr-20 02:46 PM  
**WEST LINN GIS**



# Developed Basin Map



Map created by: public  
Date Created: 29-Apr-20 02:46 PM

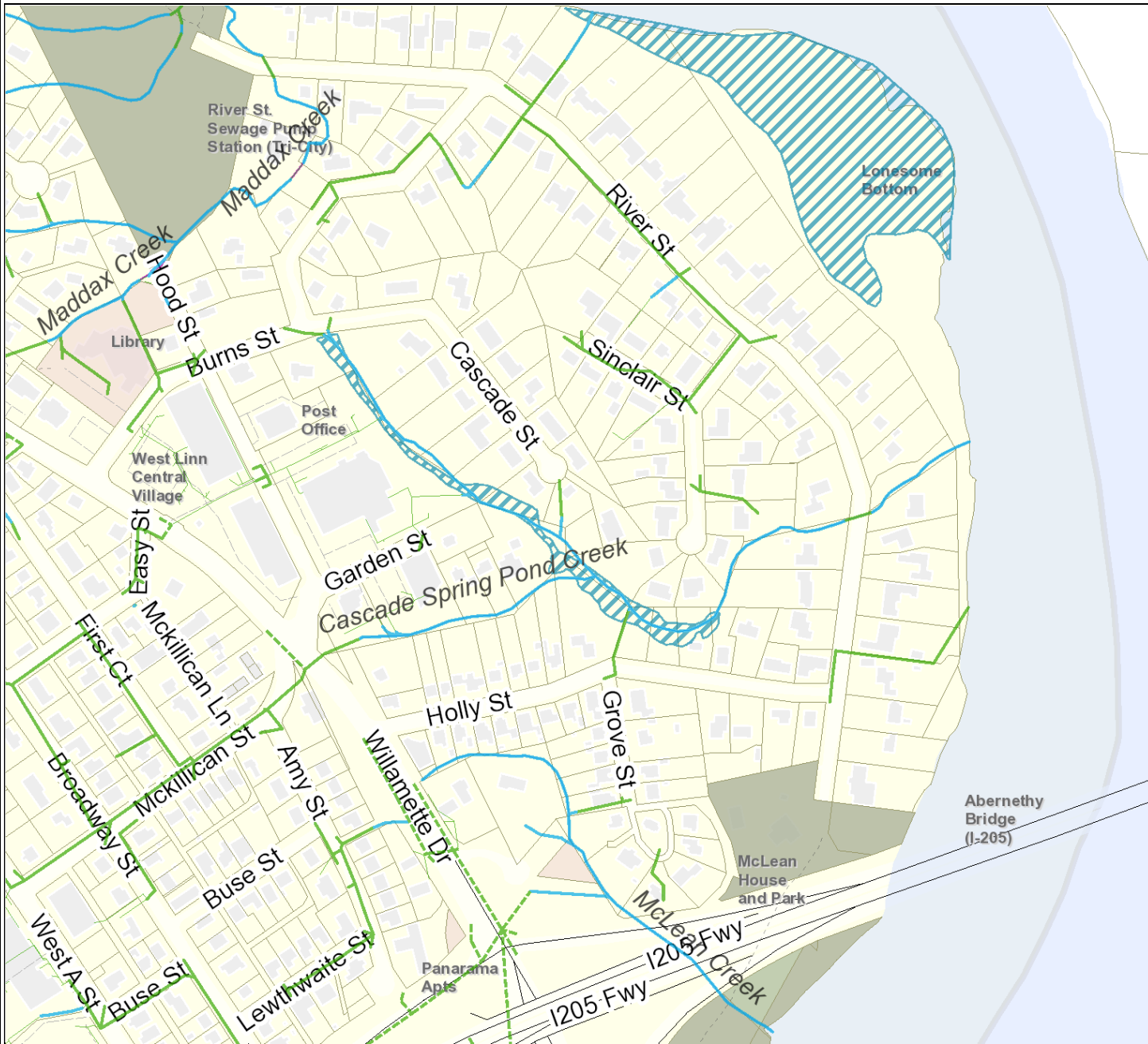
**WEST LINN GIS**

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



# WETLAND, AND HABITAT INVENTORY

# Wetland Inventory Map

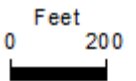
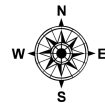


## Legend

- Storm Lines
- Storm Pipes
- - - Storm Pipes County
- - - Storm Pipes ODOT
- Ditches and Creeks
- Private Pipes

## Wetland Inventory 2005 Goal

5



Scale 1:4,800 - 1 in = 400 ft  
Scale is based on 8-1/2 x 11 paper size



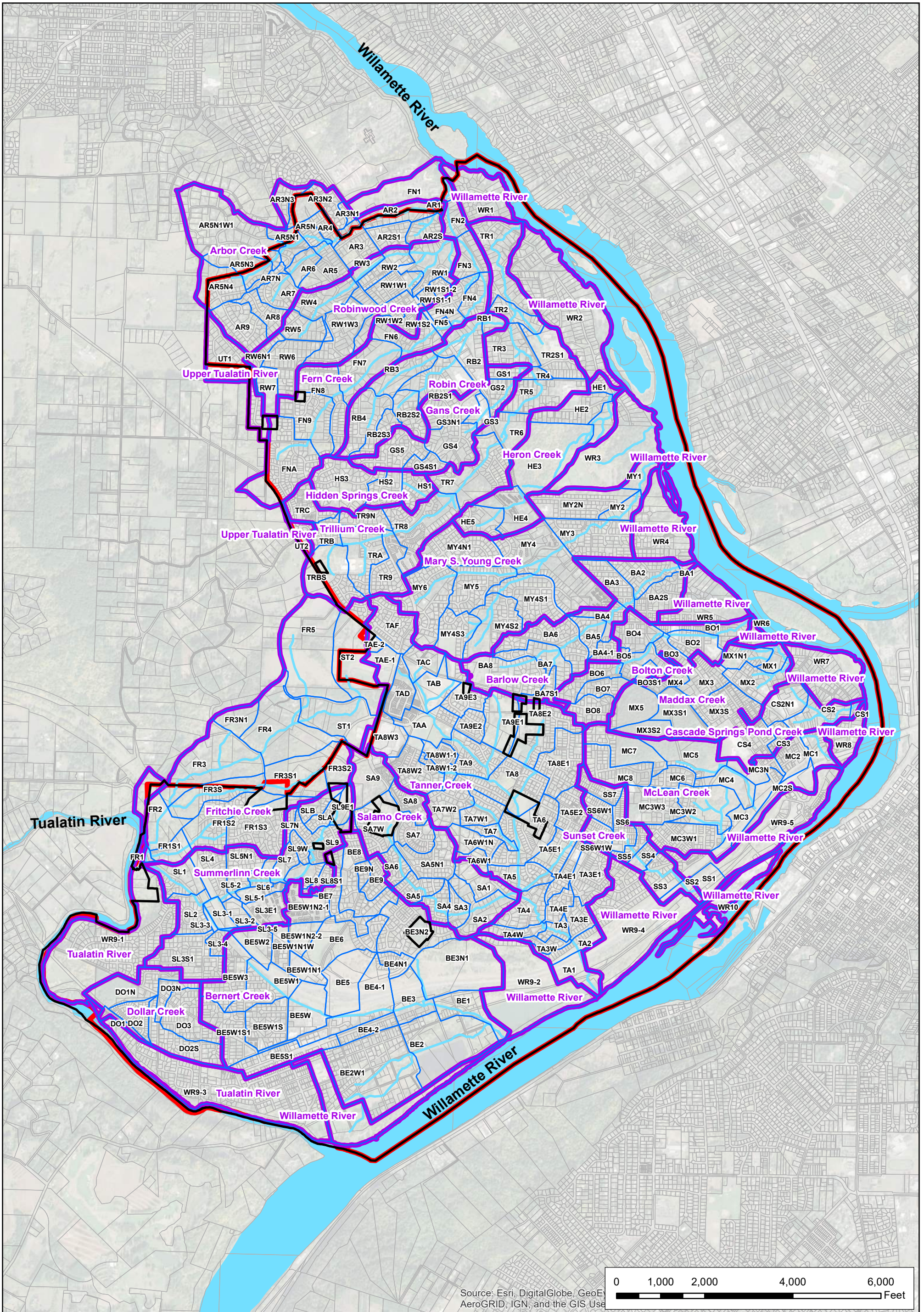
Map created by: public  
Date Created: 30-Jan-20 02:47 PM

**WEST LINN GIS**

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

# BASIN INFORMATION





1:24,000 scale



**CITY OF WEST LINN, OREGON**  
 Storm Drainage and Sanitary Master Plan 2019

Figure B-1: Stormwater Subbasins

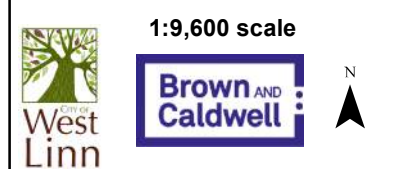
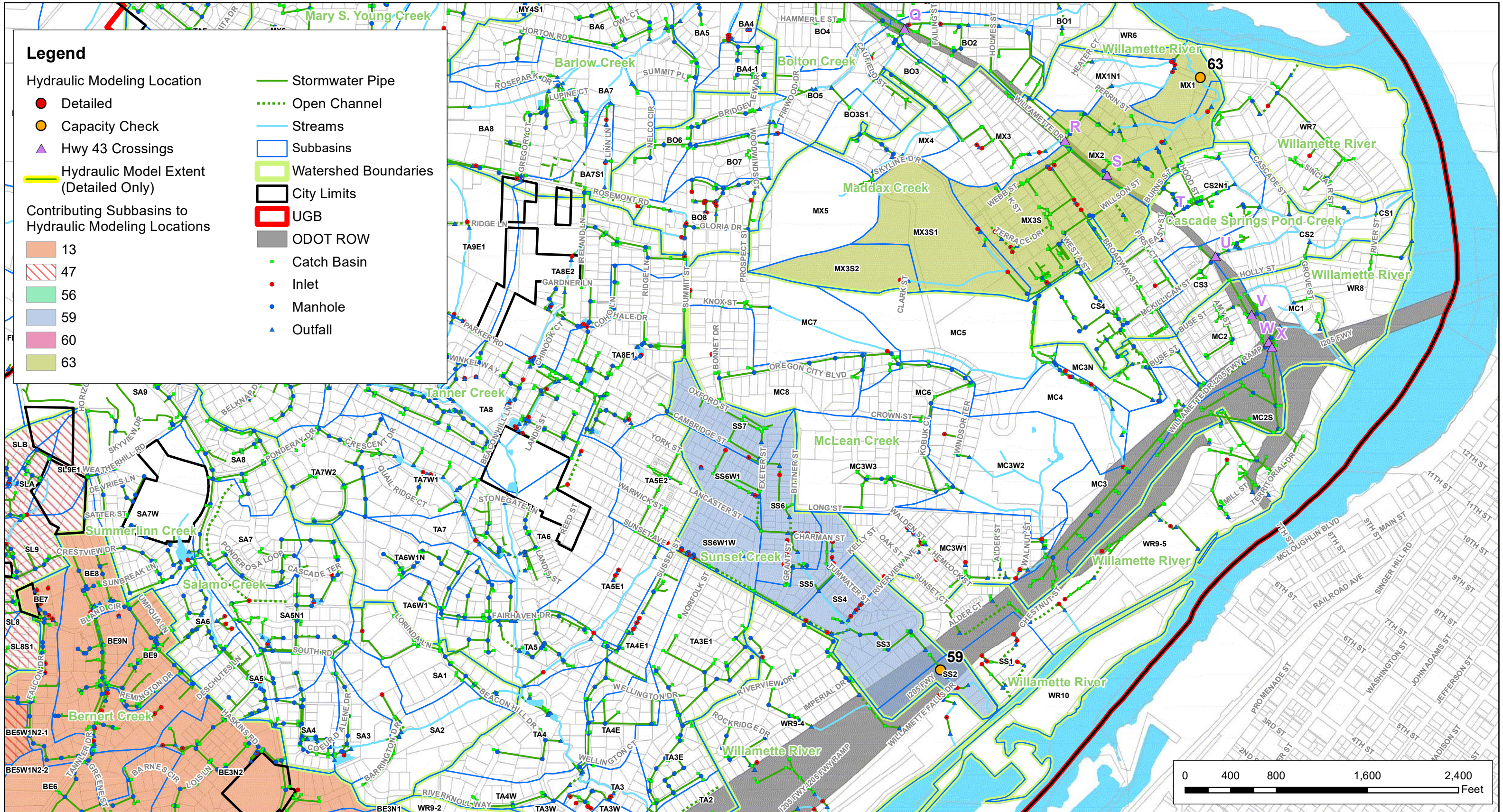
- City Boundary
- UGB
- Subbasins
- Watershed Boundaries
- Streams

Data Source: City of West Linn GIS and Metro RLIS

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

Map Publication/Print Date: November 2018 Produced by Brown and Caldwell





Data Source: City of West Linn GIS and Metro RLIS

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

Map Publication/Print Date: November 2018 Produced by Brown and Caldwell

**CITY OF WEST LINN, OREGON**  
 Storm Drainage and Sanitary Master Plan 2019  
 Figure B-4: Hydraulic Modeling Overview (South)



**Attachment A. Table A-1: Hydrology Parameters and Model Results**

Basin ID	Area (acres)	Width (ft)	Slope (ft/ft)	Existing Impervious Percentage	Future Impervious Percentage	Existing Land Use			Future Land Use			Future Land Use			Future Land Use		
						Maximum Flow (cfs)			Maximum Flow (cfs)			Absolute Increase in Maximum			Percent Increase in Maximum Flow		
						2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr
BE5W	21.46	862.53	0.03	56.19	56.19	9.37	15.47	17.78	9.37	15.47	17.78	0.00	0.00	0.00	0.00	0.00	0.00
BE5W1	23.58	631.68	0.06	32.24	32.24	7.82	15.52	18.21	7.82	15.52	18.21	0.00	0.00	0.00	0.00	0.01	0.00
BE5W1N1	7.87	423.89	0.05	84.69	84.69	4.29	6.16	7.02	4.29	6.16	7.02	0.00	0.00	0.00	0.00	0.00	0.00
BE5W1N1W	9.50	210.81	0.05	66.69	66.69	4.27	6.82	7.84	4.27	6.82	7.84	0.00	0.00	0.00	0.00	0.00	0.00
BE5W1N2-1	15.77	363.01	0.07	34.26	48.79	5.18	10.27	12.09	6.23	10.98	12.72	1.05	0.70	0.63	20.36	6.85	5.23
BE5W1N2-2	8.98	361.75	0.15	68.66	84.98	4.73	7.03	8.01	5.02	7.13	8.11	0.29	0.10	0.10	6.18	1.39	1.21
BE5W1S	21.41	550.38	0.04	31.82	31.95	6.44	13.34	15.87	6.45	13.35	15.88	0.01	0.01	0.01	0.22	0.09	0.06
BE5W1S1	22.68	464.81	0.02	31.11	31.67	5.77	12.42	15.20	5.83	12.48	15.26	0.06	0.06	0.06	1.06	0.50	0.39
BE5W2	11.96	526.59	0.02	43.29	43.29	4.61	8.29	9.61	4.61	8.29	9.61	0.00	0.00	0.00	0.00	0.00	0.00
BE5W3	21.99	632.15	0.06	30.71	30.71	7.27	14.49	17.00	7.27	14.49	17.00	0.00	0.00	0.00	0.00	0.00	0.00
BE6	28.38	505.71	0.13	21.24	48.79	7.75	17.42	20.79	11.48	19.97	23.08	3.73	2.54	2.29	48.17	14.60	11.01
BE7	15.60	291.98	0.08	29.67	30.21	4.57	9.64	11.50	4.61	9.68	11.53	0.04	0.04	0.03	0.94	0.36	0.28
BE8	25.60	534.32	0.10	28.95	28.96	8.04	16.52	19.48	8.04	16.52	19.48	0.00	0.00	0.00	0.01	0.00	0.01
BE9	8.75	313.98	0.09	29.73	29.73	3.26	6.05	7.04	3.26	6.05	7.04	0.00	0.00	0.00	0.00	0.00	0.00
BE9N	3.60	252.10	0.11	30.00	30.00	1.60	2.65	3.05	1.60	2.65	3.05	0.00	0.00	0.00	0.00	0.00	0.00
<b>Bolton Creek</b>																	
B01	14.30	417.48	0.09	25.42	28.48	4.71	9.50	11.10	4.92	9.62	11.22	0.21	0.13	0.11	4.42	1.33	1.03
B02	14.35	520.28	0.08	36.27	37.39	5.69	10.11	11.75	5.76	10.16	11.79	0.07	0.05	0.04	1.19	0.46	0.37
B03	6.71	302.28	0.06	31.84	32.46	2.55	4.66	5.42	2.57	4.67	5.43	0.02	0.01	0.01	0.71	0.19	0.20
BO3S1	4.64	563.72	0.25	28.38	30.85	2.28	3.49	4.00	2.31	3.50	4.01	0.03	0.02	0.01	1.14	0.46	0.38
B04	15.40	454.25	0.14	31.79	33.00	5.90	10.73	12.49	5.98	10.78	12.54	0.08	0.06	0.05	1.36	0.52	0.42
B05	12.47	523.04	0.16	31.54	31.68	2.30	5.50	7.80	2.40	5.50	7.80	0.10	0.00	0.00	4.35	0.00	0.00
B06	13.53	310.87	0.10	30.00	30.00	4.44	8.90	10.44	4.44	8.90	10.44	0.00	0.00	0.00	0.00	0.00	0.00
B07	8.91	385.28	0.11	25.09	25.09	3.43	6.25	7.25	3.43	6.25	7.25	0.00	0.00	0.00	0.00	0.00	0.00
B08	13.32	457.55	0.10	30.00	30.00	4.98	9.21	10.71	4.98	9.21	10.71	0.00	0.00	0.00	0.00	0.00	0.00
<b>Cascade Springs Pond Creek</b>																	
CS1	1.77	157.47	0.06	25.36	29.99	0.76	1.29	1.49	0.79	1.31	1.50	0.03	0.02	0.01	3.28	1.24	1.01
CS2	16.54	390.84	0.05	39.60	40.74	5.60	10.79	12.71	5.69	10.86	12.77	0.09	0.07	0.06	1.57	0.61	0.47
CS2N1	16.50	482.55	0.07	65.01	65.01	7.93	12.25	14.08	7.93	12.25	14.08	0.00	0.00	0.00	0.00	0.00	0.00
CS3	5.47	282.05	0.07	41.27	41.89	2.41	4.03	4.63	2.42	4.03	4.64	0.01	0.01	0.01	0.50	0.20	0.15
CS4	20.45	499.57	0.05	32.10	32.36	6.29	12.91	15.32	6.32	12.93	15.34	0.03	0.02	0.02	0.41	0.16	0.13
<b>Dollar Creek</b>																	
DO1	3.75	119.44	0.06	30.02	30.13	1.25	2.48	2.91	1.25	2.49	2.91	0.00	0.00	0.00	0.16	0.04	0.03
DO1N	24.53	508.68	0.04	18.07	29.91	5.20	12.97	16.05	6.71	14.42	17.40	1.51	1.45	1.35	29.07	11.15	8.40
DO2	10.85	368.67	0.02	34.97	34.97	3.30	6.72	8.01	3.30	6.72	8.01	0.00	0.00	0.00	0.00	0.00	0.00
DO2S	21.52	398.94	0.02	29.97	30.26	5.06	11.04	13.68	5.09	11.07	13.71	0.03	0.03	0.03	0.59	0.29	0.23
DO3	23.72	642.92	0.01	30.00	30.00	5.89	12.83	15.75	5.89	12.83	15.75	0.00	0.00	0.00	0.00	0.00	0.00
DO3N	8.00	209.29	0.02	29.94	30.00	2.13	4.59	5.57	2.13	4.60	5.57	0.00	0.00	0.00	0.09	0.07	0.04
<b>Fern Creek</b>																	
FN1	31.74	437.01	0.05	30.00	30.00	7.98	17.36	21.27	7.98	17.36	21.27	0.00	0.00	0.00	0.00	0.00	0.00
FN2	9.27	408.46	0.05	29.52	29.52	3.33	6.33	7.35	3.33	6.33	7.35	0.00	0.00	0.00	0.00	0.00	0.00
FN3	13.99	418.88	0.04	16.37	16.37	3.27	8.03	9.75	3.27	8.03	9.75	0.00	0.00	0.00	0.00	0.00	0.00
FN4	11.60	328.13	0.03	29.67	30.00	3.26	6.97	8.37	3.28	6.99	8.38	0.02	0.02	0.02	0.58	0.24	0.18
FN4N	13.46	372.26	0.05	38.80	38.80	4.85	9.11	10.62	4.85	9.11	10.62	0.00	0.00	0.00	0.00	0.00	0.00
FN5	3.66	169.57	0.03	82.17	82.17	1.91	2.75	3.14	1.91	2.75	3.14	0.00	0.00	0.00	0.00	0.00	0.00
FN6	18.67	520.42	0.08	30.34	33.15	6.39	12.51	14.60	6.64	12.66	14.74	0.25	0.15	0.14	3.90	1.22	0.94

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX B**

---

**NRCS SOIL REPORT**

Hydrologic Soil Group—Clackamas County Area, Oregon  
(Bolton Terrace Hydrologic Map)



Soil Map may not be valid at this scale.

Map Scale: 1:465 if printed on A landscape (11" x 8.5") sheet.



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



## MAP LEGEND

### Area of Interest (AOI)









 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons





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

#### Soil Rating Lines

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

#### Soil Rating Points






 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available


### Water Features

 Streams and Canals

### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Clackamas County Area, Oregon  
 Survey Area Data: Version 15, Sep 10, 2019

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

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

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



## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
91B	Woodburn silt loam, 3 to 8 percent slopes	C	0.6	100.0%
<b>Totals for Area of Interest</b>			<b>0.6</b>	<b>100.0%</b>

### Description

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

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

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

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

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

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

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

### Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher

Soil Map—Clackamas County Area, Oregon  
(Bolton Terrace Soil Map)



Map Scale: 1:465 if printed on A landscape (11" x 8.5") sheet.



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



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Clackamas County Area, Oregon

Survey Area Data: Version 15, Sep 10, 2019

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

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

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

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
91B	Woodburn silt loam, 3 to 8 percent slopes	0.6	100.0%
<b>Totals for Area of Interest</b>		<b>0.6</b>	<b>100.0%</b>



**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

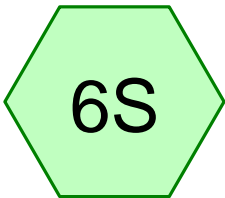
**APPENDIX C**

---

**HYDROCAD SUMMARIES**



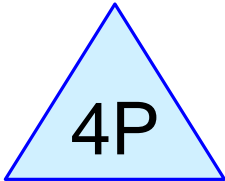
Existing Site



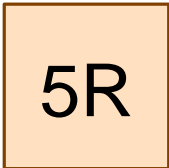
CSJ2



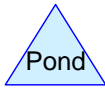
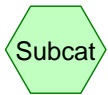
Site Developed



Infiltration



Cascade Springs Pond  
Creek



**Routing Diagram for Bolton Terrace**  
Prepared by Westech Engineering, Inc., Printed 5/7/2020  
HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 10 YR Rainfall=3.40"

Printed 5/7/2020

Page 1

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.18 cfs @ 8.03 hrs, Volume= 0.078 af, Depth= 1.49"

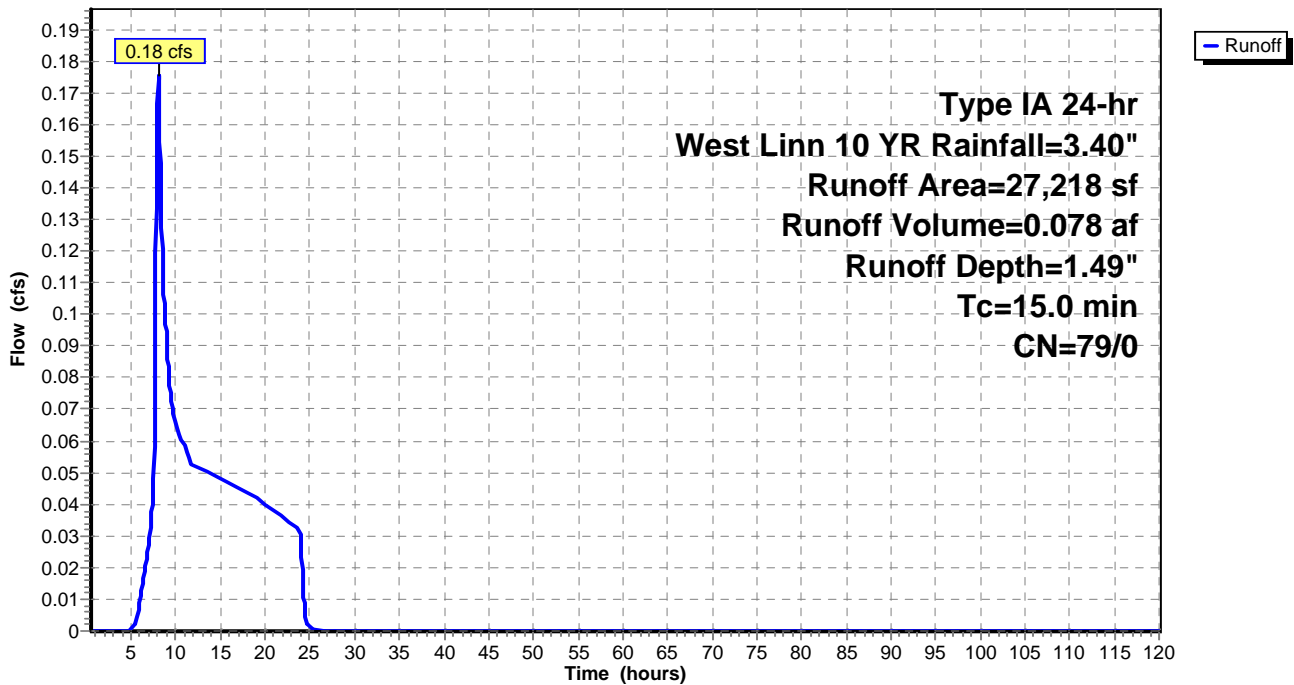
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 10 YR Rainfall=3.40"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Bolton Terrace**

Type IA 24-hr West Linn 100 YR Rainfall=4.50"

Prepared by Westech Engineering, Inc.

Printed 5/7/2020

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Page 2

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.31 cfs @ 8.02 hrs, Volume= 0.124 af, Depth= 2.38"

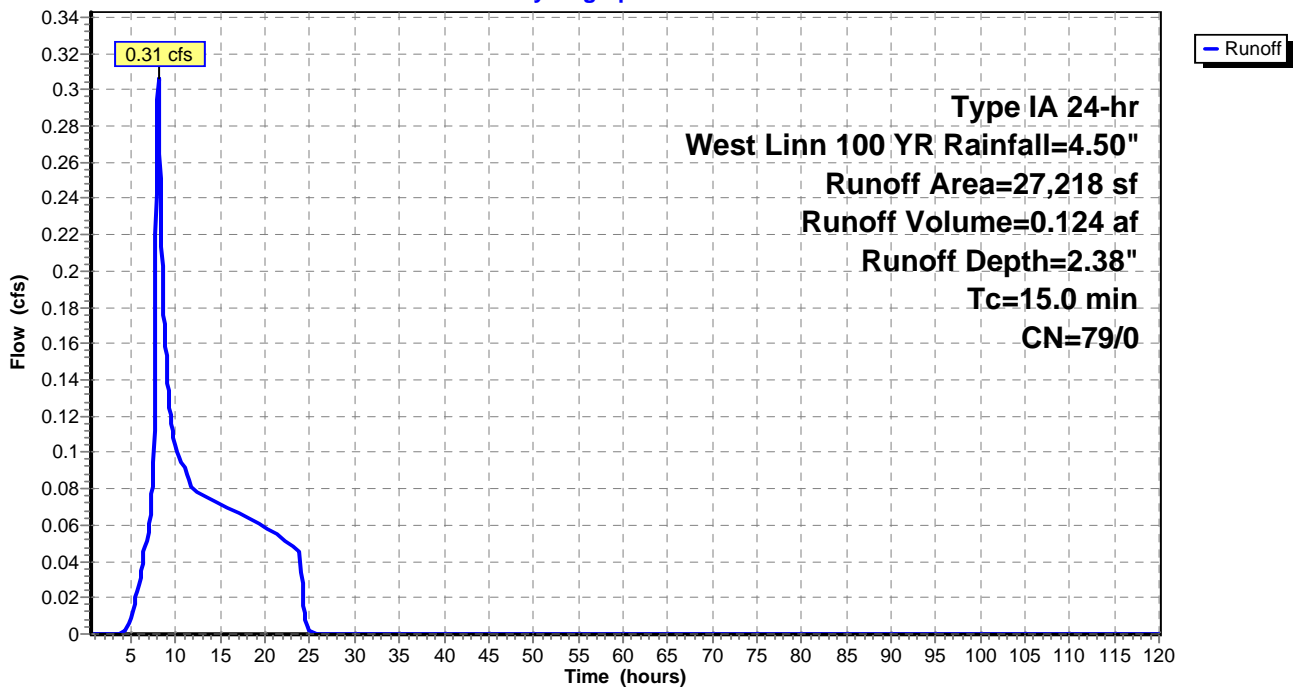
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Type IA 24-hr West Linn 100 YR Rainfall=4.50"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 3

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.28 cfs @ 8.02 hrs, Volume= 0.115 af, Depth= 2.21"

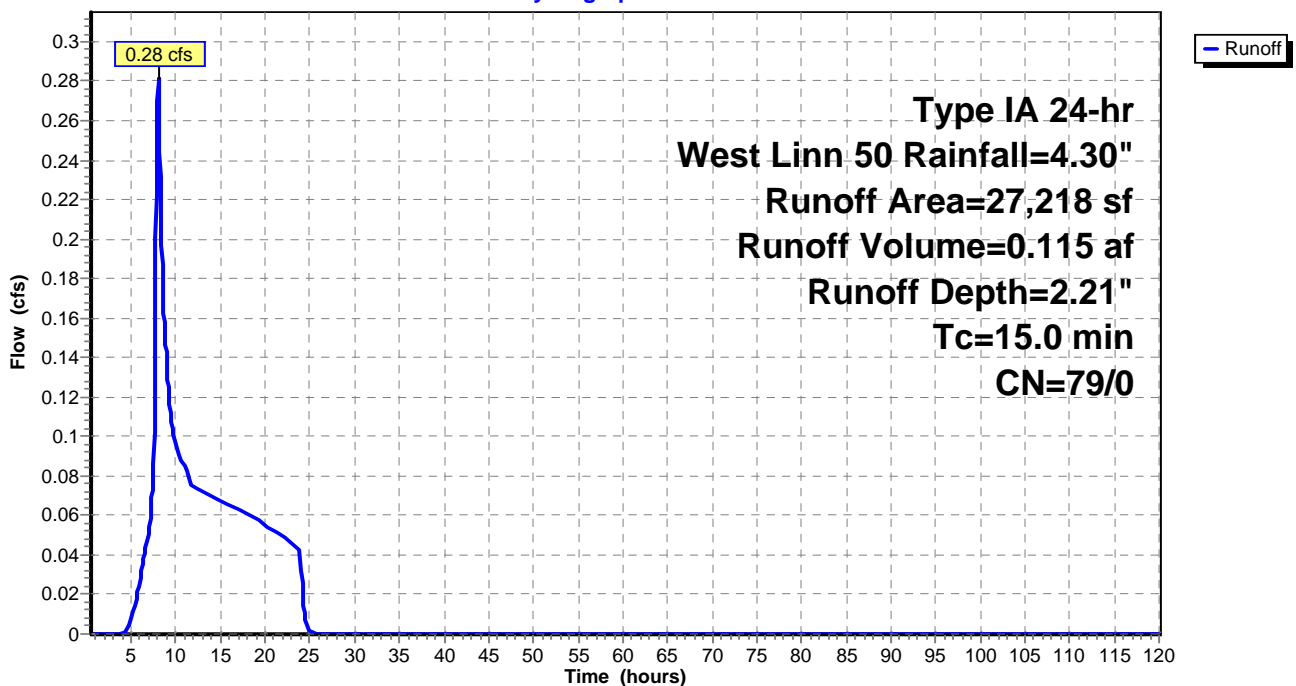
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Type IA 24-hr West Linn 50 Rainfall=4.30"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph





**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn WQ Rainfall=1.20"

Printed 5/7/2020

Page 4

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.01 cfs @ 17.99 hrs, Volume= 0.007 af, Depth= 0.13"

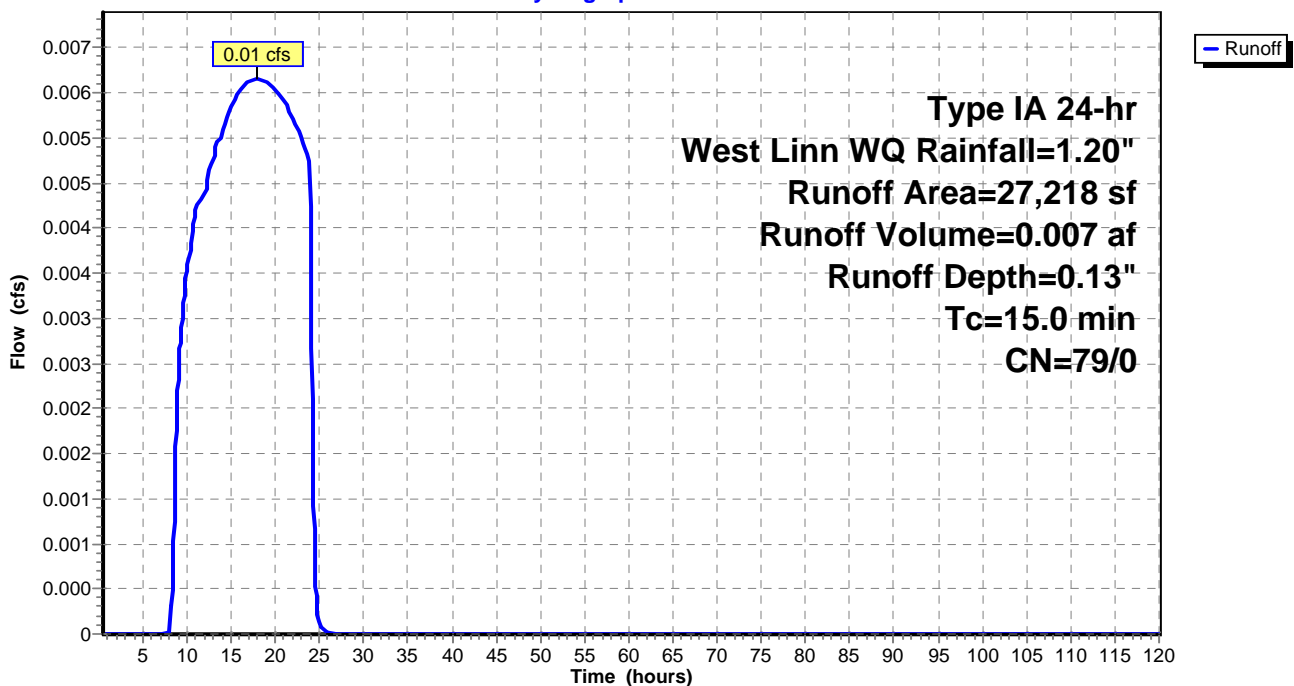
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn WQ Rainfall=1.20"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.45 cfs @ 7.91 hrs, Volume= 0.152 af, Depth= 2.92"

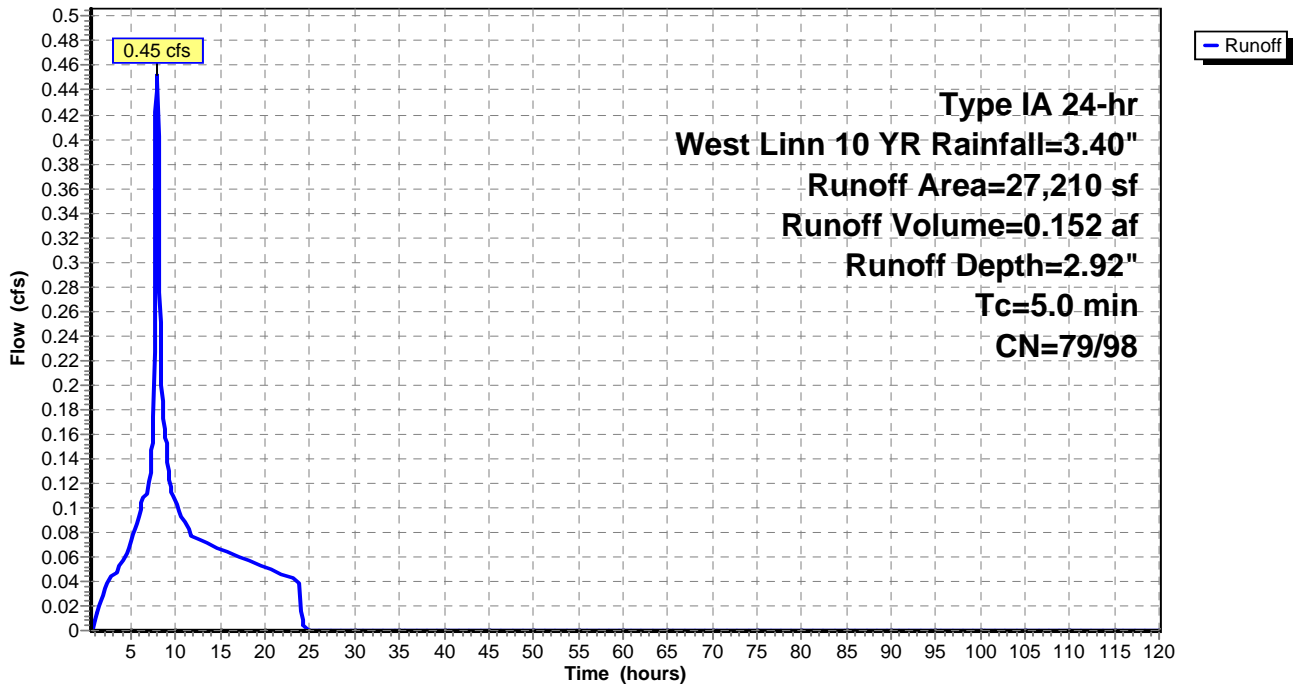
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 10 YR Rainfall=3.40"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph



**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.62 cfs @ 7.90 hrs, Volume= 0.207 af, Depth> 3.98"

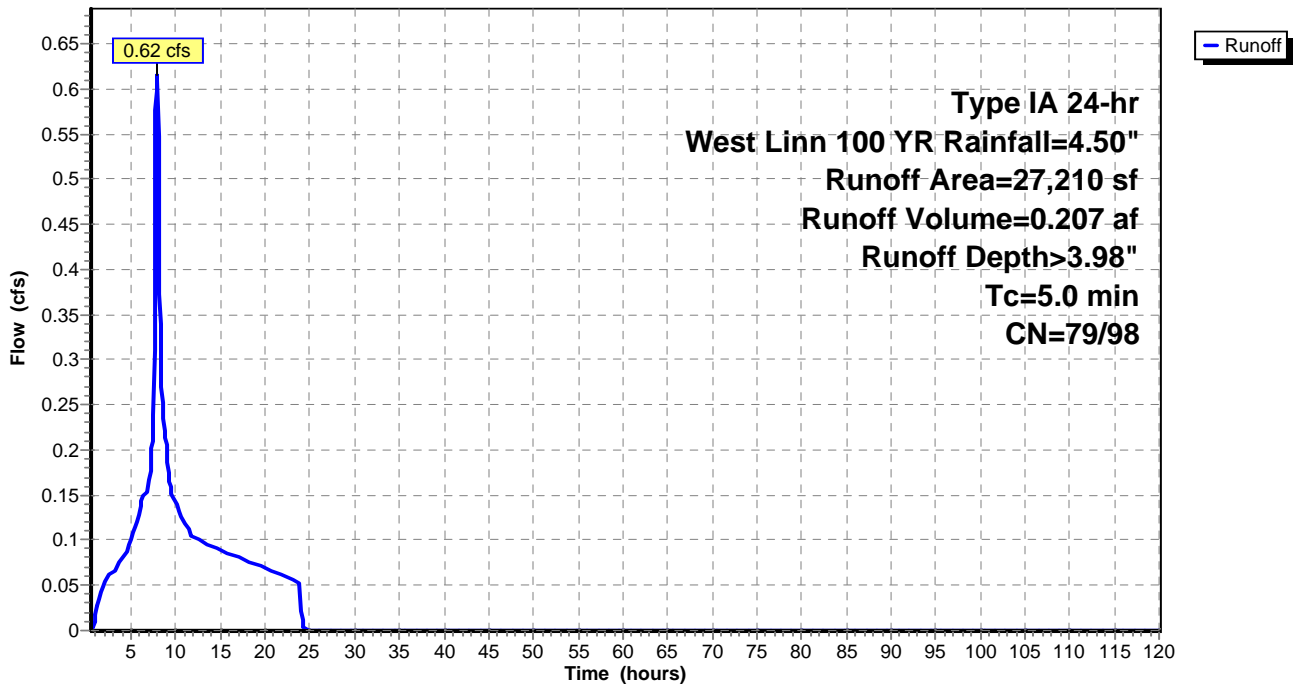
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 100 YR Rainfall=4.50"

Area (sf)	CN	Description
23,130	98	rooftop
4,080	79	50-75% Grass cover, Fair, HSG C
27,210	95	Weighted Average
4,080		14.99% Pervious Area
23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 3

**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.59 cfs @ 7.90 hrs, Volume= 0.197 af, Depth> 3.79"

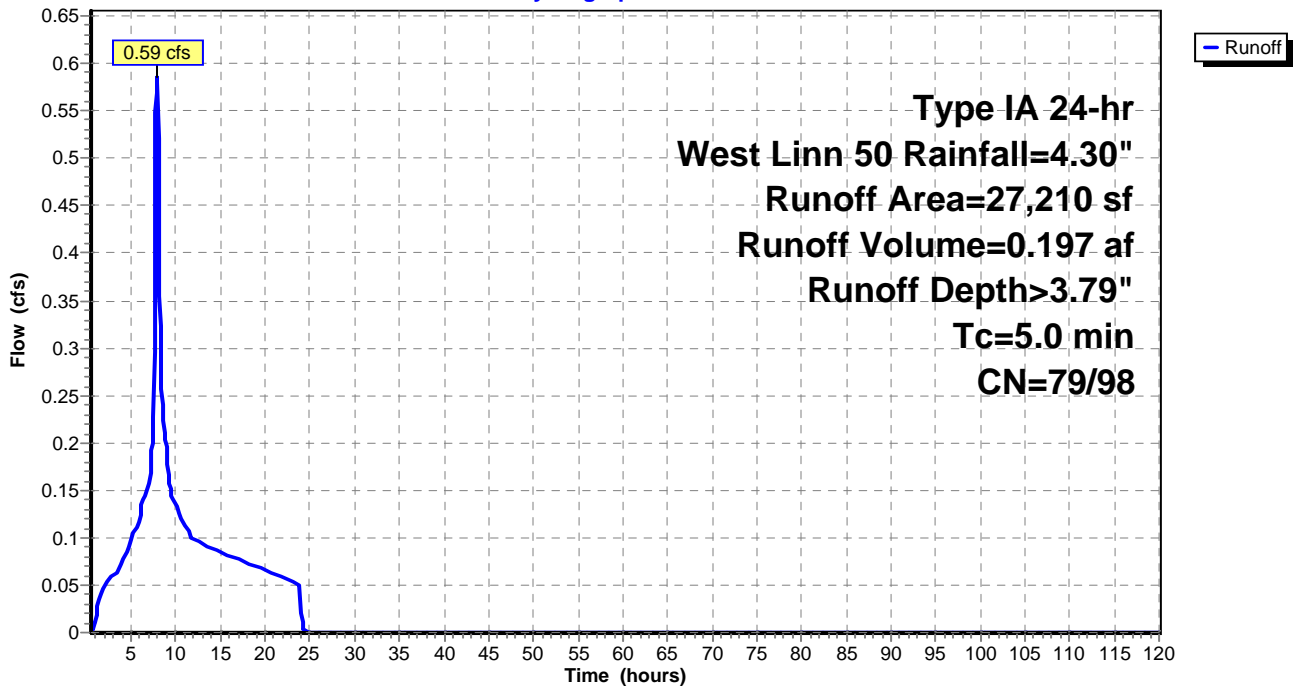
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Type IA 24-hr West Linn 50 Rainfall=4.30"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn WQ Rainfall=1.20"

Printed 5/7/2020

Page 4

**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.14 cfs @ 7.91 hrs, Volume= 0.045 af, Depth= 0.86"

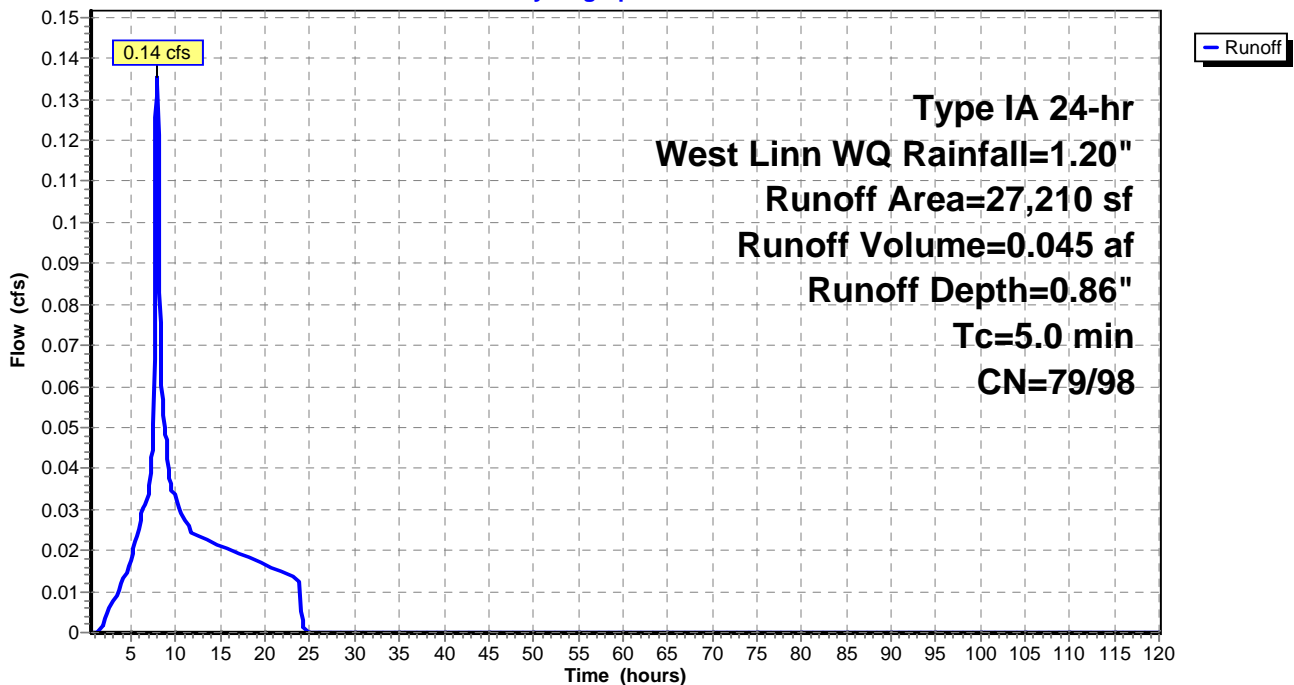
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Type IA 24-hr West Linn WQ Rainfall=1.20"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph





**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 1

**Summary for Subcatchment 6S: CSJ2**

Runoff = 31.82 cfs @ 7.98 hrs, Volume= 10.898 af, Depth= 2.38"

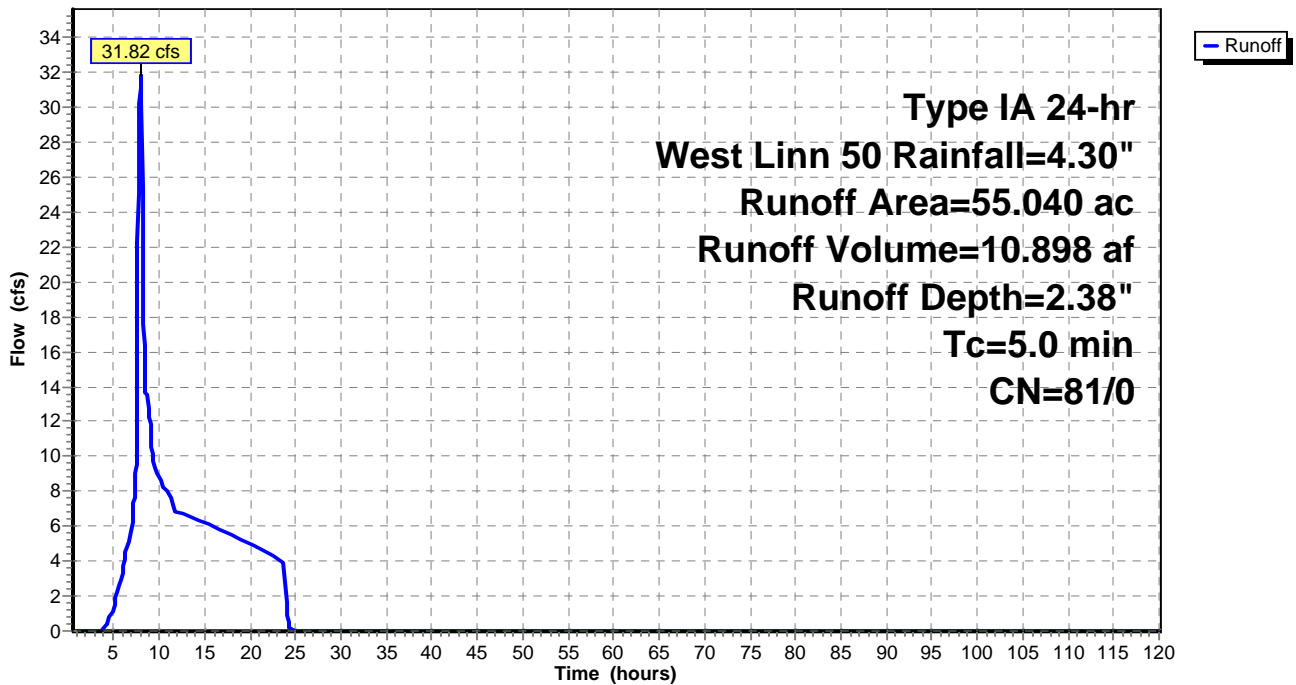
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Type IA 24-hr West Linn 50 Rainfall=4.30"

Area (ac)	CN	Description
* 55.040	81	>75% Grass cover, Good, HSG D
55.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 6S: CSJ2**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 1

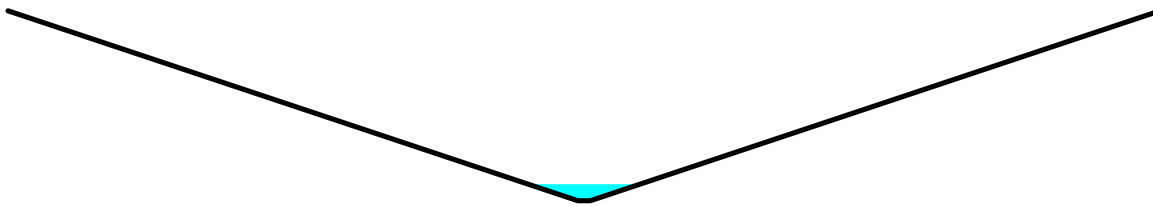
**Summary for Reach 5R: Cascade Springs Pond Creek**

Inflow Area = 55.040 ac, 0.00% Impervious, Inflow Depth = 2.38" for West Linn 50 event  
Inflow = 31.82 cfs @ 7.98 hrs, Volume= 10.898 af  
Outflow = 31.04 cfs @ 8.00 hrs, Volume= 10.898 af, Atten= 2%, Lag= 1.8 min

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Max. Velocity= 4.82 fps, Min. Travel Time= 5.2 min  
Avg. Velocity = 2.94 fps, Avg. Travel Time= 8.5 min

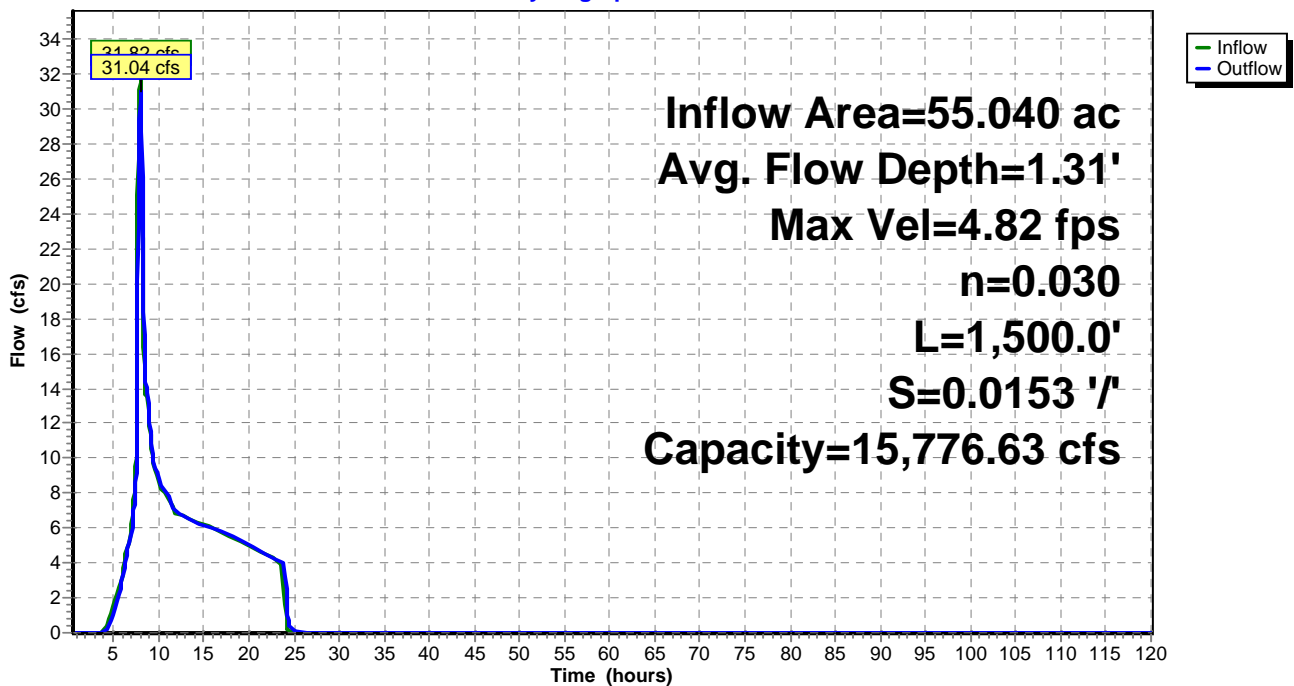
Peak Storage= 9,660 cf @ 8.00 hrs  
Average Depth at Peak Storage= 1.31'  
Bank-Full Depth= 15.00' Flow Area= 690.0 sf, Capacity= 15,776.63 cfs

1.00' x 15.00' deep channel, n= 0.030 Earth, grassed & winding  
Side Slope Z-value= 3.0 '/ Top Width= 91.00'  
Length= 1,500.0' Slope= 0.0153 '/  
Inlet Invert= 80.00', Outlet Invert= 57.00'



**Reach 5R: Cascade Springs Pond Creek**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 1

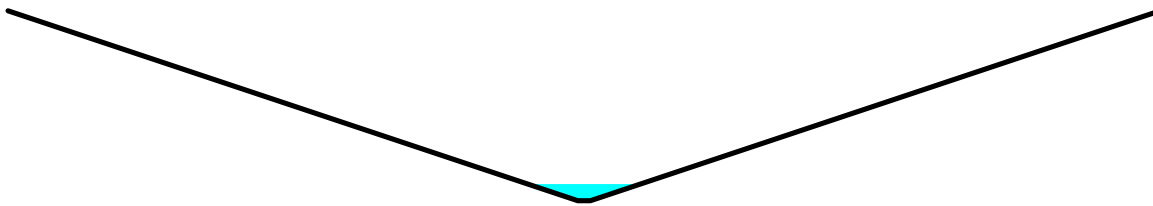
**Summary for Reach 5R: Cascade Springs Pond Creek**

Inflow Area = 55.665 ac, 0.95% Impervious, Inflow Depth = 2.39" for West Linn 50 event  
 Inflow = 32.15 cfs @ 7.97 hrs, Volume= 11.095 af  
 Outflow = 31.62 cfs @ 8.00 hrs, Volume= 11.095 af, Atten= 2%, Lag= 1.8 min

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 4.84 fps, Min. Travel Time= 5.2 min  
 Avg. Velocity = 2.76 fps, Avg. Travel Time= 9.1 min

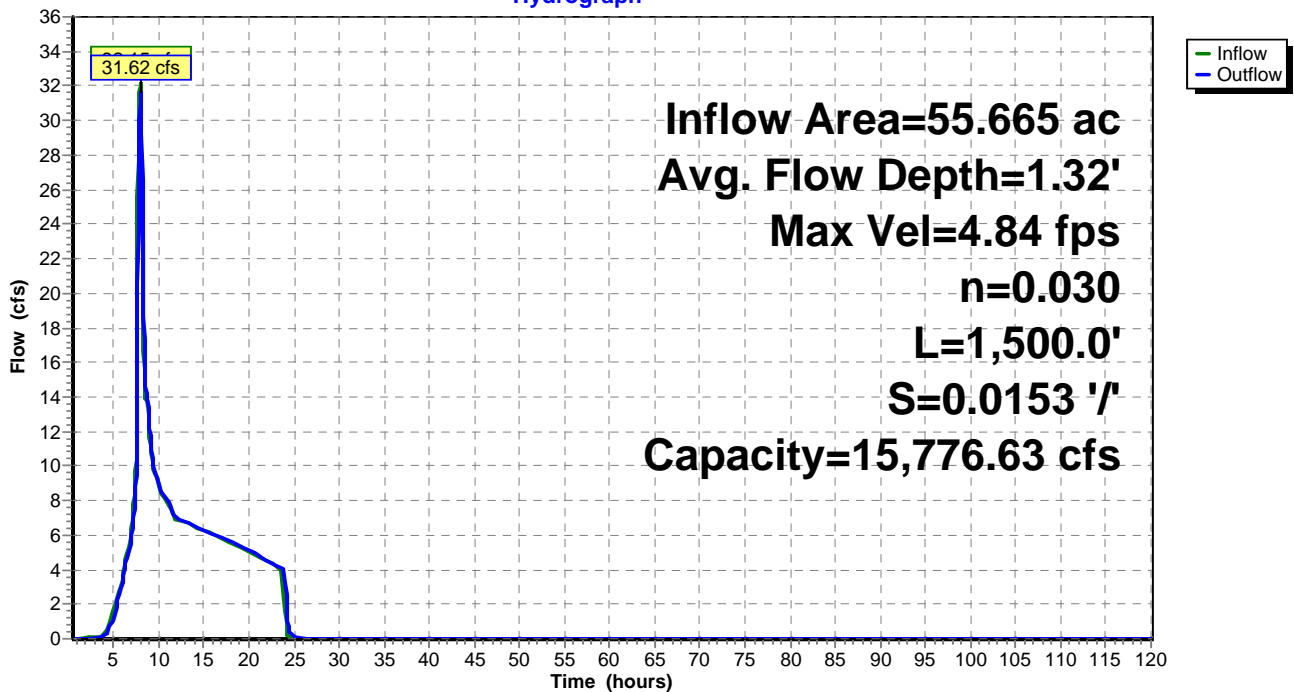
Peak Storage= 9,797 cf @ 8.00 hrs  
 Average Depth at Peak Storage= 1.32'  
 Bank-Full Depth= 15.00' Flow Area= 690.0 sf, Capacity= 15,776.63 cfs

1.00' x 15.00' deep channel, n= 0.030 Earth, grassed & winding  
 Side Slope Z-value= 3.0 '/ Top Width= 91.00'  
 Length= 1,500.0' Slope= 0.0153 '/  
 Inlet Invert= 80.00', Outlet Invert= 57.00'



**Reach 5R: Cascade Springs Pond Creek**

Hydrograph



**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX D**

---

**GEOTECHNICAL REPORT**



# REDMOND & ASSOCIATES

**Geotechnical Investigation**

**Proposed Commercial Building Site**

**1575 Burns Street**

**West Linn (Clackamas County), Oregon**

**for**

**Mr. Rolf Olson**

**Project No. 943.001.G  
May 20, 2005**





# REDMOND & ASSOCIATES

Project No. 943.001.G  
Page No. 1

May 20, 2005

Mr. Rolf Olson  
3453 Augusta National Drive South  
Salem, Oregon 97302

Dear Mr. Olson:

**Re: Geotechnical Investigation, Proposed Commercial Building Site, 1575 Burns Street,  
West Linn (Clackamas County), Oregon**

## INTRODUCTION

In accordance with the request of Mr. Rolf Olson, we have completed our Geotechnical Investigation at the above subject proposed commercial building site. The site, a rectangular shaped property, is located to the north of Burns Street and to the east of Hood Street in West Linn (Clackamas County), Oregon.

We understand that present plans are to develop the site by constructing a new commercial building. Although the project is still in the preliminary planning and design stages, we understand that the commercial structure will be a one- and/or two-story structure which will include a below grade parking level. Specific building materials are not presently known but are anticipated to include wood- and/or metal frame with concrete and/or masonry blocks walls. The planned commercial structure is anticipated to be supported on conventional continuous (strip) and/or individual spread (column) footings with a concrete slab-on-grade floor. Structural loading is anticipated to result in maximum dead plus live continuous footing and column footing loads on the order of about 2.0 to 4.0 kips per lineal foot (klf) and 50 to 100 kips, respectively. Other associated site improvements will include asphalt pavements for both automobile drive and parking areas, underground utility services and landscaping.

## SITE DESCRIPTION

The proposed commercial site, located within Township 2 South, Range 2 East, and Section 30 of the Willamette Meridian, is presently unimproved and consists of existing open commercial lot.

Topographically, the westerly portion of the site is characterized as relatively flat-lying terrain while the easterly portion of the site is characterized as moderately sloping terrain descending down to the east with overall topographic relief across the entire estimated at about 10 to 15 feet and is estimated lie near to Elevation 180 feet.

Vegetation across most of the site consists of a moderate growth of grass, weeds, and brush as well as numerous small to large sized trees.

### SCOPE OF WORK

The purpose of our geotechnical studies is to evaluate the overall site subsurface soil and ground water characteristics as well as any associated impacts or concerns with regard to the planned construction and development of the site. Specifically, our geotechnical investigation included the following scope of work items:

1. Site exploration by means of three (3) exploratory backhoe test pit excavations. The exploratory test pits were excavated at various locations across the site as shown on the Site Exploration Map, Figure No. 2 to depths ranging from about 8 to 11 feet beneath existing site grades. Detailed logs of the exploratory test pit excavations, presenting conditions encountered at each location explored, are presented on the Log of Test Pits, Figure No's. 5 and 6. Additionally, representative samples of the subsurface soils encountered at the site were collected at selected depths and/or intervals and returned to our laboratory for further examination and testing.
2. A laboratory testing program to assess the pertinent physical and engineering characteristics of the subsurface soils. The laboratory program consisted of tests to evaluate the natural (field) moisture content and dry density, Atterberg Limits, gradational properties and Direct Shear Strength tests. Results of the moisture content and dry density tests are shown on their respective test pit log, Figure No's. 5 and 6. Results of the Atterberg Limits, gradation and direct shear strength tests are shown graphically on Figure No's. 7 through 9.
3. Recommendations and our final written report presenting the results of our investigation. Our report includes recommendations for site preparation and grading including any overexcavation of unsuitable materials revealed by the explorations, placement and compaction of any required structural fill(s), suitability of the on-site soils for use as structural fill as well as criteria for import fill materials, and preparation of pavement and foundation areas.
4. Recommendations for foundation support and design including allowable contact bearing pressures for proportioning footings, minimum width and embedment depths, and estimates of foundation settlement as well as lateral earth pressures for below grade walls. Additionally, we have developed flexible pavement sections for automobile and/or truck traffic areas.

### SUBSURFACE CONDITIONS

Our understanding of the subsurface conditions which underlie the site was developed by means of three (3) exploratory test pits excavated on April 23, 2005 with a rubber-tired excavator at the approximate locations shown on Figure No. 2. The test pits revealed that the site is underlain by native soil deposits comprised of lacustrine and fluvial sedimentary soil deposits of Pleistocene age. Specifically, the native soil materials were comprised of very moist to wet, medium stiff to stiff, clayey, sandy silt to the maximum depth explored of about 11.0 feet beneath existing site grades. These clayey, sandy silt subgrade soils are best characterized by relatively low to moderate strength and compressibility.

Ground water was not encountered at the site during our field exploration work and is not expected to be a factor during construction. However, topsoil materials were encountered at the site and consist of about 12 to 16 inches of organic, clayey and sandy silt. All soils encountered at the site were classified in accordance with the Unified Soil Classification System (USCS) which is outlined on Figure No. 4.

### **CONCLUSIONS AND RECOMMENDATIONS**

From a geotechnical engineering and constructability standpoint, we are of the opinion that the site is suitable for the planned new commercial structure and its associated site improvements provided that the recommendations contained within this report are properly incorporated into the design and construction of the project.

The primary feature of concern at the site is the moisture sensitivity characteristics of the underlying clayey, sandy silt subgrade soil materials

In regards to the moisture sensitivity characteristics of the underlying clayey, sandy silt subgrade soils, we recommend that all foundation excavation and site grading work be performed during the drier summer months which is typically June through September.

The following sections of this report present specific recommendations for site preparation and grading as well as foundation design and construction for the commercial building project.

### **SITE PREPARATION**

In general, we recommend that all planned structural improvement areas for the commercial building and pavements be stripped and cleared of any existing site improvements, vegetation, topsoil materials, and any deleterious materials present at the time of construction. In general, we envision that about 12 to 16 inches of topsoil stripping may be required to remove existing topsoil materials. Holes resulting from the removal of any buried obstructions, such as old foundation remnants and/or boulders, should be backfilled and compacted with structural fill materials. Areas resulting in deeper stripping and removals should be evaluated at the time of construction by the Geotechnical Engineer. The stripped and cleared materials should be properly disposed of as they are generally not considered suitable for use/reuse as structural fill.

Following the stripping and clearing operations, and prior to the placement of any required structural fills and/or structural improvements, the exposed subgrade soils within the planned building and pavement areas should be inspected by the Geotechnical Engineer and possibly proof-rolled with a half-loaded dump truck. Areas found to be soft or otherwise unsuitable for support of structural loads or improvements should be scarified and recompacted or overexcavated and replaced with structural fill. During wet or inclement weather conditions, proof-rolling as recommended above will not be appropriate.

The on-site native clayey, sandy silt subgrade soils are considered suitable for use/reuse as structural fill provided that they are free of organic materials, debris, and rock fragments in excess of 8 inches in dimension. If grading is conducted during wet weather, the use of the on-site clayey, sandy silt soils may be difficult and the use of an import granular fill material may be required. In general, we recommend that a free-draining (clean) granular fill (sand & gravel) containing no more than about 5 percent fines be used during wet weather grading. Representative samples of the material(s) to be used as structural fill should be submitted to our laboratory for approval and to determine the maximum dry density and optimum moisture content for compaction.

All required structural fill materials placed within the building and pavement (structural) areas should be moistened or dried as necessary to near (within 3 percent) optimum moisture conditions and compacted by mechanical means to a minimum of 92 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Fill materials should be placed in lifts (layers) such that when compacted do not exceed about 8 inches.

#### **FOUNDATION SUPPORT**

Based on the results of our investigation, it is our opinion that the proposed commercial building structure may be supported directly on the underlying native medium stiff to stiff, clayey, sandy silt subgrade soil deposits and/or by structural fill materials with conventional continuous and individual spread footings. As such, were foundations are constructed on approved native subgrade soils and/or properly placed and compacted structural fill materials, an allowable contact bearing pressure of about 2,500 pounds per square foot (psf) is recommended for design. However, where higher allowable contact bearing pressures are required, an allowable contact bearing pressure of 3,000 psf may be used for design where the foundations are supported by a minimum of at least 12 inches of compacted crushed aggregate base rock structural fill materials. These allowable contact bearing pressures are intended for dead loads and sustained live loads and may be increased by one-third for the total of all loads including short-term wind or seismic loads.

In general, continuous strip footings should have a minimum width of at least 16 inches and be embedded at least 18 inches below the lowest adjacent finish grade (includes frost protection). Individual column footings (if required) should be embedded at least 16 inches below grade and have a minimum width of about 24 inches.

Total and differential settlements of foundations constructed as recommended above and supported directly by approved native subgrade soils or on properly placed and compacted structural fill materials are expected to be well within tolerable limits for this type of structure and should generally be less than about 1-inch and 1/2-inch, respectively.

Allowable lateral frictional resistance between the base of the footings and the clayey, sandy silt or a gravel subgrade soil can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.35 and 0.45, respectively. In addition, lateral loads may be resisted by passive pressures on footings poured "neat" against in-situ native soils or properly compacted structural fill materials. For passive earth pressure resistance we recommend that an equivalent fluid density of 300 pounds per cubic foot (pcf) be used for design.

#### **FLOOR SLAB SUPPORT**

In order to provide uniform subgrade reaction beneath concrete slab-on-grade floors, we recommend that the floor slabs be underlain by a minimum of 6 inches of free-draining (less than 5 percent passing the No. 200 sieve), well-graded, crushed rock. The crushed rock should provide a capillary break to prevent migration of moisture through the slab. Additional moisture protection can be provided by using a 6-mil visqueen vapor barrier covered with a 1-inch protective layer of sand on the top and bottom. The base course materials should be compacted to at least 95 percent of the maximum dry density obtainable by the ASTM D-1557 (AASHTO T-180) test procedures.

**BELOW GRADE/RETAINING WALLS**

Below grade walls should be designed to resist lateral earth pressures imposed by native soils and/or granular backfill materials as well as any adjacent surcharge loads. For walls which are fully restrained from rotation at the top and supporting level backfill, we recommend that at-rest earth pressures be computed on the basis of an equivalent fluid density of 50 pcf and 60 pcf for granular backfill or sandy silt soil backfill materials, respectively. However, for walls which are free to rotate at the top and retaining level backfill, we recommend that active earth pressures be computed on the basis of an equivalent fluid density of 30 pcf and 40 pcf for granular backfill and sandy silt soil backfill materials, respectively. The above recommended lateral earth pressure values assume that the wall(s) will adequately drained to prevent the buildup of hydrostatic pressures. Where wall drainage will not be present and/or where adjacent surcharge loading and/or sloping ground conditions are present, the above recommended lateral earth pressure values will be higher.

Non structural backfill materials behind retaining walls should be compacted to at least 85 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Where structural backfill materials are required, the degree of compaction should be at least 90 percent of the maximum dry density. However, special care should be taken to avoid overcompaction near the wall(s) which could result in higher lateral earth pressures than those indicated herein. In an area within about three (3) to five (5) feet behind walls, we recommend the use of light hand operated compaction equipment.

**EXCAVATIONS**

Temporary excavations within native subgrade soils of up to four (4) feet in depth are expected to remain fairly stable at near vertical inclinations. Excavations to depths of between four (4) feet to ten (10) feet should be properly braced and shored or backcut to inclinations of at least 1 to 1 (Horizontal to Vertical). Where excavations are planned to exceed ten (10) feet, this office should be consulted. Additionally, at present levels, we do not anticipate that ground water will not be a factor during construction.

**PAVEMENTS**

Flexible pavement design for the project was determined on the basis of projected traffic volume and loading conditions relative to assumed subgrade soil strength characteristics. Based on an assumed subgrade "R"-value of 35 (CBR = 4.0) and utilizing the Oregon State Highway Flexible Pavement Design Procedures, we recommend that the asphaltic concrete pavement sections for automobile parking and drive area use at the site consist of the following:

	<b><u>Asphaltic Concrete Thickness (Inches)</u></b>	<b><u>Crushed Base Rock Thickness (Inches)</u></b>
Automobile Parking Areas	2.5	8.0
Automobile Drive Areas	3.0	9.0

Note: Where heavy vehicle traffic is anticipated, we recommend that the main access drive area pavement section be increased by adding 1.0 inches of asphalt and 3.0 inches of aggregate base rock. Additionally, for wet and/or winter time construction, we recommend that a minimum of at least 12 inches of aggregate base rock be used in all pavement areas.

The above recommended pavement section(s) assume that the subgrade will be prepared as recommended herein, that the exposed subgrade soils will be properly protected from rain and construction traffic, and that the subgrade is firm and unyielding at the time of paving. Additionally, it assumes that the subgrade is graded to prevent any ponding of water which may tend to accumulate in the base course. Further, the above recommended flexible pavement section(s) assumes a design life of about 20 years.

Pavement base course materials should consist of well-graded 1 1/2-inch and/or 3/4-inch minus crushed base rock having less than 5 percent fine materials passing the No. 200 sieve. The base course and asphaltic concrete materials should conform to the requirements set forth in the latest edition of the Oregon Department of Transportation, Standard Specifications of Highway Construction. The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. The asphaltic concrete materials should be compacted to at least 91 percent of the theoretical maximum density as determined by the ASTM D-2041 (Rice Gravity) test method.

#### SEISMIC DESIGN CONSIDERATIONS

Subgrade acceleration coefficients for the project were obtained from the seismic hazard/design mapping project performed by Geomatrix Consultants. Geomatrix mapping indicates that a peak ground acceleration on bedrock soils in the area of the site are 0.19g with a return period of about 500 years. The UBC seismic zone factor (Z) for the subject site is 0.30. Additionally, the IBC soil profile for the subject site to estimate the site class is recommended at D.

#### USE OF REPORT

This report is intended for the exclusive use of the addressee and their representatives to use to design the proposed commercial building structure and its associated site improvements described herein and to prepare any construction documents. The data, analyses, and recommendations may not be appropriate for other structures or purposes. We recommend that parties contemplating other structures or purposes contact our office. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report.

#### LEVEL OF CARE

Services performed by the Geotechnical Engineer for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in the area under similar budget and time restraints. No warranty, either expressed or implied, is made.

#### CONSTRUCTION MONITORING AND TESTING

We recommend that **Redmond & Associates** be retained to provide construction monitoring and testing services during all earthwork operations. The purpose of our monitoring services would be to confirm that the site conditions which are encountered are as anticipated, provide field recommendations as necessary based on the actual conditions encountered, and document the activities of the contractor and assess his/her compliance with the project specifications and recommendations.



It is important that we meet with the grading contractor prior to any site grading work to establish a plan that will minimize costly overexcavation and site preparation work. Of primary importance will be observations made during the site preparation, structural fill placement, footing excavation and preparation, and construction of all below grade retaining walls.

We will be pleased to provide such additional assistance or information as you may require in the balance of the design phase of this project and to aid in construction control or solution of unforeseen conditions which may arise during the construction period.

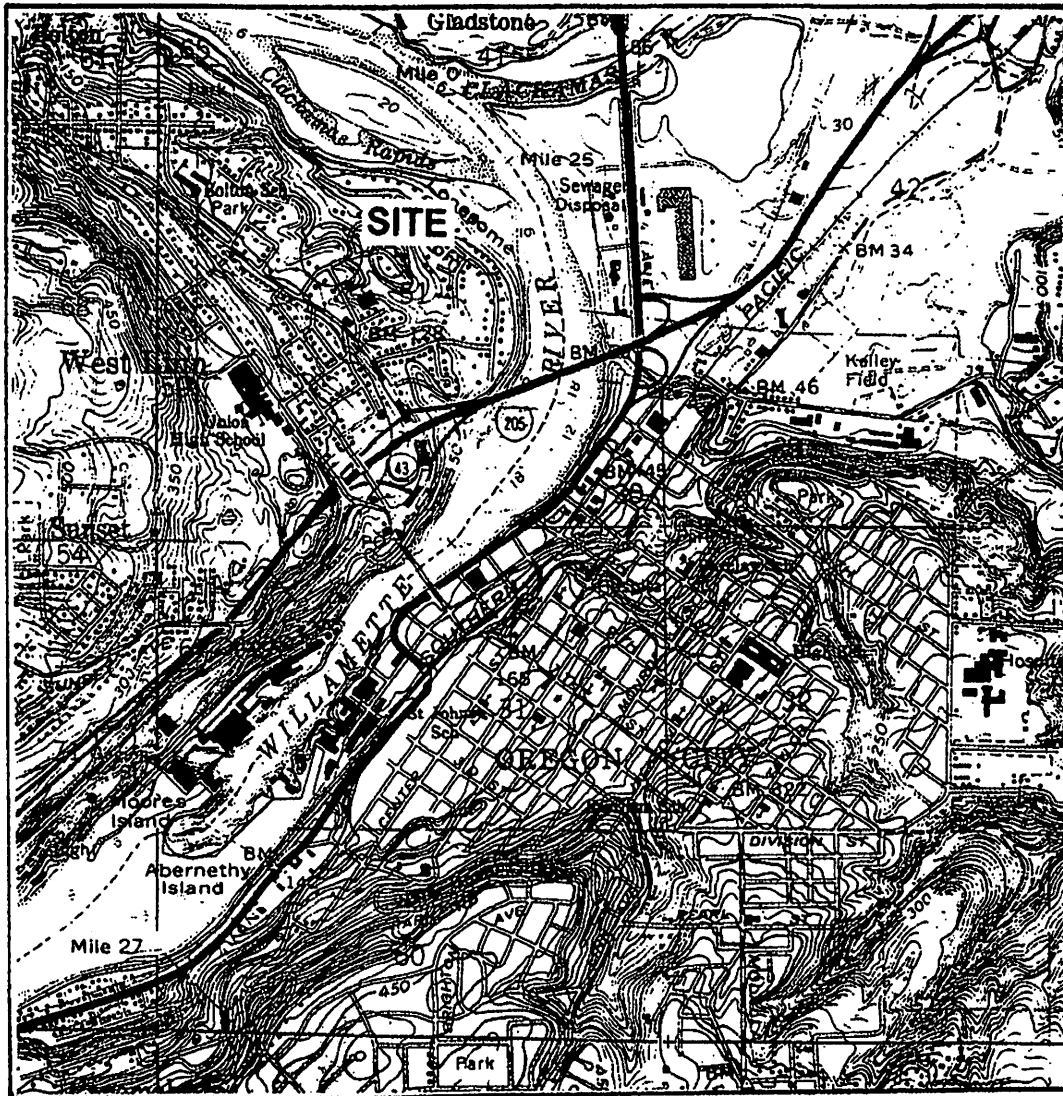
Sincerely,



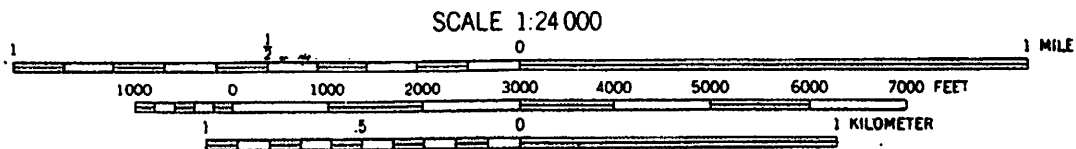
Daniel M. Redmond, P.E.  
President/Principal Geotechnical Engineer



Expires 12-31-06



OREGON CITY QUADRANGLE  
 OREGON-CLACKAMAS CO.  
 7.5 MINUTE SERIES (TOPOGRAPHIC)  
 SE/4 OREGON CITY 15' QUADRANGLE



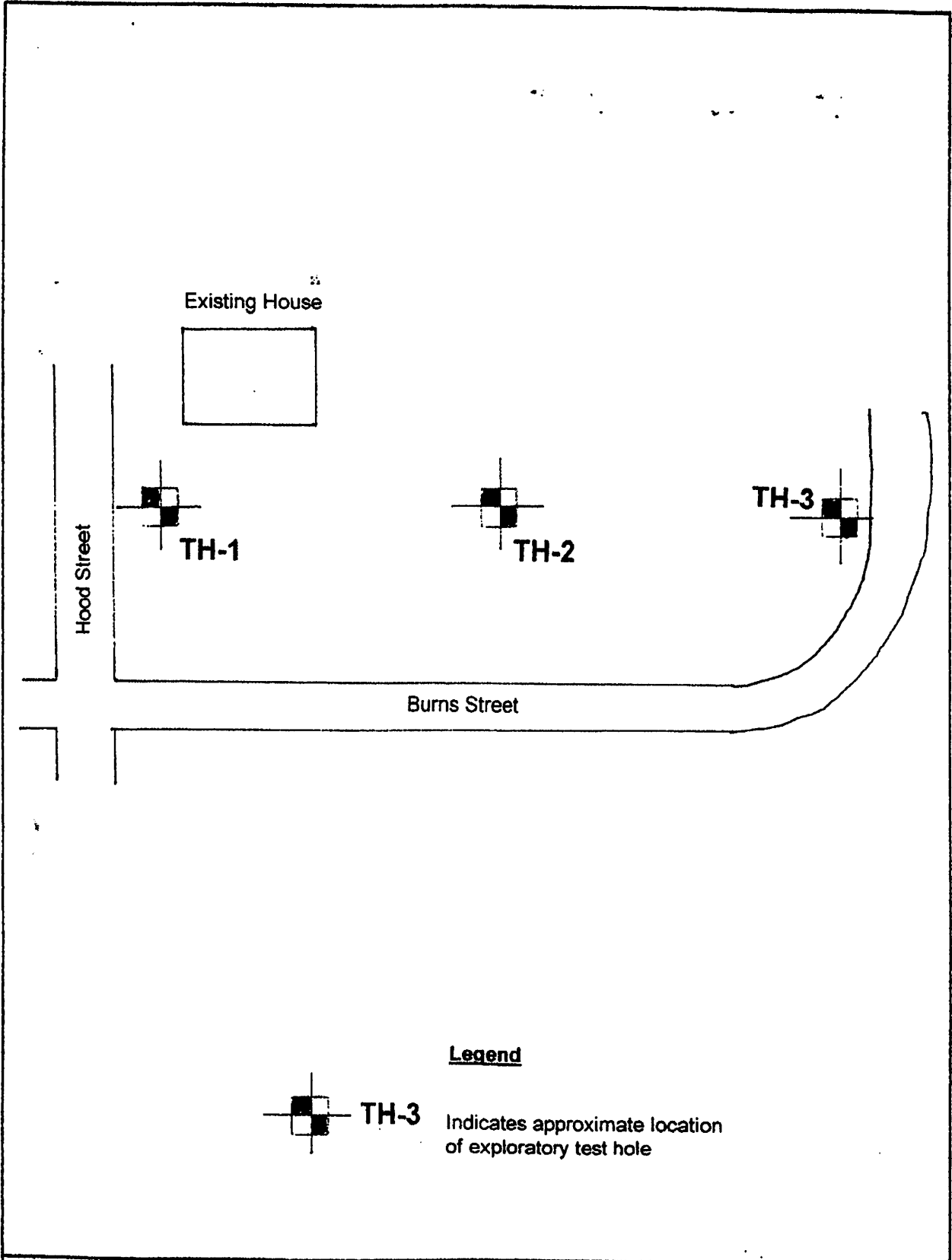
CONTOUR INTERVAL 10 FEET  
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

**SITE VICINITY MAP**

Project No. 943.001.G

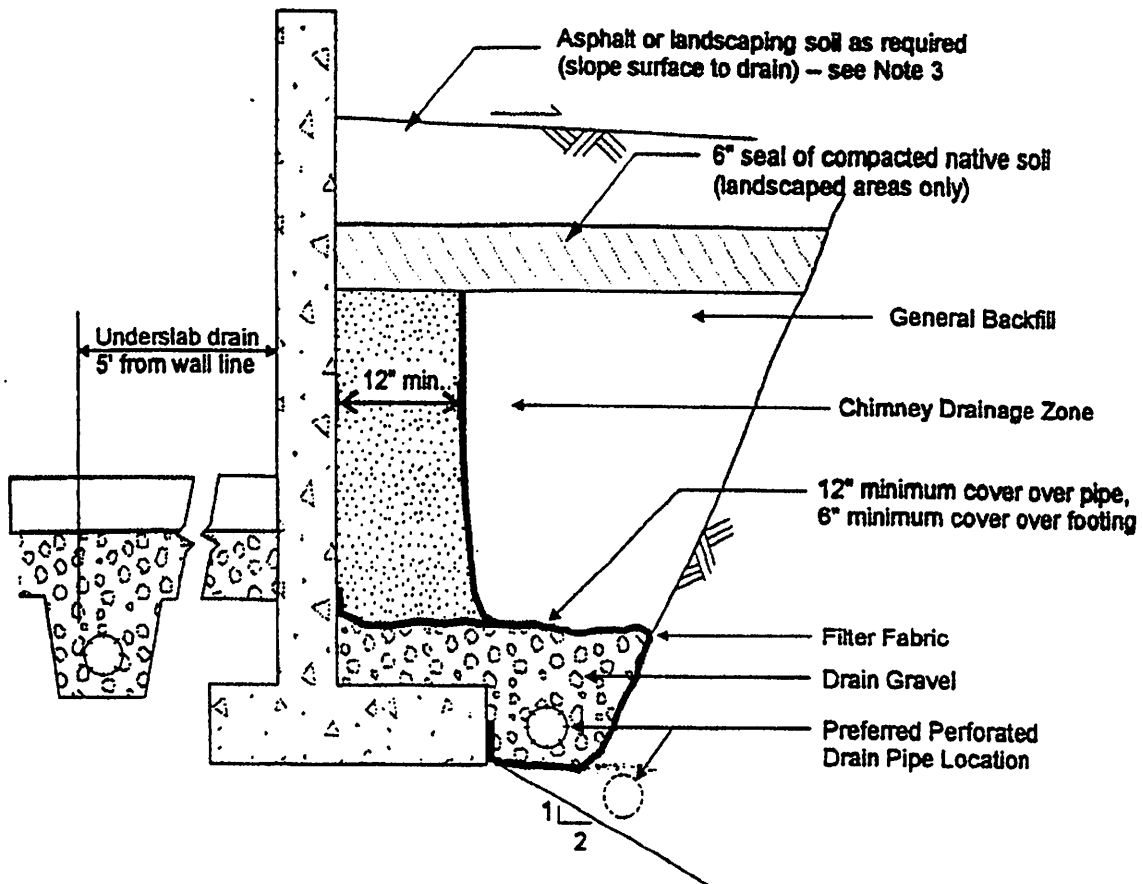
**1575 BURNS STREET**

Figure No. 1



**SITE EXPLORATION MAP**

Project No. 943.001.G	1575 BURNS STREET	Figure No. 2
-----------------------	-------------------	--------------



**SCHEMATIC - NOT TO SCALE**

**NOTES:**

1. Filter Fabric to be non-woven geotextile (Amoco 4545, Mirafi 140N, or equivalent)
2. Lay perforated drain pipe on minimum 0.5% gradient, widening excavation as required. Maintain pipe above 2:1 slope, as shown.
3. All-granular backfill is recommended for support of slabs, pavements, etc. (see text for structural fill).
4. Drain gravel to be clean, washed ¾" to 1½" gravel.
5. General backfill to be on-site gravels, or ¾"-0 or 1½"-0 crushed rock compacted to 92% Modified Proctor (AASHTO T-180).
6. Chimney drainage zone to be 12" wide (minimum) zone of clean washed, medium to coarse sand or drain gravel if protected with filter fabric. Alternatively, prefabricated drainage structures (Miradrain 6000 or similar) may be used.

**FOOTING/RETAINING WALL DRAIN**

Project No. 943.001.G

1575 BURNS STREET

Figure No. 3

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
			GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
		GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.	
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
		SANDS WITH FINES	SP	Poorly graded sands or gravelly sands, little or no fines.
			SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

**DEFINITION OF TERMS**

SILTS AND CLAYS	U.S. STANDARD SERIES SIEVE			CLEAR SQUARE SIEVE OPENINGS			COBBLES	BOULDERS
	200	40	10	4	3/4"	3"		
	SAND			GRAVEL				
	FINE	MEDIUM	COARSE	FINE	COARSE			

**GRAIN SIZES**

SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT <sup>1</sup>
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CLAYS AND PLASTIC SILTS	STRENGTH <sup>‡</sup>	BLOWS/FOOT <sup>‡</sup>
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

**RELATIVE DENSITY**

<sup>1</sup>Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

<sup>‡</sup>Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

**CONSISTENCY**

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • Portland, OR 97230

**KEY TO EXPLORATORY TEST PIT LOGS  
Unified Soil Classification System (ASTM D-2487)**

1575 BURNS STREET COMMERCIAL SITE  
WEST LINN, OREGON

185 PROJECT NO.	DATE	Figure 4
943 001 C	May 20, 2005	

BACKHOE COMPANY: **Kavik, Inc.**

BUCKET SIZE: **24 inches**

DATE: **4/23/05**

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION	
						TEST PIT NO. <b>TH-1</b>	ELEVATION
0					ML	Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)	
	X			24.4	ML	Medium brown to olive-brown, very moist, medium stiff to stiff, clayey, sandy SILT	
5	X			27.2			
10						Total Depth - 9.0 feet No ground water encountered	

						TEST PIT NO. <b>TH-2</b>	ELEVATION
0					ML	Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)	
	X			26.1	ML	Medium brown to olive-brown, very moist, medium stiff to stiff, clayey, sandy SILT	
5							
	X			28.3			
10							
15						Total Depth = 11.0 feet No ground water encountered	

**LOG OF TEST PITS**

PROJECT NO. **943.001.G**

**1575 BURNS STREET COMMERCIAL SITE**

FIGURE NO. **5**



BACKHOE COMPANY: Kavik, Inc.

BUCKET SIZE: 24 inches

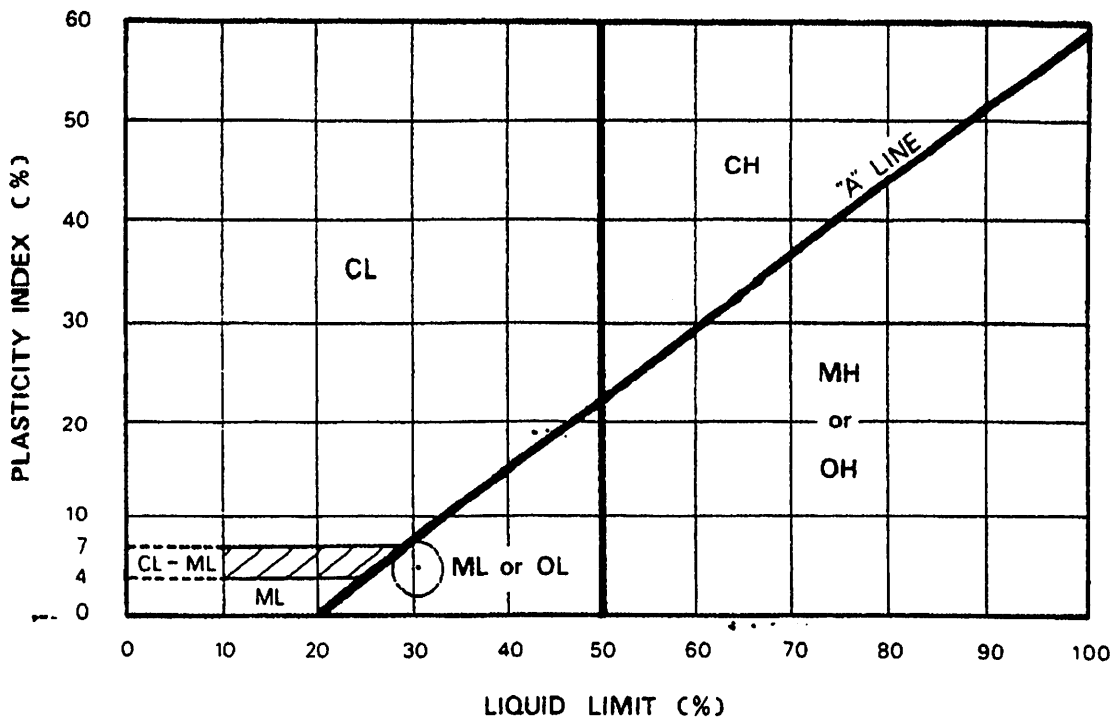
DATE: 4/23/05

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-3
0					ML	Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)
	X			35.5	ML	Gray-brown, wet, soft to medium stiff, sandy, clayey SILT
5	X			32.6	ML	Medium brown to olive-brown, very moist to wet, medium stiff to stiff, clayey, sandy SILT
10						Total Depth = 8.0 feet No ground water encountered

TEST PIT NO.						ELEVATION					
0											
5											
10											
15											

**LOG OF TEST PITS**

PROJECT NO. 943.001.G	1575 BURNS STREET COMMERCIAL SITE	FIGURE NO. 6
-----------------------	-----------------------------------	--------------



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
○	TH-2	3.0	28.3	30.6	5.5	76.0		ML

**REDMOND & ASSOCIATES**  
 P.O. Box 301545 • PORTLAND, OR 97294

PLASTICITY CHART AND DATA

1575 BURNS STREET COMMERCIAL SITE  
 West Linn, Oregon

PROJECT NO.

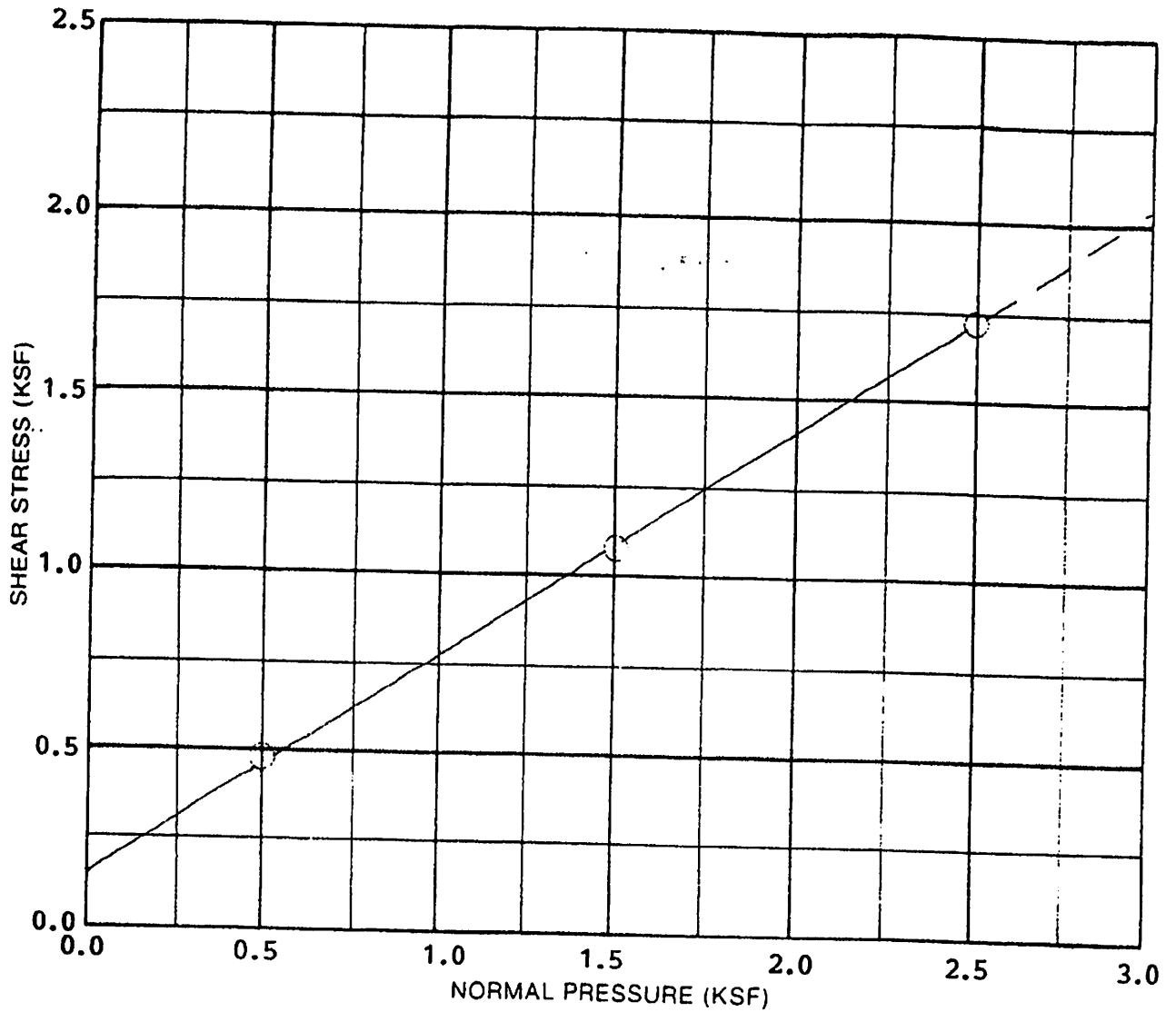
DATE

943 001 C

May 20 2005

Figure 7





SAMPLE DATA	
DESCRIPTION: <b>Medium to olive-brown, clayey, sandy SILT</b>	
BORING NO.: <b>TH-2</b>	
DEPTH (ft.): <b>3.0'</b>	ELEVATION (ft.):
TEST RESULTS	
APPARENT COHESION (C): <b>150 psf</b>	
APPARENT ANGLE OF INTERNAL FRICTION ( $\phi$ ): <b>32°</b>	

TEST DATA				
TEST NUMBER	1	2	3	4
NORMAL PRESSURE (KSF)	0.5	1.5	2.5	
SHEAR STRENGTH (KSF)	0.48	1.09	1.74	
INITIAL H <sub>2</sub> O CONTENT (%)	26.0	26.0	26.0	
FINAL H <sub>2</sub> O CONTENT (%)	25.9	24.2	22.1	
INITIAL DRY DENSITY (PCF)	91.1	91.1	91.1	
FINAL DRY DENSITY (PCF)	91.6	93.1	95.4	
STRAIN RATE: <b>0.02 inches per minute</b>				

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • Portland, OR 97294

DIRECT SHEAR TEST DATA		
1575 BURNS STREET COMMERCIAL SITE West Linn, Oregon		
PROJECT NO.	DATE	
943.001.G	May 20 2005	
		Figure 9

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX E**

---

**FIELD VISIT EXPLORATIONS**

## Field Visit Notes:

A field visit for the Bolton Terrace project located at 1575 Burns Street in West Linn, OR 97068 was conducted on April 14<sup>th</sup>, 2020. The purpose of this visit was to determine if the north fork of Cascade Springs Pond Creek had adequate downstream capacity for the added runoff produced from the developed project site.

During the field visit it was observed that at the mouth of the creek, located near the southeast corner of the project site, the creek had a width of over 30 feet and depth of 10-15 feet. The observed slope at this area was 1.50%.

It was observed, that the creek increases in width and depth further downstream. The next measurement observed was 300 feet downstream. At this point, the creek was greater than 40 feet in depth and greater than 50 feet in width at the widest point. The slope at this point was 1.65%. The width at the bottom of the creek was on average 15 feet in diameter.

These characteristics continue until 1900 feet downstream. The creek decreases to 10 feet in width and approximately 6 feet in depth. The creek then flows through a 30-inch diameter concrete pipe, flowing under River Street and into a 25-foot depth and 30-foot wide creek on the other side. This creek then flows into the Willamette River.

Through field observations, it is determined that Cascade Springs Pond Creek will have more than enough downstream capacity to convey the 0.20 feet of added runoff depth produced by the proposed developed site.



## Field Visit Pictures:

Picture 1:



From mouth of creek looking southeast

Picture 2:



From mouth of creek looking northwest

Picture 3:



From project site looking southeast

Picture 4:



300 ft downstream looking northwest



Picture 5:



300 ft downstream looking southeast

Picture 6:



1900 ft downstream looking west

Picture 7:

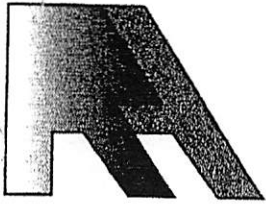


1900 ft downstream looking east

Picture 8:



1920ft downstream looking east



# REDMOND & ASSOCIATES

**Geotechnical Investigation**

**Proposed Commercial Building Site**

**1575 Burns Street**

**West Linn (Clackamas County), Oregon**

**for**

**Mr. Rolf Olson**

**Project No. 943.001.G  
May 20, 2005**



# REDMOND & ASSOCIATES

Project No. 943.001.G  
Page No. 1

May 20, 2005

Mr. Rolf Olson  
3453 Augusta National Drive South  
Salem, Oregon 97302

Dear Mr. Olson:

**Re: Geotechnical Investigation, Proposed Commercial Building Site, 1575 Burns Street,  
West Linn (Clackamas County), Oregon**

## INTRODUCTION

In accordance with the request of Mr. Rolf Olson, we have completed our Geotechnical Investigation at the above subject proposed commercial building site. The site, a rectangular shaped property, is located to the north of Burns Street and to the east of Hood Street in West Linn (Clackamas County), Oregon.

We understand that present plans are to develop the site by constructing a new commercial building. Although the project is still in the preliminary planning and design stages, we understand that the commercial structure will be a one- and/or two-story structure which will include a below grade parking level. Specific building materials are not presently known but are anticipated to include wood- and/or metal frame with concrete and/or masonry blocks walls. The planned commercial structure is anticipated to be supported on conventional continuous (strip) and/or individual spread (column) footings with a concrete slab-on-grade floor. Structural loading is anticipated to result in maximum dead plus live continuous footing and column footing loads on the order of about 2.0 to 4.0 kips per lineal foot (klf) and 50 to 100 kips, respectively. Other associated site improvements will include asphalt pavements for both automobile drive and parking areas, underground utility services and landscaping.

## SITE DESCRIPTION

The proposed commercial site, located within Township 2 South, Range 2 East, and Section 30 of the Willamette Meridian, is presently unimproved and consists of existing open commercial lot.

Topographically, the westerly portion of the site is characterized as relatively flat-lying terrain while the easterly portion of the site is characterized as moderately sloping terrain descending down to the east with overall topographic relief across the entire estimated at about 10 to 15 feet and is estimated lie near to Elevation 180 feet.

Vegetation across most of the site consists of a moderate growth of grass, weeds, and brush as well as numerous small to large sized trees.

### SCOPE OF WORK

The purpose of our geotechnical studies is to evaluate the overall site subsurface soil and ground water characteristics as well as any associated impacts or concerns with regard to the planned construction and development of the site. Specifically, our geotechnical investigation included the following scope of work items:

1. Site exploration by means of three (3) exploratory backhoe test pit excavations. The exploratory test pits were excavated at various locations across the site as shown on the Site Exploration Map, Figure No. 2 to depths ranging from about 8 to 11 feet beneath existing site grades. Detailed logs of the exploratory test pit excavations, presenting conditions encountered at each location explored, are presented on the Log of Test Pits, Figure No's. 5 and 6. Additionally, representative samples of the subsurface soils encountered at the site were collected at selected depths and/or intervals and returned to our laboratory for further examination and testing.
2. A laboratory testing program to assess the pertinent physical and engineering characteristics of the subsurface soils. The laboratory program consisted of tests to evaluate the natural (field) moisture content and dry density, Atterberg Limits, gradational properties and Direct Shear Strength tests. Results of the moisture content and dry density tests are shown on their respective test pit log, Figure No's. 5 and 6. Results of the Atterberg Limits, gradation and direct shear strength tests are shown graphically on Figure No's. 7 through 9.
3. Recommendations and our final written report presenting the results of our investigation. Our report includes recommendations for site preparation and grading including any overexcavation of unsuitable materials revealed by the explorations, placement and compaction of any required structural fill(s), suitability of the on-site soils for use as structural fill as well as criteria for import fill materials, and preparation of pavement and foundation areas.
4. Recommendations for foundation support and design including allowable contact bearing pressures for proportioning footings, minimum width and embedment depths, and estimates of foundation settlement as well as lateral earth pressures for below grade walls. Additionally, we have developed flexible pavement sections for automobile and/or truck traffic areas.

### SUBSURFACE CONDITIONS

Our understanding of the subsurface conditions which underlie the site was developed by means of three (3) exploratory test pits excavated on April 23, 2005 with a rubber-tired excavator at the approximate locations shown on Figure No. 2. The test pits revealed that the site is underlain by native soil deposits comprised of lacustrine and fluvial sedimentary soil deposits of Pleistocene age. Specifically, the native soil materials were comprised of very moist to wet, medium stiff to stiff, clayey, sandy silt to the maximum depth explored of about 11.0 feet beneath existing site grades. These clayey, sandy silt subgrade soils are best characterized by relatively low to moderate strength and compressibility.



Ground water was not encountered at the site during our field exploration work and is not expected to be a factor during construction. However, topsoil materials were encountered at the site and consist of about 12 to 16 inches of organic, clayey and sandy silt. All soils encountered at the site were classified in accordance with the Unified Soil Classification System (USCS) which is outlined on Figure No. 4.

### **CONCLUSIONS AND RECOMMENDATIONS**

From a geotechnical engineering and constructability standpoint, we are of the opinion that the site is suitable for the planned new commercial structure and its associated site improvements provided that the recommendations contained within this report are properly incorporated into the design and construction of the project.

The primary feature of concern at the site is the moisture sensitivity characteristics of the underlying clayey, sandy silt subgrade soil materials

In regards to the moisture sensitivity characteristics of the underlying clayey, sandy silt subgrade soils, we recommend that all foundation excavation and site grading work be performed during the drier summer months which is typically June through September.

The following sections of this report present specific recommendations for site preparation and grading as well as foundation design and construction for the commercial building project.

### **SITE PREPARATION**

In general, we recommend that all planned structural improvement areas for the commercial building and pavements be stripped and cleared of any existing site improvements, vegetation, topsoil materials, and any deleterious materials present at the time of construction. In general, we envision that about 12 to 16 inches of topsoil stripping may be required to remove existing topsoil materials. Holes resulting from the removal of any buried obstructions, such as old foundation remnants and/or boulders, should be backfilled and compacted with structural fill materials. Areas resulting in deeper stripping and removals should be evaluated at the time of construction by the Geotechnical Engineer. The stripped and cleared materials should be properly disposed of as they are generally not considered suitable for use/reuse as structural fill.

Following the stripping and clearing operations, and prior to the placement of any required structural fills and/or structural improvements, the exposed subgrade soils within the planned building and pavement areas should be inspected by the Geotechnical Engineer and possibly proof-rolled with a half-loaded dump truck. Areas found to be soft or otherwise unsuitable for support of structural loads or improvements should be scarified and recompacted or overexcavated and replaced with structural fill. During wet or inclement weather conditions, proof-rolling as recommended above will not be appropriate.

The on-site native clayey, sandy silt subgrade soils are considered suitable for use/reuse as structural fill provided that they are free of organic materials, debris, and rock fragments in excess of 8 inches in dimension. If grading is conducted during wet weather, the use of the on-site clayey, sandy silt soils may be difficult and the use of an import granular fill material may be required. In general, we recommend that a free-draining (clean) granular fill (sand & gravel) containing no more than about 5 percent fines be used during wet weather grading. Representative samples of the material(s) to be used as structural fill should be submitted to our laboratory for approval and to determine the maximum dry density and optimum moisture content for compaction.



All required structural fill materials placed within the building and pavement (structural) areas should be moistened or dried as necessary to near (within 3 percent) optimum moisture conditions and compacted by mechanical means to a minimum of 92 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Fill materials should be placed in lifts (layers) such that when compacted do not exceed about 8 inches.

### **FOUNDATION SUPPORT**

Based on the results of our investigation, it is our opinion that the proposed commercial building structure may be supported directly on the underlying native medium stiff to stiff, clayey, sandy silt subgrade soil deposits and/or by structural fill materials with conventional continuous and individual spread footings. As such, were foundations are constructed on approved native subgrade soils and/or properly placed and compacted structural fill materials, an allowable contact bearing pressure of about 2,500 pounds per square foot (psf) is recommended for design. However, where higher allowable contact bearing pressures are required, an allowable contact bearing pressure of 3,000 psf may be used for design where the foundations are supported by a minimum of at least 12 inches of compacted crushed aggregate base rock structural fill materials. These allowable contact bearing pressures are intended for dead loads and sustained live loads and may be increased by one-third for the total of all loads including short-term wind or seismic loads.

In general, continuous strip footings should have a minimum width of at least 16 inches and be embedded at least 18 inches below the lowest adjacent finish grade (includes frost protection). Individual column footings (if required) should be embedded at least 16 inches below grade and have a minimum width of about 24 inches.

Total and differential settlements of foundations constructed as recommended above and supported directly by approved native subgrade soils or on properly placed and compacted structural fill materials are expected to be well within tolerable limits for this type of structure and should generally be less than about 1-inch and 1/2-inch, respectively.

Allowable lateral frictional resistance between the base of the footings and the clayey, sandy silt or a gravel subgrade soil can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.35 and 0.45, respectively. In addition, lateral loads may be resisted by passive pressures on footings poured "neat" against in-situ native soils or properly compacted structural fill materials. For passive earth pressure resistance we recommend that an equivalent fluid density of 300 pounds per cubic foot (pcf) be used for design.

### **FLOOR SLAB SUPPORT**

In order to provide uniform subgrade reaction beneath concrete slab-on-grade floors, we recommend that the floor slabs be underlain by a minimum of 6 inches of free-draining (less than 5 percent passing the No. 200 sieve), well-graded, crushed rock. The crushed rock should provide a capillary break to prevent migration of moisture through the slab. Additional moisture protection can be provided by using a 6-mil visqueen vapor barrier covered with a 1-inch protective layer of sand on the top and bottom. The base course materials should be compacted to at least 95 percent of the maximum dry density obtainable by the ASTM D-1557 (AASHTO T-180) test procedures.

**BELOW GRADE/RETAINING WALLS**

Below grade walls should be designed to resist lateral earth pressures imposed by native soils and/or granular backfill materials as well as any adjacent surcharge loads. For walls which are fully restrained from rotation at the top and supporting level backfill, we recommend that at-rest earth pressures be computed on the basis of an equivalent fluid density of 50 pcf and 60 pcf for granular backfill or sandy silt soil backfill materials, respectively. However, for walls which are free to rotate at the top and retaining level backfill, we recommend that active earth pressures be computed on the basis of an equivalent fluid density of 30 pcf and 40 pcf for granular backfill and sandy silt soil backfill materials, respectively. The above recommended lateral earth pressure values assume that the wall(s) will adequately drained to prevent the buildup of hydrostatic pressures. Where wall drainage will not be present and/or where adjacent surcharge loading and/or sloping ground conditions are present, the above recommended lateral earth pressure values will be higher.

Non structural backfill materials behind retaining walls should be compacted to at least 85 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Where structural backfill materials are required, the degree of compaction should be at least 90 percent of the maximum dry density. However, special care should be taken to avoid overcompaction near the wall(s) which could result in higher lateral earth pressures than those indicated herein. In an area within about three (3) to five (5) feet behind walls, we recommend the use of light hand operated compaction equipment.

**EXCAVATIONS**

Temporary excavations within native subgrade soils of up to four (4) feet in depth are expected to remain fairly stable at near vertical inclinations. Excavations to depths of between four (4) feet to ten (10) feet should be properly braced and shored or backcut to inclinations of at least 1 to 1 (Horizontal to Vertical). Where excavations are planned to exceed ten (10) feet, this office should be consulted. Additionally, at present levels, we do not anticipate that ground water will not be a factor during construction.

**PAVEMENTS**

Flexible pavement design for the project was determined on the basis of projected traffic volume and loading conditions relative to assumed subgrade soil strength characteristics. Based on an assumed subgrade "R"-value of 35 (CBR = 4.0) and utilizing the Oregon State Highway Flexible Pavement Design Procedures, we recommend that the asphaltic concrete pavement sections for automobile parking and drive area use at the site consist of the following:

	<b><u>Asphaltic Concrete Thickness (Inches)</u></b>	<b><u>Crushed Base Rock Thickness (Inches)</u></b>
Automobile Parking Areas	2.5	8.0
Automobile Drive Areas	3.0	9.0

Note: Where heavy vehicle traffic is anticipated, we recommend that the main access drive area pavement section be increased by adding 1.0 inches of asphalt and 3.0 inches of aggregate base rock. Additionally, for wet and/or winter time construction, we recommend that a minimum of at least 12 inches of aggregate base rock be used in all pavement areas.

The above recommended pavement section(s) assume that the subgrade will be prepared as recommended herein, that the exposed subgrade soils will be properly protected from rain and construction traffic, and that the subgrade is firm and unyielding at the time of paving. Additionally, it assumes that the subgrade is graded to prevent any ponding of water which may tend to accumulate in the base course. Further, the above recommended flexible pavement section(s) assumes a design life of about 20 years.

Pavement base course materials should consist of well-graded 1 1/2-inch and/or 3/4-inch minus crushed base rock having less than 5 percent fine materials passing the No. 200 sieve. The base course and asphaltic concrete materials should conform to the requirements set forth in the latest edition of the Oregon Department of Transportation, Standard Specifications of Highway Construction. The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. The asphaltic concrete materials should be compacted to at least 91 percent of the theoretical maximum density as determined by the ASTM D-2041 (Rice Gravity) test method.

#### SEISMIC DESIGN CONSIDERATIONS

Subgrade acceleration coefficients for the project were obtained from the seismic hazard/design mapping project performed by Geomatrix Consultants. Geomatrix mapping indicates that a peak ground acceleration on bedrock soils in the area of the site are 0.19g with a return period of about 500 years. The UBC seismic zone factor (Z) for the subject site is 0.30. Additionally, the IBC soil profile for the subject site to estimate the site class is recommended at D.

#### USE OF REPORT

This report is intended for the exclusive use of the addressee and their representatives to use to design the proposed commercial building structure and its associated site improvements described herein and to prepare any construction documents. The data, analyses, and recommendations may not be appropriate for other structures or purposes. We recommend that parties contemplating other structures or purposes contact our office. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report.

#### LEVEL OF CARE

Services performed by the Geotechnical Engineer for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in the area under similar budget and time restraints. No warranty, either expressed or implied, is made.

#### CONSTRUCTION MONITORING AND TESTING

We recommend that **Redmond & Associates** be retained to provide construction monitoring and testing services during all earthwork operations. The purpose of our monitoring services would be to confirm that the site conditions which are encountered are as anticipated, provide field recommendations as necessary based on the actual conditions encountered, and document the activities of the contractor and assess his/her compliance with the project specifications and recommendations.

It is important that we meet with the grading contractor prior to any site grading work to establish a plan that will minimize costly overexcavation and site preparation work. Of primary importance will be observations made during the site preparation, structural fill placement, footing excavation and preparation, and construction of all below grade retaining walls.

We will be pleased to provide such additional assistance or information as you may require in the balance of the design phase of this project and to aid in construction control or solution of unforeseen conditions which may arise during the construction period.

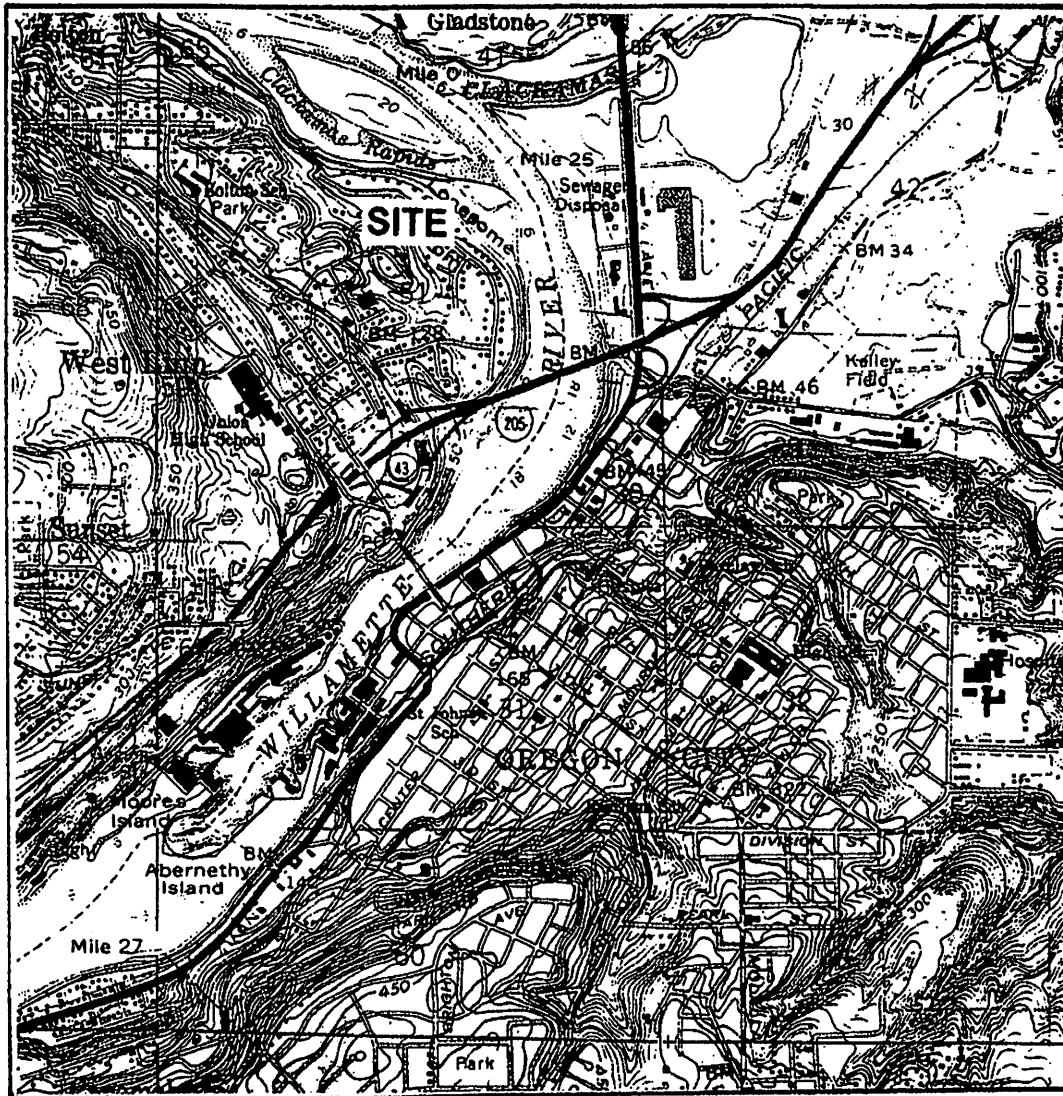
Sincerely,



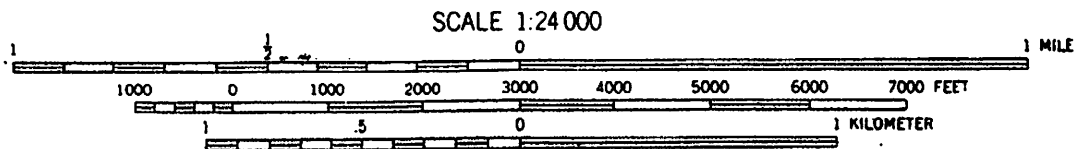
Daniel M. Redmond, P.E.  
President/Principal Geotechnical Engineer



Expires 12-31-06



OREGON CITY QUADRANGLE  
 OREGON-CLACKAMAS CO.  
 7.5 MINUTE SERIES (TOPOGRAPHIC)  
 SE/4 OREGON CITY 15' QUADRANGLE



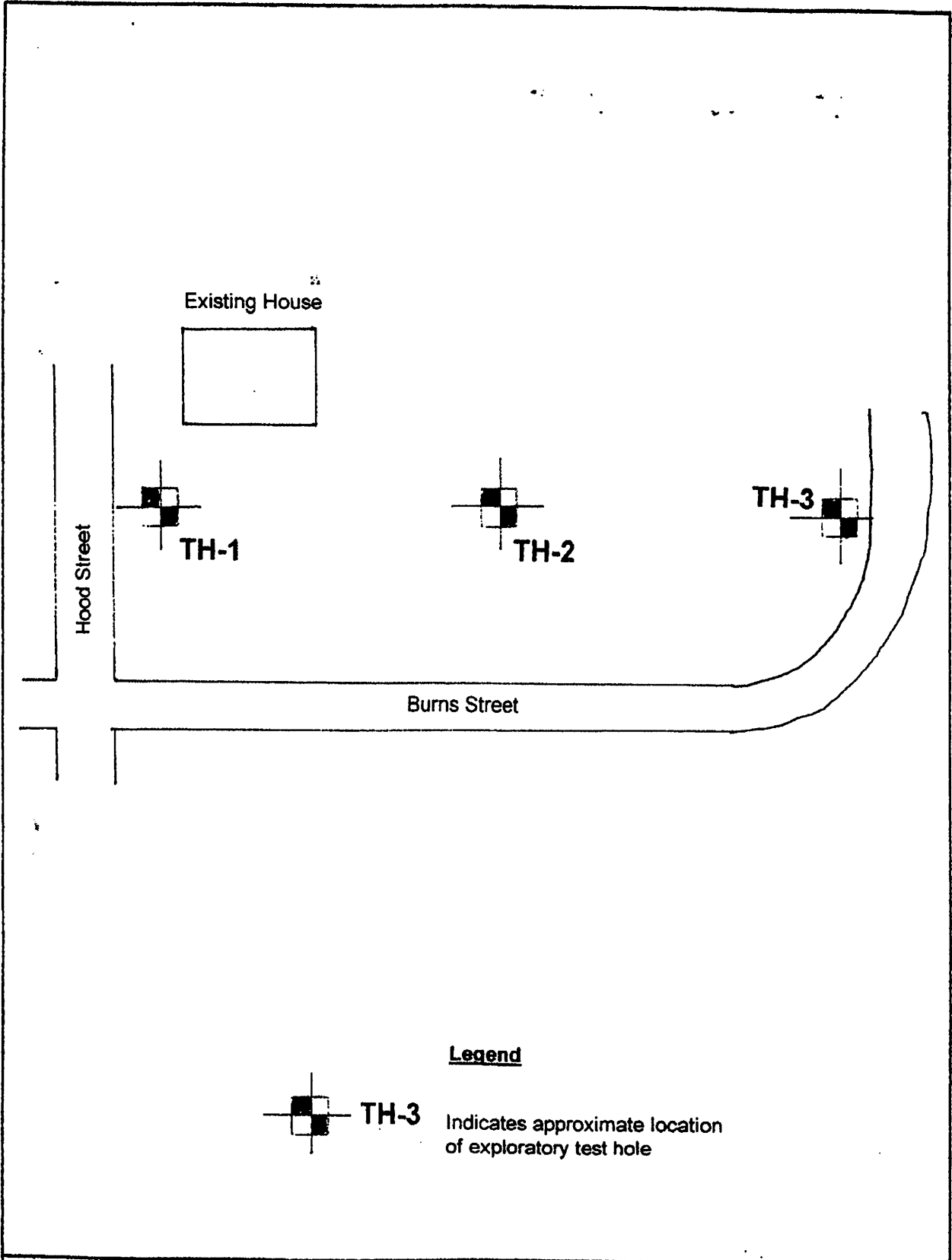
CONTOUR INTERVAL 10 FEET  
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

**SITE VICINITY MAP**

Project No. 943.001.G

1575 BURNS STREET

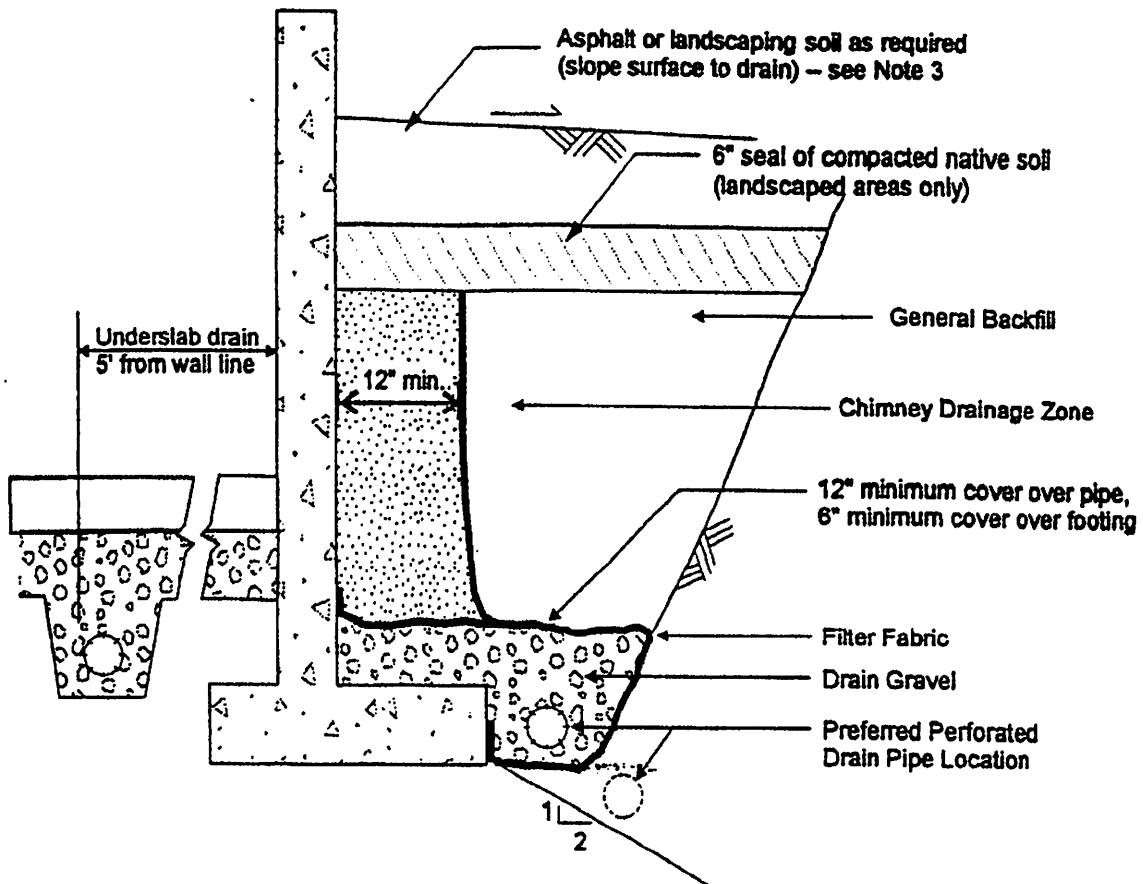
Figure No. 1



**SITE EXPLORATION MAP**

Project No. 943.001.G	1575 BURNS STREET	Figure No. 2
-----------------------	-------------------	--------------





**SCHEMATIC - NOT TO SCALE**

**NOTES:**

1. Filter Fabric to be non-woven geotextile (Amoco 4545, Mirafi 140N, or equivalent)
2. Lay perforated drain pipe on minimum 0.5% gradient, widening excavation as required. Maintain pipe above 2:1 slope, as shown.
3. All-granular backfill is recommended for support of slabs, pavements, etc. (see text for structural fill).
4. Drain gravel to be clean, washed ¾" to 1½" gravel.
5. General backfill to be on-site gravels, or ¾"-0 or 1½"-0 crushed rock compacted to 92% Modified Proctor (AASHTO T-180).
6. Chimney drainage zone to be 12" wide (minimum) zone of clean washed, medium to coarse sand or drain gravel if protected with filter fabric. Alternatively, prefabricated drainage structures (Miradrain 6000 or similar) may be used.

**FOOTING/RETAINING WALL DRAIN**

Project No. 943.001.G

1575 BURNS STREET

Figure No. 3

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
			GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
		GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.	
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
		SANDS WITH FINES	SP	Poorly graded sands or gravelly sands, little or no fines.
			SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

**DEFINITION OF TERMS**

SILTS AND CLAYS	U.S. STANDARD SERIES SIEVE			CLEAR SQUARE SIEVE OPENINGS			COBBLES	BOULDERS
	200	40	10	4	3/4"	3"		
	SAND			GRAVEL				
	FINE	MEDIUM	COARSE	FINE	COARSE			

**GRAIN SIZES**

SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT <sup>1</sup>
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CLAYS AND PLASTIC SILTS	STRENGTH <sup>‡</sup>	BLOWS/FOOT <sup>‡</sup>
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

**RELATIVE DENSITY**

<sup>1</sup>Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

<sup>‡</sup>Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

**CONSISTENCY**

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • Portland, OR 97230

**KEY TO EXPLORATORY TEST PIT LOGS  
Unified Soil Classification System (ASTM D-2487)**

1575 BURNS STREET COMMERCIAL SITE  
WEST LINN, OREGON

206 PROJECT NO.	DATE	Figure 4
943 001 C	May 20, 2005	

BACKHOE COMPANY: **Kavik, Inc.**

BUCKET SIZE: **24 inches**

DATE: **4/23/05**

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION	
						TEST PIT NO. <b>TH-1</b>	ELEVATION
0					ML	Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)	
	X			24.4	ML	Medium brown to olive-brown, very moist, medium stiff to stiff, clayey, sandy SILT	
5	X			27.2			
10						Total Depth - 9.0 feet No ground water encountered	

						TEST PIT NO. <b>TH-2</b>	ELEVATION
0					ML	Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)	
	X			26.1	ML	Medium brown to olive-brown, very moist, medium stiff to stiff, clayey, sandy SILT	
5							
	X			28.3			
10							
15						Total Depth = 11.0 feet No ground water encountered	

**LOG OF TEST PITS**

PROJECT NO. **943.001.G**

**1575 BURNS STREET COMMERCIAL SITE**

FIGURE NO. **5**

BACKHOE COMPANY: Kavik, Inc.

BUCKET SIZE: 24 inches

DATE: 4/23/05

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION	
						TEST PIT NO. TH-3	ELEVATION
0					ML		Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)
	X			35.5	ML		Gray-brown, wet, soft to medium stiff, sandy, clayey SILT
5	X			32.6	ML		Medium brown to olive-brown, very moist to wet, medium stiff to stiff, clayey, sandy SILT
10							Total Depth = 8.0 feet No ground water encountered

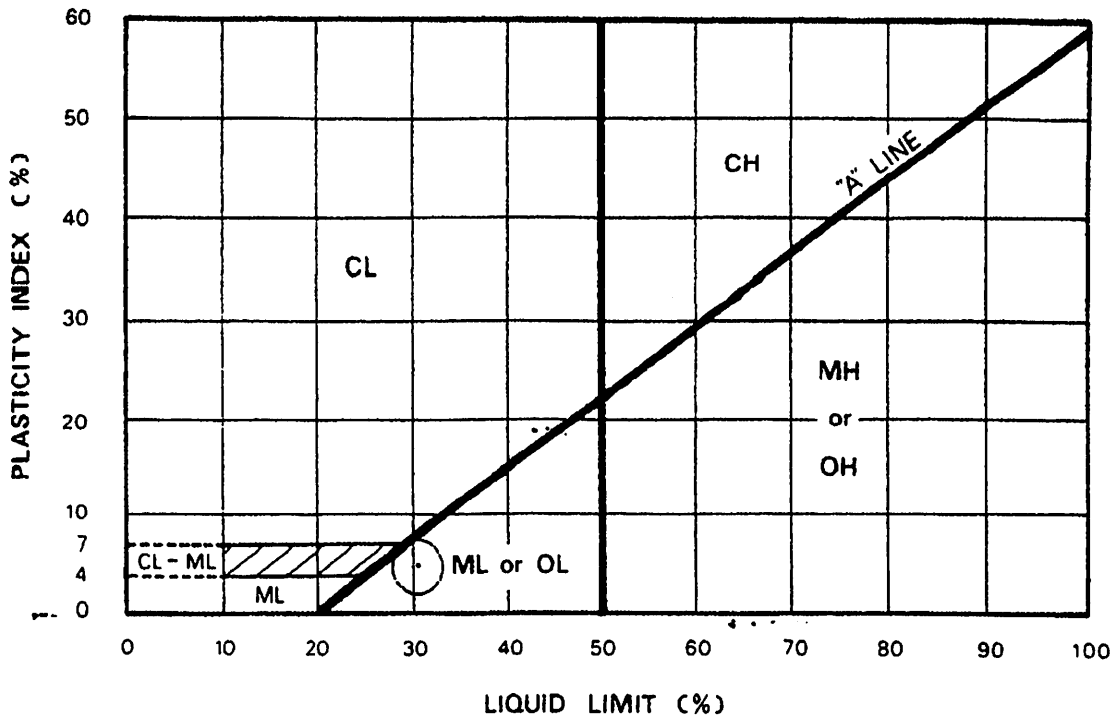
						TEST PIT NO.	ELEVATION
0							
5							
10							
15							

**LOG OF TEST PITS**

PROJECT NO. 943.001.G

1575 BURNS STREET COMMERCIAL SITE

FIGURE NO. 6



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
	TH-2	3.0	28.3	30.6	5.5	76.0		ML

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • PORTLAND, OR 97294

PLASTICITY CHART AND DATA

1575 BURNS STREET COMMERCIAL SITE  
West Linn, Oregon

PROJECT NO.

DATE

943 001 C

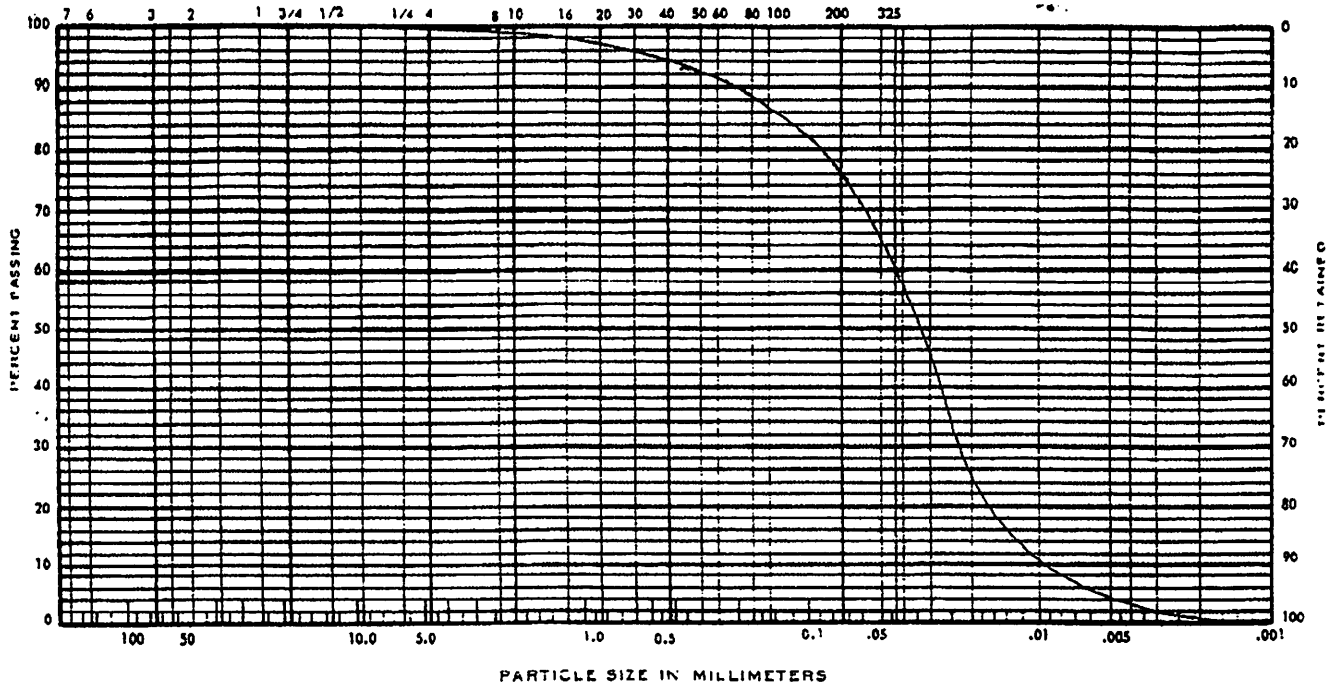
May 20 2005

Figure 7

# UNIFIED SOIL CLASSIFICATION SYSTEM

(ASTM D 422-72)

U. S. STANDARD SIEVE SIZES



COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	ELEV. (feet)	UNIFIED SOIL CLASSIFICATION SYMBOL	SAMPLE DESCRIPTION
—	TH-1	3.0		ML	Medium brown to olive-brown, clayey, sandy SILT

**REDMOND & ASSOCIATES**  
 P.O. Box 301545 • PORTLAND, OR 97294

GRADATION TEST DATA

1575 BURNS STREET COMMERCIAL SITE  
 West Linn, Oregon

PROJECT NO.

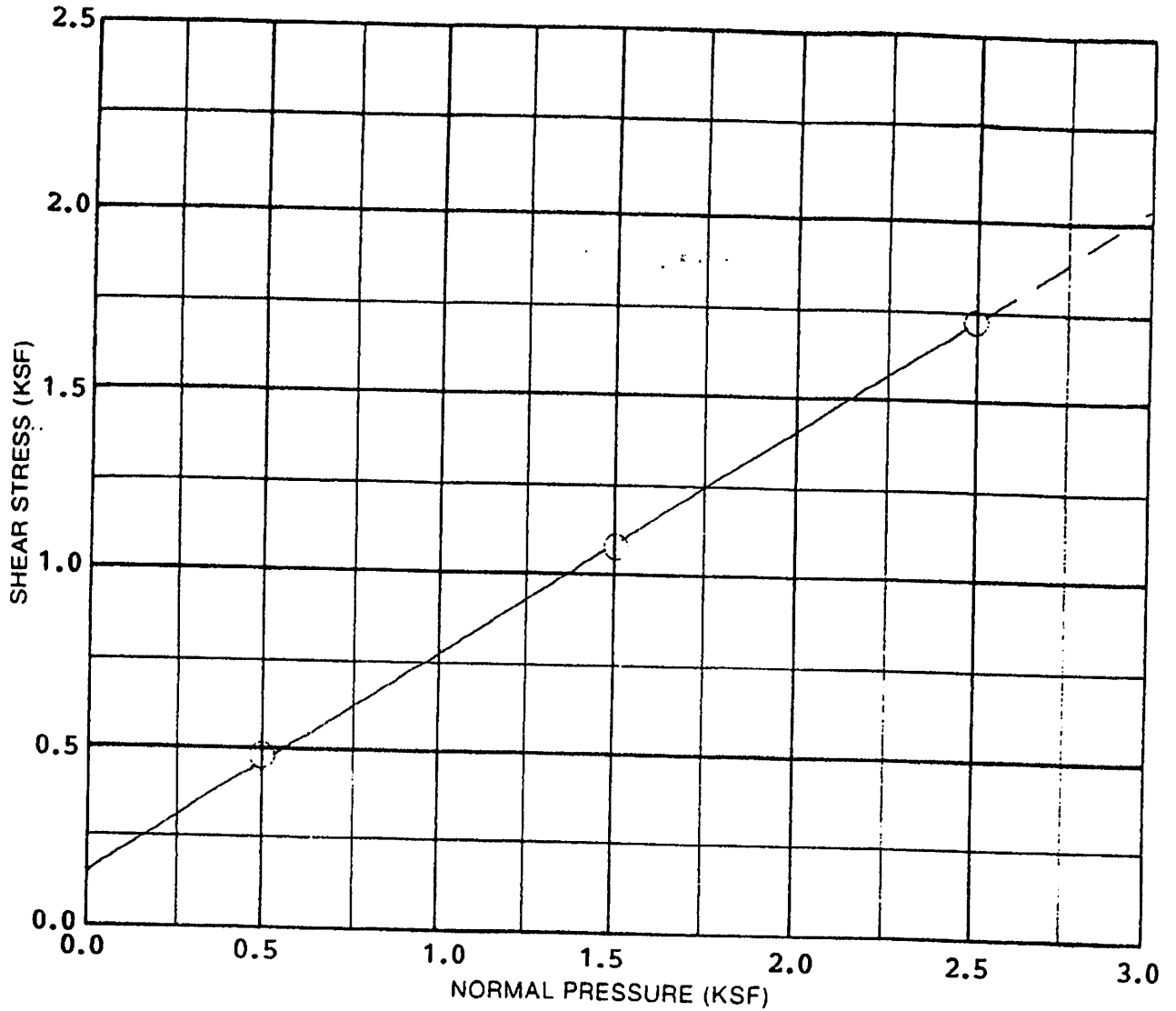
DATE

FIGURE 8

943.001.C

May 20, 2005





SAMPLE DATA	
DESCRIPTION: <b>Medium to olive-brown, clayey, sandy SILT</b>	
BORING NO.: <b>TH-2</b>	
DEPTH (ft.): <b>3.0'</b>	ELEVATION (ft.):
TEST RESULTS	
APPARENT COHESION (C): <b>150 psf</b>	
APPARENT ANGLE OF INTERNAL FRICTION ( $\phi$ ): <b>32°</b>	

TEST DATA				
TEST NUMBER	1	2	3	4
NORMAL PRESSURE (KSF)	0.5	1.5	2.5	
SHEAR STRENGTH (KSF)	0.48	1.09	1.74	
INITIAL H <sub>2</sub> O CONTENT (%)	26.0	26.0	26.0	
FINAL H <sub>2</sub> O CONTENT (%)	25.9	24.2	22.1	
INITIAL DRY DENSITY (PCF)	91.1	91.1	91.1	
FINAL DRY DENSITY (PCF)	91.6	93.1	95.4	
STRAIN RATE: <b>0.02 inches per minute</b>				

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • Portland, OR 97294

DIRECT SHEAR TEST DATA		
1575 BURNS STREET COMMERCIAL SITE West Linn, Oregon		
PROJECT NO.	DATE	
943.001.G	May 20 2005	
		Figure 9

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX E**

---

**FIELD VISIT EXPLORATIONS**

## Field Visit Notes:

A field visit for the Bolton Terrace project located at 1575 Burns Street in West Linn, OR 97068 was conducted on April 14<sup>th</sup>, 2020. The purpose of this visit was to determine if the north fork of Cascade Springs Pond Creek had adequate downstream capacity for the added runoff produced from the developed project site.

During the field visit it was observed that at the mouth of the creek, located near the southeast corner of the project site, the creek had a width of over 30 feet and depth of 10-15 feet. The observed slope at this area was 1.50%.

It was observed, that the creek increases in width and depth further downstream. The next measurement observed was 300 feet downstream. At this point, the creek was greater than 40 feet in depth and greater than 50 feet in width at the widest point. The slope at this point was 1.65%. The width at the bottom of the creek was on average 15 feet in diameter.

These characteristics continue until 1900 feet downstream. The creek decreases to 10 feet in width and approximately 6 feet in depth. The creek then flows through a 30-inch diameter concrete pipe, flowing under River Street and into a 25-foot depth and 30-foot wide creek on the other side. This creek then flows into the Willamette River.

Through field observations, it is determined that Cascade Springs Pond Creek will have more than enough downstream capacity to convey the 0.20 feet of added runoff depth produced by the proposed developed site.

## Field Visit Pictures:

Picture 1:



From mouth of creek looking southeast

Picture 2:



From mouth of creek looking northwest

Picture 3:



From project site looking southeast

Picture 4:



300 ft downstream looking northwest



Picture 5:



300 ft downstream looking southeast

Picture 6:



1900 ft downstream looking west

Picture 7:



1900 ft downstream looking east

Picture 8:



1920ft downstream looking east

# SITE STORMWATER AND DOWNSTREAM ANALYSIS REPORT

**Prepared For:**

Lenity Architecture  
3150 Kettle Ct SE  
Salem, OR 97301

**Project Location:**

Bolton Terrace  
1575 Burns Street  
West Linn, OR 97068

**Permit Number:** CO -

**Prepared By:**



Renews: 6/30/2020



Westech Engineering, Inc.  
3841 Fairview Industrial Drive SE, Suite 100  
Salem, OR 97302  
(503) 585-2474 FAX: (503) 585-3986



# TABLE OF CONTENTS

---

<b>Chapter</b>	<b>Page</b>
<b>1 Project Overview &amp; Description .....</b>	<b>1-1</b>
1.1 Size & Location of Project .....	1-1
1.2 Brief description of project scope and proposed improvements.....	1-1
1.3 Description of Size of Watershed Draining to the Site.....	1-1
1.4 Description of the Existing Site Conditions, Trees & Native Vegetation, Constraints, Sensitive Areas & Waterways .....	1-1
1.5 Regulatory Permits Required.....	1-1
1.6 Emergency Storm Escape Routes.....	1-1
<b>2 Methodology .....</b>	<b>2-1</b>
2.1 Depth to Groundwater .....	2-1
2.2 Maximum Infiltration and Vegetative Treatment.....	2-1
2.3 Soil Information.....	2-1
2.4 Hazardous Material.....	2-1
<b>3 Analysis.....</b>	<b>3-1</b>
3.1 Methods & Software Used.....	3-1
3.2 Curve Number and Time of Concentration Calculations .....	3-1
3.3 Review of Resources & Drainage Basin .....	3-1
3.4 Inspection of Affected Area.....	3-1
3.5 Treatment & Water Quality .....	3-2
3.6 Conveyance System & Analysis of Downstream Effects.....	3-3
3.7 Summary.....	3-4

## LIST OF TABLES

---

<b>Table</b>	<b>Page</b>
Table 1   City of West Linn 24-hour Design Storms .....	3-1
Table 2   Summary of Developed & Allowable Flow for 48-inch Manhole with Up-Flo Filter .....	3-2
Table 3   Summary of Site Peak Flows.....	3-2
Table 3   City of Gresham Conveyance Design Storm Sizing Criteria.....	3-3
Table 3   Summary of Cascade Springs Pond Creek During 50-year Storm .....	3-3

## APPENDICES

---

Appendix A	Basin Maps & Resources
Appendix B	NRCS Soil Report
Appendix C	HydroCAD Summaries
Appendix D	Geotechnical Report
Appendix E	Field Visit Explorations

## 1.1 SIZE & LOCATION OF PROJECT

The proposed project is located on a primarily undeveloped 27,210 square feet lot at 1575 Burns Street in West Linn, Oregon. There is currently a 1,000 square foot house on the lot that will be removed prior to construction. Refer to the Civil Drawings for more detail.

## 1.2 BRIEF DESCRIPTION OF PROJECT SCOPE AND PROPOSED IMPROVEMENTS

The project scope is to develop the full 27,210 square foot lot. The new development will include two one new commercial building and associated parking and landscaping.

## 1.3 DESCRIPTION OF SIZE OF WATERSHED DRAINING TO THE SITE

The 27,210 square foot developed site will drain to an existing 12-inch stormwater pipe located in the southeast corner of the lot. This stormwater pipe then drains into the north fork of Cascade Springs Pond Creek. No other areas drain to the developed site.

## 1.4 DESCRIPTION OF THE EXISTING SITE CONDITIONS, TREES & NATIVE VEGETATION, CONSTRAINTS, SENSITIVE AREAS & WATERWAYS

The existing site is currently undeveloped with a 1,000 square feet single family home on the lot. There are multiple trees on the site and the ground is covered with grass. The westerly portion of the lot is relatively flat, while the eastern portion is moderately sloped descending to the east. Numerous small to large sized trees exist on site.

## 1.5 REGULATORY PERMITS REQUIRED

City of West Linn permits are required. No other permits are required for this project.

## 1.6 EMERGENCY STORM ESCAPE ROUTES

Please refer to the Developed Basin Map in Appendix A for emergency overflow routes.

## 2.1 DEPTH TO GROUNDWATER

Per the Geotechnical Report in Appendix D, groundwater seepage was not encountered and is not expected during construction. See the Geotech Report in Appendix D for details.

## 2.2 MAXIMUM INFILTRATION AND VEGETATIVE TREATMENT

The proposed stormwater design will not provide detention for onsite runoff due to topography constraints. Detention is not required because Cascade Springs Pond Creek has adequate downstream capacity. During the field visit conducted on April 14, 2020, it was determined that Cascade Springs Pond Creek will not see adverse effects due to the increase in stormwater runoff, created by the site, draining into the creek. See Appendix E for details on the field explorations. A Contech stormfilter will be designed to treat the water quality storm event because the site is extremely steep and infiltration is not feasible. See the Civil Drawings for more details.

## 2.3 SOIL INFORMATION

The pre-developed project site contains hydrologic soil group C soils. Refer to the Soils Report in Appendix B for more details.

## 2.4 HAZARDOUS MATERIAL

The owner is not aware of any hazardous material contamination onsite.

**3.1 METHODS & SOFTWARE USED**

HydroCAD modeling software was used to size the stormwater facilities. The Santa Barbara Unit Hydrograph Type 1A storm was used to model the required design storms. Per the City of West Linn Design Standards the design storms used were the 1.2 inch, 24-hour (water quality storm), half the 2-year, 24-hour and the 10-year, 24-hour storm events.

**Table 1 | City of West Linn 24-hour Design Storms**

	24-Hour Rainfall Depths for West Linn, OR							
Recurrence Interval, Years	2	5	10	25	50	100	500	WQ
24-Hour Depths, Inches	2.5	3.0	3.4	3.9	4.3	4.5	5.3	1.2

*Source: City of West Linn Stormwater Management Plan*

**3.2 CURVE NUMBER AND TIME OF CONCENTRATION CALCULATIONS**

Curve numbers were derived from the NRCS runoff curve numbers contained in TR-55 *Urban Hydrology for Small Watersheds* per the City of Gresham Standards. The developed impervious area and pervious areas were assigned curve numbers of 98 and 79 respectively. The impervious areas were assigned a curve number of 98 which corresponds to paved/parking areas. The pervious areas were assigned a curve number of 79 which corresponds to amended soil coverage with C-rated soils.

Time of concentration (Tc) for the pre-developed conditions was calculated to be 15 minutes using the sheet flow equation. See the Pre-Developed Basin Map in Appendix A for the flow path used and refer to the HydroCAD Summaries in Appendix C for calculations. A minimum time of concentration of 5 minutes is applied to the developed basin due to the minimum time-step used by the HydroCAD modeling software.

**3.3 REVIEW OF RESOURCES & DRAINAGE BASIN**

The entire 27,210 square foot lot will drain into Cascade Springs Pond Creek. There are five sub-basins within the Cascade Springs basin. The project site is located within the CS2N1 sub-basin per the West Linn Stormwater Management Plan. For more detail and resources refer to Appendix A.

**3.4 INSPECTION OF AFFECTED AREA**

No problem areas or areas of concern were notable during the review of resources. Additionally, there were no existing or potential areas where flooding, capacity problems, channel destruction, or significant destruction of aquatic habitat identified in the inspection.

### 3.5 TREATMENT & WATER QUALITY

The proposed design uses proprietary treatment in lieu of green stormwater management. A 48-inch manhole with a Contech StormFilter is proposed to treat the water quality storm event and provide adequate capacity for the 100-year storm event.

**Table 2 | Summary of Developed & Allowable Flow for 48-inch Manhole with Up-Flo Filter**

Design Storm	Developed Site Flow (cfs)	Allowable Flow (cfs)
WQ Event	0.14	0.15 <sup>1</sup>
Overflow 100-Year	0.63	1.00

<sup>1</sup>Allowable release rate for Contech StormFilter with 3 filter modules

Table 2 above displays that a 48-inch Manhole equipped with a Contech StormFilter with 3 filter cartridges will provide treatment for the water quality event and have capacity for the 100-year storm.

**Table 3 | Summary of Site Peak Flows**

Basin ID	Source (Roof/Road/Other)	Impervious Area (sq ft)	Pervious Area (sq ft)	Design Storms			CN	Tc
				WQ (cfs)	10 Year (cfs)	100 Year (cfs)		
PD	Native	-	27,210	-	0.15	0.29	79	15
DEV	Paved/Landscape	22,510	4,700	0.14	0.45	0.62	98/79 <sup>2</sup>	5.0

<sup>1</sup> PD = pre-developed site conditions (i.e., pre-developed release rates)

<sup>2</sup> The first curve number listed is for the impervious area in the basin (98), then for the pervious area (80)

Table 3 above depicts the runoff experience from developed site compared to that of the predeveloped site. The design storms analyzed were provided in the West Linn Stormwater Management Plan and consisted of the water quality, 10-year, and 100-year, 24-hour storm events.

The proposed Contech Stormfilter system is designed to provide treatment for the water quality storm event and have adequate capacity for the 100-year, 24-hour storm event.



### 3.6 CONVEYANCE SYSTEM & ANALYSIS OF DOWNSTREAM EFFECTS

Per City of West Linn Design Standards, this project is exempt from detention requirements due to adequate downstream capacity of conveyance system. However, a downstream analysis was conducted per the City of Gresham Standards to determine if Cascade Springs Pond Creek will have adequate capacity. The following table provides the COG design storm sizing criteria.

**Table 3 | City of Gresham Conveyance Design Storm Sizing Criteria**

Structure or Facility	Design Storm Recurrence Interval (years)	
Storm sewers, ditches, and outfall pipes	Draining less than 250 acres	10
	Draining greater than 250 acres	50
Creek or stream Channels	Without designated floodplain	50
	With designated floodplain	100
Culverts and bridges	100	

The downstream analysis was conducted using the 50-year, 24-hour design storm per COG Design Standards for a creek with drainage area less than 50 acres.

Peak flow rates for each sub-basin within the Cascade Springs basin were provided by the West Linn Stormwater Management Plan. Additionally, peak flow rates for the junction of sub-basins were also provided. The junction node CSJ2 was selected for this analysis. The peak flow of CSJ2 was combined with the added onsite runoff for the 50-year, 24-hour storm event to determine adequate downstream capacity. Based on inspection and mapping, the creek has 1,500 feet of length, 3:1 side slopes, a width varying 10-30 feet at the bottom, slope of 1.50%, a depth of 10-30 feet, and a Manning’s number of 0.03 was used, corresponding to a typical open, earth channel, that is grassed and winding. See below for water depth in channel, calculated using Manning’s Equation.

**Table 3 | Summary of Cascade Springs Pond Creek During 50-year Storm**

Basin ID	Drainage Area (acres)	50-Year (cfs)	Water Depth in Channel (ft) <sup>a</sup>
CSJ2	55.04	31.15	1.31
DEV	0.62	0.59	0.20
<b>Total</b>	<b>55.56</b>	<b>31.74</b>	<b>1.32<sup>a</sup></b>

<sup>a</sup>Totals do not sum to the addition of the individual flows. This is due to the fact that the time of concentration per basin varies. The totals are the combination of the basin hydrographs. Refer to Link: OUT in Appendix D.

The calculations in Table 3 above display the added runoff to the Cascade Springs Pond Creek that will result from the developed project. The undetained developed 50-year event runoff peak for the site is 0.59 cfs. The developed runoff only contributes to approximately 2% of the total runoff conveyed by Cascade Springs Pond Creek. The peak water surface elevation will rise approximately a tenth of an inch with the added runoff from the developed site. Therefore, the conveyance system will provide adequate capacity for developed stormwater runoff and detention facilities are not required onsite.

### 3.7 SUMMARY

The stormwater system consisting of a 48-inch manhole with a Contech StormFilter with 3 stormfilter cartridges has been designed to treat the water quality storm, and have capacity for the 100-year storm event. Detention was not required to be provided on site because Cascade Springs Pond Creek has adequate downstream capacity. Therefore, the project can meet the flow control and treatment requirements as set forth in the City of West Linn Stormwater Management Plan and the City of Gresham Stormwater Management Manual.

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

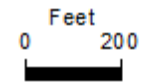
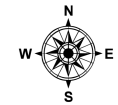
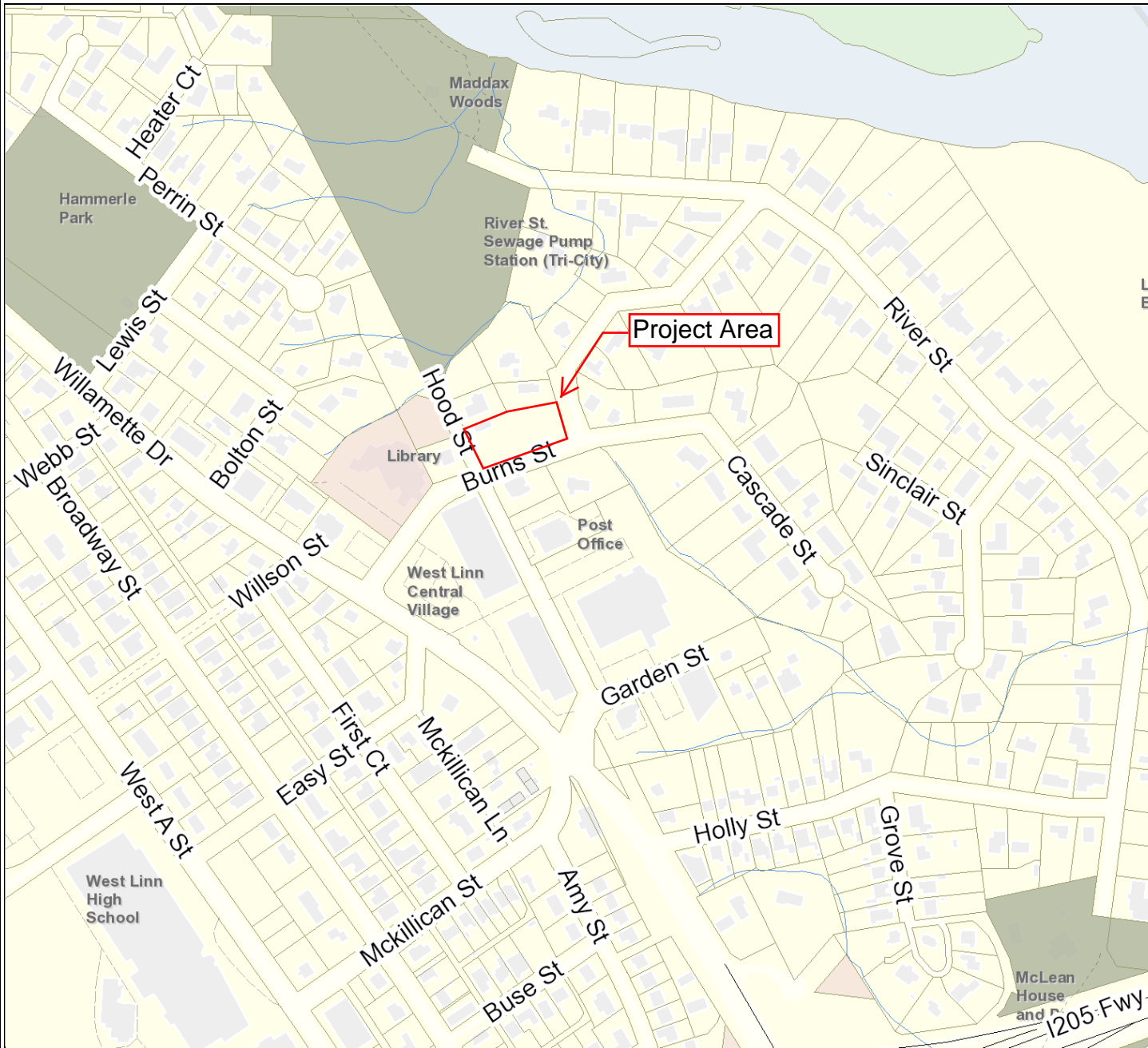
**APPENDIX A**

---

**BASIN MAPS & RESOURCES**

# BASIN & AREA MAPS

# Project Area Map



Scale 1:4,800 - 1 in = 400 ft  
Scale is based on 8-1/2 x 11 paper size



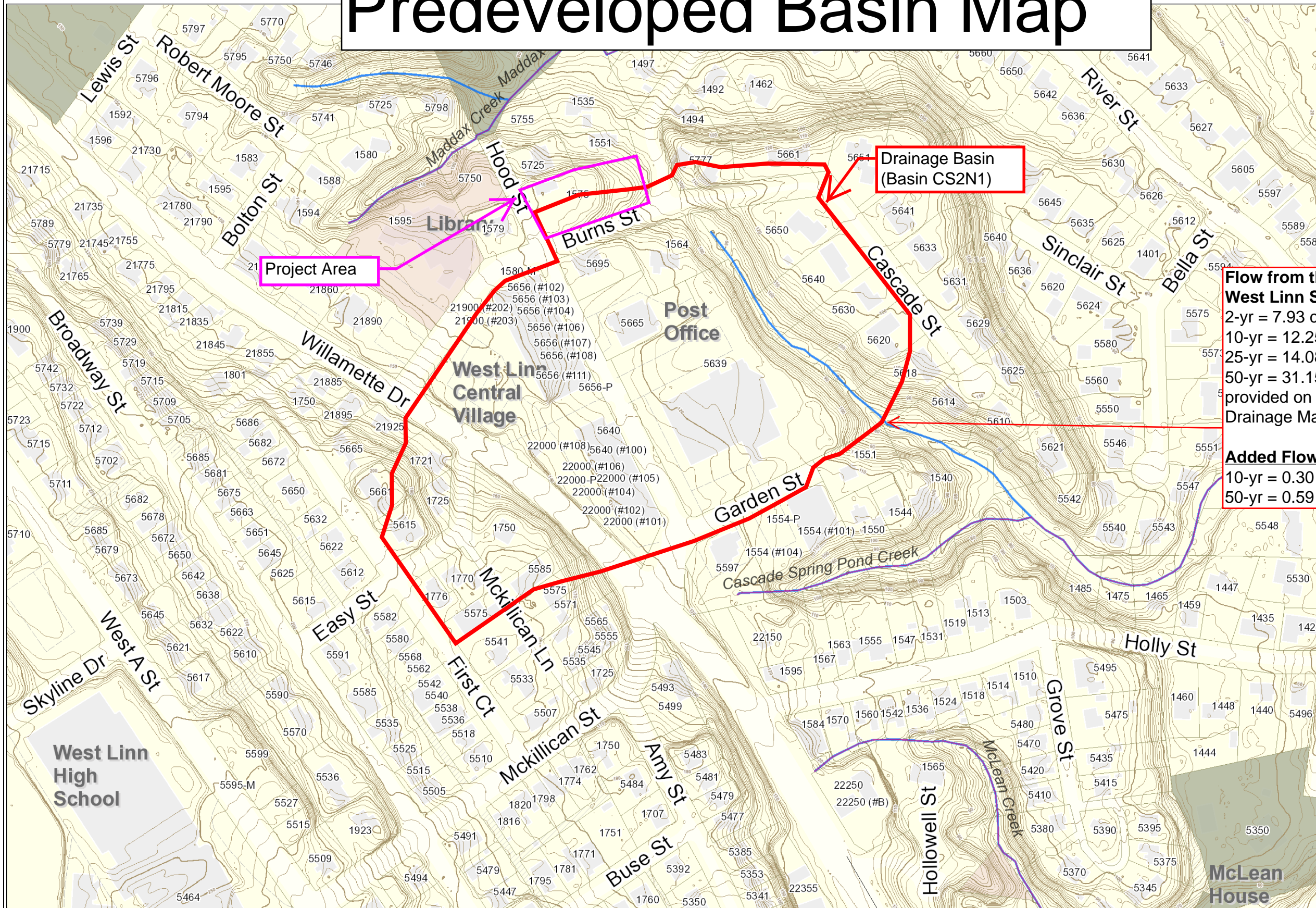
Map created by: public  
Date Created: 30-Jan-20 02:24 PM

**WEST LINN GIS**

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

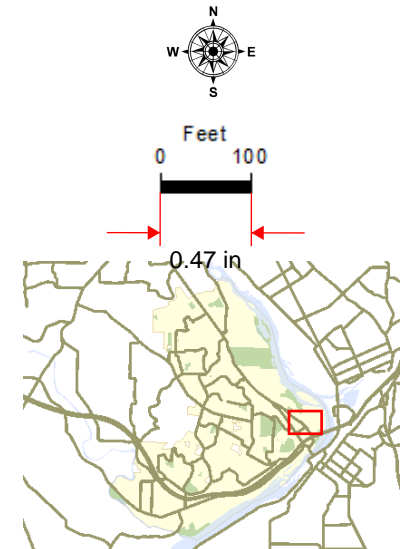


# Predeveloped Basin Map



**Flow from this node according to 2019 West Linn Storm Drainage Master Plan:**  
 2-yr = 7.93 cfs  
 10-yr = 12.25 cfs  
 25-yr = 14.08 cfs  
 50-yr = 31.15 cfs (50-yr storm value only provided on 2006 West Linn Storm Drainage Master Plan)

**Added Flow From Project:**  
 10-yr = 0.30 cfs  
 50-yr = 0.59 cfs

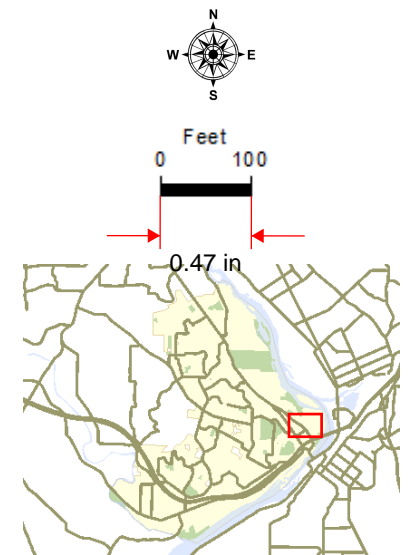


DISCLAIMER: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Map scale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

Map created by: public  
 Date Created: 29-Apr-20 02:46 PM  
**WEST LINN GIS**



# Developed Basin Map



Map created by: public  
Date Created: 29-Apr-20 02:46 PM

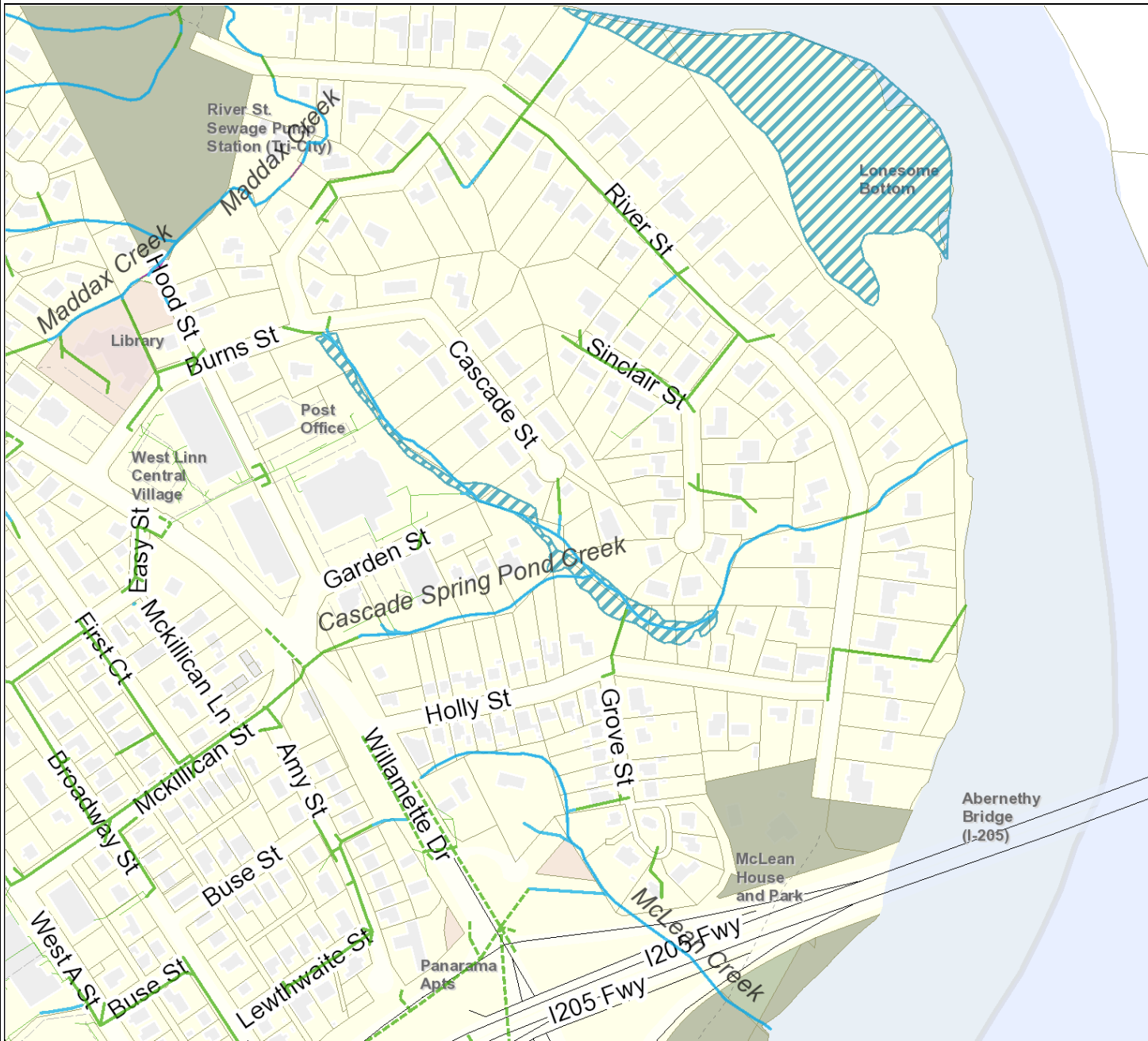
**WEST LINN GIS**

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



# WETLAND, AND HABITAT INVENTORY

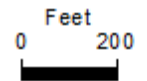
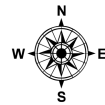
# Wetland Inventory Map



### Legend

- Storm Lines
- Storm Pipes
- - - Storm Pipes County
- - - Storm Pipes ODOT
- Ditches and Creeks
- Private Pipes

### Wetland Inventory 2005 Goal



Scale 1:4,800 - 1 in = 400 ft  
Scale is based on 8-1/2 x 11 paper size



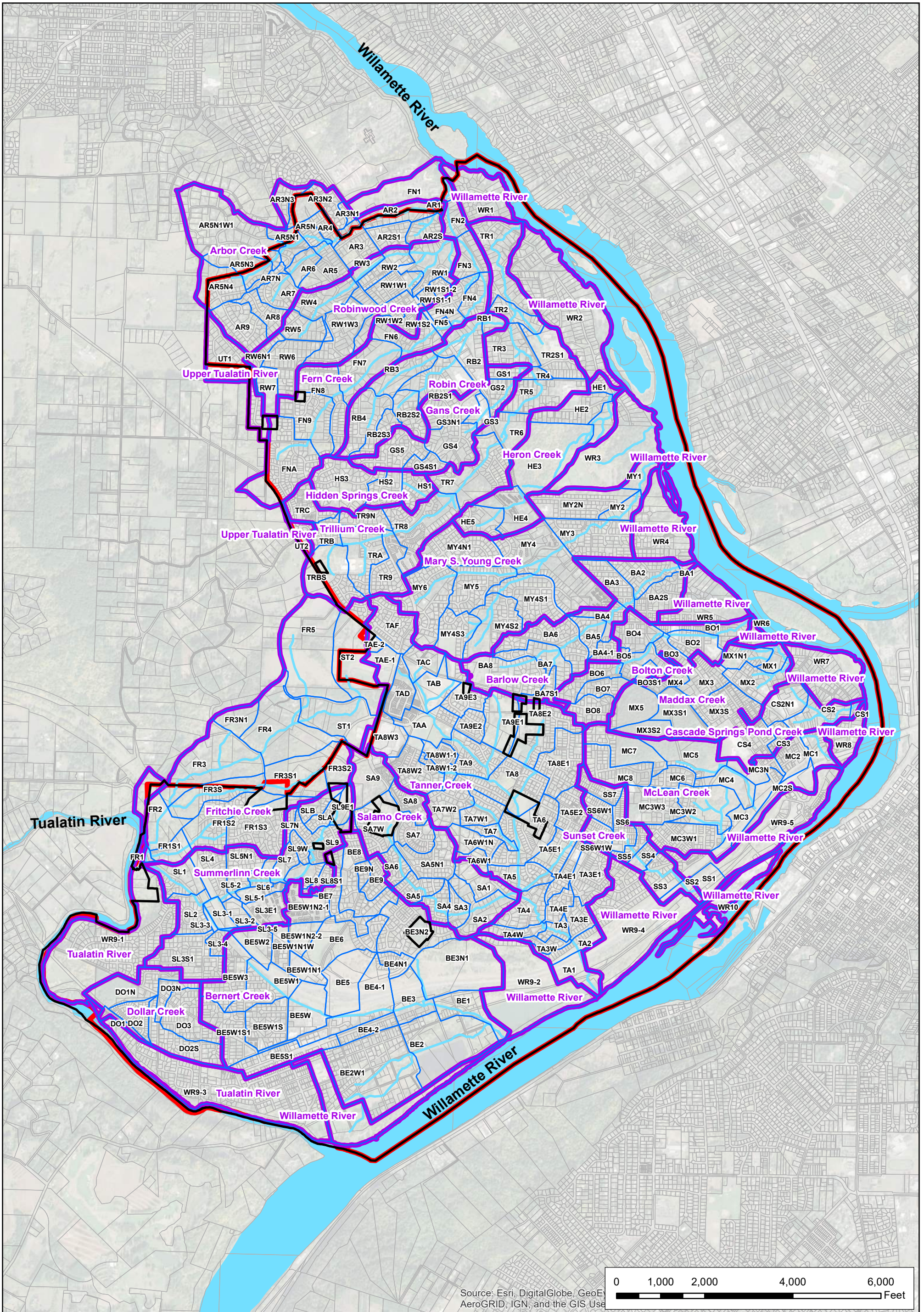
Map created by: public  
Date Created: 30-Jan-20 02:47 PM

**WEST LINN GIS**

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

# BASIN INFORMATION





1:24,000 scale



**CITY OF WEST LINN, OREGON**  
 Storm Drainage and Sanitary Master Plan 2019

Figure B-1: Stormwater Subbasins

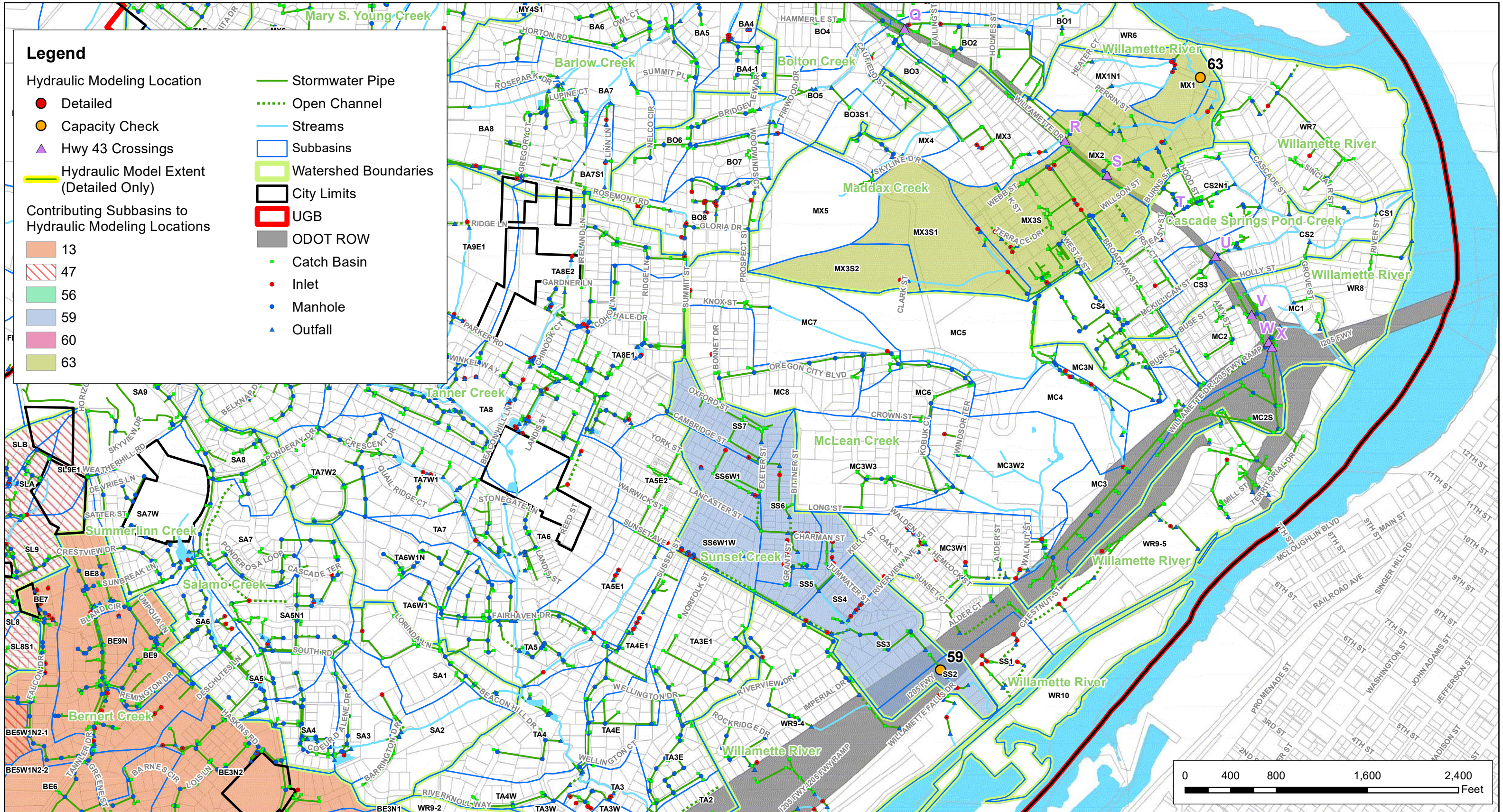
- City Boundary
- UGB
- Subbasins
- Watershed Boundaries
- Streams

Data Source: City of West Linn GIS and Metro RLIS

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

Map Publication/Print Date: November 2018 Produced by Brown and Caldwell





**Legend**

Hydraulic Modeling Location

- Detailed
- Capacity Check
- ▲ Hwy 43 Crossings
- ▭ Hydraulic Model Extent (Detailed Only)

Contributing Subbasins to Hydraulic Modeling Locations

- 13
- 47
- 56
- 59
- 60
- 63

- Stormwater Pipe
- ⋯ Open Channel
- Streams
- ▭ Subbasins
- ▭ Watershed Boundaries
- ▭ City Limits
- ▭ UGB
- ▭ ODOT ROW
- Catch Basin
- Inlet
- Manhole
- ▲ Outfall

1:9,600 scale

N

**CITY OF WEST LINN, OREGON**  
 Storm Drainage and Sanitary Master Plan 2019  
 Figure B-4: Hydraulic Modeling Overview (South)

Data Source: City of West Linn GIS and Metro RLIS  
 Disclaimer: This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.  
 Map Publication/Print Date: November 2018 Produced by Brown and Caldwell



**Attachment A. Table A-1: Hydrology Parameters and Model Results**

Basin ID	Area (acres)	Width (ft)	Slope (ft/ft)	Existing Impervious Percentage	Future Impervious Percentage	Existing Land Use			Future Land Use			Future Land Use			Future Land Use		
						Maximum Flow (cfs)			Maximum Flow (cfs)			Absolute Increase in Maximum			Percent Increase in Maximum Flow		
						2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr
BE5W	21.46	862.53	0.03	56.19	56.19	9.37	15.47	17.78	9.37	15.47	17.78	0.00	0.00	0.00	0.00	0.00	0.00
BE5W1	23.58	631.68	0.06	32.24	32.24	7.82	15.52	18.21	7.82	15.52	18.21	0.00	0.00	0.00	0.00	0.01	0.00
BE5W1N1	7.87	423.89	0.05	84.69	84.69	4.29	6.16	7.02	4.29	6.16	7.02	0.00	0.00	0.00	0.00	0.00	0.00
BE5W1N1W	9.50	210.81	0.05	66.69	66.69	4.27	6.82	7.84	4.27	6.82	7.84	0.00	0.00	0.00	0.00	0.00	0.00
BE5W1N2-1	15.77	363.01	0.07	34.26	48.79	5.18	10.27	12.09	6.23	10.98	12.72	1.05	0.70	0.63	20.36	6.85	5.23
BE5W1N2-2	8.98	361.75	0.15	68.66	84.98	4.73	7.03	8.01	5.02	7.13	8.11	0.29	0.10	0.10	6.18	1.39	1.21
BE5W1S	21.41	550.38	0.04	31.82	31.95	6.44	13.34	15.87	6.45	13.35	15.88	0.01	0.01	0.01	0.22	0.09	0.06
BE5W1S1	22.68	464.81	0.02	31.11	31.67	5.77	12.42	15.20	5.83	12.48	15.26	0.06	0.06	0.06	1.06	0.50	0.39
BE5W2	11.96	526.59	0.02	43.29	43.29	4.61	8.29	9.61	4.61	8.29	9.61	0.00	0.00	0.00	0.00	0.00	0.00
BE5W3	21.99	632.15	0.06	30.71	30.71	7.27	14.49	17.00	7.27	14.49	17.00	0.00	0.00	0.00	0.00	0.00	0.00
BE6	28.38	505.71	0.13	21.24	48.79	7.75	17.42	20.79	11.48	19.97	23.08	3.73	2.54	2.29	48.17	14.60	11.01
BE7	15.60	291.98	0.08	29.67	30.21	4.57	9.64	11.50	4.61	9.68	11.53	0.04	0.04	0.03	0.94	0.36	0.28
BE8	25.60	534.32	0.10	28.95	28.96	8.04	16.52	19.48	8.04	16.52	19.48	0.00	0.00	0.00	0.01	0.00	0.01
BE9	8.75	313.98	0.09	29.73	29.73	3.26	6.05	7.04	3.26	6.05	7.04	0.00	0.00	0.00	0.00	0.00	0.00
BE9N	3.60	252.10	0.11	30.00	30.00	1.60	2.65	3.05	1.60	2.65	3.05	0.00	0.00	0.00	0.00	0.00	0.00
<b>Bolton Creek</b>																	
B01	14.30	417.48	0.09	25.42	28.48	4.71	9.50	11.10	4.92	9.62	11.22	0.21	0.13	0.11	4.42	1.33	1.03
B02	14.35	520.28	0.08	36.27	37.39	5.69	10.11	11.75	5.76	10.16	11.79	0.07	0.05	0.04	1.19	0.46	0.37
B03	6.71	302.28	0.06	31.84	32.46	2.55	4.66	5.42	2.57	4.67	5.43	0.02	0.01	0.01	0.71	0.19	0.20
BO3S1	4.64	563.72	0.25	28.38	30.85	2.28	3.49	4.00	2.31	3.50	4.01	0.03	0.02	0.01	1.14	0.46	0.38
B04	15.40	454.25	0.14	31.79	33.00	5.90	10.73	12.49	5.98	10.78	12.54	0.08	0.06	0.05	1.36	0.52	0.42
B05	12.47	523.04	0.16	31.54	31.68	2.30	5.50	7.80	2.40	5.50	7.80	0.10	0.00	0.00	4.35	0.00	0.00
B06	13.53	310.87	0.10	30.00	30.00	4.44	8.90	10.44	4.44	8.90	10.44	0.00	0.00	0.00	0.00	0.00	0.00
B07	8.91	385.28	0.11	25.09	25.09	3.43	6.25	7.25	3.43	6.25	7.25	0.00	0.00	0.00	0.00	0.00	0.00
B08	13.32	457.55	0.10	30.00	30.00	4.98	9.21	10.71	4.98	9.21	10.71	0.00	0.00	0.00	0.00	0.00	0.00
<b>Cascade Springs Pond Creek</b>																	
CS1	1.77	157.47	0.06	25.36	29.99	0.76	1.29	1.49	0.79	1.31	1.50	0.03	0.02	0.01	3.28	1.24	1.01
CS2	16.54	390.84	0.05	39.60	40.74	5.60	10.79	12.71	5.69	10.86	12.77	0.09	0.07	0.06	1.57	0.61	0.47
CS2N1	16.50	482.55	0.07	65.01	65.01	7.93	12.25	14.08	7.93	12.25	14.08	0.00	0.00	0.00	0.00	0.00	0.00
CS3	5.47	282.05	0.07	41.27	41.89	2.41	4.03	4.63	2.42	4.03	4.64	0.01	0.01	0.01	0.50	0.20	0.15
CS4	20.45	499.57	0.05	32.10	32.36	6.29	12.91	15.32	6.32	12.93	15.34	0.03	0.02	0.02	0.41	0.16	0.13
<b>Dollar Creek</b>																	
DO1	3.75	119.44	0.06	30.02	30.13	1.25	2.48	2.91	1.25	2.49	2.91	0.00	0.00	0.00	0.16	0.04	0.03
DO1N	24.53	508.68	0.04	18.07	29.91	5.20	12.97	16.05	6.71	14.42	17.40	1.51	1.45	1.35	29.07	11.15	8.40
DO2	10.85	368.67	0.02	34.97	34.97	3.30	6.72	8.01	3.30	6.72	8.01	0.00	0.00	0.00	0.00	0.00	0.00
DO2S	21.52	398.94	0.02	29.97	30.26	5.06	11.04	13.68	5.09	11.07	13.71	0.03	0.03	0.03	0.59	0.29	0.23
DO3	23.72	642.92	0.01	30.00	30.00	5.89	12.83	15.75	5.89	12.83	15.75	0.00	0.00	0.00	0.00	0.00	0.00
DO3N	8.00	209.29	0.02	29.94	30.00	2.13	4.59	5.57	2.13	4.60	5.57	0.00	0.00	0.00	0.09	0.07	0.04
<b>Fern Creek</b>																	
FN1	31.74	437.01	0.05	30.00	30.00	7.98	17.36	21.27	7.98	17.36	21.27	0.00	0.00	0.00	0.00	0.00	0.00
FN2	9.27	408.46	0.05	29.52	29.52	3.33	6.33	7.35	3.33	6.33	7.35	0.00	0.00	0.00	0.00	0.00	0.00
FN3	13.99	418.88	0.04	16.37	16.37	3.27	8.03	9.75	3.27	8.03	9.75	0.00	0.00	0.00	0.00	0.00	0.00
FN4	11.60	328.13	0.03	29.67	30.00	3.26	6.97	8.37	3.28	6.99	8.38	0.02	0.02	0.02	0.58	0.24	0.18
FN4N	13.46	372.26	0.05	38.80	38.80	4.85	9.11	10.62	4.85	9.11	10.62	0.00	0.00	0.00	0.00	0.00	0.00
FN5	3.66	169.57	0.03	82.17	82.17	1.91	2.75	3.14	1.91	2.75	3.14	0.00	0.00	0.00	0.00	0.00	0.00
FN6	18.67	520.42	0.08	30.34	33.15	6.39	12.51	14.60	6.64	12.66	14.74	0.25	0.15	0.14	3.90	1.22	0.94

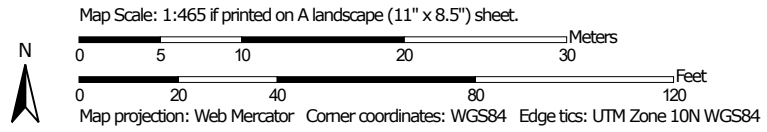
**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX B**

---

**NRCS SOIL REPORT**

Hydrologic Soil Group—Clackamas County Area, Oregon  
(Bolton Terrace Hydrologic Map)



## MAP LEGEND

### Area of Interest (AOI)









 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons





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

#### Soil Rating Lines


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

#### Soil Rating Points






 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available


### Water Features

 Streams and Canals

### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Clackamas County Area, Oregon  
 Survey Area Data: Version 15, Sep 10, 2019

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

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

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

## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
91B	Woodburn silt loam, 3 to 8 percent slopes	C	0.6	100.0%
<b>Totals for Area of Interest</b>			<b>0.6</b>	<b>100.0%</b>

### Description

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

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

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

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

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

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

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

### Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher

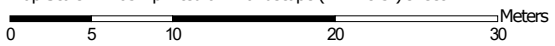


Soil Map—Clackamas County Area, Oregon  
(Bolton Terrace Soil Map)



Soil Map may not be valid at this scale.

Map Scale: 1:465 if printed on A landscape (11" x 8.5") sheet.



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



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Clackamas County Area, Oregon

Survey Area Data: Version 15, Sep 10, 2019

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

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

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

## Map Unit Legend

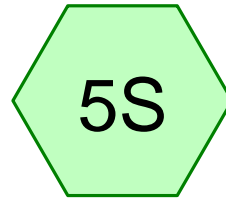
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
91B	Woodburn silt loam, 3 to 8 percent slopes	0.6	100.0%
<b>Totals for Area of Interest</b>		<b>0.6</b>	<b>100.0%</b>

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

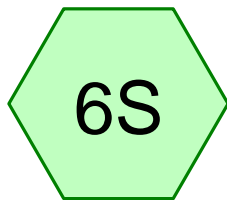
**APPENDIX C**

---

**HYDROCAD SUMMARIES**



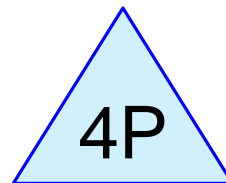
Existing Site



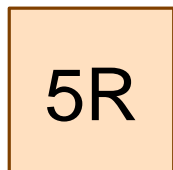
CSJ2



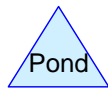
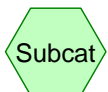
Site Developed



Infiltration



Cascade Springs Pond  
Creek



**Routing Diagram for Bolton Terrace**  
Prepared by Westech Engineering, Inc., Printed 5/7/2020  
HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 10 YR Rainfall=3.40"

Printed 5/7/2020

Page 1

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.18 cfs @ 8.03 hrs, Volume= 0.078 af, Depth= 1.49"

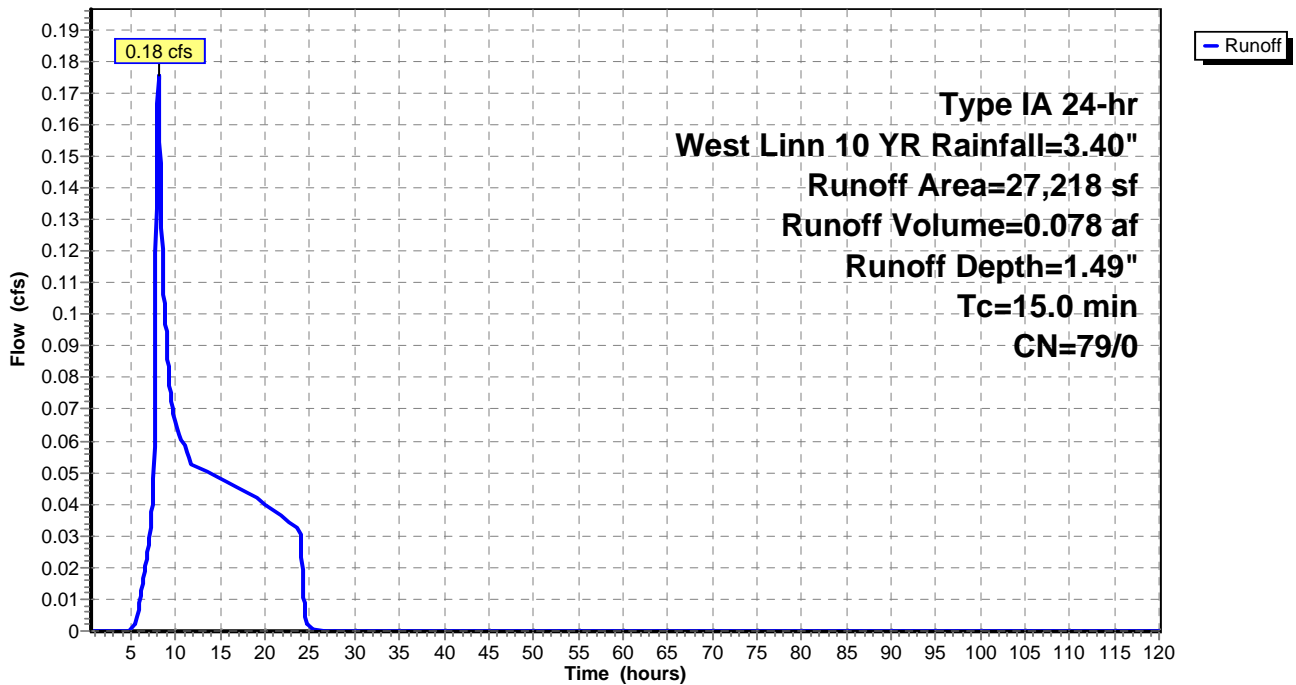
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 10 YR Rainfall=3.40"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Bolton Terrace**

Type IA 24-hr West Linn 100 YR Rainfall=4.50"

Prepared by Westech Engineering, Inc.

Printed 5/7/2020

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Page 2

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.31 cfs @ 8.02 hrs, Volume= 0.124 af, Depth= 2.38"

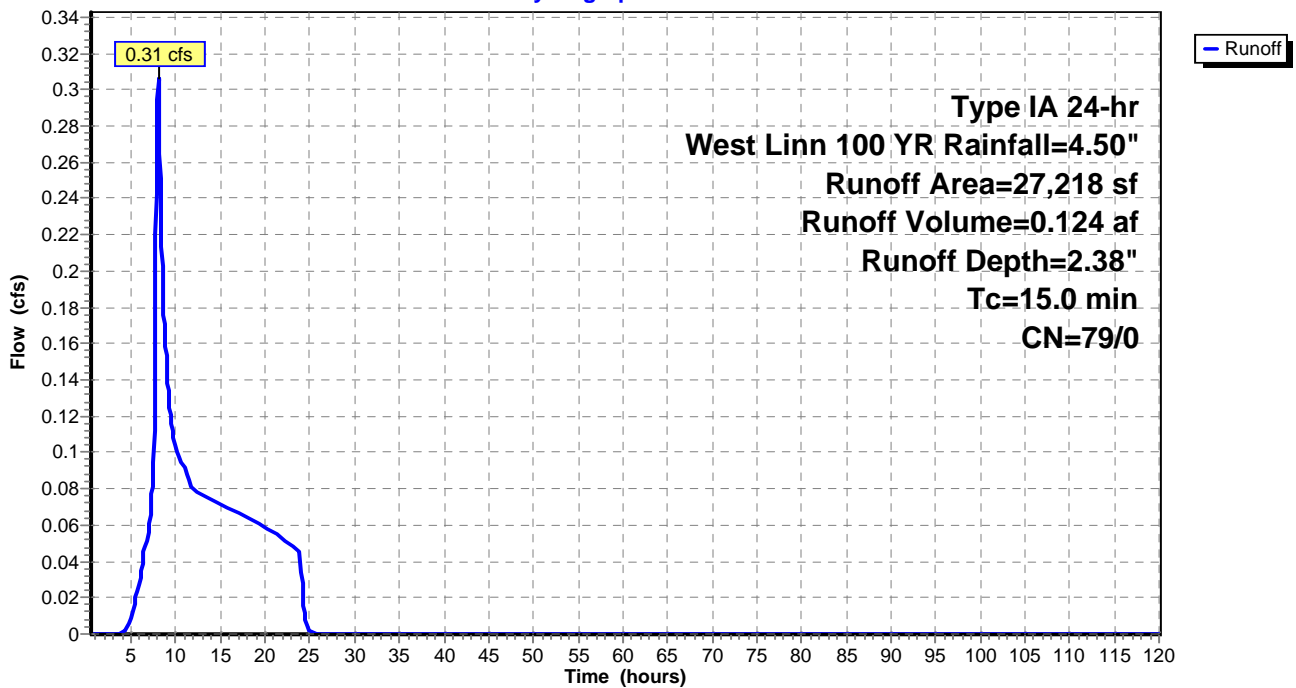
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Type IA 24-hr West Linn 100 YR Rainfall=4.50"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 3

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.28 cfs @ 8.02 hrs, Volume= 0.115 af, Depth= 2.21"

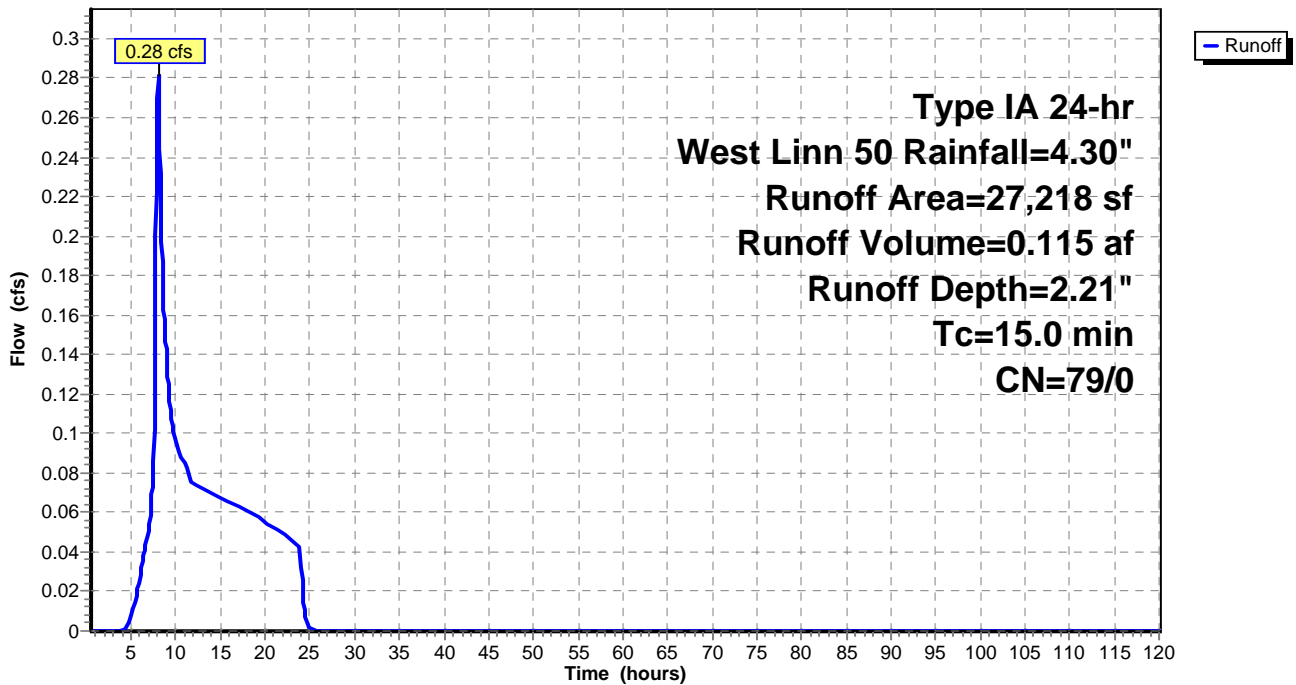
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 50 Rainfall=4.30"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn WQ Rainfall=1.20"

Printed 5/7/2020

Page 4

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.01 cfs @ 17.99 hrs, Volume= 0.007 af, Depth= 0.13"

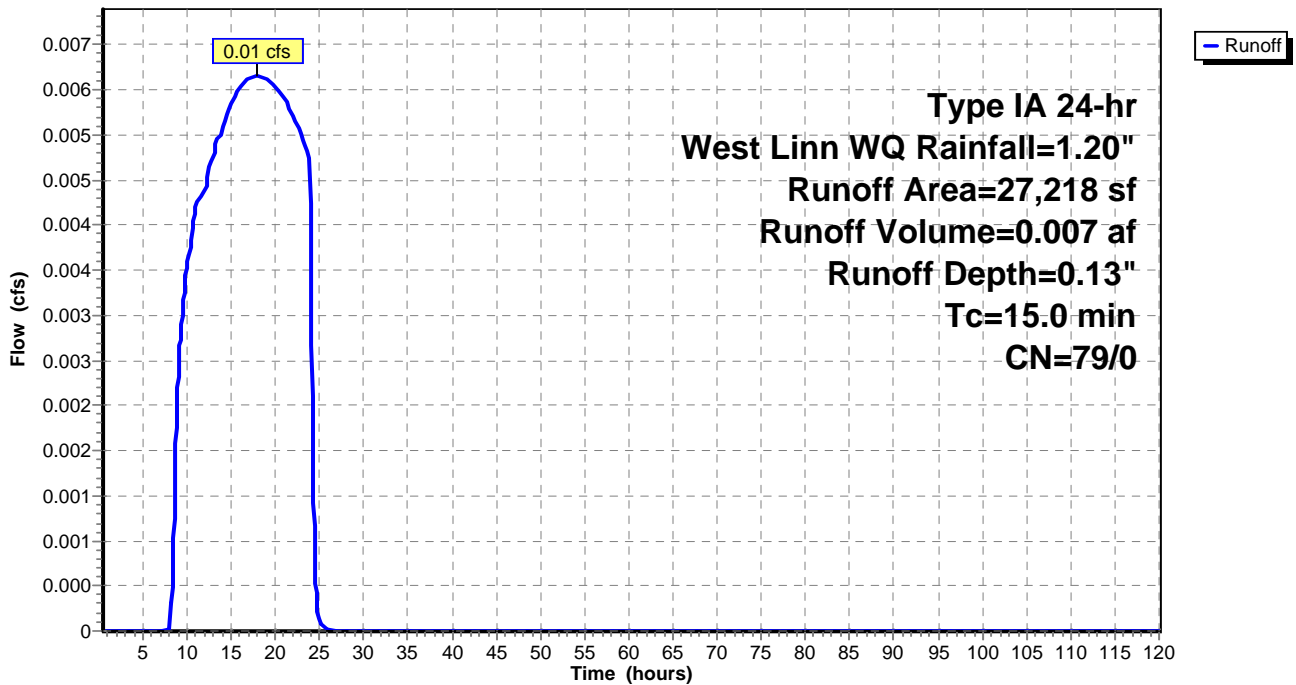
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn WQ Rainfall=1.20"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.45 cfs @ 7.91 hrs, Volume= 0.152 af, Depth= 2.92"

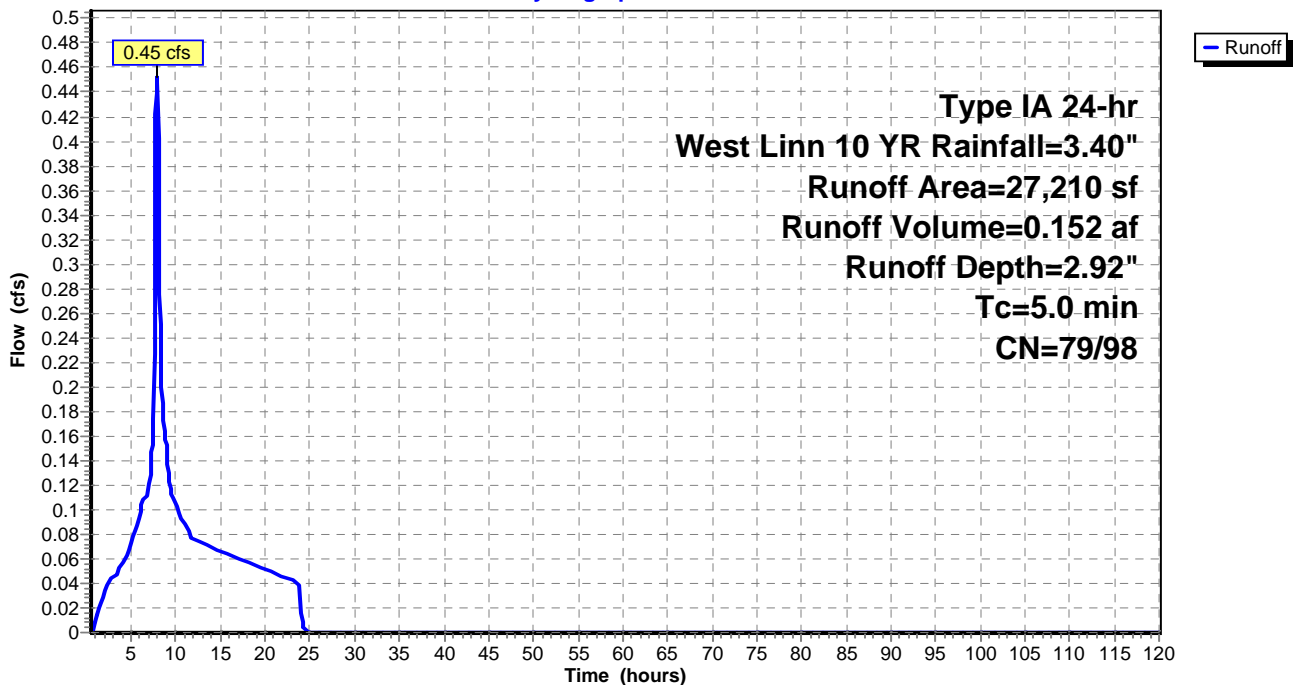
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 10 YR Rainfall=3.40"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph





**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.62 cfs @ 7.90 hrs, Volume= 0.207 af, Depth> 3.98"

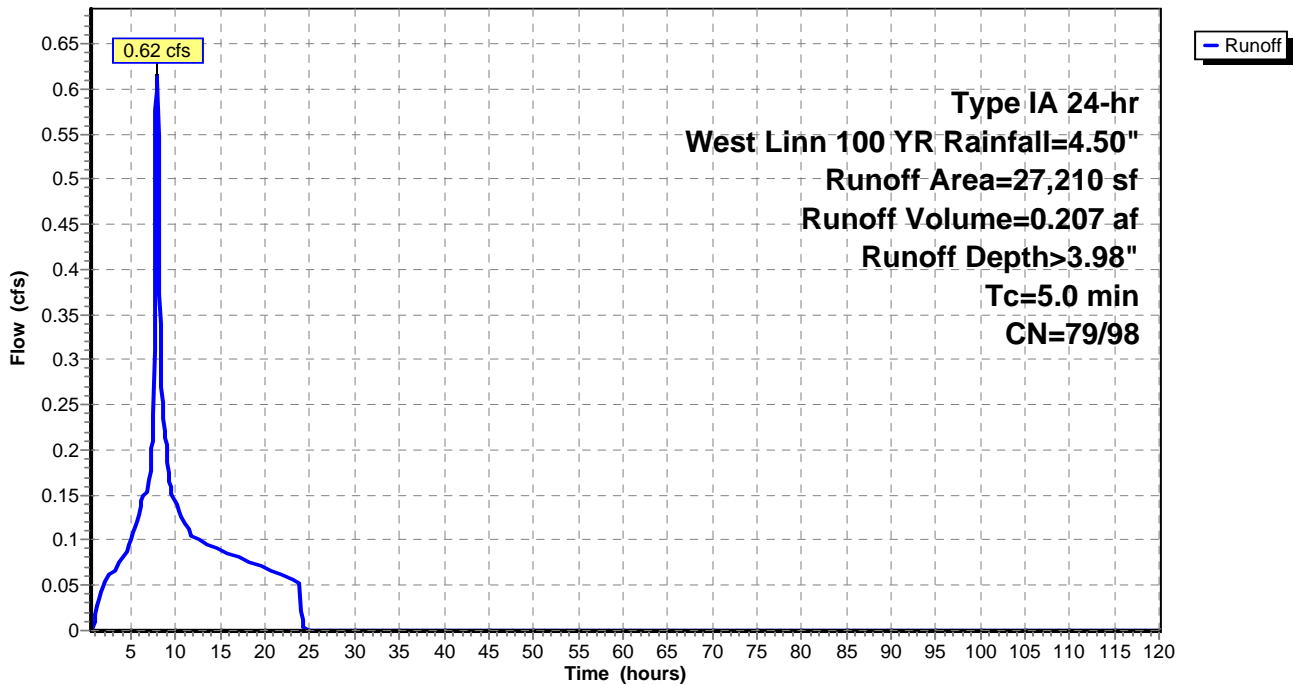
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 100 YR Rainfall=4.50"

Area (sf)	CN	Description
23,130	98	rooftop
4,080	79	50-75% Grass cover, Fair, HSG C
27,210	95	Weighted Average
4,080		14.99% Pervious Area
23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 3

**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.59 cfs @ 7.90 hrs, Volume= 0.197 af, Depth> 3.79"

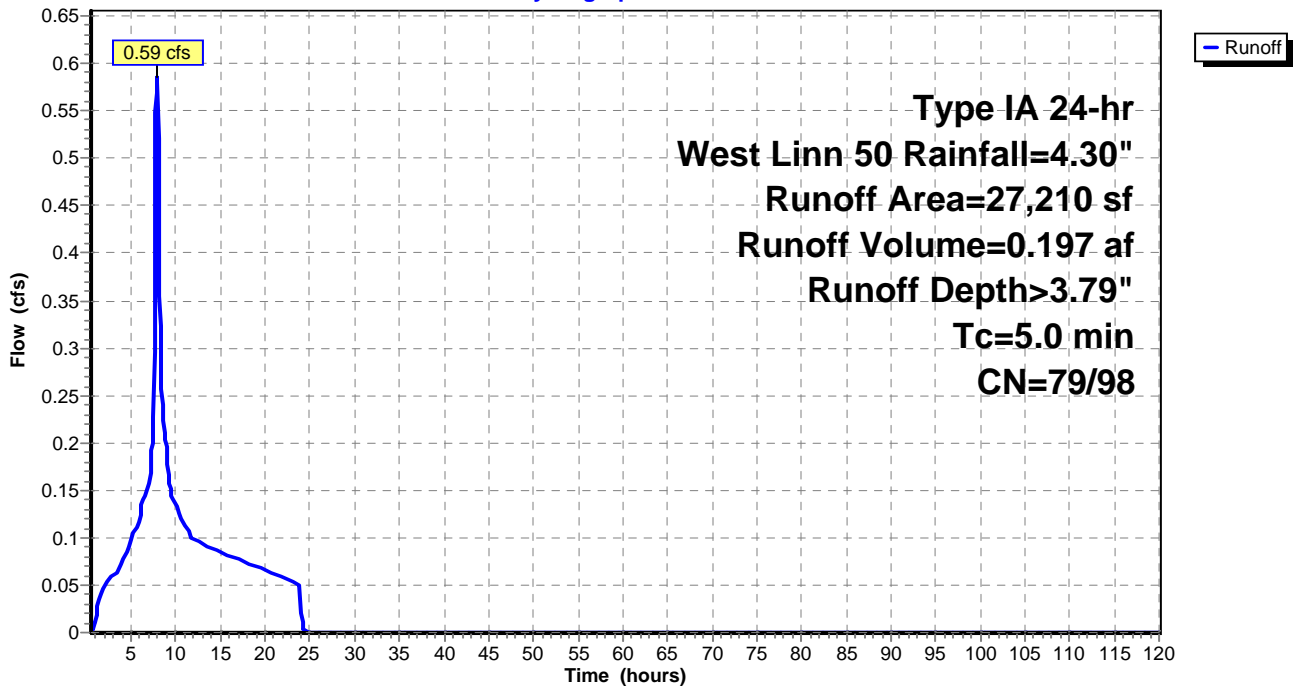
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 50 Rainfall=4.30"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph



**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.14 cfs @ 7.91 hrs, Volume= 0.045 af, Depth= 0.86"

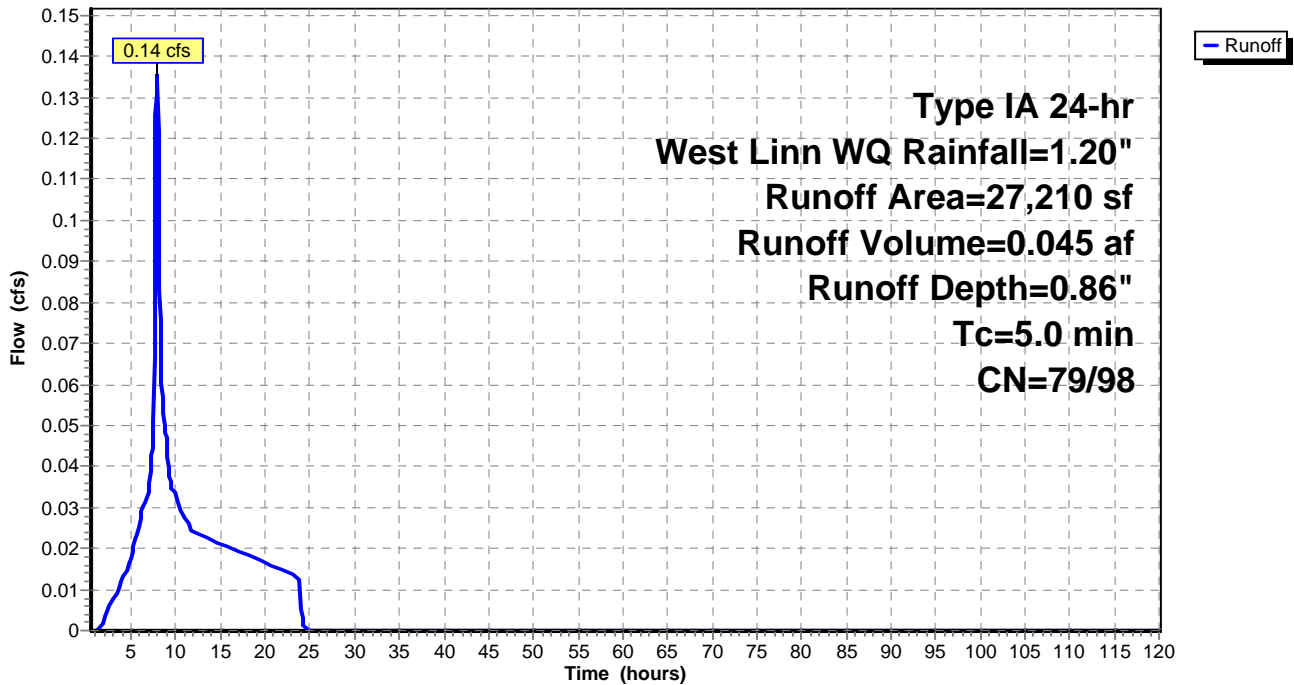
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Type IA 24-hr West Linn WQ Rainfall=1.20"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 1

**Summary for Subcatchment 6S: CSJ2**

Runoff = 31.82 cfs @ 7.98 hrs, Volume= 10.898 af, Depth= 2.38"

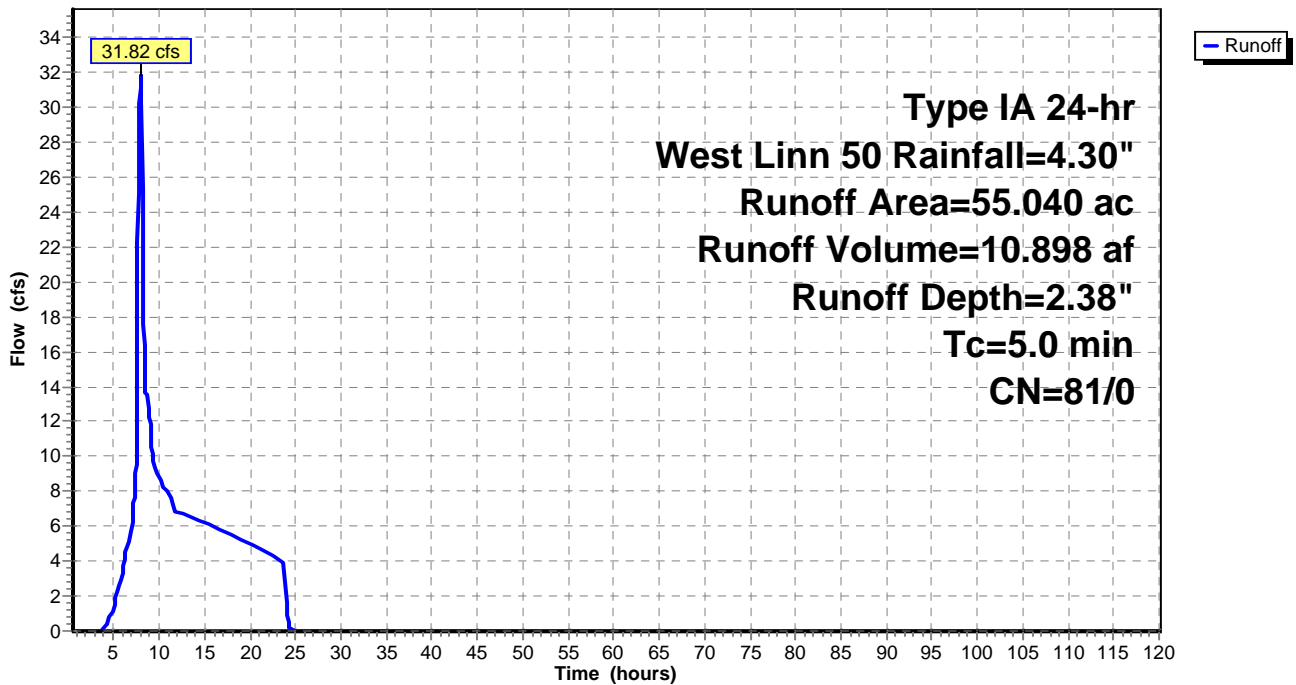
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Type IA 24-hr West Linn 50 Rainfall=4.30"

Area (ac)	CN	Description
* 55.040	81	>75% Grass cover, Good, HSG D
55.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 6S: CSJ2**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 1

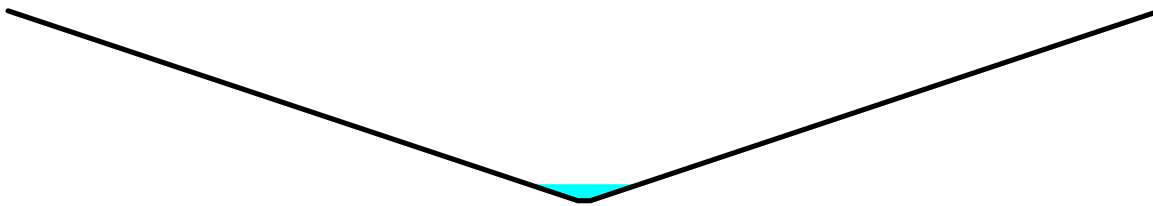
**Summary for Reach 5R: Cascade Springs Pond Creek**

Inflow Area = 55.040 ac, 0.00% Impervious, Inflow Depth = 2.38" for West Linn 50 event  
Inflow = 31.82 cfs @ 7.98 hrs, Volume= 10.898 af  
Outflow = 31.04 cfs @ 8.00 hrs, Volume= 10.898 af, Atten= 2%, Lag= 1.8 min

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Max. Velocity= 4.82 fps, Min. Travel Time= 5.2 min  
Avg. Velocity = 2.94 fps, Avg. Travel Time= 8.5 min

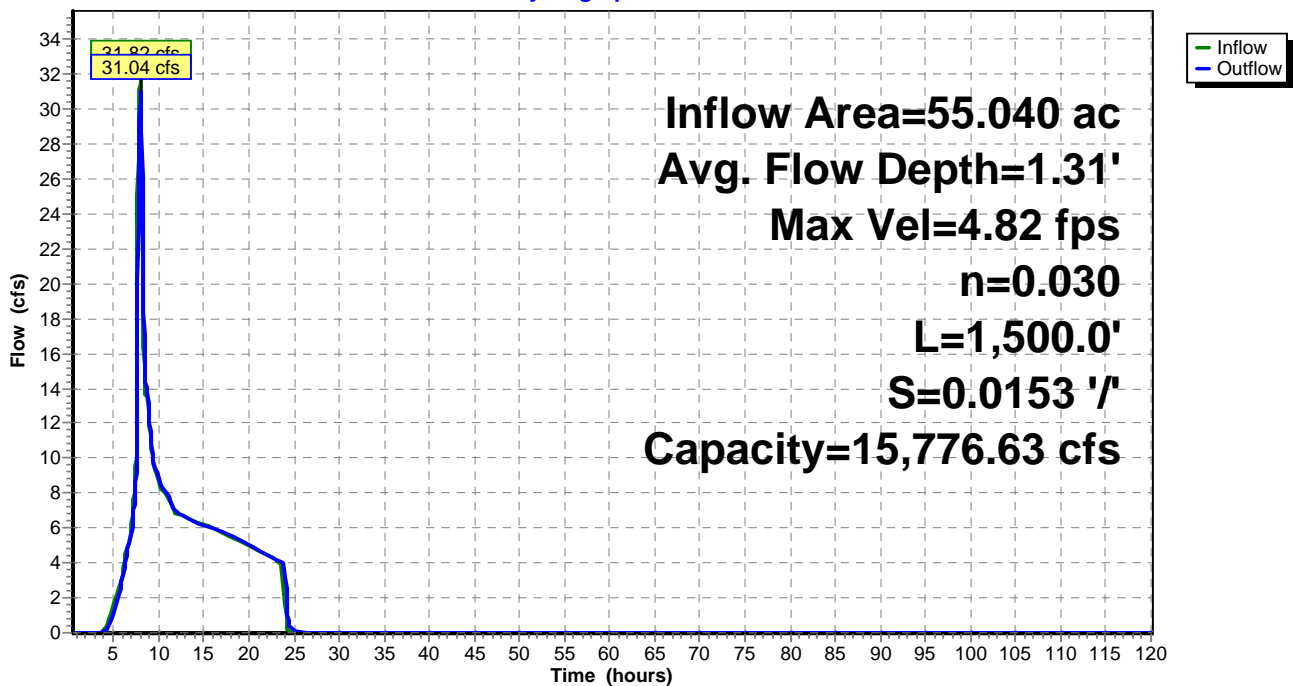
Peak Storage= 9,660 cf @ 8.00 hrs  
Average Depth at Peak Storage= 1.31'  
Bank-Full Depth= 15.00' Flow Area= 690.0 sf, Capacity= 15,776.63 cfs

1.00' x 15.00' deep channel, n= 0.030 Earth, grassed & winding  
Side Slope Z-value= 3.0 '/' Top Width= 91.00'  
Length= 1,500.0' Slope= 0.0153 '/'  
Inlet Invert= 80.00', Outlet Invert= 57.00'



**Reach 5R: Cascade Springs Pond Creek**

Hydrograph





# Bolton Terrace

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 1

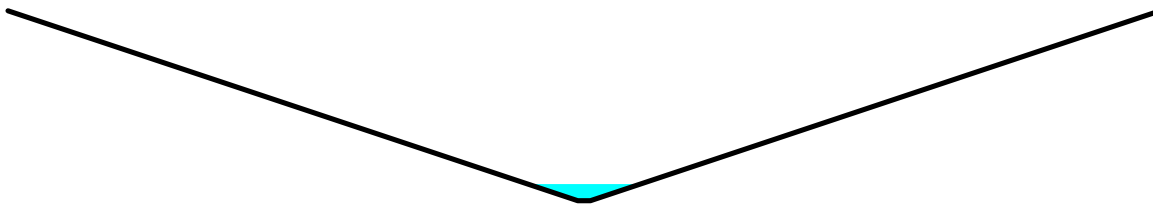
## Summary for Reach 5R: Cascade Springs Pond Creek

Inflow Area = 55.665 ac, 0.95% Impervious, Inflow Depth = 2.39" for West Linn 50 event  
Inflow = 32.15 cfs @ 7.97 hrs, Volume= 11.095 af  
Outflow = 31.62 cfs @ 8.00 hrs, Volume= 11.095 af, Atten= 2%, Lag= 1.8 min

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Max. Velocity= 4.84 fps, Min. Travel Time= 5.2 min  
Avg. Velocity = 2.76 fps, Avg. Travel Time= 9.1 min

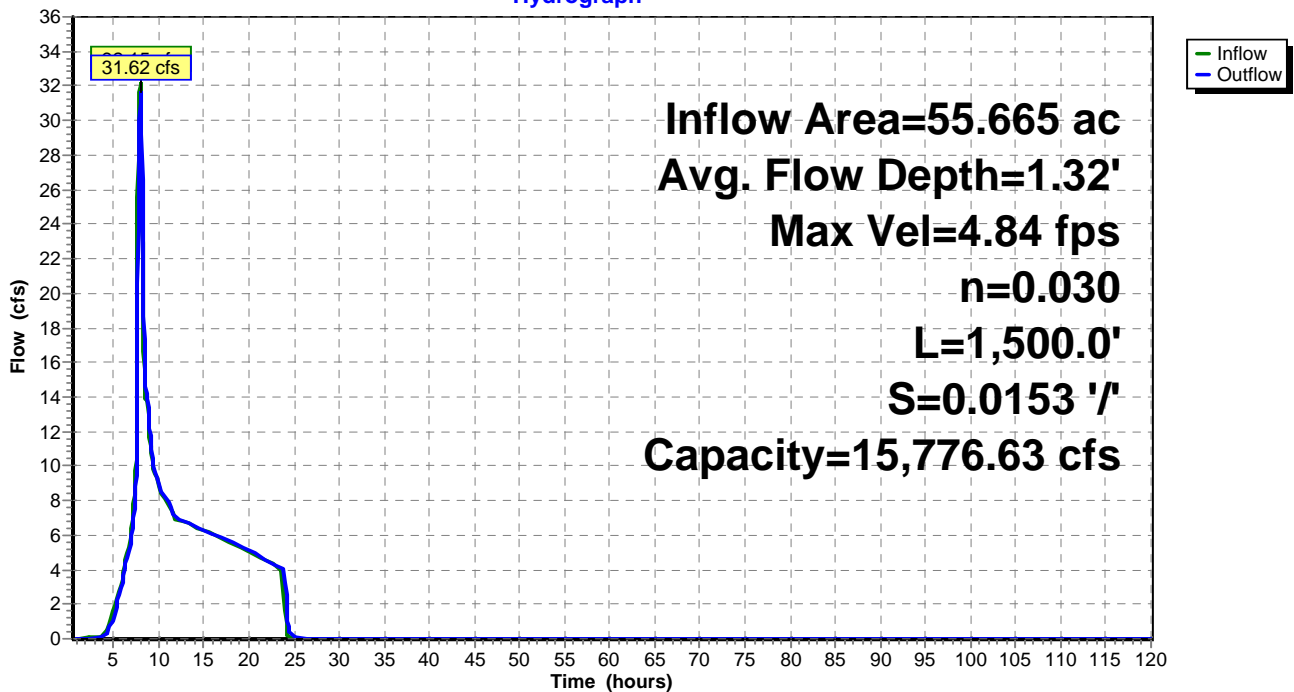
Peak Storage= 9,797 cf @ 8.00 hrs  
Average Depth at Peak Storage= 1.32'  
Bank-Full Depth= 15.00' Flow Area= 690.0 sf, Capacity= 15,776.63 cfs

1.00' x 15.00' deep channel, n= 0.030 Earth, grassed & winding  
Side Slope Z-value= 3.0 '/' Top Width= 91.00'  
Length= 1,500.0' Slope= 0.0153 '/'  
Inlet Invert= 80.00', Outlet Invert= 57.00'



## Reach 5R: Cascade Springs Pond Creek

Hydrograph



**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX D**

---

**GEOTECHNICAL REPORT**



# REDMOND & ASSOCIATES

**Geotechnical Investigation**

**Proposed Commercial Building Site**

**1575 Burns Street**

**West Linn (Clackamas County), Oregon**

**for**

**Mr. Rolf Olson**

**Project No. 943.001.G  
May 20, 2005**



# REDMOND & ASSOCIATES

Project No. 943.001.G  
Page No. 1

May 20, 2005

Mr. Rolf Olson  
3453 Augusta National Drive South  
Salem, Oregon 97302

Dear Mr. Olson:

**Re: Geotechnical Investigation, Proposed Commercial Building Site, 1575 Burns Street,  
West Linn (Clackamas County), Oregon**

## INTRODUCTION

In accordance with the request of Mr. Rolf Olson, we have completed our Geotechnical Investigation at the above subject proposed commercial building site. The site, a rectangular shaped property, is located to the north of Burns Street and to the east of Hood Street in West Linn (Clackamas County), Oregon.

We understand that present plans are to develop the site by constructing a new commercial building. Although the project is still in the preliminary planning and design stages, we understand that the commercial structure will be a one- and/or two-story structure which will include a below grade parking level. Specific building materials are not presently known but are anticipated to include wood- and/or metal frame with concrete and/or masonry blocks walls. The planned commercial structure is anticipated to be supported on conventional continuous (strip) and/or individual spread (column) footings with a concrete slab-on-grade floor. Structural loading is anticipated to result in maximum dead plus live continuous footing and column footing loads on the order of about 2.0 to 4.0 kips per lineal foot (klf) and 50 to 100 kips, respectively. Other associated site improvements will include asphalt pavements for both automobile drive and parking areas, underground utility services and landscaping.

## SITE DESCRIPTION

The proposed commercial site, located within Township 2 South, Range 2 East, and Section 30 of the Willamette Meridian, is presently unimproved and consists of existing open commercial lot.

Topographically, the westerly portion of the site is characterized as relatively flat-lying terrain while the easterly portion of the site is characterized as moderately sloping terrain descending down to the east with overall topographic relief across the entire estimated at about 10 to 15 feet and is estimated lie near to Elevation 180 feet.

Vegetation across most of the site consists of a moderate growth of grass, weeds, and brush as well as numerous small to large sized trees.

### SCOPE OF WORK

The purpose of our geotechnical studies is to evaluate the overall site subsurface soil and ground water characteristics as well as any associated impacts or concerns with regard to the planned construction and development of the site. Specifically, our geotechnical investigation included the following scope of work items:

1. Site exploration by means of three (3) exploratory backhoe test pit excavations. The exploratory test pits were excavated at various locations across the site as shown on the Site Exploration Map, Figure No. 2 to depths ranging from about 8 to 11 feet beneath existing site grades. Detailed logs of the exploratory test pit excavations, presenting conditions encountered at each location explored, are presented on the Log of Test Pits, Figure No's. 5 and 6. Additionally, representative samples of the subsurface soils encountered at the site were collected at selected depths and/or intervals and returned to our laboratory for further examination and testing.
2. A laboratory testing program to assess the pertinent physical and engineering characteristics of the subsurface soils. The laboratory program consisted of tests to evaluate the natural (field) moisture content and dry density, Atterberg Limits, gradational properties and Direct Shear Strength tests. Results of the moisture content and dry density tests are shown on their respective test pit log, Figure No's. 5 and 6. Results of the Atterberg Limits, gradation and direct shear strength tests are shown graphically on Figure No's. 7 through 9.
3. Recommendations and our final written report presenting the results of our investigation. Our report includes recommendations for site preparation and grading including any overexcavation of unsuitable materials revealed by the explorations, placement and compaction of any required structural fill(s), suitability of the on-site soils for use as structural fill as well as criteria for import fill materials, and preparation of pavement and foundation areas.
4. Recommendations for foundation support and design including allowable contact bearing pressures for proportioning footings, minimum width and embedment depths, and estimates of foundation settlement as well as lateral earth pressures for below grade walls. Additionally, we have developed flexible pavement sections for automobile and/or truck traffic areas.

### SUBSURFACE CONDITIONS

Our understanding of the subsurface conditions which underlie the site was developed by means of three (3) exploratory test pits excavated on April 23, 2005 with a rubber-tired excavator at the approximate locations shown on Figure No. 2. The test pits revealed that the site is underlain by native soil deposits comprised of lacustrine and fluvial sedimentary soil deposits of Pleistocene age. Specifically, the native soil materials were comprised of very moist to wet, medium stiff to stiff, clayey, sandy silt to the maximum depth explored of about 11.0 feet beneath existing site grades. These clayey, sandy silt subgrade soils are best characterized by relatively low to moderate strength and compressibility.

Ground water was not encountered at the site during our field exploration work and is not expected to be a factor during construction. However, topsoil materials were encountered at the site and consist of about 12 to 16 inches of organic, clayey and sandy silt. All soils encountered at the site were classified in accordance with the Unified Soil Classification System (USCS) which is outlined on Figure No. 4.

### **CONCLUSIONS AND RECOMMENDATIONS**

From a geotechnical engineering and constructability standpoint, we are of the opinion that the site is suitable for the planned new commercial structure and its associated site improvements provided that the recommendations contained within this report are properly incorporated into the design and construction of the project.

The primary feature of concern at the site is the moisture sensitivity characteristics of the underlying clayey, sandy silt subgrade soil materials

In regards to the moisture sensitivity characteristics of the underlying clayey, sandy silt subgrade soils, we recommend that all foundation excavation and site grading work be performed during the drier summer months which is typically June through September.

The following sections of this report present specific recommendations for site preparation and grading as well as foundation design and construction for the commercial building project.

### **SITE PREPARATION**

In general, we recommend that all planned structural improvement areas for the commercial building and pavements be stripped and cleared of any existing site improvements, vegetation, topsoil materials, and any deleterious materials present at the time of construction. In general, we envision that about 12 to 16 inches of topsoil stripping may be required to remove existing topsoil materials. Holes resulting from the removal of any buried obstructions, such as old foundation remnants and/or boulders, should be backfilled and compacted with structural fill materials. Areas resulting in deeper stripping and removals should be evaluated at the time of construction by the Geotechnical Engineer. The stripped and cleared materials should be properly disposed of as they are generally not considered suitable for use/reuse as structural fill.

Following the stripping and clearing operations, and prior to the placement of any required structural fills and/or structural improvements, the exposed subgrade soils within the planned building and pavement areas should be inspected by the Geotechnical Engineer and possibly proof-rolled with a half-loaded dump truck. Areas found to be soft or otherwise unsuitable for support of structural loads or improvements should be scarified and recompacted or overexcavated and replaced with structural fill. During wet or inclement weather conditions, proof-rolling as recommended above will not be appropriate.

The on-site native clayey, sandy silt subgrade soils are considered suitable for use/reuse as structural fill provided that they are free of organic materials, debris, and rock fragments in excess of 8 inches in dimension. If grading is conducted during wet weather, the use of the on-site clayey, sandy silt soils may be difficult and the use of an import granular fill material may be required. In general, we recommend that a free-draining (clean) granular fill (sand & gravel) containing no more than about 5 percent fines be used during wet weather grading. Representative samples of the material(s) to be used as structural fill should be submitted to our laboratory for approval and to determine the maximum dry density and optimum moisture content for compaction.



All required structural fill materials placed within the building and pavement (structural) areas should be moistened or dried as necessary to near (within 3 percent) optimum moisture conditions and compacted by mechanical means to a minimum of 92 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Fill materials should be placed in lifts (layers) such that when compacted do not exceed about 8 inches.

#### **FOUNDATION SUPPORT**

Based on the results of our investigation, it is our opinion that the proposed commercial building structure may be supported directly on the underlying native medium stiff to stiff, clayey, sandy silt subgrade soil deposits and/or by structural fill materials with conventional continuous and individual spread footings. As such, were foundations are constructed on approved native subgrade soils and/or properly placed and compacted structural fill materials, an allowable contact bearing pressure of about 2,500 pounds per square foot (psf) is recommended for design. However, where higher allowable contact bearing pressures are required, an allowable contact bearing pressure of 3,000 psf may be used for design where the foundations are supported by a minimum of at least 12 inches of compacted crushed aggregate base rock structural fill materials. These allowable contact bearing pressures are intended for dead loads and sustained live loads and may be increased by one-third for the total of all loads including short-term wind or seismic loads.

In general, continuous strip footings should have a minimum width of at least 16 inches and be embedded at least 18 inches below the lowest adjacent finish grade (includes frost protection). Individual column footings (if required) should be embedded at least 16 inches below grade and have a minimum width of about 24 inches.

Total and differential settlements of foundations constructed as recommended above and supported directly by approved native subgrade soils or on properly placed and compacted structural fill materials are expected to be well within tolerable limits for this type of structure and should generally be less than about 1-inch and 1/2-inch, respectively.

Allowable lateral frictional resistance between the base of the footings and the clayey, sandy silt or a gravel subgrade soil can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.35 and 0.45, respectively. In addition, lateral loads may be resisted by passive pressures on footings poured "neat" against in-situ native soils or properly compacted structural fill materials. For passive earth pressure resistance we recommend that an equivalent fluid density of 300 pounds per cubic foot (pcf) be used for design.

#### **FLOOR SLAB SUPPORT**

In order to provide uniform subgrade reaction beneath concrete slab-on-grade floors, we recommend that the floor slabs be underlain by a minimum of 6 inches of free-draining (less than 5 percent passing the No. 200 sieve), well-graded, crushed rock. The crushed rock should provide a capillary break to prevent migration of moisture through the slab. Additional moisture protection can be provided by using a 6-mil visqueen vapor barrier covered with a 1-inch protective layer of sand on the top and bottom. The base course materials should be compacted to at least 95 percent of the maximum dry density obtainable by the ASTM D-1557 (AASHTO T-180) test procedures.

**BELOW GRADE/RETAINING WALLS**

Below grade walls should be designed to resist lateral earth pressures imposed by native soils and/or granular backfill materials as well as any adjacent surcharge loads. For walls which are fully restrained from rotation at the top and supporting level backfill, we recommend that at-rest earth pressures be computed on the basis of an equivalent fluid density of 50 pcf and 60 pcf for granular backfill or sandy silt soil backfill materials, respectively. However, for walls which are free to rotate at the top and retaining level backfill, we recommend that active earth pressures be computed on the basis of an equivalent fluid density of 30 pcf and 40 pcf for granular backfill and sandy silt soil backfill materials, respectively. The above recommended lateral earth pressure values assume that the wall(s) will adequately drained to prevent the buildup of hydrostatic pressures. Where wall drainage will not be present and/or where adjacent surcharge loading and/or sloping ground conditions are present, the above recommended lateral earth pressure values will be higher.

Non structural backfill materials behind retaining walls should be compacted to at least 85 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Where structural backfill materials are required, the degree of compaction should be at least 90 percent of the maximum dry density. However, special care should be taken to avoid overcompaction near the wall(s) which could result in higher lateral earth pressures than those indicated herein. In an area within about three (3) to five (5) feet behind walls, we recommend the use of light hand operated compaction equipment.

**EXCAVATIONS**

Temporary excavations within native subgrade soils of up to four (4) feet in depth are expected to remain fairly stable at near vertical inclinations. Excavations to depths of between four (4) feet to ten (10) feet should be properly braced and shored or backcut to inclinations of at least 1 to 1 (Horizontal to Vertical). Where excavations are planned to exceed ten (10) feet, this office should be consulted. Additionally, at present levels, we do not anticipate that ground water will not be a factor during construction.

**PAVEMENTS**

Flexible pavement design for the project was determined on the basis of projected traffic volume and loading conditions relative to assumed subgrade soil strength characteristics. Based on an assumed subgrade "R"-value of 35 (CBR = 4.0) and utilizing the Oregon State Highway Flexible Pavement Design Procedures, we recommend that the asphaltic concrete pavement sections for automobile parking and drive area use at the site consist of the following:

	<b><u>Asphaltic Concrete Thickness (Inches)</u></b>	<b><u>Crushed Base Rock Thickness (Inches)</u></b>
Automobile Parking Areas	2.5	8.0
Automobile Drive Areas	3.0	9.0

Note: Where heavy vehicle traffic is anticipated, we recommend that the main access drive area pavement section be increased by adding 1.0 inches of asphalt and 3.0 inches of aggregate base rock. Additionally, for wet and/or winter time construction, we recommend that a minimum of at least 12 inches of aggregate base rock be used in all pavement areas.

The above recommended pavement section(s) assume that the subgrade will be prepared as recommended herein, that the exposed subgrade soils will be properly protected from rain and construction traffic, and that the subgrade is firm and unyielding at the time of paving. Additionally, it assumes that the subgrade is graded to prevent any ponding of water which may tend to accumulate in the base course. Further, the above recommended flexible pavement section(s) assumes a design life of about 20 years.

Pavement base course materials should consist of well-graded 1 1/2-inch and/or 3/4-inch minus crushed base rock having less than 5 percent fine materials passing the No. 200 sieve. The base course and asphaltic concrete materials should conform to the requirements set forth in the latest edition of the Oregon Department of Transportation, Standard Specifications of Highway Construction. The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. The asphaltic concrete materials should be compacted to at least 91 percent of the theoretical maximum density as determined by the ASTM D-2041 (Rice Gravity) test method.

#### SEISMIC DESIGN CONSIDERATIONS

Subgrade acceleration coefficients for the project were obtained from the seismic hazard/design mapping project performed by Geomatrix Consultants. Geomatrix mapping indicates that a peak ground acceleration on bedrock soils in the area of the site are 0.19g with a return period of about 500 years. The UBC seismic zone factor (Z) for the subject site is 0.30. Additionally, the IBC soil profile for the subject site to estimate the site class is recommended at D.

#### USE OF REPORT

This report is intended for the exclusive use of the addressee and their representatives to use to design the proposed commercial building structure and its associated site improvements described herein and to prepare any construction documents. The data, analyses, and recommendations may not be appropriate for other structures or purposes. We recommend that parties contemplating other structures or purposes contact our office. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report.

#### LEVEL OF CARE

Services performed by the Geotechnical Engineer for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in the area under similar budget and time restraints. No warranty, either expressed or implied, is made.

#### CONSTRUCTION MONITORING AND TESTING

We recommend that **Redmond & Associates** be retained to provide construction monitoring and testing services during all earthwork operations. The purpose of our monitoring services would be to confirm that the site conditions which are encountered are as anticipated, provide field recommendations as necessary based on the actual conditions encountered, and document the activities of the contractor and assess his/her compliance with the project specifications and recommendations.

It is important that we meet with the grading contractor prior to any site grading work to establish a plan that will minimize costly overexcavation and site preparation work. Of primary importance will be observations made during the site preparation, structural fill placement, footing excavation and preparation, and construction of all below grade retaining walls.

We will be pleased to provide such additional assistance or information as you may require in the balance of the design phase of this project and to aid in construction control or solution of unforeseen conditions which may arise during the construction period.

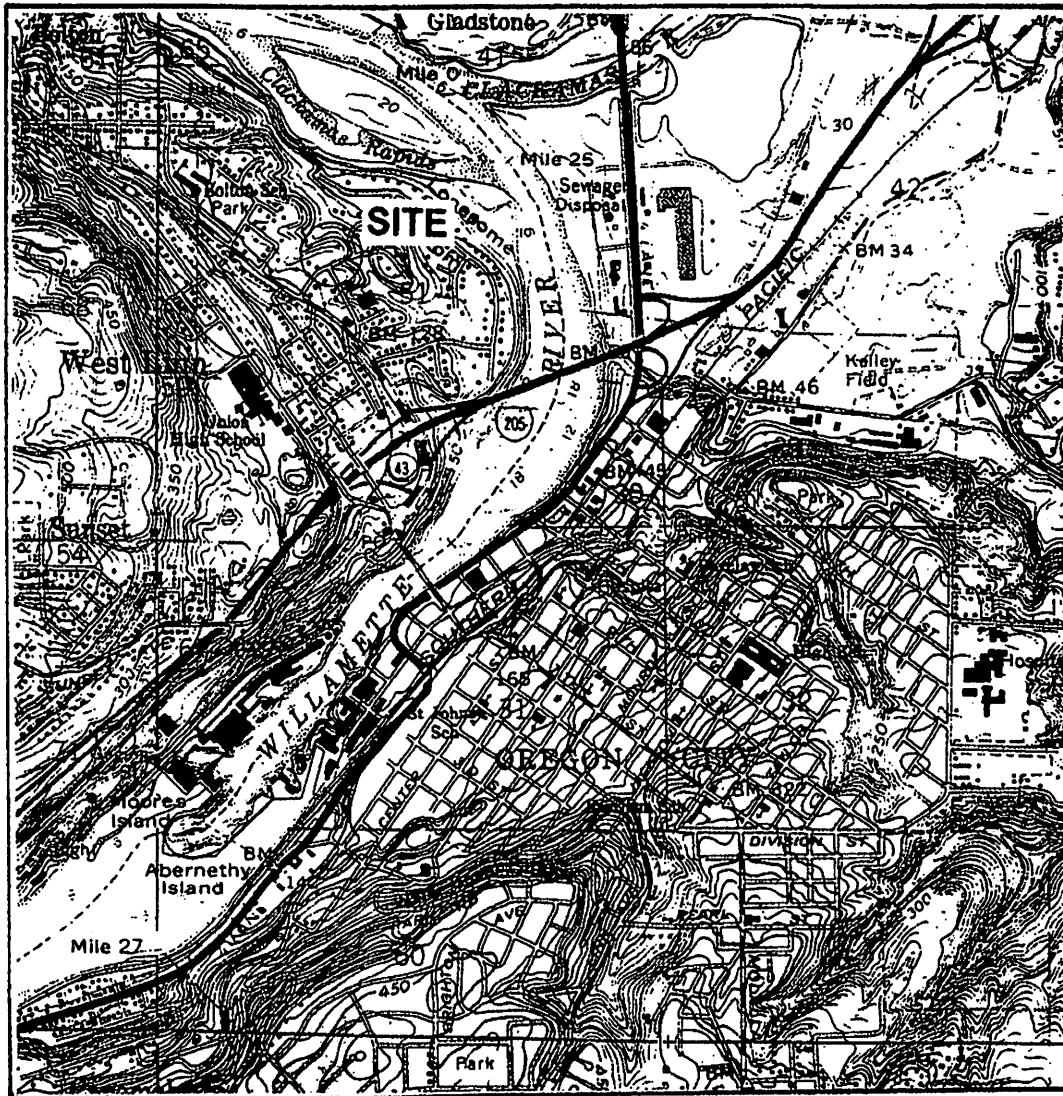
Sincerely,



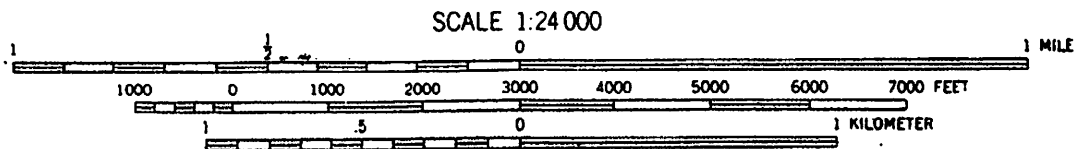
Daniel M. Redmond, P.E.  
President/Principal Geotechnical Engineer



Expires 12-31-06



OREGON CITY QUADRANGLE  
 OREGON-CLACKAMAS CO.  
 7.5 MINUTE SERIES (TOPOGRAPHIC)  
 SE/4 OREGON CITY 15' QUADRANGLE



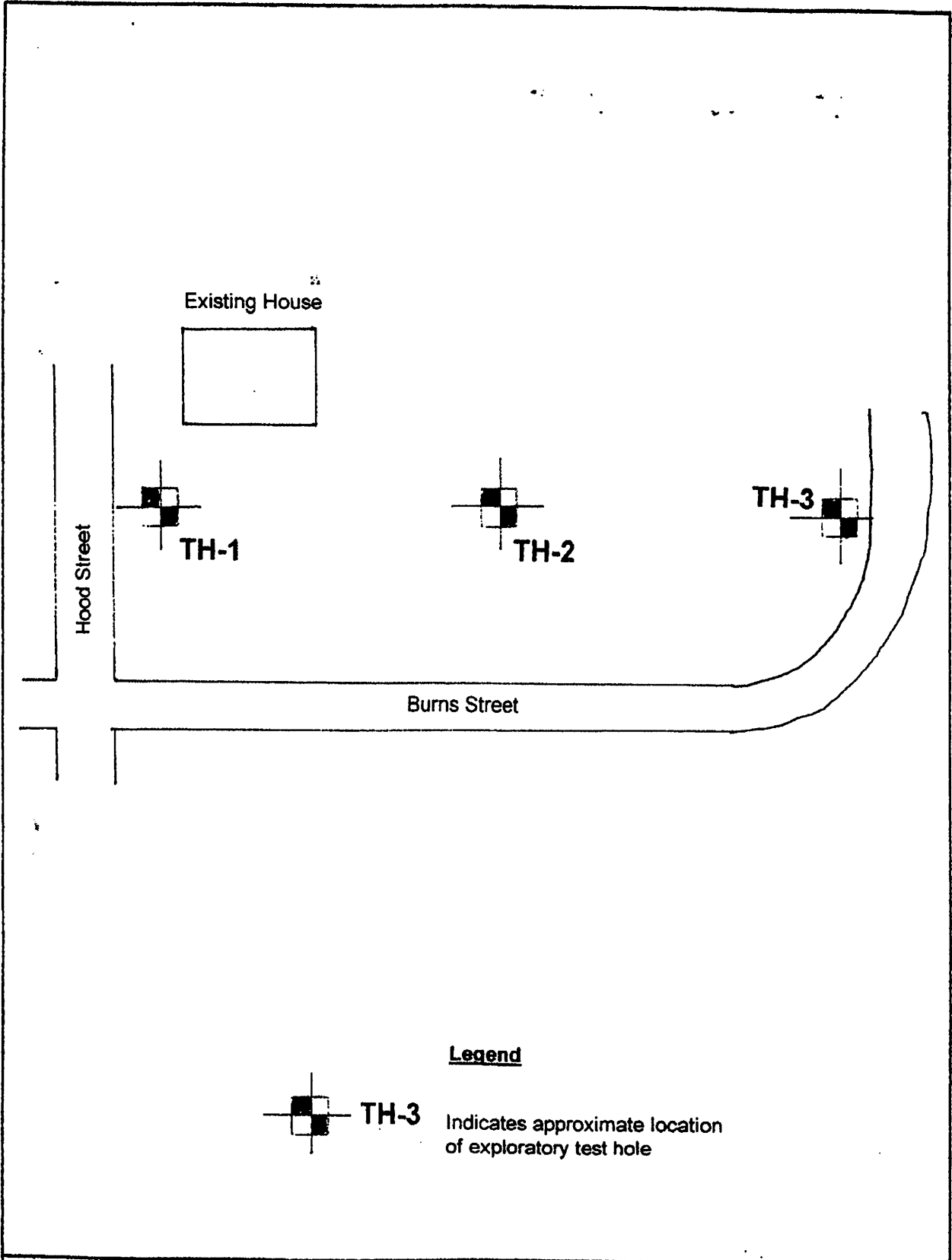
CONTOUR INTERVAL 10 FEET  
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

**SITE VICINITY MAP**

Project No. 943.001.G

1575 BURNS STREET

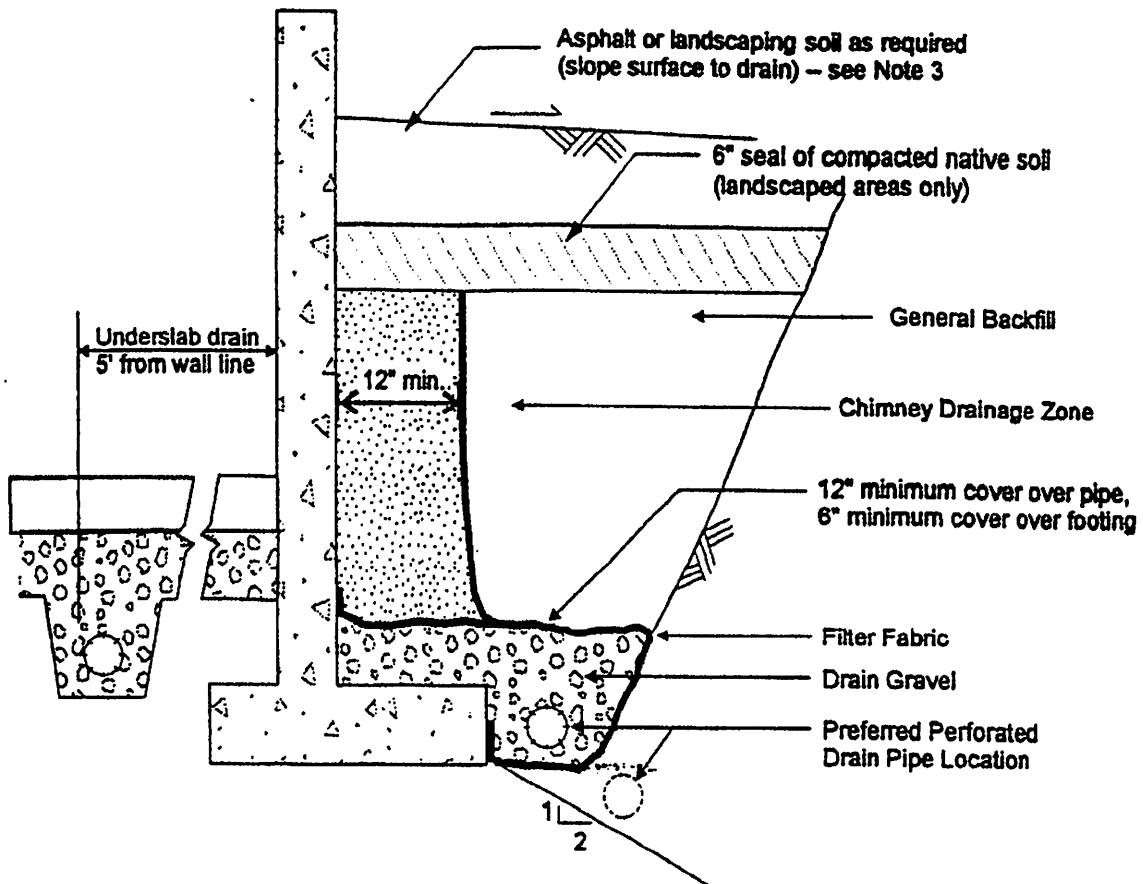
Figure No. 1



**SITE EXPLORATION MAP**

Project No. 943.001.G	1575 BURNS STREET	Figure No. 2
-----------------------	-------------------	--------------





**SCHEMATIC - NOT TO SCALE**

**NOTES:**

1. Filter Fabric to be non-woven geotextile (Amoco 4545, Mirafi 140N, or equivalent)
2. Lay perforated drain pipe on minimum 0.5% gradient, widening excavation as required. Maintain pipe above 2:1 slope, as shown.
3. All-granular backfill is recommended for support of slabs, pavements, etc. (see text for structural fill).
4. Drain gravel to be clean, washed ¾" to 1½" gravel.
5. General backfill to be on-site gravels, or ¾"-0 or 1½"-0 crushed rock compacted to 92% Modified Proctor (AASHTO T-180).
6. Chimney drainage zone to be 12" wide (minimum) zone of clean washed, medium to coarse sand or drain gravel if protected with filter fabric. Alternatively, prefabricated drainage structures (Miradrain 6000 or similar) may be used.

**FOOTING/RETAINING WALL DRAIN**

Project No. 943.001.G

1575 BURNS STREET

Figure No. 3

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
			GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
		GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.	
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
		SANDS WITH FINES	SP	Poorly graded sands or gravelly sands, little or no fines.
			SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

**DEFINITION OF TERMS**

SILTS AND CLAYS	U.S. STANDARD SERIES SIEVE			CLEAR SQUARE SIEVE OPENINGS			COBBLES	BOULDERS
	200	40	10	4	3/4"	3"		
	SAND			GRAVEL				
	FINE	MEDIUM	COARSE	FINE	COARSE			

**GRAIN SIZES**

SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT <sup>1</sup>
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CLAYS AND PLASTIC SILTS	STRENGTH <sup>‡</sup>	BLOWS/FOOT <sup>‡</sup>
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

**RELATIVE DENSITY**

<sup>1</sup>Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

<sup>‡</sup>Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

**CONSISTENCY**

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • Portland, OR 97230

**KEY TO EXPLORATORY TEST PIT LOGS  
Unified Soil Classification System (ASTM D-2487)**

1575 BURNS STREET COMMERCIAL SITE  
WEST LINN, OREGON

269 PROJECT NO.	DATE	Figure 4
943 001 C	May 20, 2005	

BACKHOE COMPANY: **Kavik, Inc.**

BUCKET SIZE: **24 inches**

DATE: **4/23/05**

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION	
						TEST PIT NO. <b>TH-1</b>	ELEVATION
0					ML	Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)	
	X			24.4	ML	Medium brown to olive-brown, very moist, medium stiff to stiff, clayey, sandy SILT	
5	X			27.2			
10						Total Depth - 9.0 feet No ground water encountered	

						TEST PIT NO. <b>TH-2</b>	ELEVATION
0					ML	Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)	
	X			26.1	ML	Medium brown to olive-brown, very moist, medium stiff to stiff, clayey, sandy SILT	
5							
	X			28.3			
10							
15						Total Depth = 11.0 feet No ground water encountered	

**LOG OF TEST PITS**

PROJECT NO. **943.001.G**

**1575 BURNS STREET COMMERCIAL SITE**

FIGURE NO. **5**

BACKHOE COMPANY: Kavik, Inc.

BUCKET SIZE: 24 inches

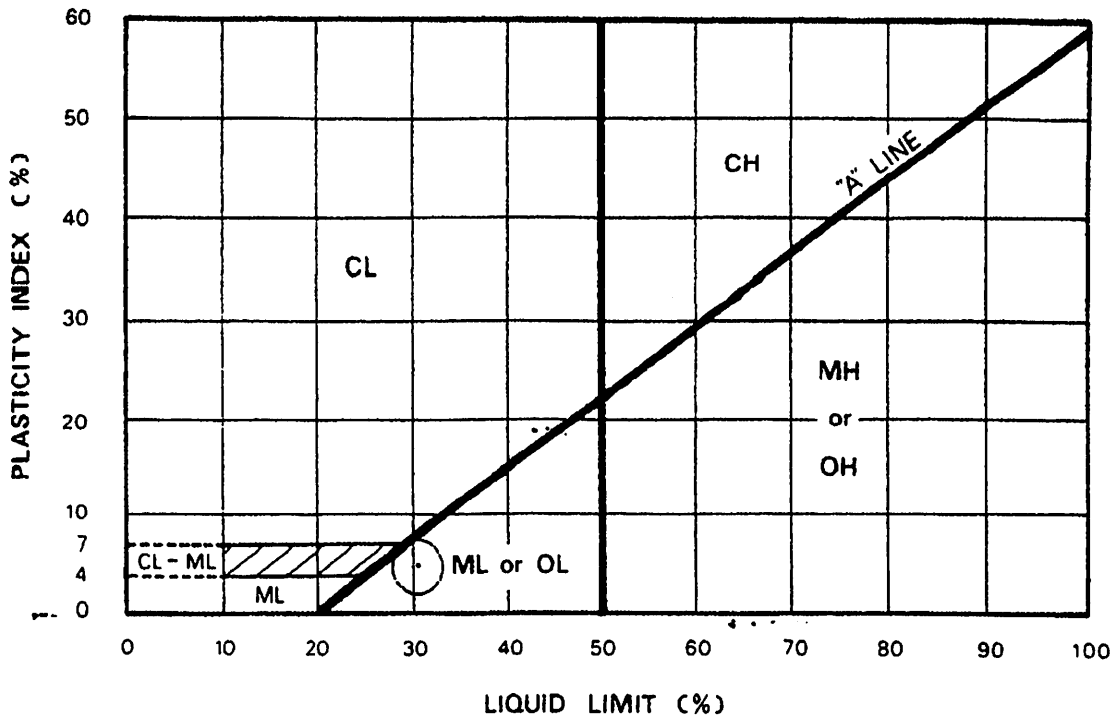
DATE: 4/23/05

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION	
						TEST PIT NO. TH-3	ELEVATION
0					ML		Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)
	X			35.5	ML		Gray-brown, wet, soft to medium stiff, sandy, clayey SILT
5	X			32.6	ML		Medium brown to olive-brown, very moist to wet, medium stiff to stiff, clayey, sandy SILT
10							Total Depth = 8.0 feet No ground water encountered

						TEST PIT NO.	ELEVATION
0							
5							
10							
15							

**LOG OF TEST PITS**

PROJECT NO. 943.001.G	1575 BURNS STREET COMMERCIAL SITE	FIGURE NO. 6
-----------------------	-----------------------------------	--------------



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
	TH-2	3.0	28.3	30.6	5.5	76.0		ML

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • PORTLAND, OR 97294

PLASTICITY CHART AND DATA

1575 BURNS STREET COMMERCIAL SITE  
West Linn, Oregon

PROJECT NO.

DATE

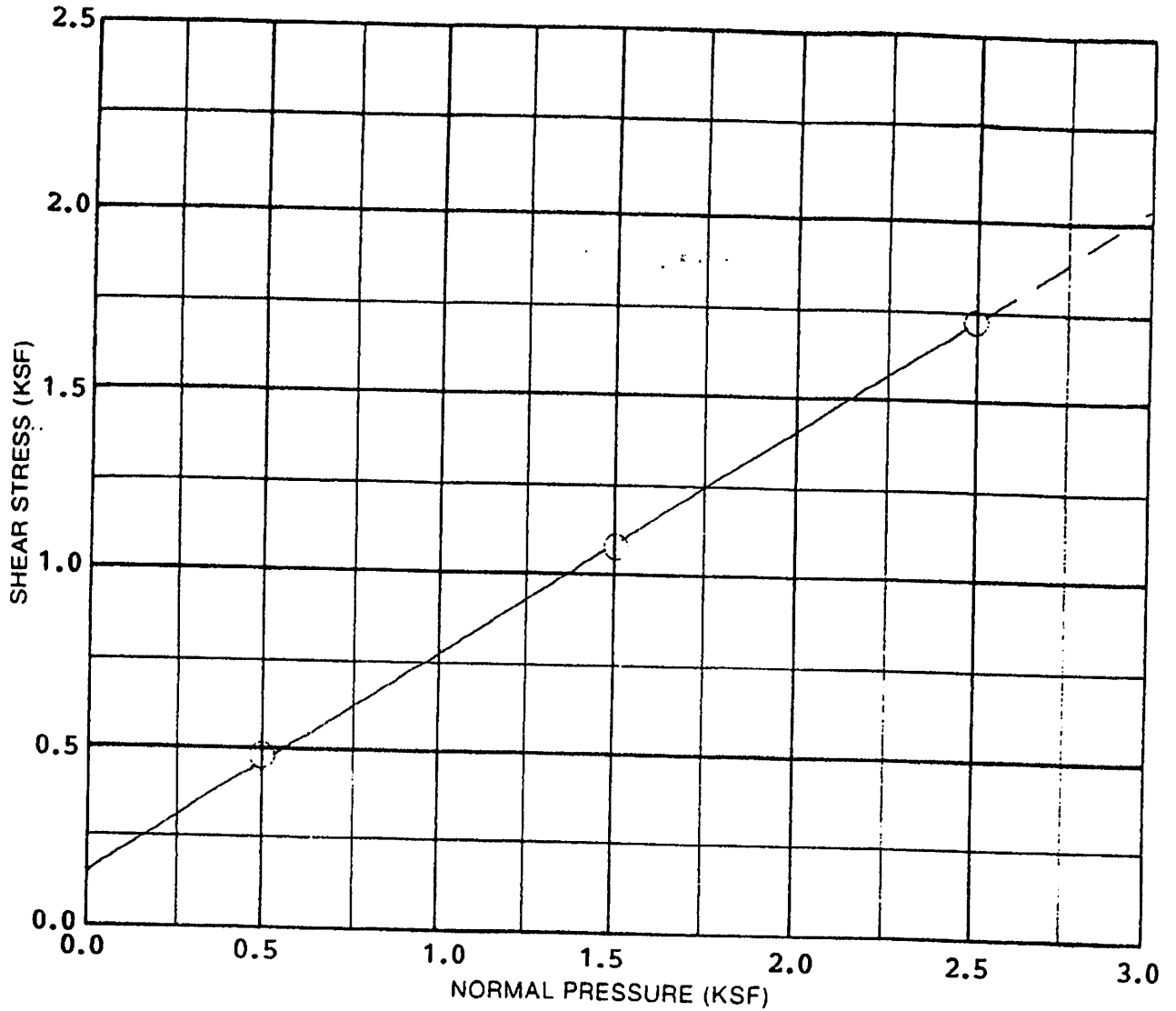
943 001 C

May 20 2005

Figure 7







SAMPLE DATA	
DESCRIPTION: <b>Medium to olive-brown, clayey, sandy SILT</b>	
BORING NO.: <b>TH-2</b>	
DEPTH (ft.): <b>3.0'</b>	ELEVATION (ft.):
TEST RESULTS	
APPARENT COHESION (C): <b>150 psf</b>	
APPARENT ANGLE OF INTERNAL FRICTION ( $\phi$ ): <b>32°</b>	

TEST DATA				
TEST NUMBER	1	2	3	4
NORMAL PRESSURE (KSF)	0.5	1.5	2.5	
SHEAR STRENGTH (KSF)	0.48	1.09	1.74	
INITIAL H <sub>2</sub> O CONTENT (%)	26.0	26.0	26.0	
FINAL H <sub>2</sub> O CONTENT (%)	25.9	24.2	22.1	
INITIAL DRY DENSITY (PCF)	91.1	91.1	91.1	
FINAL DRY DENSITY (PCF)	91.6	93.1	95.4	
STRAIN RATE: <b>0.02 inches per minute</b>				

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • Portland, OR 97294

DIRECT SHEAR TEST DATA		
1575 BURNS STREET COMMERCIAL SITE West Linn, Oregon		
PROJECT NO.	DATE	
943.001.G	May 20 2005	
		Figure 9

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX E**

---

**FIELD VISIT EXPLORATIONS**

## Field Visit Notes:

A field visit for the Bolton Terrace project located at 1575 Burns Street in West Linn, OR 97068 was conducted on April 14<sup>th</sup>, 2020. The purpose of this visit was to determine if the north fork of Cascade Springs Pond Creek had adequate downstream capacity for the added runoff produced from the developed project site.

During the field visit it was observed that at the mouth of the creek, located near the southeast corner of the project site, the creek had a width of over 30 feet and depth of 10-15 feet. The observed slope at this area was 1.50%.

It was observed, that the creek increases in width and depth further downstream. The next measurement observed was 300 feet downstream. At this point, the creek was greater than 40 feet in depth and greater than 50 feet in width at the widest point. The slope at this point was 1.65%. The width at the bottom of the creek was on average 15 feet in diameter.

These characteristics continue until 1900 feet downstream. The creek decreases to 10 feet in width and approximately 6 feet in depth. The creek then flows through a 30-inch diameter concrete pipe, flowing under River Street and into a 25-foot depth and 30-foot wide creek on the other side. This creek then flows into the Willamette River.

Through field observations, it is determined that Cascade Springs Pond Creek will have more than enough downstream capacity to convey the 0.20 feet of added runoff depth produced by the proposed developed site.

## Field Visit Pictures:

Picture 1:



From mouth of creek looking southeast

Picture 2:



From mouth of creek looking northwest

Picture 3:



From project site looking southeast

Picture 4:



300 ft downstream looking northwest



Picture 5:



300 ft downstream looking southeast

Picture 6:



1900 ft downstream looking west

Picture 7:



1900 ft downstream looking east

Picture 8:



1920ft downstream looking east

# SITE STORMWATER AND DOWNSTREAM ANALYSIS REPORT

**Prepared For:**

Lenity Architecture  
3150 Kettle Ct SE  
Salem, OR 97301

**Project Location:**

Bolton Terrace  
1575 Burns Street  
West Linn, OR 97068

**Permit Number:** CO -

**Prepared By:**



Renews: 6/30/2020



Westech Engineering, Inc.  
3841 Fairview Industrial Drive SE, Suite 100  
Salem, OR 97302  
(503) 585-2474 FAX: (503) 585-3986



# TABLE OF CONTENTS

---

<b>Chapter</b>	<b>Page</b>
<b>1 Project Overview &amp; Description .....</b>	<b>1-1</b>
1.1 Size & Location of Project .....	1-1
1.2 Brief description of project scope and proposed improvements.....	1-1
1.3 Description of Size of Watershed Draining to the Site.....	1-1
1.4 Description of the Existing Site Conditions, Trees & Native Vegetation, Constraints, Sensitive Areas & Waterways .....	1-1
1.5 Regulatory Permits Required.....	1-1
1.6 Emergency Storm Escape Routes.....	1-1
<b>2 Methodology .....</b>	<b>2-1</b>
2.1 Depth to Groundwater .....	2-1
2.2 Maximum Infiltration and Vegetative Treatment.....	2-1
2.3 Soil Information.....	2-1
2.4 Hazardous Material.....	2-1
<b>3 Analysis.....</b>	<b>3-1</b>
3.1 Methods & Software Used.....	3-1
3.2 Curve Number and Time of Concentration Calculations .....	3-1
3.3 Review of Resources & Drainage Basin .....	3-1
3.4 Inspection of Affected Area.....	3-1
3.5 Treatment & Water Quality .....	3-2
3.6 Conveyance System & Analysis of Downstream Effects.....	3-3
3.7 Summary.....	3-4

## LIST OF TABLES

---

<b>Table</b>	<b>Page</b>
Table 1   City of West Linn 24-hour Design Storms .....	3-1
Table 2   Summary of Developed & Allowable Flow for 48-inch Manhole with Up-Flo Filter .....	3-2
Table 3   Summary of Site Peak Flows.....	3-2
Table 3   City of Gresham Conveyance Design Storm Sizing Criteria.....	3-3
Table 3   Summary of Cascade Springs Pond Creek During 50-year Storm .....	3-3

## APPENDICES

---

Appendix A	Basin Maps & Resources
Appendix B	NRCS Soil Report
Appendix C	HydroCAD Summaries
Appendix D	Geotechnical Report
Appendix E	Field Visit Explorations

## 1.1 SIZE & LOCATION OF PROJECT

The proposed project is located on a primarily undeveloped 27,210 square feet lot at 1575 Burns Street in West Linn, Oregon. There is currently a 1,000 square foot house on the lot that will be removed prior to construction. Refer to the Civil Drawings for more detail.

## 1.2 BRIEF DESCRIPTION OF PROJECT SCOPE AND PROPOSED IMPROVEMENTS

The project scope is to develop the full 27,210 square foot lot. The new development will include two one new commercial building and associated parking and landscaping.

## 1.3 DESCRIPTION OF SIZE OF WATERSHED DRAINING TO THE SITE

The 27,210 square foot developed site will drain to an existing 12-inch stormwater pipe located in the southeast corner of the lot. This stormwater pipe then drains into the north fork of Cascade Springs Pond Creek. No other areas drain to the developed site.

## 1.4 DESCRIPTION OF THE EXISTING SITE CONDITIONS, TREES & NATIVE VEGETATION, CONSTRAINTS, SENSITIVE AREAS & WATERWAYS

The existing site is currently undeveloped with a 1,000 square feet single family home on the lot. There are multiple trees on the site and the ground is covered with grass. The westerly portion of the lot is relatively flat, while the eastern portion is moderately sloped descending to the east. Numerous small to large sized trees exist on site.

## 1.5 REGULATORY PERMITS REQUIRED

City of West Linn permits are required. No other permits are required for this project.

## 1.6 EMERGENCY STORM ESCAPE ROUTES

Please refer to the Developed Basin Map in Appendix A for emergency overflow routes.

## 2.1 DEPTH TO GROUNDWATER

Per the Geotechnical Report in Appendix D, groundwater seepage was not encountered and is not expected during construction. See the Geotech Report in Appendix D for details.

## 2.2 MAXIMUM INFILTRATION AND VEGETATIVE TREATMENT

The proposed stormwater design will not provide detention for onsite runoff due to topography constraints. Detention is not required because Cascade Springs Pond Creek has adequate downstream capacity. During the field visit conducted on April 14, 2020, it was determined that Cascade Springs Pond Creek will not see adverse effects due to the increase in stormwater runoff, created by the site, draining into the creek. See Appendix E for details on the field explorations. A Contech stormfilter will be designed to treat the water quality storm event because the site is extremely steep and infiltration is not feasible. See the Civil Drawings for more details.

## 2.3 SOIL INFORMATION

The pre-developed project site contains hydrologic soil group C soils. Refer to the Soils Report in Appendix B for more details.

## 2.4 HAZARDOUS MATERIAL

The owner is not aware of any hazardous material contamination onsite.

**3.1 METHODS & SOFTWARE USED**

HydroCAD modeling software was used to size the stormwater facilities. The Santa Barbara Unit Hydrograph Type 1A storm was used to model the required design storms. Per the City of West Linn Design Standards the design storms used were the 1.2 inch, 24-hour (water quality storm), half the 2-year, 24-hour and the 10-year, 24-hour storm events.

**Table 1 | City of West Linn 24-hour Design Storms**

	24-Hour Rainfall Depths for West Linn, OR							
Recurrence Interval, Years	2	5	10	25	50	100	500	WQ
24-Hour Depths, Inches	2.5	3.0	3.4	3.9	4.3	4.5	5.3	1.2

*Source: City of West Linn Stormwater Management Plan*

**3.2 CURVE NUMBER AND TIME OF CONCENTRATION CALCULATIONS**

Curve numbers were derived from the NRCS runoff curve numbers contained in TR-55 *Urban Hydrology for Small Watersheds* per the City of Gresham Standards. The developed impervious area and pervious areas were assigned curve numbers of 98 and 79 respectively. The impervious areas were assigned a curve number of 98 which corresponds to paved/parking areas. The pervious areas were assigned a curve number of 79 which corresponds to amended soil coverage with C-rated soils.

Time of concentration (Tc) for the pre-developed conditions was calculated to be 15 minutes using the sheet flow equation. See the Pre-Developed Basin Map in Appendix A for the flow path used and refer to the HydroCAD Summaries in Appendix C for calculations. A minimum time of concentration of 5 minutes is applied to the developed basin due to the minimum time-step used by the HydroCAD modeling software.

**3.3 REVIEW OF RESOURCES & DRAINAGE BASIN**

The entire 27,210 square foot lot will drain into Cascade Springs Pond Creek. There are five sub-basins within the Cascade Springs basin. The project site is located within the CS2N1 sub-basin per the West Linn Stormwater Management Plan. For more detail and resources refer to Appendix A.

**3.4 INSPECTION OF AFFECTED AREA**

No problem areas or areas of concern were notable during the review of resources. Additionally, there were no existing or potential areas where flooding, capacity problems, channel destruction, or significant destruction of aquatic habitat identified in the inspection.

### 3.5 TREATMENT & WATER QUALITY

The proposed design uses proprietary treatment in lieu of green stormwater management. A 48-inch manhole with a Contech StormFilter is proposed to treat the water quality storm event and provide adequate capacity for the 100-year storm event.

**Table 2 | Summary of Developed & Allowable Flow for 48-inch Manhole with Up-Flo Filter**

Design Storm	Developed Site Flow (cfs)	Allowable Flow (cfs)
WQ Event	0.14	0.15 <sup>1</sup>
Overflow 100-Year	0.63	1.00

<sup>1</sup>Allowable release rate for Contech StormFilter with 3 filter modules

Table 2 above displays that a 48-inch Manhole equipped with a Contech StormFilter with 3 filter cartridges will provide treatment for the water quality event and have capacity for the 100-year storm.

**Table 3 | Summary of Site Peak Flows**

Basin ID	Source (Roof/Road/Other)	Impervious Area (sq ft)	Pervious Area (sq ft)	Design Storms			CN	Tc
				WQ (cfs)	10 Year (cfs)	100 Year (cfs)		
PD	Native	-	27,210	-	0.15	0.29	79	15
DEV	Paved/Landscape	22,510	4,700	0.14	0.45	0.62	98/79 <sup>2</sup>	5.0

<sup>1</sup> PD = pre-developed site conditions (i.e., pre-developed release rates)

<sup>2</sup> The first curve number listed is for the impervious area in the basin (98), then for the pervious area (80)

Table 3 above depicts the runoff experience from developed site compared to that of the predeveloped site. The design storms analyzed were provided in the West Linn Stormwater Management Plan and consisted of the water quality, 10-year, and 100-year, 24-hour storm events.

The proposed Contech Stormfilter system is designed to provide treatment for the water quality storm event and have adequate capacity for the 100-year, 24-hour storm event.



### 3.6 CONVEYANCE SYSTEM & ANALYSIS OF DOWNSTREAM EFFECTS

Per City of West Linn Design Standards, this project is exempt from detention requirements due to adequate downstream capacity of conveyance system. However, a downstream analysis was conducted per the City of Gresham Standards to determine if Cascade Springs Pond Creek will have adequate capacity. The following table provides the COG design storm sizing criteria.

**Table 3 | City of Gresham Conveyance Design Storm Sizing Criteria**

Structure or Facility	Design Storm Recurrence Interval (years)	
Storm sewers, ditches, and outfall pipes	Draining less than 250 acres	10
	Draining greater than 250 acres	50
Creek or stream Channels	Without designated floodplain	50
	With designated floodplain	100
Culverts and bridges	100	

The downstream analysis was conducted using the 50-year, 24-hour design storm per COG Design Standards for a creek with drainage area less than 50 acres.

Peak flow rates for each sub-basin within the Cascade Springs basin were provided by the West Linn Stormwater Management Plan. Additionally, peak flow rates for the junction of sub-basins were also provided. The junction node CSJ2 was selected for this analysis. The peak flow of CSJ2 was combined with the added onsite runoff for the 50-year, 24-hour storm event to determine adequate downstream capacity. Based on inspection and mapping, the creek has 1,500 feet of length, 3:1 side slopes, a width varying 10-30 feet at the bottom, slope of 1.50%, a depth of 10-30 feet, and a Manning’s number of 0.03 was used, corresponding to a typical open, earth channel, that is grassed and winding. See below for water depth in channel, calculated using Manning’s Equation.

**Table 3 | Summary of Cascade Springs Pond Creek During 50-year Storm**

Basin ID	Drainage Area (acres)	50-Year (cfs)	Water Depth in Channel (ft) <sup>a</sup>
CSJ2	55.04	31.15	1.31
DEV	0.62	0.59	0.20
<b>Total</b>	<b>55.56</b>	<b>31.74</b>	<b>1.32<sup>a</sup></b>

<sup>a</sup>Totals do not sum to the addition of the individual flows. This is due to the fact that the time of concentration per basin varies. The totals are the combination of the basin hydrographs. Refer to Link: OUT in Appendix D.

The calculations in Table 3 above display the added runoff to the Cascade Springs Pond Creek that will result from the developed project. The undetained developed 50-year event runoff peak for the site is 0.59 cfs. The developed runoff only contributes to approximately 2% of the total runoff conveyed by Cascade Springs Pond Creek. The peak water surface elevation will rise approximately a tenth of an inch with the added runoff from the developed site. Therefore, the conveyance system will provide adequate capacity for developed stormwater runoff and detention facilities are not required onsite.

### 3.7 SUMMARY

The stormwater system consisting of a 48-inch manhole with a Contech StormFilter with 3 stormfilter cartridges has been designed to treat the water quality storm, and have capacity for the 100-year storm event. Detention was not required to be provided on site because Cascade Springs Pond Creek has adequate downstream capacity. Therefore, the project can meet the flow control and treatment requirements as set forth in the City of West Linn Stormwater Management Plan and the City of Gresham Stormwater Management Manual.

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

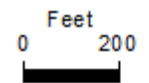
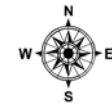
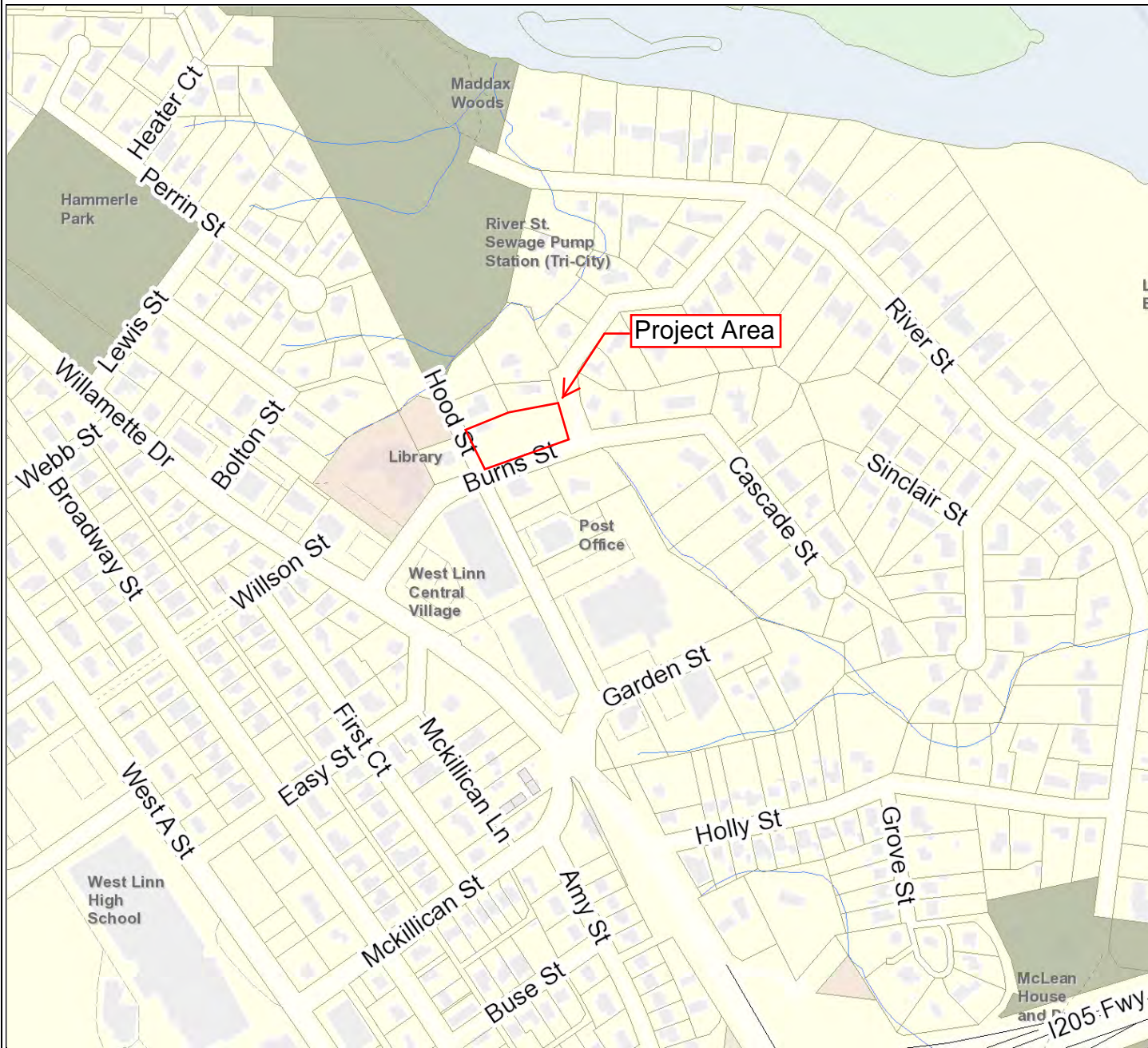
**APPENDIX A**

---

**BASIN MAPS & RESOURCES**

# BASIN & AREA MAPS

# Project Area Map



Scale 1:4,800 - 1 in = 400 ft  
Scale is based on 8-1/2 x 11 paper size



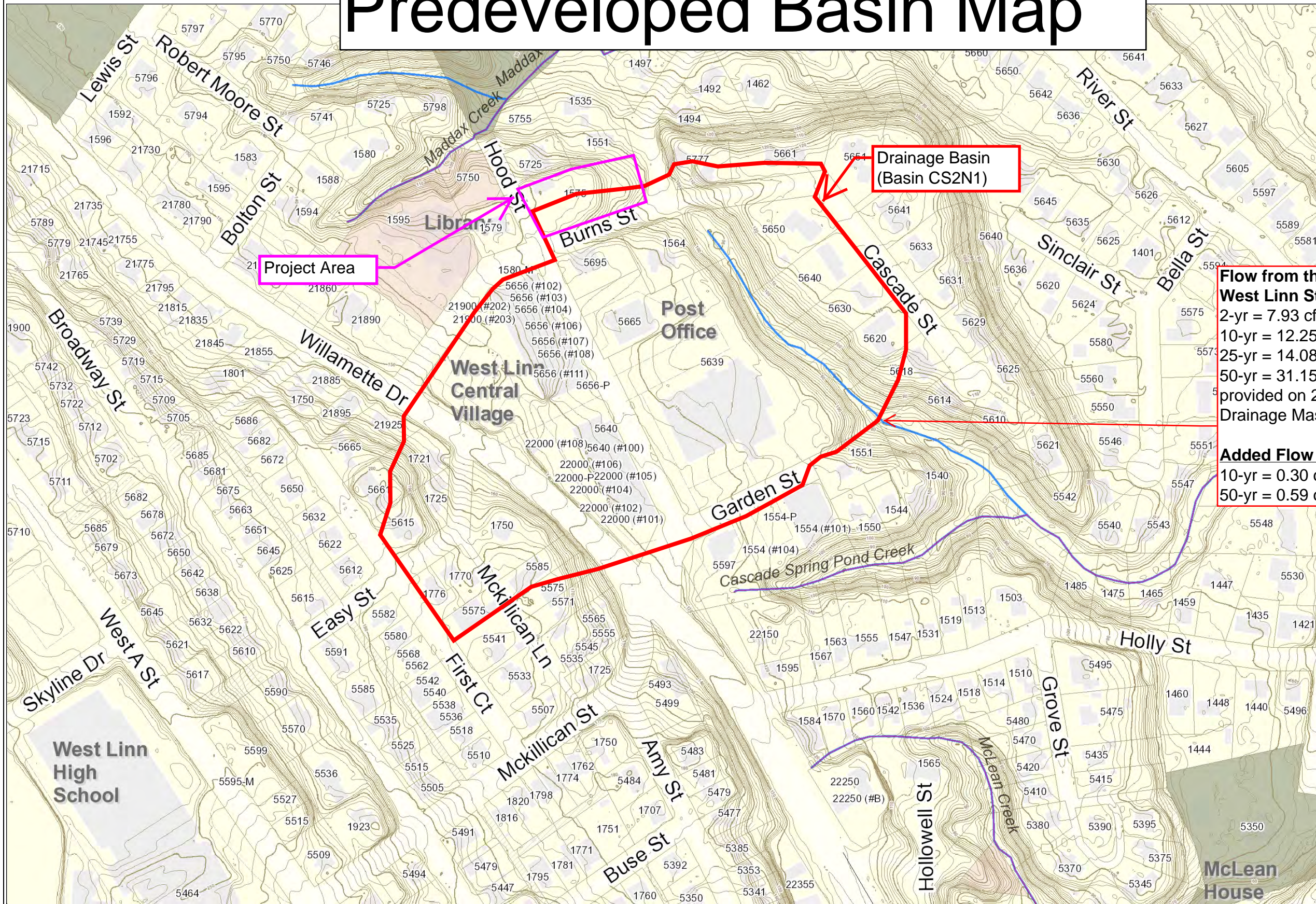
Map created by: public  
Date Created: 30-Jan-20 02:24 PM

**WEST LINN GIS**

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

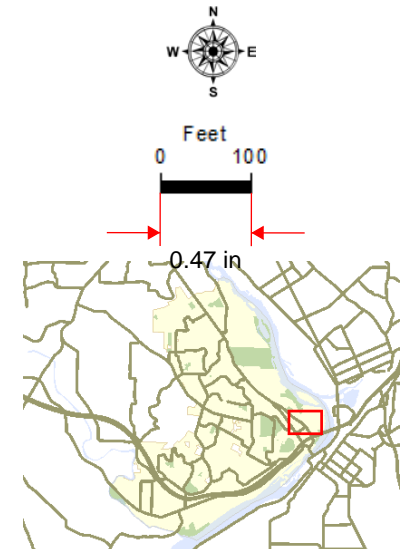


# Predeveloped Basin Map



**Flow from this node according to 2019 West Linn Storm Drainage Master Plan:**  
 2-yr = 7.93 cfs  
 10-yr = 12.25 cfs  
 25-yr = 14.08 cfs  
 50-yr = 31.15 cfs (50-yr storm value only provided on 2006 West Linn Storm Drainage Master Plan)

**Added Flow From Project:**  
 10-yr = 0.30 cfs  
 50-yr = 0.59 cfs



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

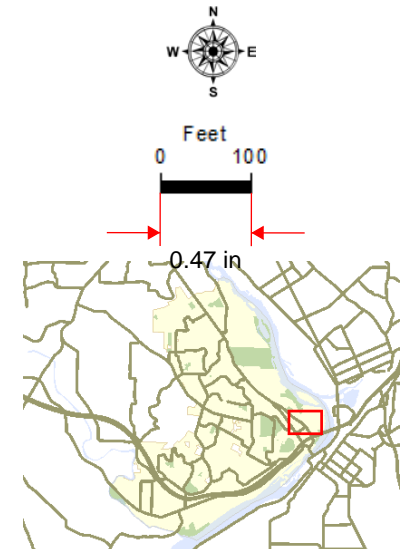
Map created by: public  
 Date Created: 29-Apr-20 02:46 PM  
**WEST LINN GIS**



# Developed Basin Map



New Drainage Basin With project area



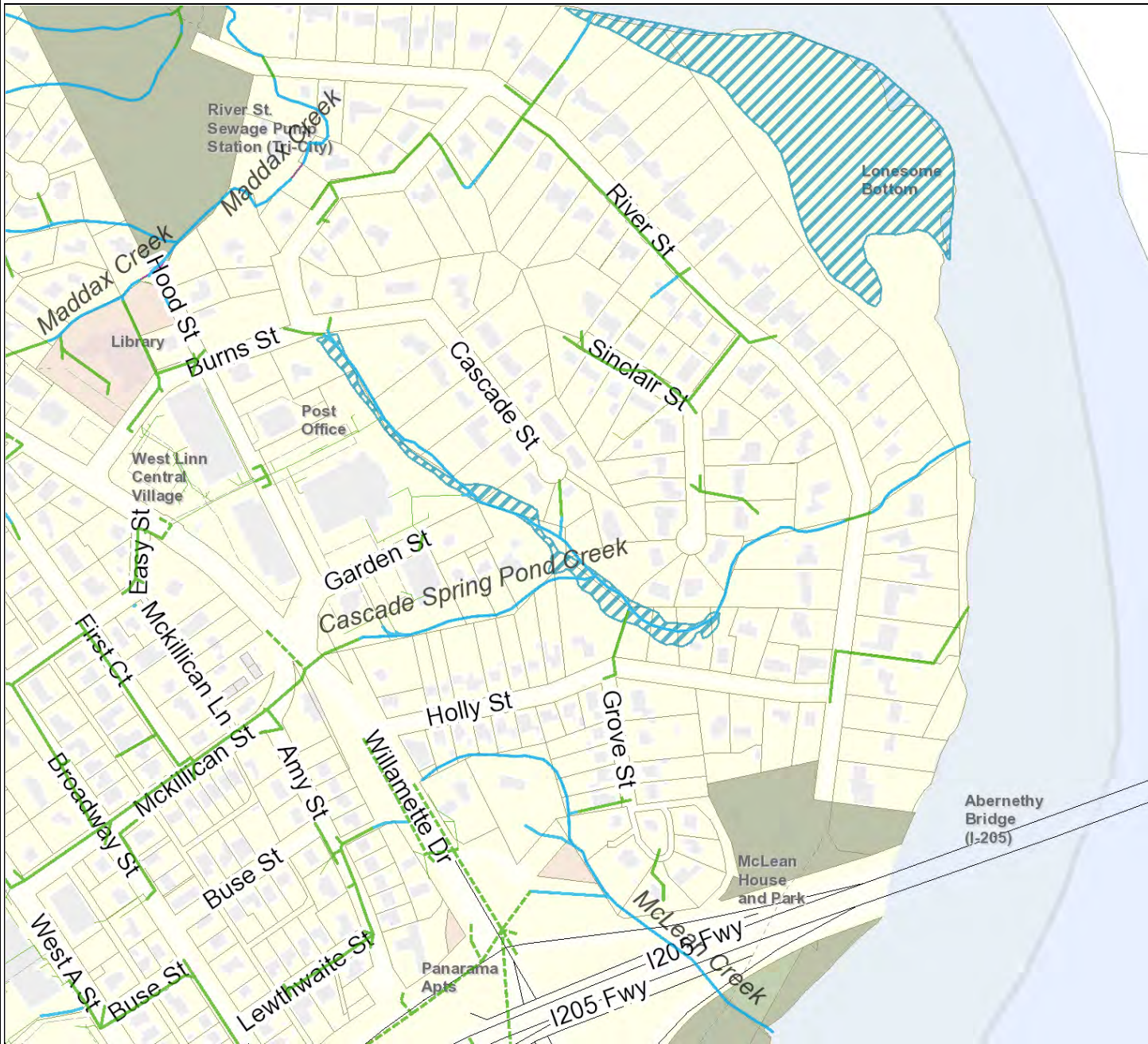
DISCLAIMER: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Map scale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

Map created by: public  
Date Created: 29-Apr-20 02:46 PM  
**WEST LINN GIS**



# WETLAND, AND HABITAT INVENTORY

# Wetland Inventory Map

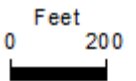
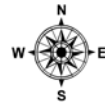


## Legend

- Storm Lines
- Storm Pipes
- - - Storm Pipes County
- - - Storm Pipes ODOT
- Ditches and Creeks
- Private Pipes

## Wetland Inventory 2005 Goal

5



Scale 1:4,800 - 1 in = 400 ft  
Scale is based on 8-1/2 x 11 paper size



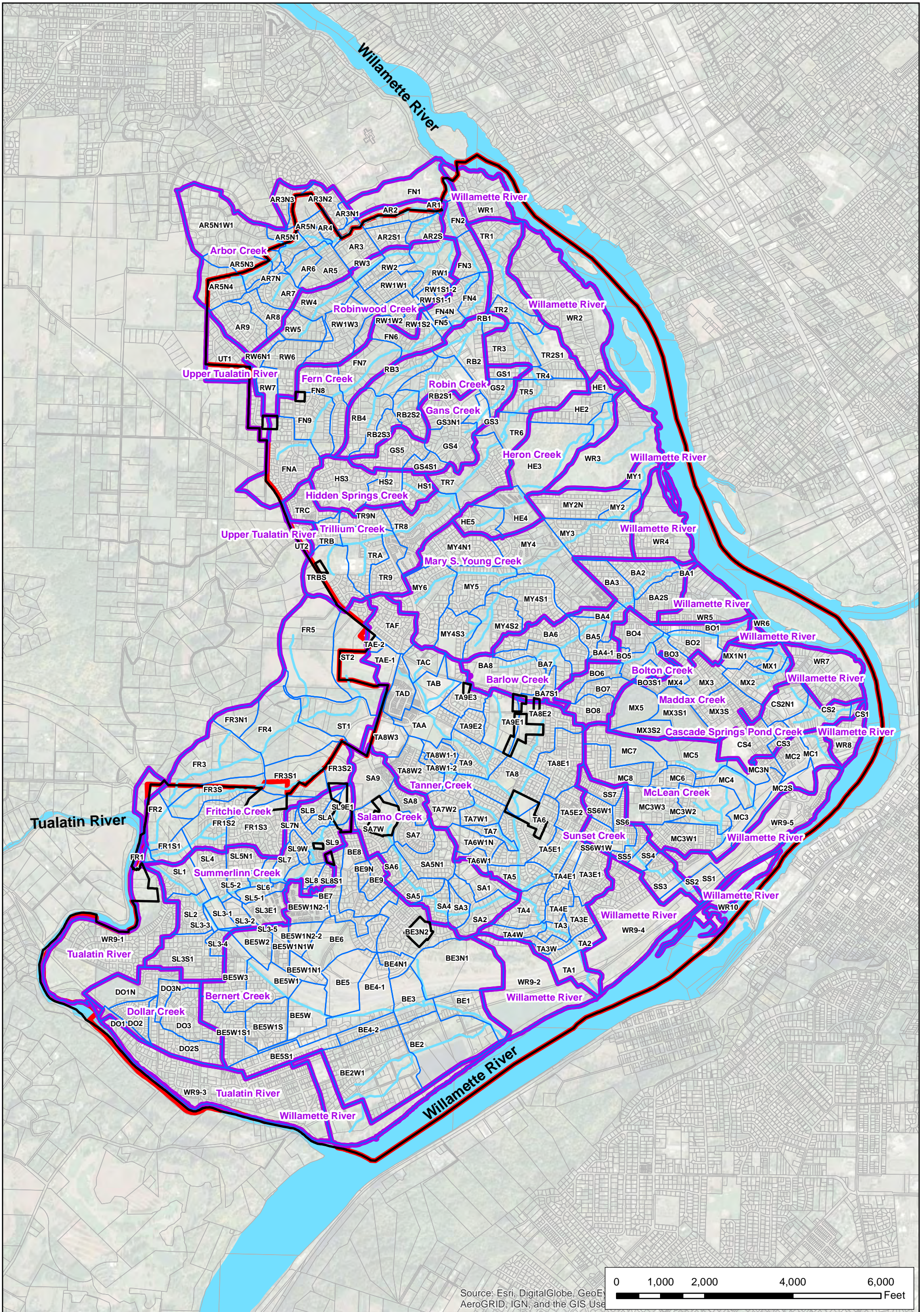
Map created by: public  
Date Created: 30-Jan-20 02:47 PM

**WEST LINN GIS**

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

# BASIN INFORMATION





1:24,000 scale



**CITY OF WEST LINN, OREGON**  
 Storm Drainage and Sanitary Master Plan 2019

Figure B-1: Stormwater Subbasins

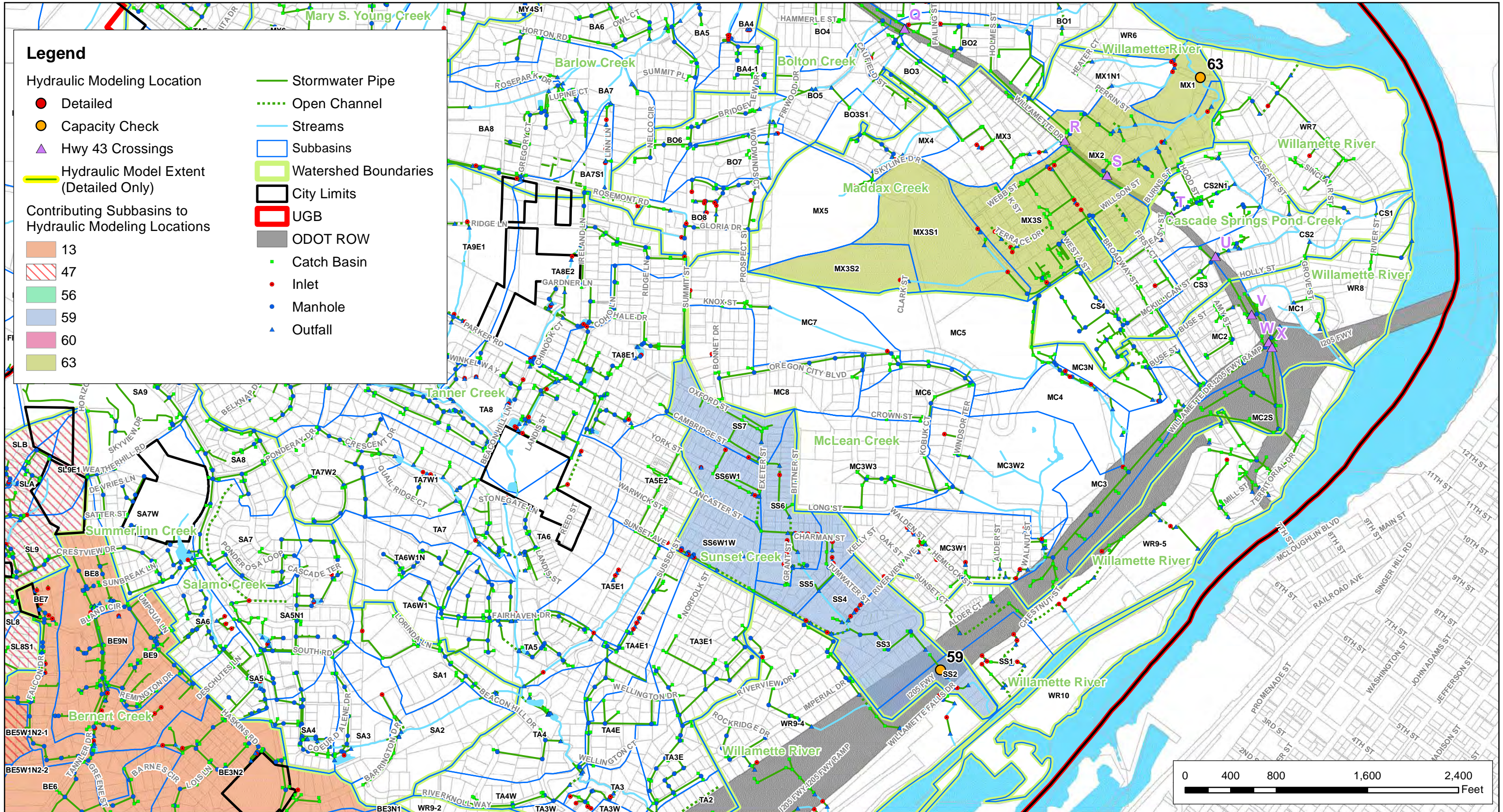
- City Boundary
- UGB
- Subbasins
- Watershed Boundaries
- Streams

Data Source: City of West Linn GIS and Metro RLIS

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

Map Publication/Print Date: November 2018 Produced by Brown and Caldwell





**Legend**

Hydraulic Modeling Location

- Detailed
- Capacity Check
- ▲ Hwy 43 Crossings
- ▭ Hydraulic Model Extent (Detailed Only)

Contributing Subbasins to Hydraulic Modeling Locations

- 13
- 47
- 56
- 59
- 60
- 63

- Stormwater Pipe
- ⋯ Open Channel
- Streams
- ▭ Subbasins
- ▭ Watershed Boundaries
- ▭ City Limits
- ▭ UGB
- ▭ ODOT ROW
- Catch Basin
- Inlet
- Manhole
- ▲ Outfall

1:9,600 scale

N

**CITY OF WEST LINN, OREGON**  
 Storm Drainage and Sanitary Master Plan 2019  
 Figure B-4: Hydraulic Modeling Overview (South)

Data Source: City of West Linn GIS and Metro RLIS  
 Disclaimer: This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.  
 Map Publication/Print Date: November 2018 Produced by Brown and Caldwell



**Attachment A. Table A-1: Hydrology Parameters and Model Results**

Basin ID	Area (acres)	Width (ft)	Slope (ft/ft)	Existing Impervious Percentage	Future Impervious Percentage	Existing Land Use			Future Land Use			Future Land Use			Future Land Use		
						Maximum Flow (cfs)			Maximum Flow (cfs)			Absolute Increase in Maximum			Percent Increase in Maximum Flow		
						2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr
BE5W	21.46	862.53	0.03	56.19	56.19	9.37	15.47	17.78	9.37	15.47	17.78	0.00	0.00	0.00	0.00	0.00	0.00
BE5W1	23.58	631.68	0.06	32.24	32.24	7.82	15.52	18.21	7.82	15.52	18.21	0.00	0.00	0.00	0.00	0.01	0.00
BE5W1N1	7.87	423.89	0.05	84.69	84.69	4.29	6.16	7.02	4.29	6.16	7.02	0.00	0.00	0.00	0.00	0.00	0.00
BE5W1N1W	9.50	210.81	0.05	66.69	66.69	4.27	6.82	7.84	4.27	6.82	7.84	0.00	0.00	0.00	0.00	0.00	0.00
BE5W1N2-1	15.77	363.01	0.07	34.26	48.79	5.18	10.27	12.09	6.23	10.98	12.72	1.05	0.70	0.63	20.36	6.85	5.23
BE5W1N2-2	8.98	361.75	0.15	68.66	84.98	4.73	7.03	8.01	5.02	7.13	8.11	0.29	0.10	0.10	6.18	1.39	1.21
BE5W1S	21.41	550.38	0.04	31.82	31.95	6.44	13.34	15.87	6.45	13.35	15.88	0.01	0.01	0.01	0.22	0.09	0.06
BE5W1S1	22.68	464.81	0.02	31.11	31.67	5.77	12.42	15.20	5.83	12.48	15.26	0.06	0.06	0.06	1.06	0.50	0.39
BE5W2	11.96	526.59	0.02	43.29	43.29	4.61	8.29	9.61	4.61	8.29	9.61	0.00	0.00	0.00	0.00	0.00	0.00
BE5W3	21.99	632.15	0.06	30.71	30.71	7.27	14.49	17.00	7.27	14.49	17.00	0.00	0.00	0.00	0.00	0.00	0.00
BE6	28.38	505.71	0.13	21.24	48.79	7.75	17.42	20.79	11.48	19.97	23.08	3.73	2.54	2.29	48.17	14.60	11.01
BE7	15.60	291.98	0.08	29.67	30.21	4.57	9.64	11.50	4.61	9.68	11.53	0.04	0.04	0.03	0.94	0.36	0.28
BE8	25.60	534.32	0.10	28.95	28.96	8.04	16.52	19.48	8.04	16.52	19.48	0.00	0.00	0.00	0.01	0.00	0.01
BE9	8.75	313.98	0.09	29.73	29.73	3.26	6.05	7.04	3.26	6.05	7.04	0.00	0.00	0.00	0.00	0.00	0.00
BE9N	3.60	252.10	0.11	30.00	30.00	1.60	2.65	3.05	1.60	2.65	3.05	0.00	0.00	0.00	0.00	0.00	0.00
<b>Bolton Creek</b>																	
B01	14.30	417.48	0.09	25.42	28.48	4.71	9.50	11.10	4.92	9.62	11.22	0.21	0.13	0.11	4.42	1.33	1.03
B02	14.35	520.28	0.08	36.27	37.39	5.69	10.11	11.75	5.76	10.16	11.79	0.07	0.05	0.04	1.19	0.46	0.37
B03	6.71	302.28	0.06	31.84	32.46	2.55	4.66	5.42	2.57	4.67	5.43	0.02	0.01	0.01	0.71	0.19	0.20
BO3S1	4.64	563.72	0.25	28.38	30.85	2.28	3.49	4.00	2.31	3.50	4.01	0.03	0.02	0.01	1.14	0.46	0.38
B04	15.40	454.25	0.14	31.79	33.00	5.90	10.73	12.49	5.98	10.78	12.54	0.08	0.06	0.05	1.36	0.52	0.42
B05	12.47	523.04	0.16	31.54	31.68	2.30	5.50	7.80	2.40	5.50	7.80	0.10	0.00	0.00	4.35	0.00	0.00
B06	13.53	310.87	0.10	30.00	30.00	4.44	8.90	10.44	4.44	8.90	10.44	0.00	0.00	0.00	0.00	0.00	0.00
B07	8.91	385.28	0.11	25.09	25.09	3.43	6.25	7.25	3.43	6.25	7.25	0.00	0.00	0.00	0.00	0.00	0.00
B08	13.32	457.55	0.10	30.00	30.00	4.98	9.21	10.71	4.98	9.21	10.71	0.00	0.00	0.00	0.00	0.00	0.00
<b>Cascade Springs Pond Creek</b>																	
CS1	1.77	157.47	0.06	25.36	29.99	0.76	1.29	1.49	0.79	1.31	1.50	0.03	0.02	0.01	3.28	1.24	1.01
CS2	16.54	390.84	0.05	39.60	40.74	5.60	10.79	12.71	5.69	10.86	12.77	0.09	0.07	0.06	1.57	0.61	0.47
CS2N1	16.50	482.55	0.07	65.01	65.01	7.93	12.25	14.08	7.93	12.25	14.08	0.00	0.00	0.00	0.00	0.00	0.00
CS3	5.47	282.05	0.07	41.27	41.89	2.41	4.03	4.63	2.42	4.03	4.64	0.01	0.01	0.01	0.50	0.20	0.15
CS4	20.45	499.57	0.05	32.10	32.36	6.29	12.91	15.32	6.32	12.93	15.34	0.03	0.02	0.02	0.41	0.16	0.13
<b>Dollar Creek</b>																	
DO1	3.75	119.44	0.06	30.02	30.13	1.25	2.48	2.91	1.25	2.49	2.91	0.00	0.00	0.00	0.16	0.04	0.03
DO1N	24.53	508.68	0.04	18.07	29.91	5.20	12.97	16.05	6.71	14.42	17.40	1.51	1.45	1.35	29.07	11.15	8.40
DO2	10.85	368.67	0.02	34.97	34.97	3.30	6.72	8.01	3.30	6.72	8.01	0.00	0.00	0.00	0.00	0.00	0.00
DO2S	21.52	398.94	0.02	29.97	30.26	5.06	11.04	13.68	5.09	11.07	13.71	0.03	0.03	0.03	0.59	0.29	0.23
DO3	23.72	642.92	0.01	30.00	30.00	5.89	12.83	15.75	5.89	12.83	15.75	0.00	0.00	0.00	0.00	0.00	0.00
DO3N	8.00	209.29	0.02	29.94	30.00	2.13	4.59	5.57	2.13	4.60	5.57	0.00	0.00	0.00	0.09	0.07	0.04
<b>Fern Creek</b>																	
FN1	31.74	437.01	0.05	30.00	30.00	7.98	17.36	21.27	7.98	17.36	21.27	0.00	0.00	0.00	0.00	0.00	0.00
FN2	9.27	408.46	0.05	29.52	29.52	3.33	6.33	7.35	3.33	6.33	7.35	0.00	0.00	0.00	0.00	0.00	0.00
FN3	13.99	418.88	0.04	16.37	16.37	3.27	8.03	9.75	3.27	8.03	9.75	0.00	0.00	0.00	0.00	0.00	0.00
FN4	11.60	328.13	0.03	29.67	30.00	3.26	6.97	8.37	3.28	6.99	8.38	0.02	0.02	0.02	0.58	0.24	0.18
FN4N	13.46	372.26	0.05	38.80	38.80	4.85	9.11	10.62	4.85	9.11	10.62	0.00	0.00	0.00	0.00	0.00	0.00
FN5	3.66	169.57	0.03	82.17	82.17	1.91	2.75	3.14	1.91	2.75	3.14	0.00	0.00	0.00	0.00	0.00	0.00
FN6	18.67	520.42	0.08	30.34	33.15	6.39	12.51	14.60	6.64	12.66	14.74	0.25	0.15	0.14	3.90	1.22	0.94

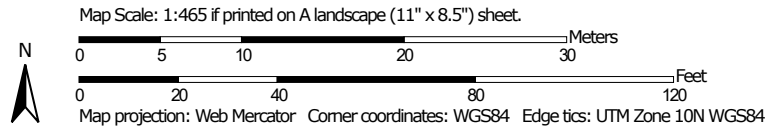
**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX B**

---

**NRCS SOIL REPORT**

Hydrologic Soil Group—Clackamas County Area, Oregon  
(Bolton Terrace Hydrologic Map)



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons





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

#### Soil Rating Lines

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

#### Soil Rating Points






 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available


### Water Features

 Streams and Canals

### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Clackamas County Area, Oregon  
 Survey Area Data: Version 15, Sep 10, 2019

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

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

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

## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
91B	Woodburn silt loam, 3 to 8 percent slopes	C	0.6	100.0%
<b>Totals for Area of Interest</b>			<b>0.6</b>	<b>100.0%</b>

### Description

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

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

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

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

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

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

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

### Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher



Soil Map—Clackamas County Area, Oregon  
(Bolton Terrace Soil Map)



Map Scale: 1:465 if printed on A landscape (11" x 8.5") sheet.



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



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Clackamas County Area, Oregon

Survey Area Data: Version 15, Sep 10, 2019

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

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

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

## Map Unit Legend

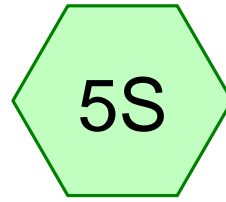
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
91B	Woodburn silt loam, 3 to 8 percent slopes	0.6	100.0%
<b>Totals for Area of Interest</b>		<b>0.6</b>	<b>100.0%</b>

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

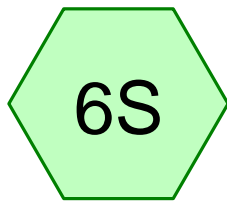
**APPENDIX C**

---

**HYDROCAD SUMMARIES**



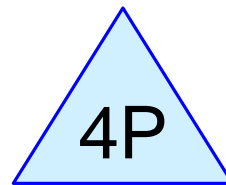
Existing Site



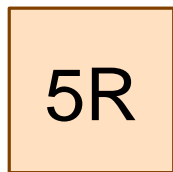
CSJ2



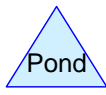
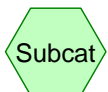
Site Developed



Infiltration



Cascade Springs Pond  
Creek



**Routing Diagram for Bolton Terrace**  
Prepared by Westech Engineering, Inc., Printed 5/7/2020  
HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 10 YR Rainfall=3.40"

Printed 5/7/2020

Page 1

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.18 cfs @ 8.03 hrs, Volume= 0.078 af, Depth= 1.49"

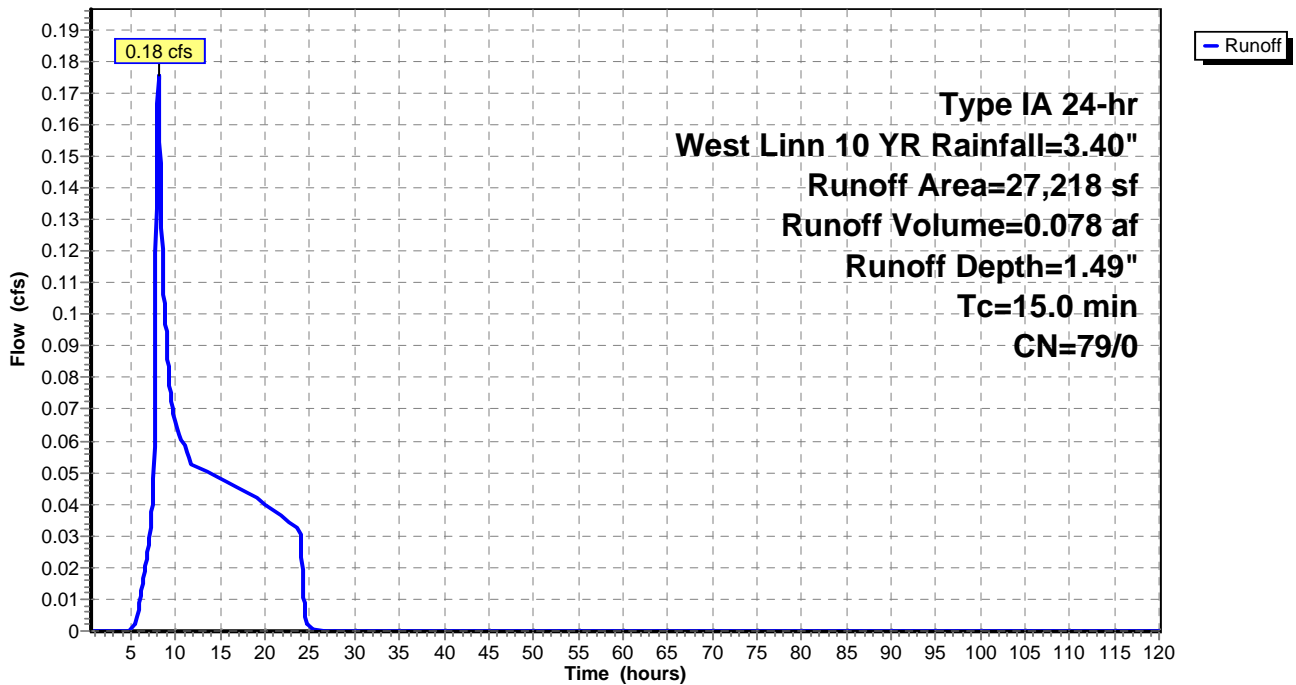
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 10 YR Rainfall=3.40"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Bolton Terrace**

Type IA 24-hr West Linn 100 YR Rainfall=4.50"

Prepared by Westech Engineering, Inc.

Printed 5/7/2020

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Page 2

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.31 cfs @ 8.02 hrs, Volume= 0.124 af, Depth= 2.38"

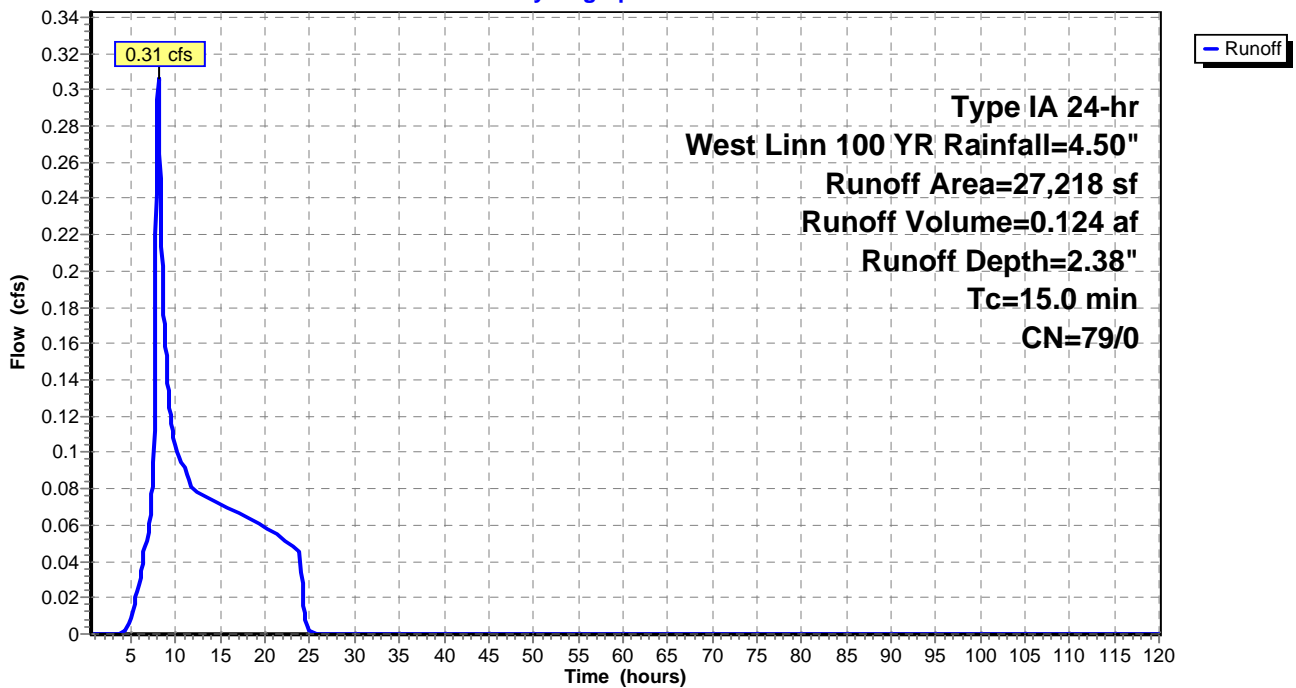
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 100 YR Rainfall=4.50"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 3

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.28 cfs @ 8.02 hrs, Volume= 0.115 af, Depth= 2.21"

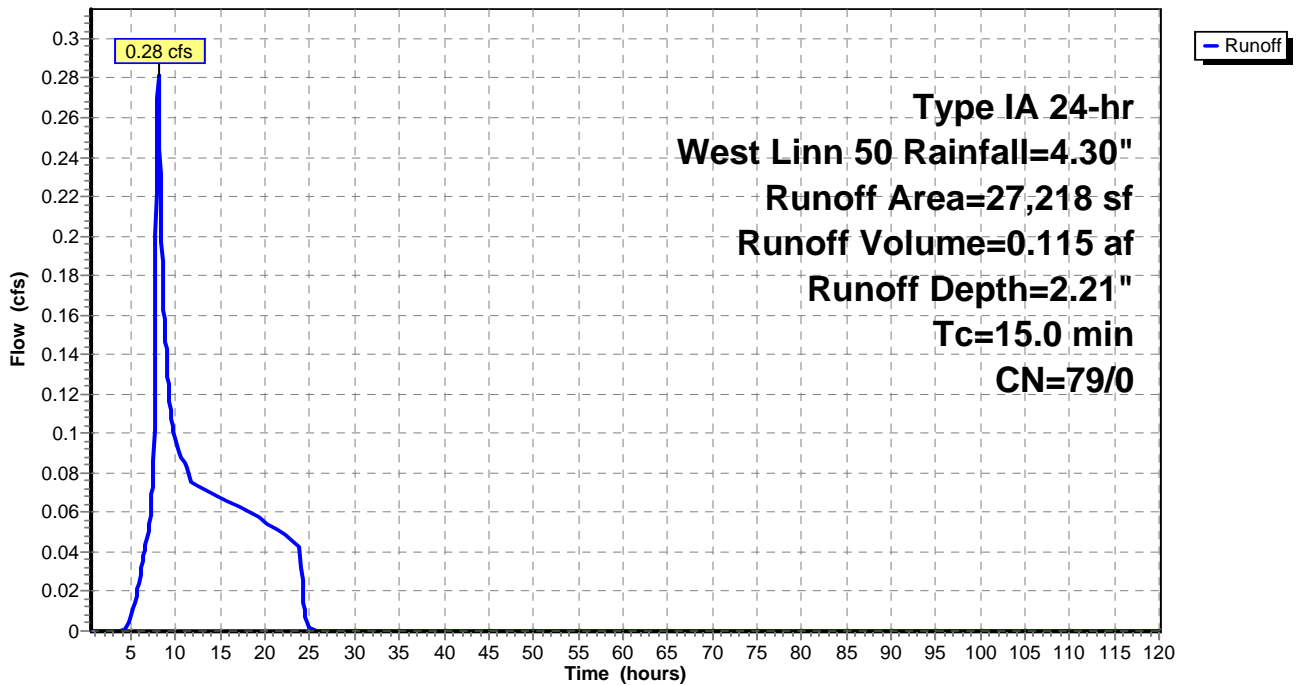
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 50 Rainfall=4.30"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn WQ Rainfall=1.20"

Printed 5/7/2020

Page 4

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.01 cfs @ 17.99 hrs, Volume= 0.007 af, Depth= 0.13"

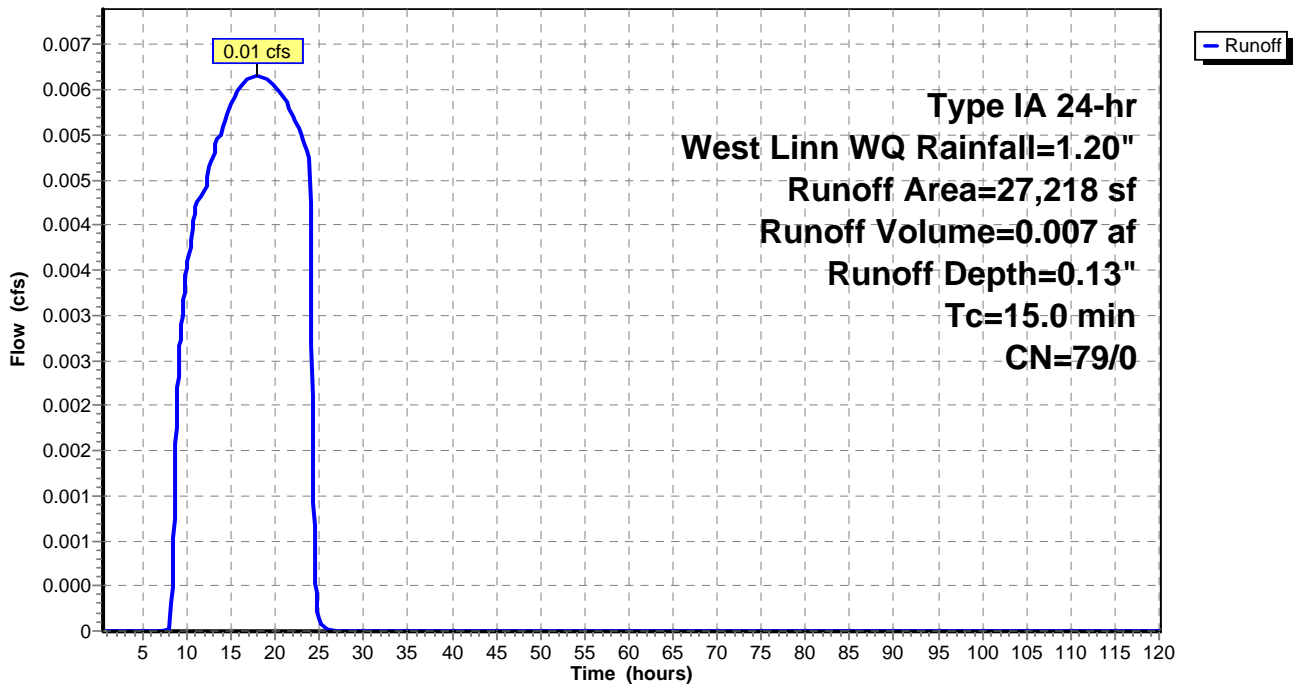
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn WQ Rainfall=1.20"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.45 cfs @ 7.91 hrs, Volume= 0.152 af, Depth= 2.92"

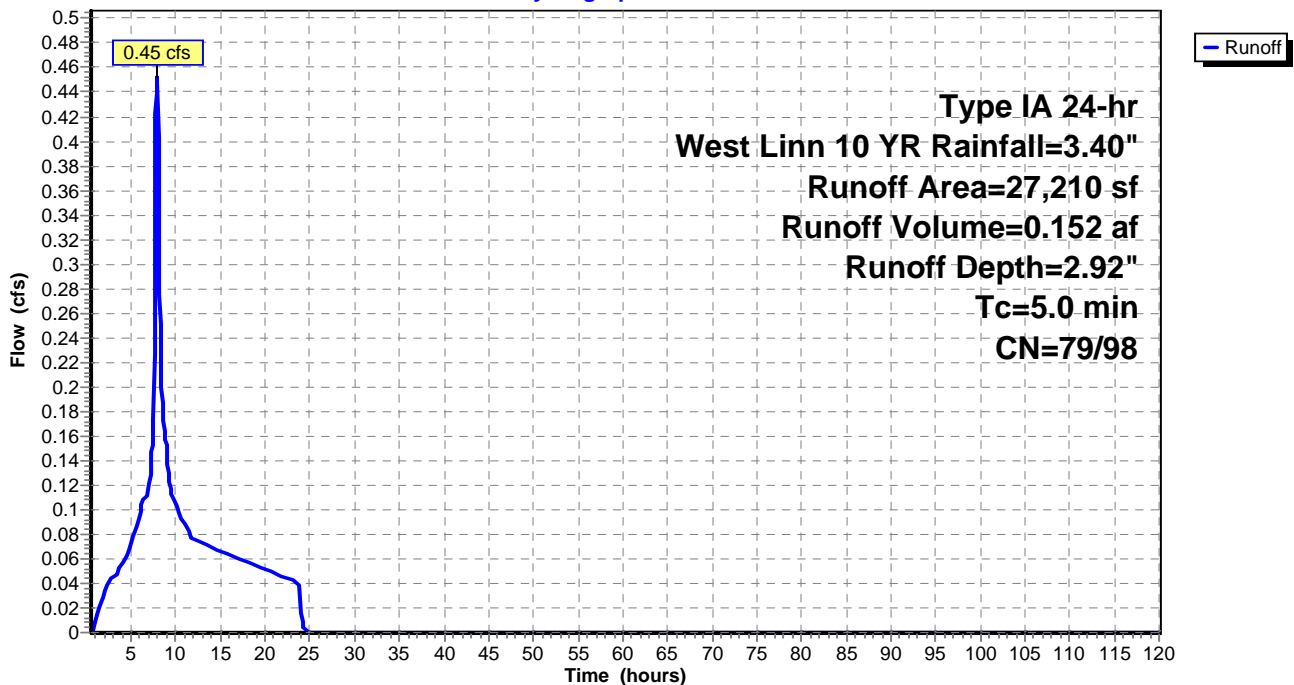
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 10 YR Rainfall=3.40"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph





**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.62 cfs @ 7.90 hrs, Volume= 0.207 af, Depth> 3.98"

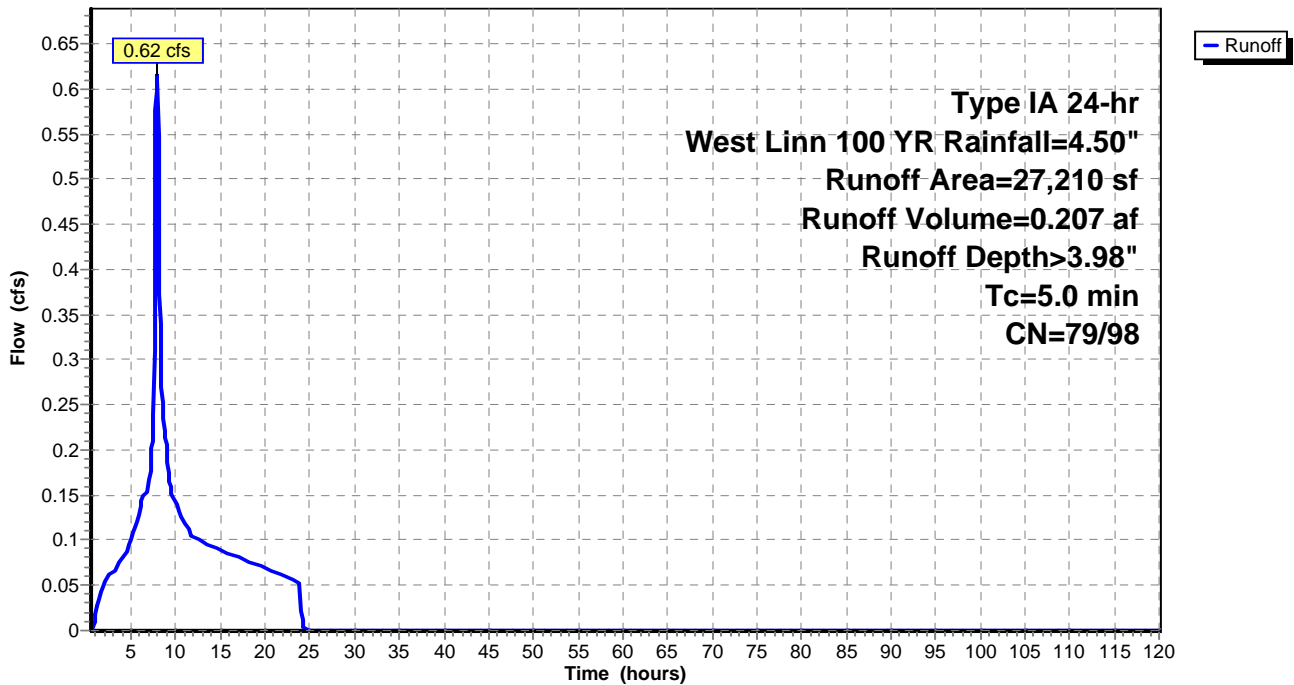
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 100 YR Rainfall=4.50"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 3

**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.59 cfs @ 7.90 hrs, Volume= 0.197 af, Depth> 3.79"

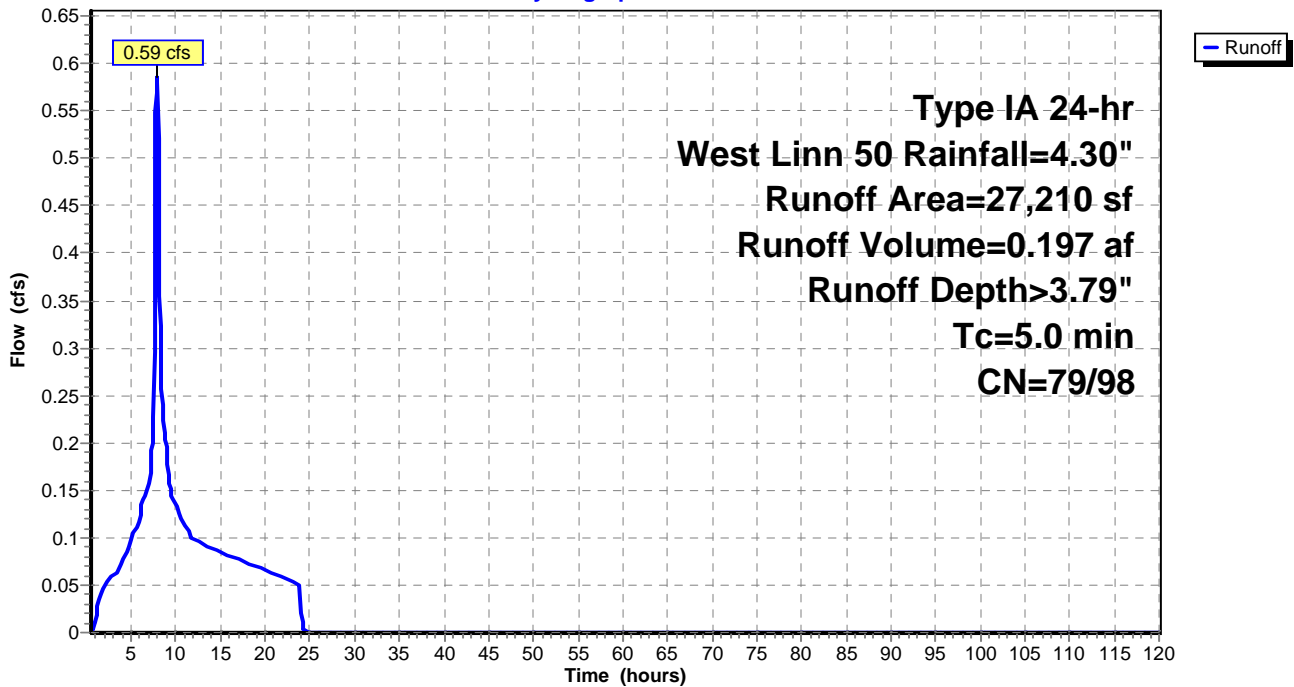
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 50 Rainfall=4.30"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn WQ Rainfall=1.20"

Printed 5/7/2020

Page 4

**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.14 cfs @ 7.91 hrs, Volume= 0.045 af, Depth= 0.86"

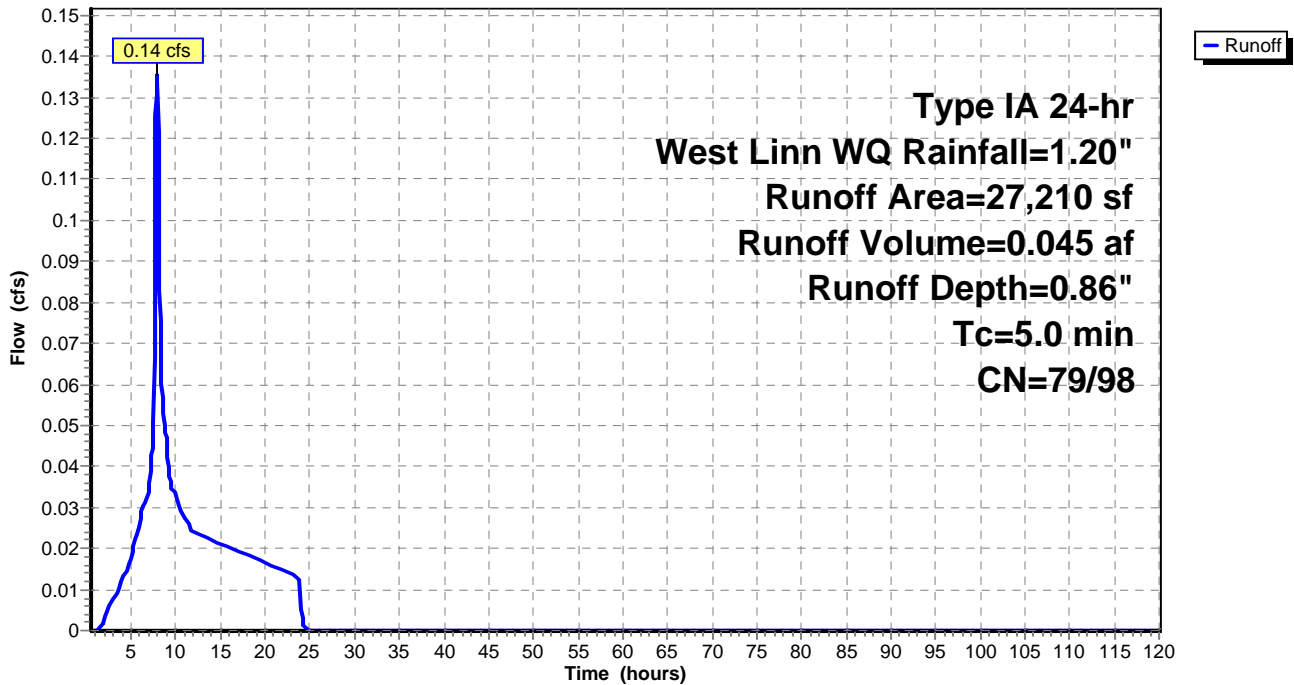
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Type IA 24-hr West Linn WQ Rainfall=1.20"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 1

**Summary for Subcatchment 6S: CSJ2**

Runoff = 31.82 cfs @ 7.98 hrs, Volume= 10.898 af, Depth= 2.38"

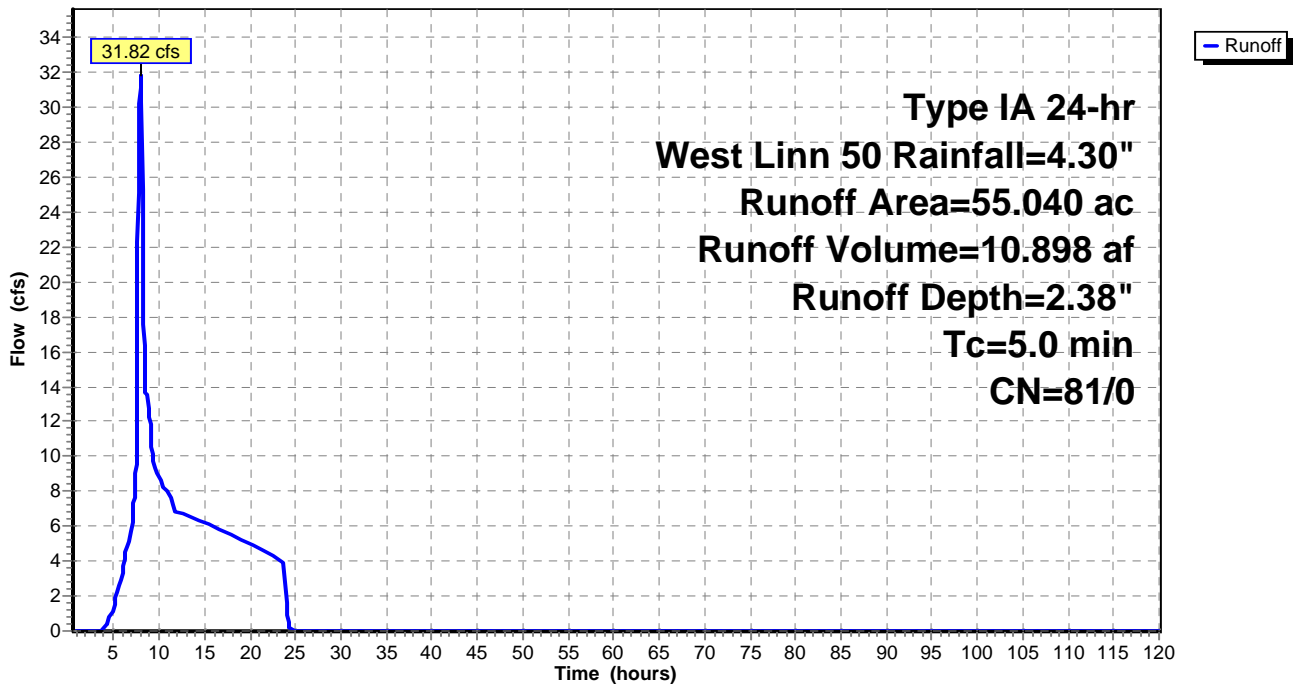
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 50 Rainfall=4.30"

Area (ac)	CN	Description
* 55.040	81	>75% Grass cover, Good, HSG D
55.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 6S: CSJ2**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 1

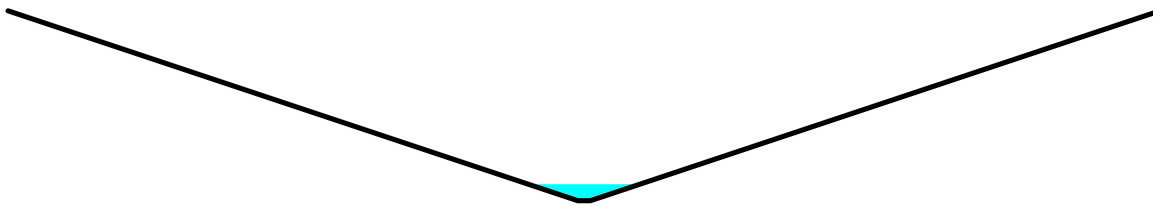
**Summary for Reach 5R: Cascade Springs Pond Creek**

Inflow Area = 55.040 ac, 0.00% Impervious, Inflow Depth = 2.38" for West Linn 50 event  
Inflow = 31.82 cfs @ 7.98 hrs, Volume= 10.898 af  
Outflow = 31.04 cfs @ 8.00 hrs, Volume= 10.898 af, Atten= 2%, Lag= 1.8 min

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Max. Velocity= 4.82 fps, Min. Travel Time= 5.2 min  
Avg. Velocity = 2.94 fps, Avg. Travel Time= 8.5 min

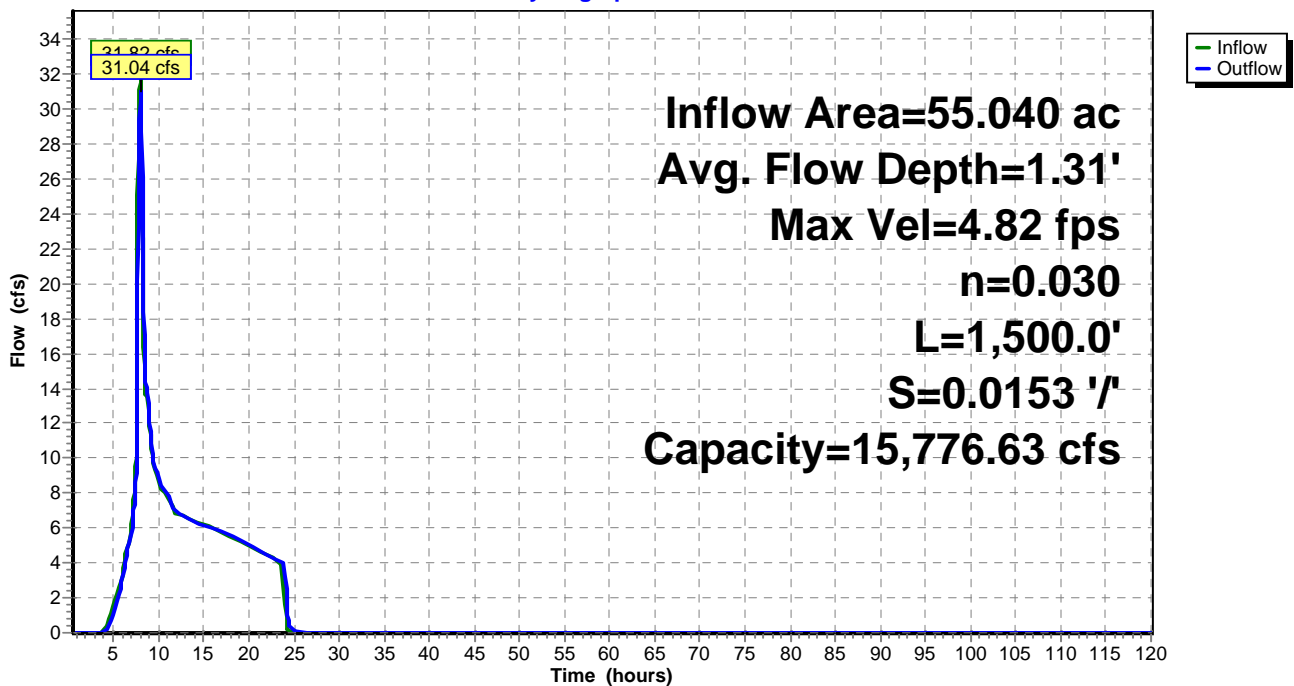
Peak Storage= 9,660 cf @ 8.00 hrs  
Average Depth at Peak Storage= 1.31'  
Bank-Full Depth= 15.00' Flow Area= 690.0 sf, Capacity= 15,776.63 cfs

1.00' x 15.00' deep channel, n= 0.030 Earth, grassed & winding  
Side Slope Z-value= 3.0 '/ Top Width= 91.00'  
Length= 1,500.0' Slope= 0.0153 '/  
Inlet Invert= 80.00', Outlet Invert= 57.00'



**Reach 5R: Cascade Springs Pond Creek**

Hydrograph





**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 5/7/2020

Page 1

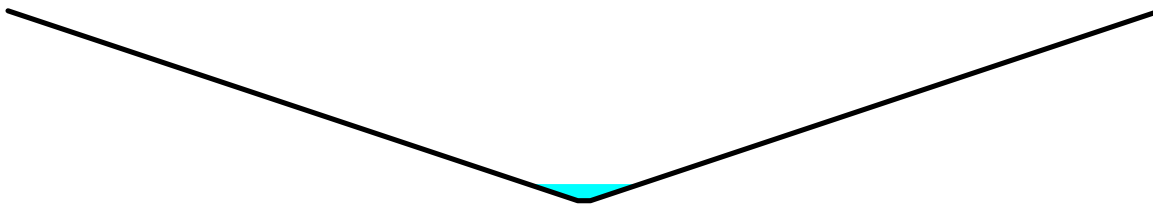
**Summary for Reach 5R: Cascade Springs Pond Creek**

Inflow Area = 55.665 ac, 0.95% Impervious, Inflow Depth = 2.39" for West Linn 50 event  
Inflow = 32.15 cfs @ 7.97 hrs, Volume= 11.095 af  
Outflow = 31.62 cfs @ 8.00 hrs, Volume= 11.095 af, Atten= 2%, Lag= 1.8 min

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Max. Velocity= 4.84 fps, Min. Travel Time= 5.2 min  
Avg. Velocity = 2.76 fps, Avg. Travel Time= 9.1 min

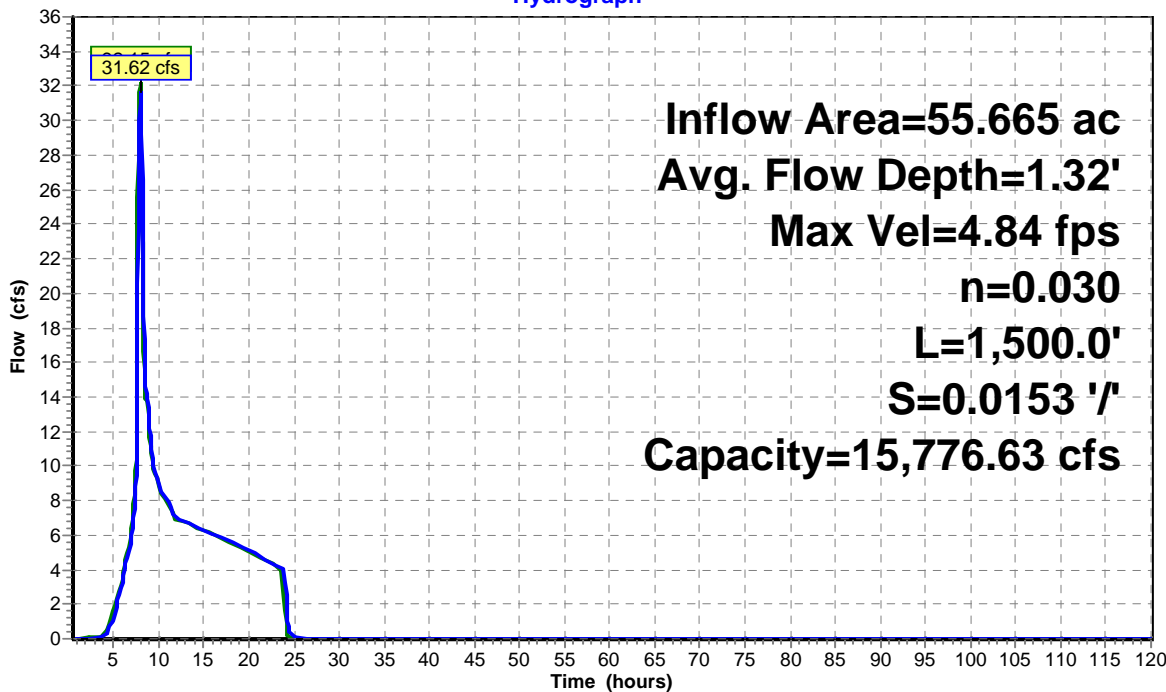
Peak Storage= 9,797 cf @ 8.00 hrs  
Average Depth at Peak Storage= 1.32'  
Bank-Full Depth= 15.00' Flow Area= 690.0 sf, Capacity= 15,776.63 cfs

1.00' x 15.00' deep channel, n= 0.030 Earth, grassed & winding  
Side Slope Z-value= 3.0 '/' Top Width= 91.00'  
Length= 1,500.0' Slope= 0.0153 '/'  
Inlet Invert= 80.00', Outlet Invert= 57.00'



**Reach 5R: Cascade Springs Pond Creek**

Hydrograph



**Inflow Area=55.665 ac**  
**Avg. Flow Depth=1.32'**  
**Max Vel=4.84 fps**  
**n=0.030**  
**L=1,500.0'**  
**S=0.0153 '/'**  
**Capacity=15,776.63 cfs**

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX D**

---

**GEOTECHNICAL REPORT**



# REDMOND & ASSOCIATES

**Geotechnical Investigation**

**Proposed Commercial Building Site**

**1575 Burns Street**

**West Linn (Clackamas County), Oregon**

**for**

**Mr. Rolf Olson**

**Project No. 943.001.G  
May 20, 2005**



# REDMOND & ASSOCIATES

Project No. 943.001.G  
Page No. 1

May 20, 2005

Mr. Rolf Olson  
3453 Augusta National Drive South  
Salem, Oregon 97302

Dear Mr. Olson:

**Re: Geotechnical Investigation, Proposed Commercial Building Site, 1575 Burns Street,  
West Linn (Clackamas County), Oregon**

## INTRODUCTION

In accordance with the request of Mr. Rolf Olson, we have completed our Geotechnical Investigation at the above subject proposed commercial building site. The site, a rectangular shaped property, is located to the north of Burns Street and to the east of Hood Street in West Linn (Clackamas County), Oregon.

We understand that present plans are to develop the site by constructing a new commercial building. Although the project is still in the preliminary planning and design stages, we understand that the commercial structure will be a one- and/or two-story structure which will include a below grade parking level. Specific building materials are not presently known but are anticipated to include wood- and/or metal frame with concrete and/or masonry blocks walls. The planned commercial structure is anticipated to be supported on conventional continuous (strip) and/or individual spread (column) footings with a concrete slab-on-grade floor. Structural loading is anticipated to result in maximum dead plus live continuous footing and column footing loads on the order of about 2.0 to 4.0 kips per lineal foot (klf) and 50 to 100 kips, respectively. Other associated site improvements will include asphalt pavements for both automobile drive and parking areas, underground utility services and landscaping.

## SITE DESCRIPTION

The proposed commercial site, located within Township 2 South, Range 2 East, and Section 30 of the Willamette Meridian, is presently unimproved and consists of existing open commercial lot.

Topographically, the westerly portion of the site is characterized as relatively flat-lying terrain while the easterly portion of the site is characterized as moderately sloping terrain descending down to the east with overall topographic relief across the entire estimated at about 10 to 15 feet and is estimated lie near to Elevation 180 feet.

Vegetation across most of the site consists of a moderate growth of grass, weeds, and brush as well as numerous small to large sized trees.

### SCOPE OF WORK

The purpose of our geotechnical studies is to evaluate the overall site subsurface soil and ground water characteristics as well as any associated impacts or concerns with regard to the planned construction and development of the site. Specifically, our geotechnical investigation included the following scope of work items:

1. Site exploration by means of three (3) exploratory backhoe test pit excavations. The exploratory test pits were excavated at various locations across the site as shown on the Site Exploration Map, Figure No. 2 to depths ranging from about 8 to 11 feet beneath existing site grades. Detailed logs of the exploratory test pit excavations, presenting conditions encountered at each location explored, are presented on the Log of Test Pits, Figure No's. 5 and 6. Additionally, representative samples of the subsurface soils encountered at the site were collected at selected depths and/or intervals and returned to our laboratory for further examination and testing.
2. A laboratory testing program to assess the pertinent physical and engineering characteristics of the subsurface soils. The laboratory program consisted of tests to evaluate the natural (field) moisture content and dry density, Atterberg Limits, gradational properties and Direct Shear Strength tests. Results of the moisture content and dry density tests are shown on their respective test pit log, Figure No's. 5 and 6. Results of the Atterberg Limits, gradation and direct shear strength tests are shown graphically on Figure No's. 7 through 9.
3. Recommendations and our final written report presenting the results of our investigation. Our report includes recommendations for site preparation and grading including any overexcavation of unsuitable materials revealed by the explorations, placement and compaction of any required structural fill(s), suitability of the on-site soils for use as structural fill as well as criteria for import fill materials, and preparation of pavement and foundation areas.
4. Recommendations for foundation support and design including allowable contact bearing pressures for proportioning footings, minimum width and embedment depths, and estimates of foundation settlement as well as lateral earth pressures for below grade walls. Additionally, we have developed flexible pavement sections for automobile and/or truck traffic areas.

### SUBSURFACE CONDITIONS

Our understanding of the subsurface conditions which underlie the site was developed by means of three (3) exploratory test pits excavated on April 23, 2005 with a rubber-tired excavator at the approximate locations shown on Figure No. 2. The test pits revealed that the site is underlain by native soil deposits comprised of lacustrine and fluvial sedimentary soil deposits of Pleistocene age. Specifically, the native soil materials were comprised of very moist to wet, medium stiff to stiff, clayey, sandy silt to the maximum depth explored of about 11.0 feet beneath existing site grades. These clayey, sandy silt subgrade soils are best characterized by relatively low to moderate strength and compressibility.



Ground water was not encountered at the site during our field exploration work and is not expected to be a factor during construction. However, topsoil materials were encountered at the site and consist of about 12 to 16 inches of organic, clayey and sandy silt. All soils encountered at the site were classified in accordance with the Unified Soil Classification System (USCS) which is outlined on Figure No. 4.

### **CONCLUSIONS AND RECOMMENDATIONS**

From a geotechnical engineering and constructability standpoint, we are of the opinion that the site is suitable for the planned new commercial structure and its associated site improvements provided that the recommendations contained within this report are properly incorporated into the design and construction of the project.

The primary feature of concern at the site is the moisture sensitivity characteristics of the underlying clayey, sandy silt subgrade soil materials

In regards to the moisture sensitivity characteristics of the underlying clayey, sandy silt subgrade soils, we recommend that all foundation excavation and site grading work be performed during the drier summer months which is typically June through September.

The following sections of this report present specific recommendations for site preparation and grading as well as foundation design and construction for the commercial building project.

### **SITE PREPARATION**

In general, we recommend that all planned structural improvement areas for the commercial building and pavements be stripped and cleared of any existing site improvements, vegetation, topsoil materials, and any deleterious materials present at the time of construction. In general, we envision that about 12 to 16 inches of topsoil stripping may be required to remove existing topsoil materials. Holes resulting from the removal of any buried obstructions, such as old foundation remnants and/or boulders, should be backfilled and compacted with structural fill materials. Areas resulting in deeper stripping and removals should be evaluated at the time of construction by the Geotechnical Engineer. The stripped and cleared materials should be properly disposed of as they are generally not considered suitable for use/reuse as structural fill.

Following the stripping and clearing operations, and prior to the placement of any required structural fills and/or structural improvements, the exposed subgrade soils within the planned building and pavement areas should be inspected by the Geotechnical Engineer and possibly proof-rolled with a half-loaded dump truck. Areas found to be soft or otherwise unsuitable for support of structural loads or improvements should be scarified and recompacted or overexcavated and replaced with structural fill. During wet or inclement weather conditions, proof-rolling as recommended above will not be appropriate.

The on-site native clayey, sandy silt subgrade soils are considered suitable for use/reuse as structural fill provided that they are free of organic materials, debris, and rock fragments in excess of 8 inches in dimension. If grading is conducted during wet weather, the use of the on-site clayey, sandy silt soils may be difficult and the use of an import granular fill material may be required. In general, we recommend that a free-draining (clean) granular fill (sand & gravel) containing no more than about 5 percent fines be used during wet weather grading. Representative samples of the material(s) to be used as structural fill should be submitted to our laboratory for approval and to determine the maximum dry density and optimum moisture content for compaction.

All required structural fill materials placed within the building and pavement (structural) areas should be moistened or dried as necessary to near (within 3 percent) optimum moisture conditions and compacted by mechanical means to a minimum of 92 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Fill materials should be placed in lifts (layers) such that when compacted do not exceed about 8 inches.

### **FOUNDATION SUPPORT**

Based on the results of our investigation, it is our opinion that the proposed commercial building structure may be supported directly on the underlying native medium stiff to stiff, clayey, sandy silt subgrade soil deposits and/or by structural fill materials with conventional continuous and individual spread footings. As such, were foundations are constructed on approved native subgrade soils and/or properly placed and compacted structural fill materials, an allowable contact bearing pressure of about 2,500 pounds per square foot (psf) is recommended for design. However, where higher allowable contact bearing pressures are required, an allowable contact bearing pressure of 3,000 psf may be used for design where the foundations are supported by a minimum of at least 12 inches of compacted crushed aggregate base rock structural fill materials. These allowable contact bearing pressures are intended for dead loads and sustained live loads and may be increased by one-third for the total of all loads including short-term wind or seismic loads.

In general, continuous strip footings should have a minimum width of at least 16 inches and be embedded at least 18 inches below the lowest adjacent finish grade (includes frost protection). Individual column footings (if required) should be embedded at least 16 inches below grade and have a minimum width of about 24 inches.

Total and differential settlements of foundations constructed as recommended above and supported directly by approved native subgrade soils or on properly placed and compacted structural fill materials are expected to be well within tolerable limits for this type of structure and should generally be less than about 1-inch and 1/2-inch, respectively.

Allowable lateral frictional resistance between the base of the footings and the clayey, sandy silt or a gravel subgrade soil can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.35 and 0.45, respectively. In addition, lateral loads may be resisted by passive pressures on footings poured "neat" against in-situ native soils or properly compacted structural fill materials. For passive earth pressure resistance we recommend that an equivalent fluid density of 300 pounds per cubic foot (pcf) be used for design.

### **FLOOR SLAB SUPPORT**

In order to provide uniform subgrade reaction beneath concrete slab-on-grade floors, we recommend that the floor slabs be underlain by a minimum of 6 inches of free-draining (less than 5 percent passing the No. 200 sieve), well-graded, crushed rock. The crushed rock should provide a capillary break to prevent migration of moisture through the slab. Additional moisture protection can be provided by using a 6-mil visqueen vapor barrier covered with a 1-inch protective layer of sand on the top and bottom. The base course materials should be compacted to at least 95 percent of the maximum dry density obtainable by the ASTM D-1557 (AASHTO T-180) test procedures.

**BELOW GRADE/RETAINING WALLS**

Below grade walls should be designed to resist lateral earth pressures imposed by native soils and/or granular backfill materials as well as any adjacent surcharge loads. For walls which are fully restrained from rotation at the top and supporting level backfill, we recommend that at-rest earth pressures be computed on the basis of an equivalent fluid density of 50 pcf and 60 pcf for granular backfill or sandy silt soil backfill materials, respectively. However, for walls which are free to rotate at the top and retaining level backfill, we recommend that active earth pressures be computed on the basis of an equivalent fluid density of 30 pcf and 40 pcf for granular backfill and sandy silt soil backfill materials, respectively. The above recommended lateral earth pressure values assume that the wall(s) will adequately drained to prevent the buildup of hydrostatic pressures. Where wall drainage will not be present and/or where adjacent surcharge loading and/or sloping ground conditions are present, the above recommended lateral earth pressure values will be higher.

Non structural backfill materials behind retaining walls should be compacted to at least 85 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Where structural backfill materials are required, the degree of compaction should be at least 90 percent of the maximum dry density. However, special care should be taken to avoid overcompaction near the wall(s) which could result in higher lateral earth pressures than those indicated herein. In an area within about three (3) to five (5) feet behind walls, we recommend the use of light hand operated compaction equipment.

**EXCAVATIONS**

Temporary excavations within native subgrade soils of up to four (4) feet in depth are expected to remain fairly stable at near vertical inclinations. Excavations to depths of between four (4) feet to ten (10) feet should be properly braced and shored or backcut to inclinations of at least 1 to 1 (Horizontal to Vertical). Where excavations are planned to exceed ten (10) feet, this office should be consulted. Additionally, at present levels, we do not anticipate that ground water will not be a factor during construction.

**PAVEMENTS**

Flexible pavement design for the project was determined on the basis of projected traffic volume and loading conditions relative to assumed subgrade soil strength characteristics. Based on an assumed subgrade "R"-value of 35 (CBR = 4.0) and utilizing the Oregon State Highway Flexible Pavement Design Procedures, we recommend that the asphaltic concrete pavement sections for automobile parking and drive area use at the site consist of the following:

	<b><u>Asphaltic Concrete Thickness (Inches)</u></b>	<b><u>Crushed Base Rock Thickness (Inches)</u></b>
Automobile Parking Areas	2.5	8.0
Automobile Drive Areas	3.0	9.0

Note: Where heavy vehicle traffic is anticipated, we recommend that the main access drive area pavement section be increased by adding 1.0 inches of asphalt and 3.0 inches of aggregate base rock. Additionally, for wet and/or winter time construction, we recommend that a minimum of at least 12 inches of aggregate base rock be used in all pavement areas.

The above recommended pavement section(s) assume that the subgrade will be prepared as recommended herein, that the exposed subgrade soils will be properly protected from rain and construction traffic, and that the subgrade is firm and unyielding at the time of paving. Additionally, it assumes that the subgrade is graded to prevent any ponding of water which may tend to accumulate in the base course. Further, the above recommended flexible pavement section(s) assumes a design life of about 20 years.

Pavement base course materials should consist of well-graded 1 1/2-inch and/or 3/4-inch minus crushed base rock having less than 5 percent fine materials passing the No. 200 sieve. The base course and asphaltic concrete materials should conform to the requirements set forth in the latest edition of the Oregon Department of Transportation, Standard Specifications of Highway Construction. The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. The asphaltic concrete materials should be compacted to at least 91 percent of the theoretical maximum density as determined by the ASTM D-2041 (Rice Gravity) test method.

#### SEISMIC DESIGN CONSIDERATIONS

Subgrade acceleration coefficients for the project were obtained from the seismic hazard/design mapping project performed by Geomatrix Consultants. Geomatrix mapping indicates that a peak ground acceleration on bedrock soils in the area of the site are 0.19g with a return period of about 500 years. The UBC seismic zone factor (Z) for the subject site is 0.30. Additionally, the IBC soil profile for the subject site to estimate the site class is recommended at D.

#### USE OF REPORT

This report is intended for the exclusive use of the addressee and their representatives to use to design the proposed commercial building structure and its associated site improvements described herein and to prepare any construction documents. The data, analyses, and recommendations may not be appropriate for other structures or purposes. We recommend that parties contemplating other structures or purposes contact our office. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report.

#### LEVEL OF CARE

Services performed by the Geotechnical Engineer for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in the area under similar budget and time restraints. No warranty, either expressed or implied, is made.

#### CONSTRUCTION MONITORING AND TESTING

We recommend that **Redmond & Associates** be retained to provide construction monitoring and testing services during all earthwork operations. The purpose of our monitoring services would be to confirm that the site conditions which are encountered are as anticipated, provide field recommendations as necessary based on the actual conditions encountered, and document the activities of the contractor and assess his/her compliance with the project specifications and recommendations.

It is important that we meet with the grading contractor prior to any site grading work to establish a plan that will minimize costly overexcavation and site preparation work. Of primary importance will be observations made during the site preparation, structural fill placement, footing excavation and preparation, and construction of all below grade retaining walls.

We will be pleased to provide such additional assistance or information as you may require in the balance of the design phase of this project and to aid in construction control or solution of unforeseen conditions which may arise during the construction period.

Sincerely,

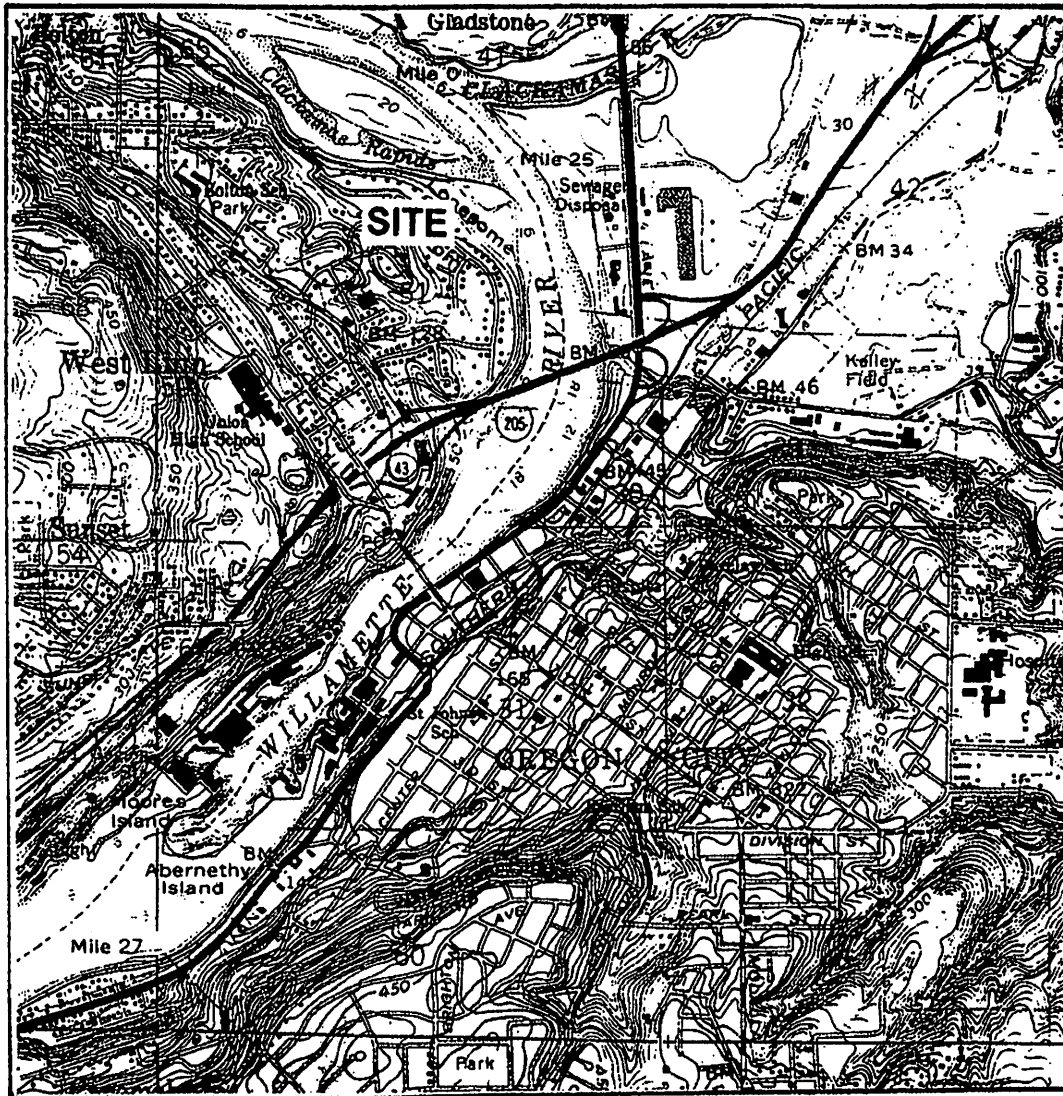


Daniel M. Redmond, P.E.  
President/Principal Geotechnical Engineer

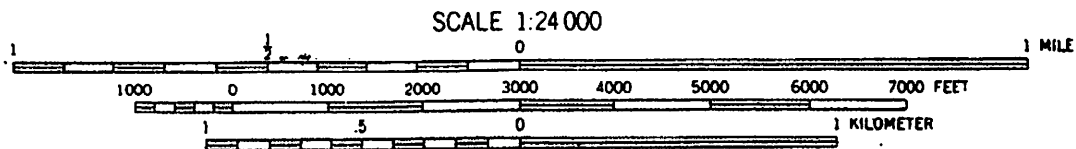


Expires 12-31-06





OREGON CITY QUADRANGLE  
 OREGON-CLACKAMAS CO.  
 7.5 MINUTE SERIES (TOPOGRAPHIC)  
 SE/4 OREGON CITY 15' QUADRANGLE



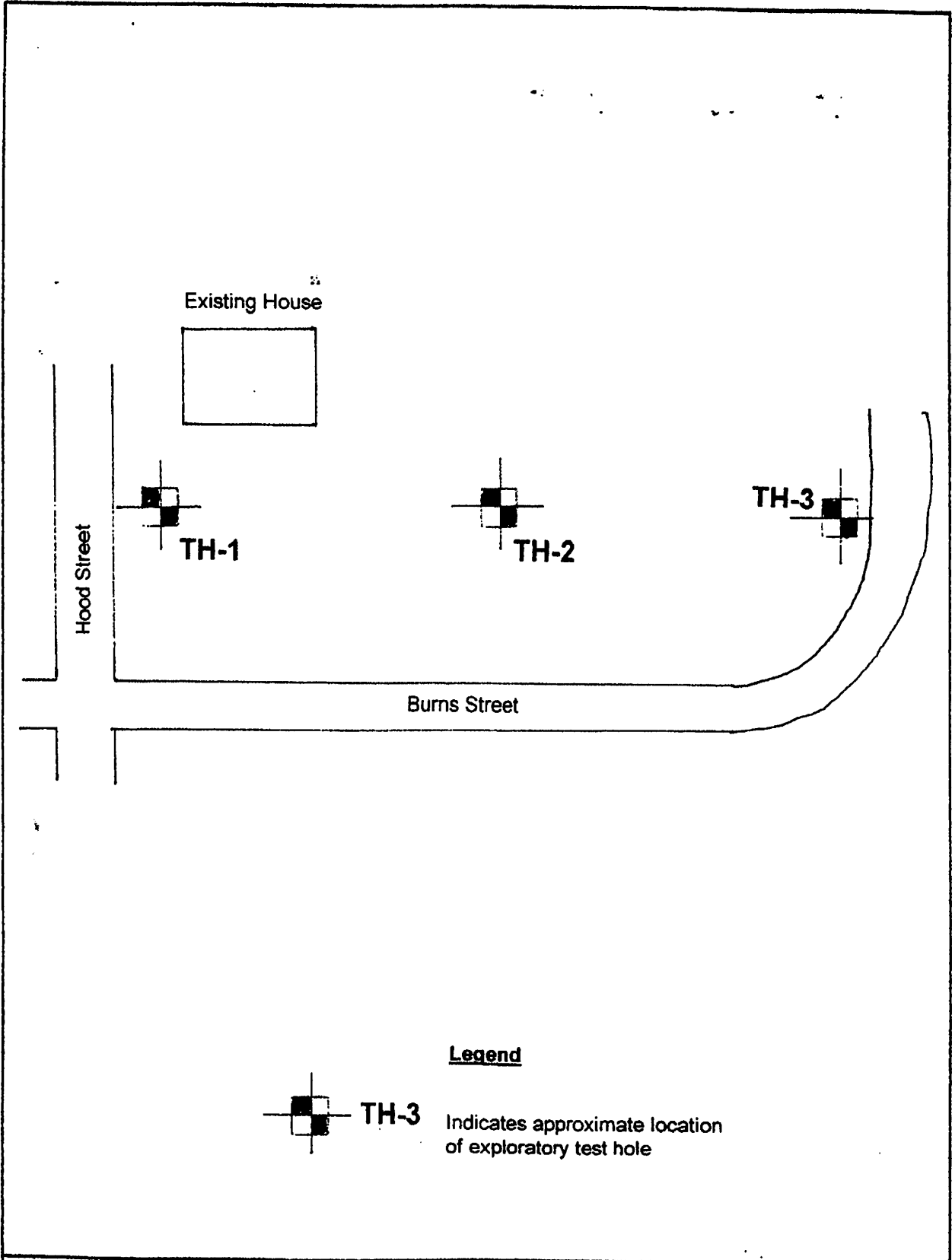
CONTOUR INTERVAL 10 FEET  
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

**SITE VICINITY MAP**

Project No. 943.001.G

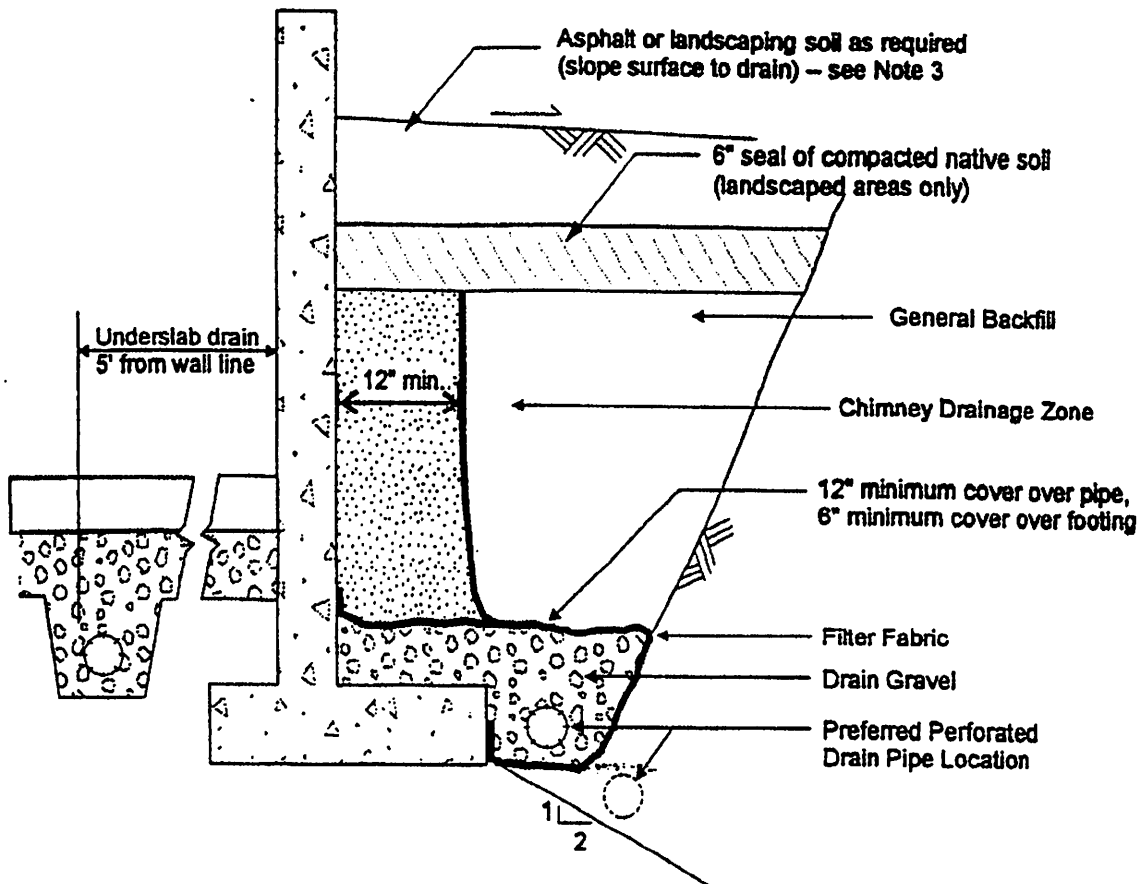
1575 BURNS STREET

Figure No. 1



**SITE EXPLORATION MAP**

Project No. 943.001.G	1575 BURNS STREET	Figure No. 2
-----------------------	-------------------	--------------



**SCHEMATIC - NOT TO SCALE**

**NOTES:**

1. Filter Fabric to be non-woven geotextile (Amoco 4545, Mirafi 140N, or equivalent)
2. Lay perforated drain pipe on minimum 0.5% gradient, widening excavation as required. Maintain pipe above 2:1 slope, as shown.
3. All-granular backfill is recommended for support of slabs, pavements, etc. (see text for structural fill).
4. Drain gravel to be clean, washed ¾" to 1½" gravel.
5. General backfill to be on-site gravels, or ¾"-0 or 1½"-0 crushed rock compacted to 92% Modified Proctor (AASHTO T-180).
6. Chimney drainage zone to be 12" wide (minimum) zone of clean washed, medium to coarse sand or drain gravel if protected with filter fabric. Alternatively, prefabricated drainage structures (Miradrain 6000 or similar) may be used.

**FOOTING/RETAINING WALL DRAIN**

Project No. 943.001.G

1575 BURNS STREET

Figure No. 3

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
			GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
		GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.	
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
		SANDS WITH FINES	SP	Poorly graded sands or gravelly sands, little or no fines.
			SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

**DEFINITION OF TERMS**

SILTS AND CLAYS	U.S. STANDARD SERIES SIEVE			CLEAR SQUARE SIEVE OPENINGS			COBBLES	BOULDERS
	200	40	10	4	3/4"	3"		
	SAND			GRAVEL				
	FINE	MEDIUM	COARSE	FINE	COARSE			

**GRAIN SIZES**

SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT <sup>1</sup>
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CLAYS AND PLASTIC SILTS	STRENGTH <sup>‡</sup>	BLOWS/FOOT <sup>‡</sup>
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

**RELATIVE DENSITY**

<sup>1</sup>Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

<sup>‡</sup>Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

**CONSISTENCY**

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • Portland, OR 97230

**KEY TO EXPLORATORY TEST PIT LOGS  
Unified Soil Classification System (ASTM D-2487)**

1575 BURNS STREET COMMERCIAL SITE  
WEST LINN, OREGON

332 PROJECT NO.	DATE
943 001 C	May 20, 2005

Figure 4

BACKHOE COMPANY: **Kavik, Inc.**

BUCKET SIZE: **24 inches**

DATE: **4/23/05**

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION	
						TEST PIT NO. <b>TH-1</b>	ELEVATION
0					ML	Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)	
	X			24.4	ML	Medium brown to olive-brown, very moist, medium stiff to stiff, clayey, sandy SILT	
5	X			27.2			
10						Total Depth - 9.0 feet No ground water encountered	

						TEST PIT NO. <b>TH-2</b>	ELEVATION
0					ML	Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)	
	X			26.1	ML	Medium brown to olive-brown, very moist, medium stiff to stiff, clayey, sandy SILT	
5							
	X			28.3			
10							
15						Total Depth = 11.0 feet No ground water encountered	

**LOG OF TEST PITS**

PROJECT NO. **943.001.G**

**1575 BURNS STREET COMMERCIAL SITE**

FIGURE NO. **5**



BACKHOE COMPANY: Kavik, Inc.

BUCKET SIZE: 24 inches

DATE: 4/23/05

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION	
						TEST PIT NO. TH-3	ELEVATION
0					ML		Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)
	X			35.5	ML		Gray-brown, wet, soft to medium stiff, sandy, clayey SILT
5	X			32.6	ML		Medium brown to olive-brown, very moist to wet, medium stiff to stiff, clayey, sandy SILT
10							Total Depth = 8.0 feet No ground water encountered

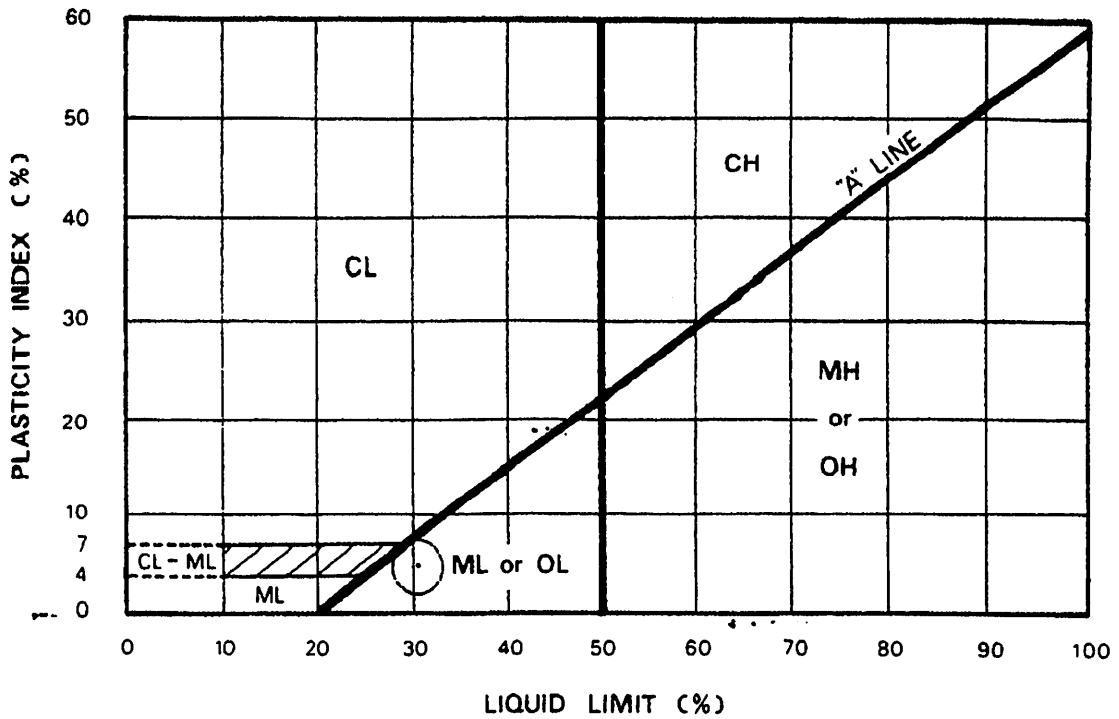
						TEST PIT NO.	ELEVATION
0							
5							
10							
15							

**LOG OF TEST PITS**

PROJECT NO. 943.001.G

1575 BURNS STREET COMMERCIAL SITE

FIGURE NO. 6



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
	TH-2	3.0	28.3	30.6	5.5	76.0		ML

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • PORTLAND, OR 97294

PLASTICITY CHART AND DATA

1575 BURNS STREET COMMERCIAL SITE  
West Linn, Oregon

PROJECT NO.

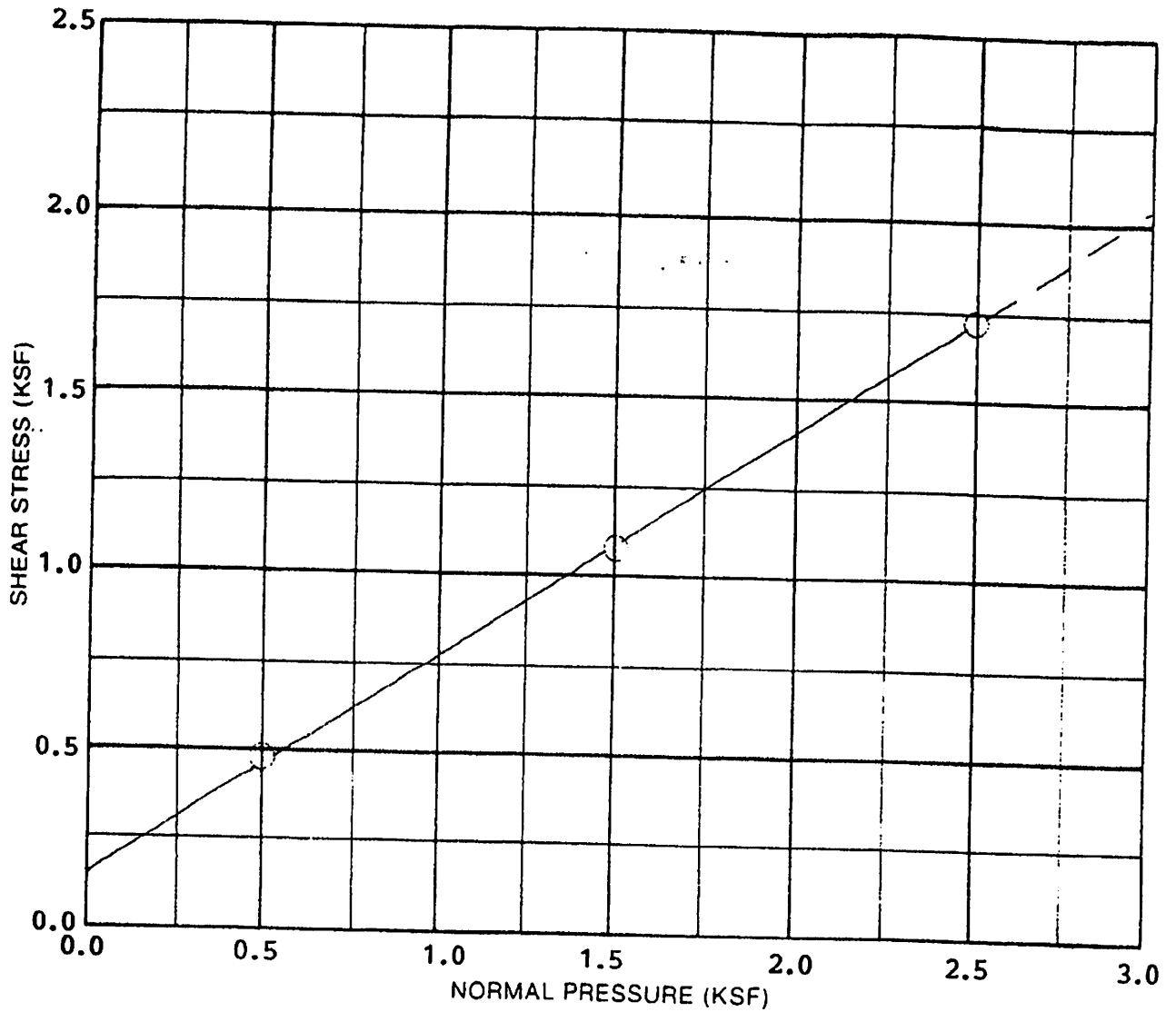
DATE

943 001 C

May 20 2005

Figure 7





SAMPLE DATA	
DESCRIPTION: <b>Medium to olive-brown, clayey, sandy SILT</b>	
BORING NO.: <b>TH-2</b>	
DEPTH (ft.): <b>3.0'</b>	ELEVATION (ft.):
TEST RESULTS	
APPARENT COHESION (C): <b>150 psf</b>	
APPARENT ANGLE OF INTERNAL FRICTION ( $\phi$ ): <b>32°</b>	

TEST DATA				
TEST NUMBER	1	2	3	4
NORMAL PRESSURE (KSF)	0.5	1.5	2.5	
SHEAR STRENGTH (KSF)	0.48	1.09	1.74	
INITIAL H <sub>2</sub> O CONTENT (%)	26.0	26.0	26.0	
FINAL H <sub>2</sub> O CONTENT (%)	25.9	24.2	22.1	
INITIAL DRY DENSITY (PCF)	91.1	91.1	91.1	
FINAL DRY DENSITY (PCF)	91.6	93.1	95.4	
STRAIN RATE: <b>0.02 inches per minute</b>				

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • Portland, OR 97294

DIRECT SHEAR TEST DATA		
1575 BURNS STREET COMMERCIAL SITE West Linn, Oregon		
PROJECT NO.	DATE	
943.001.G	May 20 2005	
		Figure 9

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX E**

---

**FIELD VISIT EXPLORATIONS**



## Field Visit Notes:

A field visit for the Bolton Terrace project located at 1575 Burns Street in West Linn, OR 97068 was conducted on April 14<sup>th</sup>, 2020. The purpose of this visit was to determine if the north fork of Cascade Springs Pond Creek had adequate downstream capacity for the added runoff produced from the developed project site.

During the field visit it was observed that at the mouth of the creek, located near the southeast corner of the project site, the creek had a width of over 30 feet and depth of 10-15 feet. The observed slope at this area was 1.50%.

It was observed, that the creek increases in width and depth further downstream. The next measurement observed was 300 feet downstream. At this point, the creek was greater than 40 feet in depth and greater than 50 feet in width at the widest point. The slope at this point was 1.65%. The width at the bottom of the creek was on average 15 feet in diameter.

These characteristics continue until 1900 feet downstream. The creek decreases to 10 feet in width and approximately 6 feet in depth. The creek then flows through a 30-inch diameter concrete pipe, flowing under River Street and into a 25-foot depth and 30-foot wide creek on the other side. This creek then flows into the Willamette River.

Through field observations, it is determined that Cascade Springs Pond Creek will have more than enough downstream capacity to convey the 0.20 feet of added runoff depth produced by the proposed developed site.

## Field Visit Pictures:

Picture 1:



From mouth of creek looking southeast

Picture 2:



From mouth of creek looking northwest

Picture 3:



From project site looking southeast

Picture 4:



300 ft downstream looking northwest



Picture 5:



300 ft downstream looking southeast

Picture 6:



1900 ft downstream looking west

Picture 7:



1900 ft downstream looking east

Picture 8:



1920ft downstream looking east



April 10, 2020

Mr. Josh Wells  
Westech Engineering, Inc.  
3841 Fairview Industrial Drive SE, Suite 100  
Salem, Oregon 97302

Dear Mr. Wells:

**Re: Supplemental Geotechnical Consultation Services, Proposed Bolton Terrace Advance Dental Arts Project, 1575 Burns Street, West Linn (Clackamas County), Oregon**

In accordance with your request, we are providing you with the following professional opinion with regard to storm water disposal at the above subject project site. As you are aware, we previously performed Geotechnical Consultation and Field Infiltration Testing Services at the site the results of which were presented in our formal report dated April 21, 2017.

Specifically, we understand that present plans are to develop the site by constructing a new commercial (Advance Dental Arts) building at the site. Based on a review of the proposed site development plan(s), we understand that the proposed new commercial building will be constructed across the upper southwesterly portion of the site. Additionally, we understand that the lower easterly portion of the site will consist of a paved parking lot. Further, we understand that the lower easterly paved parking lot will be bounded to the east by a 2H:1V cut and/or fill slope and to the west by a retaining wall. In addition to the above, we understand that storm from hard and/or impervious surfaces (i.e., roofs and pavements) is to be collected through a series of roof rain drains and parking area catch basins for possible on-site treatment and disposal.

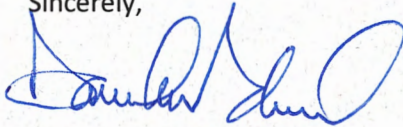
Based on the above as well as our review of a Site Stormwater and Downstream Analysis Report prepared by Westech Engineering, Inc. dated January, 2020, it is our professional opinion that the subject property is unsuitable for disposal of storm water and/or the use of a vegetated stormwater facility.

This opinion is supported by 1) the relatively low and/or poor infiltration rates measured at the site during our previous field infiltration testing and 2) the findings presented in the above subject Site Stormwater and Downstream Analysis Report. Additionally, we are of the opinion that on-site disposal of storm water may result in de-stabilization of the proposed easterly 2H:1V cut and/or fill slope and/or impacts to the proposed site retaining wall(s).

As such, it is our opinion that all storm water collected from the hard surfaces (i.e., roofs and pavements) be disposed of off-site to a suitable outfall such as the existing Cascade Springs Pond Creek drainage basin located to the southeast of the subject property.

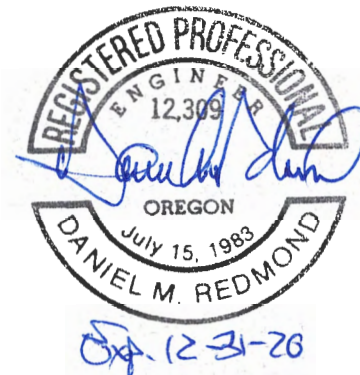
We appreciate this opportunity to be of service to you at this time and trust that the above information is suitable to your present needs. Should you have any questions regarding the above or if you require any additional information and/or assistance, please do not hesitate to call.

Sincerely,



Daniel M. Redmond, P.E., G.E.  
President/Principal Engineer

Cc: Mr. Lee Gwyn  
Lenity Architecture



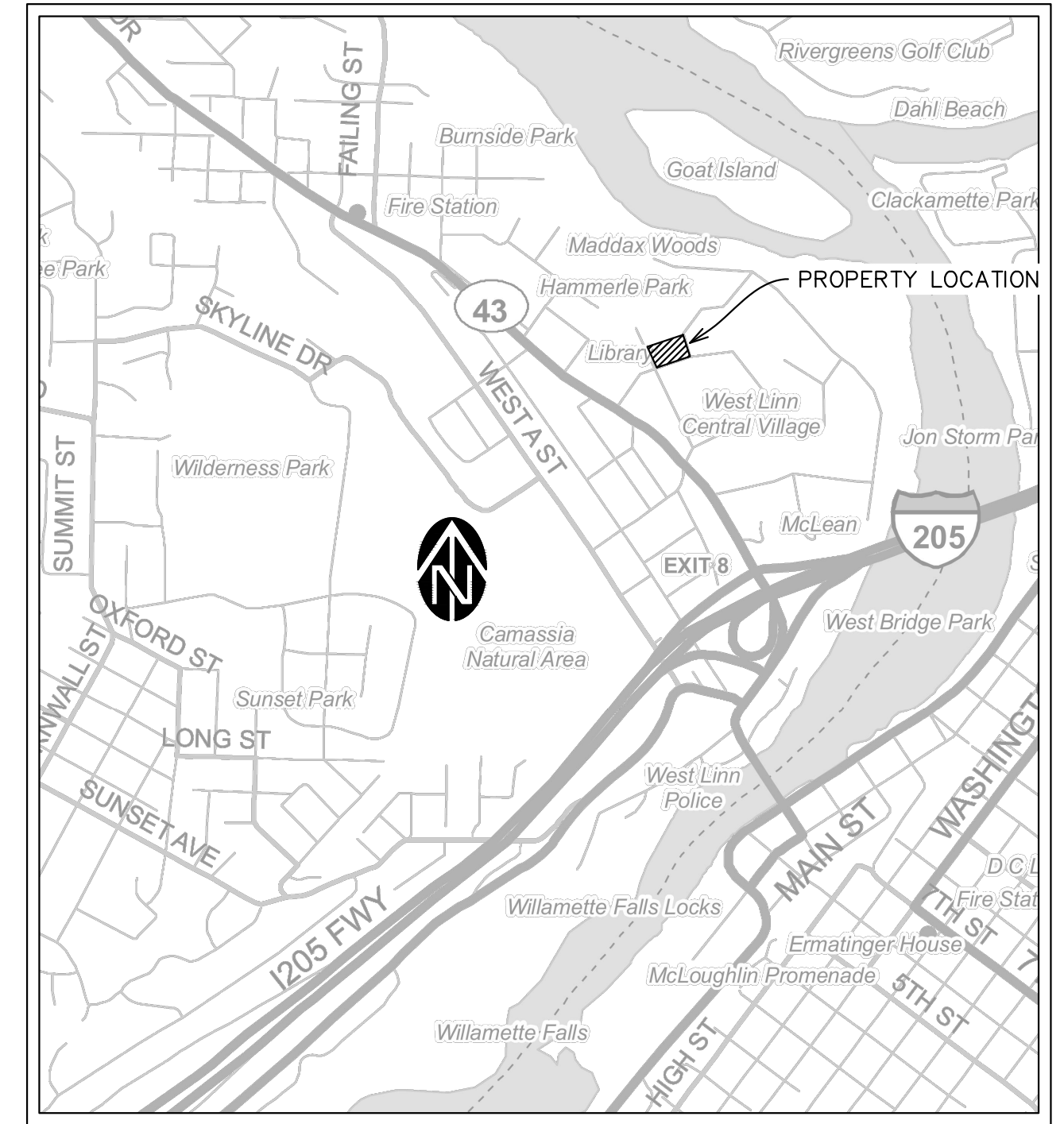
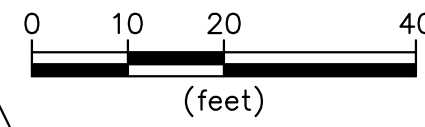


**LEGEND**

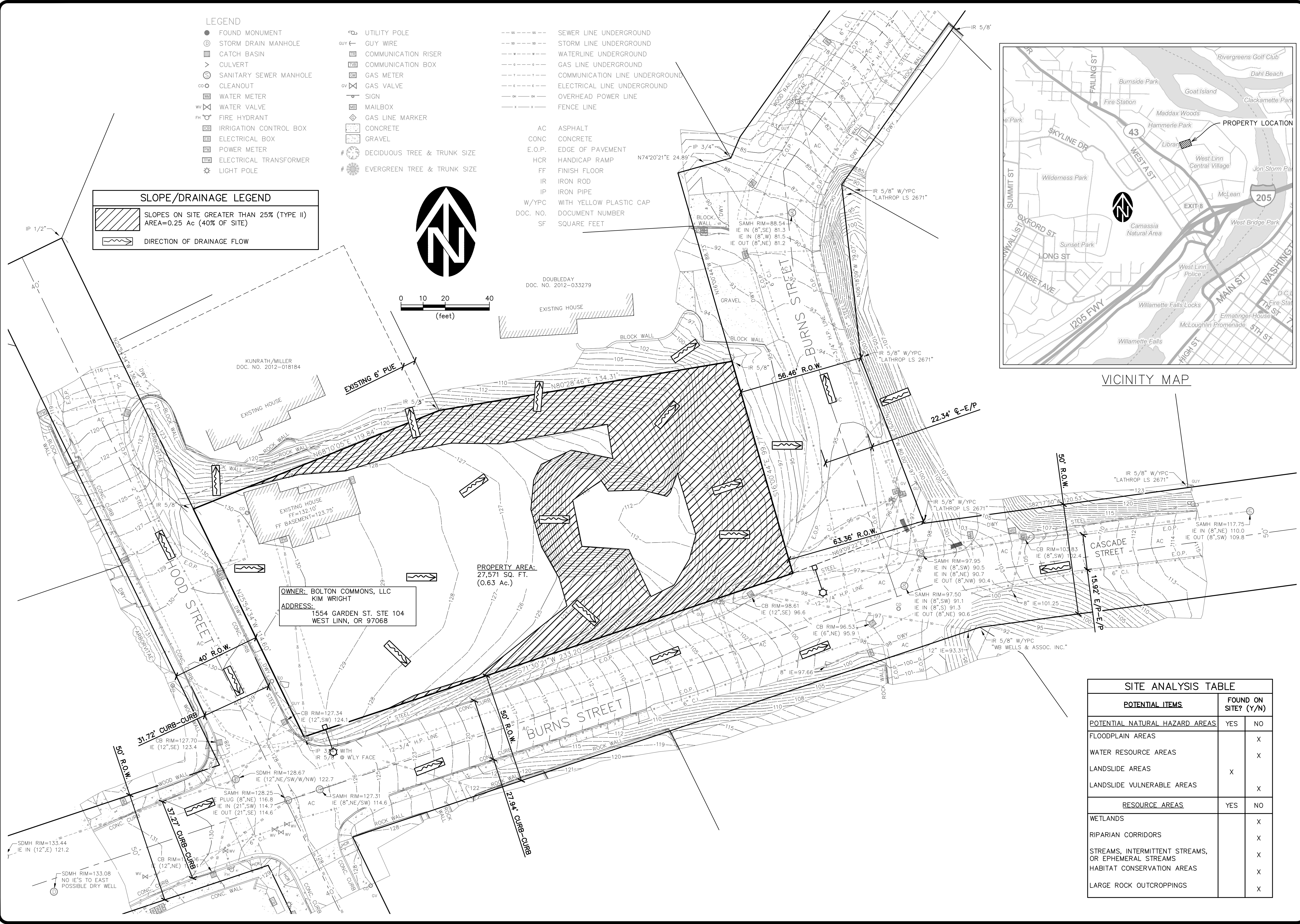
- FOUND MONUMENT
- ⊙ STORM DRAIN MANHOLE
- ▭ CATCH BASIN
- > CULVERT
- ⊙ SANITARY SEWER MANHOLE
- ∞ CLEANOUT
- ⊙ WATER METER
- wv WATER VALVE
- ⊙ FIRE HYDRANT
- ⊙ IRRIGATION CONTROL BOX
- ⊙ ELECTRICAL BOX
- ⊙ POWER METER
- ⊙ ELECTRICAL TRANSFORMER
- ☆ LIGHT POLE
- ⊙ UTILITY POLE
- GUY WIRE
- ⊙ COMMUNICATION RISER
- ⊙ COMMUNICATION BOX
- ⊙ GAS METER
- ⊙ GAS VALVE
- ⊙ SIGN
- ⊙ MAILBOX
- ⊙ GAS LINE MARKER
- ⊙ CONCRETE
- ⊙ GRAVEL
- # DECIDUOUS TREE & TRUNK SIZE
- # EVERGREEN TREE & TRUNK SIZE
- SEWER LINE UNDERGROUND
- STORM LINE UNDERGROUND
- WATERLINE UNDERGROUND
- GAS LINE UNDERGROUND
- COMMUNICATION LINE UNDERGROUND
- ELECTRICAL LINE UNDERGROUND
- OVERHEAD POWER LINE
- FENCE LINE
- AC ASPHALT
- CONC CONCRETE
- E.O.P. EDGE OF PAVEMENT
- HCR HANDICAP RAMP
- FF FINISH FLOOR
- IR IRON ROD
- IP IRON PIPE
- W/YPC WITH YELLOW PLASTIC CAP
- DOC. NO. DOCUMENT NUMBER
- SF SQUARE FEET

**SLOPE/DRAINAGE LEGEND**

- SLOPES ON SITE GREATER THAN 25% (TYPE II)  
AREA=0.25 Ac (40% OF SITE)
- DIRECTION OF DRAINAGE FLOW



VICINITY MAP



**OWNER:** BOLTON COMMONS, LLC  
**KIM WRIGHT**  
**ADDRESS:**  
 1554 GARDEN ST. STE 104  
 WEST LINN, OR 97068

**PROPERTY AREA:**  
 27,571 SQ. FT.  
 (0.63 Ac.)

SITE ANALYSIS TABLE		
POTENTIAL ITEMS	FOUND ON SITE? (Y/N)	
	YES	NO
<b>POTENTIAL NATURAL HAZARD AREAS</b>		
FLOODPLAIN AREAS		X
WATER RESOURCE AREAS		X
LANDSLIDE AREAS	X	
LANDSLIDE VULNERABLE AREAS		X
<b>RESOURCE AREAS</b>	YES	NO
WETLANDS		X
RIPARIAN CORRIDORS		X
STREAMS, INTERMITTENT STREAMS, OR EPHEMERAL STREAMS		X
HABITAT CONSERVATION AREAS		X
LARGE ROCK OUTCROPPINGS		X

NO.	DATE	DESCRIPTION	BY
1			

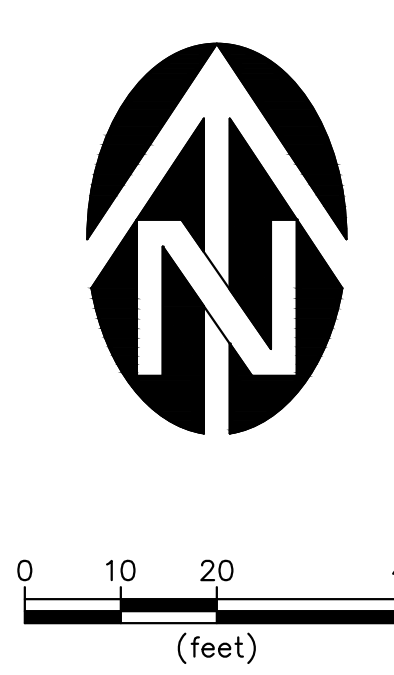
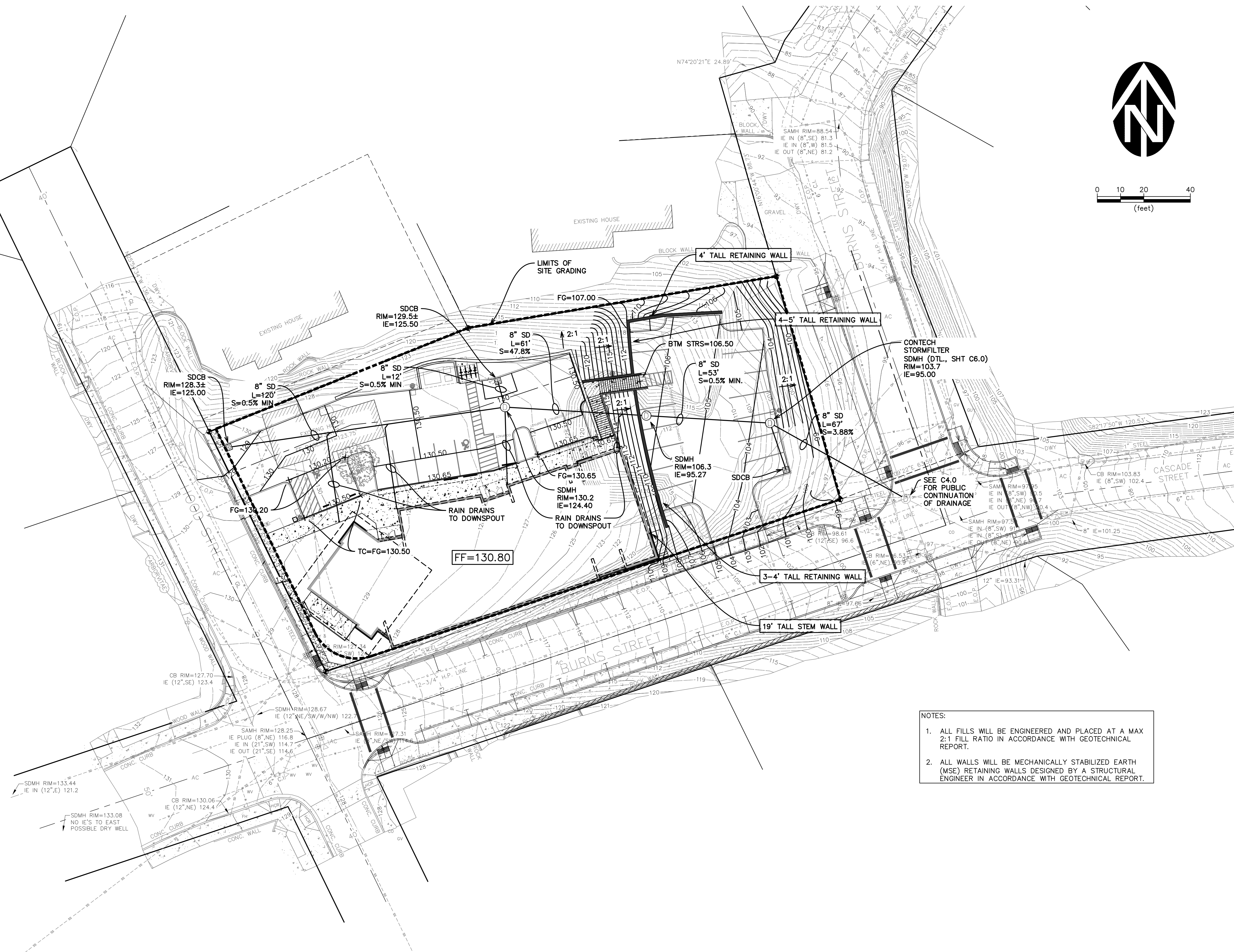
VERIFY SCALE  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
 IF NOT ONE INCH ON SCALES ACCURACIES



**WESTTECH ENGINEERING, INC.**  
 CONSULTING ENGINEERS AND PLANNERS  
 3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 585-2474 Fax: (503) 585-3966  
 E-mail: westtech@westtech-eng.com

LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS  
**SITE ANALYSIS PLAN**  
**DRAWING C1.0**  
 JOB NUMBER  
 3132.0000.0





NOTES:

1. ALL FILLS WILL BE ENGINEERED AND PLACED AT A MAX 2:1 FILL RATIO IN ACCORDANCE WITH GEOTECHNICAL REPORT.
2. ALL WALLS WILL BE MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS DESIGNED BY A STRUCTURAL ENGINEER IN ACCORDANCE WITH GEOTECHNICAL REPORT.

NO.	DATE	DESCRIPTION	BY
1			

VERIFY SCALE  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
 IF NOT ONE INCH ON SCALES ACCURACLY

DSN. JW  
 DRN. RS  
 CKD. JW  
 DATE: 05/20/20

REVIEW  
 WILLIAM J. WELLS  
 REGISTERED PROFESSIONAL ENGINEER  
 OREGON 12/20/08  
 REVIEWS: 6/20/2020

**WE**  
 WESTTECH ENGINEERING, INC.  
 CONSULTING ENGINEERS AND PLANNERS

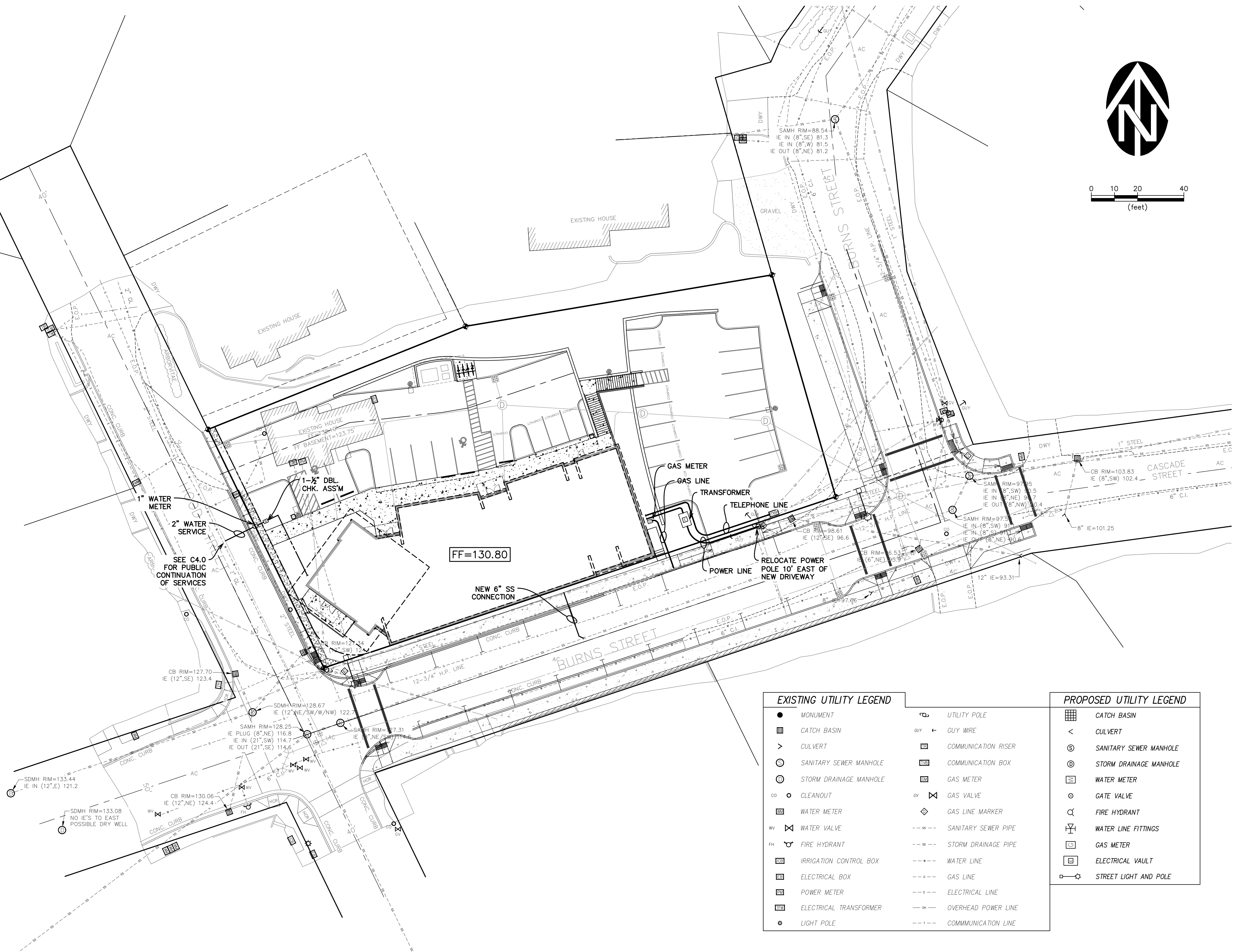
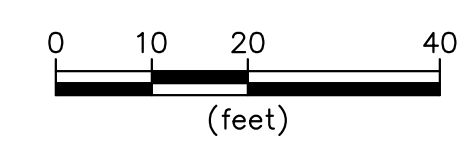
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 565-2474 Fax: (503) 565-3966  
 E-mail: westtech@westtech-eng.com

LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS

**PRELIMINARY GRADING & DRAINAGE PLAN**

DRAWING  
**C2.0**  
 JOB NUMBER  
**3132.0000.0**





**EXISTING UTILITY LEGEND**

- MONUMENT
- CATCH BASIN
- > CULVERT
- ⊙ SANITARY SEWER MANHOLE
- ⊙ STORM DRAINAGE MANHOLE
- ∞ ○ CLEANOUT
- ⊙ WATER METER
- wv ⊗ WATER VALVE
- ⊙ FIRE HYDRANT
- ⊙ IRRIGATION CONTROL BOX
- ⊙ ELECTRICAL BOX
- ⊙ POWER METER
- ⊙ ELECTRICAL TRANSFORMER
- ⊙ LIGHT POLE

- ⊙ UTILITY POLE
- guy ⊕ GUY WIRE
- ⊙ COMMUNICATION RISER
- ⊙ COMMUNICATION BOX
- ⊙ GAS METER
- gv ⊗ GAS VALVE
- ◇ GAS LINE MARKER
- - - - SANITARY SEWER PIPE
- - - - STORM DRAINAGE PIPE
- - - - WATER LINE
- - - - GAS LINE
- - - - ELECTRICAL LINE
- - - - OVERHEAD POWER LINE
- - - - COMMUNICATION LINE

**PROPOSED UTILITY LEGEND**

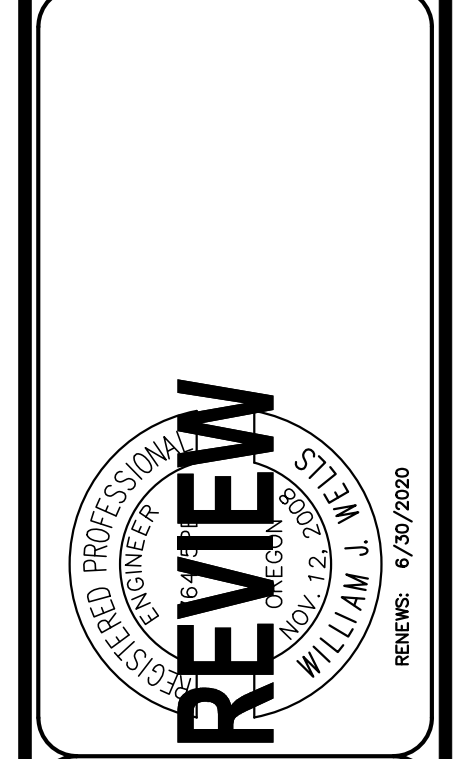
- ⊙ CATCH BASIN
- < CULVERT
- ⊙ SANITARY SEWER MANHOLE
- ⊙ STORM DRAINAGE MANHOLE
- ⊙ WATER METER
- ⊙ GATE VALVE
- ⊙ FIRE HYDRANT
- ⊙ WATER LINE FITTINGS
- ⊙ GAS METER
- ⊙ ELECTRICAL VAULT
- ⊙ STREET LIGHT AND POLE

NO.	DATE	DESCRIPTION	BY
1	05/20/2020		

VERIFY SCALE  
 SHALL BE ONE INCH ON ORIGINAL DRAWING  
 IF NOT ONE INCH ON SCALES ACCORDINGLY

0 1" 0

DSN. JW  
 DRN. RS  
 CKD. JW  
 DATE: 05/20/2020



**WESTTECH ENGINEERING, INC.**  
 CONSULTING ENGINEERS AND PLANNERS

3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 585-2474 Fax: (503) 585-3966  
 E-mail: westtech@westtech-eng.com

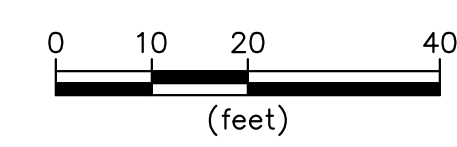
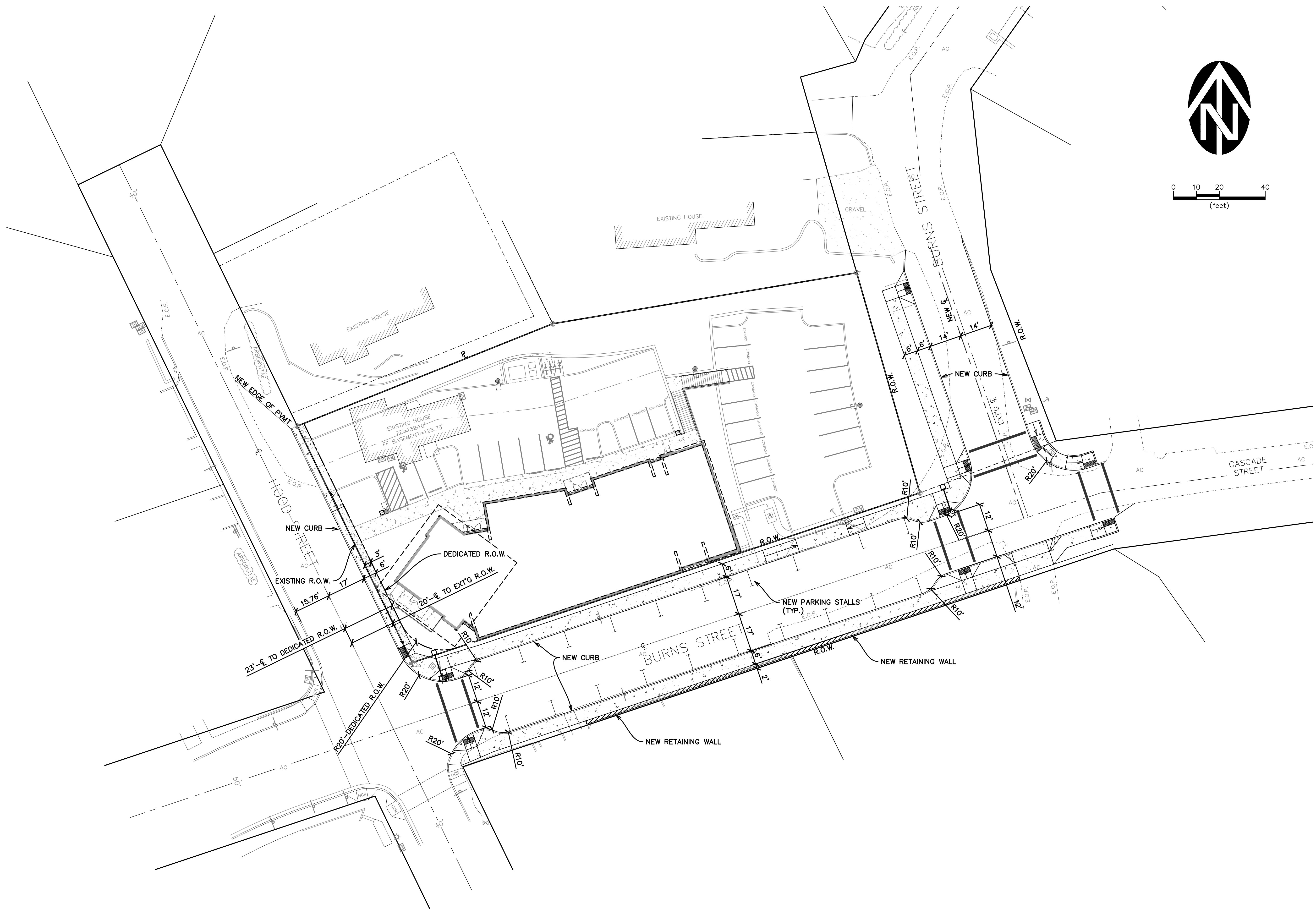
LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS

**UTILITY PLAN**

DRAWING  
**C3.0**  
 JOB NUMBER  
 3132.0000.0







NO.	DATE	DESCRIPTION	BY
1			

VERIFY SCALE  
 BASIS ONE INCH ON  
 ORIGINAL DRAWING  
 IF NOT ONE INCH ON  
 SCALES ACCORDINGLY

0 1" 0

DSN. JW  
 DRN. RS  
 CKD. JW  
 DATE: 05/20/20

**REVIEW**  
 REGISTERED PROFESSIONAL ENGINEER  
 WILLIAM J. WELLS  
 REG. NO. 12,345  
 REVIEWS: 6/30/2020

**WE**  
 WESTTECH ENGINEERING, INC.  
 CONSULTING ENGINEERS AND PLANNERS  
 3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 585-2474 Fax: (503) 585-3966  
 E-mail: westtech@westtech-eng.com

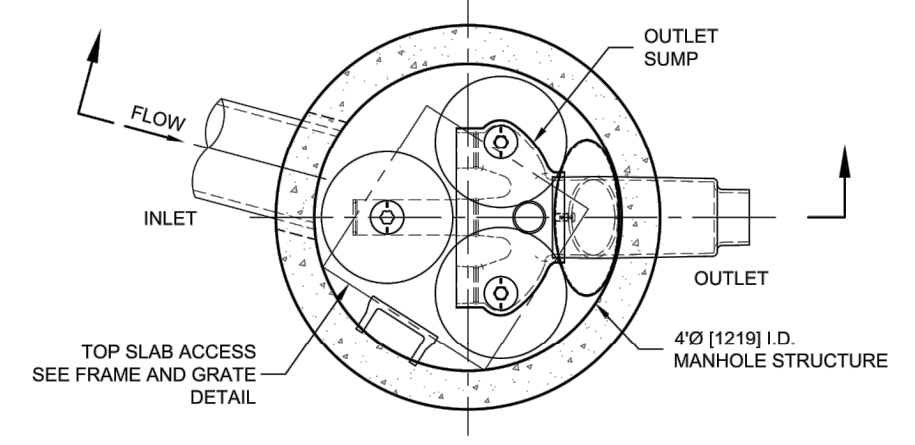
LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS

**PRELIMINARY STREET PLAN**

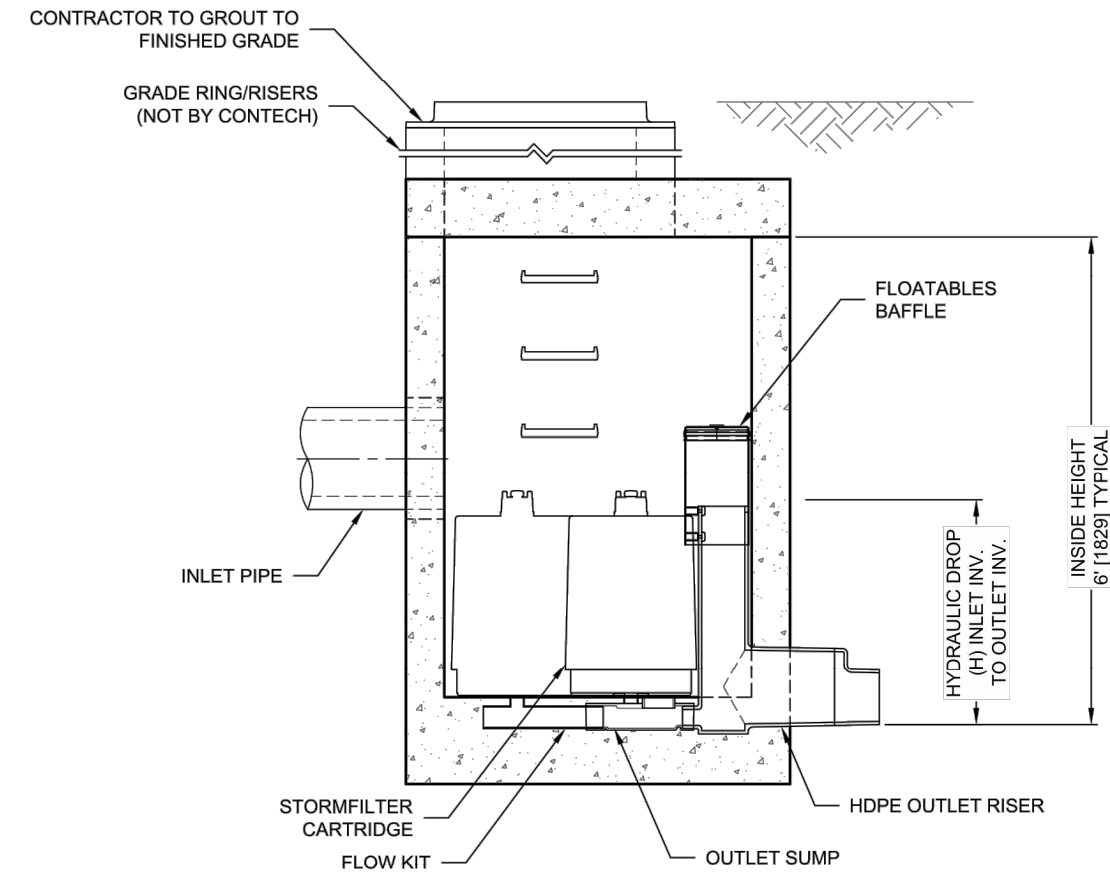
DRAWING  
**C5.0**  
 JOB NUMBER  
 3132.0000.0



C:\Users\lypho\Desktop\_VB Projects\Belton Terrace 3132.0000\0\Civil\Plots\Civil\_DTL\_S.dwg 5/12/2020 10:50 AM



**PLAN VIEW**  
 STANDARD OUTLET RISER  
 FLOWKIT: 40A



**ELEVATION SECTION A-A**

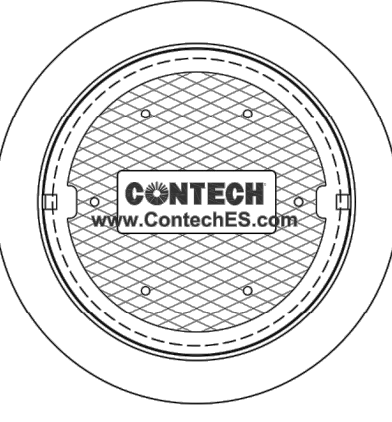


**STORMFILTER DESIGN NOTES**

- STORMFILTER TREATMENT CAPACITY VARIES BY CARTRIDGE COUNT AND LOCALLY APPROVED SURFACE AREA SPECIFIC FLOW RATE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD
- A STANDARD 4'0" (1219) MANHOLE STYLE STORMFILTER IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (3)
- A VOLUME SYSTEM IS ALSO AVAILABLE WITH 3 CARTRIDGES, MAXIMUM
- ALL PARTS AND INTERNAL ASSEMBLY PROVIDED BY CONTECH UNLESS OTHERWISE NOTED

CARTRIDGE SIZE (in. [mm])	27 [686]		
RECOMMENDED MINIMUM HYDRAULIC DROP (H) (ft. [mm])	3.05 [930]		
SPECIFIC FLOW RATE (gpm/sf [L/s/m <sup>2</sup> ])	2 [1.38]	1.67* [1.13]*	1 [0.68]
CARTRIDGE FLOW RATE (gpm [L/s])	22.5 [1.42]	18.78 [1.19]	11.25 [0.71]

\* 1.67 gpm/sf [1.13 L/s/m<sup>2</sup>] SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY



**FRAME AND COVER**  
 (DIAMETER VARIES)  
 NOT TO SCALE

- GENERAL NOTES**
- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
  - DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
  - FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
  - STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
  - STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2' (610) AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M318 AND BE CAST WITH THE CONTECH LOGO.
  - FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF-CLEANING. RADIAL MEDIA DEPTH SHALL BE 7" (178). FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
  - SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) [L/s] DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft) [m<sup>2</sup>].
  - STORMFILTER STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
  - ALTERNATE UNITS ARE IN MILLIMETERS [mm], UNLESS NOTED OTHERWISE.

- INSTALLATION NOTES**
- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
  - CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE.
  - CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
  - CONTRACTOR TO PROVIDE, INSTALL AND GROUT INLET PIPE(S).
  - CONTRACTOR TO PROVIDE AND INSTALL CONNECTOR TO THE OUTLET RISER STUB. STORMFILTER EQUIPPED WITH A DUAL DIAMETER HDPE OUTLET STUB AND SAND COLLAR. IF OUTLET PIPE IS LARGER THAN 8" (200), CONTRACTOR TO REMOVE THE 8" (200) OUTLET STUB AT MOLDED-IN OUT LINE. COUPLING BY FERROCO OR EQUAL AND PROVIDED BY CONTRACTOR.
  - CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

**SITE SPECIFIC DATA REQUIREMENTS**

STRUCTURE ID	
WATER QUALITY FLOW RATE (cfs [L/s])	0.14 CFS
PEAK FLOW RATE (cfs [L/s])	0.53 CFS
RETURN PERIOD OF PEAK FLOW (yrs)	100 YRS
CARTRIDGE SIZE (SEE TABLE ABOVE)	27"
CARTRIDGE FLOW RATE	0.501 CFS
MEDIA TYPE (PERLITE, ZPG, PSORB)	
NUMBER OF CARTRIDGES REQUIRED	3
PIPE DATA:	
INLET PIPE 1	
INLET PIPE 2	
OUTLET PIPE	
NOTES/SPECIAL REQUIREMENTS:	

**CONTECH**  
 ENGINEERED SOLUTIONS LLC  
 www.contechES.com  
 8301 State Highway 29 North, Alexandria, MN 56308  
 800-328-2047 320-852-7500 320-852-7067 FAX

SFMH48  
 STORMFILTER  
 STANDARD DETAIL

NO.	DATE	DESCRIPTION	BY
1	05/20/20		

VERIFY SCALE  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
 IF NOT ONE INCH ON SCALES ACCURACLY

0 1"

DSN. JW  
 DRN. RS  
 CKD. JW  
 DATE: 05/20/20

REVIEW  
 WILLIAM J. WELLS  
 REGISTERED PROFESSIONAL ENGINEER  
 OREGON REG. 12, 30585  
 6/30/2020

**WE**  
 WESTTECH ENGINEERING, INC.  
 CONSULTING ENGINEERS AND PLANNERS

3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 585-2474 Fax: (503) 585-3966  
 E-mail: westtech@westtech-eng.com

LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS  
 CIVIL DETAILS

DRAWING  
 C6.0  
 JOB NUMBER  
 3132.0000.0







# 1575 Burns Street

Design Review Submittal

2/18/2020

**SHAREHOLDERS**

**Daniel Roach**  
Architect  
**Marcus Hite**  
Architect  
**Kristin Newland**

**BOARD OF DIRECTORS**

**Daniel Roach**  
Architect / President  
**Marcus Hite**  
Architect / Vice President  
**Aaron Clark**  
Architect  
**Lee Gwyn**  
Architect  
**Stephen Hockman**  
Architect  
**Robert J. Hazleton, Jr.**  
Engineer  
**Brian Lind**  
Landscape Architect

Sam Thomas  
LENITY ARCHITECTURE, INC.

## 1575 BURNS STREET DENTAL/PHYSICAL THERAPY CLINIC

### WRITTEN STATEMENT & RESPONSE TO APPLICABLE REVIEW AND DECISION CRITERIA

**Project Description:** The proposed project would demolish an existing single-family dwelling in order to construct a new medical office that would house a dental clinic and physical therapy clinic. The proposed building would contain approximately 6,922 square feet. The subject property is located at northeast corner of Hood Street and Burns Street. The subject property is currently zoned Office-Business Center (OBC). The proposed use is outright permitted. The subject site is approximately 0.63-acre in size.

#### Applicable Review and Decision Criteria

#### West Linn Community Development Code – Chapters 21, 46, 48, 54, 55, and 92.

##### 21.030 PERMITTED USES

8. Medical and dental services.

**Applicant Response:** The proposed uses, a dental clinic and physical therapy clinic, are listed as outright permitted uses according to West Linn Community Development Code (CDC) Section 21.030(8).

#### 21.070 DIMENSIONAL REQUIREMENTS, USES PERMITTED OUTRIGHT AND USES PERMITTED UNDER PRESCRIBED CONDITIONS

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

1. The minimum front lot line length or the minimum lot width at the front lot line shall be 35 feet.
2. The average minimum lot width shall be 35 feet.
3. Repealed by Ord. 1622.
4. The yard dimensions or building setback area from the lot line shall be:
  - a. Interior side yard, a minimum of seven and one-half feet.
  - b. Side yard abutting a street, no minimum.
  - c. Rear yard, a minimum of 25 feet.
  - d. Front yard, no minimum and a 20-foot maximum. The front setback area between the street and the building line shall consist of landscaping or a combination of non-vehicular hardscape areas (covered with impervious surfaces) and landscaped areas. If there are not street trees within the public right-of-way, the front setback area shall include such trees per the requirements of the City Arborist.

5. The maximum lot coverage shall be 50 percent.
  6. The maximum building height shall be two and one-half stories or 35 feet for any structure located within 50 feet of a low or medium density residential zone and three and one-half stories or 45 feet for any structure located 50 feet or more from a low or medium density residential area.
- B. The requirements of subsections (A)(1) through (4) of this section may be modified for developments under the planned unit development provisions of Chapter 24 CDC. (Ord. 1425, 1998; Ord. 1622 § 24, 2014)

**Applicant Response: The current and proposed continued lot configuration will include an approximately 130-foot front lot width, which exceeds the minimum lot width of 35 feet. The interior side yard will be approximately 8 feet. The subject property has two side yards, each abutting a street and no rear yard. The front yard is 4 feet wide at the narrowest point. The front yard area will be landscaped. The proposed lot coverage is approximately 25.4% of the total lot area.**

**The height of the proposed building ranges from 25 feet, 4 inches to approximately 39 feet due to the topography of the site. The proposed building will be a story building with a large building wall on the downslope (east) side. The maximum proposed building height is approximately 39 feet at the highest point along the and the structure is more than 50 feet from a low or medium density zone.**

### **Chapter 38**

#### **ADDITIONAL YARD AREA REQUIRED; EXCEPTIONS TO YARD REQUIREMENTS; STORAGE IN YARDS; PROJECTIONS INTO YARDS**

##### **38.020 NO YARD REQUIRED; STRUCTURE NOT ON PROPERTY LINE**

In zones where a side yard or a rear yard setback is not required, a structure which is not to be built on the property line shall be set back from the property line by at least three feet, except as prescribed in CDC 58.090(C)(1). (Ord. 1675 § 36, 2018)

**Applicant Response: The proposed building will be placed at the property line adjacent to Burns Street, which is a street-abutting side yard. The front yard, interior side yard, and rear yard will be a minimum of 3 feet in width.**

##### **38.030 SETBACK FROM STREET CENTERLINE REQUIRED**

A. To assure improved light, air, and sight distance and to protect the public health, safety and welfare, a setback in addition to the yard requirements of the zone may be required where the right-of-way is inadequate. A determination shall be made based on the street standards contained in CDC 85.200(A).

**Applicant Response: The proposed property setback and ultimate right-of-way was developed through preliminary communication with Public Works Staff, which includes provisions for street widening, on-street parking, and sidewalk improvements.**



B. The minimum yard requirement shall be increased to provide for street widening in the event a yard abuts a street having a right-of-way width less than required by its functional classification on the City's Comprehensive Plan Map, and in such case the setback shall be not less than the setback required by the zone plus one-half of the projected road width as required under CDC 85.200(A); however

C. The minimum distance from the wall of any structure to the centerline of an abutting street shall not be less than 25 feet plus the yard required by the zone. This provision shall not apply to rights-of-way of 50 feet or greater in width.

**Applicant Response: The minimum distance between the proposed structure and the centerlines of Hood Street and Burns Street is at least 25 feet plus the yard required by the OBC zone.**

#### 38.050 STORAGE IN FRONT YARD

Boats, trailers, campers, camper bodies, house trailers, recreation vehicles or commercial vehicles in excess of three-quarter-ton capacity shall not be stored in a required front yard in a residential zone if the location creates an obstruction to the vision of passing motorists which constitutes a potential traffic hazard.

**Applicant Response: The proposed development does not include any proposed storage of boats, trailers, campers, camper bodies, house trailers, recreation vehicles or commercial vehicles in the front yard.**

#### 38.060 PROJECTIONS INTO REQUIRED YARDS

A. Repealed by Ord. 1635.

B. Cornices, eaves, belt courses, sills, canopies, or similar architectural features may extend or project into a required yard not more than 36 inches provided the width of such side yard is not reduced to less than three feet. Projections into the side yard may not include living space such as bay windows or overhanging breakfast nooks, etc.

**Applicant Response: There will be no architectural features that project into required minimum side yards.**

C. Projections that include living space such as bay windows or overhanging breakfast nooks, etc., may extend into the front or rear yard setbacks, but no more than two feet. The footprint or foundation of the house may not encroach into the front or rear setback area.

**Applicant Response: There are no bay windows or breakfast nooks proposed for this development.**

D. Fireplace chimneys may project into a required front, side or rear yard not more than three feet, provided the width of such side yard is not reduced to less than three feet.

**Applicant Response: There are no fireplace chimneys proposed for this development.**

E. The presence of an easement within a required yard is a limitation to projections. Uncovered open porches, decks, or balconies, not more than 30 inches in height above grade and not covered by a roof or canopy, may extend or project into a required front or rear yard until the projection

reaches a utility easement or comes within five feet of the property line, whichever provides a greater distance from the property line. The uncovered deck, porch or balcony may go into side yard setback leaving at least three feet to the property line. Encroachment into a utility easement is not allowed, except as provided below:

1. Uncovered open porches, decks, or balconies may extend into an existing utility easement, provided:
  - a. A minimum vertical clearance of 12 feet is maintained between the lowest point of the deck and the ground; and
  - b. That no posts are installed within the easement.
2. These provisions do not apply in the Willamette Historic District.

**Applicant Response: To the best of our knowledge, there are no easements that encumber the proposed development site and the subject property is not located within the Willamette Historic District.**

F. Front and rear porches, covered porches, unroofed landings and stairs (over 30 inches in height) may encroach into the front or rear yard setback up to five feet. Homes on corner lots may have a front porch that wraps around to the side street side. The porch on the side street may also encroach five feet into the required street side setback area. Enclosed porches are not permitted to encroach. The roofline of the house may be extended to cover the porch but no living space shall be allowed inside the front yard setback (i.e., dormers). The Planning Director shall determine compliance with this section as provided by CDC 99.060(A)(3). These provisions do not apply in the Willamette Historic District. (Ord. 1291, 1990; Ord. 1308, 1991; Ord. 1401, 1997; Ord. 1635 § 22, 2014)

**Applicant Response:**

#### 41.005 DETERMINING HEIGHT OF BUILDING

A. For all zoning districts, building height shall be the vertical distance above a reference datum measured to the highest point of a flat roof or to the deck line of a mansard roof or to the highest gable, ridgeline or peak of a pitched or hipped roof, not including projections above roofs such as cupolas, towers, etc. The reference datum shall be selected by either of the following, whichever yields a greater height of building.

1. For relatively flat sites where there is less than a 10-foot difference in grade between the front and rear of the building, the height of the building shall be measured from grade five feet out from the exterior wall at the front of the building; or
2. For steeper lots where there is more than a 10-foot difference in grade between the front and rear of the building, the height of the building is measured from grade at a point five feet out from the exterior wall on the lowest side (front or rear) of the building. One then measures vertically to the peak or ridgeline of the roof to determine the height.

**Applicant Response: The subject property is a relatively steep lot. There is a difference of 30 feet from the highest point along Hood Street (130 feet) to the lowest point of the site along Burns Street. The total building height using the method in 41.005 (A)(2) would be 39 feet.**

3. Buildings on cross slopes or side slopes are measured at either the front or rear of the building using methods described in subsections (A)(1) and (2) of this definition only.

Even if the cross slope creates a tall elevation on the side, the method of determining height is not modified.

Also see CDC 41.020, Height Exceptions.

Figure 1.

Height of building on relatively flat lot is measured from grade at front of house to peak of roof.

Height of building on steep lots where there is more than a 10-foot difference in elevation between the front and rear of the building is measured from grade at a point five feet out from the front or rear exterior wall on the lowest side of the house to the peak of the building.

Height of building with a cross slope is still measured at either the front or rear by methods described in subsection (A)(1) or (2) of this definition.

(Ord. 1604 § 42, 2011)

#### **41.010 FRONT YARD SETBACK EXCEPTION**

If the average slope of a building site is 25 percent or greater, as measured along the planes of the proposed structure, the minimum front yard setback for the garage shall be three feet. All structures other than the garage shall meet the setback requirement of the underlying zone, or as otherwise specified in this code.

When a garage is situated less than 20 feet from the front property line or less than 15 feet from a side property line facing a street, the following siting conditions shall apply:

A. Where lot width allows, the garage shall be set parallel to the street (i.e., the garage doors shall be perpendicularly oriented to the street), and at least two off-street parking spaces shall be provided as specified in Chapter 46 CDC (i.e., paved).

B. If the lot width prohibits the parallel siting required above, the garage may be sited perpendicular to the street (i.e., the garage door or doors facing directly onto the street), provided, in addition to the sheltered parking spaces, two off-street parking spaces are provided on site. (Ord. 1226, 1988; Ord. 1276, 1990)

#### **41.020 HEIGHT EXCEPTIONS**

A. If the highest grade of a building site which fronts on the downslope side of the street is greater than 10 feet above the lowest grade as measured along the planes of the proposed structure, the total building height may not exceed 45 feet as measured from the lowest grade at a point five feet downhill from the rear of the building, provided the building height does not

project more than 24 feet above the average grade of the street. In the R-15, R-20, and R-40 zones the 45-foot height may be increased to 50 feet.

B. If the highest grade of a building site which fronts on the upslope side of the street is greater than 10 feet above the lowest grade, as measured along the planes of the proposed structure, the total building height shall not exceed 45 feet. In the R-15, R-20, and R-40 zones the 45-foot height may be increased to 50 feet.

Height of buildings on uphill slopes where there is more than a 10-foot difference between the rear and front elevation is measured from a point five feet downhill from the front of the building to the peak or dominant ridgeline and shall not exceed 45 feet (50 feet in the R-15, R-20 and R-40 zones).

Figure 2. Height exceptions

Height of buildings on downhill slopes where there is more than a 10-foot difference between the rear and front elevation is measured from a point five feet downhill from the rear of the building to the peak or dominant ridgeline and shall not exceed 45 feet (50 feet in the R-15, R-20 and R-40 zones). Front house height cannot be more than 24 feet above average street grade. (Ord. 1276, 1990; Ord. 1308, 1991; Ord. 1538, 2006; Ord. 1604 § 43, 2011)

**Applicant Response: The proposed building will not exceed 45 feet in height.**

#### 41.030 PROJECTIONS NOT USED FOR HUMAN HABITATION

Projections such as chimneys, spires, domes, elevator shaft housings, towers, aerials, flag poles, and other similar objects not used for human occupancy are not subject to the building height limitations of this code. (Ord. 1604 § 44, 2011)

**Applicant Response: There are no projections on the proposed building above the roof height.**

#### 42.020 CLEAR VISION AREAS REQUIRED, USES PROHIBITED

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

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

**Applicant Response: The subject site design includes a clear vision area at the corner of Burns Street and Hood Street that is 30 feet by 30 feet.**

#### 42.030 EXCEPTIONS

The following described area in Willamette shall be exempt from the provisions of this chapter. The units of land zoned General Commercial which abut Willamette Falls Drive, located between 10th and 16th Streets. Beginning at the intersection of Willamette Falls Drive and 11th Street on 7th Avenue to 16th Street; on 16th Street to 9th Avenue; on 9th Avenue to 14th Street to the Tualatin River; following the Tualatin River and Willamette River to 12th Street; on 12th Street to

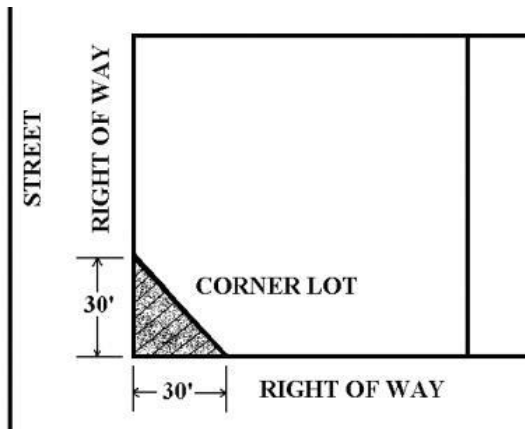
4th Avenue; on 4th Avenue to 11th Street; on 11th Street to Willamette Falls Drive. This described area does not include the northerly side of Willamette Falls Drive. (Ord. 1636 § 29, 2014)

**Applicant Response: The subject property is not located within the area described in the criterion above.**

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

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

Clear vision area for corner lots and driveways 24 feet or more in width:



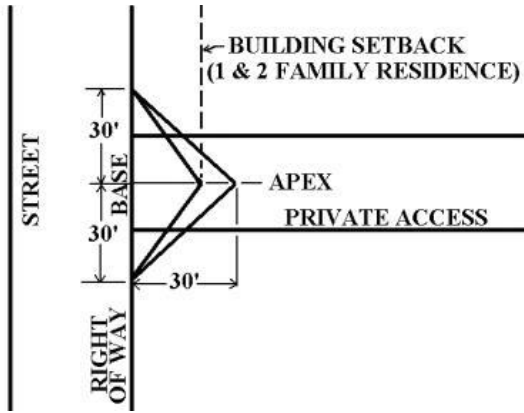
**Applicant Response: The subject site includes two private driveways to access the off-street parking areas on Hood Street and Burns Street. The driveway intersection with Hood Street is approximately 27 feet in width and will include clear vision areas that meet the 30 feet by 30 feet triangle requirement.**

**42.050 COMPUTATION; ACCESSWAY LESS THAN 24 FEET IN WIDTH**

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

Clear vision area for corner lots and driveways less than 24 feet in width:





**Applicant Response: The Burns Street driveway intersection is approximately 23 feet in width and will include clear vision areas that meet the 30 feet by 30 feet triangle from the centerline of the driveway.**

**CHAPTER 46  
OFF-STREET PARKING, LOADING AND RESERVOIR AREAS**

**46.060 STORAGE IN PARKING AND LOADING AREAS PROHIBITED**

Required parking spaces shall be available for the parking of passenger automobiles of residents, customers, patrons and employees only, and the required parking spaces shall not be used for storage of vehicles or materials or for the parking of trucks connected with the business or use with the exception of small (under one-ton) delivery trucks or cars.

**Applicant Response: The subject site parking area will not be used for storage of vehicles, materials, or large trucks.**

**46.070 MAXIMUM DISTANCE ALLOWED BETWEEN PARKING AREA AND USE**

A. Off-street parking spaces for single- and two-family dwellings shall be located on the same lot with the dwelling.

B. Off-street parking spaces for uses not listed in subsection A of this section shall be located not farther than 200 feet from an entryway to the building or use they are required to serve, measured in a straight line from the building, with the following exceptions:

1. Shared parking areas for commercial uses which require more than 40 parking spaces may provide for the spaces in excess of the required 40 spaces up to a distance of 300 feet from the entryway to the commercial building or use.
2. Industrial and manufacturing uses which require in excess of 40 spaces may locate the required spaces in excess of the 40 spaces up to a distance of 300 feet from the entryway to the building.
3. Employee parking areas for carpools and vanpools shall be located closer to the entryway to the building than general employee parking.
4. Stacked or valet parking is allowed if an attendant is present to move vehicles. If stacked parking is used for required parking spaces, the applicant shall ensure that an attendant will always be present when the lot is in operation. The requirements for minimum or maximum spaces and all parking area development standards continue to apply for stacked parking.
5. All disabled parking shall be placed closest to building entrances than all other parking. Appropriate ADA curb cuts and ramps to go from the parking lot to the ADA-accessible entrance shall be provided unless exempted by ADA code. (Ord. 1547, 2007)

**Applicant Response: The proposed off-street parking area consists of 26 auto parking stalls. Two ADA stalls are proposed, one near each main entrance. There are no industrial or manufacturing uses proposed. Carpool/vanpool? There are no proposed stacked or valet parking proposed. The two proposed ADA parking spaces are proposed to be as close to the building entrances as possible. ADA curb cuts and ramps will lead from the parking area to building entrances.**

#### 64.080 COMPUTATION OF REQUIRED PARKING SPACES AND LOADING AREA

- A. Where several uses occupy a single structure or unit of land, a combination of uses is included in one business, or a combination of uses in the same or separate buildings share a common parking area as in the case of a shopping center, the total off-street parking spaces and loading area shall be the sum of the requirements of the several uses, computed separately. For example, parking for an auto sales and repair business would be calculated using the “retail-bulky” calculation for the sales area and the “service and repair” calculation for the repair area. In another example, parking for a shopping center with a grocery store, a restaurant, and a medical office would be calculated using the “general retail store” calculation for the grocery store, the “restaurant” calculation for the restaurant, and the “medical/dental clinics” calculation for the medical office. The total number of required parking spaces may be reduced by up to 10 percent to account for cross-patronage (when a customer visits several commercial establishments during one visit to the commercial center) of adjacent businesses or services in a commercial center with five or more separate commercial establishments.
- B. To calculate building square footage as a basis for determining how many parking spaces are needed, the area measured shall be gross floor area under the roof measured from the faces of the structure, including all habitable floors and excluding only space devoted to covered off-street parking or loading.
- C. Where employees are specified, the employees counted are the persons who work on the premises including proprietors, executives, professional people, production, sales, and distribution employees, during the largest shift.
- D. Fractional space requirements shall be counted as a whole space.
- E. On-street parking along the immediate property frontage(s) may be counted toward the minimum parking requirement with approval from the City Engineer.
- F. When an office or commercial development is proposed which has yet to identify its tenants, the parking requirement shall be based upon the “office” or “general retail” categories, respectively.
- G. As permitted uses are replaced with new permitted uses within an existing commercial or business center, modification of the number of parking spaces relative to the new mix of uses is not required unless other modifications of the site which require design review approval pursuant to Chapter 55 CDC are proposed. (Ord. 1463, 2000; Ord. 1622 § 25, 2014; Ord. 1636 § 31, 2014)

**Applicant Response: The proposed uses on the property, dental and physical therapy clinic most closely fall under the parking category of “medical/dental clinics/day surgery” which requires one vehicle space for every 250 square feet of gross floor area. The proposed building would contain 6,922 square feet of gross floor area. Therefore, a minimum of 27.688 or 28 parking spaces. A reduction of 10% of the parking spaces is requested due to the proximity of transit which would then include a requirement of 25 parking spaces. The proposed development would provide 26 parking spaces, therefore exceeding the minimum parking requirement by 1 space.**

F. Maximum parking. Parking spaces (except for single-family and two-family residential uses) shall not exceed the minimum required number of spaces by more than 10 percent.

**Applicant Response: The proposed parking spaces exceed the minimum parking requirement but do not exceed more than 10% of the minimum.**

G. Parking reductions. An applicant may reduce parking up to 10 percent for development sites within one-quarter mile of a transit corridor or within a mixed-use commercial area, and up to 10 percent for commercial development sites adjacent to multi-family residential sites with the potential to accommodate more than 20 dwelling units.

**Applicant Response: The subject property is located within one-quarter mile of Willamette Drive which is a major transit corridor. The applicant is requesting a 10 percent reduction in the required number of parking spaces from 28 to 26.**

H. For office, industrial, and public uses where there are more than 20 parking spaces for employees on the site, at least 10 percent of the required employee parking spaces shall be reserved for carpool use before 9:00 a.m. on weekdays. The spaces will be the closest to the building entrance, except for any disabled parking and those signed for exclusive customer use. The carpool/vanpool spaces shall be clearly marked "Reserved – Carpool/Vanpool Before 9:00 a.m."

**Applicant Response: The subject property includes parking for a maximum of 26 vehicles, including two (2) ADA spaces.**

I. Existing developments along transit streets or near transit stops may redevelop up to 10 percent of the existing parking spaces to provide transit-oriented facilities, including bus pullouts, bus stops and shelters, park and ride stations, and other similar facilities.

**Applicant Response: The subject property is not located along a transit street and does not include existing parking spaces, therefore the criterion above does not apply.**

J. Development in water resource areas may reduce the required number of parking spaces by up to 25 percent. Adjacent improved street frontage with curb and sidewalk may also be counted towards the parking requirement at a rate of one parking space per 20 lineal feet of street frontage adjacent to the property. (Ord. 1291, 1990; Ord. 1391, 1996; Ord. 1408, 1998; Ord. 1425, 1998; Ord. 1463, 2000; Ord. 1499, 2003; Ord. 1547, 2007; Ord. 1622 § 25, 2014; Ord. 1623 § 4, 2014; Ord. 1650 § 1 (Exh. A), 2016; Ord. 1675 § 38, 2018)

**Applicant Response: Based on a review of the MapOptix GIS, the subject property is not located within a water resource area.**

## **Chapter 54 LANDSCAPING**

### **54.020 APPROVAL CRITERIA**

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

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

**Applicant Response: No trees are proposed to be preserved on the site due to the extent of development on site.**

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

**Applicant Response: The developer will comply with the municipal code chapter on tree protection.**

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

**Applicant Response: To the best of our knowledge, there are no listed heritage trees that exist on the subject property.**

E. Landscaping – By type, location and amount.

1. Residential uses (non-single-family). A minimum of 25 percent of the gross area including parking, loading and service areas shall be landscaped, and may include the open space and recreation area requirements under CDC 55.100. Parking lot landscaping may be counted in the percentage.

2. Non-residential uses. A minimum of 20 percent of the gross site area shall be landscaped. Parking lot landscaping may be counted in the percentage.

**Applicant Response: The site landscaping of the gross site area is 28% which exceeds the minimum of 20%.**

3. All uses (residential uses (non-single-family) and non-residential uses):



- a. The landscaping shall be located in defined landscaped areas which are uniformly distributed throughout the parking or loading area. There shall be one shade tree planted for every eight parking spaces. These trees shall be evenly distributed throughout the parking lot to provide shade. Parking lots with over 20 spaces shall have a minimum 10 percent of the interior of the parking lot devoted to landscaping. Pedestrian walkways in the landscaped areas are not to be counted in the percentage. The perimeter landscaping, explained in subsection (E)(3)(d) of this section, shall not be included in the 10 percent figure. Parking lots with 10 to 20 spaces shall have a minimum five percent of the interior of the parking lot devoted to landscaping. The perimeter landscaping, as explained above, shall not be included in the five percent. Parking lots with fewer than 10 spaces shall have the standard perimeter landscaping and at least two shade trees. Non-residential parking areas paved with a permeable parking surface may reduce the required minimum interior landscaping by one-third for the area with the permeable parking surface only.

**Applicant Response: The parking area includes a 3% landscaping area.**

- b. The landscaped areas shall not have a width of less than five feet.

**Applicant Response: No proposed landscape area has a width of less than 5 feet.**

- c. The soils, site, proposed soil amendments, and proposed irrigation system shall be appropriate for the healthy and long-term maintenance of the proposed plant species.
- d. A parking, loading, or service area which abuts a street shall be set back from the right-of-way line by perimeter landscaping in the form of a landscaped strip at least 10 feet in width. When a parking, loading, or service area or driveway is contiguous to an adjoining lot or parcel, there shall be an intervening five-foot-wide landscape strip. The landscaped area shall contain:
  - 1) Street trees spaced as appropriate to the species, not to exceed 50 feet apart on the average;
  - 2) Shrubs, not to reach a height greater than three feet, six inches, spaced no more than five feet apart on the average; or
  - 3) Vegetative ground cover such as grass, wildflowers, or other landscape material to cover 100 percent of the exposed ground within two growing seasons. No bark mulch shall be allowed except under the canopy of low level shrubs.
- e. If over 50 percent of the lineal frontage of the main street or arterial adjacent to the development site comprises parking lot, the landscape strip between the right-of-way and parking lot shall be increased to 15 feet in width and shall include terrain variations (e.g., one-foot-high berm) plus landscaping. This extra requirement only applies to one street frontage.
- f. A parking, loading, or service area which abuts a property line shall be separated from the property line by a landscaped area at least five feet in width and which shall act as a screen and noise buffer, and the adequacy of the screen and buffer shall be determined by the criteria set forth in CDC 55.100(C) and (D), except where shared parking is approved under CDC 46.050.

- g. All areas in a parking lot not used for parking, maneuvering, or circulation shall be landscaped.
- h. The landscaping in parking areas shall not obstruct lines of sight for safe traffic operation.
- i. Outdoor storage areas, service areas (loading docks, refuse deposits, and delivery areas), and above-ground utility facilities shall be buffered and screened to obscure their view from adjoining properties and to reduce noise levels to acceptable levels at the property line. The adequacy of the buffer and screening shall be determined by the criteria set forth in CDC 55.100(C)(1).
- j. Crime prevention shall be considered and plant materials shall not be located in a manner which prohibits surveillance of public and semi-public areas (shared or common areas).
- k. Irrigation facilities shall be located so that landscaped areas can be properly maintained and so that the facilities do not interfere with vehicular or pedestrian circulation.
- l. For commercial, office, multi-family, and other sites, the developer shall select trees that possess the following characteristics:
  - 1) Provide generous “spreading” canopy for shade.
  - 2) Roots do not break up adjacent paving.
  - 3) Tree canopy spread starts at least six feet up from grade in, or adjacent to, parking lots, roads, or sidewalks unless the tree is columnar in nature.
  - 4) No sticky leaves or sap-dripping trees (no honey-dew excretion).
  - 5) No seed pods or fruit-bearing trees (flowering trees are acceptable).
  - 6) Disease-resistant.
  - 7) Compatible with planter size.
  - 8) Drought-tolerant unless irrigation is provided.
  - 9) Attractive foliage or form all seasons.
- m. Plant materials (shrubs, ground cover, etc.) shall be selected for their appropriateness to the site, drought tolerance, year-round greenery and coverage, staggered flowering periods, and avoidance of nuisance plants (Scotch broom, etc.).

**Applicant Response: A selection of native plants have been proposed. See Sheet L1.1 for specific details on the trees, shrubs, grasses/perennials, and ground cover proposed.**

## Chapter 55 – Design Review

### 55.100 APPROVAL STANDARDS – CLASS II DESIGN REVIEW

The approval authority shall make findings with respect to the following criteria when approving, approving with conditions, or denying a Class II design review application:

A. The provisions of the following chapters shall be met:

1. Chapter 34 CDC, Accessory Structures, Accessory Dwelling Units, and Accessory Uses.

**Applicant Response: With the exception of the trash enclosure, which is addressed in more detail below, there are no proposed accessory structures, accessory dwelling units, or accessory uses proposed on site.**

2. Chapter 38 CDC, Additional Yard Area Required; Exceptions to Yard Requirements; Storage in Yards; Projections into Yards.

**Applicant Response: Yard area requirements are addressed in the responses to the standards in Chapter 38 above.**

3. Chapter 41 CDC, Building Height, Structures on Steep Lots, Exceptions.

**Applicant Response: Responses to Building Height, Structures on Steep Lots, Exceptions of Chapter 41 CDC are addressed above.**

4. Chapter 42 CDC, Clear Vision Areas.

**Applicant Response: Responses to Clear Vision Areas of Chapter 42 CDC are addressed above.**

5. Chapter 44 CDC, Fences.

**Applicant Response: The proposed project does not include new fencing on the site**

6. Chapter 46 CDC, Off-Street Parking, Loading and Reservoir Areas.

**Applicant Response: Responses to Off-Street Parking, Loading and Reservoir Areas in Chapter 42 CDC are addressed above.**

7. Chapter 48 CDC, Access, Egress and Circulation.

8. Chapter 52 CDC, Signs.

9. Chapter 54 CDC, Landscaping.

**Applicant Response: Responses to Landscaping in Chapter 54 CDC are addressed above.**

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. 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 limiting development in the protected area. The protected area includes the protected tree, its dripline, and an additional 10 feet beyond the dripline, as depicted in the figure below. 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 plus 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.

PROTECTED AREA = DRIPLINE + 10 FEET

b. Non-residential and residential projects on non-Type I and II lands shall set aside up to 20 percent of the protected areas for significant trees and tree clusters, 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 by limiting development in the protected areas. 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.

E.G., DRIPLINE + 10 FT. AREA = 2,500 SQ. FT. OR 18% OF TOTAL NON-TYPE I AND II LAND DENSITY CALCULATIONS FOR THIS PARCEL WILL BE BASED ON REMAINING NET SQ. FOOTAGE OF SITE (EXCLUDING THE 2,500 SQ. FT.)

**Applicant Response: To the best of our knowledge the existing site does not contain any heritage trees. An arborist report is provided herein. The only on-site tree to be preserved is one (1) Magnolia within the parking area.**

- b. 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.

**Applicant Response: No new stubouts of streets are proposed.**

- c. 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.

**Applicant Response: The subject property does not include any existing stands or clusters of trees.**

- d. 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.

**Applicant Response: Based upon preliminary design discussion with Engineering Staff, the anticipated road improvements will not impact any significant or heritage trees.**

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

**Applicant Response: To the best of our knowledge, there are no identified significant trees on the subject property.**

- 3. The topography and natural drainage shall be preserved to the greatest degree possible.



**Applicant Response: The subject property contains steep slopes and has a grade difference of approximately 30 feet, sloping down from west to east. The proposed preliminary grading plan and site layout has taken into consideration the existing topography and natural drainage with goal of minimizing large retaining walls.**

5. The structures shall not be located in areas subject to slumping and sliding. The Comprehensive Plan Background Report's Hazard Map, or updated material as available and as deemed acceptable by the Planning Director, shall be the basis for preliminary determination.

**Applicant Response: To the best of our knowledge, the proposed structure is not located withing slumping or sliding areas.**

5. There shall be adequate distance between on-site buildings and on-site and off-site buildings on adjoining properties to provide for adequate light and air circulation and for fire protection.

6. Architecture.

- a. The proposed structure(s) scale shall be compatible with the existing structure(s) on site and on adjoining sites. Contextual design is required. Contextual design means respecting and incorporating prominent architectural styles, building lines, roof forms, rhythm of windows, building scale and massing of surrounding buildings in the proposed structure. The materials and colors shall be complementary to the surrounding buildings.

**Applicant Response: The proposed architectural design has been developed in harmony with surrounding buildings with regard to form, colors, and materials. The proposed materials and colors, being primarily natural and earth-toned, compliment nearby commercial structures. The sloped roof at the corner element references the neighboring library. The existing commercial development across the corner of Burns and Hood Street has a similar material and color palette.**

- b. While there has been discussion in Chapter 24 CDC about transition, it is appropriate that new buildings should architecturally transition in terms of bulk and mass to work with, or fit, adjacent existing buildings. This transition can be accomplished by selecting designs that "step down" or "step up" from small to big structures and vice versa (see figure below). Transitions may also take the form of carrying building patterns and lines (e.g., parapets, windows, etc.) from the existing building to the new one.

**Applicant Response: The proposed structure has been designed as a single-story building to provide a soft transition between larger surrounding commercial buildings and the residential neighborhood. The higher roof elements of the proposed structure have been oriented toward the corner of Hood and Burns Street to address the commercial nature of the downtown while reducing imposition into residential areas.**

- c. Contrasting architecture shall only be permitted when the design is manifestly superior to adjacent architecture in terms of creativity, design, and workmanship, and/or it is adequately

separated from other buildings by distance, screening, grade variations, or is part of a development site that is large enough to set its own style of architecture.

**Applicant Response: The proposed structure was designed to stand on its own as a unique architectural work while also referencing surrounding buildings in both form and materiality.**

d. Human scale is a term that seeks to accommodate the users of the building and the notion that buildings should be designed around the human scale (i.e., their size and the average range of their perception). Human scale shall be accommodated in all designs by, for example, multi-light windows that are broken up into numerous panes, intimately scaled entryways, and visual breaks (exaggerated eaves, indentations, ledges, parapets, awnings, engaged columns, etc.) in the facades of buildings, both vertically and horizontally.

The human scale is enhanced by bringing the building and its main entrance up to the edge of the sidewalk. It creates a more dramatic and interesting streetscape and improves the “height and width” ratio referenced in this section.

**Applicant Response: The proposed building was sited near the corner of Hood Street and Burns Street to provide human scale and a pedestrian-friendly experience. Pedestrian connectivity is provided within the site at human scale with accessible paths from parking areas to building entrances.**

e. The main front elevation of commercial and office buildings shall provide at least 60 percent windows or transparency at the pedestrian level to create more interesting streetscape and window shopping opportunities. One side elevation shall provide at least 30 percent transparency. Any additional side or rear elevation, which is visible from a collector road or greater classification, shall also have at least 30 percent transparency. Transparency on other elevations is optional. The transparency is measured in lineal fashion. For example, a 100-foot-long building elevation shall have at least 60 feet (60 percent of 100 feet) in length of windows. The window height shall be, at minimum, three feet tall. The exception to transparency would be cases where demonstrated functional constraints or topography restrict that elevation from being used. When this exemption is applied to the main front elevation, the square footage of transparency that would ordinarily be required by the above formula shall be installed on the remaining elevations at pedestrian level in addition to any transparency required by a side elevation, and vice versa. The rear of the building is not required to include transparency. The transparency must be flush with the building elevation.

60 percent of lineal street facing or main elevation is windows. 30 percent of one side elevation is windows. You may transfer windows from the side to front, or vice versa.

**Applicant Response: Explain the topography change along Burns Street side elevation.**

f. Variations in depth and roof line are encouraged for all elevations.

**Applicant Response: Explain the topography change along Burns Street side elevation**

To vary the otherwise blank wall of most rear elevations, continuous flat elevations of over 100 feet in length should be avoided by indents or variations in the wall. The use of decorative brick, masonry, or stone insets and/or designs is encouraged. Another way to vary or soften this elevation is through terrain variations such as an undulating grass area with trees to provide vertical relief.

**Applicant Response: The topography of the site provides additional interest along the longest uninterrupted façade. Additionally, vining plans and material changes help to break up the length of the side elevation along Burns Street.**

- g. Consideration of the micro-climate (e.g., sensitivity to wind, sun angles, shade, etc.) shall be made for building users, pedestrians, and transit users, including features like awnings.

**Applicant Response: Awnings are proposed at each building entrance to protect building users from the elements.**

- h. The vision statement identified a strong commitment to developing safe and attractive pedestrian environments with broad sidewalks, canopied with trees and awnings.

**Applicant Response: The internal site pedestrian environment will include broad sidewalks, trees, and awnings over building entrances.**

- i. Sidewalk cafes, kiosks, vendors, and street furniture are encouraged. However, at least a four-foot-wide pedestrian accessway must be maintained per Chapter 53 CDC, Sidewalk Use.

**Applicant Response: This project proposes no sidewalk obstructions. A 6-foot wide pedestrian accessway will be provided throughout the site. Right-of-way improvements will be constructed per City requirements and standards.**

- 7. Transportation. The automobile shall be shifted from a dominant role, relative to other modes of transportation, by the following means:

- a. Commercial and office development shall be oriented to the street. At least one public entrance shall be located facing an arterial street; or, if the project does not front on an arterial, facing a collector street; or, if the project does not front on a collector, facing the local street with highest traffic levels. Parking lots shall be placed behind or to the side of commercial and office development. When a large and/or multi-building development is occurring on a large undeveloped tract (three plus acres), it is acceptable to focus internally; however, at least 20 percent of the main adjacent right-of-way shall have buildings contiguous to it unless waived per subsection (B)(7)(c) of this section. These buildings shall be oriented to the adjacent street and include pedestrian-oriented transparencies on those elevations.

For individual buildings on smaller individual lots, at least 30 lineal feet or 50 percent of the building must be adjacent to the right-of-way unless waived per subsection (B)(7)(c) of this section. The elevations oriented to the right-of-way must incorporate pedestrian-oriented transparency.

**Applicant Response: The proposed structure has been sited with a main entrance facing the corner of Burns Street and Hood Street. Other entrances are located along a pedestrian pathway on the north side of the building. The proposed parking areas are located behind and to the side of the building. The building is site along the corner of Burns Street and Hood Street with frontage along both streets.**

b. Multi-family projects shall be required to keep the parking at the side or rear of the buildings or behind the building line of the structure as it would appear from the right-of-way inside the multi-family project. For any garage which is located behind the building line of the structure, but still facing the front of the structure, architectural features such as patios, patio walls, trellis, porch roofs, overhangs, pergolas, etc., shall be used to downplay the visual impact of the garage, and to emphasize the rest of the house and front entry.

The parking may be positioned inside small courtyard areas around which the units are built. These courtyard spaces encourage socialization, defensible space, and can provide a central location for landscaping, particularly trees, which can provide an effective canopy and softening effect on the courtyard in only a few years. Vehicular access and driveways through these courtyard areas is permitted.

**Applicant Response: The proposed project does not include multi-family dwellings.**

c. Commercial, office, and multi-family projects shall be built as close to the adjacent main right-of-way as practical to facilitate safe pedestrian and transit access. Reduced frontages by buildings on public rights-of-way may be allowed due to extreme topographic (e.g., slope, creek, wetlands, etc.) conditions or compelling functional limitations, not just inconveniences or design challenges.

entrance from right-of-way

**Applicant Response: The proposed structure has been sited as close as permitted to prominently address the corner of the two primary streets, Hood and Burns.**

d. Accessways, parking lots, and internal driveways shall accommodate pedestrian circulation and access by specially textured, colored, or clearly defined footpaths at least six feet wide. Paths shall be eight feet wide when abutting parking areas or travel lanes. Paths shall be separated from parking or travel lanes by either landscaping, planters, curbs, bollards, or raised surfaces. Sidewalks in front of storefronts on the arterials and main store entrances on the arterials identified in CDC 85.200(A)(3) shall be 12 feet wide to accommodate pedestrians, sidewalk sales, sidewalk cafes, etc. Sidewalks in front of storefronts and main store entrances in commercial/OBC zone development on local streets and collectors shall be eight feet wide.

**Applicant Response: 6 foot or wider pedestrian access is provided throughout the site. Within the parking, vehicles are maintained at least two feet from sidewalks by wheel stops or curbs with widened sidewalks.**

e. Paths shall provide direct routes that pedestrians will use between buildings, adjacent rights-of-way, and adjacent commercial developments. They shall be clearly identified. They shall be laid out to attract use and to discourage people from cutting through parking lots and impacting environmentally sensitive areas.

**Applicant Response: The proposed parking lot design includes visible paths to the stairway from the lower parking area to the main building and cross-connection to adjacent commercial and public buildings. The parking lots have been designed with a single entrance and exit so there will be no opportunity to cut through the parking area.**

h. At least one entrance to the building shall be on the main street, or as close as possible to the main street. The entrance shall be designed to identify itself as a main point of ingress/egress.

**Applicant Response: The proposed main entrance has been oriented at a 45 degree angle to address the corner of Hood and Burns Street.**

g. Where transit service exists, or is expected to exist, there shall be a main entrance within a safe and reasonable distance of the transit stop. A pathway shall be provided to facilitate a direct connection.

**Applicant Response: To the best of our knowledge, there is no transit service or stops immediately adjacent to the proposed project.**

h. Projects shall bring at least part of the project adjacent to or near the main street right-of-way in order to enhance the height-to-width ratio along that particular street. (The “height-to-width ratio” is an architectural term that emphasizes height or vertical dimension of buildings adjacent to streets. The higher and closer the building is, and the narrower the width of the street, the more attractive and intimate the streetscape becomes.) For every one foot in street width, the adjacent building ideally should be one to two feet higher. This ratio is considered ideal in framing and defining the streetscape.

**Applicant Response: The existing street width along Hood Street is approximately 36.5'. The building height at the corner element along of Hood and Burns Street is approximately 30 feet on average above the street elevation. The building steps down as Burns drops toward the east giving a varied height above the street level.**

1:1 height to width ratio is ideal

(example only)

i. These architectural standards shall apply to public facilities such as reservoirs, water towers, treatment plants, fire stations, pump stations, power transmission facilities, etc. It is recognized that many of these facilities, due to their functional requirements, cannot readily be configured to meet these architectural standards. However, attempts shall be made to make the design sympathetic to surrounding properties by landscaping, setbacks, buffers, and all reasonable architectural means.



**Applicant Response: The proposed project is not a public facility.**

j. Parking spaces at trailheads shall be located so as to preserve the view of, and access to, the trailhead entrance from the roadway. The entrance apron to the trailhead shall be marked: “No Parking,” and include design features to foster trail recognition.

**Applicant Response: The proposed project does not include any trailheads.**

C. Compatibility between adjoining uses, buffering, and screening.

**Applicant Response: Significant design consideration was applied to the proposed project to address neighboring single-family dwelling concerns regarding the proximity of parking spaces adjacent to homes, landscape buffering, and view corridors. The applicant presented the project to the Bolton Neighborhood Association on October 15, 2019 and has made efforts to design the site plan to address neighbor concerns regarding the use of native plants, parking areas being too close to residential homes and lowering the height of the building from two-stories to a single story.**

1. In addition to the compatibility requirements contained in Chapter 24 CDC, buffering shall be provided between different types of land uses; for example, buffering between single-family homes and apartment blocks. However, no buffering is required between single-family homes and duplexes or single-family attached units. The following factors shall be considered in determining the adequacy of the type and extent of the buffer:

- a. The purpose of the buffer, for example to decrease noise levels, absorb air pollution, filter dust, or to provide a visual barrier.
- b. The size of the buffer required to achieve the purpose in terms of width and height.
- c. The direction(s) from which buffering is needed.
- d. The required density of the buffering.
- e. Whether the viewer is stationary or mobile.

**Applicant Response: Landscape buffering between neighboring residential properties to the north and the proposed development is achieved by a mix of fast-growing shrubs to provide a green screen and trees.**

2. On-site screening from view from adjoining properties of such things as service areas, storage areas, and parking lots shall be provided and the following factors will be considered in determining the adequacy of the type and extent of the screening:

- a. What needs to be screened?

- b. The direction from which it is needed.
  - c. How dense the screen needs to be.
  - d. Whether the viewer is stationary or mobile.
  - e. Whether the screening needs to be year-round.
3. Rooftop air cooling and heating systems and other mechanical equipment shall be screened from view from adjoining properties.

**Applicant Response: The proposed refuse enclosure is located in a central, unobtrusive area of the site and located as far from the neighboring residences as possible. The refuse enclosure area will include landscaping for additional screening and a solid wall which will match in material and color to primary structure.**

D. Privacy and noise.

1. Structures which include residential dwelling units shall provide private outdoor areas for each ground floor unit which is screened from view from adjoining units.
2. Residential dwelling units shall be placed on the site in areas having minimal noise exposure to the extent possible. Natural-appearing sound barriers shall be used to lessen noise impacts where noise levels exceed the noise standards contained in West Linn Municipal Code Section 5.487.

**Applicant Response: The proposed development does not include residential units.**

3. Structures or on-site activity areas which generate noise, lights, or glare shall be buffered from adjoining residential uses in accordance with the standards in subsection C of this section where applicable.

**Applicant Response: The proposed uses, a dental and physical therapy clinic, are not expected to generate, noise, light, or glare that would impact adjoining residential uses.**

4. Businesses or activities that can reasonably be expected to generate noise in excess of the noise standards contained in West Linn Municipal Code Section 5.487 shall undertake and submit appropriate noise studies and mitigate as necessary to comply with the code. (See CDC 55.110(B)(11) and 55.120(M).)

If the decision-making authority reasonably believes a proposed use may generate noise exceeding the standards specified in the municipal code, then the authority may require the applicant to supply professional noise studies from time to time during the user's first year of operation to monitor compliance with City standards and permit requirements.

**Applicant Response: The proposed uses, a dental and physical therapy clinic, are not expected to generate noise in excess of the noise standards of the West Linn Municipal Code.**

E. Private outdoor area. This section only applies to multi-family projects.

1. In addition to the requirements of residential living, unit shall have an outdoor private area (patio, terrace, porch) of not less than 48 square feet in area;
2. The outdoor space shall be oriented towards the sun where possible; and
3. The area shall be screened or designed to provide privacy for the users of the space.
4. Where balconies are added to units, the balconies shall not be less than 48 square feet, if they are intended to be counted as private outdoor areas.

**Applicant Response: The proposed development does not include residential uses.**

F. Shared outdoor recreation areas. This section only applies to multi-family projects and projects with 10 or more duplexes or single-family attached dwellings on lots under 4,000 square feet. In those cases, shared outdoor recreation areas are calculated on the duplexes or single-family attached dwellings only. It also applies to qualifying PUDs under the provisions of CDC 24.170.

1. In addition to the requirements of subsection E of this section, usable outdoor recreation space shall be provided in residential developments for the shared or common use of all the residents in the following amounts:
  - a. Studio up to and including two-bedroom units: 200 square feet per unit.
  - b. Three or more bedroom units: 300 square feet per unit.
2. The required recreation space may be provided as follows:
  - a. It may be all outdoor space; or
  - b. It may be part outdoor space and part indoor space; for example, an outdoor tennis court and indoor recreation room; and
  - c. Where some or all of the required recreation area is indoor, such as an indoor recreation room, then these indoor areas must be readily accessible to all residents of the development subject to clearly posted restrictions as to hours of operation and such regulations necessary for the safety of minors.
  - d. In considering the requirements of this subsection F, the emphasis shall be on usable recreation space. No single area of outdoor recreational space shall encompass an area of less than 250 square feet. All common outdoor recreational space shall be clearly delineated and readily identifiable as

such. Small, marginal, and incidental lots or parcels of land are not usable recreation spaces. The location of outdoor recreation space should be integral to the overall design concept of the site and be free of hazards or constraints that would interfere with active recreation.

3. The shared space shall be readily observable to facilitate crime prevention and safety.

**Applicant Response: The proposed development does not include residential uses.**

G. Demarcation of public, semi-public, and private spaces. The structures and site improvements shall be designed so that public areas such as streets or public gathering places, semi-public areas, and private outdoor areas are clearly defined in order to establish persons having a right to be in the space, to provide for crime prevention, and to establish maintenance responsibility. These areas may be defined by:

1. A deck, patio, fence, low wall, hedge, or draping vine;
2. A trellis or arbor;
3. A change in level;
4. A change in the texture of the path material;
5. Sign; or
6. Landscaping.

Use of gates to demarcate the boundary between a public street and a private access driveway is prohibited.

**Applicant Response: The proposed development does not include any on-site public or semi-public outdoor space.**

H. Public transit.

1. Provisions for public transit may be required where the site abuts an existing or planned public transit route. The required facilities shall be based on the following:

- a. The location of other transit facilities in the area.
- b. The size and type of the proposed development.
- c. The rough proportionality between the impacts from the development and the required facility.

2. The required facilities shall be limited to such facilities as the following:

- a. A waiting shelter with a bench surrounded by a three-sided covered structure, with transparency to allow easy surveillance of approaching buses.
  - b. A turnout area for loading and unloading designed per regional transit agency standards.
  - c. Hard-surface paths connecting the development to the waiting and boarding areas.
  - d. Regional transit agency standards shall, however, prevail if they supersede these standards.
3. The transit stop shall be located as close as possible to the main entrance to the shopping center, public or office building, or multi-family project. The entrance shall not be more than 200 feet from the transit stop with a clearly identified pedestrian link.
4. All commercial business centers (over three acres) and multi-family projects (over 40 units) may be required to provide for the relocation of transit stops to the front of the site if the existing stop is within 200 to 400 yards of the site and the exaction is roughly proportional to the impact of the development. The commercial or multi-family project may be required to provide new facilities in those cases where the nearest stop is over 400 yards away. The transit stop shall be built per subsection (H)(2) of this section.

**Applicant Response: To the best of our knowledge, the proposed development site is not along an existing or planned transit route.**

I. Public facilities. An application may only be approved if adequate public facilities will be available to provide service to the property prior to occupancy.

1. Streets. Sufficient right-of-way and slope easement shall be dedicated to accommodate all abutting streets to be improved to the City's Improvement Standards and Specifications. The City Engineer shall determine the appropriate level of street and traffic control improvements to be required, including any off-site street and traffic control improvements, based upon the transportation analysis submitted. The City Engineer's determination of developer obligation, the extent of road improvement and City's share, if any, of improvements and the timing of improvements shall be made based upon the City's systems development charge ordinance and capital improvement program, and the rough proportionality between the impact of the development and the street improvements.

In determining the appropriate sizing of the street in commercial, office, multi-family, and public settings, the street should be the minimum necessary to accommodate anticipated traffic load and needs and should provide substantial accommodations for pedestrians and bicyclists. Road and driveway alignment should consider and mitigate impacts on adjacent properties and in neighborhoods in terms of increased traffic loads, noise, vibrations, and glare.

The realignment or redesign of roads shall consider how the proposal meets accepted engineering standards, enhances public safety, and favorably relates to adjacent lands and land uses. Consideration should also be given to selecting an alignment or design that minimizes or avoids



hazard areas and loss of significant natural features (drainageways, wetlands, heavily forested areas, etc.) unless site mitigation can clearly produce a superior landscape in terms of shape, grades, and reforestation, and is fully consistent with applicable code restrictions regarding resource areas.

Streets shall be installed per Chapter 85 CDC standards. The City Engineer has the authority to require that street widths match adjacent street widths. Sidewalks shall be installed per CDC 85.200(A)(3) for commercial and office projects, and CDC 85.200(A)(16) and 92.010(H) for residential projects, and applicable provisions of this chapter. Where streets bisect or traverse water resource areas (WRAs) the street width shall be reduced to the appropriate “constrained” cross-section width indicated in the TSP or alternate configurations which are appropriate to site conditions, minimize WRA disturbance or are consistent with an adopted transportation system plan. The street design shall also be consistent with habitat friendly provisions of CDC 32.060(I).

Based upon the City Manager’s or Manager’s designee’s determination, 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 55.125 that are required to mitigate impacts from the proposed development. Proportionate share of the costs shall be determined by the City Manager or Manager’s designee, who shall assume that the proposed development provides improvements in rough proportion to identified impacts of the development.

**Applicant Response: The proposed development will include street improvements along Hood Street and Burns Street to include street-widening, sidewalks, ADA accessible ramps, crosswalks, and street signage to meet the ultimate ROW widths and improve vehicle and pedestrian safety.**

2. Storm detention and treatment and geologic hazards. Per the submittals required by CDC 55.130 and 92.010(E), all proposed storm detention and treatment facilities must 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 the applicant must provide sufficient factual data to support the conclusions of the submitted plan.

Per the submittals required by CDC 55.130(E), the applicant must demonstrate that the proposed methods of rendering known or potential hazard sites safe for development, including proposed geotechnical remediation, are feasible and adequate to prevent landslides or other damage to property and safety. The review authority may impose conditions, including limits on type or intensity of land use, which it determines are necessary to mitigate known risks of landslides or property damage.

**Applicant Response: A stormwater report and geotechnical report are submitted with this application that provides insight to the characteristics of the proposed development site**

3. Municipal water. A registered civil engineer shall prepare a plan for the provision of water which demonstrates to the City Engineer’s satisfaction the availability of sufficient volume, capacity, and

pressure to serve the proposed development's domestic, commercial, and industrial fire flows. All plans will then be reviewed by the City Engineer.

**Applicant Response: See attached Civil plans detailing the water service requested.**

4. Sanitary sewers. A registered civil engineer shall prepare a sewerage collection system plan which demonstrates sufficient on-site capacity to serve the proposed development. The City Engineer shall determine whether the existing City system has sufficient capacity to serve the development.

**Applicant Response: See attached Civil plans detailing the sanitary sewer service requested.**

6. Solid waste and recycling storage areas. Appropriately sized and located solid waste and recycling storage areas shall be provided. Metro standards shall be used.

**Applicant Response: The proposed refuse/recycling area has been developed to meet Metro standards.**

J. Crime prevention and safety/defensible space.

1. Windows shall be located so that areas vulnerable to crime can be surveyed by the occupants.

2. Interior laundry and service areas shall be located in a way that they can be observed by others.

3. Mailboxes, recycling, and solid waste facilities shall be located in lighted areas having vehicular or pedestrian traffic.

4. The exterior lighting levels shall be selected and the angles shall be oriented towards areas vulnerable to crime.

5. Light fixtures shall be provided in areas having heavy pedestrian or vehicular traffic and in potentially dangerous areas such as parking lots, stairs, ramps, and abrupt grade changes.

6. Fixtures shall be placed at a height so that light patterns overlap at a height of seven feet which is sufficient to illuminate a person. All commercial, industrial, residential, and public facility projects undergoing design review shall use low or high pressure sodium bulbs and be able to demonstrate effective shielding so that the light is directed downwards rather than omni-directional. Omni-directional lights of an ornamental nature may be used in general commercial districts only.

**Applicant Response: Site lighting has been designed by a registered engineer. See sheet E1.1, E1.2, and the attached electrical lighting cut sheets.**

7. Lines of sight shall be reasonably established so that the development site is visible to police and residents.

**Applicant Response: The proposed structure and parking areas are located at visible areas from the intersection of Burns Street and Hood Street, providing excellent sight lines for police and residents.**

8. Security fences for utilities (e.g., power transformers, pump stations, pipeline control equipment, etc.) or wireless communication facilities may be up to eight feet tall in order to protect public safety. No variances are required regardless of location.

**Applicant Response: The proposed structure and parking areas are located at visible areas from the intersection of Burns Street and Hood Street, providing excellent sight lines for police and residents.**

K. Provisions for persons with disabilities.

1. The needs of a person with a disability shall be provided for. Accessible routes shall be provided between all buildings and accessible site facilities. The accessible route shall be the most practical direct route between accessible building entries, accessible site facilities, and the accessible entry to the site. An accessible route shall connect to the public right-of-way and to at least one on-site or adjacent transit stop (if the area is served by transit). All facilities shall conform to, or exceed, the Americans with Disabilities Act (ADA) standards, including those included in the Uniform Building Code.

**Applicant Response: The proposed site will be developed with accessible routes between parking areas and building entrances. There are no transit stops adjacent to the subject property.**

L. Signs.

1. Based on considerations of crime prevention and the needs of emergency vehicles, a system of signs for identifying the location of each residential unit, store, or industry shall be established.

buildings shall be numbered for emergency identification

2. The signs, graphics, and letter styles shall be designed to be compatible with surrounding development, to contribute to a sense of project identity, or, when appropriate, to reflect a sense of the history of the area and the architectural style.

3. The sign graphics and letter styles shall announce, inform, and designate particular areas or uses as simply and clearly as possible.

4. The signs shall not obscure vehicle driver's sight distance.

5. Signs indicating future use shall be installed on land dedicated for public facilities (e.g., parks, water reservoir, fire halls, etc.).

6. Signs and appropriate traffic control devices and markings shall be installed or painted in the driveway and parking lot areas to identify bicycle and pedestrian routes.

**Applicant Response: The exact sign details are still under development but will adhere to the criteria above.**

M. 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, as practical. The design standards of Tables 1 and 2 above, and of subsection 5.487 of the West Linn Municipal Code relative to existing high ambient noise levels shall apply to this section.

**Applicant Response: The developer will work with the local utility providers to achieve undergrounding as needed.**

N. Wireless communication facilities (WCFs). (This section only applicable to WCFs.) WCFs as defined in Chapter 57 CDC may be required to go through Class I or Class II design review. The approval criteria for Class I design review is that the visual impact of the WCF shall be minimal to the extent allowed by Chapter 57 CDC. Stealth designs shall be sufficiently camouflaged so that they are not easily seen by passersby in the public right-of-way or from any adjoining residential unit. WCFs that are classified as Class II design review must respond to all of the approval criteria of this chapter.

**Applicant Response: The proposed project does not include any plans to develop a Wireless Communication Facility.**

O. Refuse and recycling standards.

1. All commercial, industrial and multi-family developments over five units requiring Class II design review shall comply with the standards set forth in these provisions. Modifications to these provisions may be permitted if the Planning Commission determines that the changes are consistent with the purpose of these provisions and the City receives written evidence from the local franchised solid waste and recycling firm that they are in agreement with the proposed modifications.

2. Compactors, containers, and drop boxes shall be located on a level Portland cement concrete pad, a minimum of four inches thick, at ground elevation or other location compatible with the local franchise collection firm's equipment at the time of construction. The pad shall be designed to discharge surface water runoff to avoid ponding.

3. Recycling and solid waste service areas.

a. Recycling receptacles shall be designed and located to serve the collection requirements for the specific type of material.

b. The recycling area shall be located in close proximity to the garbage container areas and be accessible to the local franchised collection firm's equipment.

- c. Recycling receptacles or shelters located outside a structure shall have lids and be covered by a roof constructed of water and insect-resistive material. The maintenance of enclosures, receptacles and shelters is the responsibility of the property owner.
- d. The location of the recycling area and method of storage shall be approved by the local fire marshal.
- e. Recycling and solid waste service areas shall be at ground level and/or otherwise accessible to the franchised solid waste and recycling collection firm.
- f. Recycling and solid waste service areas shall be used only for purposes of storing solid waste and recyclable materials and shall not be a general storage area to store personal belongings of tenants, lessees, property management or owners of the development or premises.
- g. Recyclable material service areas shall be maintained in a clean and safe condition.

#### 4. Special wastes or recyclable materials.

- a. Environmentally hazardous wastes defined in ORS 466.005 shall be located, prepared, stored, maintained, collected, transported, and disposed in a manner acceptable to the Oregon Department of Environmental Quality.
- b. Containers used to store cooking oils, grease or animal renderings for recycling or disposal shall not be located in the principal recyclable materials or solid waste storage areas. These materials shall be stored in a separate storage area designed for such purpose.

#### 5. Screening and buffering.

- a. Enclosures shall include a curbed landscape area at least three feet in width on the sides and rear. Landscaping shall include, at a minimum, a continuous hedge maintained at a height of 36 inches.
- b. Placement of enclosures adjacent to residentially zoned property and along street frontages is strongly discouraged. They shall be located so as to conceal them from public view to the maximum extent possible.
- c. All dumpsters and other trash containers shall be completely screened on all four sides with an enclosure that is comprised of a durable material such as masonry with a finish that is architecturally compatible with the project. Chain link fencing, with or without slats, will not be allowed.

#### 6. Litter receptacles.

- a. Location. Litter receptacles may not encroach upon the minimum required walkway widths.
- b. Litter receptacles may not be located within public rights-of-way except as permitted through an agreement with the City in a manner acceptable to the City Attorney or his/her designee.



- d. Number. The number and location of proposed litter receptacles shall be based on the type and size of the proposed uses. However, at a minimum, for non-residential uses, at least one external litter receptacle shall be provided for every 25 parking spaces for first 100 spaces, plus one receptacle for every additional 100 spaces. (Ord. 1547, 2007; Ord. 1604 § 52, 2011; Ord. 1613 § 12, 2013; amended during July 2014 supplement; Ord. 1623 § 6, 2014; Ord. 1635 § 26, 2014; Ord. 1636 § 37, 2014; Ord. 1647 § 6, 2016; Ord. 1650 § 1 (Exh. A), 2016; Ord. 1662 § 8, 2017; Ord. 1675 § 45, 2018)

## **CHAPTER 92 – REQUIRED IMPROVEMENTS.**

### **92.010 PUBLIC IMPROVEMENTS FOR ALL DEVELOPMENT**

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

#### **A. Streets within subdivisions.**

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

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

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

**Applicant Response: The subject property is not located or proposing to develop a subdivision. The above criteria do not apply to this application.**

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.

**Applicant Response: Based on preliminary discussions with Engineering Staff, we do not anticipate any vacations, trails, bicycle paths, or other appropriate public ways as part of the proposed development.**

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

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

**Applicant Response: The proposed development does not include plans for the development of a subdivision. No lot configuration changes are proposed, aside from required right-of-way dedications.**

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.

**Applicant Response: The owner/developer will ensure the criterion above is met during road construction.**

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.

**Applicant Response: A detailed stormwater plan prepared by a registered civil engineer will be developed and submitted for review as part of development approvals.**

Conclusion:

The proposed development is in conformance with West Linn Municipal Code as evidenced by the responses above.

If you have any questions, please contact me at (503) 399-1090 or [samt@lenityarchitecture.com](mailto:samt@lenityarchitecture.com)

Sincerely,



Samuel A. Thomas  
Senior Land Use Specialist

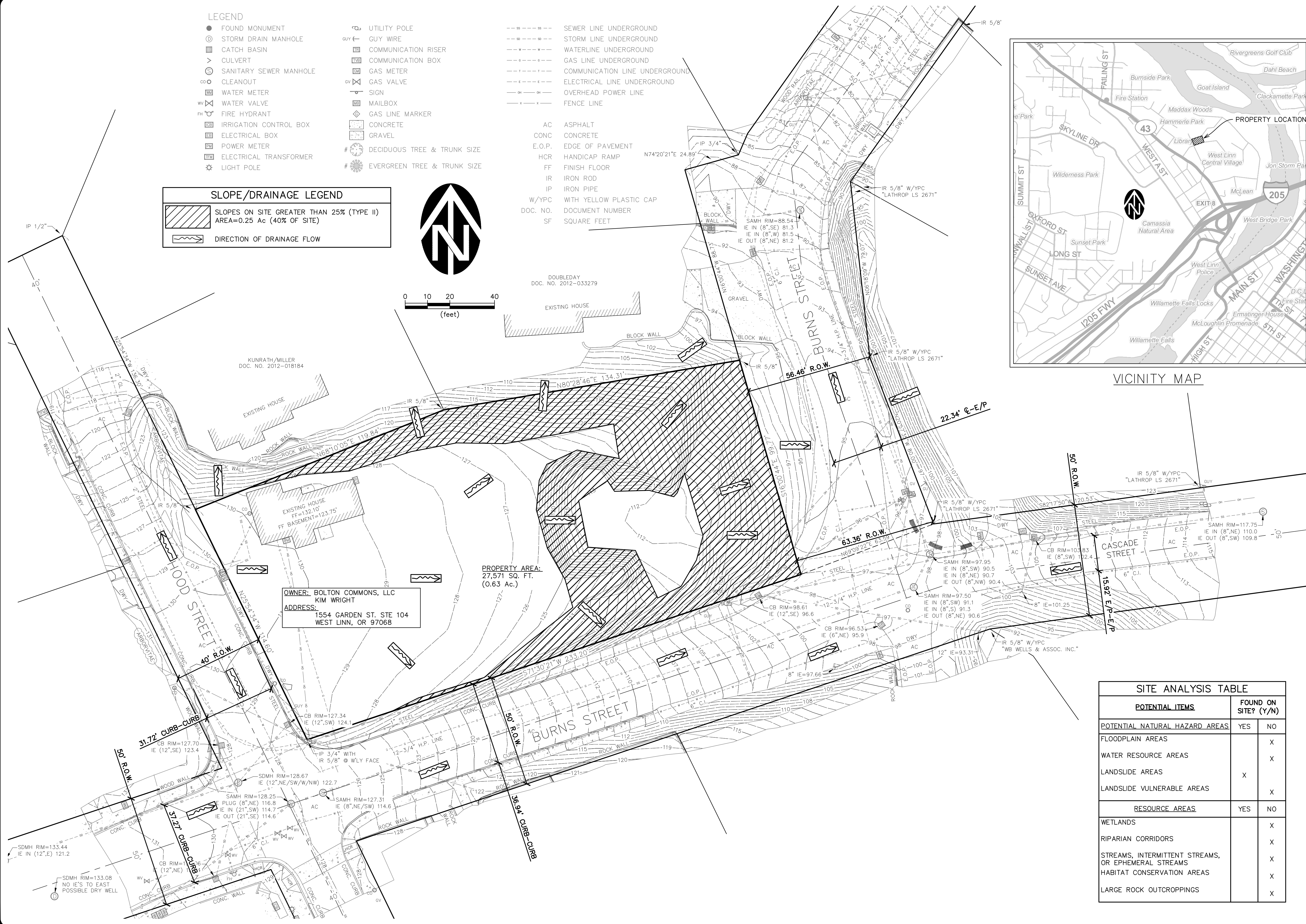
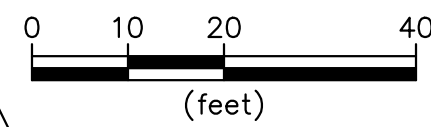
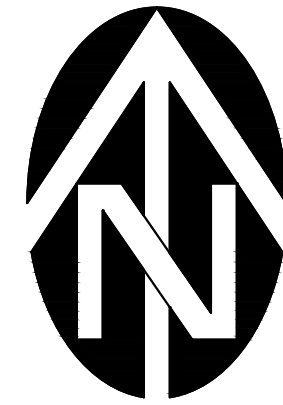


**LEGEND**

- FOUND MONUMENT
- ⊙ STORM DRAIN MANHOLE
- ▭ CATCH BASIN
- > CULVERT
- ⊙ SANITARY SEWER MANHOLE
- ∞ CLEANOUT
- ⊙ WATER METER
- ⊙ WATER VALVE
- ⊙ FIRE HYDRANT
- ⊙ IRRIGATION CONTROL BOX
- ⊙ ELECTRICAL BOX
- ⊙ POWER METER
- ⊙ ELECTRICAL TRANSFORMER
- ⊙ LIGHT POLE
- ⊙ UTILITY POLE
- GUY WIRE
- ⊙ COMMUNICATION RISER
- ⊙ COMMUNICATION BOX
- ⊙ GAS METER
- ⊙ GAS VALVE
- ⊙ SIGN
- ⊙ MAILBOX
- ⊙ GAS LINE MARKER
- ⊙ CONCRETE
- ⊙ GRAVEL
- ⊙ DECIDUOUS TREE & TRUNK SIZE
- ⊙ EVERGREEN TREE & TRUNK SIZE
- SEWER LINE UNDERGROUND
- STORM LINE UNDERGROUND
- WATERLINE UNDERGROUND
- GAS LINE UNDERGROUND
- COMMUNICATION LINE UNDERGROUND
- ELECTRICAL LINE UNDERGROUND
- OVERHEAD POWER LINE
- FENCE LINE
- AC ASPHALT
- CONC CONCRETE
- E.O.P. EDGE OF PAVEMENT
- HCR HANDICAP RAMP
- FF FINISH FLOOR
- IR IRON ROD
- IP IRON PIPE
- W/YPC WITH YELLOW PLASTIC CAP
- DOC. NO. DOCUMENT NUMBER
- SF SQUARE FEET

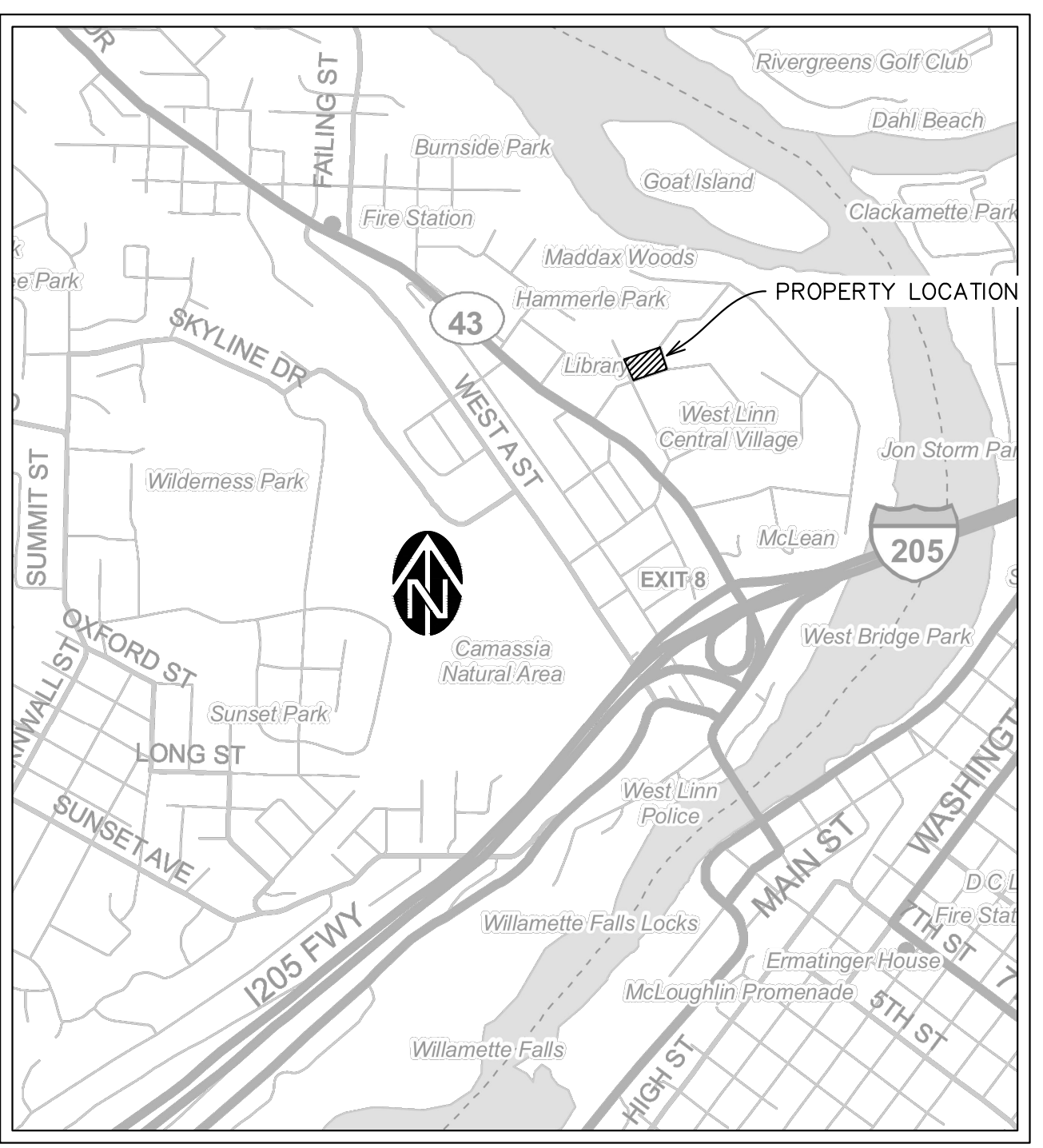
**SLOPE/DRAINAGE LEGEND**

- SLOPES ON SITE GREATER THAN 25% (TYPE II) AREA=0.25 Ac (40% OF SITE)
- DIRECTION OF DRAINAGE FLOW



**OWNER:** BOLTON COMMONS, LLC  
**KIM WRIGHT**  
**ADDRESS:**  
 1554 GARDEN ST. STE 104  
 WEST LINN, OR 97068

**PROPERTY AREA:**  
 27,571 SQ. FT.  
 (0.63 Ac.)



VICINITY MAP

**SITE ANALYSIS TABLE**

POTENTIAL ITEMS	FOUND ON SITE? (Y/N)	
	YES	NO
<b>POTENTIAL NATURAL HAZARD AREAS</b>		
FLOODPLAIN AREAS		X
WATER RESOURCE AREAS		X
LANDSLIDE AREAS	X	
LANDSLIDE VULNERABLE AREAS		X
<b>RESOURCE AREAS</b>	YES	NO
WETLANDS		X
RIPARIAN CORRIDORS		X
STREAMS, INTERMITTENT STREAMS, OR EPHEMERAL STREAMS		X
HABITAT CONSERVATION AREAS		X
LARGE ROCK OUTCROPPINGS		X

VERIFY SCALE  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
 IF NOT ONE INCH ON SCALES ACCURACIES

DSN. JW  
 DRN. RS  
 CKD. JW

NO. 1  
 DATE  
 02/2020

DESCRIPTION  
 REVISIONS

BY

**WESTECH ENGINEERING, INC.**  
 CONSULTING ENGINEERS AND PLANNERS

3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 585-2474 Fax: (503) 585-3966  
 E-mail: westech@westech-eng.com

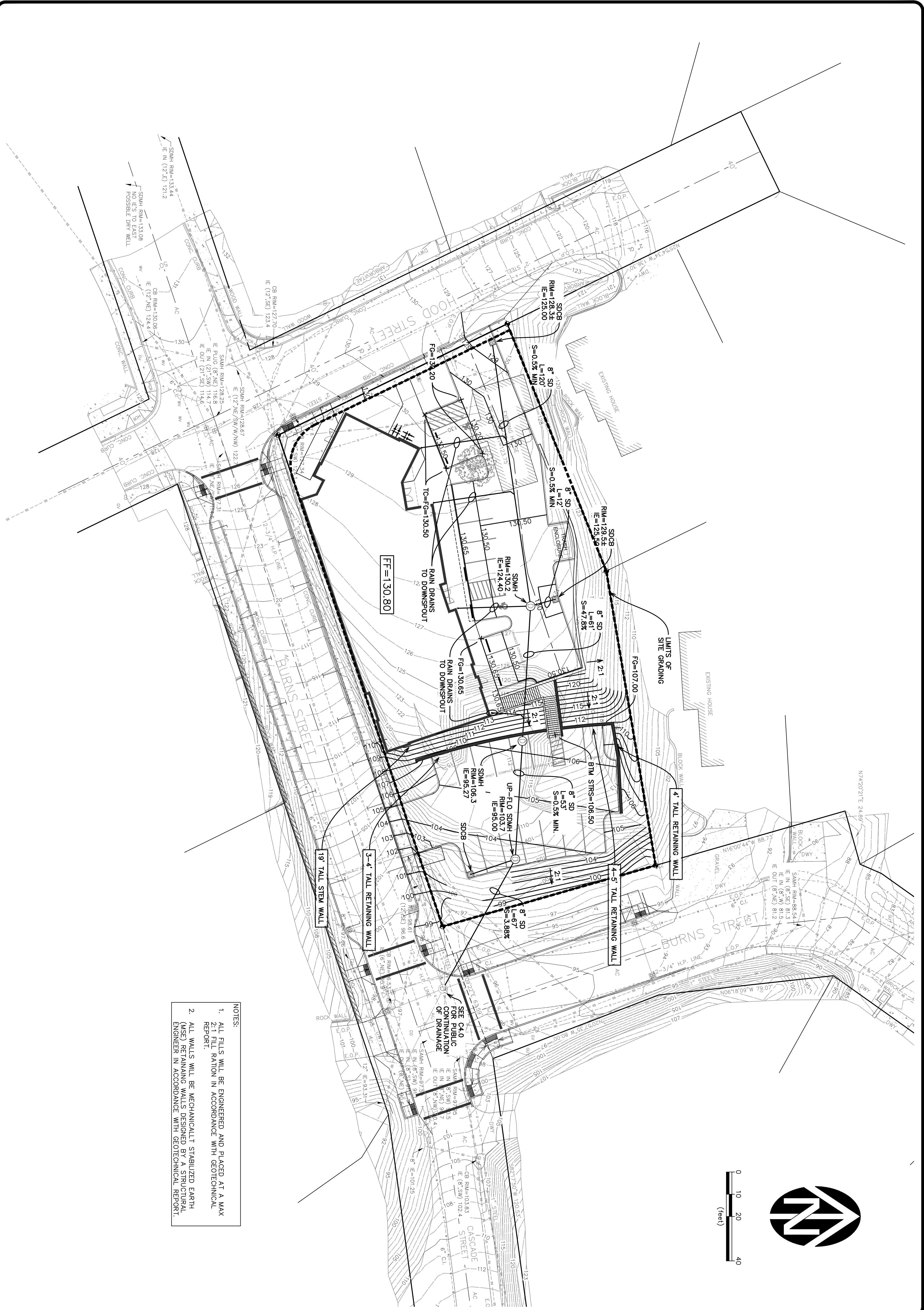
LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS

SITE ANALYSIS PLAN

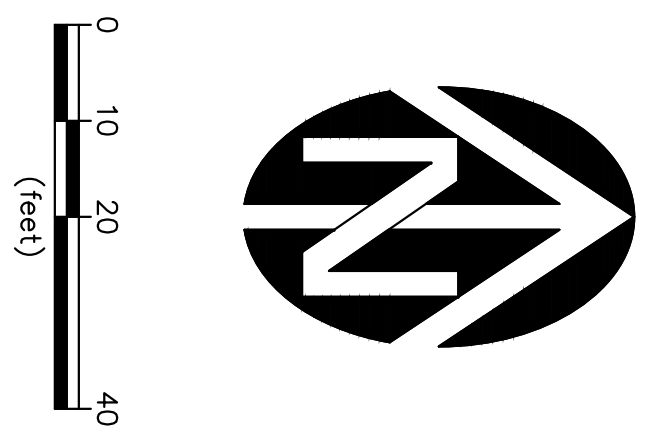
DRAWING  
**C1.0**

JOB NUMBER  
**3132.0000.0**





- NOTES:
1. ALL FILLS WILL BE ENGINEERED AND PLACED AT A MAX 2:1 FILL RATIO IN ACCORDANCE WITH GEOTECHNICAL REPORT.
  2. ALL WALLS WILL BE MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS DESIGNED BY A STRUCTURAL ENGINEER IN ACCORDANCE WITH GEOTECHNICAL REPORT.



DRAWING  
C2.0  
JOB NUMBER  
3132.0000.0

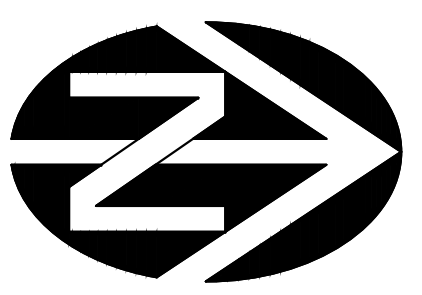
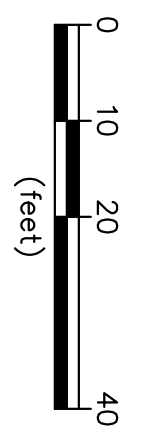
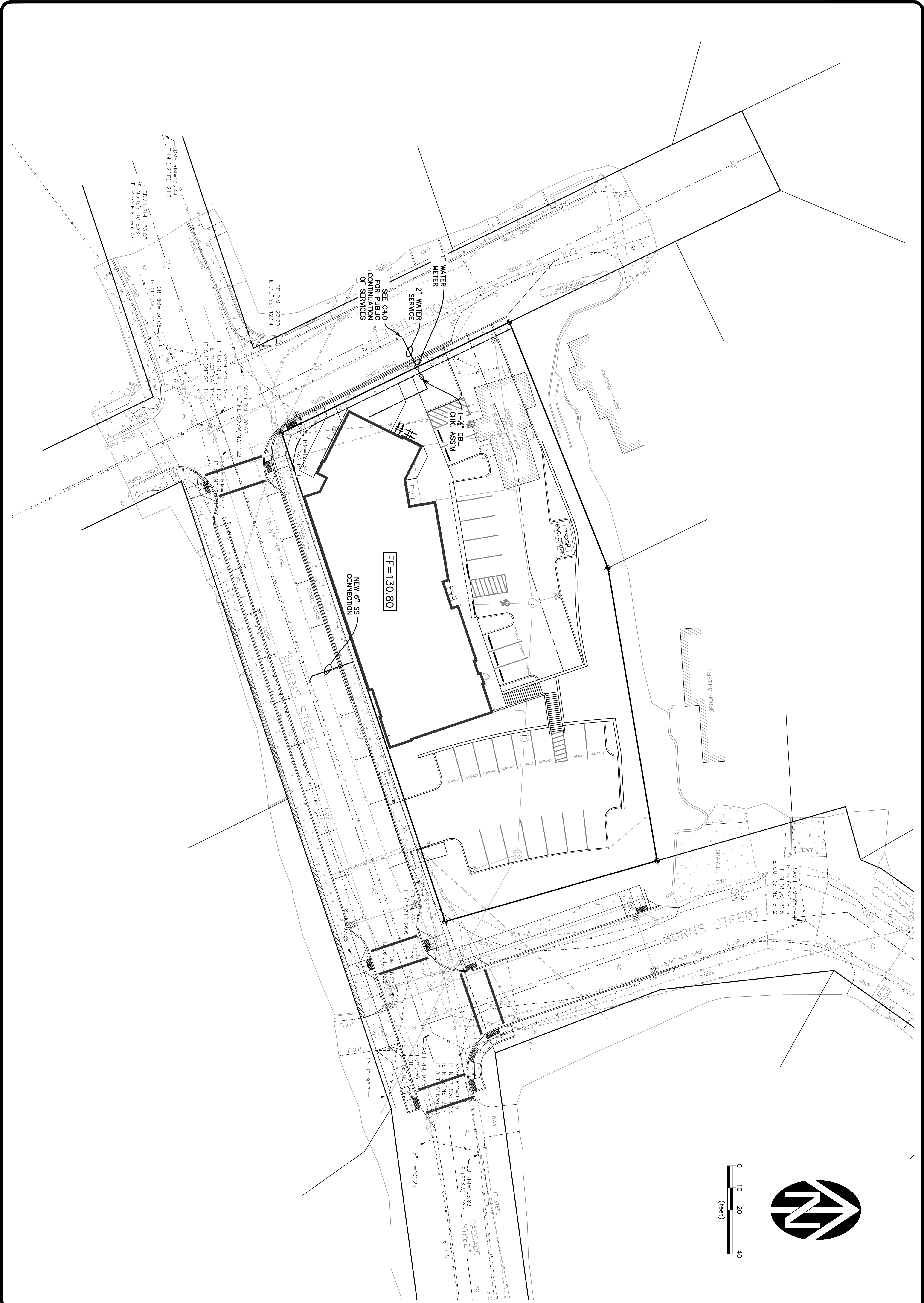
LENITY ARCHITECTURE  
ADVANCE DENTAL ARTS  
**PRELIMINARY GRADING & DRAINAGE PLAN**

**WE**  
WESTECH ENGINEERING, INC.  
CONSULTING ENGINEERS AND PLANNERS  
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
Phone: (503) 585-2474 Fax: (503) 585-3986  
E-mail: westech@westech-eng.com

**REGISTERED PROFESSIONAL ENGINEER**  
**REVIEW**  
NOV. 12, 2020  
WILLIAM J. WELLS  
RENEWS: 6/30/2020

VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY		1"	
DSN.	JW	NO.	1
DRN.	RS	DATE	02/2020
CKD.	JW	DESCRIPTION	REVISIONS
DATE:	02/2020	BY	





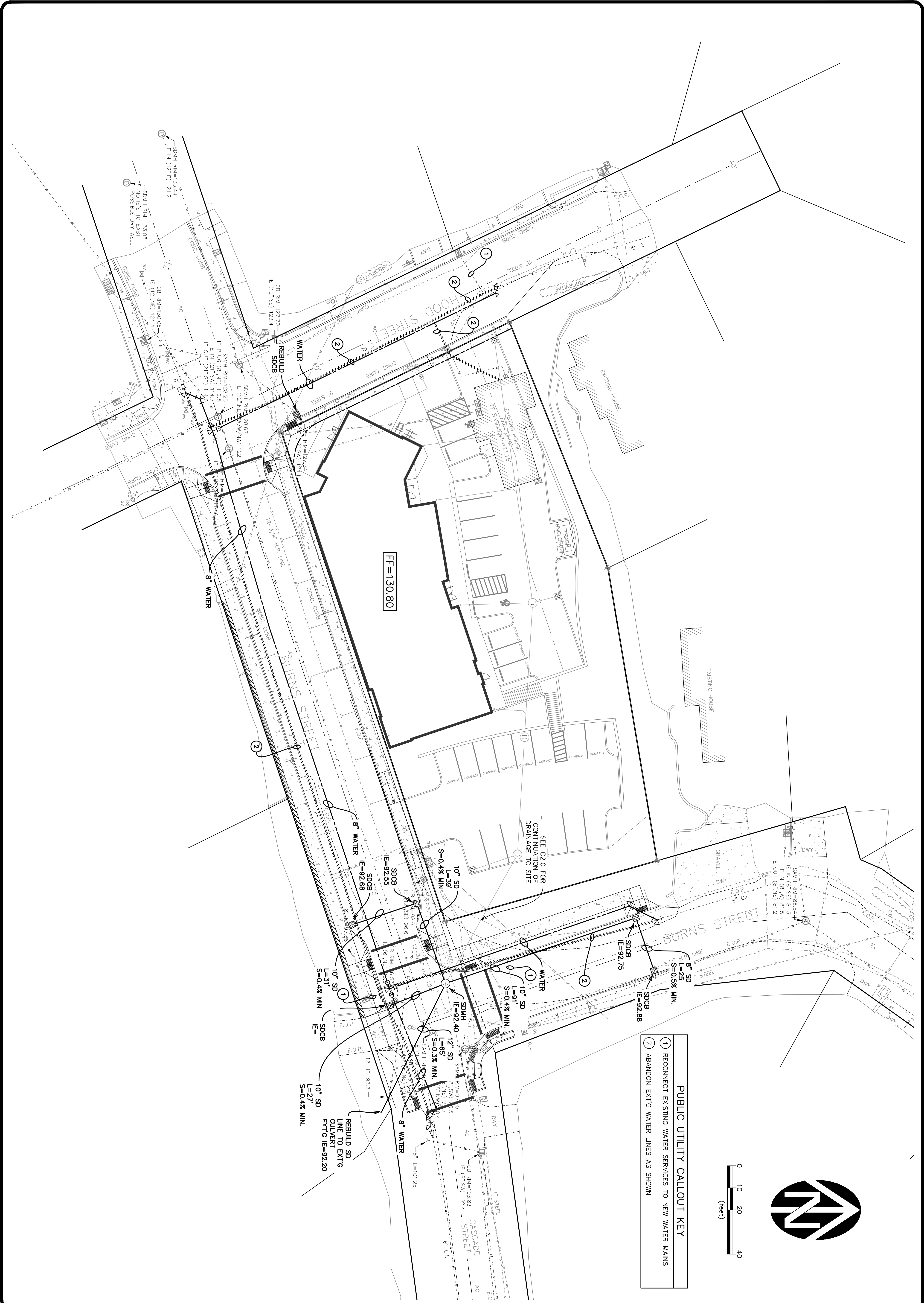
DRAWING  
C3.0  
JOB NUMBER  
3132.0000.0

LENITY ARCHITECTURE  
ADVANCE DENTAL ARTS  
  
UTILITY PLAN

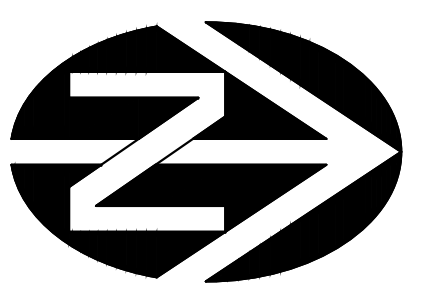
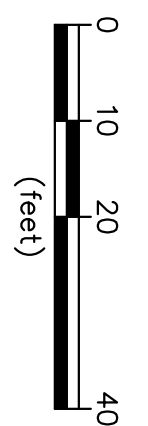
**WE**  
WESTECH ENGINEERING, INC.  
CONSULTING ENGINEERS AND PLANNERS  
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
Phone: (503) 585-2474 Fax: (503) 585-3986  
E-mail: westech@westech-eng.com

REGISTERED PROFESSIONAL ENGINEER  
**REVIEW**  
WILLIAM J. WELLS  
NOV. 12, 2008  
RENEWS: 6/30/2020

VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY					
DSN.	JW	NO.	1	DATE	
DRN.	RS	NO.		DATE	
CKD.	JW	NO.		DATE	
DATE:	02/2020	NO.		DATE	
				DESCRIPTION	BY
				REVISIONS	



- PUBLIC UTILITY CALLOUT KEY**
- ① RECONNECT EXISTING WATER SERVICES TO NEW WATER MAINS
  - ② ABANDON EXTG WATER LINES AS SHOWN



DRAWING  
C4.0  
JOB NUMBER  
3132.0000.0

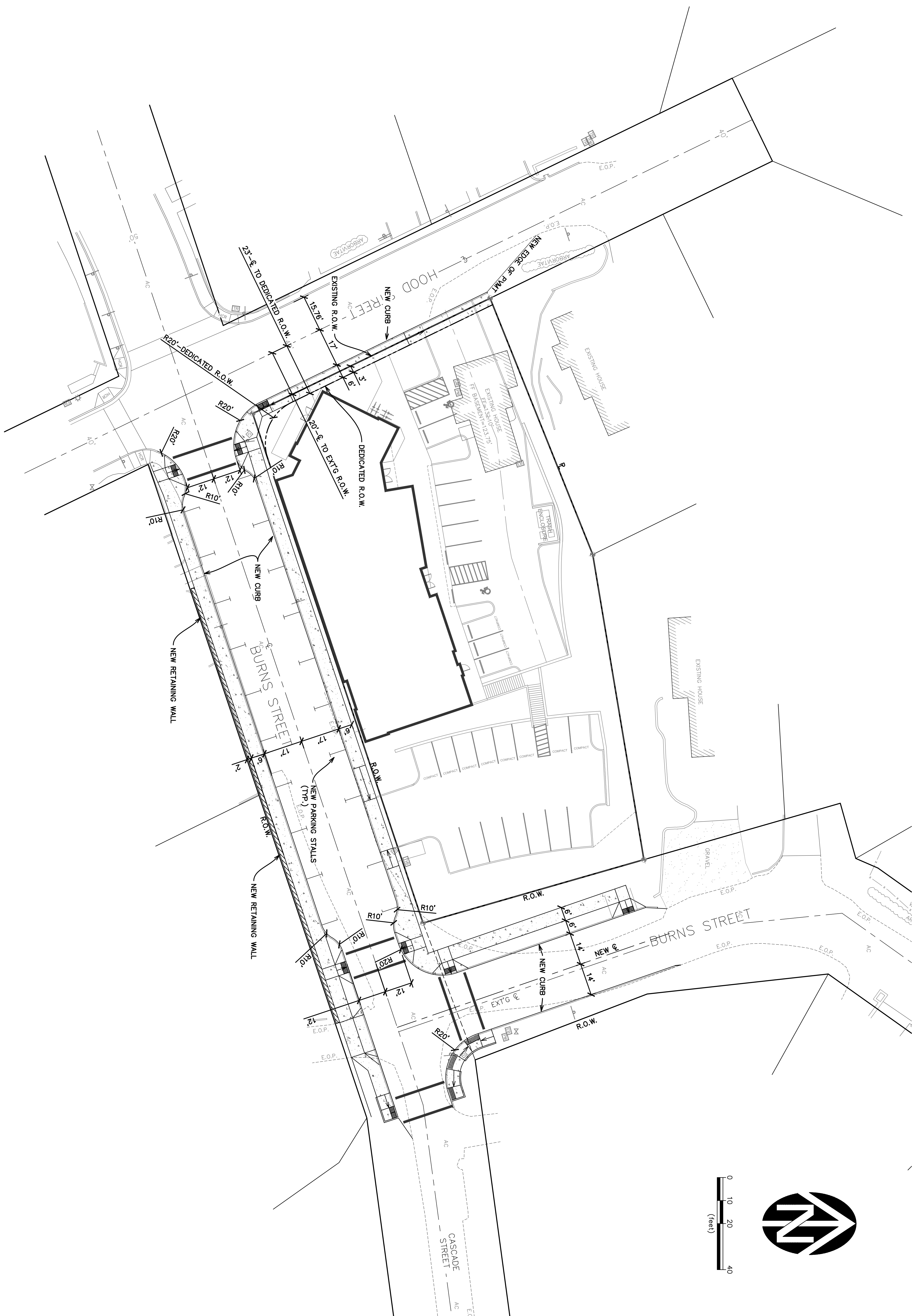
LENITY ARCHITECTURE  
ADVANCE DENTAL ARTS  
**PRELIMINARY PUBLIC UTILITY  
IMPROVEMENT PLAN**

**WE**  
WESTECH ENGINEERING, INC.  
CONSULTING ENGINEERS AND PLANNERS  
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
Phone: (503) 585-2474 Fax: (503) 585-3986  
E-mail: westech@westech-eng.com

**REGISTERED PROFESSIONAL  
ENGINEER**  
NOV. 12, 2020  
**WILLIAM J. WELLS**  
RENEWS: 6/30/2020


VERIFY SCALE		DATE		DESCRIPTION		BY
BAR IS ONE INCH ON ORIGINAL DRAWING	1"					
IF NOT ONE INCH ON THIS SHEET ADJUST SCALES ACCORDINGLY						
DSN.	JW	NO.	1	DATE		
DRN.	RS					
CKD.	JW					
DATE:	02/2020					





DRAWING  
**C5.0**  
 JOB NUMBER  
**3132.0000.0**

LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS  
**PRELIMINARY STREET PLAN**

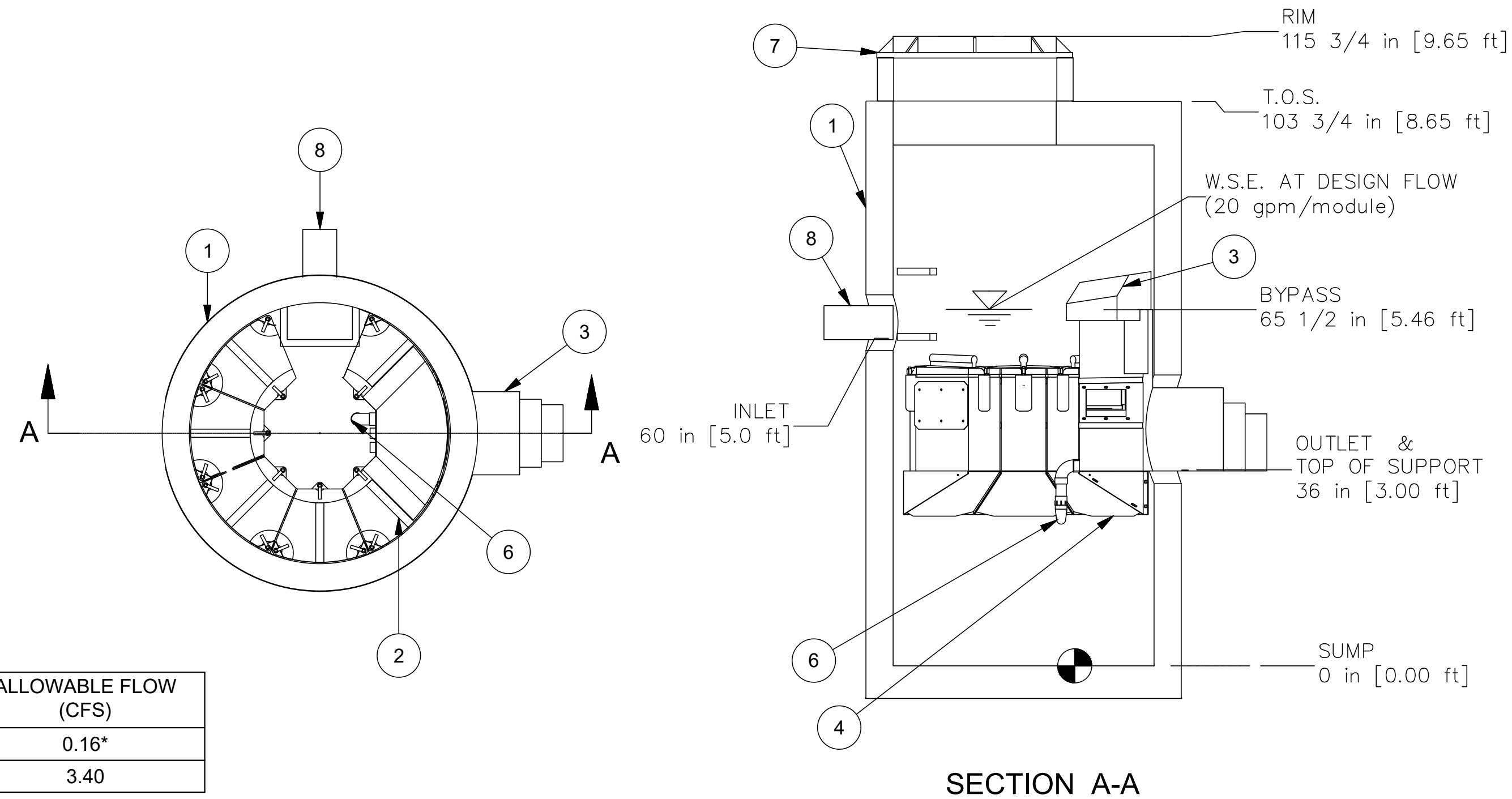
  
**WESTECH ENGINEERING, INC.**  
 CONSULTING ENGINEERS AND PLANNERS  
 3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 585-2474 Fax: (503) 585-3986  
 E-mail: westech@westech-eng.com

  
**REVIEW**  
 WILLIAM J. WELLS  
 RENEWS: 6/30/2020

VERIFY SCALE  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY  
 DSN. **JW**  
 DRN. **RS**  
 CKD. **JW**  
 DATE: **02/2020**

NO.	DATE	DESCRIPTION	BY
1			

## UP-FLO FILTER MANHOLE



DESIGN STORM	DEVELOPED SITE FLOW (CFS)	ALLOWABLE FLOW (CFS)
WATER QUALITY EVENT	0.14	0.16*
BYPASS 100-YEAR	0.63	3.40

\*ALLOWABLE PEAK TREATMENT FLOW FOR 3 FILTER MODULES

### EQUIPMENT PERFORMANCE

The stormwater filtration system shall adhere to the parameters listed below:  
 Minimum Performance Criteria: 80% removal of Sil-Co-Sil 106 at the peak treatment flow.  
 Peak Treatment Flow for 6 Filter Modules: 150 gpm (9.48 l/s)  
 Minimum Bypass Capacity: 1527 gpm (96.20 l/s)  
 Minimum Sediment Storage Capacity: 16.6 cu. ft. (0.47 cu. m.)  
 Minimum Oil Storage Capacity: 50 gal. (189 liters)  
 Media Type: CPZ

### OUTLET PIPE STUB SIZE INFORMATION

Outside Diameter: 10.5", 12.5" or 15.3" OD  
 Concrete Penetration: Pipe Boot (by Hydro)  
 Hook-up: Fernco-type coupling (by others)

Parts List			
ITEM	QTY	SIZE	DESCRIPTION
1	1	48 in	CONCRETE MANHOLE
2	6		FILTER MODULE
3	1		OUTLET MODULE AND PIPE STUB
4	1		SINGLE SUPPORT BRACKET
5	1		OUTLET SUPPORT BRACKET
6	1		DRAINDOWN FILTER
7	1	30 in	FRAME AND COVER
8	1	12 in	INLET PIPE

NO.	DATE	DESCRIPTION	BY
1			

VERIFY SCALE  
 BASE IS ONE INCH ON ORIGINAL DRAWING  
 IF NOT ONE INCH ON SCALES ACCORDINGLY

DSN. JW  
 DRN. RS  
 CKD. JW  
 DATE: 02/20/20



**WESTTECH ENGINEERING, INC.**  
 CONSULTING ENGINEERS AND PLANNERS

**WE**

3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 585-2474 Fax: (503) 585-3966  
 E-mail: westtech@westtech-eng.com

LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS  
 CIVIL DETAILS

DRAWING  
**C6.0**

JOB NUMBER  
 3132.0000.0



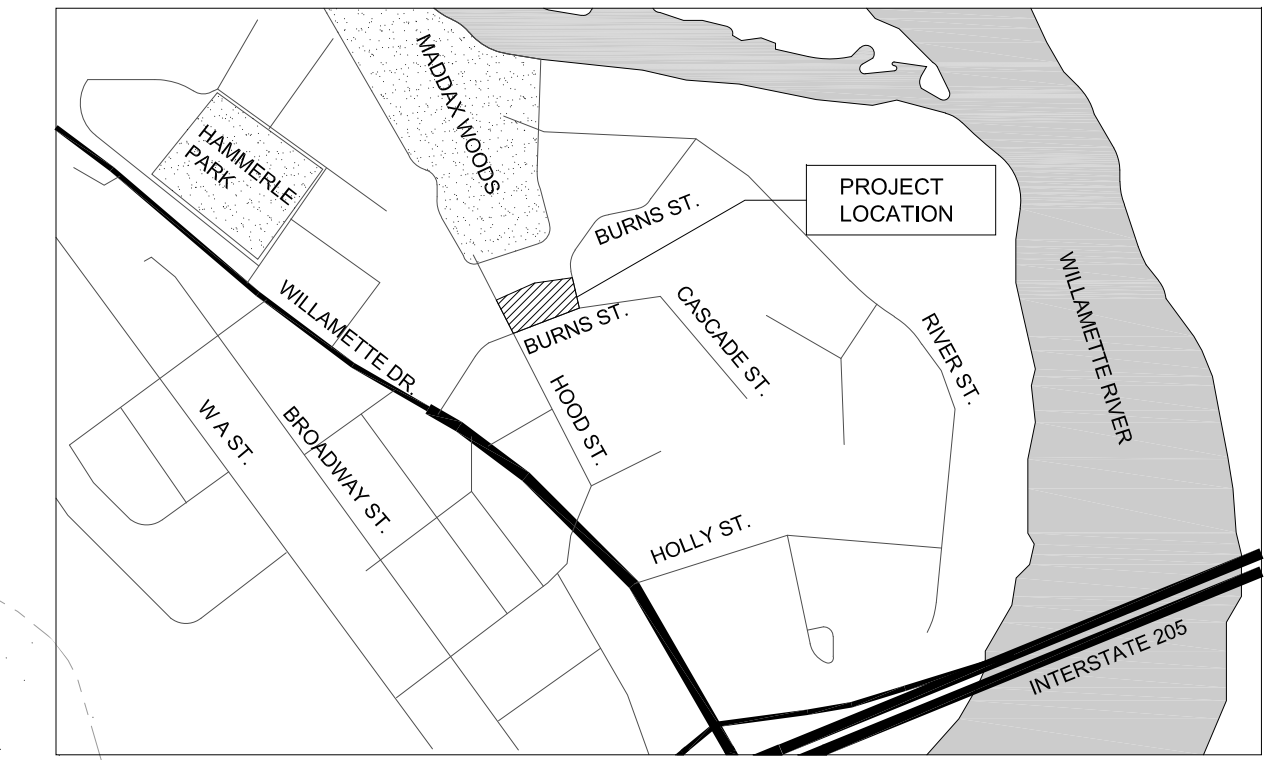
**SITE PLAN LEGEND**

- # = KEYNOTE TAG
- [Solid Line] = BUILDING FOOTPRINT
- [Dotted Pattern] = CONCRETE PAVING AREA
- [Stippled Pattern] = LANDSCAPED AREA
- [Light Dotted Pattern] = SITE LIGHTING LOCATION. SEE PHOTOMETRICS & ELEC. DRAWINGS.

**SITE PLAN KEYNOTES**

- 1 NEW BIKE RACK FOR 4 BIKES, 2 SPACES UNDER EXTENDED ROOF
- 2 COVERED BRICK-CLAD WASTE ENCLOSURE. EXTEND ROOF OVER BIKE PARKING.
- 3 SITE STAIR DOWN TO LOWER PARKING AREA
- 4 6' WIDE PEDESTRIAN CIRCULATION WALKWAY. ADDITIONAL 2' ADDED AT PARKING FOR BUMPER OVERHANGS.
- 5 CANOPY ABOVE ENTRYWAY SHOWN DASHED.
- 6 30'X30' VISION CLEARANCE TRIANGLE.

**VICINITY MAP** N.T.S.



**PROJECT STATS:**

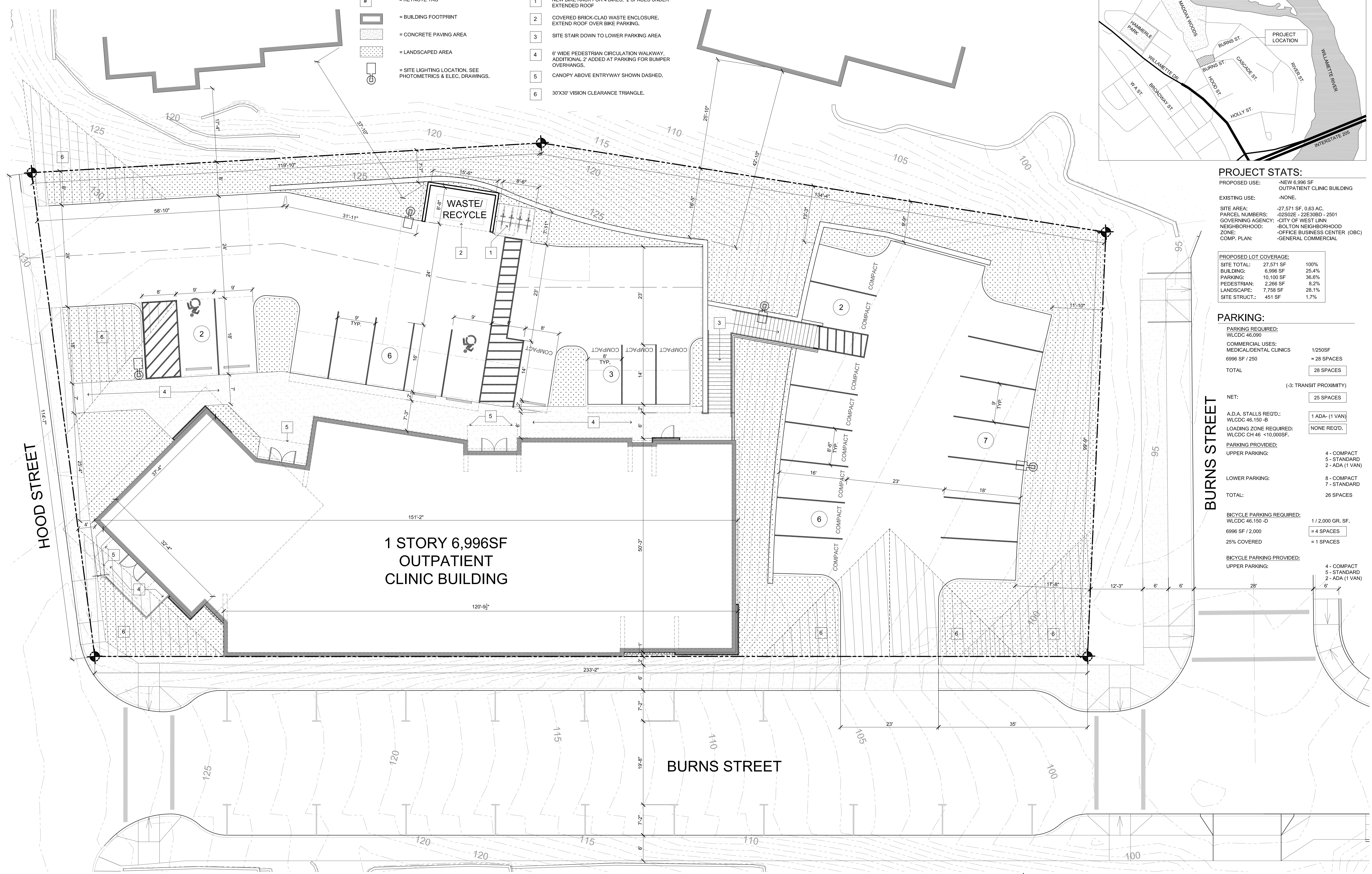
PROPOSED USE: NEW 6,996 SF OUTPATIENT CLINIC BUILDING  
 EXISTING USE: NONE  
 SITE AREA: -27,571 SF, 0.63 AC.  
 PARCEL NUMBERS: -02502E - 22E30BD - 2501  
 GOVERNING AGENCY: CITY OF WEST Linn  
 NEIGHBORHOOD: -BOLTON NEIGHBORHOOD  
 ZONE: -OFFICE BUSINESS CENTER (OBC)  
 COMP. PLAN: -GENERAL COMMERCIAL

**PROPOSED LOT COVERAGE:**

SITE TOTAL:	27,571 SF	100%
BUILDING:	6,996 SF	25.4%
PARKING:	10,100 SF	36.6%
PEDESTRIAN:	2,266 SF	8.2%
LANDSCAPE:	7,758 SF	28.1%
SITE STRUCT.:	451 SF	1.7%

**PARKING:**

PARKING REQUIRED:  
 WLCDC 46.090  
 COMMERCIAL USES:  
 MEDICAL/DENTAL CLINICS  
 6996 SF / 250  
 TOTAL  
 28 SPACES  
 (-3: TRANSIT PROXIMITY)  
 25 SPACES  
 NET:  
 A.D.A. STALLS REQ'D:  
 WLCDC 46.150 - B  
 1 ADA - (1 VAN)  
 LOADING ZONE REQUIRED:  
 WLCDC CH 46 <10,000SF.  
 NONE REQ'D.  
 PARKING PROVIDED:  
 UPPER PARKING:  
 4 - COMPACT  
 5 - STANDARD  
 2 - ADA (1 VAN)  
 LOWER PARKING:  
 8 - COMPACT  
 7 - STANDARD  
 TOTAL:  
 26 SPACES  
 BICYCLE PARKING REQUIRED:  
 WLCDC 46.150 - D  
 6996 SF / 2,000  
 25% COVERED  
 1 / 2,000 GR. SF.  
 = 4 SPACES  
 = 1 SPACES  
 BICYCLE PARKING PROVIDED:  
 UPPER PARKING:  
 4 - COMPACT  
 5 - STANDARD  
 2 - ADA (1 VAN)



PRELIMINARY  
 NOT FOR  
 CONSTRUCTION

**lenity**  
 architecture, inc.  
 3150 Kettle Court SE, Salem, Oregon 97301  
 P 503.399.1050 F 503.399.0565 W lenityarchitecture.com

**EMMETT PHAIR**  
 CONSTRUCTION  
 6305 SW ROSEWOOD ST. SUITE E,  
 LAKE OSWEGO, OR 97035  
 phone: 503-572-8606

NEW BUILDING  
 FOR ADVANCE DENTAL  
 ARTS CENTER  
 1575 BURNS ST., WEST LINN, OR 97068

**SITE PLAN**

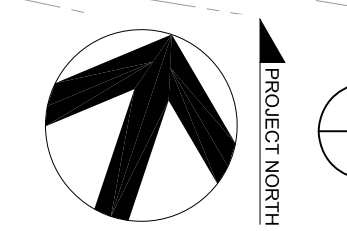
DATE  
 2/14/2020

REVISED DATE

SHEET

A1.1

DESIGN REVIEW SET



1 SITE PLAN  
 SCALE: 1" = 10'-0"





PRELIMINARY  
NOT FOR  
CONSTRUCTION

**lenity**  
architecture, inc.  
3750 N. Kenton, Suite 100  
Portland, Oregon 97205  
P: 503-399-1090 F: 503-399-0565  
www.lenityarchitecture.com

**EMMETT PHAIR**  
CONSTRUCTION  
6305 SW ROSEWOOD ST, SUITE E,  
LAKE OSWEGO, OR, 97035  
phone: 503-572-8806

NEW BUILDING  
FOR ADVANCE DENTAL  
ARTS CENTER  
1575 BURNS ST., WEST LINN, OR 97068

EXTERIOR  
BUILDING  
ELEVATIONS

DATE  
2/14/2020

REVISED DATE

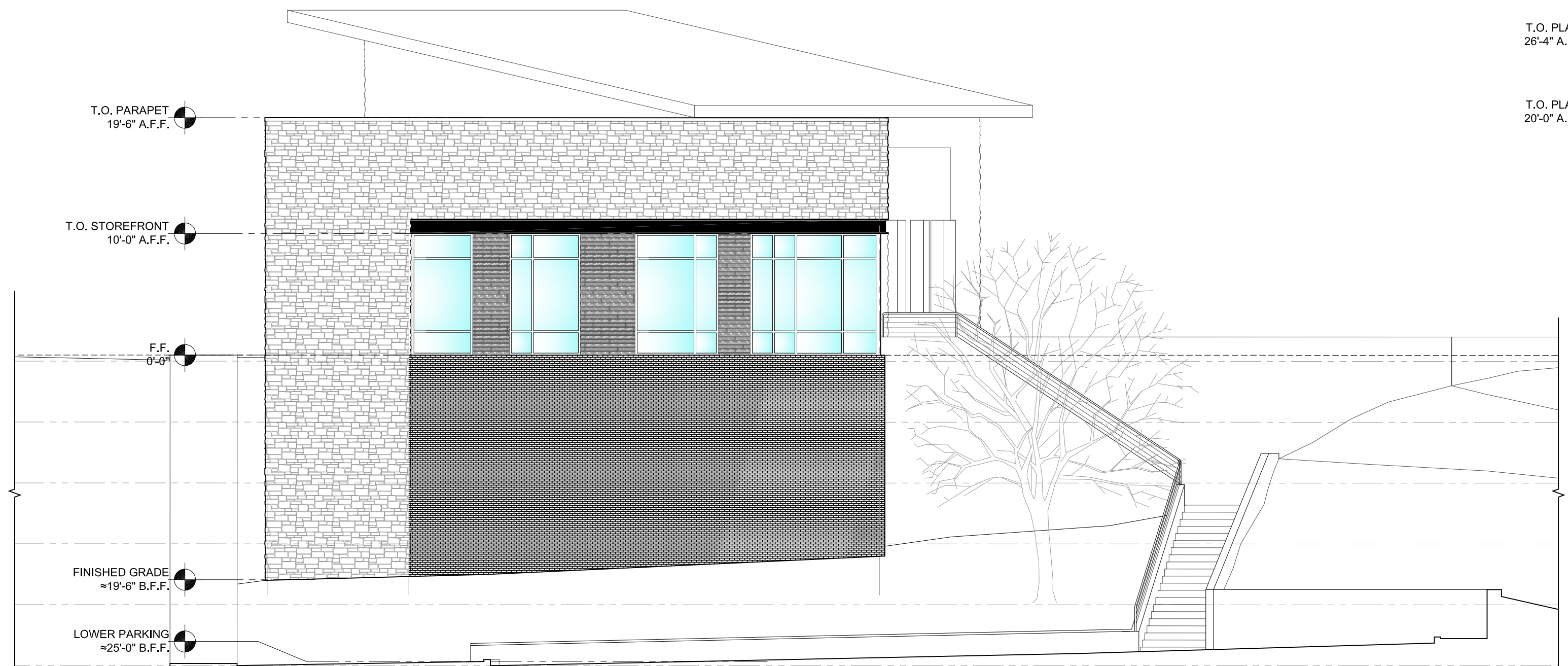
SHEET

A6.1

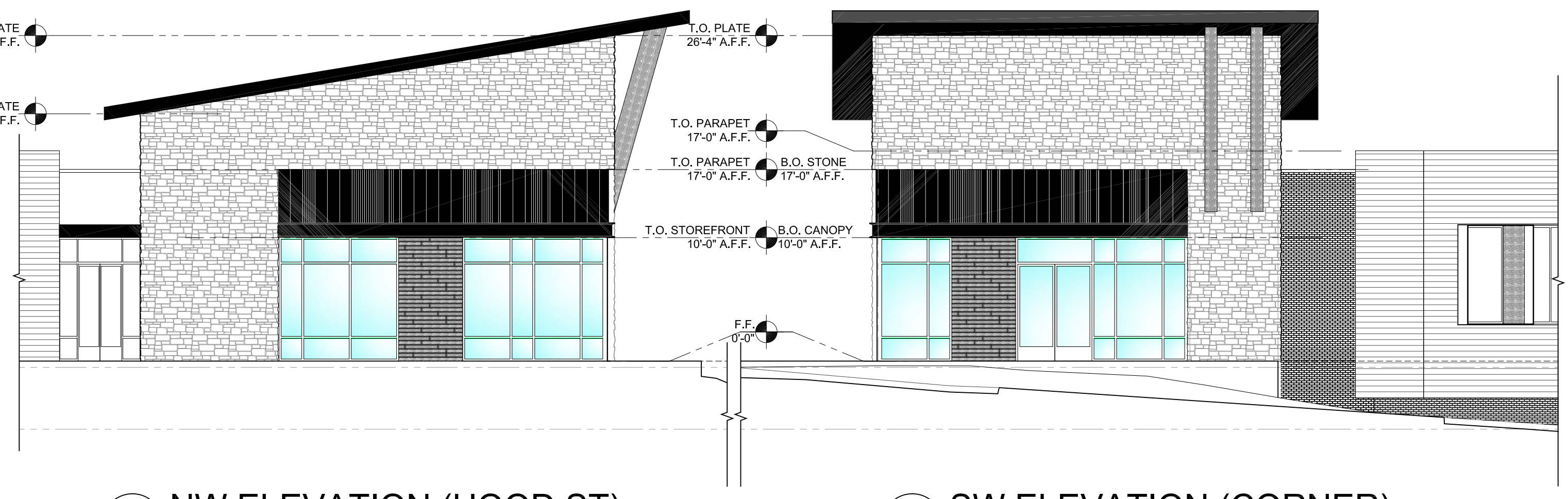
DESIGN REVIEW SET



**A SOUTH ELEVATION (BURNS ST)**  
SCALE: 1/8"=1'-0"



**B EAST ELEVATION (BURNS ST)**  
SCALE: 1/8"=1'-0"



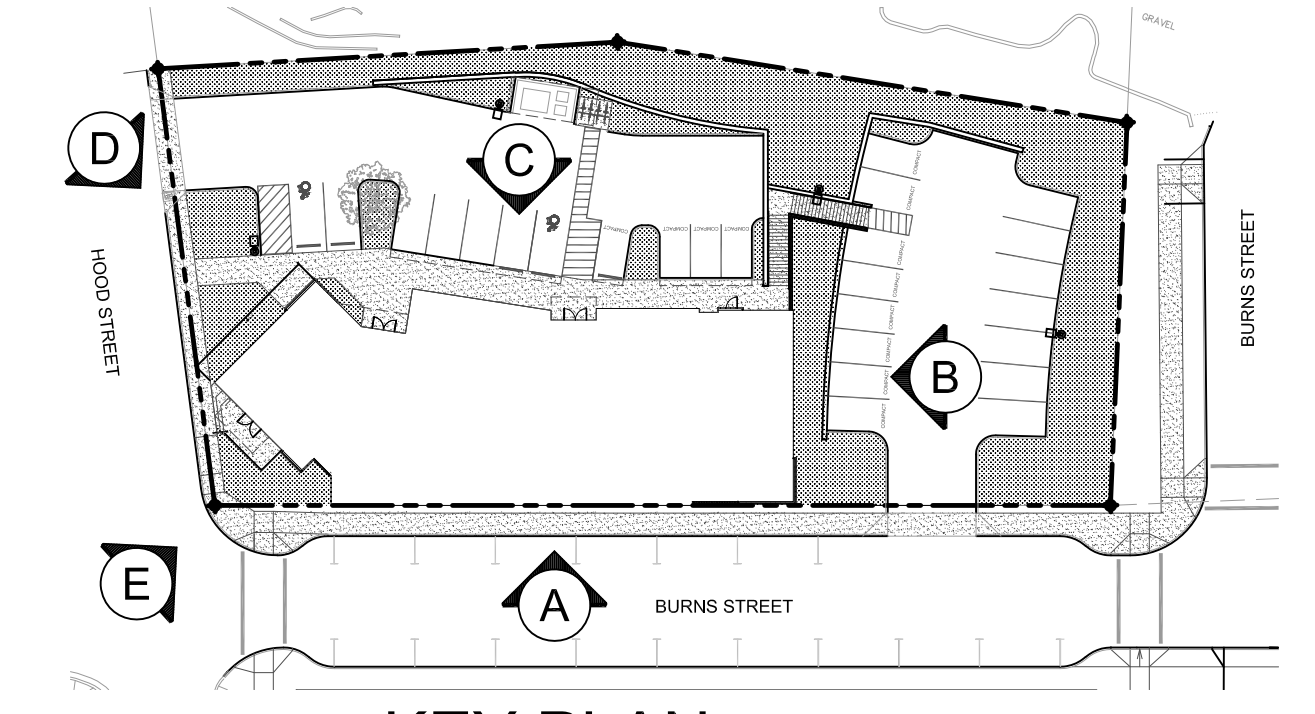
**D NW ELEVATION (HOOD ST)**  
SCALE: 1/8"=1'-0"



**E SW ELEVATION (CORNER)**  
SCALE: 1/8"=1'-0"



**C NORTH ELEVATION (PARKING LOT)**  
SCALE: 1/8"=1'-0"



KEY PLAN  
NTS





DATE: 2/14/2020  
 REVISED DATE:  
 SHEET: E1.1

# ELECTRICAL SITE PLAN

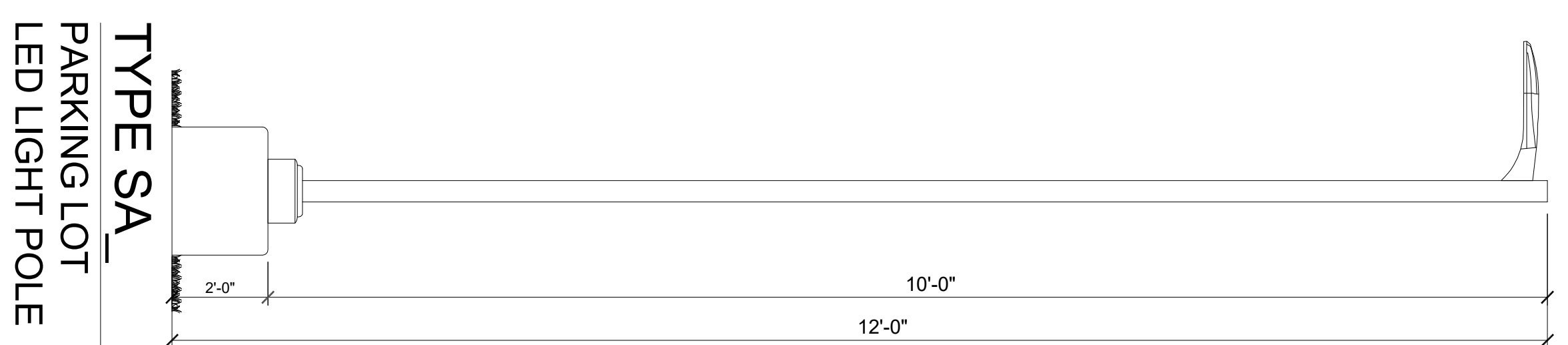
NEW BUILDING FOR ADVANCED DENTAL ARTS CENTER  
 1575 BURNS ST. WEST LINN, OR 97068

**EMMETT PHAIR**  
 CONSTRUCTION  
 6305 SW ROSEWOOD ST. SUITE E,  
 LAKE OSWEGO, OR 97035  
 phone: 503-572-8606

**lenity**  
 architecture, inc.  
 3150 Kettle Court SE, Salem, Oregon 97301  
 503 399 1090 503 399 0565 lenityarchitecture.com

PRELIMINARY  
 NOT FOR  
 CONSTRUCTION





**TYPE SA**  
PARKING LOT  
LED LIGHT POLE

TYPE	DESCRIPTION	LAMP	MANUFACTURE
	CATEGORY: 7- SURFACE DOWNLIGHT HOUSING: ALUMINUM LENS/REFL: WAVESTREAM POLYMER BALLAST: ELECTRONIC D VOLTAGE: 120 WATTAGE: 13 LISTING/STND: UL, L70/50,000 FINISH: WHITE MSC:	TYPE: LED QUANTITY: 3000 CCT (K): 3000 CRI: 80 LUMENS: 1200 MSC: L70/50,000 LIFE:	JUNO LIGHTING JLF-71N1DLA-30K-90CRI-AM-VOLT-TZ1-WH
	CATEGORY: LED SITE AREA LUMINAIRE - 10 POLE HOUSING: 25"x13"x7" (LXVWH) CAST ALUMINUM LENS/REFL: TYPE 2 MEDIUM BALLAST: ELECTRONIC S24H VOLTAGE: MVOLT WATTAGE: 49 LISTING/STND: IP66 FINISH: BRONZE MSC: PROVIDE HOUSE SIDE SHIELD	TYPE: LED QUANTITY: 3000 CCT (K): 3000 CRI: 70 LUMENS: 5,593 MSC: BUG - 101 LIFE: L85/100,000	LITHONIA LIGHTING DSXO LED-P23BK-12M-AM-VOLT-PIR HS-DOBXO
	CATEGORY: LED SITE AREA LUMINAIRE - 10 POLE HOUSING: 25"x13"x7" (LXVWH) CAST ALUMINUM LENS/REFL: TYPE 4 MEDIUM BALLAST: ELECTRONIC S24H VOLTAGE: MVOLT WATTAGE: 49 LISTING/STND: IP66 FINISH: BRONZE MSC: PROVIDE HOUSE SIDE SHIELD	TYPE: LED QUANTITY: 3000 CCT (K): 3000 CRI: 70 LUMENS: 5,458 MSC: BUG - 102 LIFE: L85/100,000	LITHONIA LIGHTING DSXO LED-P23BK-12M-AM-VOLT-PIR HS-DOBXO
	CATEGORY: LED SITE AREA LUMINAIRE - 10 POLE HOUSING: 25"x13"x7" (LXVWH) CAST ALUMINUM LENS/REFL: TYPE 5 MEDIUM BALLAST: ELECTRONIC S45 VOLTAGE: MVOLT WATTAGE: 49 LISTING/STND: IP66 FINISH: BRONZE MSC: PROVIDE HOUSE SIDE SHIELD	TYPE: LED QUANTITY: 3000 CCT (K): 3000 CRI: 70 LUMENS: 5,789 MSC: BUG - 101 LIFE: L85/100,000	LITHONIA LIGHTING DSXO LED-P23BK-12M-AM-VOLT-PIR HS-DOBXO
	CATEGORY: WALL MOUNTED LED HOUSING: (4.5"x4.5"x7.125") ALUMINUM LENS/REFL: 33-DEGREE DOWNLIGHT FLOOD BALLAST: ELECTRONIC S2D VOLTAGE: MVOLT WATTAGE: 25 LISTING/STND: IP66 FINISH: BRONZE MSC:	TYPE: LED QUANTITY: 3000 CCT (K): 3000 CRI: 85 LUMENS: 2390 MSC: L70/90,000 LIFE:	WAC LIGHTING DC-WS95-F-830S-BZ
	CATEGORY: WALL MOUNTED LED HOUSING: (5.5"x6.5"x18") ALUMINUM LENS/REFL: 38-DEGREE UP/DOWN FLOOD BALLAST: ELECTRONIC S2DU VOLTAGE: MVOLT WATTAGE: 35 LISTING/STND: IP66 FINISH: BRONZE MSC:	TYPE: LED QUANTITY: 3000 CCT (K): 3000 CRI: 85 LUMENS: 7090 MSC: L70/90,000 LIFE:	WAC LIGHTING DC-WD96-F-830S-BZ

DATE: 2/14/2020  
REVISID DATE: \_\_\_\_\_  
SHEET: \_\_\_\_\_  
E1.2

LUMINAIRE SCHEDULE & DETAIL SCHEDULE

NEW BUILDING FOR ADVANCE DENTAL ARTS CENTER  
1575 BURNS ST. WEST LINN, OR 97068

EMMETT PHAIR CONSTRUCTION  
6305 SW ROSEWOOD ST. SUITE E, LAKE OSWEGO, OR 97035  
phone: 503-572-8606

lenity architecture, inc.  
3150 Kettle Court SE, Salem, Oregon 97301  
P 503 399 1090 F 503 399 0565 wlenityarchitecture.com

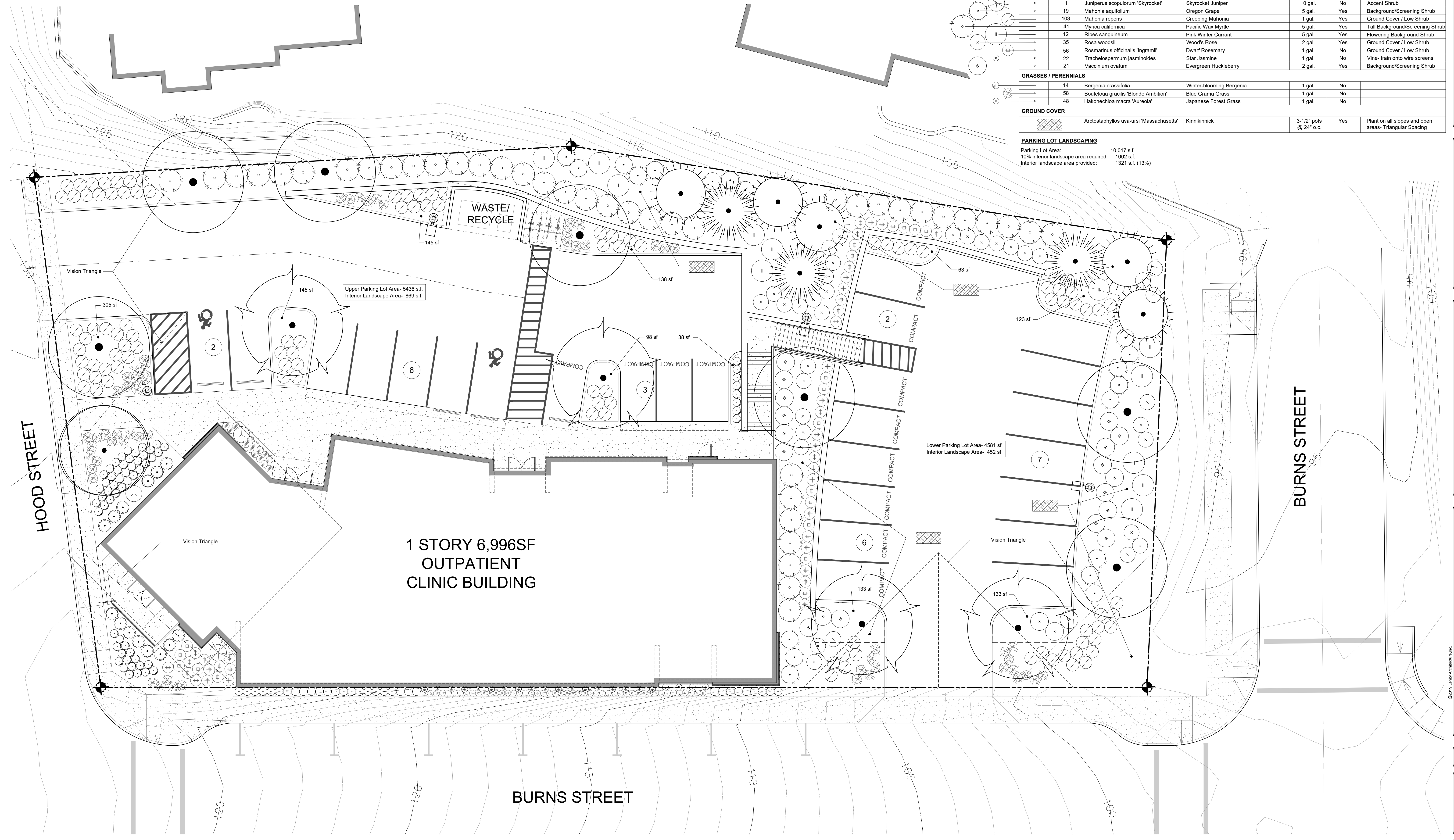
PRELIMINARY NOT FOR CONSTRUCTION



- Notes-
- Soil Preparation for all building area planting beds (per 1000 s.f.):  
5 cu. yds. organic compost free of biosolids & harmful pathogens  
100 lbs. Gro-Power Plus w/M (mycorrhizae)  
Spread evenly and rototill into soil in two directions to a depth of 8"  
Do not disturb slopes (no soil preparation)
  - Backfill mixture for trees and shrubs (per cu. yd.):  
2/3 site soil  
1/3 organic compost free of biosolids & harmful pathogens  
10 lbs. Gro-Power 12-8-8 Controlled Release fertilizer  
3 lbs. Gro-Power Gro-Life granular fertilizer
  - All shrub/ground cover beds to receive a 2" layer of bark mulch, submit samples to Owner for selection.
  - All landscape areas shall be irrigated with a permanent automated irrigation system utilizing SMART Technology. Landscape Contractor shall submit a Design/Build Irrigation Plan and bid to Owner for approval. Provide additional irrigation bubblers or drip emitter assemblies for all trees.

PLANTING SCHEDULE						
SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	NATIVE	REMARKS
<b>TREES</b> Note-some tree symbols are reduced in scale in Planting Schedule						
→	4	<i>Cercis canadensis</i>	Eastern Redbud	2" cal. B&B	No	Standard-branching @ 7 ft.
→	1	<i>Styrax obassia</i>	Fragrant Snowbell Tree	1-1/2" cal. B&B	No	Accent Tree- natural form
→	5	<i>Thuja plicata 'Fastigiata'</i>	Hogan Cedar	6-7 ft. B&B	Yes	Low-branching
→	3	<i>Tsuga heterophylla</i>	Western Hemlock	6-7 ft. B&B	Yes	Low-branching
→	7	<i>Zeikova serrata 'City Sprite'</i>	City Sprite Sawleaf Zeikova	2" cal. B&B	No	Standard-branching @ 7 ft.
<b>SHRUBS</b>						
→	2	<i>Camellia sasanqua 'Setsugekka'</i>	Setsugekka Camellia	5 gal.	No	Accent Shrub
→	61	<i>Erica vagans 'Mrs D.F. Maxwell'</i>	Mrs D.F. Maxwell Cornish Heath	1 gal.	No	Ground Cover / Low Shrub
→	14	<i>Hebe pinguifolia 'Sutherlandii'</i>	Sutherland's Hebe	2 gal.	No	Foundation Shrub
→	32	<i>Ilex crenata 'Helleri'</i>	Heller's Japanese Holly	2 gal.	No	Foundation Shrub
→	1	<i>Juniperus scopulorum 'Skyrocket'</i>	Skyrocket Juniper	10 gal.	No	Accent Shrub
→	19	<i>Mahonia aquifolium</i>	Oregon Grape	5 gal.	Yes	Background/Screening Shrub
→	103	<i>Mahonia repens</i>	Creeping Mahonia	1 gal.	Yes	Ground Cover / Low Shrub
→	41	<i>Myrica californica</i>	Pacific Wax Myrtle	5 gal.	Yes	Tall Background/Screening Shrub
→	12	<i>Ribes sanguineum</i>	Pink Winter Currant	5 gal.	Yes	Flowering Background Shrub
→	35	<i>Rosa woodii</i>	Wood's Rose	2 gal.	Yes	Ground Cover / Low Shrub
→	56	<i>Rosmarinus officinalis 'Ingramii'</i>	Dwarf Rosemary	1 gal.	No	Ground Cover / Low Shrub
→	22	<i>Trachelospermum jasminoides</i>	Star Jasmine	1 gal.	No	Vine- train onto wire screens
→	21	<i>Vaccinium ovatum</i>	Evergreen Huckleberry	2 gal.	Yes	Background/Screening Shrub
<b>GRASSES / PERENNIALS</b>						
→	14	<i>Bergenia crassifolia</i>	Winter-blooming Bergenia	1 gal.	No	
→	58	<i>Bouteloua gracilis 'Blonde Ambition'</i>	Blue Grama Grass	1 gal.	No	
→	48	<i>Hakonechloa macra 'Aureola'</i>	Japanese Forest Grass	1 gal.	No	
<b>GROUND COVER</b>						
→		<i>Arcostaphylos uva-ursi 'Massachusetts'</i>	Kinnikinnick	3-1/2" pots @ 24" o.c.	Yes	Plant on all slopes and open areas- Triangular Spacing

**PARKING LOT LANDSCAPING**  
 Parking Lot Area: 10,017 s.f.  
 10% interior landscape area required: 1002 s.f.  
 Interior landscape area provided: 1321 s.f. (13%)



PRELIMINARY  
NOT FOR  
CONSTRUCTION

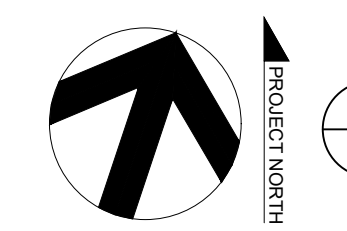
**lenity**  
 architecture, inc.  
 3150 Kettle Court SE, Salem, Oregon 97301  
 phone: 503.399.1050

**EMMETT PHAIR**  
 CONSTRUCTION  
 6305 SW ROSEWOOD ST., SUITE E,  
 LAKE OSWEGO, OR 97035  
 phone: 503-572-8606

NEW BUILDING  
FOR ADVANCE DENTAL  
ARTS CENTER  
1575 BURNS ST., WEST LINN, OR 97068

**LANDSCAPE PLAN**  
 L1.1

DATE  
2/14/2020  
 REVISED DATE  
 SHEET  
L1.1  
 DESIGN REVIEW SET

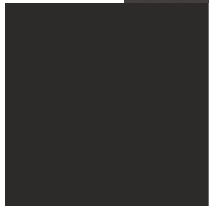


1 LANDSCAPE PLAN  
 SCALE: 1" = 10'





# MATERIAL AND COLOR BOARD

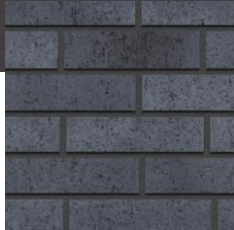


**Metal Siding**

MFR: Morin

Color: Bristol Black

Trim/Fascia to match

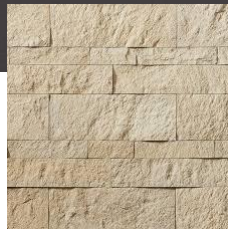


**Brick**

MFR: Pacific Clay

Color: Dark Iron Spot

Texture: Modular Smooth



**Stone**

MFR: Boral

Series: Talus

Color: Hewn Stone



**Siding**

MFR: James Hardie

Color: Dovetail - SW 7108



**Wood Lap**

MFR: Woodtone on Allura

Style: Rustic Series

Colors: Aspen Ridge/Maple/Old Cherry

New Building for Advance Dental Arts Center - 1575 Burns Street



EXTERIOR LIGHTING  
CUTSHEETS

New Building for Advance Dental Arts  
Center

1575 Burns St. West Linn, OR 97068



# JUNO SLIMFORM™ LED SURFACE MOUNT DOWNLIGHTS

FOR J-BOX INSTALLATION  
5", 7", 11", 13" ROUND

## JSF SERIES

Project: \_\_\_\_\_

Fixture Type: \_\_\_\_\_

Location: \_\_\_\_\_

Contact/Phone: \_\_\_\_\_



### PRODUCT DESCRIPTION

Sleek, ultra-low profile energy efficient LED surface mount downlights in multiple sizes from 5" to 13" • Provides economical installation by mounting directly over standard and fire-rated junction boxes • Optional finish trims and shrouds available for custom, designer look similar to standard recessed downlights • Provides general illumination in residential and commercial applications including multi-family and hospitality • Ideal for use in corridors, living spaces, closets, hallways, pantries, stairways, outdoor covered areas and much more.

### PRODUCT SPECIFICATIONS

**Construction** Shallow, less than 1", solid ring with white finish

• Non conductive fixture for shower light applications • Optional, field installable finish trims available for 5" and 7" versions to change the exterior finish of fixture • Optional, field installable decorative baffle and cone shrouds for 5" and 7" versions provide the aesthetic and source shielding similar to the experience of a fully recessed downlight.

**Optics** Light guide technology combined with diffusing lens conceals the LEDs from direct view and provides uniform lens luminance.

**LED Light Engine** LEDs mounted directly to heatsink designed to provide superior thermal management and ensure long life • 2700K, 3000K, 3500K or 4000K LED color temperature • LEDs binned for 4-step MacAdam ellipse color consistency • 90 CRI minimum.

**LED Driver** Choice of dedicated 120 volt (120) driver or universal voltage (MVOLT) driver that accommodates input voltages from 120-277 volts AC at 50/60Hz • Power factor > 0.9 at 120V input • 120 volt driver is dimmable with the use of most incandescent, magnetic low voltage and electronic low voltage wall box dimmers • Universal voltage driver is dimmable with the use of most 0-10V wall box dimmers • External driver is only available on 5" and 7" models • For a list of compatible dimmers, see [JUNOSLIMFORM-DIM](#).

**Emergency Battery Option** Available on fixture sizes 11" and larger • Battery factory assembled to fixture with integral test switch (EL option) • Drives LEDs for 90 minutes to meet Life Safety Code (NFPA-LSC), National Electrical Code (NEC), and UL requirements • Emergency battery not available in California due to Title 20 restrictions • EBX option provides back box without battery for consistent look when used in same space as fixtures with EL emergency option.

**Life** Rated for 50,000 hours at >70% lumen maintenance.

**Labels** ENERGY STAR® certified • Certified to the high efficacy requirements of California T24 JA8-2016 • CSA listed for US and Canada • Suitable for wet locations (covered ceilings).

**Testing** All reports are based on published industry procedures; actual performance may differ as a result of the end-user environment and applications. All values are design or typical values, measured under laboratory conditions at 25 °C.

**Warranty** 5-year limited warranty. Complete warranty terms located at [www.acuitybrands.com/CustomResources/Terms\\_and\\_conditions.aspx](http://www.acuitybrands.com/CustomResources/Terms_and_conditions.aspx)

Specifications subject to change without notice.

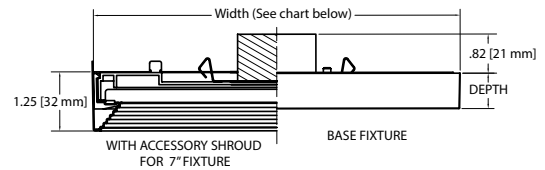
### INSTALLATION

**Junction Box Mounting** Fixture provided with leads for direct wire connection in j-box • Installs directly to industry standard junction boxes • Compatible boxes include 4" metal or plastic octagonal standard and fire-rated junction boxes (3 1/2" junction box screw-hole spacing required for installation) • Minimum 2 1/8" deep junction box required for 5" and 7" fixtures (no depth requirement for 11" and larger fixtures) • Quick mount bracket provides fast installation of fully assembled fixture to junction box • Suitable for ceiling mount • Suitable for use within closet storage spaces when installed per NEC requirements.

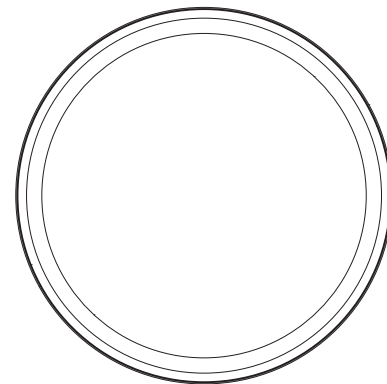
*Junction box sizes vary - Verify compatibility with fixture prior to installation*



### DIMENSIONS



External driver available on 5" and 7" models only.

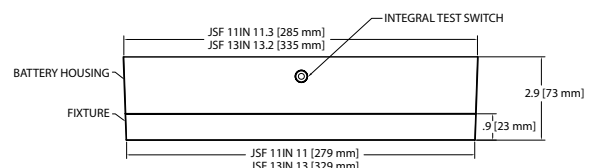


### ROUND SPECIFICATIONS

	Width	Depth
JSF 5IN	5.25 (13.34)	0.75 (1.91)
JSF 7IN	7.77 (19.74)	0.75 (1.91)
JSF 11IN	11.08 (28.14)	0.9 (2.29)
JSF 13IN	13.05 (33.15)	0.9 (2.29)

All dimensions are in inches (centimeters) unless otherwise indicated.

### EMERGENCY BATTERY FOR 11" AND 13"



# JUNO SLIMFORM™ LED SURFACE MOUNT DOWNLIGHTS

FOR J-BOX INSTALLATION  
5", 7", 11", 13" ROUND  
**JSF SERIES**

## PERFORMANCE DATA

	JSF 5IN		JSF 7IN		JSF 11IN		JSF 13IN	
	120V	MVOLT	120V	MVOLT	120V	MVOLT	120V	MVOLT
Lumens	700	700	1000	1000	1300	1300	1800	1800
CRI	90CRI		90CRI		90CRI		90CRI	
CCT	27K, 30K, 35K, 40K		27K, 30K, 35K, 40K		27K, 30K, 35K, 40K		27K, 30K, 35K, 40K	
Voltage	120V	120V-277V	120V	120V-277V	120V	120V-277V	120V	120V-277V
Input Power	10W	10W	13W	13W	15W	15W	20W	20W
Input Current	110MA	50MA	150MA	60MA	180MA	80MA	240MA	110MA
Frequency	50/60Hz		50/60Hz		50/60Hz		50/60Hz	
Power Factor	>0.9		>0.9		>0.9		>0.9	

## ORDERING INFORMATION

Example: JSF 5IN 07LM 27K 90CRI 120 FRPC WH

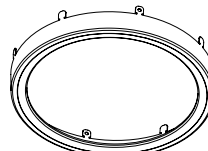
Series	Size/Lumens	Color Temperature	CRI	Voltage/Driver	Finish	Emergency Battery <sup>1,2,3</sup>
JSF SlimForm Surface Mount Downlight - Round	5IN 07LM 5", 700 Lumens	27K 2700K	90CRI 90+ CRI	120 FRPC Dedicated 120V, Forward Reverse Phase Dimmign MVOLT ZT Universal Voltage 120V-277V, 0-10V Dimming	WH White	EL <sup>3</sup> Battery Back-up Option EBX Empty Back Box for Aesthetics
	7IN 10LM 7", 1000 Lumens	30K 3000K				
	11IN 13LM 11", 1300 Lumens	35K 3500K				
	13IN 18LM 13", 1800 Lumens	40K 4000K				

## ACCESSORIES

**TRIM** – Optional, field installable finish trim rings available to change the exterior finish of fixture.

Example: JSFTRIM 5IN BL

Series	Size	Finish
JSFTRIM SlimForm Accessory- Trim	5IN 5 inches	BL Black
	7IN 7 inches	BZ Bronze
		SN Satin Nickel

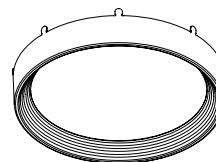


**TRIM**

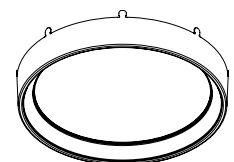
**SHROUD** – Optional, field installable decorative baffle and cone shrouds provides the aesthetic and source shielding similar to the experience of a fully recessed downlight.

Example: JSFSHROUD 5IN DB WWH

Series	Size	Shroud Style	Finish
JSFSHROUD SlimForm Accessory Shroud - Round	5IN 5 inches	DB Downlight Baffle	WWH White trim, white shroud
	7IN 7 inches	DC Downlight Cone	BWH <sup>4</sup> Black trim, white shroud
			HZWH Haze trim, white shroud
			WHZWH Wheat Haze trim, white shroud



**BAFFLE SHROUD**



**CONE SHROUD**

Note:

- Emergency battery available with 11IN and 13IN only.
- Emergency battery is only available with MVOLT ZT.
- Emergency battery option not available in California due to Title 20 restrictions.
- BWH only available with downlight baffle.

# JUNO SLIMFORM™ LED SURFACE MOUNT DOWNLIGHTS

FOR J-BOX INSTALLATION

5", 7", 11", 13" ROUND

## JSF SERIES

### PHOTOMETRICS

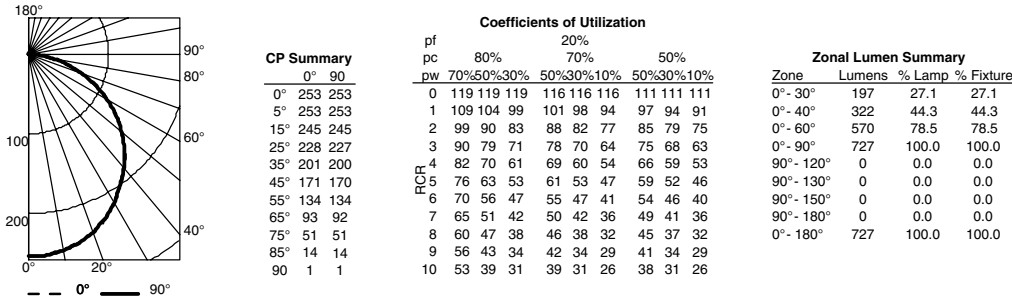
**Distribution Curve**

**Distribution Data**

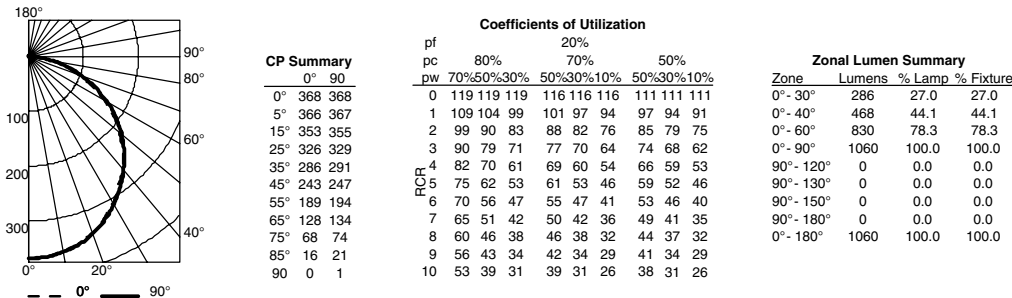
**Coefficient of Utilization**

**Illuminance Data at 30" Above Floor for a Single Luminaire**

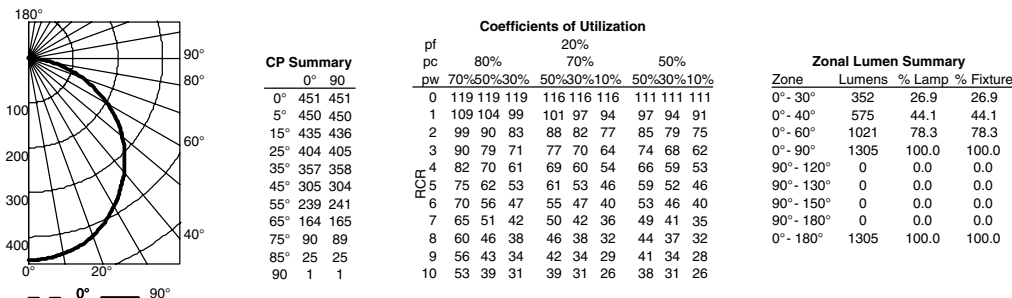
**JSF 5IN 27K**, 2700K LEDs, input watts: 9.72, delivered lumens: 727, LM/W = 74.8, test no. ISF 33599, tested in accordance to IESNA LM-79.



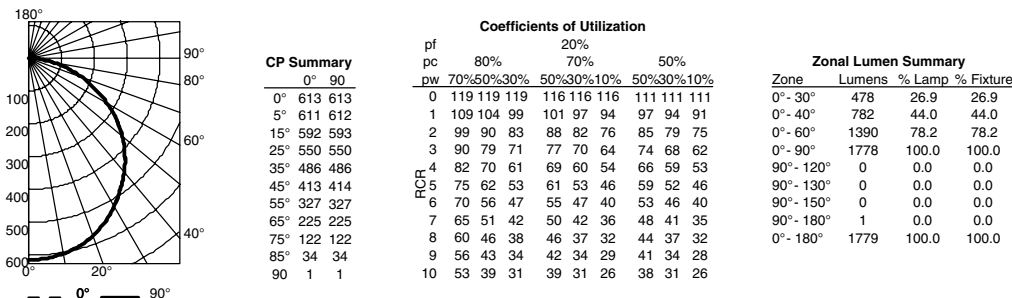
**JSF 7IN 27K**, 2700K LEDs, input watts: 12.8, delivered lumens: 1060, LM/W = 82.8, test no. ISF 33600, tested in accordance to IESNA LM-79.



**JSF 11IN 27K**, 2700K LEDs, input watts: 15.2, delivered lumens: 1305, LM/W = 85.9, test no. ISF 33661, tested in accordance to IESNA LM-79.



**JSF 13IN 27K**, 2700K LEDs, input watts: 20.2, delivered lumens: 1779, LM/W = 88, test no. ISF 33663, tested in accordance to IESNA LM-79.



For 30K fixtures, use 1.02 multiplier; For 35K fixtures, use 1.03 multiplier, For 40K fixtures, use 1.07 multiplier.



# D-Series Size 0 LED Area Luminaire



Catalog Number
Notes
Type

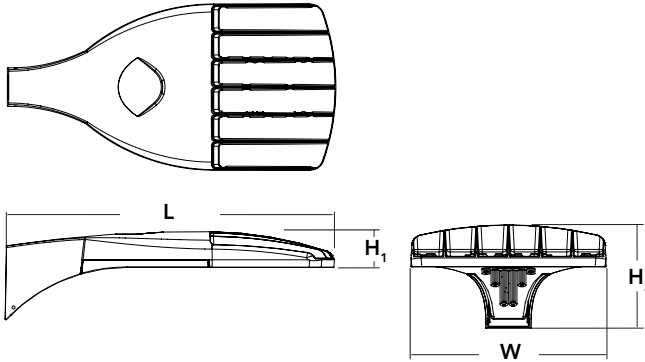
Hit the Tab key or mouse over the page to see all interactive elements.

## Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment. The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 400W metal halide with typical energy savings of 70% and expected service life of over 100,000 hours.

## Specifications

EPA:	0.95 ft <sup>2</sup> (.09 m <sup>2</sup> )
Length:	26" (66.0 cm)
Width:	13" (33.0 cm)
Height <sub>1</sub> :	3" (7.62 cm)
Height <sub>2</sub> :	7" (17.8 cm)
Weight (max):	16 lbs (7.25 kg)



A+ Capable options indicated by this color background.

## Ordering Information

**EXAMPLE:** DSX0 LED P6 40K T3M MVOLT SPA NLTAIR2 PIRHN DDBXD

DSX0 LED	Series	LEDs	Color temperature	Distribution	Voltage	Mounting		
DSX0 LED	<b>Forward optics</b>	P1 P4 P7	30K 3000 K	T1S Type I short (Automotive)	T5S Type V short <sup>2</sup>	MVOLT <sup>4,5</sup>	<b>Shipped included</b> SPA Square pole mounting RPA Round pole mounting WBA Wall bracket <sup>2</sup> SPUMBA Square pole universal mounting adaptor <sup>7</sup> RPUMBA Round pole universal mounting adaptor <sup>7</sup> <b>Shipped separately</b> KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish) <sup>8</sup>	
		P2 P5	40K 4000 K	T2S Type II short	T5M Type V medium <sup>2</sup>	120 <sup>5</sup>		
		P3 P6	50K 5000 K	T2M Type II medium	T5W Type V wide <sup>2</sup>	208 <sup>5</sup>		
		<b>Rotated optics</b>	P10 <sup>1</sup> P12 <sup>1</sup>		T3S Type III short	BLC Backlight control <sup>3</sup>		240 <sup>5</sup>
			P11 <sup>1</sup> P13 <sup>1</sup>		T3M Type III medium	LCCO Left corner cutoff <sup>3</sup>		277 <sup>5</sup>
					T4M Type IV medium	RCCO Right corner cutoff <sup>3</sup>		347 <sup>5,6</sup>
					TFTM Forward throw medium			480 <sup>5,6</sup>
					T5VS Type V very short <sup>2</sup>			

Control options	Other options	Finish (required)
<b>Shipped installed</b> NLTAIR2 nLight AIR generation 2 enabled <sup>9,10</sup> PIRHN Network, high/low motion/ambient sensor <sup>11</sup> PER NEMA twist-lock receptacle only (control ordered separate) <sup>12</sup> PER5 Five-pin receptacle only (control ordered separate) <sup>12,13</sup> PER7 Seven-pin receptacle only (leads exit fixture) (control ordered separate) <sup>12,13</sup> DMG 0-10V dimming extend out back of housing for external control (control ordered separate) <sup>14</sup>	<b>Shipped installed</b> HS House-side shield <sup>18</sup> SF Single fuse (120, 277, 347V) <sup>5</sup> DF Double fuse (208, 240, 480V) <sup>5</sup> L90 Left rotated optics <sup>1</sup> R90 Right rotated optics <sup>1</sup> DDL Diffused drop lens <sup>18</sup> <b>Shipped separately</b> BS Bird spikes <sup>19</sup> EGS External glare shield	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white
PIR High/low, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 5fc <sup>15,16</sup> PIRH High/low, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 5fc <sup>15,16</sup> PIR1FC3V High/low, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 1fc <sup>15,16</sup> PIRH1FC3V High/low, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 1fc <sup>15,16</sup> FAO Field adjustable output <sup>17</sup>		





## Ordering Information

### Accessories

Ordered and shipped separately.

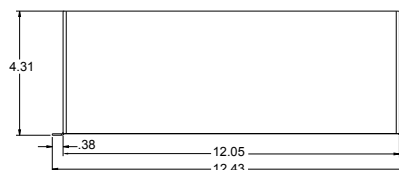
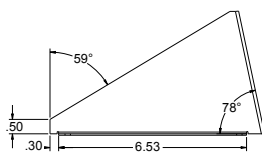
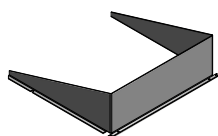
DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V) <sup>20</sup>
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V) <sup>20</sup>
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V) <sup>20</sup>
DSHORT SBK U	Shorting cap <sup>23</sup>
DSXOHS 20C U	House-side shield for P1,P2,P3 and P4 <sup>18</sup>
DSXOHS 30C U	House-side shield for P10,P11,P12 and P13 <sup>18</sup>
DSXOHS 40C U	House-side shield for P5,P6 and P7 <sup>18</sup>
DSXODDL U	Diffused drop lens (polycarbonate) <sup>18</sup>
PUMBA DDBXD U*	Square and round pole universal mounting bracket adaptor (specify finish) <sup>21</sup>
KMA8 DDBXD U	Mast arm mounting bracket adaptor (specify finish) <sup>17</sup>
DSXOEGS (FINISH) U	External glare shield

For more control options, visit [DTL](#) and [ROAM](#) online. Link to [nLight Air 2](#)

### NOTES

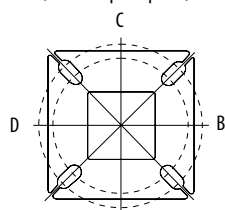
- P10, P11, P12 and P13 and rotated options (L90 or R90) only available together.
- Any Type 5 distribution with photocell, is not available with WBA.
- Not available with HS or DDL.
- MVOLT driver operates on any line voltage from 120-277V (50/60 Hz).
- Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
- Not available with BL30, BL50 or PNMT options.
- Universal mounting brackets intended for retrofit on existing pre-drilled poles only. 1.5 G vibration load rating per ANCI C136.31.
- MUST order fixture with SPA mounting. Must be ordered as a separate accessory; see Accessories information. For use with 2-3/8" mast arm (not included).
- Must be ordered with PIRHN.
- Sensor cover available only in dark bronze, black, white and natural aluminum colors.
- Must be ordered with NLTAIR2. For more information on nLight Air 2 visit [this link](#).
- Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories. Shorting Cap included.
- If ROAM<sup>®</sup> node required, it must be ordered and shipped as a separate line item from Acuity Brands Controls. Shorting Cap included.
- DMG not available with PIRHN, PER5, PER7, PIR, PIRH, PIR1FC3V or PIRH1FC3V.
- Reference Motion Sensor table on page 3.
- Reference PER Table on page 3 to see functionality.
- Not available with other dimming controls options.
- Not available with BLC, LCCO and RCCO distribution.
- Must be ordered with fixture for factory pre-drilling.
- Requires luminaire to be specified with PER, PER5 or PER7 option. See PER Table on page 3.
- For retrofit use only.

## EGS – External Glare Shield

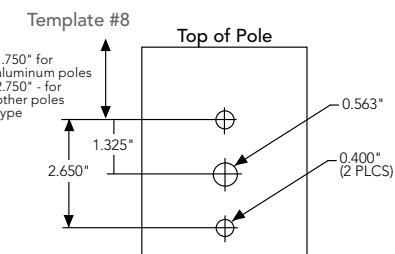


## Drilling

### HANDHOLE ORIENTATION (from top of pole)



A  
Handhole



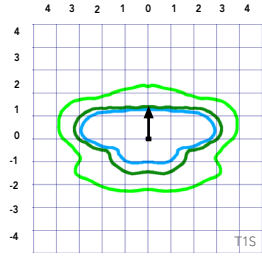
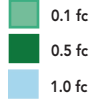
### Tenon Mounting Slipfitter

Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8"	AST20-190	AST20-280	AST20-290	AST20-320	AST20-390	AST20-490
2-7/8"	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4"	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

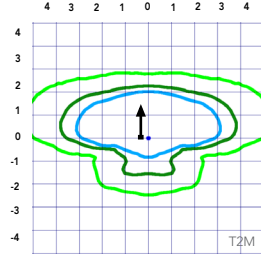
Mounting Option	Drilling Template	Single	2 @ 180	2 @ 90	3 @ 90	3 @ 120	4 @ 90
Head Location		Side B	Side B & D	Side B & C	Side B, C & D	Round Pole Only	Side A, B, C & D
Drill Nomenclature	#8	DM19AS	DM28AS	DM29AS	DM39AS	DM32AS	DM49AS
<b>Minimum Acceptable Outside Pole Dimension</b>							
SPA	#8	2-7/8"	2-7/8"	3.5"	3.5"		3.5"
RPA	#8	2-7/8"	2-7/8"	3.5"	3.5"	3"	3.5"
SPUMBA	#5	2-7/8"	3"	4"	4"		4"
RPUMBA	#5	2-7/8"	3.5"	5"	5"	3.5"	5"

Isofootcandle plots for the DSX0 LED 40C 1000 40K. Distances are in units of mounting height (20').

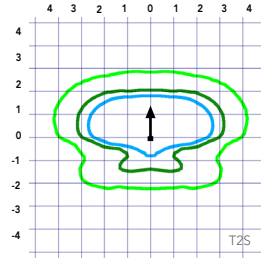
**LEGEND**



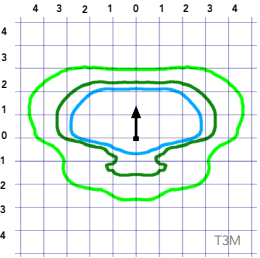
Test No.



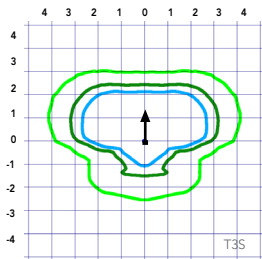
Test No.



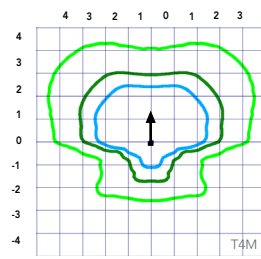
Test No. LTL23457P25 tested in accordance with IESNA LM-79-08.



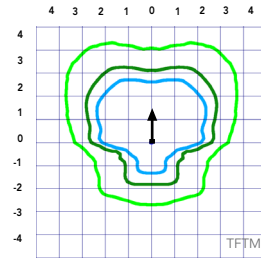
Test No. LTL23457P25 tested in accordance with IESNA LM-79-08.



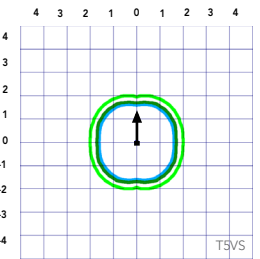
Test No. LTL23457P25 tested in accordance with IESNA LM-79-08.



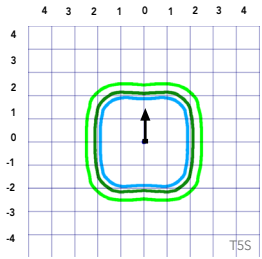
Test No.



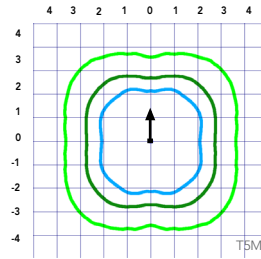
Test No.



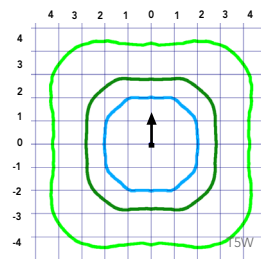
Test No.



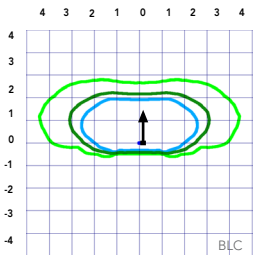
Test No.



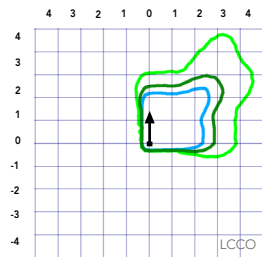
Test No.



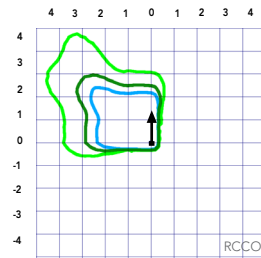
Test No. LTL23451P25 tested in accordance with IESNA LM-79-08.



Test No.



Test No.



Test No.

## Performance Data

### Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.04
5°C	41°F	1.04
10°C	50°F	1.03
15°C	59°F	1.02
20°C	68°F	1.01
<b>25°C</b>	<b>77°C</b>	<b>1.00</b>
30°C	86°F	0.99
35°C	95°F	0.98
40°C	104°F	0.97

### Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	Lumen Maintenance Factor
25,000	0.96
50,000	0.92
100,000	0.85

Motion Sensor Default Settings						
Option	Dimmed State	High Level (when triggered)	Photocell Operation	Dwell Time	Ramp-up Time	Ramp-down Time
PIR or PIRH	3V (37%) Output	10V (100%) Output	Enabled @ 5FC	5 min	3 sec	5 min
*PIR1FC3V or PIRH1FC3V	3V (37%) Output	10V (100%) Output	Enabled @ 1FC	5 min	3 sec	5 min

\*for use with separate Dusk to Dawn or timer.

### Controls Options

Nomenclature	Description	Functionality	Primary control device	Notes
FAO	Field adjustable output device installed inside the luminaire; wired to the driver dimming leads.	Allows the luminaire to be manually dimmed, effectively trimming the light output.	FAO device	Cannot be used with other controls options that need the 0-10V leads
DS	Drivers wired independently for 50/50 luminaire operation	The luminaire is wired to two separate circuits, allowing for 50/50 operation.	Independently wired drivers	Requires two separately switched circuits. Consider nLight AIR as a more cost effective alternative.
PERS or PER7	Twist-lock photocell receptacle	Compatible with standard twist-lock photocells for dusk to dawn operation, or advanced control nodes that provide 0-10V dimming signals.	Twist-lock photocells such as DLL Elite or advanced control nodes such as ROAM.	Pins 4 & 5 to dimming leads on driver, Pins 6 & 7 are capped inside luminaire
PIR or PIRH	Motion sensors with integral photocell. PIR for 8-15' mounting; PIRH for 15-30' mounting	Luminaires dim when no occupancy is detected.	Acuity Controls SBGR	Also available with PIRH1FC3V when the sensor photocell is used for dusk-to-dawn operation.
NLTAIR2 PIRHN	nLight AIR enabled luminaire for motion sensing, photocell and wireless communication.	Motion and ambient light sensing with group response. Scheduled dimming with motion sensor over-ride when wirelessly connected to the nLight Eclipse.	nLight Air rSDGR	nLight AIR sensors can be programmed and commissioned from the ground using the CIAIRity Pro app.

### Electrical Load

					Current (A)					
	Performance Package	LED Count	Drive Current	Wattage	120	208	240	277	347	480
Forward Optics (Non-Rotated)	P1	20	530	38	0.32	0.18	0.15	0.15	0.10	0.08
	P2	20	700	49	0.41	0.23	0.20	0.19	0.14	0.11
	P3	20	1050	71	0.60	0.37	0.32	0.27	0.21	0.15
	P4	20	1400	92	0.77	0.45	0.39	0.35	0.28	0.20
	P5	40	700	89	0.74	0.43	0.38	0.34	0.26	0.20
	P6	40	1050	134	1.13	0.65	0.55	0.48	0.39	0.29
	P7	40	1300	166	1.38	0.80	0.69	0.60	0.50	0.37
Rotated Optics (Requires L90 or R90)	P10	30	530	53	0.45	0.26	0.23	0.21	0.16	0.12
	P11	30	700	72	0.60	0.35	0.30	0.27	0.20	0.16
	P12	30	1050	104	0.88	0.50	0.44	0.39	0.31	0.23
	P13	30	1300	128	1.08	0.62	0.54	0.48	0.37	0.27

# Performance Data

## Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics																							
Power Package	LED Count	Drive Current	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)								
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW				
P1	20	530	38W	T1S	4,369	1	0	1	115	4,706	1	0	1	124	4,766	1	0	1	125				
				T2S	4,364	1	0	1	115	4,701	1	0	1	124	4,761	1	0	1	125				
				T2M	4,387	1	0	1	115	4,726	1	0	1	124	4,785	1	0	1	126				
				T3S	4,248	1	0	1	112	4,577	1	0	1	120	4,634	1	0	1	122				
				T3M	4,376	1	0	1	115	4,714	1	0	1	124	4,774	1	0	1	126				
				T4M	4,281	1	0	1	113	4,612	1	0	2	121	4,670	1	0	2	123				
				TFTM	4,373	1	0	1	115	4,711	1	0	2	124	4,771	1	0	2	126				
				TSVS	4,548	2	0	0	120	4,900	2	0	0	129	4,962	2	0	0	131				
				TSS	4,552	2	0	0	120	4,904	2	0	0	129	4,966	2	0	0	131				
				TSM	4,541	3	0	1	120	4,891	3	0	1	129	4,953	3	0	1	130				
				TSW	4,576	3	0	2	120	4,929	3	0	2	130	4,992	3	0	2	131				
				BLC	3,586	1	0	1	94	3,863	1	0	1	102	3,912	1	0	1	103				
				LCCO	2,668	1	0	1	70	2,874	1	0	2	76	2,911	1	0	2	77				
				RCCO	2,668	1	0	1	70	2,874	1	0	2	76	2,911	1	0	2	77				
				P2	20	700	49W	T1S	5,570	1	0	1	114	6,001	1	0	1	122	6,077	2	0	2	124
T2S	5,564	1	0					2	114	5,994	1	0	2	122	6,070	2	0	2	124				
T2M	5,593	1	0					1	114	6,025	1	0	1	123	6,102	1	0	1	125				
T3S	5,417	1	0					2	111	5,835	1	0	2	119	5,909	2	0	2	121				
T3M	5,580	1	0					2	114	6,011	1	0	2	123	6,087	1	0	2	124				
T4M	5,458	1	0					2	111	5,880	1	0	2	120	5,955	1	0	2	122				
TFTM	5,576	1	0					2	114	6,007	1	0	2	123	6,083	1	0	2	124				
TSVS	5,799	2	0					0	118	6,247	2	0	0	127	6,327	2	0	0	129				
TSS	5,804	2	0					0	118	6,252	2	0	0	128	6,332	2	0	1	129				
TSM	5,789	3	0					1	118	6,237	3	0	1	127	6,316	3	0	1	129				
TSW	5,834	3	0					2	119	6,285	3	0	2	128	6,364	3	0	2	130				
BLC	4,572	1	0					1	93	4,925	1	0	1	101	4,987	1	0	1	102				
LCCO	3,402	1	0					2	69	3,665	1	0	2	75	3,711	1	0	2	76				
RCCO	3,402	1	0					2	69	3,665	1	0	2	75	3,711	1	0	2	76				
P3	20	1050	71W					T1S	7,833	2	0	2	110	8,438	2	0	2	119	8,545	2	0	2	120
				T2S	7,825	2	0	2	110	8,429	2	0	2	119	8,536	2	0	2	120				
				T2M	7,865	2	0	2	111	8,473	2	0	2	119	8,580	2	0	2	121				
				T3S	7,617	2	0	2	107	8,205	2	0	2	116	8,309	2	0	2	117				
				T3M	7,846	2	0	2	111	8,452	2	0	2	119	8,559	2	0	2	121				
				T4M	7,675	2	0	2	108	8,269	2	0	2	116	8,373	2	0	2	118				
				TFTM	7,841	2	0	2	110	8,447	2	0	2	119	8,554	2	0	2	120				
				TSVS	8,155	3	0	0	115	8,785	3	0	0	124	8,896	3	0	0	125				
				TSS	8,162	3	0	1	115	8,792	3	0	1	124	8,904	3	0	1	125				
				TSM	8,141	3	0	2	115	8,770	3	0	2	124	8,881	3	0	2	125				
				TSW	8,204	3	0	2	116	8,838	4	0	2	124	8,950	4	0	2	126				
				BLC	6,429	1	0	2	91	6,926	1	0	2	98	7,013	1	0	2	99				
				LCCO	4,784	1	0	2	67	5,153	1	0	2	73	5,218	1	0	2	73				
				RCCO	4,784	1	0	2	67	5,153	1	0	2	73	5,218	1	0	2	73				
				P4	20	1400	92W	T1S	9,791	2	0	2	106	10,547	2	0	2	115	10,681	2	0	2	116
T2S	9,780	2	0					2	106	10,536	2	0	2	115	10,669	2	0	2	116				
T2M	9,831	2	0					2	107	10,590	2	0	2	115	10,724	2	0	2	117				
T3S	9,521	2	0					2	103	10,256	2	0	2	111	10,386	2	0	2	113				
T3M	9,807	2	0					2	107	10,565	2	0	2	115	10,698	2	0	2	116				
T4M	9,594	2	0					2	104	10,335	2	0	3	112	10,466	2	0	3	114				
TFTM	9,801	2	0					2	107	10,558	2	0	2	115	10,692	2	0	2	116				
TSVS	10,193	3	0					1	111	10,981	3	0	1	119	11,120	3	0	1	121				
TSS	10,201	3	0					1	111	10,990	3	0	1	119	11,129	3	0	1	121				
TSM	10,176	4	0					2	111	10,962	4	0	2	119	11,101	4	0	2	121				
TSW	10,254	4	0					3	111	11,047	4	0	3	120	11,186	4	0	3	122				
BLC	8,036	1	0					2	87	8,656	1	0	2	94	8,766	1	0	2	95				
LCCO	5,979	1	0					2	65	6,441	1	0	2	70	6,523	1	0	3	71				
									5,979	1	0	2	65	6,441	1	0	2	70	6,523	1	0	3	71

# Performance Data

## Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics																			
Power Package	LED Count	Drive Current	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P5	40	700	89W	T1S	10,831	2	0	2	122	11,668	2	0	2	131	11,816	2	0	2	133
				T2S	10,820	2	0	2	122	11,656	2	0	2	131	11,803	2	0	2	133
				T2M	10,876	2	0	2	122	11,716	2	0	2	132	11,864	2	0	2	133
				T3S	10,532	2	0	2	118	11,346	2	0	2	127	11,490	2	0	2	129
				T3M	10,849	2	0	2	122	11,687	2	0	2	131	11,835	2	0	2	133
				T4M	10,613	2	0	3	119	11,434	2	0	3	128	11,578	2	0	3	130
				TFTM	10,842	2	0	2	122	11,680	2	0	2	131	11,828	2	0	2	133
				TSVS	11,276	3	0	1	127	12,148	3	0	1	136	12,302	3	0	1	138
				T5S	11,286	3	0	1	127	12,158	3	0	1	137	12,312	3	0	1	138
				T5M	11,257	4	0	2	126	12,127	4	0	2	136	12,280	4	0	2	138
				T5W	11,344	4	0	3	127	12,221	4	0	3	137	12,375	4	0	3	139
				BLC	8,890	1	0	2	100	9,576	1	0	2	108	9,698	1	0	2	109
				LCCO	6,615	1	0	3	74	7,126	1	0	3	80	7,216	1	0	3	81
				RCCO	6,615	1	0	3	74	7,126	1	0	3	80	7,216	1	0	3	81
				P6	40	1050	134W	T1S	14,805	3	0	3	110	15,949	3	0	3	119	16,151
T2S	14,789	3	0					3	110	15,932	3	0	3	119	16,134	3	0	3	120
T2M	14,865	3	0					3	111	16,014	3	0	3	120	16,217	3	0	3	121
T3S	14,396	3	0					3	107	15,509	3	0	3	116	15,705	3	0	3	117
T3M	14,829	2	0					3	111	15,975	3	0	3	119	16,177	3	0	3	121
T4M	14,507	2	0					3	108	15,628	3	0	3	117	15,826	3	0	3	118
TFTM	14,820	2	0					3	111	15,965	3	0	3	119	16,167	3	0	3	121
TSVS	15,413	4	0					1	115	16,604	4	0	1	124	16,815	4	0	1	125
T5S	15,426	3	0					1	115	16,618	4	0	1	124	16,828	4	0	1	126
T5M	15,387	4	0					2	115	16,576	4	0	2	124	16,786	4	0	2	125
T5W	15,506	4	0					3	116	16,704	4	0	3	125	16,915	4	0	3	126
BLC	12,151	1	0					2	91	13,090	1	0	2	98	13,255	1	0	2	99
LCCO	9,041	1	0					3	67	9,740	1	0	3	73	9,863	1	0	3	74
RCCO	9,041	1	0					3	67	9,740	1	0	3	73	9,863	1	0	3	74
P7	40	1300	166W					T1S	17,023	3	0	3	103	18,338	3	0	3	110	18,570
				T2S	17,005	3	0	3	102	18,319	3	0	3	110	18,551	3	0	3	112
				T2M	17,092	3	0	3	103	18,413	3	0	3	111	18,646	3	0	3	112
				T3S	16,553	3	0	3	100	17,832	3	0	3	107	18,058	3	0	3	109
				T3M	17,051	3	0	3	103	18,369	3	0	3	111	18,601	3	0	3	112
				T4M	16,681	3	0	3	100	17,969	3	0	3	108	18,197	3	0	3	110
				TFTM	17,040	3	0	3	103	18,357	3	0	4	111	18,590	3	0	4	112
				TSVS	17,723	4	0	1	107	19,092	4	0	1	115	19,334	4	0	1	116
				T5S	17,737	4	0	2	107	19,108	4	0	2	115	19,349	4	0	2	117
				T5M	17,692	4	0	2	107	19,059	4	0	2	115	19,301	4	0	2	116
				T5W	17,829	5	0	3	107	19,207	5	0	3	116	19,450	5	0	3	117
				BLC	13,971	2	0	2	84	15,051	2	0	2	91	15,241	2	0	2	92
				LCCO	10,396	1	0	3	63	11,199	1	0	3	67	11,341	1	0	3	68
					10,396	1	0	3	63	11,199	1	0	3	67	11,341	1	0	3	68



# Performance Data

## Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Rotated Optics																			
Power Package	LED Count	Drive Current	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P10	30	530	53W	T1S	6,727	2	0	2	127	7,247	3	0	3	137	7,339	3	0	3	138
				T2S	6,689	3	0	3	126	7,205	3	0	3	136	7,297	3	0	3	138
				T2M	6,809	3	0	3	128	7,336	3	0	3	138	7,428	3	0	3	140
				T3S	6,585	3	0	3	124	7,094	3	0	3	134	7,183	3	0	3	136
				T3M	6,805	3	0	3	128	7,331	3	0	3	138	7,424	3	0	3	140
				T4M	6,677	3	0	3	126	7,193	3	0	3	136	7,284	3	0	3	137
				TFTM	6,850	3	0	3	129	7,379	3	0	3	139	7,472	3	0	3	141
				TSVS	6,898	3	0	0	130	7,431	3	0	0	140	7,525	3	0	0	142
				T5S	6,840	2	0	1	129	7,368	2	0	1	139	7,461	2	0	1	141
				T5M	6,838	3	0	1	129	7,366	3	0	2	139	7,460	3	0	2	141
				TSW	6,777	3	0	2	128	7,300	3	0	2	138	7,393	3	0	2	139
				BLC	5,626	2	0	2	106	6,060	2	0	2	114	6,137	2	0	2	116
				LCCO	4,018	1	0	2	76	4,328	1	0	2	82	4,383	1	0	2	83
				RCCO	4,013	3	0	3	76	4,323	3	0	3	82	4,377	3	0	3	83
				P11	30	700	72W	T1S	8,594	3	0	3	119	9,258	3	0	3	129	9,376
T2S	8,545	3	0					3	119	9,205	3	0	3	128	9,322	3	0	3	129
T2M	8,699	3	0					3	121	9,371	3	0	3	130	9,490	3	0	3	132
T3S	8,412	3	0					3	117	9,062	3	0	3	126	9,177	3	0	3	127
T3M	8,694	3	0					3	121	9,366	3	0	3	130	9,484	3	0	3	132
T4M	8,530	3	0					3	118	9,189	3	0	3	128	9,305	3	0	3	129
TFTM	8,750	3	0					3	122	9,427	3	0	3	131	9,546	3	0	3	133
TSVS	8,812	3	0					0	122	9,493	3	0	0	132	9,613	3	0	0	134
T5S	8,738	3	0					1	121	9,413	3	0	1	131	9,532	3	0	1	132
T5M	8,736	3	0					2	121	9,411	3	0	2	131	9,530	3	0	2	132
TSW	8,657	4	0					2	120	9,326	4	0	2	130	9,444	4	0	2	131
BLC	7,187	3	0					3	100	7,742	3	0	3	108	7,840	3	0	3	109
LCCO	5,133	1	0					2	71	5,529	1	0	2	77	5,599	1	0	2	78
RCCO	5,126	3	0					3	71	5,522	3	0	3	77	5,592	3	0	3	78
P12	30	1050	104W					T1S	12,149	3	0	3	117	13,088	3	0	3	126	13,253
				T2S	12,079	4	0	4	116	13,012	4	0	4	125	13,177	4	0	4	127
				T2M	12,297	3	0	3	118	13,247	3	0	3	127	13,415	3	0	3	129
				T3S	11,891	4	0	4	114	12,810	4	0	4	123	12,972	4	0	4	125
				T3M	12,290	3	0	3	118	13,239	4	0	4	127	13,407	4	0	4	129
				T4M	12,058	4	0	4	116	12,990	4	0	4	125	13,154	4	0	4	126
				TFTM	12,369	4	0	4	119	13,325	4	0	4	128	13,494	4	0	4	130
				TSVS	12,456	3	0	1	120	13,419	3	0	1	129	13,589	4	0	1	131
				T5S	12,351	3	0	1	119	13,306	3	0	1	128	13,474	3	0	1	130
				T5M	12,349	4	0	2	119	13,303	4	0	2	128	13,471	4	0	2	130
				TSW	12,238	4	0	3	118	13,183	4	0	3	127	13,350	4	0	3	128
				BLC	10,159	3	0	3	98	10,944	3	0	3	105	11,083	3	0	3	107
				LCCO	7,256	1	0	3	70	7,816	1	0	3	75	7,915	1	0	3	76
				RCCO	7,246	3	0	3	70	7,806	4	0	4	75	7,905	4	0	4	76
				P13	30	1300	128W	T1S	14,438	3	0	3	113	15,554	3	0	3	122	15,751
T2S	14,355	4	0					4	112	15,465	4	0	4	121	15,660	4	0	4	122
T2M	14,614	3	0					3	114	15,744	4	0	4	123	15,943	4	0	4	125
T3S	14,132	4	0					4	110	15,224	4	0	4	119	15,417	4	0	4	120
T3M	14,606	4	0					4	114	15,735	4	0	4	123	15,934	4	0	4	124
T4M	14,330	4	0					4	112	15,438	4	0	4	121	15,633	4	0	4	122
TFTM	14,701	4	0					4	115	15,836	4	0	4	124	16,037	4	0	4	125
TSVS	14,804	4	0					1	116	15,948	4	0	1	125	16,150	4	0	1	126
T5S	14,679	3	0					1	115	15,814	3	0	1	124	16,014	3	0	1	125
T5M	14,676	4	0					2	115	15,810	4	0	2	124	16,010	4	0	2	125
TSW	14,544	4	0					3	114	15,668	4	0	3	122	15,866	4	0	3	124
BLC	7,919	3	0					3	62	8,531	3	0	3	67	8,639	3	0	3	67
LCCO	5,145	1	0					2	40	5,543	1	0	2	43	5,613	1	0	2	44
	5,139	3	0					3	40	5,536	3	0	3	43	5,606	3	0	3	44

## Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and system-level interoperability.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is A+ Certified when ordered with DTL® controls marked by a shaded background. DTL DLL equipped luminaires meet the A+ specification for luminaire to photocontrol interoperability<sup>1</sup>
- This luminaire is part of an A+ Certified solution for ROAM® or XPoint™ Wireless control networks, providing out-of-the-box control compatibility with simple commissioning, when ordered with drivers and control options marked by a shaded background<sup>1</sup>

To learn more about A+, visit [www.acuitybrands.com/aplus](http://www.acuitybrands.com/aplus).

1. See ordering tree for details.
2. A+ Certified Solutions for ROAM require the order of one ROAM node per luminaire.  
Sold Separately: [Link to Roam](#); [Link to DTL DLL](#)

## FEATURES & SPECIFICATIONS

### INTENDED USE

The sleek design of the D-Series Size 0 reflects the embedded high performance LED technology. It is ideal for many commercial and municipal applications, such as parking lots, plazas, campuses, and pedestrian areas.

### CONSTRUCTION

Single-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance and future light engine upgrades. The LED driver is mounted in direct contact with the casting to promote low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65). Low EPA (0.95 ft<sup>2</sup>) for optimized pole wind loading.

### FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in both textured and non-textured finishes.

### OPTICS

Precision-molded proprietary acrylic lenses are engineered for superior area lighting distribution, uniformity, and pole spacing. Light engines are available in 3000 K, 4000 K or 5000 K (70 CRI) configurations. The D-Series Size 0 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

### ELECTRICAL

Light engine(s) configurations consist of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L85/100,000 hours at 25°C). Class 1 electronic drivers are designed to have a power factor >90%, THD <20%, and an expected life of 100,000 hours with <1% failure rate. Easily serviceable 10kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

### STANDARD CONTROLS

The DSX0 LED area luminaire has a number of control options. Dusk to dawn controls can be utilized via optional NEMA twist-lock photocell receptacles. Integrated motion sensors with on-board photocells feature field-adjustable programming and are suitable for mounting heights up to 30 feet.

### nLIGHT AIR CONTROLS

The DSX0 LED area luminaire is also available with nLight® AIR for the ultimate in wireless control. This powerful controls platform provides out-of-the-box basic motion sensing and photocontrol functionality and is suitable for mounting heights up to 40 feet. Once commissioned using a smartphone and the easy-to-use CLAIRITY app, nLight AIR equipped luminaires can be grouped, resulting in motion sensor and photocell group response without the need for additional equipment. Scheduled dimming with motion sensor over-ride can be achieved when used with the nLight Eclipse. Additional information about nLight Air can be found [here](#).

### INSTALLATION

Included mounting block and integral arm facilitate quick and easy installation. Stainless steel bolts fasten the mounting block securely to poles and walls, enabling the D-Series Size 0 to withstand up to a 3.0 G vibration load rating per ANSI C136.31. The D-Series Size 0 utilizes the AERIS™ series pole drilling pattern (template #8). Optional terminal block and NEMA photocell receptacle are also available.

### LISTINGS

UL Listed for wet locations. Light engines are IP66 rated; luminaire is IP65 rated. Rated for -40°C minimum ambient. U.S. Patent No. D672,492 S. International patent pending.

DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at [www.designlights.org/QPL](http://www.designlights.org/QPL) to confirm which versions are qualified.

International Dark-Sky Association (IDA) Fixture Seal of Approval (FSA) is available for all products on this page utilizing 3000K color temperature only.

### WARRANTY

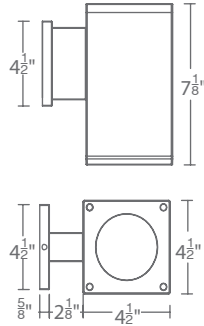
5-year limited warranty. Complete warranty terms located at: [www.acuitybrands.com/support/customer-support/terms-and-conditions](http://www.acuitybrands.com/support/customer-support/terms-and-conditions)

**Note:** Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

## LED Wall Mounts



Fixture Type:

**SWD**

Catalog Number:

Project:

Location:

### PRODUCT DESCRIPTION

The latest energy efficient LED technology in an appealing cubical profile delivers accent and wall wash lighting. Comes in various light distribution and beam angle options.

### FEATURES

- High performance exterior rated LED wall mount light
- Fixture can install upside down to alter light distribution
- Solid aluminum construction
- 5 year warranty

### SPECIFICATIONS

- Input:** Universal voltage 120V - 277VAC, 50/60Hz
- Dimming:** Electronic low voltage (ELV) : 100% - 5%  
0-10V: 100% - 1%
- Light Source:** High output 3 Step Mac Adam Ellipse COB  
Rated life of 60,000 hours at L70
- Finish:** Electrostatically powder coated, white, black, bronze and graphite
- Standards:** IP65 rated, UL & cUL wet location listed, Energy Star® 2.2 rated Title 24 JA8-2016 Compliant
- Operating Temp:** -13°F to 122°F (-25°C to 50°C)

### ORDERING NUMBER

Diameter	Watt	Beam	Beam Angle	Color Temp	CRI	Reference Output <sup>1</sup> Lumen	CBCP	Efficacy (lm/w)	Light Distribution	Finish			
DC-WS05	5"	S Straight up or down	16°	927S	2700K	90	1825	10050	73		BK Black WT White BZ Bronze GH Graphite		
				827S	2700K	85	2190	12057	88				
				930S	3000K	90	1895	10427	76				
				830S	3000K	85	2300	12644	92				
				835S	3500K	85	2350	12937	94				
		840S	4000K	85	2375	13062	95						
		N Straight up or down	25°	927S	2700K	90	1810	5280	72				
				827S	2700K	85	2170	6335	87				
				930S	3000K	90	1880	5478	75				
				830S	3000K	85	2275	6643	91				
				835S	3500K	85	2330	6797	93				
		840S	4000K	85	2350	6863	94						
		DC-WS0517	5"	F Straight up or down	33°	927S	2700K	90	1900	4515		76	
						827S	2700K	85	2280	5417		91	
						930S	3000K	90	1970	4685		79	
830S	3000K					85	2390	5681	96				
835S	3500K					85	2445	5812	98				
840S	4000K	85	2470	5870	99								
DC-WS0517	5"	F Away from the wall	N/A	927A	2700K	90	2000		80				
				827A	2700K	85	2400		96				
				930A	3000K	90	2075	N/A	83				
				830A	3000K	85	2520	N/A	101				
				835A	3500K	85	2575		103				
		840A	4000K	85	2600		104						
		F Towards the wall	N/A	927B	2700K	90	2000		80				
				827B	2700K	85	2400		96				
				930B	3000K	90	2075	N/A	83				
				830B	3000K	85	2520	N/A	101				
835B	3500K			85	2575		103						
840B	4000K	85	2600		104								

DC-WS05-\_\_\_\_\_ - \_\_\_\_\_ <sup>1</sup>Reference output shows 25W output. Multiply by 0.7 to determine output for 17W combinations.

Example: DC-WS05-F930A-WT

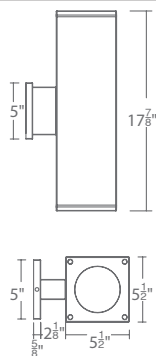
wacighting.com  
Phone (800) 526.2588  
Fax (800) 526.2585

Headquarters/Eastern Distribution Center  
44 Harbor Park Drive  
Port Washington, NY 11050

Central Distribution Center  
1600 Distribution Ct  
Lithia Springs, GA 30122

Western Distribution Center  
1750 Archibald Avenue  
Ontario, CA 91760

## LED Wall Mounts



Fixture Type:

**SWDU**

Catalog Number:

Project:

Location:

### PRODUCT DESCRIPTION

The latest energy efficient LED technology in an appealing cubical profile delivers accent and wall wash lighting. Comes in various light distribution and beam angle options.

### FEATURES

- High performance exterior rated LED wall mount light
- Fixture can install upside down to alter light distribution
- Solid aluminum construction
- 5 year warranty

### SPECIFICATIONS

**Input:** Universal voltage 120V - 277VAC, 50/60Hz  
**Dimming:** Electronic low voltage (ELV) : 100% - 5%  
 0-10V: 100% - 1%  
**Light Source:** High output 3 Step Mac Adam Ellipse COB  
 Rated life of 60,000 hours at L70  
**Finish:** Electrostatically powder coated, white, black, bronze and graphite  
**Standards:** IP65 rated, UL & cUL wet location listed  
 Title 24 JA8-2016 Compliant  
**Operating Temp:** -13°F to 122°F (-25°C to 50°C)

### ORDERING NUMBER

Diameter	Watt	Beam	Beam Angle	Color Temp	CRI	Reference Output <sup>1</sup>			Light Distribution	Finish	
						Lumen	CBCP	Efficacy (lm/w)			
DC-WD06	6" 35W x 2	<b>S</b> Straight up and down	16°	<b>927S</b>	2700K	90	2820 x 2	18842 x 2	81 x 2		<b>BK</b> Black <b>WT</b> White <b>BZ</b> Bronze <b>GH</b> Graphite
				<b>827S</b>	2700K	85	3385 x 2	22608 x 2	97 x 2		
				<b>930S</b>	3000K	90	2925 x 2	19543 x 2	84 x 2		
				<b>830S</b>	3000K	85	3535 x 2	23632 x 2	101 x 2		
				<b>835S</b>	3500K	85	3630 x 2	24255 x 2	104 x 2		
		<b>840S</b>	4000K	85	3665 x 2	24490 x 2	105 x 2				
		<b>N</b> Straight up and down	28°	<b>927S</b>	2700K	90	2800 x 2	7992 x 2	80 x 2		
				<b>827S</b>	2700K	85	3360 x 2	9589 x 2	96 x 2		
				<b>930S</b>	3000K	90	2900 x 2	8290 x 2	83 x 2		
				<b>830S</b>	3000K	85	3510 x 2	10024 x 2	100 x 2		
				<b>835S</b>	3500K	85	3600 x 2	10288 x 2	103 x 2		
		<b>840S</b>	4000K	85	3635 x 2	10388 x 2	104 x 2				
		<b>F</b> Straight up and down	38°	<b>927S</b>	2700K	90	2825 x 2	5451 x 2	81 x 2		
				<b>827S</b>	2700K	85	3390 x 2	6540 x 2	97 x 2		
				<b>930S</b>	3000K	90	2930 x 2	5654 x 2	84 x 2		
<b>830S</b>	3000K			85	3545 x 2	6836 x 2	101 x 2				
<b>835S</b>	3500K			85	3640 x 2	7017 x 2	104 x 2				
<b>840S</b>	4000K	85	3675 x 2	7085 x 2	105 x 2						
DC-WD0644	6" 22W x 2	<b>F</b> Away from the wall	N/A	<b>927A</b>	2700K	90	2860 x 2	N/A	82 x 2		
				<b>827A</b>	2700K	85	3435 x 2	N/A	98 x 2		
				<b>930A</b>	3000K	90	2970 x 2	N/A	85 x 2		
				<b>830A</b>	3000K	85	3590 x 2	N/A	103 x 2		
				<b>835A</b>	3500K	85	3685 x 2	N/A	105 x 2		
				<b>840A</b>	4000K	85	3720 x 2	N/A	106 x 2		
<b>F</b> Towards the wall	N/A	<b>927B</b>	2700K	90	2860 x 2	N/A	82 x 2				
		<b>827B</b>	2700K	85	3435 x 2	N/A	98 x 2				
		<b>930B</b>	3000K	90	2970 x 2	N/A	85 x 2				
		<b>830B</b>	3000K	85	3590 x 2	N/A	103 x 2				
		<b>835B</b>	3500K	85	3685 x 2	N/A	105 x 2				
		<b>840B</b>	4000K	85	3720 x 2	N/A	106 x 2				
<b>F</b> One side each	N/A	<b>927C</b>	2700K	90	2860 x 2	N/A	82 x 2				
		<b>827C</b>	2700K	85	3435 x 2	N/A	98 x 2				
		<b>930C</b>	3000K	90	2970 x 2	N/A	85 x 2				
		<b>830C</b>	3000K	85	3590 x 2	N/A	103 x 2				
		<b>835C</b>	3500K	85	3685 x 2	N/A	105 x 2				
		<b>840C</b>	4000K	85	3720 x 2	N/A	106 x 2				

**DC-WD06-** \_\_\_\_\_ - \_\_\_\_\_ Example: **DC-WD06-F930A-WT** <sup>1</sup>Reference output shows 35W output. Multiply by 0.7 to determine output for 22W combinations.

wacighting.com  
 Phone (800) 526.2588  
 Fax (800) 526.2585

Headquarters/Eastern Distribution Center  
 44 Harbor Park Drive  
 Port Washington, NY 11050

Central Distribution Center  
 1600 Distribution Ct  
 Lithia Springs, GA 30122

Western Distribution Center  
 1750 Archibald Avenue  
 Ontario, CA 91760

# SITE STORMWATER AND DOWNSTREAM ANALYSIS REPORT

**Prepared For:**

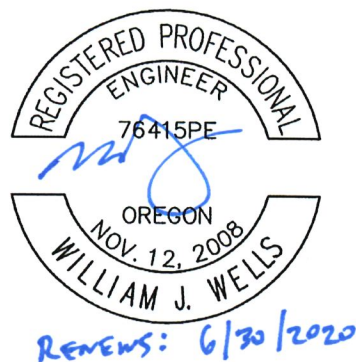
Lenity Architecture  
3150 Kettle Ct SE  
Salem, OR 97301

**Project Location:**

Bolton Terrace  
1575 Burns Street  
West Linn, OR 97068

**Permit Number:** CO -

**Prepared By:**



Westtech Engineering, Inc.  
3841 Fairview Industrial Drive SE, Suite 100  
Salem, OR 97302  
(503) 585-2474 FAX: (503) 585-3986



# TABLE OF CONTENTS

---

Chapter	Page
<b>1 Project Overview &amp; Description .....</b>	<b>1-1</b>
1.1 Size & Location of Project .....	1-1
1.2 Brief description of project scope and proposed improvements.....	1-1
1.3 Description of Size of Watershed Draining to the Site.....	1-1
1.4 Description of the Existing Site Conditions, Trees & Native Vegetation, Constraints, Sensitive Areas & Waterways .....	1-1
1.5 Regulatory Permits Required.....	1-1
1.6 Emergency Storm Escape Routes.....	1-1
<b>2 Methodology .....</b>	<b>2-1</b>
2.1 Depth to Groundwater .....	2-1
2.2 Maximum Infiltration and Vegetative Treatment .....	2-1
2.3 Soil Information.....	2-1
2.4 Hazardous Material.....	2-1
<b>3 Analysis.....</b>	<b>3-1</b>
3.1 Methods & Software Used.....	3-1
3.2 Curve Number and Time of Concentration Calculations .....	3-1
3.3 Review of Resources & Drainage Basin .....	3-1
3.4 Inspection of Affected Area.....	3-1
3.5 Treatment & Water Quality .....	3-2
3.6 Conveyance System & Analysis of Downstream Effects.....	3-3
3.7 Summary.....	3-4

## LIST OF TABLES

---

<b>Table</b>	<b>Page</b>
Table 1   City of West Linn 24-hour Design Storms .....	3-1
Table 2   Summary of Developed & Allowable Flow for 48-inch Manhole with Up-Flo Filter .....	3-2
Table 3   Summary of Site Peak Flows.....	3-2
Table 3   City of Gresham Conveyance Design Storm Sizing Criteria.....	3-3
Table 3   Summary of Cascade Springs Pond Creek During 50-year Storm .....	3-3

## APPENDICES

---

Appendix A	Basin Maps & Resources
Appendix B	NRCS Soil Report
Appendix C	HydroCAD Summaries
Appendix D	Geotechnical Report

## 1.1 SIZE & LOCATION OF PROJECT

The proposed project is located on a primarily undeveloped 27,210 square foot lot at 1575 Burns Street in West Linn, Oregon. There is currently a 1,000 square foot house on the lot that will be removed prior to construction. Refer to the Civil Drawings for more detail.

## 1.2 BRIEF DESCRIPTION OF PROJECT SCOPE AND PROPOSED IMPROVEMENTS

The project scope is to develop the full 27,210 square foot lot. The new development will include two one new commercial building and associated parking and landscaping.

## 1.3 DESCRIPTION OF SIZE OF WATERSHED DRAINING TO THE SITE

The 27,210 square foot developed site will drain to an existing 12-inch stormwater pipe located in the southeast corner of the lot. No other areas drain to the developed site.

## 1.4 DESCRIPTION OF THE EXISTING SITE CONDITIONS, TREES & NATIVE VEGETATION, CONSTRAINTS, SENSITIVE AREAS & WATERWAYS

The existing site is currently undeveloped with a 1,000 square feet single family home on the lot. There are multiple trees on the site and the ground is covered with grass. The westerly portion of the lot is relatively flat, while the eastern portion is moderately sloped descending to the east. Numerous small to large sized trees exist on site.

## 1.5 REGULATORY PERMITS REQUIRED

City of West Linn permits are required. No other permits are required for this project.

## 1.6 EMERGENCY STORM ESCAPE ROUTES

Please refer to the Developed Basin Map in Appendix A for emergency overflow routes.

## 2.1 DEPTH TO GROUNDWATER

Per the Geotechnical Report in Appendix D, groundwater seepage was not encountered and is not expected during construction. See the Geotech Report in Appendix D for details.

## 2.2 MAXIMUM INFILTRATION AND VEGETATIVE TREATMENT

The proposed stormwater design will not provide detention for onsite runoff due to topography constraints. Detention is not required because Cascade Springs Pond Creek has adequate downstream capacity. An up-flow filter will be designed to treat the water quality storm event because the site is extremely steep and infiltration is not feasible. See the Civil Drawings for more details.

## 2.3 SOIL INFORMATION

The pre-developed project site contains hydrologic soil group C soils. Refer to the Soils Report in Appendix B for more details.

## 2.4 HAZARDOUS MATERIAL

The owner is not aware of any hazardous material contamination onsite.

## 3.1 METHODS & SOFTWARE USED

HydroCAD modeling software was used to size the stormwater facilities. The Santa Barbara Unit Hydrograph Type 1A storm was used to model the required design storms. Per the City of West Linn Design Standards the design storms used were the 1.2 inch, 24-hour (water quality storm), half the 2-year, 24-hour and the 10-year, 24-hour storm events.

**Table 1** | City of West Linn 24-hour Design Storms

	24-Hour Rainfall Depths for West Linn, OR							
Recurrence Interval, Years	2	5	10	25	50	100	500	WQ
24-Hour Depths, Inches	2.5	3.0	3.4	3.9	4.3	4.5	5.3	1.2

*Source: City of West Linn Stormwater Management Plan*

## 3.2 CURVE NUMBER AND TIME OF CONCENTRATION CALCULATIONS

Curve numbers were derived from the NRCS runoff curve numbers contained in TR-55 *Urban Hydrology for Small Watersheds* per the City of Gresham Standards. The developed impervious area and pervious areas were assigned curve numbers of 98 and 79 respectively. The impervious areas were assigned a curve number of 98 which corresponds to paved/parking areas. The pervious areas were assigned a curve number of 79 which corresponds to amended soil coverage with C-rated soils.

Time of concentration (Tc) for the pre-developed conditions was calculated to be 15 minutes using the sheet flow equation. See the Pre-Developed Basin Map in Appendix A for the flow path used and refer to the HydroCAD Summaries in Appendix C for calculations. A minimum time of concentration of 5 minutes is applied to the developed basin due to the minimum time-step used by the HydroCAD modeling software.

## 3.3 REVIEW OF RESOURCES & DRAINAGE BASIN

The entire 27,210 square foot lot will drain into Cascade Springs Pond Creek. There are five sub-basins within the Cascade Springs basin. The project site is located within the CS2N1 sub-basin per the West Linn Stormwater Management Plan. For more detail and resources refer to Appendix A.

## 3.4 INSPECTION OF AFFECTED AREA

No problem areas or areas of concern were notable during the review of resources. Additionally, there were no existing or potential areas where flooding, capacity problems, channel destruction, or significant destruction of aquatic habitat identified in the inspection.



### 3.5 TREATMENT & WATER QUALITY

The proposed design uses proprietary treatment in lieu of green stormwater management. A 48-inch manhole with an Up-Flo filter is proposed to treat the water quality storm event and provide adequate capacity for the 100-year storm event.

**Table 2 | Summary of Developed & Allowable Flow for 48-inch Manhole with Up-Flo Filter**

Design Storm	Developed Site Flow (cfs)	Allowable Flow (cfs)
WQ Event	0.14	0.17
Overflow 100-Year	0.62	3.40

<sup>1</sup>Allowable release rate for Up-Flo filter with 3 filter modules

Table 2 above displays that a 48-inch Manhole with an Up-Flo filter equipped with 3 filter modules will provide treatment for the water quality event and have capacity for the 100-year storm.

**Table 3 | Summary of Site Peak Flows**

Basin ID	Source (Roof/Road/Other)	Impervious Area (sq ft)	Pervious Area (sq ft)	Design Storms			CN	Tc
				WQ (cfs)	10 Year (cfs)	100 Year (cfs)		
PD	Native	-	27,210	-	0.15	0.29	79	15
DEV	Paved/Landscape	22,510	4,700	0.14	0.45	0.62	98/79 <sup>2</sup>	5.0

<sup>1</sup> PD = pre-developed site conditions (i.e., pre-developed release rates)

<sup>2</sup> The first curve number listed is for the impervious area in the basin (98), then for the pervious area (80)

Table 3 above depicts the runoff experience from developed site compared to that of the predeveloped site. The design storms analyzed were provided in the West Linn Stormwater Management Plan and consisted of the water quality, 10-year, and 100-year, 24-hour storm events.

### 3.6 CONVEYANCE SYSTEM & ANALYSIS OF DOWNSTREAM EFFECTS

Per City of West Linn Design Standards, this project is exempt from detention requirements due to adequate downstream capacity of conveyance system. However, a downstream analysis was conducted per the City of Gresham Standards to determine if Cascade Springs Pond Creek will have adequate capacity. The following table provides the COG design storm sizing criteria.

**Table 3 | City of Gresham Conveyance Design Storm Sizing Criteria**

Structure or Facility	Design Storm Recurrence Interval (years)	
Storm sewers, ditches, and outfall pipes	Draining less than 250 acres	10
	Draining greater than 250 acres	50
Creek or stream Channels	Without designated floodplain	50
	With designated floodplain	100
Culverts and bridges	100	

The downstream analysis was conducted using the 50-year, 24-hour design storm per COG Design Standards for a creek with drainage area less than 50 acres.

Peak flow rates for each sub-basin within the Cascade Springs basin were provided by the West Linn Stormwater Management Plan. Additionally, peak flow rates for the junction of sub-basins were also provided. The junction node CSJ2 was selected for this analysis. The peak flow of CSJ2 was combined with the added onsite runoff for the 50-year, 24-hour storm event to determine adequate downstream capacity. Based on inspection and mapping, the creek has 1,500 feet of length, 3:1 side slopes, width of 1 foot at the bottom, slope of 1.53%, and a Manning’s number of 0.03 was used, corresponding to a typical open, earth channel, that is grassed and winding. See below for water depth in channel, calculated using Manning’s Equation.

**Table 3 | Summary of Cascade Springs Pond Creek During 50-year Storm**

Basin ID	Drainage Area (acres)	50-Year (cfs)	Water Depth in Channel (ft) <sup>a</sup>
CSJ2	55.04	31.15	1.31
DEV	0.62	0.59	0.20
<b>Total</b>	<b>55.56</b>	<b>31.74</b>	<b>1.32<sup>a</sup></b>

<sup>a</sup>Totals do not sum to the addition of the individual flows. This is due to the fact that the time of concentration per basin varies. The totals are the combination of the basin hydrographs. Refer to Link: OUT in Appendix D.

The calculations in Table 3 above display the added runoff to the Cascade Springs Pond Creek that will result from the developed project. The undetained developed 50-year event runoff peak for the site is 0.52 cfs. The developed runoff only contributes to 2% of the total runoff conveyed by Cascade Springs Pond Creek. The peak water surface elevation will rise approximately a tenth of an inch with the added runoff from the developed site. Therefore, the conveyance system will provide adequate capacity for developed stormwater runoff and detention facilities are not required onsite.

### **3.7 SUMMARY**

The stormwater system consisting of a 48-inch manhole with an Up-Flo filter has been designed to treat the water quality storm, and have capacity for the 100-year storm event. Detention was not required to be provided on site because Cascade Springs Pond Creek has adequate downstream capacity. Therefore, the project can meet the flow control and treatment requirements as set forth in the City of West Linn Stormwater Management Plan and the City of Gresham Stormwater Management Manual.

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX A**

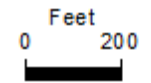
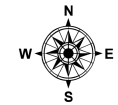
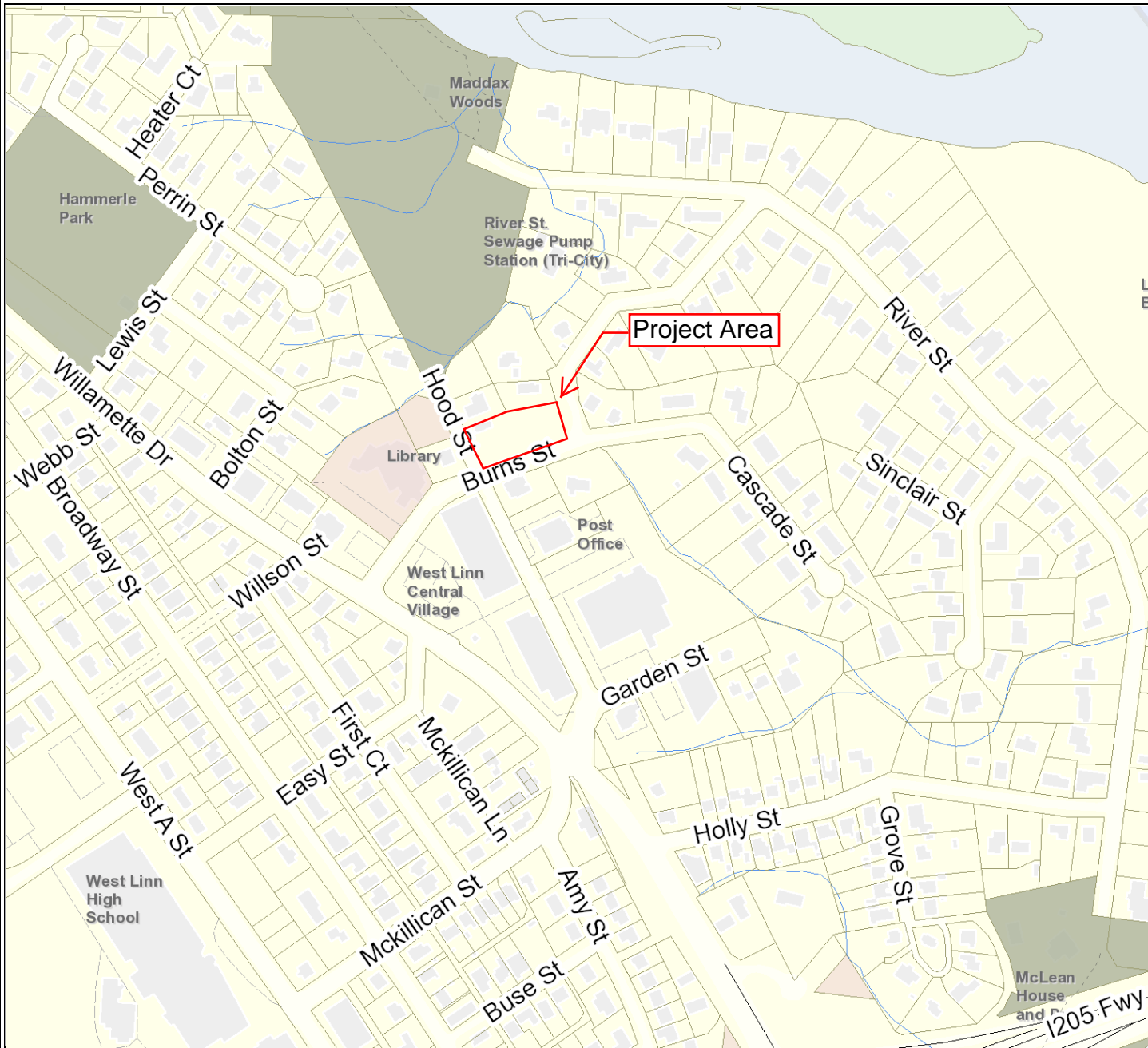
---

**BASIN MAPS & RESOURCES**

# BASIN & AREA MAPS



# Project Area Map



Scale 1:4,800 - 1 in = 400 ft  
Scale is based on 8-1/2 x 11 paper size

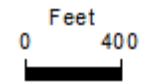
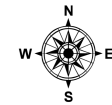


Map created by: public  
Date Created: 30-Jan-20 02:24 PM

**WEST LINN GIS**

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

# Drainage Basin Map



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



Map created by: public  
Date Created: 30-Jan-20 02:32 PM

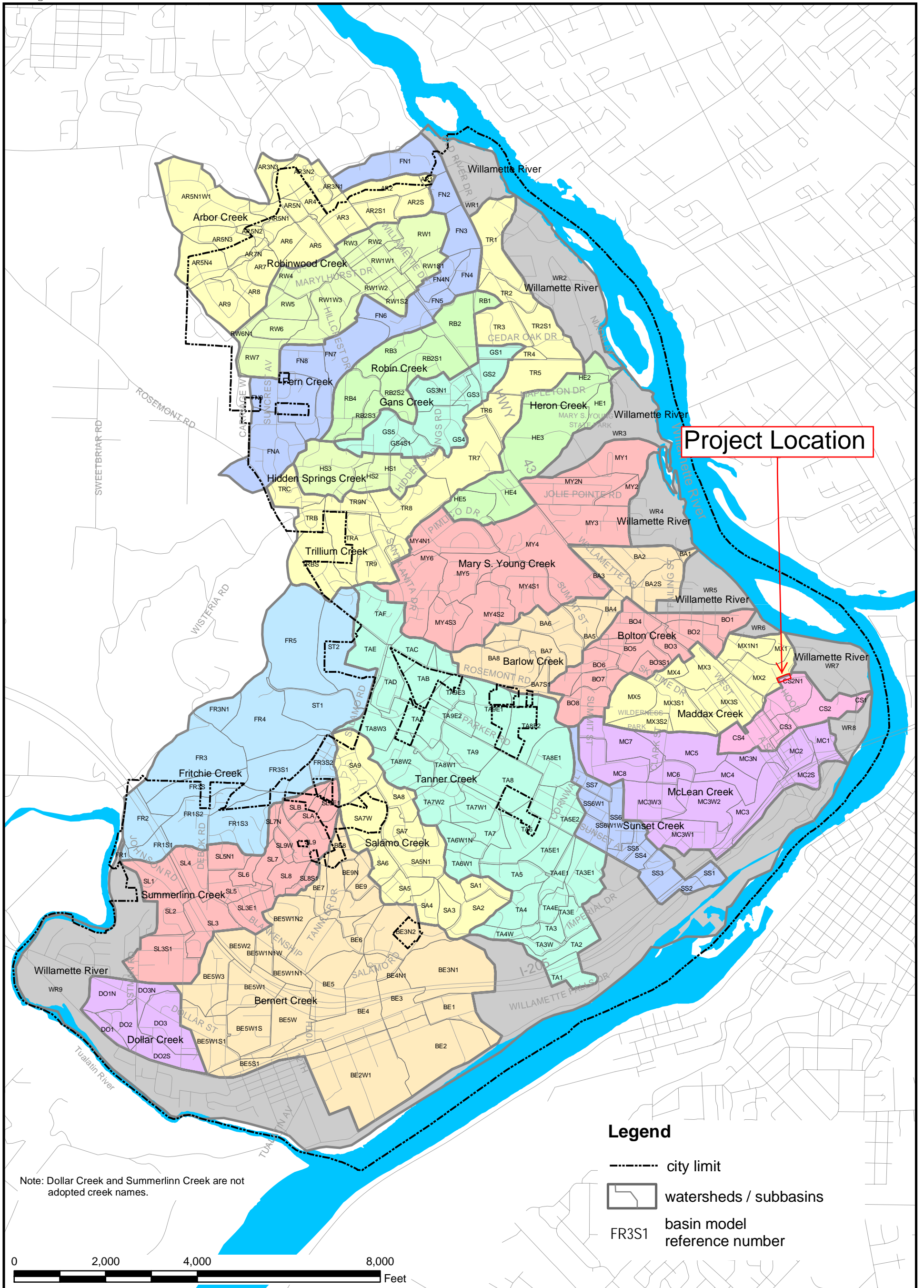
**WEST LINN GIS**

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





# Surface Water Management Plan 2006



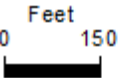
storm\_mp2004\watershed\_delineations.mxd | Lee | 9-14-06 (draft 8-03-04)

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.

### Figure 4.1 Watershed Delineations

Taxlot Base Source: Clackamas County GIS

# Flow Path and 1,500 ft Downstream Location



Scale 1:3,600 - 1 in = 300 ft  
Scale is based on 8-1/2 x 11 paper size



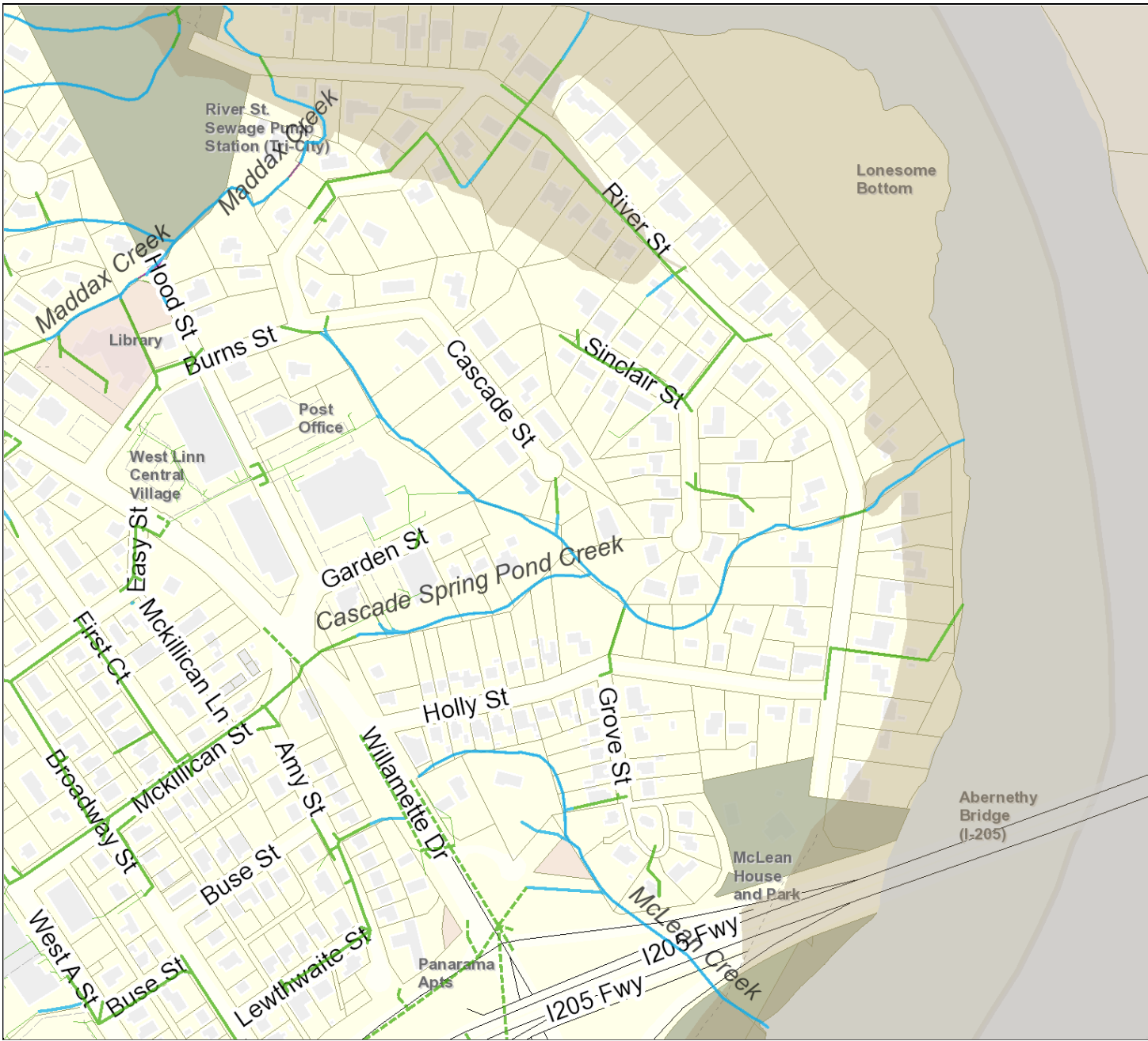
Map created by: public  
Date Created: 23-Jan-20 11:50 AM

**WEST LINN GIS**

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



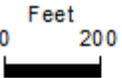
# Floodplain Map



Legend

- Storm Lines
- Storm Pipes
- - - Storm Pipes County
- - - Storm Pipes ODOT
- Ditches and Creeks
- Private Pipes

Flood Management Areas



Scale 1:4,800 - 1 in = 400 ft  
Scale is based on 8-1/2 x 11 paper size



Map created by: public  
Date Created: 30-Jan-20 02:45 PM

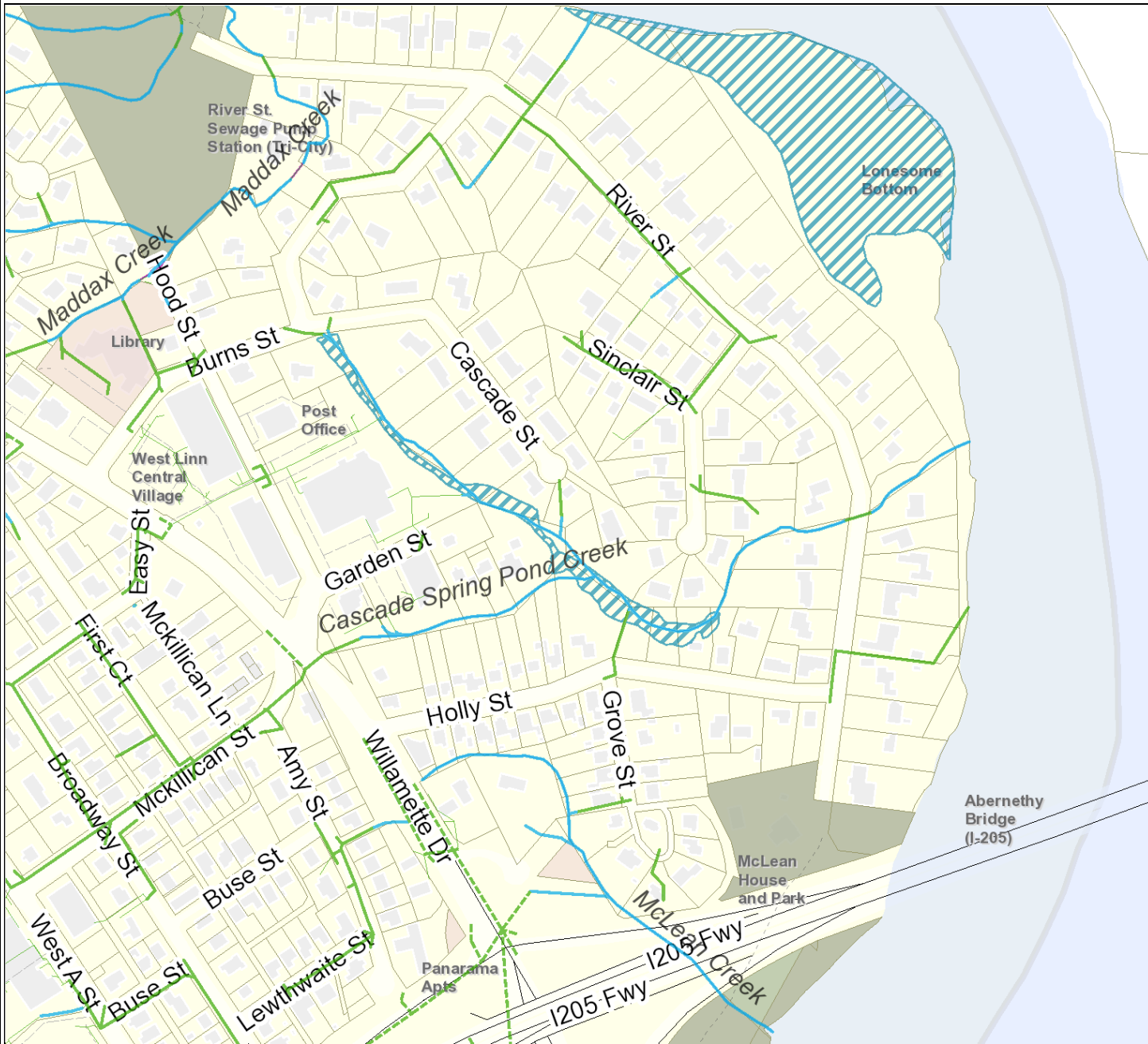
**WEST LINN GIS**

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



# WETLAND, AND HABITAT INVENTORY

# Wetland Inventory Map

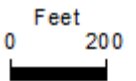
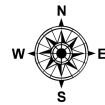


## Legend

- Storm Lines
- Storm Pipes
- - - Storm Pipes County
- - - Storm Pipes ODOT
- Ditches and Creeks
- Private Pipes

## Wetland Inventory 2005 Goal

5



Scale 1:4,800 - 1 in = 400 ft  
Scale is based on 8-1/2 x 11 paper size



Map created by: public  
Date Created: 30-Jan-20 02:47 PM

**WEST LINN GIS**

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

**Mapping Procedures**

Field maps were prepared using Year 2001 digital color ortho-photographs at a scale of 1 inch = 200 feet. All data was geo-referenced and registered with the City parcel data in GIS. Information shown on the field maps included property boundaries, rights-of-way with street names, designated open space areas and public lands, map number (and corresponding City Atlas number), hydrologic basin boundaries, topography, hydric soils, streams and City storm system data (detention basins, ponds, ditches, etc), existing wetland data (including digitized DSL and City wetland determinations, NWI wetlands, Wetland Visual Sites (City point data), and 1988 Wetland Study (digitized point data)), and photo-interpreted potential wetland sites.

Wetlands and sample plots were mapped on the field maps. A combination of reference points was used to establish the location and perimeter of each wetland polygon and the location of sample plots. These references included property lines (e.g., survey corner markers), topography (4-foot contours, or less where available), building lines, streets, utilities, trees and other mapped physical features that could be used to determine location and distances on the ground.

Wetland boundaries and sample plots were digitized and registered with the base map in GIS. Inventory maps meeting the requirements of OAR 141-086-0210 and the Digital Map Standards of OAR 141-086-0225 were provided to the City and DSL.

**Inventory Results**

Forty-four wetlands were identified as part of the Local Wetland Inventory. Wetlands varied in size between 5,000 square feet and 15.5 acres, with a total combined acreage of 72.8 acres. Wetlands were distributed within 10 subwatersheds: Bernert Creek, Camassia, Cascade Springs Pond Creek, Fern Creek, Fritchie Creek, Tanner Creek, Trillium Creek, Turkey Creek, and the remaining portions of the Tualatin and Willamette River basins. Several additional subwatersheds were identified in the study area but did not contain wetlands. Table 3 summarizes the distribution and relative size of wetlands by subwatershed.

**Table 3. Wetland Size by Subwatershed**

Hydrologic Basin	Basin Area (acres)	Wetland (acres)	Percent wetland in basin
Barlow Creek	201	0.00	0
Bernert Creek	412	0.65	0.2%
Bolton Creek	117	0.00	0.0%
Camassia	219	2.55	1.2%
Cascade Springs Pond Creek	52	1.09	2.1%
Fern Creek	555	4.14	0.7%
Fritchie Creek	393	2.34	0.6%
Heron Creek	123	0.00	0
Maddax Creek	106	0.00	0





Hydrologic Basin	Basin Area (acres)	Wetland (acres)	Percent wetland in basin
Mary S Young Creek	269	0.00	0
McLean Creek	38	0.00	0
Sunset Creek	77	0.00	0
Tanner Creek	659	5.90	0.9%
Trillium Creek	543	5.50	1.0%
Tualatin River	309	7.30	2.4%
Turkey Creek	20	0.16	0.8%
Willamette River	1165	43.23	3.5%
<b>Study Area Total</b>	<b>5258</b>	<b>72.8</b>	<b>0.14%</b>

With the exception of a few wetlands in the Camassia and Tanner Creek basins, most wetlands were associated with rivers and streams. As a result, the hydrogeomorphic classification of wetlands was predominantly Riverine Flow-Through, as shown in Table 4.

**Table 4. Wetland Hydrogeomorphic Classifications**

Hydrogeomorphic Class/subclass	Area (acres)	Number of Wetland Units
Riverine Flow-Through (RFT)	65.51	32
Headwater Slope (SH)	4.59	5
Depressional Outflow (DOF)	1.04	2
Depressional Closed, Permanently Flooded (DCP)	0.89	1
Depressional Closed, Nonpermanently Flooded (DNCP)	0.79	3
Flats	0.04	1
<b>Total</b>	<b>72.8</b>	<b>44</b>

Table 5 summarizes the distribution of wetlands by Cowardin classification within the study area. Since some wetlands had multiple classifications, total acres of each class is shown without the number of wetland units affected.

**Table 5. Wetland Cowardin Classifications**

Cowardin Class	Area (acres)
Forested Wetlands (PFO)	37.48
Scrub-Shrub Wetlands (PSS)	9.61
Emergent Wetlands (PEM)	25.39
Open Water (POW)	0.36
<b>Total</b>	<b>72.8</b>

Table 6 provides a detailed summary of the distribution and size of wetlands within each sub-watershed and the approximate acreages of each wetland type (Cowardin class).



Table 6. Wetland Size and Class by Subwatershed

Sub-Watershed	Wetland code	Area (acres)	Cowardin Class			
			PEM	PSS	PFO	POW
Bernert Creek (BE)	BE-01	0.34	0.20		0.14	
	BE-02	0.32	0.15		0.16	
		<b>0.66</b>	<b>0.35</b>	<b>0.00</b>	<b>0.30</b>	<b>0.00</b>
Camassia (CA)	CA-01	0.71		0.54		0.18
	CA-02	0.89		0.89		
	CA-03P	0.35	0.35			
	CA-04	0.04*		0.04		
	CA-05	0.14		0.14		
	CA-06	0.42	0.42			
		<b>2.55</b>	<b>0.77</b>	<b>1.61</b>	<b>0.00</b>	<b>0.18</b>
<b>Cascade Springs Pond Creek (CS)</b>	<b>CS-01</b>	<b>1.09</b>	<b>1.09</b>			
		<b>1.09</b>	<b>1.09</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Fern Creek (FE) (incl. Robinwood-RO-tributary)	FE-01	1.52	1.52			
	FE-02	2.33	.26	2.07		
	RO-01	0.29	.05		0.24	
		<b>3.17</b>	<b>1.83</b>	<b>2.07</b>	<b>0.24</b>	<b>0.00</b>
Fritchie Creek (FR)	FR-01	1.42	1.42			
	FR-02	0.16	0.13		0.03	
	FR-03	0.35			0.35	
	FR-04	0.41	0.41			
		<b>2.34</b>	<b>1.96</b>	<b>0.00</b>	<b>0.38</b>	<b>0.00</b>
Tanner Creek (TA)	TA-01	0.37	0.37			
	TA-02	0.59		0.49	0.10	
	TA-03	0.48		0.48		
	TA-04	0.25		0.25		
	TA-05	1.34	0.53		0.69	0.15
	TA-06	0.18	0.18			
	TA-07	0.69			0.69	
	TA-08	0.39			0.39	
	TA-09	1.58		0.28	1.27	0.03
		<b>5.87</b>	<b>1.08</b>	<b>1.50</b>	<b>3.14</b>	<b>0.18</b>
Trillium Creek (TR) (incl. Hidden Springs-HI-tributary)	TR-01	1.59	0.16		1.43	
	TR-02	0.61		0.54	0.07	
	TR-03	2.06	0.30	0.20	1.56	
	TR-04	0.93		0.93		
	HI-01	0.33		0.33		
		<b>5.52</b>	<b>0.46</b>	<b>2.00</b>	<b>3.06</b>	<b>0.00</b>
Tualatin River (TU)	TU-01	1.14	1.14			
	TU-02	0.30	0.30			
	TU-03	1.89			1.89	
	TU-04	0.13	0.13			
	TU-05	3.83	3.39		0.44	



141



Sub-Watershed	Wetland code	Area (acres)	Cowardin Class			
			PEM	PSS	PFO	POW
		728	4.96	0.00	2.33	0.00
Turkey Creek (TY)	TY-01	0.16	0.16			
		0.16	0.16	0.00	0.00	0.00
Willamette River (WI)	WI-01	8.09	6.44		1.65	
	WI-01a	0.84	0.84			
	WI-02	15.55	6.55		9.00	
	WI-03	2.43		2.43**		
	WI-04	7.13	3.64		3.49	
	WI-05	0.21	0.21			
	WI-06	2.70	0.90		1.80	
	WI-07	6.28	6.28			
		43.23	24.86	2.43	15.94	0.00
<b>TOTAL</b>		<b>72.84</b>	<b>37.48</b>	<b>9.61</b>	<b>25.39</b>	<b>0.36</b>

\* Wetland was below the minimum size threshold but was included due to its local significance and protected status.

\*\* This area includes the wetland portion (60%) of the wetland mosaic area.

### OFWAM Assessment Results

Wetland quality was assessed for each wetland unit using the Oregon Freshwater Wetland Assessment Methodology (OFWAM). The OFWAM assesses wetland functions (wildlife habitat, fish habitat, water quality, hydrologic control), values (education and recreation), and conditions (sensitivity to impact, enhancement potential, and aesthetic quality). The assessment result is a determination of whether a function, value or condition is high (intact), moderate (impacted/degraded), or low (not present/appropriate).

Table 7 provides the results of the OFWAM assessments for each wetland unit in the study area. Certain categories were not applicable to particular wetlands. For example, if a wetland was not connected to a stream or other water body, fish habitat functions were not assessed. Also, if wildlife habitat functions were determined to be "diverse," then enhancement potential was considered inapplicable as provided in the OFWAM methodology.



Table 7. OFWAM Wetland Assessment Results

Wetland code	Area (acres)	Wildlife Habitat	Fish Habitat	Water Quality	Hydrologic Control	Sensitivity to Impact	Enhancement Potential	Education	Recreation	Aesthetic Quality
BE-01	0.337	some	impacted degraded	intact	impacted degraded	potentially sensitive	high opportunities	not appropriate	potential	moderately pleasing
BE-02	0.316	some	impacted degraded	intact	impacted degraded	potentially sensitive	high opportunities	not appropriate	potential	moderately pleasing
CA-01	0.714	diverse	N/A	impacted degraded	impacted degraded	potentially sensitive	N/A	educational	recreational	moderately pleasing
CA-02	0.887	some	N/A	not present	intact	potentially sensitive	moderate	educational	recreational	moderately pleasing
CA-03P	0.346	some	N/A	impacted degraded	impacted degraded	potentially sensitive	little	educational	recreational	pleasing
CA-04	0.041	some	N/A	not present	intact	potentially sensitive	moderate	educational	recreational	pleasing
CA-05	0.141	some	N/A	not present	intact	potentially sensitive	moderate	potential	recreational	pleasing
CA-06	0.421	some	impacted degraded	impacted degraded	impacted degraded	potentially sensitive	high opportunities	potential	not appropriate	pleasing
CS-01	1.09	some	impacted degraded	impacted degraded	impacted degraded	potentially sensitive	high opportunities	not appropriate	potential	moderately pleasing
FE-01	1.518	some	impacted degraded	not present	lost	potentially sensitive	moderate	not appropriate	not appropriate	moderately pleasing
FE-02	2.332	diverse	intact	impacted degraded	impacted degraded	potentially sensitive	N/A	potential	potential	moderately pleasing
FR-01	1.424	some	intact	impacted degraded	impacted degraded	potentially sensitive	high opportunities	not appropriate	not appropriate	not pleasing
FR-02	0.162	some	impacted degraded	impacted degraded	intact	potentially sensitive	high opportunities	not appropriate	not appropriate	pleasing
FR-03	0.349	some	impacted degraded	impacted degraded	impacted degraded	potentially sensitive	high opportunities	not appropriate	not appropriate	moderately pleasing
FR-04	0.409	some	impacted degraded	impacted degraded	intact	potentially sensitive	high opportunities	not appropriate	not appropriate	not pleasing

143

ORD 1545 A10





Table 8 summarizes the relative distribution of assessments for each function and condition, with the percentage of total wetlands ranking high in each category.

**Table 8. Wetland Assessment Results for the Study Area**

Function / Condition	High	Moderate	Low	N/A	% Wetlands Assessed High
Wildlife habitat	6	38	0		14%
Fish habitat	8	26	0	10	18%
Water quality	3	35	6		7%
Hydrologic control	20	21	3		45%
Sensitivity to impact	2	41	1		5%
Enhancement potential	26	11	1	6	59%
Education	14	10	20		32%
Recreation	18	14	12		41%
Aesthetic quality	7	28	9		16%

Each wetland was assessed to determine whether it should be considered a Wetland of Special Interest for Protection (WSIP). The questions in the WSIP category cover the presence of federal or state listed species and habitats, existing local, state or federal protections, and existing management plans. The following wetlands were found to be WSIP wetlands: TU-01 (red-legged frog breeding site) and CA-01 through CA-05 (part of Nature Conservancy's Camassia Preserve).

During field investigations, no vacant, former wetlands of five acres or larger in size were identified. Therefore, no potential wetland mitigation or restoration sites were noted in the LWI.

**Significant Wetlands Determination**

In Oregon, local government planning responsibilities include the determination, designation, and protection of significant wetlands. Wetlands are considered significant if the OFWAM evaluation determines that they:

1. provide diverse wildlife habitat, intact fish habitat, intact water quality function, or intact hydrologic control function;
2. are located within 1/4-mile of a "water quality limited stream" and have "intact" or "impacted or degraded" water quality function;
3. contain rare plant communities or federal or state-listed species; or
4. have a surface water connection to a stream that is habitat for indigenous anadromous salmonids and have "intact" or "impacted or degraded" fish habitat function.

As noted above, the City of West Linn chose to apply the two optional significance criteria:



1. wetlands that represent a locally unique native plant community; or
2. wetlands that are publicly owned and have educational uses.

A total of 38 wetlands met the criteria and were determined to be significant. These wetlands generally had 1) high wildlife or fish habitat, water quality, or hydrologic control function, 2) a surface water connection to a salmonid stream, or 3) were located within 1/4-mile of a water quality limited stream. Approximately one-half (20) of the significant wetlands were less than one-half acre in size. The six wetlands not meeting the criteria were:

- FE-01
- HI-01
- TA-06
- TA-07
- TA-08
- TU-04 (stormwater swale created from upland, excluded)



Appendix A

## Wetland Characterization

168

ORD 1545 A15



**West Linn Goal 5 Inventory  
Wetland Characterization Sheet**



**GENERAL INFORMATION**

Wetland: Cascade Springs      Code: CS-01      Field dates: 4/22/02  
 Plot #s: DP-1 to DP-4      Size: 1.09 acres      Method:  on-site     off-site  
 Cowardin Class: PEM      HGM Class: RFT      Investigators: TB, LW, AK  
 Basin: Willamette River      Sub-basin: Cascade Spring Pond Creek

**LOCATION**

Location/address: north of Holly St., south of Cascade St.  
 Legal description: Lots 200, 300, 400, 500, 900, 2100, 2103, 2105, 2106, 3800, 3900, 5003, 5004, 5005, 5400, 5600; T2S, R2E, Section 30 (Atlas #5235, 5236)

**WETLAND CHARACTERISTICS**

Description (incl. topo. position, land use, basis): Wetland CS-01 is associated with Cascade Spring Pond Creek, and is on a narrow floodplain at the bottom of a steep-sided canyon, surrounded by residential uses, with commercial at the west end of the site. The stream has a meandering and braided channel extending from side-slope to side-slope. The wetland is dominated by reed canarygrass near the sample site, but upstream there are also patches of skunk cabbage and other native emergents. Wetland hydrology is provided primarily by stream flow plus smaller amounts of sheet flow from the surrounding side-slopes. The wetland boundary is at a sharp topographic break at the foot of the canyon embankments. The forested canyon walls are relatively undisturbed, except for a few cleared residential back yards. Uplands are dominated by big-leaf maple and Himalayan blackberry (which, in addition to steep slopes, does provide a buffer).

Soils: Xerochrepts and Haploxerolls, very steep

Hydrologic Source: stream flow, sheetflow

Dominant Vegetation:

Trees	Shrubs	Vines	Herbs
red alder		climbing nightshade	reed canarygrass stinging nettle

Wetland Functions: high enhancement potential; not appropriate for education; other functions moderate

Significant?  Yes     No    Remarks: within 1/4 mile of WQ limited stream

Potential Restoration Opportunities: Manage invasive species, particularly reed canarygrass and Himalayan blackberry. Plant a variety of native emergents and shrubs (along perimeter) to diversify habitat.

ORD 1545  
A24

177

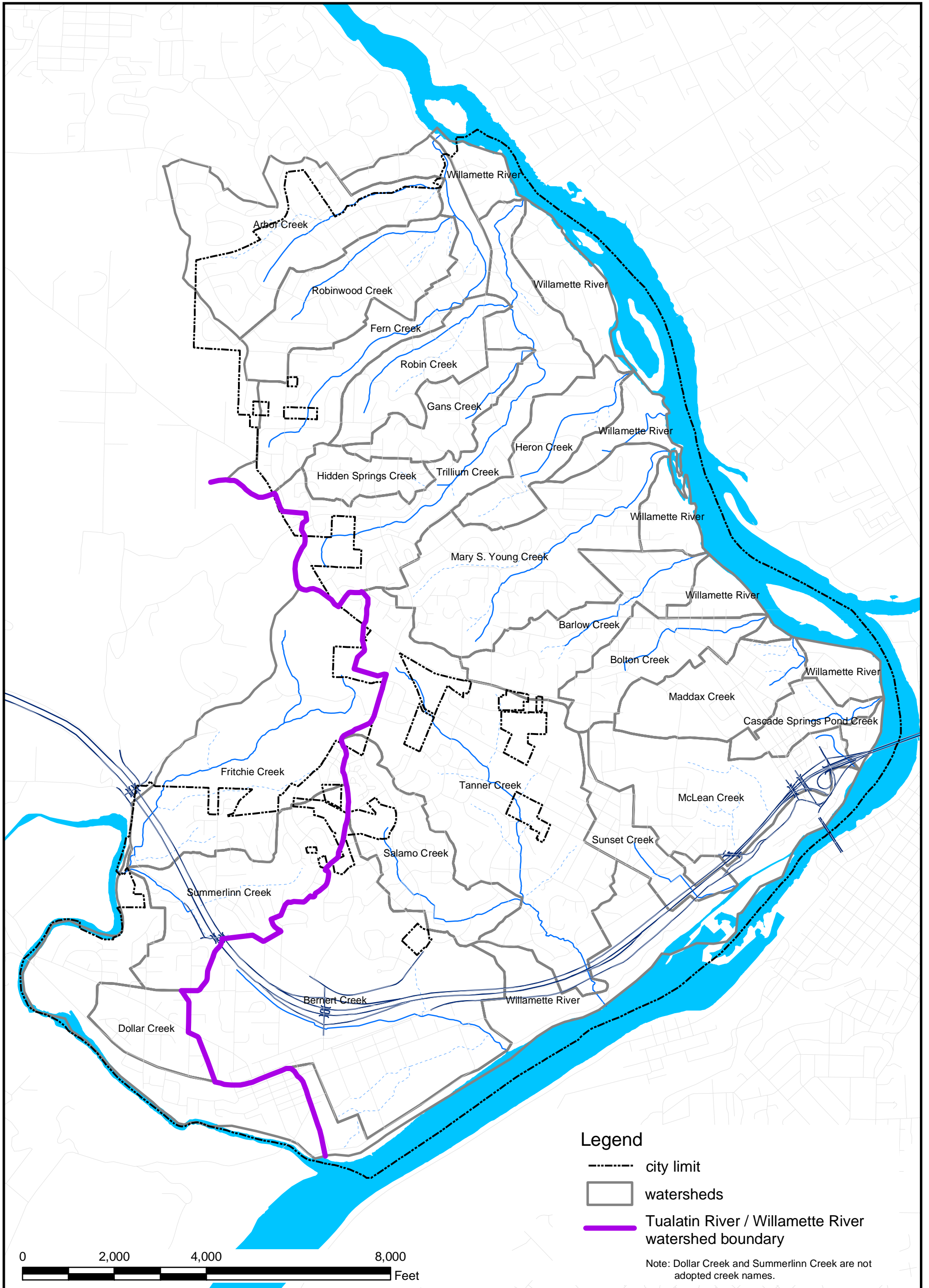
# BASIN INFORMATION







# Surface Water Management Plan 2006



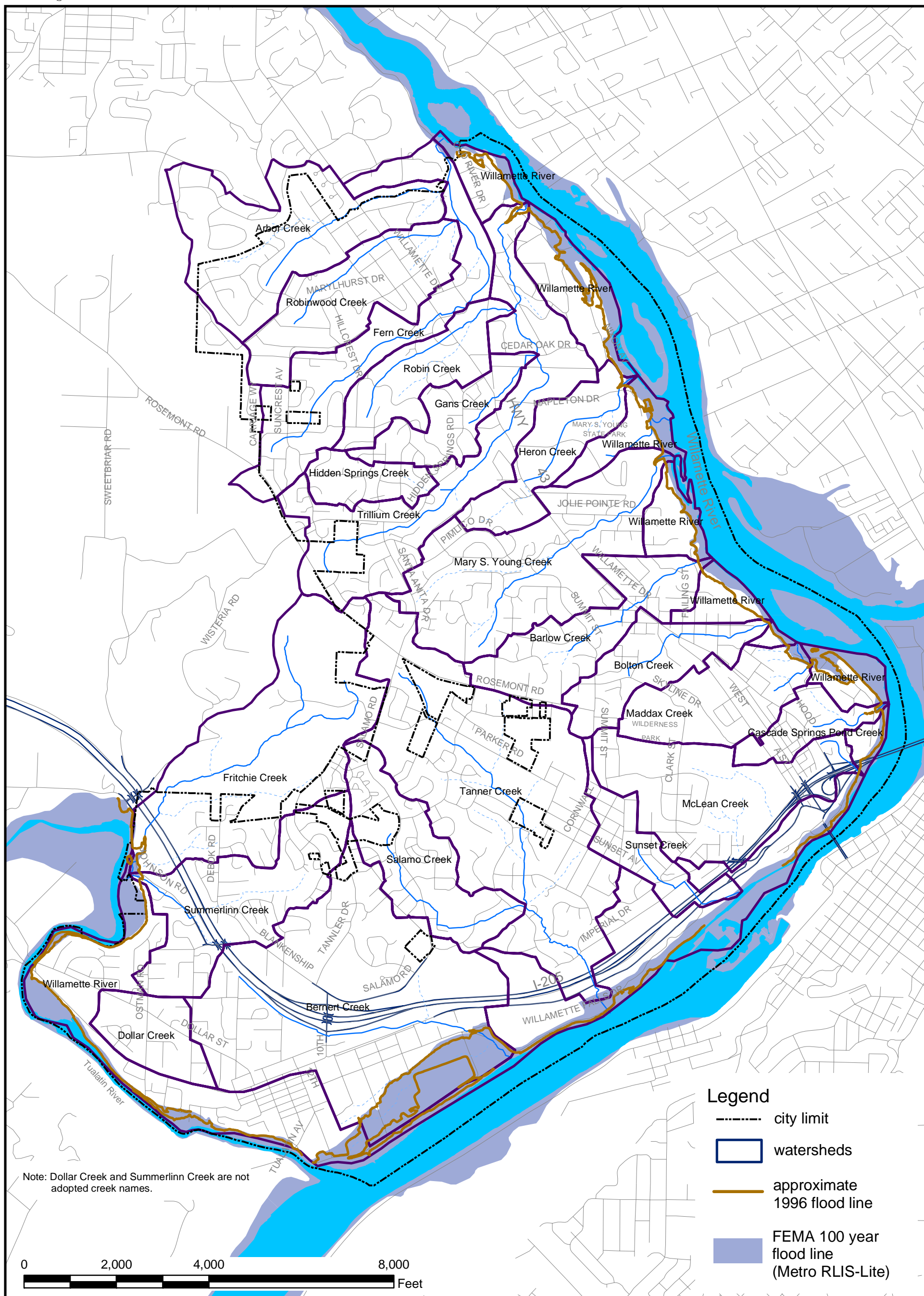
This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Taxlot Base Source: Clackamas County GIS

### Figure 3.9 Study Area Watersheds



# Surface Water Management Plan 2006



storm\_mp2004/flood\_management.mxd | Lee | 9-14-06 (draft 8-10-04)

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.

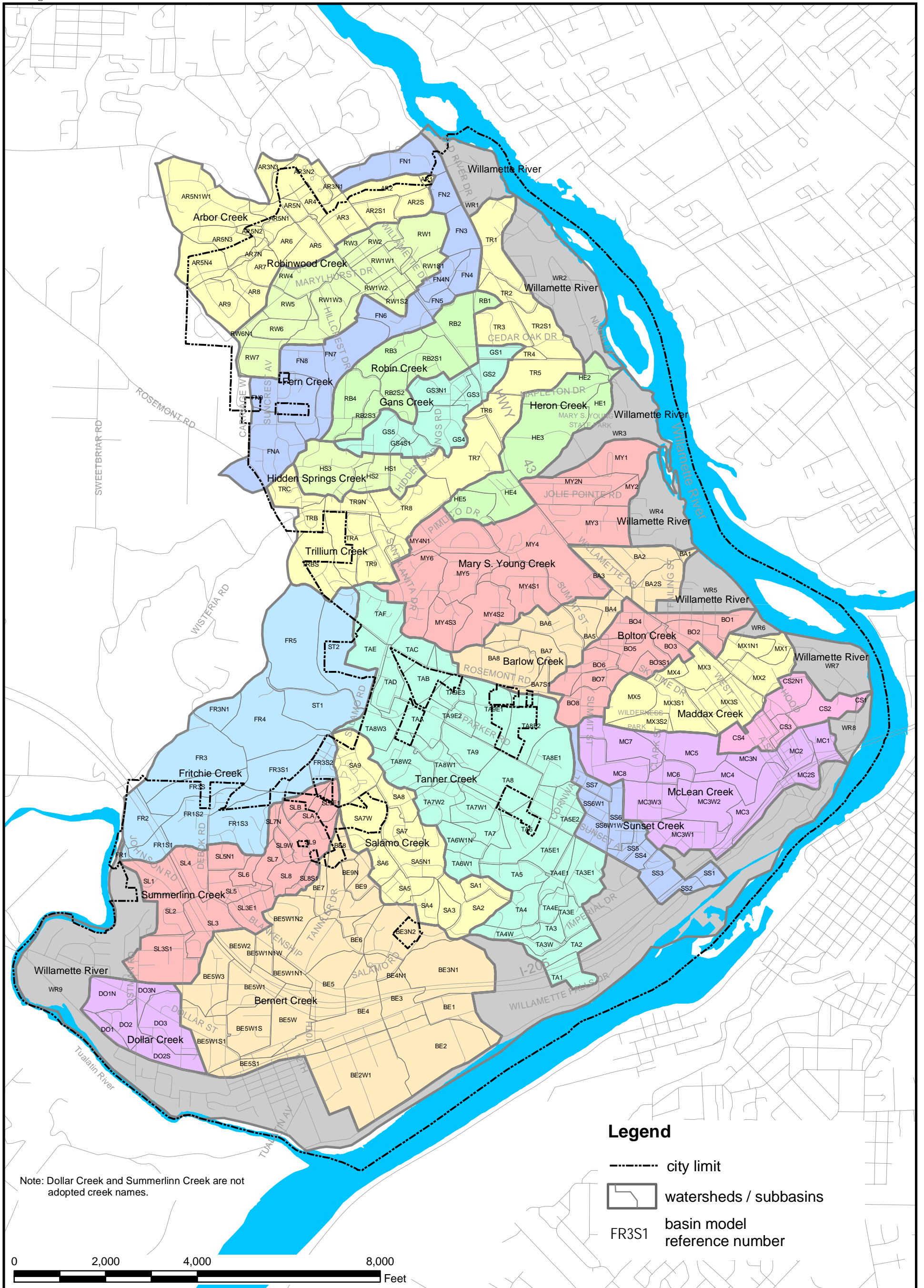
### Figure 3.10 Flood Management Area

Taxlot Base Source: Clackamas County GIS





# Surface Water Management Plan 2006



storm\_mp2004\watershed\_delineations.mxd | Lee | 9-14-06 (draft 8-03-04)

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.

### Figure 4.1 Watershed Delineations

Taxlot Base Source: Clackamas County GIS

**Appendix A**  
**HEC-HMS Input Parameter Values**

Subbasin	Total Area (acres)	Impervious Area (acres)		Lag Time (hours)		Aerially Averaged Infiltration Rate	
		Existing	Future	Existing	Future	Existing	Future
AR1	1.60	0.16	0.16	1.03	1.03	0.398	0.398
AR2	15.29	1.06	1.76	1.82	1.51	0.475	0.371
AR2S	9.50	1.97	1.99	0.48	0.48	0.163	0.158
AR2S1	10.64	2.12	2.23	0.50	0.49	0.183	0.158
AR3	15.19	3.11	2.21	0.50	0.50	0.231	0.299
AR3N1	2.21	0.04	0.04	1.81	1.81	0.59	0.59
AR3N2	19.38	2.55	1.71	0.64	0.64	0.41	0.41
AR3N3	7.75	0.17	0.16	0.79	0.79	0.46	0.46
AR4	7.13	0.95	1.42	0.62	0.47	0.42	0.18
AR5	15.93	2.44	3.32	0.44	0.40	0.35	0.17
AR5N	4.94	0.60	1.04	0.54	0.40	0.41	0.16
AR5N1	10.27	0.90	1.27	0.60	0.50	0.33	0.28
AR5N1W1	49.87	1.00	1.03	2.49	2.48	0.59	0.59
AR5N2	3.62	0.17	0.44	0.96	0.69	0.86	0.46
AR5N3	16.15	0.62	0.62	1.80	1.80	0.68	0.68
AR5N4	19.96	2.25	2.05	0.67	0.67	0.44	0.46
AR6	8.27	0.36	1.41	1.34	0.70	0.35	0.20
AR7	12.22	1.69	2.15	0.55	0.44	0.28	0.20
AR7N	3.48	0.71	0.73	0.41	0.41	0.18	0.16
AR8	10.24	2.15	2.14	0.38	0.38	0.16	0.16
AR9	21.32	4.48	4.04	0.41	0.41	0.16	0.20
BA1	1.80	0.38	0.38	0.34	0.34	0.16	0.16
BA2	18.96	3.56	3.81	0.47	0.46	0.22	0.20
BA2S	18.61	3.79	3.76	0.45	0.45	0.19	0.17
BA3	15.02	3.20	3.15	0.58	0.58	0.16	0.16
BA4	10.79	1.70	2.32	0.40	0.37	0.52	0.16
BA5	9.62	1.23	1.69	0.48	0.37	0.53	0.31
BA6	27.67	5.49	5.55	0.48	0.48	0.21	0.20
BA7	16.04	2.39	2.40	0.54	0.54	0.43	0.43
BA7S1	7.30	0.92	1.53	0.67	0.49	0.31	0.16
BA8	30.72	2.85	6.45	1.96	1.13	0.37	0.16
BE1	18.00	7.00	8.62	0.60	0.48	0.19	0.15
BE2	51.24	28.88	30.22	0.25	0.23	0.15	0.15
BE2W1	70.88	10.19	15.80	0.58	0.43	0.28	0.17
BE3	19.68	12.30	12.47	0.15	0.15	0.15	0.15
BE3N1	47.53	28.87	29.16	0.16	0.16	0.15	0.15
BE3N2	31.59	4.01	6.56	1.92	1.33	0.33	0.16
BE4	39.89	22.79	23.35	0.14	0.14	0.18	0.15
BE4N1	6.91	1.27	1.27	0.52	0.52	0.29	0.29
BE5	26.76	18.94	19.64	0.16	0.16	0.19	0.15
BE5S1	13.29	7.05	7.12	0.22	0.22	0.15	0.15
BE5W	25.68	16.86	17.39	0.22	0.21	0.15	0.15
BE5W1	23.58	11.47	11.54	0.39	0.38	0.15	0.15
BE5W1N1	7.87	6.69	6.69	0.12	0.12	0.15	0.15

Subbasin	Total Area (acres)	Impervious Area (acres)		Lag Time (hours)		Aerially Averaged Infiltration Rate	
		Existing	Future	Existing	Future	Existing	Future
BE5W1N1W	7.98	3.69	4.13	0.19	0.17	0.15	0.15
BE5W1N2	22.23	12.17	12.17	0.19	0.19	0.15	0.15
BE5W1S	21.41	4.14	4.79	0.56	0.53	0.20	0.16
BE5W1S1	24.38	5.20	5.36	0.45	0.45	0.16	0.16
BE5W2	11.82	6.88	6.88	0.16	0.16	0.15	0.15
BE5W3	24.52	6.32	6.96	0.44	0.42	0.20	0.15
BE6	29.82	18.49	18.66	0.16	0.16	0.15	0.15
BE7	13.19	2.51	2.74	0.47	0.45	0.20	0.17
BE8	26.40	2.73	5.45	0.67	0.43	0.35	0.17
BE9	8.72	1.81	1.82	0.37	0.37	0.16	0.16
BE9N	3.52	0.74	0.74	0.50	0.50	0.16	0.16
BO1	14.19	3.03	2.55	0.52	0.52	0.32	0.26
BO2	14.53	3.62	3.77	0.39	0.38	0.19	0.17
BO3	7.81	1.76	1.67	0.40	0.40	0.20	0.16
BO3S1	5.62	0.98	1.18	0.45	0.43	0.18	0.16
BO4	15.97	2.81	3.35	0.43	0.41	0.36	0.16
BO5	14.87	2.12	3.12	0.60	0.46	0.35	0.16
BO6	14.62	2.68	3.07	0.38	0.37	0.25	0.16
BO7	8.91	1.50	1.57	0.52	0.52	0.31	0.31
BO8	16.81	2.28	3.46	0.53	0.40	0.31	0.17
CS1	1.80	0.38	0.38	0.50	0.50	0.16	0.16
CS2	16.54	4.62	4.95	0.45	0.43	0.17	0.15
CS2N1	15.83	9.04	9.31	0.38	0.16	0.15	0.15
CS3	5.47	1.81	1.61	0.30	0.30	0.20	0.15
CS4	17.50	4.35	3.67	0.44	0.44	0.19	0.16
DO1	5.11	1.76	1.11	0.40	0.40	0.15	0.16
DO1N	16.33	2.22	3.43	1.12	0.80	0.42	0.16
DO2	11.99	3.30	2.52	0.38	0.38	0.19	0.16
DO2S	13.34	2.61	2.81	0.52	0.50	0.19	0.16
DO3	24.87	4.83	5.22	0.55	0.53	0.19	0.16
DO3N	6.79	1.35	1.43	0.54	0.53	0.18	0.16
FN1	31.06	1.08	1.08	2.65	2.65	0.35	0.35
FN2	9.87	1.42	2.04	1.43	1.06	0.30	0.17
FN3	13.99	1.34	1.61	1.44	1.34	0.36	0.46
FN4	10.69	2.18	2.24	0.46	0.45	0.16	0.16
FN4N	10.85	3.30	3.53	0.43	0.42	0.18	0.15
FN5	5.45	3.13	3.13	0.15	0.15	0.15	0.15
FN6	18.38	4.02	4.72	0.46	0.43	0.37	0.28
FN7	25.80	2.98	3.08	1.35	1.33	0.60	0.61
FN8	24.57	4.49	4.75	0.45	0.44	0.22	0.22
FN9	33.55	4.09	6.00	0.69	0.53	0.35	0.26
FNA	41.36	6.18	6.24	0.70	0.61	0.26	0.29
FR1	1.36	0.11	0.29	0.70	0.43	0.60	0.16
FR1S1	9.19	3.49	4.47	0.34	0.31	0.23	0.15
FR1S2	29.27	5.09	6.92	0.52	0.46	0.27	0.15
FR1S3	32.94	5.47	6.92	0.51	0.47	0.24	0.16
FR2	17.20	7.23	8.98	0.33	0.17	0.29	0.15
FR3	47.64	1.20	2.11	2.40	2.15	0.49	0.42
FR3N1	10.73	0.21	0.21	1.31	1.31	0.59	0.59

Appendix B

HEC-HMS SUMMARY OF PEAK FLOWS WITH DETENTION FACILITIES

ID	Drainage Area (mi <sup>2</sup> )	2-YEAR		5-YEAR		10-YEAR		25-YEAR		50-YEAR		100-YEAR		500-YEAR	
		Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future
		Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)
BER3-4	0.528	91.62	96.49	116.46	121.81	128.94	134.26	165.69	171.26	175.88	181.51	191.89	198.99	218.02	233.30
BER3N1-3N2	0.049	3.20	4.72	4.01	6.01	4.43	6.69	5.73	8.73	6.09	9.29	6.66	10.12	7.63	11.52
BER4-4N1	0.011	0.79	0.79	0.93	0.93	1.00	1.00	2.09	2.09	2.40	2.40	2.83	2.83	3.48	3.48
BER4-5	0.455	78.94	82.35	99.65	103.64	110.23	114.20	141.34	145.76	150.12	154.83	164.11	172.53	186.46	202.96
BER5-5S1	0.021	4.66	4.66	5.91	5.91	6.53	6.53	8.37	8.37	8.86	8.86	9.59	9.59	10.80	10.80
BER5-5W1	0.224	39.28	41.07	49.70	51.96	54.94	57.38	72.04	74.57	77.32	79.89	84.72	87.54	96.08	98.98
BER5-6	0.128	18.29	18.70	22.73	23.19	24.87	25.42	31.25	33.56	32.93	37.60	35.44	44.12	39.57	54.33
BER5W1-5W1N1	0.059	13.32	13.49	16.57	16.77	18.15	18.37	22.82	23.09	25.02	25.08	28.95	29.13	33.87	34.20
BER5W1-5W1S1	0.038	6.97	6.97	8.76	8.76	9.65	9.65	12.29	12.29	12.99	12.99	14.04	14.04	15.77	15.77
BER5W1-5W2	0.018	5.15	5.15	6.42	6.42	7.05	7.05	8.91	8.91	9.35	9.35	10.10	10.10	11.30	11.30
BER5W1-5W3	0.038	5.58	6.49	7.27	8.32	8.14	9.24	10.81	11.98	11.52	12.70	12.60	13.78	14.39	15.58
BER5W1N1-5W1N	0.035	9.00	9.00	11.22	11.22	12.32	12.32	15.57	15.57	16.43	16.43	17.71	17.71	19.84	19.84
BER6-7	0.081	7.45	7.93	8.82	11.10	9.49	13.92	15.10	23.61	17.37	26.00	20.58	29.32	25.49	34.01
BER7-8	0.06	5.95	6.27	7.06	8.90	7.61	11.71	10.87	18.82	12.49	20.50	14.83	22.65	18.36	25.52
BER8-9	0.019	3.65	3.65	4.58	4.58	5.04	5.04	6.42	6.42	6.78	6.78	7.33	7.33	8.23	8.23
BO1	0.022	2.40	2.67	3.20	3.52	3.62	3.95	4.92	5.32	5.28	5.69	5.82	6.27	6.75	7.24
BO2	0.029	4.42	5.10	5.75	6.52	6.44	7.23	8.54	9.35	9.10	9.91	9.94	10.75	11.33	12.14
BO3	0.012	2.13	2.34	2.72	2.94	3.01	3.23	3.91	4.12	4.15	4.35	4.50	4.70	5.09	5.28
BO3S1	0.013	2.18	2.44	2.77	3.06	3.07	3.37	3.98	4.29	4.23	4.53	4.59	4.90	5.20	5.50
BO4	0.025	3.35	4.77	4.40	5.99	4.94	6.59	6.58	8.39	7.03	8.87	7.71	9.58	8.87	10.76
BO5	0.019	2.32	3.42	2.98	4.30	3.32	4.74	4.37	6.04	4.66	6.39	5.09	6.90	5.83	7.75
BO6	0.023	3.76	4.54	4.83	5.70	5.38	6.27	7.08	7.98	7.53	8.43	8.22	9.10	9.37	10.22
BO7	0.014	1.89	1.89	2.43	2.43	2.71	2.71	3.56	3.56	3.79	3.79	4.14	4.14	4.74	4.74
BO8	0.028	2.98	4.79	3.97	6.14	4.48	6.81	6.08	8.81	6.53	9.34	7.20	10.13	8.35	11.45
BOJ1	0.184	24.99	31.59	32.48	40.12	36.32	44.39	48.15	57.21	51.38	60.63	56.24	65.76	64.44	74.27
BOJ2	0.162	22.60	28.92	29.32	36.63	32.76	40.47	43.32	51.97	46.19	55.01	50.52	59.58	57.79	67.15
BOJ3	0.134	18.33	24.03	23.74	30.34	26.52	33.48	35.05	42.90	37.38	45.40	40.89	49.14	46.81	55.35
BOJ3S1	0.013	2.18	2.44	2.77	3.06	3.07	3.37	3.98	4.29	4.23	4.53	4.59	4.90	5.20	5.50
BOJ4	0.108	14.07	19.29	18.31	24.38	20.50	26.93	27.25	34.54	29.10	36.56	31.90	39.59	36.63	44.63
BOJ5	0.083	10.80	14.55	14.02	18.43	15.67	20.37	20.78	26.18	22.18	27.73	24.29	30.05	27.87	33.91
BOJ6	0.064	8.51	11.17	11.04	14.18	12.36	15.69	16.47	20.21	17.59	21.42	19.28	23.23	22.14	26.23
BOJ7	0.042	4.87	6.67	6.38	8.54	7.17	9.47	9.61	12.30	10.28	13.06	11.31	14.20	13.06	16.10
BOJ8	0.028	2.98	4.79	3.97	6.14	4.48	6.81	6.08	8.81	6.53	9.34	7.20	10.13	8.35	11.45
BOR1-2	0.162	22.59	28.91	29.28	36.60	32.70	40.44	43.24	51.90	46.10	54.94	50.42	59.48	57.68	67.03
BOR2-3	0.134	18.33	23.96	23.71	30.26	26.47	33.39	34.97	42.77	37.29	45.26	40.79	48.99	46.69	55.17
BOR3-3S1	0.013	2.17	2.42	2.76	3.04	3.06	3.35	3.98	4.27	4.22	4.51	4.58	4.88	5.19	5.48
BOR3-4	0.108	14.07	19.27	18.31	24.36	20.49	26.90	27.23	34.51	29.08	36.53	31.88	39.56	36.62	44.59
BOR4-5	0.083	10.79	14.52	14.01	18.40	15.66	20.34	20.76	26.15	22.15	27.70	24.27	30.01	27.85	33.87
BOR5-6	0.064	8.47	11.12	11.04	14.12	12.36	15.63	16.44	20.14	17.56	21.35	19.25	23.15	22.11	26.15
BOR6-7	0.042	4.86	6.65	6.37	8.51	7.15	9.45	9.60	12.27	10.28	13.03	11.31	14.17	13.06	16.06
BOR7-8	0.028	2.98	4.78	3.95	6.13	4.46	6.80	6.06	8.80	6.50	9.33	7.18	10.12	8.34	11.44
CS1	0.003	0.49	0.49	0.62	0.62	0.68	0.68	0.87	0.87	0.92	0.92	0.99	0.99	1.11	1.11
CS2	0.026	4.25	4.35	5.45	5.57	6.05	6.18	7.84	8.01	8.32	8.50	9.03	9.22	10.20	10.42
CS2N1	0.025	4.40	6.47	5.63	8.14	6.24	8.96	8.07	11.43	8.56	12.08	9.28	13.06	10.48	14.68



Appendix B

HEC-HMS SUMMARY OF PEAK FLOWS WITH DETENTION FACILITIES

ID	Drainage Area (mi <sup>2</sup> )	2-YEAR		5-YEAR		10-YEAR		25-YEAR		50-YEAR		100-YEAR		500-YEAR	
		Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future
		Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)
CS3	0.009	1.68	1.84	2.14	2.31	2.38	2.54	3.08	3.23	3.26	3.41	3.54	3.68	4.00	4.13
CS4	0.027	4.00	4.53	5.21	5.81	5.83	6.45	7.74	8.37	8.25	8.87	9.02	9.63	10.30	10.88
CSJ1	0.089	14.67	16.54	18.87	21.08	20.98	23.36	27.37	30.13	29.06	31.93	31.60	34.59	35.81	39.02
CSJ2	0.086	14.21	16.16	18.29	20.60	20.34	22.81	26.53	29.41	28.18	31.15	30.64	33.74	34.72	38.06
CSJ2N1	0.025	4.40	6.47	5.63	8.14	6.24	8.96	8.07	11.43	8.56	12.08	9.28	13.06	10.48	14.68
CSJ3	0.036	5.60	6.30	7.26	8.03	8.11	8.90	10.70	11.47	11.39	12.15	12.42	13.17	14.14	14.86
CSJ4	0.027	4.00	4.53	5.21	5.81	5.83	6.45	7.74	8.37	8.25	8.87	9.02	9.63	10.30	10.88
CSR1-2	0.086	14.18	16.06	18.25	20.49	20.30	22.70	26.50	29.29	28.15	31.05	30.61	33.64	34.70	37.95
CSR2-2N1	0.025	4.39	6.43	5.61	8.09	6.22	8.92	8.04	11.31	8.53	12.00	9.24	12.98	10.45	14.57
CSR2-3	0.036	5.59	6.29	7.25	8.01	8.09	8.88	10.67	11.44	11.36	12.13	12.39	13.14	14.11	14.83
CSR3-4	0.027	4.00	4.53	5.20	5.81	5.82	6.45	7.73	8.36	8.25	8.86	9.01	9.62	10.29	10.87
DO1	0.008	1.53	1.53	1.93	1.93	2.12	2.12	2.70	2.70	2.85	2.85	3.08	3.08	3.46	3.46
DO1N	0.025	1.81	3.12	2.35	4.02	2.62	4.47	3.49	5.85	3.73	6.21	4.10	6.76	4.75	7.68
DO2	0.019	3.36	3.68	4.28	4.62	4.74	5.09	6.15	6.48	6.53	6.84	7.09	7.39	8.01	8.30
DO2S	0.021	2.80	3.25	3.64	4.18	4.08	4.64	5.43	6.03	5.79	6.40	6.34	6.95	7.24	7.86
DO3	0.039	5.97	6.62	7.54	8.31	8.35	9.15	10.84	11.68	11.50	12.35	12.50	13.35	14.15	15.01
DO3N	0.011	1.40	1.60	1.82	2.06	2.03	2.29	2.71	2.98	2.89	3.16	3.17	3.43	3.62	3.89
DOJ1	0.123	16.49	19.37	21.00	24.57	23.31	27.17	30.37	34.98	32.26	37.05	35.10	40.15	39.84	45.28
DOJ2	0.089	13.40	15.04	17.13	19.03	19.05	21.02	24.93	26.98	26.50	28.55	28.86	30.91	32.78	34.82
DOJ3	0.049	7.37	8.22	9.36	10.37	10.39	11.44	13.55	14.66	14.39	15.51	15.66	16.78	17.77	18.90
DOR1-2	0.089	13.38	15.02	17.10	19.01	19.01	21.00	24.89	26.95	26.46	28.52	28.81	30.88	32.73	34.79
DOR2-3	0.049	7.35	8.20	9.36	10.35	10.38	11.42	13.55	14.63	14.39	15.48	15.66	16.75	17.77	18.86
FN1	0.049	4.16	4.16	4.96	4.96	5.37	5.37	6.65	6.65	7.00	7.00	7.53	7.53	8.42	8.42
FN2	0.015	1.56	1.93	1.92	2.40	2.10	2.63	2.66	3.35	2.81	3.54	3.03	3.84	3.41	4.32
FN3	0.022	1.53	1.42	1.95	1.83	2.16	2.04	2.84	2.69	3.03	2.87	3.32	3.15	3.82	3.62
FN4	0.017	3.01	3.06	3.78	3.85	4.16	4.24	5.31	5.40	5.61	5.71	6.07	6.17	6.82	6.93
FN4N	0.017	2.91	3.22	3.70	4.04	4.10	4.45	5.32	5.67	5.65	5.99	6.13	6.47	6.94	7.26
FN5	0.009	2.43	2.43	3.02	3.02	3.31	3.31	4.17	4.17	4.40	4.40	4.74	4.74	5.31	5.31
FN6	0.029	2.93	3.39	4.00	4.55	4.55	5.15	6.25	7.02	6.72	7.54	7.44	8.32	8.67	9.65
FN7	0.04	2.26	2.26	2.95	2.96	3.33	3.34	4.46	4.48	4.77	4.79	5.24	5.27	6.04	6.07
FN8	0.038	5.58	5.63	7.26	7.32	8.12	8.19	10.79	10.89	11.51	11.61	12.58	12.69	14.36	14.49
FN9	0.052	4.60	6.26	6.11	8.23	6.90	9.25	9.38	12.44	10.08	13.32	11.14	14.67	12.94	16.94
FNA	0.065	6.76	6.52	8.82	8.63	9.90	9.73	13.25	13.18	14.19	14.14	15.64	15.59	18.08	18.08
FNA-R	0.065	3.93	3.81	4.46	4.34	4.72	4.58	11.66	10.40	13.36	12.24	15.60	14.77	18.88	17.65
FNJ1	1.042	111.88	122.15	141.79	154.65	156.87	171.00	202.85	220.41	215.32	233.65	234.06	253.51	265.54	286.70
FNJ2-ARJ1	0.994	107.97	118.39	137.38	150.30	152.20	166.38	197.59	214.99	209.92	228.06	228.42	247.66	259.55	280.45
FNJ3-RWJ1	0.564	63.93	69.91	81.46	88.82	90.34	98.39	117.42	127.20	124.80	134.95	135.86	146.59	156.01	166.00
FNJ4	0.267	24.82	27.46	31.77	35.11	35.27	38.96	45.99	50.75	48.92	53.96	55.35	58.77	68.81	72.03
FNJ5	0.233	19.14	21.38	24.58	27.44	27.32	30.52	35.79	40.04	39.31	42.63	46.40	48.38	57.36	60.33
FNJ6	0.224	17.83	20.04	22.91	25.73	25.48	28.64	33.52	37.63	38.10	40.09	44.84	46.79	55.47	58.48
FNJ7	0.196	15.21	16.96	19.30	21.53	21.39	23.85	30.16	30.99	34.04	34.64	39.69	41.07	48.77	51.17
FNJ8	0.155	13.00	14.75	16.52	18.79	18.30	20.82	25.76	27.12	29.61	30.41	34.94	36.36	43.30	45.60
FNJ9	0.117	7.80	9.28	9.63	11.59	10.60	12.78	18.74	18.95	21.45	22.25	25.15	26.58	30.97	33.31
FNJA	0.065	3.93	3.81	4.46	4.34	4.72	4.58	11.66	10.40	13.36	12.24	15.60	14.77	18.88	17.65



**Appendix C  
CULVERT AND PIPE INVENTORY WITH HYDRAULIC DEFICIENCIES**

Count	Watershed	PWR ID	HEC-HMS Subbasin	Drainage Area (mi <sup>2</sup> )	Location / Description	Existing Structure						25-Year Design Flow (cfs)		Is it Deficient?		100-Year Design Flow (cfs)		Is it Deficient?			
						Diam (ft)	Length (ft)	Inlet Type	Material	Shape	Slope (ft/ft)	Capacity (cfs)	Structure Type	Existing	Future	Now	Future	Existing	Future	Now	Future
1	ARBOR	495	ARJ5N1	0.156	PIPE FROM SCENIC DR TO HILLSIDE DR.	1.50	400	HW45	CONC	CIRC	0.170	24.5	P	18.6	19.4	NO	NO	21.4	22.3	NO	NO
2	ARBOR	496	ARJ9	0.033	FROM BRAEMAR CT TO SKYE PARKWAY	4.00	390	HW45	CMP	CIRC	0.164	4.0	P	11.2	10.7	YES	YES	12.8	12.3	YES	YES
3	ARBOR	497	ARR5-6	0.087	ENTRANCE TO PIEP SYSTEM UNDER UPPER MIDHILL	3.00	92	HW90	CONC	CIRC	0.158	103.9	C	24.2	26.4	NO	NO	27.7	30.4	NO	NO
4	ARBOR	657	ARJ3	0.356	CULVERT UNDER PACIFIC HIGHWAY NR ARBOR DR.	2.00	72	HW90	CONC	CIRC	0.083	70.8	C	66.2	72.8	NO	NO	76.6	84.0	YES	YES
5	ARBOR	659	ARR5-5N1	0.156	ENTRANCE TO PIPE SYSTEM UNDER COLLEGE HILL PL.	1.50	275	HW90	CONC	CIRC	0.113	55.1	C	18.6	19.4	NO	NO	21.4	22.3	NO	NO
6	ARBOR	660	ARR5-6	0.087	PIPE UNDER UPPER MIDHILL NR COLLEGE HILL PL.	2.00	33	HW45	CONC	CIRC	0.066	109.8	P	24.2	26.4	NO	NO	27.7	30.4	NO	NO
7	ARBOR	661	ARJ6	0.062	UNDER HILLSIDE DR.	4.00	150	PROJ	CMP	CIRC	0.173	161.6	C	24.2	26.4	NO	NO	27.7	30.4	NO	NO
8	ARBOR	662	ARR5-2	0.062	ENTRANCE TO PIPE SYSTEM UNDER SKYE PARKWAY	3.00	420	HW90	CONC	CIRC	0.217	34.5	P	9.1	9.4	NO	NO	10.6	11.0	NO	NO
9	ARBOR	663	AR5N1W1	0.078	ENTRANCE TO PIPE SYSTEM AT SCENIC DR.	2.25	170	HW90	CONC	CIRC	0.382	19.7	P	7.4	7.4	NO	NO	8.5	8.5	NO	NO
10	ARBOR	664	ARJ8	0.049	UPSTREAM OF BRAEMAR CT.	4.00	120	HW45	CONC	CIRC	0.017	12.5	P	16.7	16.2	YES	YES	19.1	18.6	YES	YES
11	BARLOW	481	BAJ8	0.048	UNDER ROSE PARK DR. AT LUPIN CT.	3.00	60	PROJ	CMP	CIRC	0.117	39.9	C	7.3	10.2	NO	NO	8.3	11.6	NO	NO
12	BARLOW	597	BAJ6	0.127	UNDER SUMMIT ST AT HORTON RD.	3.00	140	PROJ	CMP	CIRC	0.050	10.9	C	26.2	29.8	YES	YES	30.0	34.4	YES	YES
13	BARLOW	598	BAJ5	0.142	UNDER RANDALL ST.	2.00	265	HW45	CONC	CIRC	0.159	70.8	P	28.5	33.4	NO	NO	32.8	38.7	NO	NO
14	BARLOW	599	BAJ5	0.142	PIPE ENTRANCE AT BUCK ST.	2.50	164	HW90	CMP	CIRC	0.048	46.8	C	28.5	33.4	NO	NO	32.8	38.7	NO	NO
15	BARLOW	600	BAJ3	0.184	PIPE UNDER LOWRY DR.	2.00	70	HW90	CONC	CIRC	0.214	34.5	C	39.2	46.0	YES	YES	45.2	53.1	YES	YES
16	BARLOW	601	BAJ4	0.159	UNDER WILLAMETTE DR. NR RANDALL ST.	2.25	87	PROJ	CMP	CIRC	0.082	39.9	C	32.2	38.9	NO	NO	37.2	45.0	YES	YES
17	BARLOW	602	BAJ4	0.159	UNDER WILLAMETTE DR. NR RANDALL ST.	2.00	110	PROJ	CMP	CIRC	0.167	22.8	C	32.2	38.9	YES	YES	37.2	45.0	YES	YES
18	BARLOW	603	BAR2-3	0.184	UNDER WILLAMETTE VIEW CT.	2.00	150	PROJ	CMP	CIRC	0.140	14.8	C	39.2	46.0	YES	YES	45.2	53.0	YES	YES
19	BARLOW	604	BAJ2	0.241	CULVERT UNDER FAILING STREET	2.00	317	PROJ	CMP	CIRC	0.098	9.1	C	55.6	62.9	YES	YES	64.3	72.6	YES	YES
20	BERNERT	443	BEJ5S1	0.021	UNDER 10TH STREET	1.00	600	HW45	CONC	CIRC	0.044	12.5	P	8.4	8.4	NO	NO	9.6	9.6	NO	NO
21	BERNERT	444	BER5W1-5W1S1	0.038	ALONG 13TH AVENUE	3.00	120	HW45	CONC	CIRC	0.029	4.5	P	12.3	12.3	YES	YES	14.0	14.0	YES	YES
22	BERNERT	445	BEJ5W1S1	0.038	FROM 16TH AVENUE TO 13TH AVENUE	1.25	1000	HW45	CONC	CIRC	0.050	4.5	P	12.3	12.3	YES	YES	14.1	14.1	YES	YES
23	BERNERT	446	BEJ5W1N1	0.059	UNDER I-205 AT 13TH AVENUE	2.50	526	HW45	CONC	CIRC	0.009	36.9	P	22.9	23.2	NO	NO	29.2	29.3	NO	NO
24	BERNERT	447	BEJ5W2	0.018	UNDER I-205 AT VIRGINIA LN.	3.50	288	HW45	CONC	CIRC	0.010	5.2	P	8.9	8.9	YES	YES	10.1	10.1	YES	YES
25	BERNERT	448	BEJAN1	0.011	UNDER I-205	2.50	538	HW90	CMP	CIRC	0.210	8.1	C	2.1	2.1	NO	NO	2.8	2.8	NO	NO
26	BERNERT	449	BEJAN1	0.011	ABOVE I-205	3.00	115	HW90	CONC	CIRC	0.280	7.9	C	2.1	2.1	NO	NO	2.8	2.8	NO	NO
27	BERNERT	450	BEJ9	0.019	ALONG TANNER NR FALCON DR	1.50	214	HW90	CONC	CIRC	0.114	12.5	P	6.4	6.4	NO	NO	7.3	7.3	NO	NO
28	BERNERT	451	BEJ9	0.019	ALONG TANNER NR FALCON DR	2.00	214	HW90	CONC	CIRC	0.079	9.1	P	6.4	6.4	NO	NO	7.3	7.3	NO	NO
29	BERNERT	452	BER3N1-3N2	0.049	DOWN TO WILLAMETTE FALLS DR.	3.00	484	PROJ	CMP	CIRC	0.178	28.6	C	5.7	8.7	NO	NO	6.7	10.1	NO	NO
30	BERNERT	453	BEJ3N2	0.049	UNDER SALAMO NR HALL CT.	1.50	150	HW45	CONC	CIRC	0.020	6.6	P	5.7	8.7	NO	YES	6.7	10.1	YES	YES
31	BERNERT	454	BE2W1	0.111	UNDER 9TH ST. NR VOLPP ST.	2.00	80	PROJ	CMP	CIRC	0.004	7.0	C	23.3	34.5	YES	YES	27.6	39.7	YES	YES
32	BERNERT	523	BERG-7	0.081	ALONG TANNER RD TO BLANKENSHIP RD	2.00	900	HW45	CONC	CIRC	0.128	70.8	P	15.1	23.6	NO	NO	20.6	29.3	NO	NO
33	BERNERT	524	BEJ7	0.081	ALONG TANNER D DOWNSTREAM OF GREENE ST	1.50	335	HW45	CMP	CIRC	0.119	26.1	P	15.2	23.7	NO	NO	20.6	29.6	NO	YES
34	BERNERT	525	BEJ8	0.06	ALONG TANNER RD UNDER GREENE STREET	1.50	100	HW45	CONC	CIRC	0.250	25.7	P	10.9	18.8	NO	NO	14.8	22.7	NO	NO
35	BERNERT	526	BEJ9	0.019	AT TANNER AND REMINGTON	1.25	83	HW90	CONC	CIRC	0.081	12.5	P	6.4	6.4	NO	NO	7.3	7.3	NO	NO
36	BERNERT	527	BEJ6	0.128	UNDER SALAMO AT TANNER DR.	3.00	327	HW45	CONC	CIRC	0.019	70.8	P	31.8	33.8	NO	NO	35.9	44.2	NO	NO
37	BERNERT	528	BEJ6	0.128	UNDER I-205	3.00	538	HW90	CMP	CIRC	0.026	35.9	C	31.6	33.6	NO	NO	35.9	44.2	NO	YES
38	BERNERT	529	BER5-5W1	0.224	UNDER 10TH	1.25	150	HW90	CONC	CIRC	0.040	70.8	C	72.0	74.6	YES	YES	84.7	87.5	YES	YES
39	BERNERT	530	BEJ4	0.528	NR 7TH	1.00	100	HW90	CONC	CIRC	0.050	25.7	C	166.0	171.5	YES	YES	192.4	199.5	YES	YES
40	BERNERT	531	BER3-4	0.528	UNDER WILLAMETTE FALLS DR NR 6TH ST.	1.25	160	PROJ	CMP	CIRC	0.040	92.5	C	165.7	171.3	YES	YES	191.9	199.0	YES	YES
41	BERNERT	532	BEJ3N1	0.124	UNDER WILLAMETTE FALLS DR AT 6TH ST.	3.50	90	HW45	CMP	CIRC	0.043	105.8	P	39.0	40.4	NO	NO	44.3	46.2	NO	NO
42	BERNERT	533	BEJ3N1	0.124	PAIR UNDER WILLAMETTE FALLS DR AT 6TH ST.	3.00	50	HW45	CONC	CIRC	0.132	25.7	P	39.0	40.4	YES	YES	44.3	46.2	YES	YES
43	BERNERT	534	BER2-3	0.682	UNDER 5TH AVENUE AT MOEHNKE ST.	2.00	37	PROJ	CMP	CIRC	0.076	49.9	C	213.2	220.6	YES	YES	245.6	254.5	YES	YES
44	BERNERT	535	BER2-2W1	0.111	UNDER 4TH ST. NR OUTFALL	1.50	45	PROJ	CMP	CIRC	0.016	66.0	C	21.7	31.9	NO	NO	25.8	36.8	NO	NO
45	BOLTON	590	BOJ2-3	0.134	PIPE FROM HWY 43 TO HOLMES ST S. OF BUCK	1.75	520	HW45	CONC	CIRC	0.052	23.4	P	35.0	42.9	YES	YES	40.8	49.0	YES	YES
46	BOLTON	591	BOJ3	0.134	PIPE FROM HWY 43 TO FAILING ST. S. OF BUCK	2.50	250	HW45	CONC	CIRC	0.065	28.5	P	35.1	42.9	YES	YES	40.9	49.1	YES	YES
47	BOLTON	592	BOJ3	0.134	UNDER HIGHWAY 43 AT WEST A ST.	2.67	90	HW90	CONC	BOX	0.001	81.9	C	35.1	42.9	NO	NO	40.9	49.1	NO	NO
48	BOLTON	593	BOJ4	0.108	PIPE ALONG HWY 43 AT WEST A ST.	2.00	228	HW45	CONC	CIRC	0.036	25.7	P	27.2	34.5	YES	YES	31.9	39.6	YES	YES
49	BOLTON	594	BOJ5	0.083	UNDER CAULFIELD ST.	2.25	61	PROJ	CMP	CIRC	0.033	49.9	C	20.8	26.2	NO	NO	24.3	30.1	NO	NO
50	BOLTON	595	BOJ6	0.064	UNDER FIRWOOD CT.	2.00	230	PROJ	CMP	CIRC	0.130	20.5	C	16.5	20.2	NO	NO	19.3	23.2	NO	YES
51	BOLTON	596	BOJ7	0.042	UNDER SKYLINE DR NR. WOODWINDS CT.	2.50	140	PROJ	CMP	CIRC	0.057	22.8	C	9.6	12.3	NO	NO	11.3	14.2	NO	NO
52	CASCADE SPRINGS	475	CSJ3	0.036	DOWNSTREAM OF MCKILLICAN ST.	1.50	250	HW45	CONC	CIRC	0.011	25.5	P	10.7	11.5	NO	NO	12.4	13.2	NO	NO
53	CASCADE SPRINGS	476	CSJ4	0.027	PIPE ALONG MCKILLICAN FROM WEST A ST. TO	2.00	975	HW45	CONC	CIRC	0.105	12.5	P	7.7	8.4	NO	NO	9.0	9.6	NO	NO
54	CASCADE SPRINGS	477	CSJ5	0.036	UNDER PACIFIC HIGHWAY AT MCKILLICAN	2.50	167	HW45	CONC	CIRC	0.079	42.9	P	11.5	12.3	NO	NO	13.0	13.2	YES	YES
55	CASCADE SPRINGS	478	CSJ2	0.086	CULVERT UNDER RIVER STREET	2.00	60	PROJ	CMP	CIRC	0.142	48.9	C	26.5	29.4	NO	NO	30.8	33.0	NO	NO
56	DOLLAR	520	DOJ1	0.123	OUTFALL PIPE	2.00	325	HW45	CMP	CIRC	0.110	12.7	P	30.4	35.0	YES	YES	35.1	40.1	YES	YES
57	DOLLAR	521	DOJ2	0.089	ALONG BORLAND FROM OSTMAN TO OUTFALL PIPE	2.00	1200	HW45	CONC	CIRC	0.037	25.7	P	24.9	27.0	NO	YES	28.9	30.9	YES	YES
58	DOLLAR	522	DOJ3	0.049	FROM BEXHILL TO BORLAND	1.50	420	HW45	CONC	CIRC	0.053	25.7	P	13.5	14.7	NO	NO	15.7	16.8	NO	NO
59	FERN	434	FNJ2-ARJ1	0.994	CULVERTS NR ARBOR DRIVE (8", 12", 30" UNDER PVT.	#N/A	20	PROJ	CMP	CIRC	0.010	25.5	C	197.6	215.0	YES	YES	228.4	247.7	YES	YES
60	FERN	500	FNJA	0.065	PAIR UNDER CARRIAGE WAY	2.00	100	PROJ	CMP	CIRC	0.050	23.8	C	11.7	10.4	NO	NO	15.6	14.8	NO	NO
61	FERN	500	FNJA	0.065	PAIR UNDER CARRIAGE WAY	2.00	100	PROJ	CMP	CIRC	0.050	20.6	C	11.7	10.4	NO	NO	15.6	14.8	NO	NO
62	FERN	636	FNJ7	0.196	CULVERT NR KANTARA WAY	3.50	65	PROJ	CMP	CIRC	0.108	28.6	C	30.2	31.0	YES	YES	39.7	41.1	YES	YES
63	FERN	637	FNJ7	0.196	NEAR KANTARA WAY	3.50	28	PROJ	CMP	CIRC	0.071	20.3	C	30.2	31.0	YES	YES	39.7	41.1	YES	YES
64	FERN	638	FNJ6	0.223	UNDER PACIFIC HIGHWAY NR NORTH END OF	2.67	400	HW45	CONC	CIRC	0.083	34.1	P	37.8	40.0	NO	NO	44.8	48.8	NO	NO
65	FERN	639	FNJR-6	0.196	ENTRANCE PIPE TO SYSTEM UNDER PACIFIC	3.00	85	HW90	CONC	CIRC	0.076	104.1	C	29.9	30.9	NO	NO	39.6	41.0	NO	NO
66	FERN	640	FNJ5	0.233	CULVERT UNDER ROSE WAY	2.67	205	PROJ	CMP	CIRC	0.044	51.2									

**Appendix C  
CULVERT AND PIPE INVENTORY WITH HYDRAULIC DEFICIENCIES**

Count	Watershed	PWR ID	HEC-HMS Subbasin	Drainage Area (mi <sup>2</sup> )	Location / Description	Existing Structure						25-Year Design Flow (cfs)		Is it Deficient?		100-Year Design Flow (cfs)		Is it Deficient?			
						Diam (ft)	Length (ft)	Inlet Type	Material	Shape	Slope (ft/ft)	Capacity (cfs)	Structure Type	Existing	Future	Now	Future	Existing	Future	Now	Future
						192	SUNSET	468	SSR6-7	0.016	RUNNING PARALLEL TO BITTNER ST.	1.50	275	HW45	CONC	CIRC	0.051	7.9	P	3.7	4.8
193	SUNSET	470	SSJ7	0.016	PIPE UNDER EXETER STREET	2.00	180	HW45	CONC	CIRC	0.018	18.4	P	3.7	4.8	NO	NO	4.4	5.6	NO	NO
194	SUNSET	471	SSR6-7	0.016	PIPE UNDER LONG ST.	1.75	125	HW45	CONC	CIRC	0.208	9.3	P	3.7	4.8	NO	NO	4.4	5.6	NO	NO
195	SUNSET	472	SSJ6	0.061	UNDER CHARMAN ST.	1.25	81	PROJ	CMP	CIRC	0.025	19.3	C	18.4	19.9	NO	YES	21.3	22.8	YES	YES
196	SUNSET	473	SSR3-4	0.079	PIPE FROM SUNSET AVE. TO IMPERIAL DR.	2.00	250	HW90	CONC	CIRC	0.028	25.7	P	24.4	26.0	NO	YES	28.1	29.8	YES	YES
197	SUNSET	558	SSJ5	0.07	UNDER KELLEY STREET	1.33	60	PROJ	CMP	CIRC	0.050	22.8	C	21.5	23.1	NO	YES	24.8	26.5	YES	YES
198	SUNSET	559	SSJ4	0.079	ENTRANCE PIPE FROM SUNSET AVE. TO IMPERIAL DR.	2.00	412	HW90	CONC	CIRC	0.143	14.8	C	24.4	26.1	YES	YES	28.2	29.9	YES	YES
199	SUNSET	560	SSR3-4	0.079	FROM IMPERIAL DR. TO I-205	2.00	188	HW45	CONC	CIRC	0.128	25.3	P	24.4	26.0	NO	YES	28.1	29.8	YES	YES
200	SUNSET	561	SSJ3	0.101	UNDER I-205	2.00	172	HW45	CONC	CIRC	0.023	7.0	P	31.3	33.5	YES	YES	36.2	38.4	YES	YES
201	SUNSET	562	SSJ3	0.101	UNDER WILLAMETTE FALLS DR.	2.25	90	PROJ	CONC	CIRC	0.007	20.1	C	31.3	33.5	YES	YES	36.2	38.4	YES	YES
202	SUNSET	563	SSR1-2	0.109	CULVERT TO OUTFALL	1.25	420	PROJ	CONC	CIRC	0.075	28.6	C	34.1	36.3	YES	YES	39.4	41.6	YES	YES
203	TANNER	455	TAJ8W2	0.061	CHELAN DR TO PONDERAY DR.	3.00	179	HW45	CONC	CIRC	0.035	25.7	P	21.4	21.4	NO	NO	25.5	25.5	NO	NO
204	TANNER	456	TAR8W2-8W3	0.022	FROM BELKNAP TO CHELAN	2.00	278	HW45	CONC	CIRC	0.031	25.7	P	8.5	8.5	NO	NO	11.3	11.3	NO	NO
205	TANNER	457	TAJ8W3	0.022	FROM SALAMO TO BELKNAP	2.00	668	HW45	CONC	CIRC	0.032	25.7	P	8.9	8.9	NO	NO	11.5	11.5	NO	NO
206	TANNER	458	TAJ3E1	0.033	PIPE UNDER FAIRHAVEN DR	1.75	601	HW45	CONC	CIRC	0.080	7.9	P	8.5	10.0	YES	YES	10.0	11.5	YES	YES
207	TANNER	459	TAJF	0.035	NEW PIPE NR MIDDLE SCHOOL	1.75	339	HW90	CONC	CIRC	0.025	44.9	C	8.8	10.2	NO	NO	10.3	11.7	NO	NO
208	TANNER	460	TAJE	0.059	CULVERT UNDER DAY RD. NR HOOD CT.	2.00	76	PROJ	CONC	CIRC	0.011	45.7	P	13.3	14.2	NO	NO	15.6	16.4	NO	NO
209	TANNER	461	TAJB	0.122	PIPE UNDER PARKER RD.	2.50	150	HW90	CONC	CIRC	0.029	70.8	P	19.9	25.4	NO	NO	25.2	31.6	NO	NO
210	TANNER	536	TAJF	0.035	UNDER ROSEMONT NR PARKER RRD	2.50	50	PROJ	CONC	CIRC	0.118	20.5	C	8.8	10.2	NO	NO	10.3	11.7	NO	NO
211	TANNER	536	TAJF	0.035	UNDER ROSEMONT NR PARKER RRD	2.50	50	HW90	CONC	CIRC	0.118	18.4	C	8.8	10.2	NO	NO	10.3	11.7	NO	NO
212	TANNER	537	TAJC	0.098	CULVERT UNDER PARKER RD.	1.25	40	PROJ	CONC	CIRC	0.088	49.9	C	16.9	19.7	NO	NO	21.7	25.3	NO	NO
213	TANNER	538	TAJB	0.122	CULVERT UNDER PARKER RD	4.50	50	PROJ	CONC	CIRC	0.065	28.6	C	19.9	25.4	NO	NO	25.2	31.6	NO	YES
214	TANNER	539	TARA-B	0.122	CULVERT UNDER PATH	4.50	20	PROJ	CMP	CIRC	0.030	6.1	C	19.8	25.2	YES	YES	25.1	31.6	YES	YES
215	TANNER	540	TAJ8E1	0.079	UNDER PARKER RD NR COHO LN	1.00	65	HW45	CONC	CIRC	0.054	25.7	C	11.3	23.5	NO	NO	14.9	28.5	NO	YES
216	TANNER	541	TAJ8E1	0.075	UNDER PARKER RD.	2.00	66	PROJ	CONC	CIRC	0.030	13.9	C	12.3	19.5	NO	YES	16.5	24.2	YES	YES
217	TANNER	548	TAJ8E1	0.042	UNDER FAIRHAVEN DR.	3.00	60	PROJ	CONC	CIRC	0.017	78.7	C	8.7	11.8	NO	NO	10.2	13.6	NO	NO
218	TANNER	549	TAJ5-SAJ1	0.93	CULVERTS BETWEEN PONDS	1.50	78	HW90	CMP	CIRC	0.004	66.2	C	164.3	203.0	YES	YES	210.2	263.2	YES	YES
219	TANNER	549	TAJ5-SAJ1	0.93	CULVERTS BETWEEN PONDS	6.00	78	HW90	CMP	CIRC	0.004	66.2	C	164.3	203.0	YES	YES	210.2	263.2	YES	YES
220	TANNER	549	TAJ5-SAJ1	0.93	CULVERTS BETWEEN PONDS	4.50	78	HW90	CMP	CIRC	0.004	66.2	C	164.3	203.0	YES	YES	210.2	263.2	YES	YES
221	TANNER	550	TAJ4E1	0.013	FROM WELLINGTON DR TO WELLINGTON CT.	2.00	325	HW45	CONC	CIRC	0.129	11.5	P	3.7	4.1	NO	NO	4.4	4.7	NO	NO
222	TANNER	551	TAR4-4E1	0.013	ALONG WELLINGTON CT.	1.25	82	HW45	CONC	CIRC	0.265	25.7	P	3.7	4.1	NO	NO	4.4	4.7	NO	NO
223	TANNER	552	TAR4-4E1	0.013	UNDER WELLINGTON CT.	2.50	50	HW45	CONC	CIRC	0.005	17.4	P	3.7	4.1	NO	NO	4.4	4.7	NO	NO
224	TANNER	553	TAR4-5	0.93	UNDER WELLINGTON CT.	8.50	100	PROJ	CMP	CIRC	0.005	162.6	C	164.0	202.6	YES	YES	210.1	262.7	YES	YES
225	TANNER	554	TAR3-3E1	0.033	PIPE FROM RADCLIFF TO IMPERIAL	5.00	83	HW90	CONC	CIRC	0.012	12.5	P	8.5	9.9	NO	NO	10.0	11.4	NO	NO
226	TANNER	555	TAR3-4	0.995	UNDER IMPERIAL DR	2.00	90	PROJ	CMP	CIRC	0.011	613.8	C	179.2	220.2	NO	NO	228.4	282.5	NO	NO
227	TANNER	556	TAJ2	1.076	CULVERT UNDER I-205 NR RADCLIFF CT.	5.00	502	HW90	CONC	BOX	0.001	194.5	C	195.7	242.9	YES	YES	250.6	306.4	YES	YES
228	TANNER	557	TAJ1	1.094	WILLMETTE FALLS DR TO OUTFALL	2.00	280	PROJ	CONC	CIRC	0.246	282.2	C	199.6	247.0	NO	NO	254.7	310.4	NO	YES
229	TRILLIUM	494	TRJ6	0.046	PIPE SYSTEM UNDER MAPLETON, OUTFALL TO POND	2.00	75	HW45	CONC	CIRC	0.009	105.9	P	93.0	96.4	NO	NO	107.5	111.6	YES	YES
230	TRILLIUM	612	TRRA-B	0.046	CULVERT UNDER PRIVATE DRIVE NR CLUB HOUSE	2.25	49	PROJ	CONC	CIRC	0.027	35.2	C	19.9	21.9	NO	NO	23.0	25.2	NO	NO
231	TRILLIUM	613	TRJA	0.046	PIPE UNDER SANTA ANITA DR.	2.00	150	PROJ	CONC	CIRC	0.053	36.2	C	29.8	33.7	NO	NO	34.3	38.8	NO	YES
232	TRILLIUM	618	TRJ7	0.046	UNDER PACIFIC HIGHWAY NR CHOW MEIN LN. (HAS	2.25	90	HW90	CONC	CIRC	0.111	44.9	C	90.0	93.5	YES	YES	103.7	108.1	YES	YES
233	TRILLIUM	619	TRJ6	0.046	PIPE BETWEEN MAPLETON AND POND	2.00	180	PROJ	CONC	CIRC	0.041	52.9	P	93.0	96.4	YES	YES	107.5	111.6	YES	YES
234	TRILLIUM	620	TRJ6	0.046	ENTRANCE PIPE TO SYSTEM UNDER MAPLETON DR.	2.50	75	HW90	CONC	CIRC	0.011	25.4	C	93.0	96.4	YES	YES	107.5	111.6	YES	YES
235	TRILLIUM	620	TRJ6	0.046	ENTRANCE PIPE TO SYSTEM UNDER MAPLETON DR.	2.50	75	HW90	CONC	CIRC	0.011	25.4	C	93.0	96.4	YES	YES	107.5	111.6	YES	YES
236	TRILLIUM	625	TRJ5	0.046	PAIR UNDER KENTHORPE WAY	3.00	50	PROJ	CONC	CIRC	0.056	20.2	C	51.6	108.0	YES	YES	119.3	124.9	YES	YES
237	TRILLIUM	626	TRJ5	0.046	PAIR UNDER KENTHORPE WAY	4.00	50	PROJ	CONC	CIRC	0.056	90.7	C	103.2	108.0	YES	YES	119.3	124.9	YES	YES
238	TRILLIUM	627	TRR4-5	0.046	THREE CULVERTS UNDER CEDAR OAK DR	1.75	50	PROJ	CONC	CIRC	0.028	44.2	C	103.2	107.8	YES	YES	119.2	124.8	YES	YES
239	TRILLIUM	627	TRR4-5	0.046	THREE CULVERTS UNDER CEDAR OAK DR	3.50	50	PROJ	CONC	CIRC	0.028	65.4	C	103.2	107.8	YES	YES	119.2	124.8	YES	YES
240	TRILLIUM	627	TRR4-5	0.046	THREE CULVERTS UNDER CEDAR OAK DR	2.50	50	PROJ	CONC	CIRC	0.028	65.4	C	103.2	107.8	YES	YES	119.2	124.8	YES	YES
241	TRILLIUM	633	TRJ3-RBJ1	0.046	NEW CULVERT -TRILLIUM DR AT GLEN TERRACE	3.00	85	PROJ	CONC	CIRC	0.035	147.2	C	201.4	211.7	YES	YES	232.6	244.5	YES	YES
242	TRILLIUM	634	TRJ2	0.046	THREE CULVERTS UNDER ELMRAN AVE NR TRILLIUM	3.00	90	PROJ	CONC	CIRC	0.007	36.4	C	211.9	224.0	YES	YES	244.8	258.7	YES	YES
243	TRILLIUM	634	TRJ2	0.046	THREE CULVERTS UNDER ELMRAN AVE NR TRILLIUM	4.50	90	PROJ	CONC	CIRC	0.007	36.4	C	211.9	224.0	YES	YES	244.8	258.7	YES	YES
244	TRILLIUM	634	TRJ2	0.046	THREE CULVERTS UNDER ELMRAN AVE NR TRILLIUM	2.50	90	PROJ	CONC	CIRC	0.007	36.4	C	211.9	224.0	YES	YES	244.8	258.7	YES	YES
245	TRILLIUM	635	TRR1-2	0.046	UNDER CALAROGA DR.	2.50	54	PROJ	CONC	CIRC	0.059	190.6	C	211.7	223.6	YES	YES	244.8	258.6	YES	YES

Note: Prior to project design all field conditions shall be verified

Fish barriers: Drop to river  
Channel type: Moderately steep narrow valley channel  
Bank/channel conditions: Natural / semi-natural  
Notes: Mature trees provide good habitat, LWD recruitment potential.  
Recommendations: Restore and daylight channel in new park.

***CASCADE SPRINGS POND BASIN***  
**Cascade Springs Pond Creek**

**Cascade Springs Pond Creek (CS-R-1)**

Tributary to Willamette River

Location: Willamette River to Cascade Street  
Description: Perennial spring fed stream within a small forested ravine; wide central terrace contains braided channels and emergent wetlands.  
Fish bearing? No  
Fish barriers: River Drive culvert, 5-6-foot drop  
Channel type: Steep narrow valley channel  
Bank/channel conditions: Some downcutting, well vegetated  
Notes: Major ivy problem upstream, potential amphibian breeding.  
Recommendations: Remove trash; manage invasive species, particularly ivy and blackberry.

***MCLEAN CREEK BASIN***  
**McLean Creek**

**McLean Creek (MC-R-1)**

Tributary to Willamette River

Location: Willamette River to Highway 43 (under I-205 bridge)  
Description: Small free-flowing stream within forested ravine flows through McLean Park and cascades over rocky ledge before entering the Willamette River. Invasive species encroachment is high.  
Fish bearing? No  
Fish barriers: Steep drop to Willamette River  
Channel type: Moderately steep narrow valley channel  
Bank/channel conditions: Some grading below I-205  
Notes: Peregrine falcon aerie on I-205 bridge  
Recommendations: Remove ivy and blackberry, which have infested large areas of the corridor. Reestablish diverse native floral community.

***CAMASSIA BASIN***  
**Camassia Creek (No name on LWI / RCI maps)**

**Camassia Creek (CA-R-1)**

Tributary to Willamette River

Location: I-250 to Wilderness Park

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

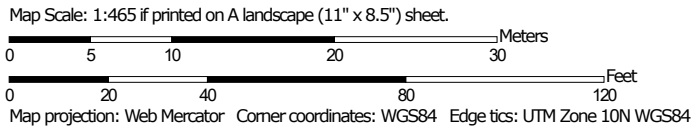
**APPENDIX B**

---

**NRCS SOIL REPORT**



Soil Map may not be valid at this scale.






Hydrologic Soil Group—Clackamas County Area, Oregon  
(Bolton Terrace Hydrologic Map)

### MAP LEGEND

**Area of Interest (AOI)**









 Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**





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

**Soil Rating Lines**


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

**Soil Rating Points**






-  A
-  A/D
-  B
-  B/D

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


**Water Features**

 Streams and Canals

**Transportation**

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

**Background**

 Aerial Photography

### MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Clackamas County Area, Oregon  
Survey Area Data: Version 15, Sep 10, 2019

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

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

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

## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
91B	Woodburn silt loam, 3 to 8 percent slopes	C	0.6	100.0%
<b>Totals for Area of Interest</b>			<b>0.6</b>	<b>100.0%</b>

### Description

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

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

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

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

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

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

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

### Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher

Soil Map—Clackamas County Area, Oregon  
(Bolton Terrace Soil Map)



Soil Map may not be valid at this scale.

Map Scale: 1:465 if printed on A landscape (11" x 8.5") sheet.




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



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Clackamas County Area, Oregon

Survey Area Data: Version 15, Sep 10, 2019

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

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

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



## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
91B	Woodburn silt loam, 3 to 8 percent slopes	0.6	100.0%
<b>Totals for Area of Interest</b>		<b>0.6</b>	<b>100.0%</b>

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

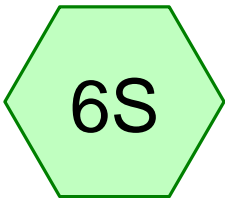
**APPENDIX C**

---

**HYDROCAD SUMMARIES**



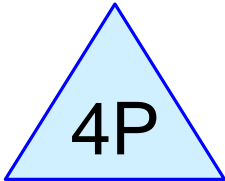
Existing Site



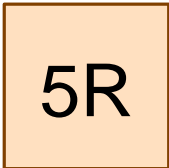
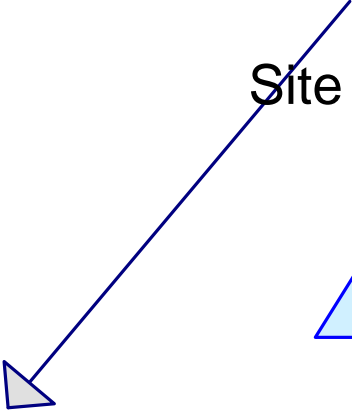
CSJ2



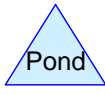
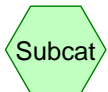
Site Developed



Infiltration



Cascade Springs Pond  
Creek



**Routing Diagram for Bolton Terrace**  
Prepared by Westech Engineering, Inc., Printed 1/31/2020  
HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 10 YR Rainfall=3.40"

Printed 1/31/2020

Page 3

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.18 cfs @ 8.03 hrs, Volume= 0.078 af, Depth= 1.49"

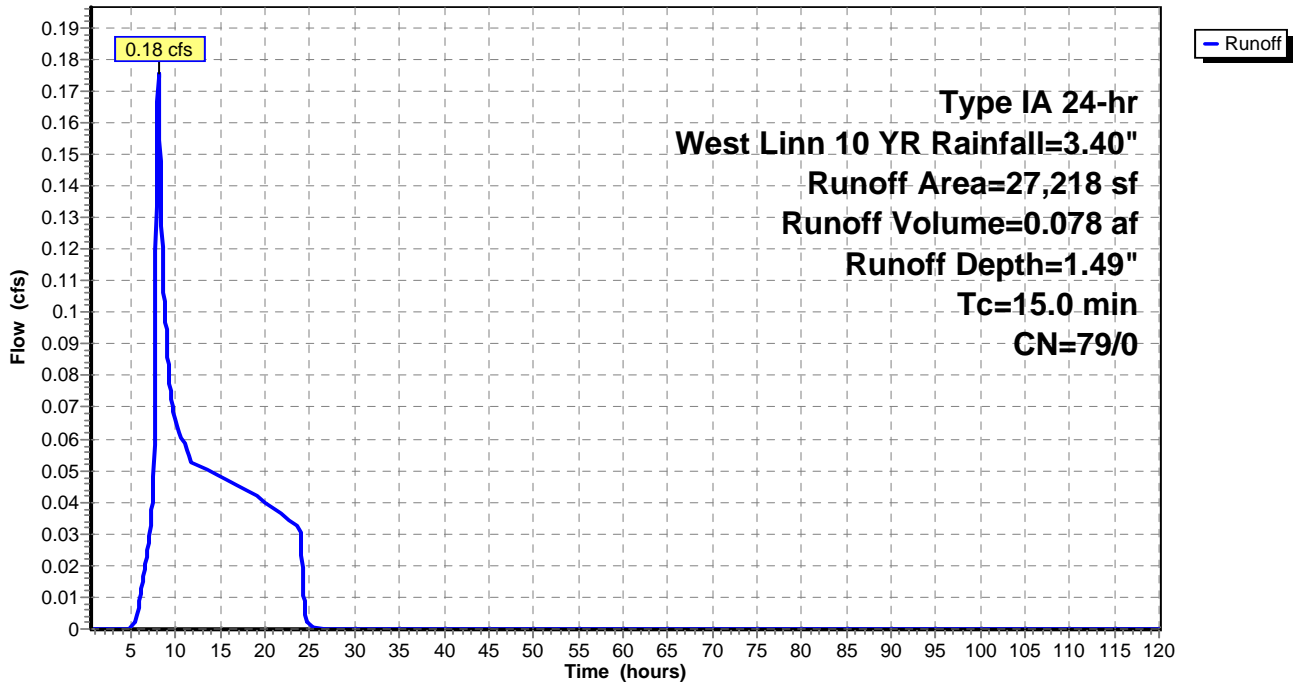
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 10 YR Rainfall=3.40"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Bolton Terrace**

Type IA 24-hr West Linn 100 YR Rainfall=4.50"

Prepared by Westech Engineering, Inc.

Printed 1/31/2020

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Page 4

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.31 cfs @ 8.02 hrs, Volume= 0.124 af, Depth= 2.38"

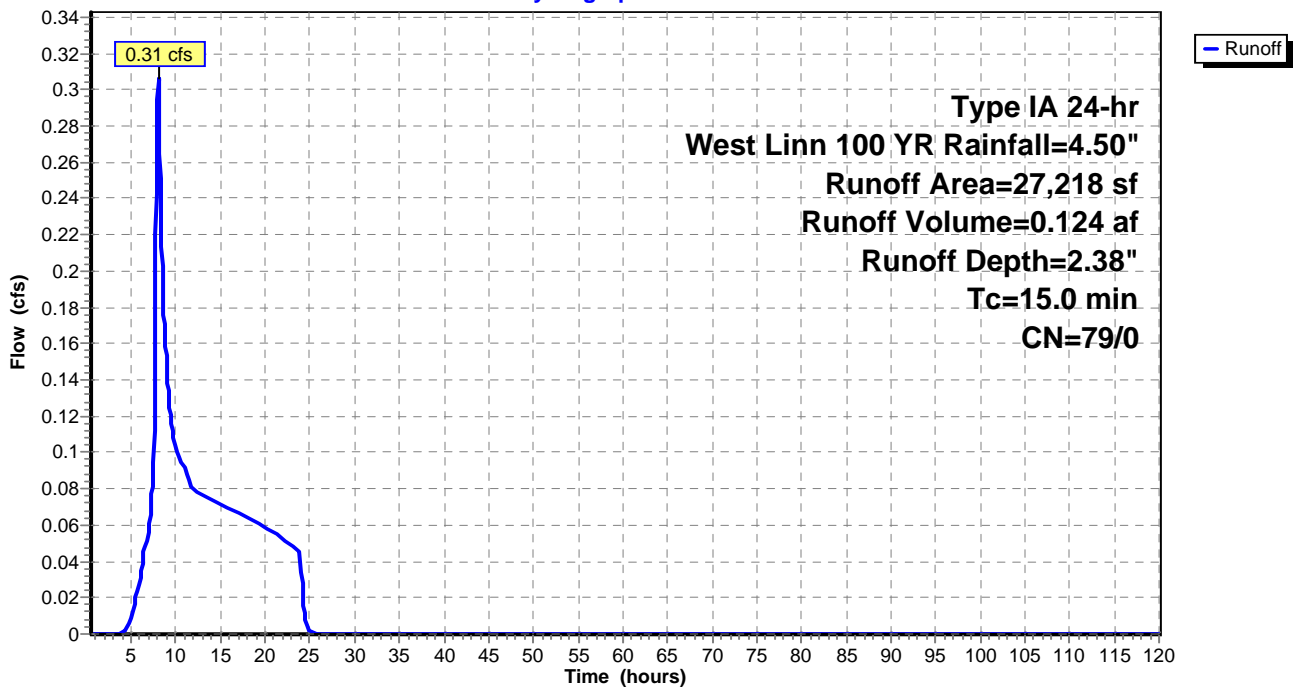
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 100 YR Rainfall=4.50"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph





**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn WQ Rainfall=1.20"

Printed 1/31/2020

Page 6

**Summary for Subcatchment 5S: Existing Site**

Runoff = 0.01 cfs @ 17.99 hrs, Volume= 0.007 af, Depth= 0.13"

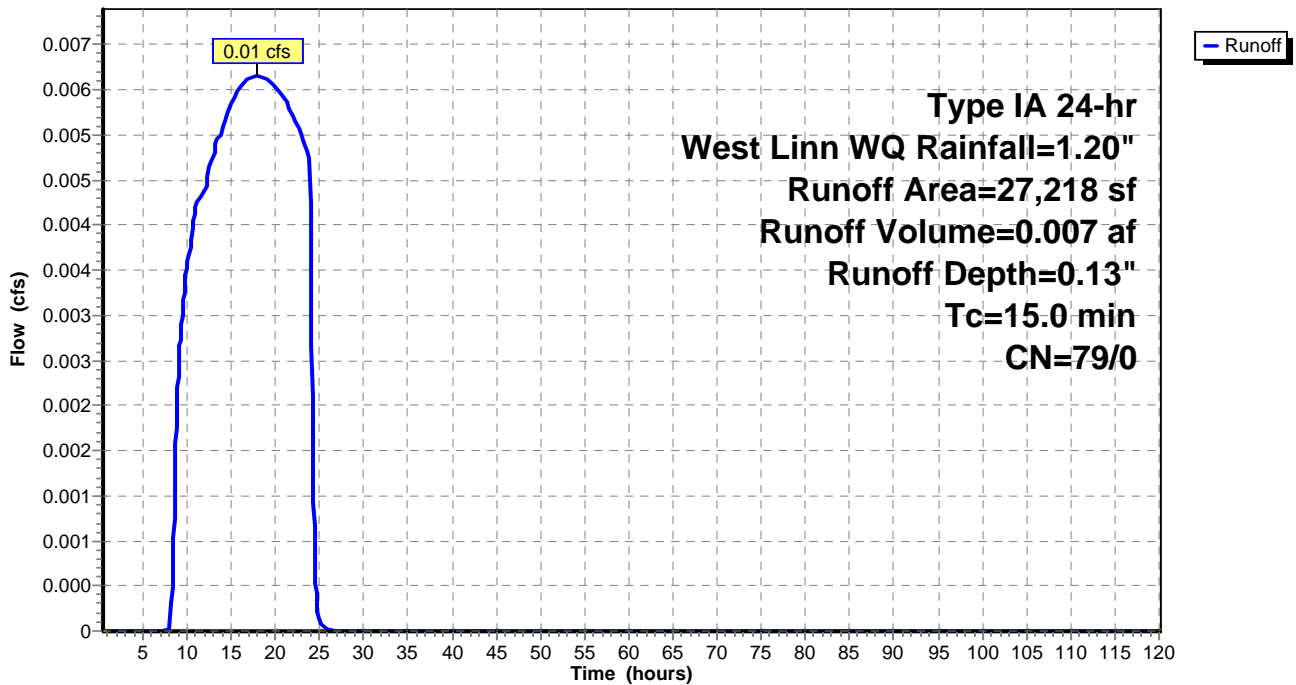
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn WQ Rainfall=1.20"

Area (sf)	CN	Description
* 27,218	79	
27,218		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 5S: Existing Site**

Hydrograph



**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.45 cfs @ 7.91 hrs, Volume= 0.152 af, Depth= 2.92"

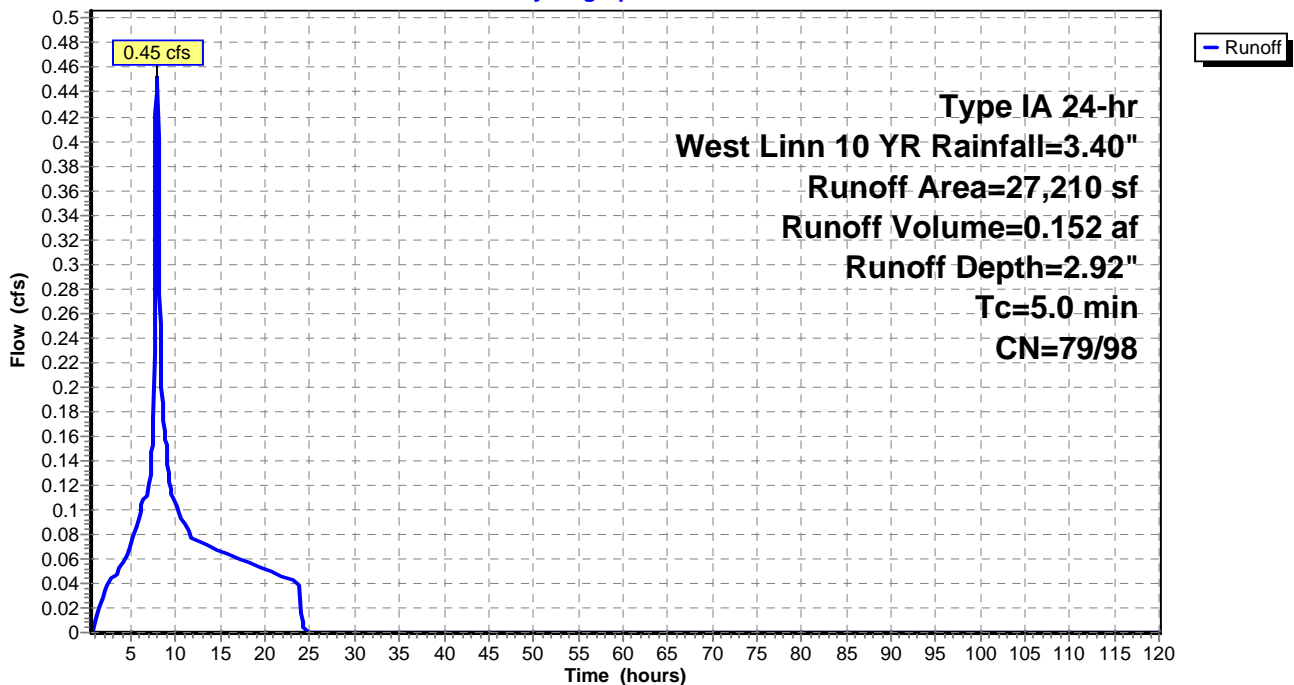
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 10 YR Rainfall=3.40"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph



**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.62 cfs @ 7.90 hrs, Volume= 0.207 af, Depth> 3.98"

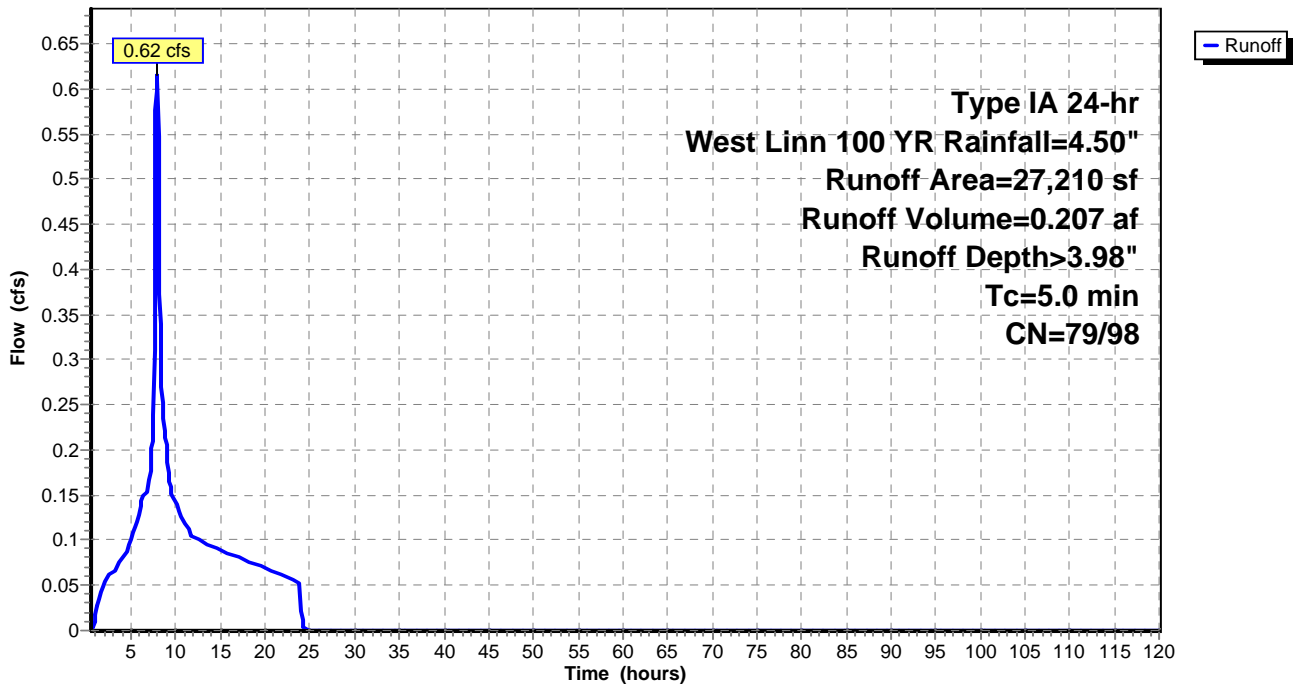
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Type IA 24-hr West Linn 100 YR Rainfall=4.50"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 1/31/2020

Page 3

**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.59 cfs @ 7.90 hrs, Volume= 0.197 af, Depth> 3.79"

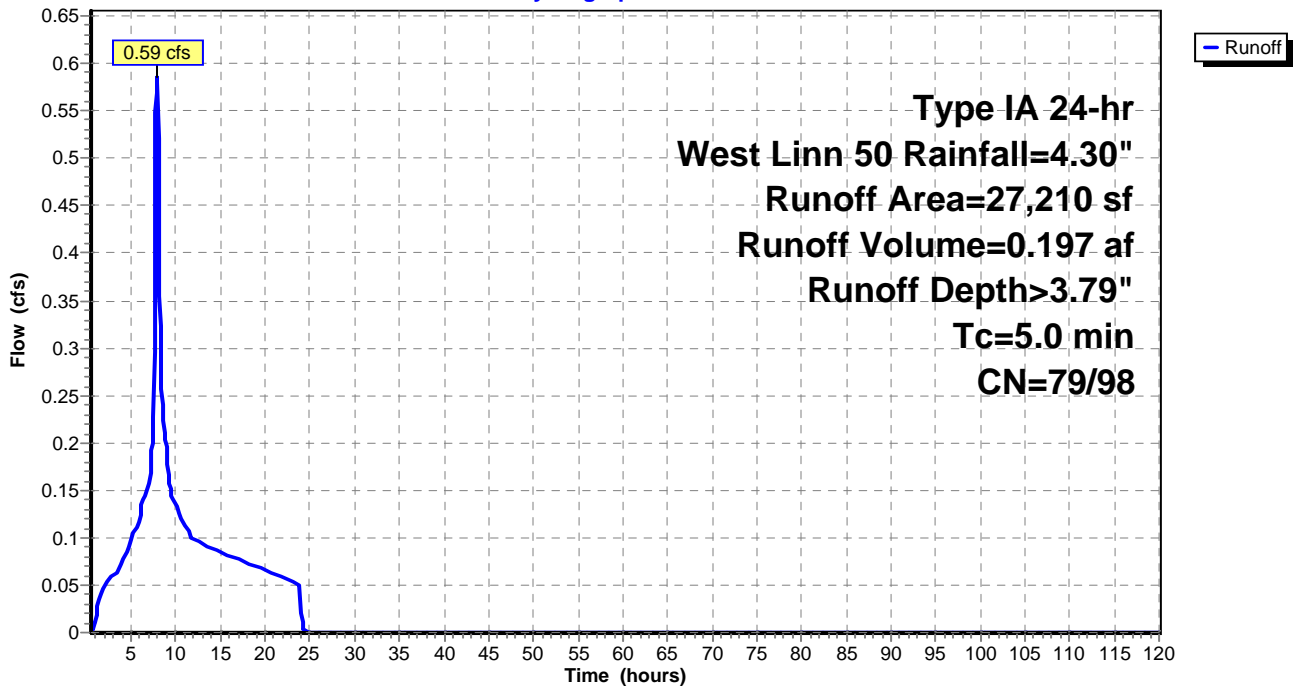
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Type IA 24-hr West Linn 50 Rainfall=4.30"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph



**Summary for Subcatchment DEV: Site Developed**

Runoff = 0.14 cfs @ 7.91 hrs, Volume= 0.045 af, Depth= 0.86"

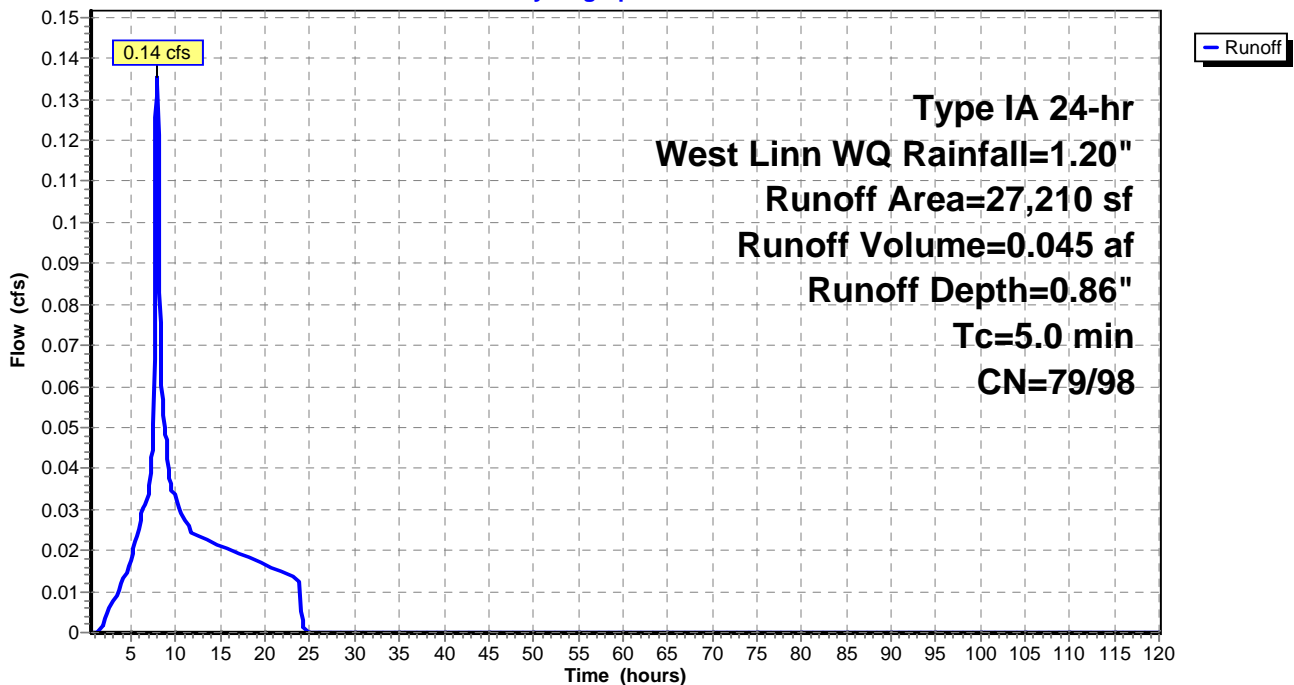
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Type IA 24-hr West Linn WQ Rainfall=1.20"

	Area (sf)	CN	Description
*	23,130	98	rooftop
	4,080	79	50-75% Grass cover, Fair, HSG C
	27,210	95	Weighted Average
	4,080		14.99% Pervious Area
	23,130		85.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment DEV: Site Developed**

Hydrograph





# Bolton Terrace

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 1/31/2020

Page 1

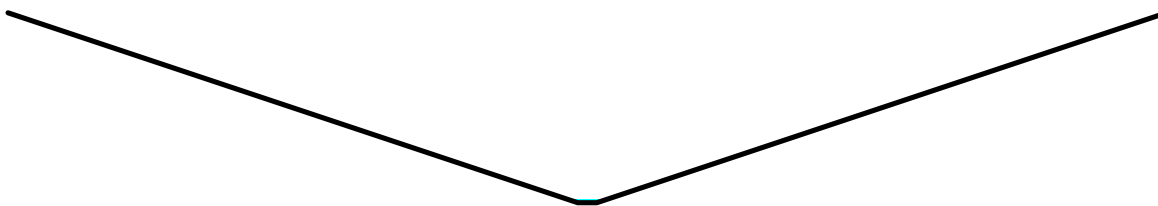
## Summary for Reach 5R: Cascade Springs Pond Creek

Inflow Area = 0.625 ac, 85.01% Impervious, Inflow Depth > 3.79" for West Linn 50 event  
Inflow = 0.59 cfs @ 7.90 hrs, Volume= 0.197 af  
Outflow = 0.52 cfs @ 8.05 hrs, Volume= 0.197 af, Atten= 11%, Lag= 8.6 min

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
Max. Velocity= 1.66 fps, Min. Travel Time= 15.1 min  
Avg. Velocity = 1.16 fps, Avg. Travel Time= 21.6 min

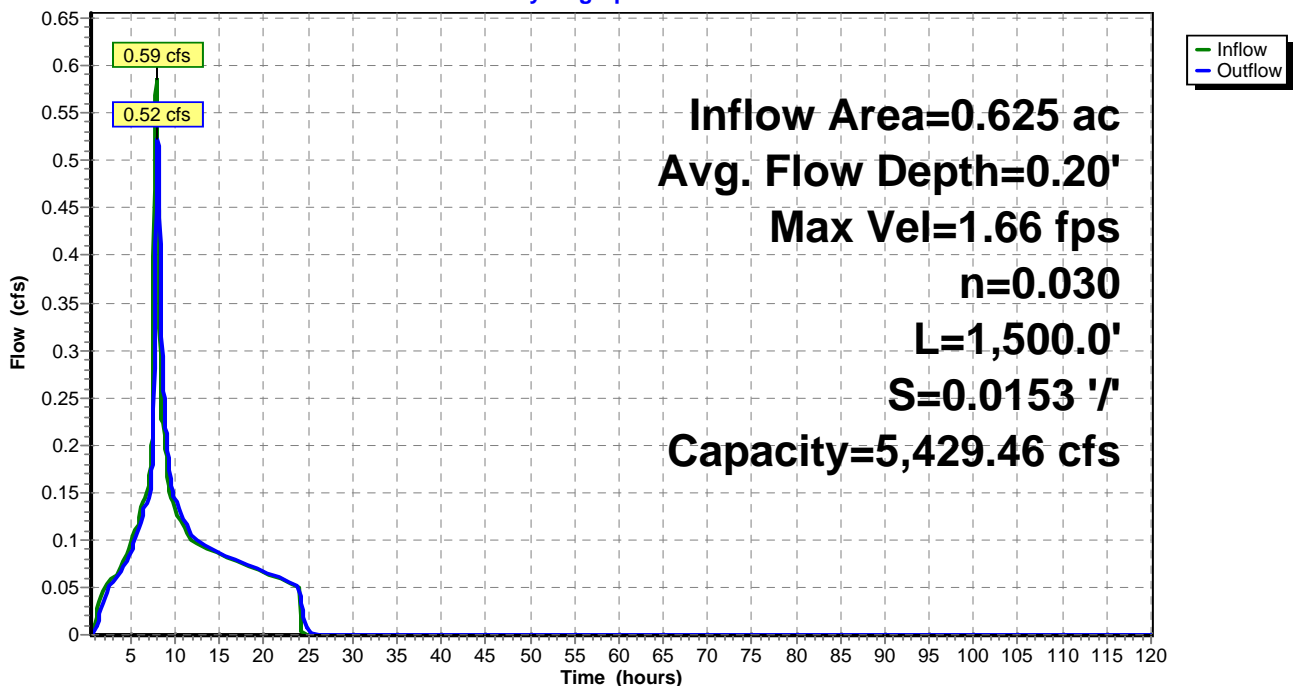
Peak Storage= 473 cf @ 8.05 hrs  
Average Depth at Peak Storage= 0.20'  
Bank-Full Depth= 10.00' Flow Area= 310.0 sf, Capacity= 5,429.46 cfs

1.00' x 10.00' deep channel, n= 0.030 Earth, grassed & winding  
Side Slope Z-value= 3.0 '/ Top Width= 61.00'  
Length= 1,500.0' Slope= 0.0153 '/  
Inlet Invert= 80.00', Outlet Invert= 57.00'



## Reach 5R: Cascade Springs Pond Creek

Hydrograph



**Bolton Terrace**

Prepared by Westech Engineering, Inc.

HydroCAD® 10.00-24 s/n 07289 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr West Linn 50 Rainfall=4.30"

Printed 1/31/2020

Page 1

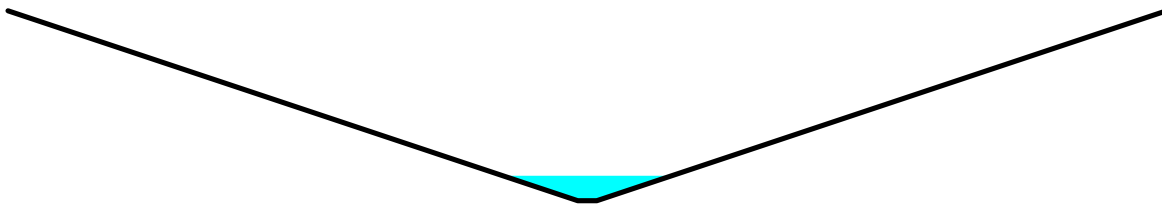
**Summary for Reach 5R: Cascade Springs Pond Creek**

Inflow Area = 55.665 ac, 0.95% Impervious, Inflow Depth = 2.39" for West Linn 50 event  
 Inflow = 32.15 cfs @ 7.97 hrs, Volume= 11.095 af  
 Outflow = 31.63 cfs @ 8.00 hrs, Volume= 11.095 af, Atten= 2%, Lag= 1.8 min

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 4.84 fps, Min. Travel Time= 5.2 min  
 Avg. Velocity = 2.66 fps, Avg. Travel Time= 9.4 min

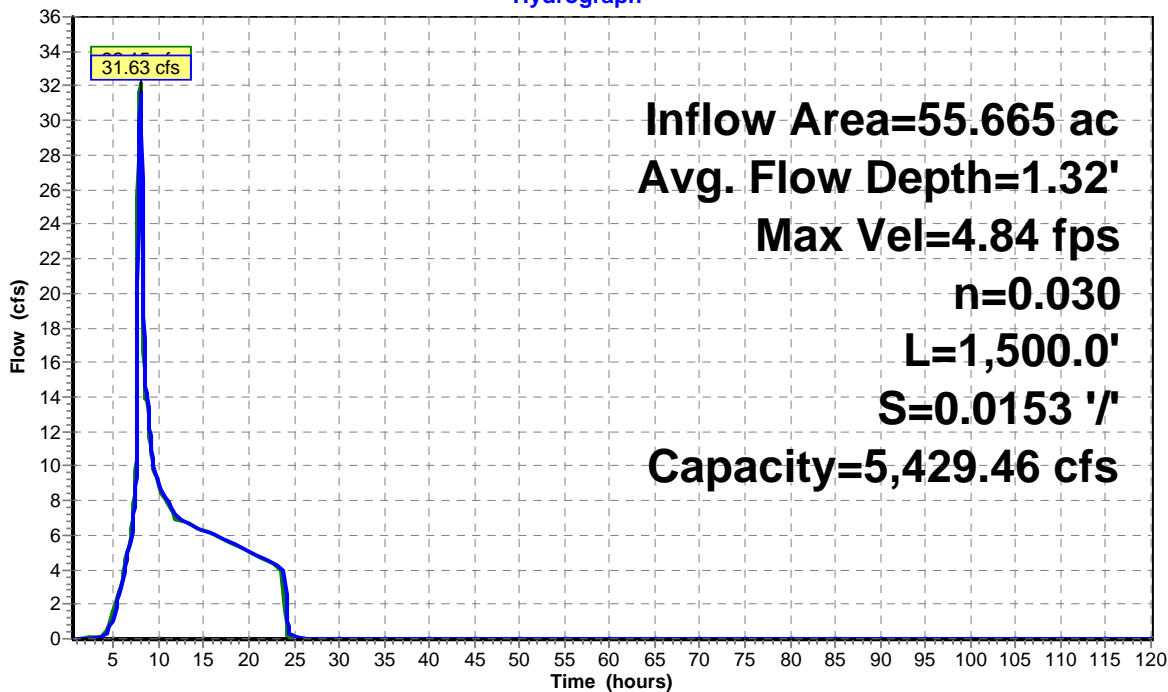
Peak Storage= 9,807 cf @ 8.00 hrs  
 Average Depth at Peak Storage= 1.32'  
 Bank-Full Depth= 10.00' Flow Area= 310.0 sf, Capacity= 5,429.46 cfs

1.00' x 10.00' deep channel, n= 0.030 Earth, grassed & winding  
 Side Slope Z-value= 3.0 '/' Top Width= 61.00'  
 Length= 1,500.0' Slope= 0.0153 '/'  
 Inlet Invert= 80.00', Outlet Invert= 57.00'



**Reach 5R: Cascade Springs Pond Creek**

Hydrograph



— Inflow  
 — Outflow

**Inflow Area=55.665 ac**  
**Avg. Flow Depth=1.32'**  
**Max Vel=4.84 fps**  
**n=0.030**  
**L=1,500.0'**  
**S=0.0153 '/'**  
**Capacity=5,429.46 cfs**

**BOLTON TERRACE COMMERCIAL BUILDING**  
**Stormwater Calculations**  
**West Linn, Oregon**

**APPENDIX D**

---

**GEOTECHNICAL REPORT**



# REDMOND & ASSOCIATES

**Geotechnical Investigation**

**Proposed Commercial Building Site**

**1575 Burns Street**

**West Linn (Clackamas County), Oregon**

**for**

**Mr. Rolf Olson**

**Project No. 943.001.G  
May 20, 2005**



# REDMOND & ASSOCIATES

Project No. 943.001.G  
Page No. 1

May 20, 2005

Mr. Rolf Olson  
3453 Augusta National Drive South  
Salem, Oregon 97302

Dear Mr. Olson:

**Re: Geotechnical Investigation, Proposed Commercial Building Site, 1575 Burns Street,  
West Linn (Clackamas County), Oregon**

## INTRODUCTION

In accordance with the request of Mr. Rolf Olson, we have completed our Geotechnical Investigation at the above subject proposed commercial building site. The site, a rectangular shaped property, is located to the north of Burns Street and to the east of Hood Street in West Linn (Clackamas County), Oregon.

We understand that present plans are to develop the site by constructing a new commercial building. Although the project is still in the preliminary planning and design stages, we understand that the commercial structure will be a one- and/or two-story structure which will include a below grade parking level. Specific building materials are not presently known but are anticipated to include wood- and/or metal frame with concrete and/or masonry blocks walls. The planned commercial structure is anticipated to be supported on conventional continuous (strip) and/or individual spread (column) footings with a concrete slab-on-grade floor. Structural loading is anticipated to result in maximum dead plus live continuous footing and column footing loads on the order of about 2.0 to 4.0 kips per lineal foot (klf) and 50 to 100 kips, respectively. Other associated site improvements will include asphalt pavements for both automobile drive and parking areas, underground utility services and landscaping.

## SITE DESCRIPTION

The proposed commercial site, located within Township 2 South, Range 2 East, and Section 30 of the Willamette Meridian, is presently unimproved and consists of existing open commercial lot.

Topographically, the westerly portion of the site is characterized as relatively flat-lying terrain while the easterly portion of the site is characterized as moderately sloping terrain descending down to the east with overall topographic relief across the entire estimated at about 10 to 15 feet and is estimated lie near to Elevation 180 feet.



Vegetation across most of the site consists of a moderate growth of grass, weeds, and brush as well as numerous small to large sized trees.

### SCOPE OF WORK

The purpose of our geotechnical studies is to evaluate the overall site subsurface soil and ground water characteristics as well as any associated impacts or concerns with regard to the planned construction and development of the site. Specifically, our geotechnical investigation included the following scope of work items:

1. Site exploration by means of three (3) exploratory backhoe test pit excavations. The exploratory test pits were excavated at various locations across the site as shown on the Site Exploration Map, Figure No. 2 to depths ranging from about 8 to 11 feet beneath existing site grades. Detailed logs of the exploratory test pit excavations, presenting conditions encountered at each location explored, are presented on the Log of Test Pits, Figure No's. 5 and 6. Additionally, representative samples of the subsurface soils encountered at the site were collected at selected depths and/or intervals and returned to our laboratory for further examination and testing.
2. A laboratory testing program to assess the pertinent physical and engineering characteristics of the subsurface soils. The laboratory program consisted of tests to evaluate the natural (field) moisture content and dry density, Atterberg Limits, gradational properties and Direct Shear Strength tests. Results of the moisture content and dry density tests are shown on their respective test pit log, Figure No's. 5 and 6. Results of the Atterberg Limits, gradation and direct shear strength tests are shown graphically on Figure No's. 7 through 9.
3. Recommendations and our final written report presenting the results of our investigation. Our report includes recommendations for site preparation and grading including any overexcavation of unsuitable materials revealed by the explorations, placement and compaction of any required structural fill(s), suitability of the on-site soils for use as structural fill as well as criteria for import fill materials, and preparation of pavement and foundation areas.
4. Recommendations for foundation support and design including allowable contact bearing pressures for proportioning footings, minimum width and embedment depths, and estimates of foundation settlement as well as lateral earth pressures for below grade walls. Additionally, we have developed flexible pavement sections for automobile and/or truck traffic areas.

### SUBSURFACE CONDITIONS

Our understanding of the subsurface conditions which underlie the site was developed by means of three (3) exploratory test pits excavated on April 23, 2005 with a rubber-tired excavator at the approximate locations shown on Figure No. 2. The test pits revealed that the site is underlain by native soil deposits comprised of lacustrine and fluvial sedimentary soil deposits of Pleistocene age. Specifically, the native soil materials were comprised of very moist to wet, medium stiff to stiff, clayey, sandy silt to the maximum depth explored of about 11.0 feet beneath existing site grades. These clayey, sandy silt subgrade soils are best characterized by relatively low to moderate strength and compressibility.

Ground water was not encountered at the site during our field exploration work and is not expected to be a factor during construction. However, topsoil materials were encountered at the site and consist of about 12 to 16 inches of organic, clayey and sandy silt. All soils encountered at the site were classified in accordance with the Unified Soil Classification System (USCS) which is outlined on Figure No. 4.

### **CONCLUSIONS AND RECOMMENDATIONS**

From a geotechnical engineering and constructability standpoint, we are of the opinion that the site is suitable for the planned new commercial structure and its associated site improvements provided that the recommendations contained within this report are properly incorporated into the design and construction of the project.

The primary feature of concern at the site is the moisture sensitivity characteristics of the underlying clayey, sandy silt subgrade soil materials

In regards to the moisture sensitivity characteristics of the underlying clayey, sandy silt subgrade soils, we recommend that all foundation excavation and site grading work be performed during the drier summer months which is typically June through September.

The following sections of this report present specific recommendations for site preparation and grading as well as foundation design and construction for the commercial building project.

### **SITE PREPARATION**

In general, we recommend that all planned structural improvement areas for the commercial building and pavements be stripped and cleared of any existing site improvements, vegetation, topsoil materials, and any deleterious materials present at the time of construction. In general, we envision that about 12 to 16 inches of topsoil stripping may be required to remove existing topsoil materials. Holes resulting from the removal of any buried obstructions, such as old foundation remnants and/or boulders, should be backfilled and compacted with structural fill materials. Areas resulting in deeper stripping and removals should be evaluated at the time of construction by the Geotechnical Engineer. The stripped and cleared materials should be properly disposed of as they are generally not considered suitable for use/reuse as structural fill.

Following the stripping and clearing operations, and prior to the placement of any required structural fills and/or structural improvements, the exposed subgrade soils within the planned building and pavement areas should be inspected by the Geotechnical Engineer and possibly proof-rolled with a half-loaded dump truck. Areas found to be soft or otherwise unsuitable for support of structural loads or improvements should be scarified and recompacted or overexcavated and replaced with structural fill. During wet or inclement weather conditions, proof-rolling as recommended above will not be appropriate.

The on-site native clayey, sandy silt subgrade soils are considered suitable for use/reuse as structural fill provided that they are free of organic materials, debris, and rock fragments in excess of 8 inches in dimension. If grading is conducted during wet weather, the use of the on-site clayey, sandy silt soils may be difficult and the use of an import granular fill material may be required. In general, we recommend that a free-draining (clean) granular fill (sand & gravel) containing no more than about 5 percent fines be used during wet weather grading. Representative samples of the material(s) to be used as structural fill should be submitted to our laboratory for approval and to determine the maximum dry density and optimum moisture content for compaction.

All required structural fill materials placed within the building and pavement (structural) areas should be moistened or dried as necessary to near (within 3 percent) optimum moisture conditions and compacted by mechanical means to a minimum of 92 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Fill materials should be placed in lifts (layers) such that when compacted do not exceed about 8 inches.

#### **FOUNDATION SUPPORT**

Based on the results of our investigation, it is our opinion that the proposed commercial building structure may be supported directly on the underlying native medium stiff to stiff, clayey, sandy silt subgrade soil deposits and/or by structural fill materials with conventional continuous and individual spread footings. As such, were foundations are constructed on approved native subgrade soils and/or properly placed and compacted structural fill materials, an allowable contact bearing pressure of about 2,500 pounds per square foot (psf) is recommended for design. However, where higher allowable contact bearing pressures are required, an allowable contact bearing pressure of 3,000 psf may be used for design where the foundations are supported by a minimum of at least 12 inches of compacted crushed aggregate base rock structural fill materials. These allowable contact bearing pressures are intended for dead loads and sustained live loads and may be increased by one-third for the total of all loads including short-term wind or seismic loads.

In general, continuous strip footings should have a minimum width of at least 16 inches and be embedded at least 18 inches below the lowest adjacent finish grade (includes frost protection). Individual column footings (if required) should be embedded at least 16 inches below grade and have a minimum width of about 24 inches.

Total and differential settlements of foundations constructed as recommended above and supported directly by approved native subgrade soils or on properly placed and compacted structural fill materials are expected to be well within tolerable limits for this type of structure and should generally be less than about 1-inch and 1/2-inch, respectively.

Allowable lateral frictional resistance between the base of the footings and the clayey, sandy silt or a gravel subgrade soil can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.35 and 0.45, respectively. In addition, lateral loads may be resisted by passive pressures on footings poured "neat" against in-situ native soils or properly compacted structural fill materials. For passive earth pressure resistance we recommend that an equivalent fluid density of 300 pounds per cubic foot (pcf) be used for design.

#### **FLOOR SLAB SUPPORT**

In order to provide uniform subgrade reaction beneath concrete slab-on-grade floors, we recommend that the floor slabs be underlain by a minimum of 6 inches of free-draining (less than 5 percent passing the No. 200 sieve), well-graded, crushed rock. The crushed rock should provide a capillary break to prevent migration of moisture through the slab. Additional moisture protection can be provided by using a 6-mil visqueen vapor barrier covered with a 1-inch protective layer of sand on the top and bottom. The base course materials should be compacted to at least 95 percent of the maximum dry density obtainable by the ASTM D-1557 (AASHTO T-180) test procedures.

**BELOW GRADE/RETAINING WALLS**

Below grade walls should be designed to resist lateral earth pressures imposed by native soils and/or granular backfill materials as well as any adjacent surcharge loads. For walls which are fully restrained from rotation at the top and supporting level backfill, we recommend that at-rest earth pressures be computed on the basis of an equivalent fluid density of 50 pcf and 60 pcf for granular backfill or sandy silt soil backfill materials, respectively. However, for walls which are free to rotate at the top and retaining level backfill, we recommend that active earth pressures be computed on the basis of an equivalent fluid density of 30 pcf and 40 pcf for granular backfill and sandy silt soil backfill materials, respectively. The above recommended lateral earth pressure values assume that the wall(s) will adequately drained to prevent the buildup of hydrostatic pressures. Where wall drainage will not be present and/or where adjacent surcharge loading and/or sloping ground conditions are present, the above recommended lateral earth pressure values will be higher.

Non structural backfill materials behind retaining walls should be compacted to at least 85 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Where structural backfill materials are required, the degree of compaction should be at least 90 percent of the maximum dry density. However, special care should be taken to avoid overcompaction near the wall(s) which could result in higher lateral earth pressures than those indicated herein. In an area within about three (3) to five (5) feet behind walls, we recommend the use of light hand operated compaction equipment.

**EXCAVATIONS**

Temporary excavations within native subgrade soils of up to four (4) feet in depth are expected to remain fairly stable at near vertical inclinations. Excavations to depths of between four (4) feet to ten (10) feet should be properly braced and shored or backcut to inclinations of at least 1 to 1 (Horizontal to Vertical). Where excavations are planned to exceed ten (10) feet, this office should be consulted. Additionally, at present levels, we do not anticipate that ground water will not be a factor during construction.

**PAVEMENTS**

Flexible pavement design for the project was determined on the basis of projected traffic volume and loading conditions relative to assumed subgrade soil strength characteristics. Based on an assumed subgrade "R"-value of 35 (CBR = 4.0) and utilizing the Oregon State Highway Flexible Pavement Design Procedures, we recommend that the asphaltic concrete pavement sections for automobile parking and drive area use at the site consist of the following:

	<b><u>Asphaltic Concrete Thickness (Inches)</u></b>	<b><u>Crushed Base Rock Thickness (Inches)</u></b>
Automobile Parking Areas	2.5	8.0
Automobile Drive Areas	3.0	9.0

Note: Where heavy vehicle traffic is anticipated, we recommend that the main access drive area pavement section be increased by adding 1.0 inches of asphalt and 3.0 inches of aggregate base rock. Additionally, for wet and/or winter time construction, we recommend that a minimum of at least 12 inches of aggregate base rock be used in all pavement areas.

The above recommended pavement section(s) assume that the subgrade will be prepared as recommended herein, that the exposed subgrade soils will be properly protected from rain and construction traffic, and that the subgrade is firm and unyielding at the time of paving. Additionally, it assumes that the subgrade is graded to prevent any ponding of water which may tend to accumulate in the base course. Further, the above recommended flexible pavement section(s) assumes a design life of about 20 years.

Pavement base course materials should consist of well-graded 1 1/2-inch and/or 3/4-inch minus crushed base rock having less than 5 percent fine materials passing the No. 200 sieve. The base course and asphaltic concrete materials should conform to the requirements set forth in the latest edition of the Oregon Department of Transportation, Standard Specifications of Highway Construction. The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. The asphaltic concrete materials should be compacted to at least 91 percent of the theoretical maximum density as determined by the ASTM D-2041 (Rice Gravity) test method.

#### SEISMIC DESIGN CONSIDERATIONS

Subgrade acceleration coefficients for the project were obtained from the seismic hazard/design mapping project performed by Geomatrix Consultants. Geomatrix mapping indicates that a peak ground acceleration on bedrock soils in the area of the site are 0.19g with a return period of about 500 years. The UBC seismic zone factor (Z) for the subject site is 0.30. Additionally, the IBC soil profile for the subject site to estimate the site class is recommended at D.

#### USE OF REPORT

This report is intended for the exclusive use of the addressee and their representatives to use to design the proposed commercial building structure and its associated site improvements described herein and to prepare any construction documents. The data, analyses, and recommendations may not be appropriate for other structures or purposes. We recommend that parties contemplating other structures or purposes contact our office. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report.

#### LEVEL OF CARE

Services performed by the Geotechnical Engineer for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in the area under similar budget and time restraints. No warranty, either expressed or implied, is made.

#### CONSTRUCTION MONITORING AND TESTING

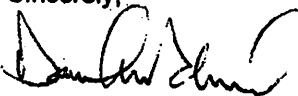
We recommend that **Redmond & Associates** be retained to provide construction monitoring and testing services during all earthwork operations. The purpose of our monitoring services would be to confirm that the site conditions which are encountered are as anticipated, provide field recommendations as necessary based on the actual conditions encountered, and document the activities of the contractor and assess his/her compliance with the project specifications and recommendations.



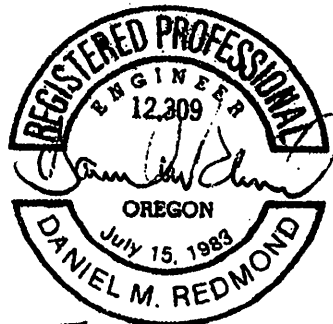
It is important that we meet with the grading contractor prior to any site grading work to establish a plan that will minimize costly overexcavation and site preparation work. Of primary importance will be observations made during the site preparation, structural fill placement, footing excavation and preparation, and construction of all below grade retaining walls.

We will be pleased to provide such additional assistance or information as you may require in the balance of the design phase of this project and to aid in construction control or solution of unforeseen conditions which may arise during the construction period.

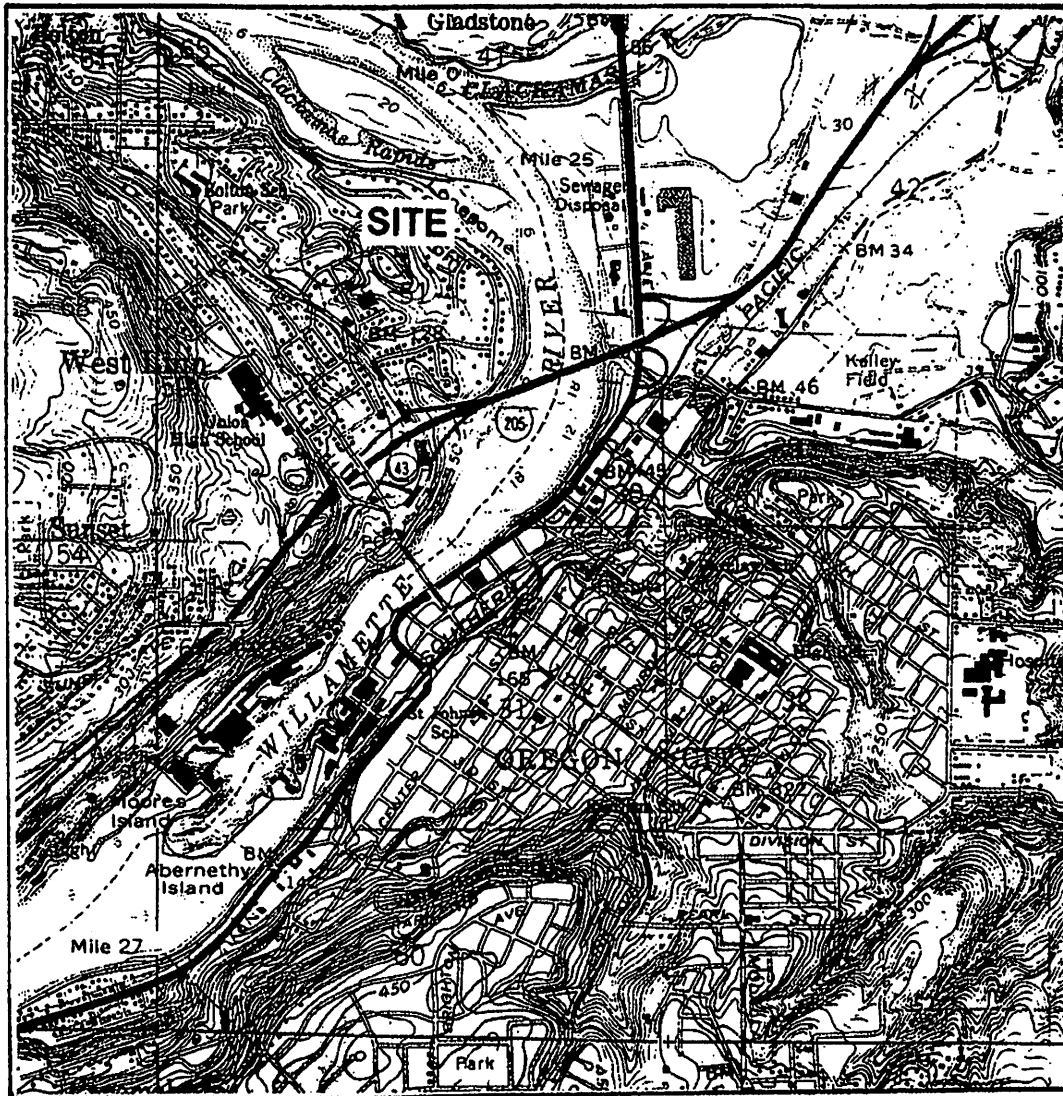
Sincerely,



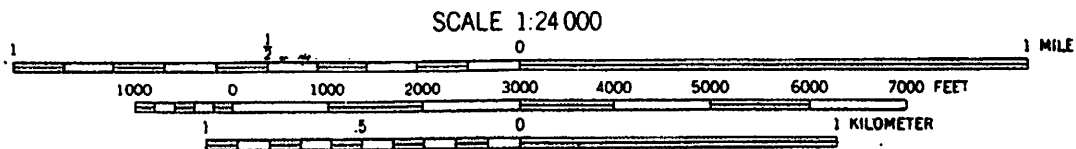
Daniel M. Redmond, P.E.  
President/Principal Geotechnical Engineer



Expires 12-31-06



OREGON CITY QUADRANGLE  
 OREGON-CLACKAMAS CO.  
 7.5 MINUTE SERIES (TOPOGRAPHIC)  
 SE/4 OREGON CITY 15' QUADRANGLE



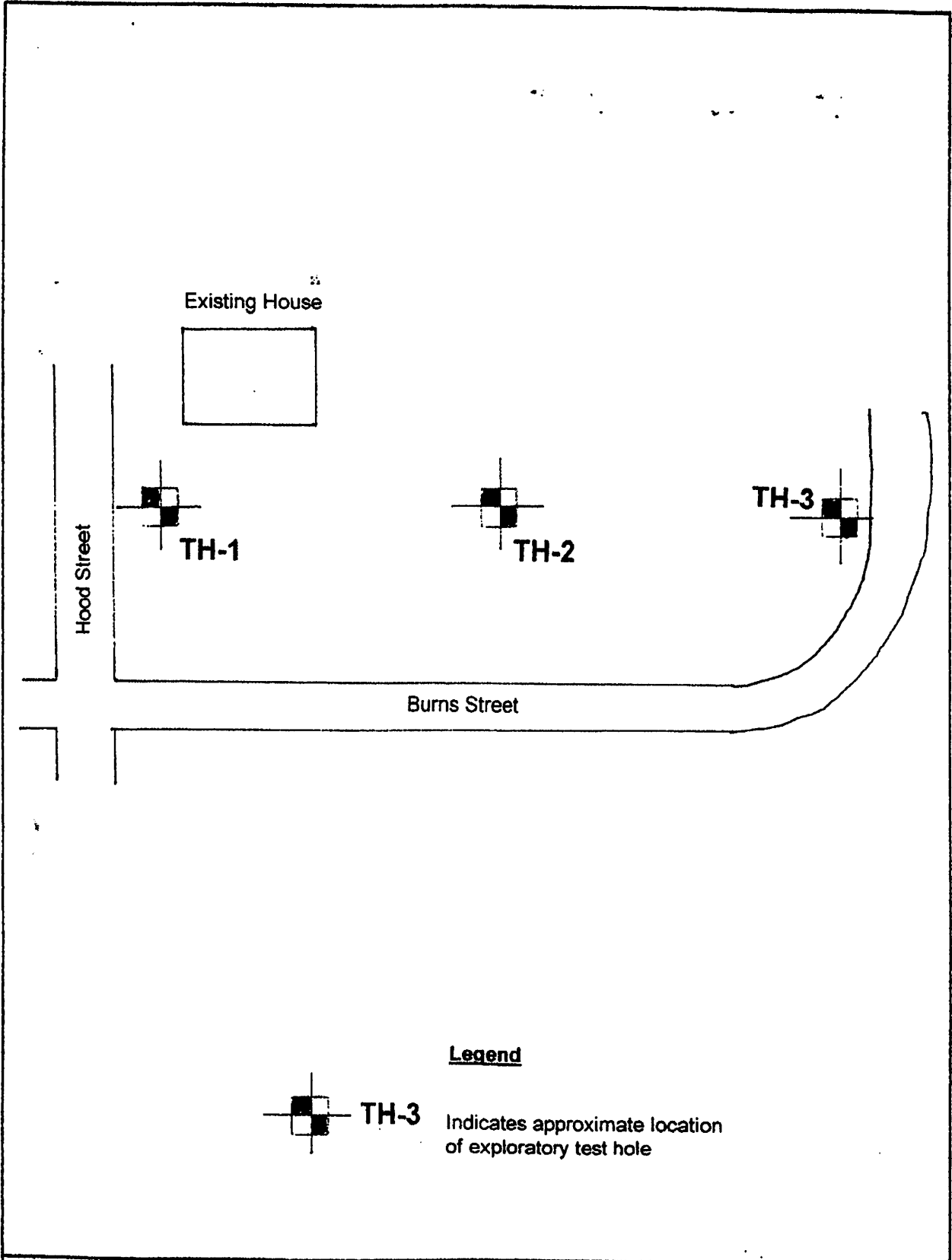
CONTOUR INTERVAL 10 FEET  
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

**SITE VICINITY MAP**

Project No. 943.001.G

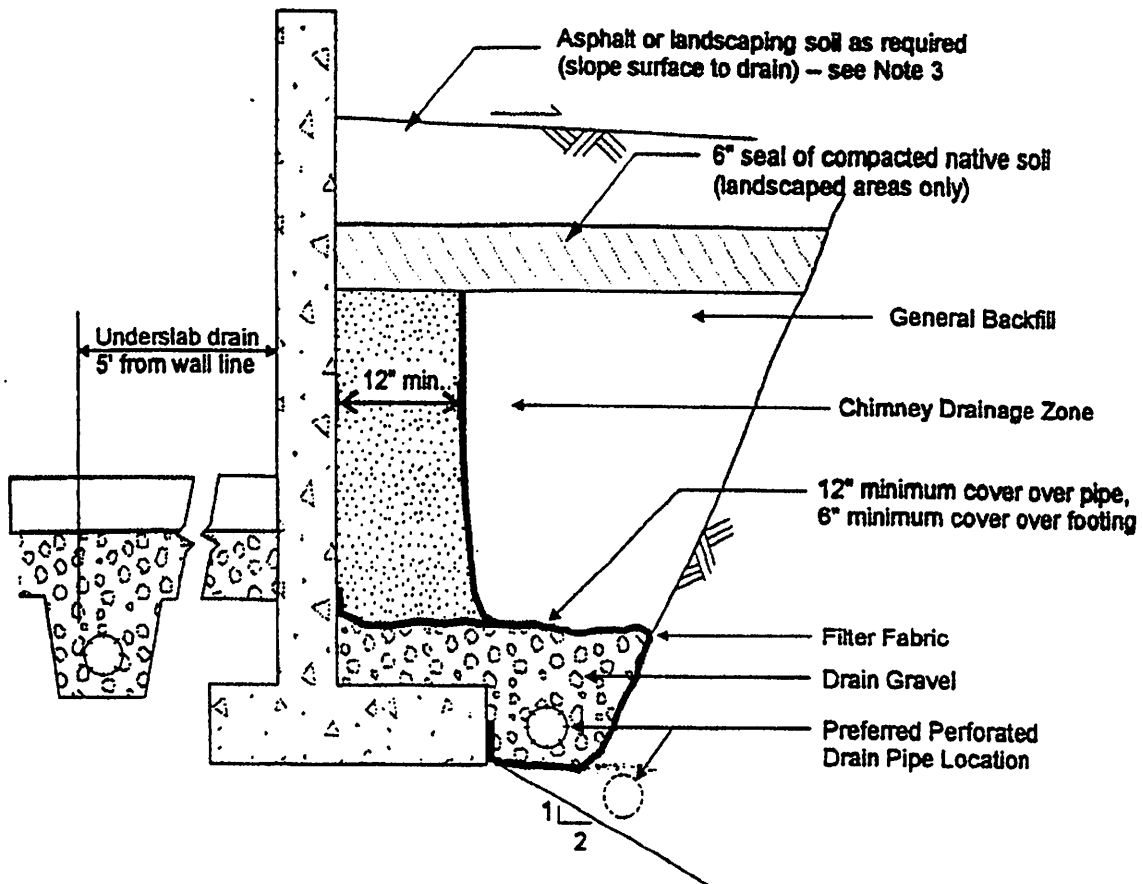
**1575 BURNS STREET**

Figure No. 1



**SITE EXPLORATION MAP**

Project No. 943.001.G	1575 BURNS STREET	Figure No. 2
-----------------------	-------------------	--------------



**SCHEMATIC - NOT TO SCALE**

**NOTES:**

1. Filter Fabric to be non-woven geotextile (Amoco 4545, Mirafi 140N, or equivalent)
2. Lay perforated drain pipe on minimum 0.5% gradient, widening excavation as required. Maintain pipe above 2:1 slope, as shown.
3. All-granular backfill is recommended for support of slabs, pavements, etc. (see text for structural fill).
4. Drain gravel to be clean, washed ¾" to 1½" gravel.
5. General backfill to be on-site gravels, or ¾"-0 or 1½"-0 crushed rock compacted to 92% Modified Proctor (AASHTO T-180).
6. Chimney drainage zone to be 12" wide (minimum) zone of clean washed, medium to coarse sand or drain gravel if protected with filter fabric. Alternatively, prefabricated drainage structures (Miradrain 6000 or similar) may be used.

**FOOTING/RETAINING WALL DRAIN**

Project No. 943.001.G

1575 BURNS STREET

Figure No. 3

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
			GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
		GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.	
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
		SANDS WITH FINES	SP	Poorly graded sands or gravelly sands, little or no fines.
			SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

### DEFINITION OF TERMS

SILTS AND CLAYS	U.S. STANDARD SERIES SIEVE			CLEAR SQUARE SIEVE OPENINGS			COBBLES	BOULDERS
	200	40	10	4	3/4"	3"		
	SAND			GRAVEL				
	FINE	MEDIUM	COARSE	FINE	COARSE			

### GRAIN SIZES

SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT <sup>1</sup>
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CLAYS AND PLASTIC SILTS	STRENGTH <sup>‡</sup>	BLOWS/FOOT <sup>‡</sup>
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

### RELATIVE DENSITY

<sup>1</sup>Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

<sup>‡</sup>Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

### CONSISTENCY

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • Portland, OR 97230

### KEY TO EXPLORATORY TEST PIT LOGS Unified Soil Classification System (ASTM D-2487)

1575 BURNS STREET COMMERCIAL SITE  
WEST LINN, OREGON

483 PROJECT NO. DATE  
943 001 C May 20, 2005

Figure 4



BACKHOE COMPANY: **Kavik, Inc.**

BUCKET SIZE: **24 inches**

DATE: **4/23/05**

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION	
						TEST PIT NO. <b>TH-1</b>	ELEVATION
0					ML	Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)	
	X			24.4	ML	Medium brown to olive-brown, very moist, medium stiff to stiff, clayey, sandy SILT	
5	X			27.2			
10						Total Depth - 9.0 feet No ground water encountered	

						TEST PIT NO. <b>TH-2</b>	ELEVATION
0					ML	Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)	
	X			26.1	ML	Medium brown to olive-brown, very moist, medium stiff to stiff, clayey, sandy SILT	
5							
	X			28.3			
10							
15						Total Depth = 11.0 feet No ground water encountered	

**LOG OF TEST PITS**

PROJECT NO. **943.001.G**

**1575 BURNS STREET COMMERCIAL SITE**

FIGURE NO. **5**

BACKHOE COMPANY: Kavik, Inc.

BUCKET SIZE: 24 inches

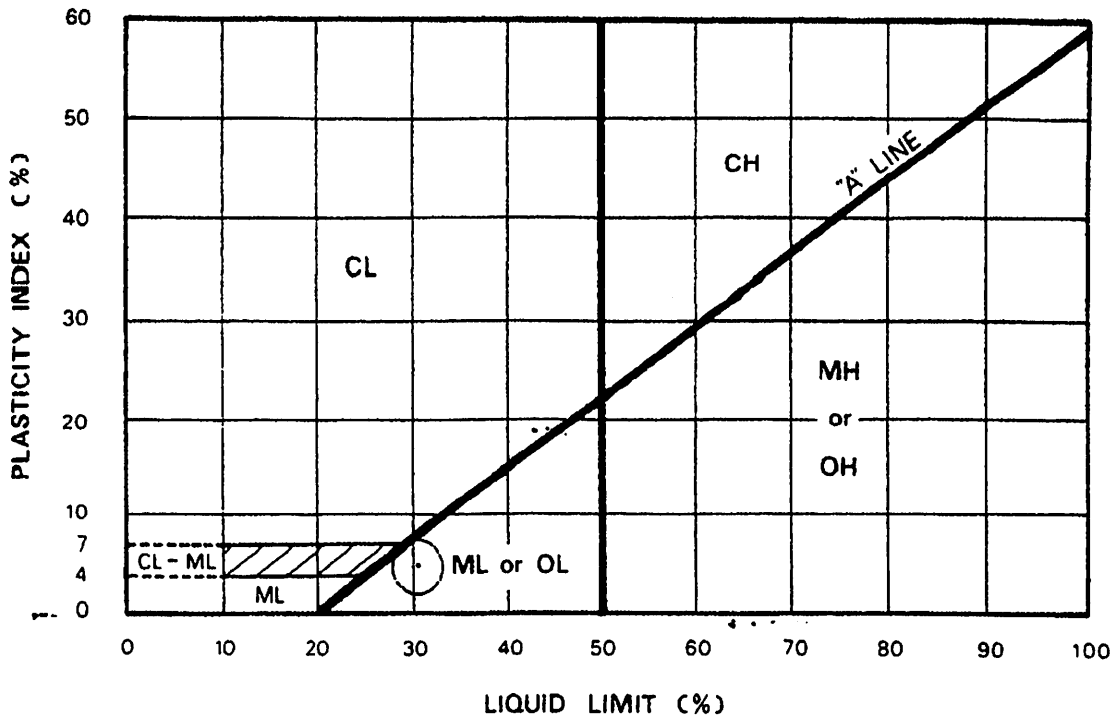
DATE: 4/23/05

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-3
0					ML	Dark brown, very moist to wet, soft, organic, sandy and clayey SILT (Topsoil)
	X			35.5	ML	Gray-brown, wet, soft to medium stiff, sandy, clayey SILT
5	X			32.6	ML	Medium brown to olive-brown, very moist to wet, medium stiff to stiff, clayey, sandy SILT
10						Total Depth = 8.0 feet No ground water encountered

TEST PIT NO.						ELEVATION					
0											
5											
10											
15											

**LOG OF TEST PITS**

PROJECT NO. 943.001.G	1575 BURNS STREET COMMERCIAL SITE	FIGURE NO. 6
-----------------------	-----------------------------------	--------------



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
○	TH-2	3.0	28.3	30.6	5.5	76.0		ML

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • PORTLAND, OR 97294

PLASTICITY CHART AND DATA

1575 BURNS STREET COMMERCIAL SITE  
West Linn, Oregon

PROJECT NO.

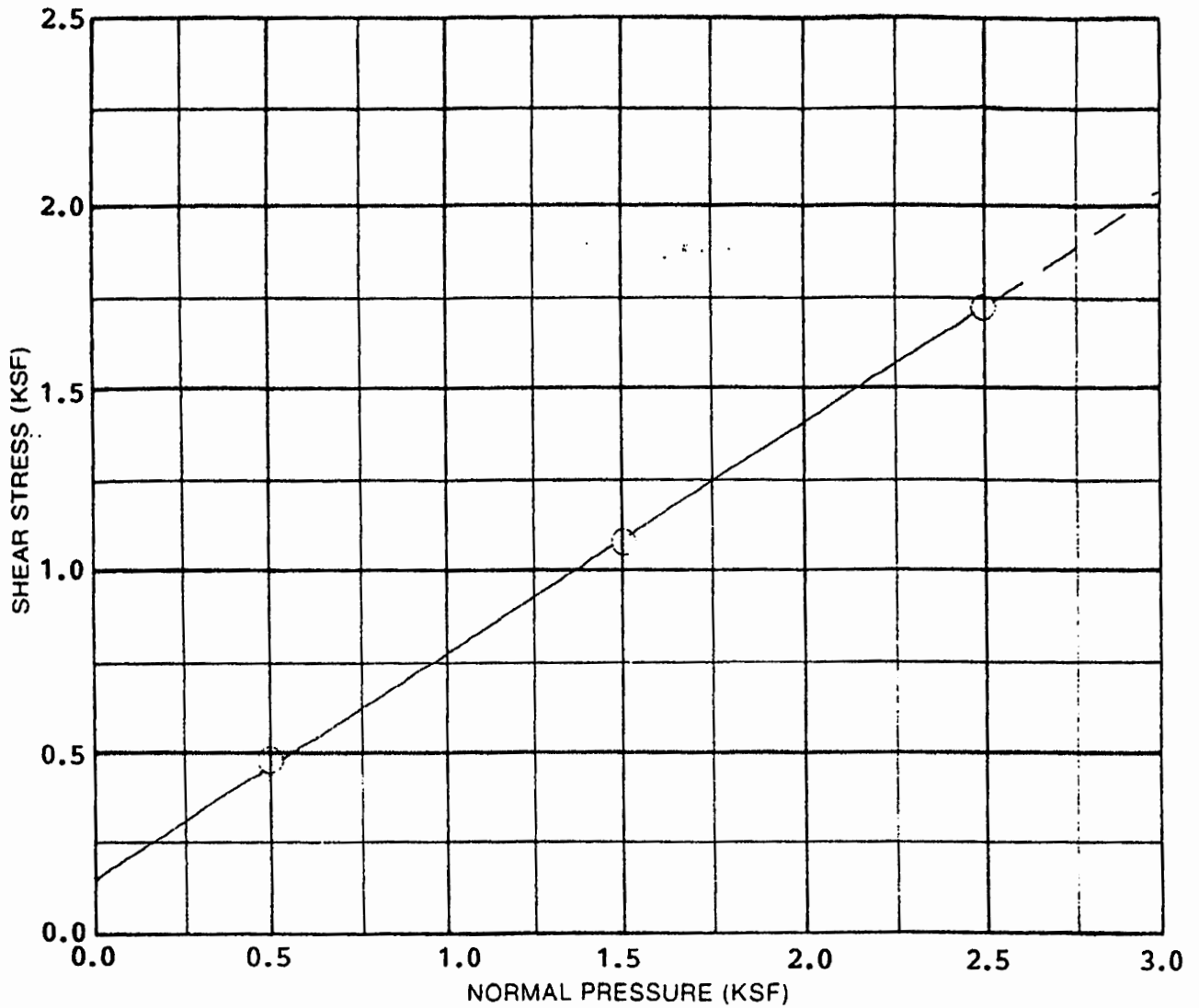
DATE

943 001 C

May 20 2005

Figure 7





SAMPLE DATA	
DESCRIPTION: <b>Medium to olive-brown, clayey, sandy SILT</b>	
BORING NO.: <b>TH-2</b>	
DEPTH (ft.): <b>3.0'</b>	ELEVATION (ft.):
TEST RESULTS	
APPARENT COHESION (C): <b>150 psf</b>	
APPARENT ANGLE OF INTERNAL FRICTION ( $\phi$ ): <b>32°</b>	

TEST DATA				
TEST NUMBER	1	2	3	4
NORMAL PRESSURE (KSF)	0.5	1.5	2.5	
SHEAR STRENGTH (KSF)	0.48	1.09	1.74	
INITIAL H <sub>2</sub> O CONTENT (%)	26.0	26.0	26.0	
FINAL H <sub>2</sub> O CONTENT (%)	25.9	24.2	22.1	
INITIAL DRY DENSITY (PCF)	91.1	91.1	91.1	
FINAL DRY DENSITY (PCF)	91.6	93.1	95.4	
STRAIN RATE: <b>0.02 inches per minute</b>				

**REDMOND & ASSOCIATES**  
P.O. Box 301545 • Portland, OR 97294

**DIRECT SHEAR TEST DATA**

**1575 BURNS STREET COMMERCIAL SITE**  
**West Linn, Oregon**

PROJECT NO.

DATE

943.001.G

May 20 2005

Figure 9



Arborist

**MEMORANDUM**

**DATE:** August 31, 2010

**TO:** Rolf Olson

**FROM:** Morgan E. Holen, ISA Certified Arborist (PN-6145A)

**RE:** Tree Preservation and Construction for Street Improvements  
0944 Olson Project

---

At your request, I met with you and Wink Brooks on your project site located at the northwest intersection of Hood and Burns in West Linn on Friday, July 16, 2010, in order to evaluate three Douglas-fir trees in terms of proposed construction impacts. This memorandum documents the site visit and provides arborist recommendations.

Earlier this year I met with Mike Perkins, West Linn City Arborist, at the site for the purpose of identifying any trees he found to be significant. At that time he concluded that three Douglas-fir trees, in a cluster along the south property line, were significant. We looked at other trees that had potential significance but no others were identified as significant. The trees have a crown radius of approximately 18-feet towards the street and 22-feet towards the construction site. If protection is not feasible, the applicant must demonstrate why. Design alternatives were evaluated by the applicant in an effort to retain these trees. Irrespective of the development plan however, the City is requiring half street improvements on Burns Street, along the south property line which include a required 8-foot sidewalk due to the commercial nature of the project.

Refer to attached Exhibit C "Site Plan, Street and Sidewalk Study Plan." The street improvements include new curbs and sidewalks along the northern edge of Burns Road, approximately 9-feet from the largest of the three Douglas-firs. The back of the sidewalk is at elevation 116.5-feet and the approximate base of the largest Douglas-fir is at elevation 123.5-feet, a difference of 7-feet.

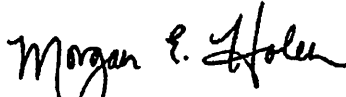
Based on the proposed site plans depicting the street improvement requirements, the trees are not suitable for preservation with construction. The existing curb is approximately 16-feet from the face of the trees, and the edge of the new sidewalk will come within 9-feet of the trees. As shown in the photograph below, the area between the road and the trees is a steep slope which limits the ability to provide recommendations for alternative tree protection measures—grading in this area appears unavoidable. While on site, we discussed the potential for constructing a retaining wall to help maintain the existing grade at the trees, however this does not seem feasible considering

drainage and any sloughing of material from the slope. The drawing shows graphically why the largest Douglas-fir tree must be removed due to the required half street improvements.

While the tree illustrated on the drawing is the one in the cluster located closest to the existing curb, Burns Street slopes downward to the east at a grade of approximately 12%, which increases the elevation difference between the sidewalk and the other two Douglas-firs in the cluster and thereby increases the after construction slope between the sidewalk and those trees. Based on the cross-section, approximately 50% of the root system will be impacted, and the trees will become hazardous and have inadequate growing space. In addition, Mr. Foster agreed that using a retaining wall is also not a viable solution since a wall would have to be located on the project site outside of the right-of-way and a wall ~6-feet tall would require an additional 4-feet or more of excavation into the slope towards the trees.

Removal of these three trees is recommended because they are not suitable for retention considering the City requested sidewalk and half street improvements. If there was a requirement to retain these trees, not only would the trees have very limited growing space after the sidewalk and street construction, they also would likely become hazardous considering the change in grade south of the trees and the unavoidable root impacts. Removal and replacement in a more appropriate on-site location is preferred since construction impacts are unavoidable.

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



Morgan E. Holen  
ISA Certified Arborist, PN-6145A  
ISA Certified Tree Risk Assessor, PN-449  
Forest Biologist, PBS Environmental

Enclosures: Exhibit C "Site Plan, Street and Sidewalk Study Plan  
Cross Section Drawing at Douglas-fir

the engineering requirements of such a wall and the relatively narrow width between the new sidewalk and the trees.

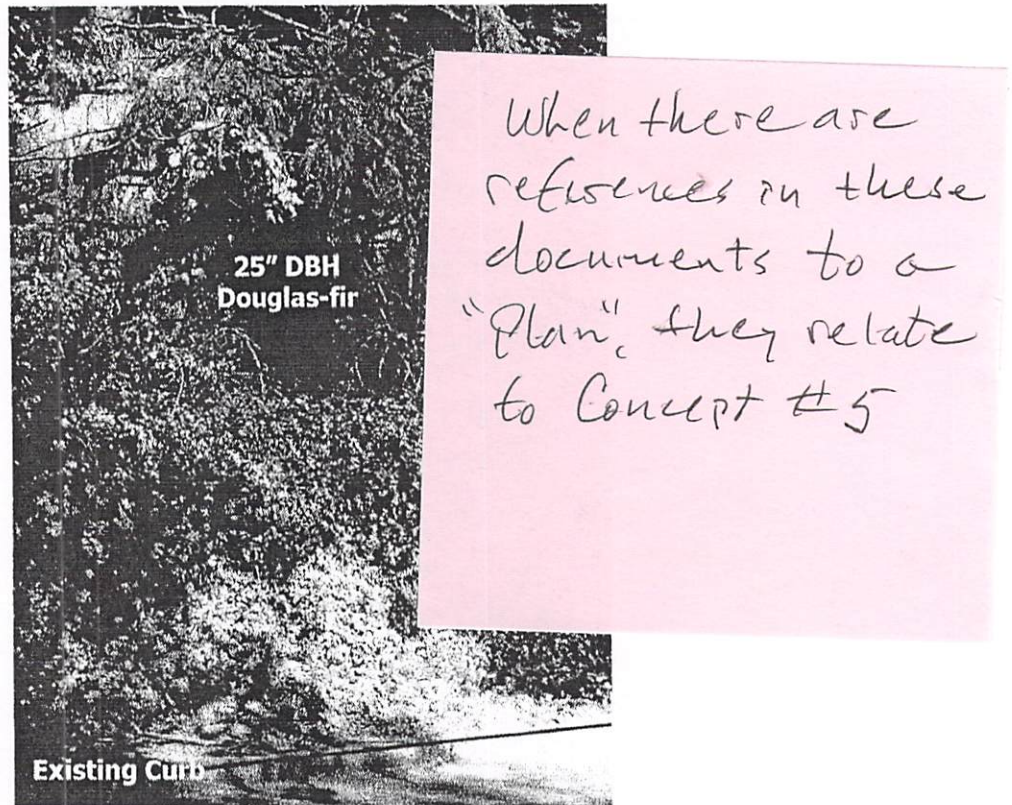


Photo 1. Existing curb and 25-inch Douglas-fir on top of slope.

Since my last visit to the site, Landscape Architect Bob Foster has provided a scaled north to south cross section at the point of the largest of the three Douglas-firs (attached). In addition, Mr. Foster and I spoke over the telephone regarding his drawing and the proposed construction impacts to the three Douglas-firs. The drawing illustrates the proposed impacts resulting from the required half street improvements. Only the largest of the three Douglas-firs is illustrated—this tree is sufficient for the illustration since retention of the other two trees is not recommended if one is removed. Since the trees are growing in a cluster and have adapted to being so close to one another over time, removal of one or more trees will expose the remaining tree, revealing a one-sided crown and increased probability for windthrow. This is potentially hazardous considering the primary targets are powerlines, the roadway, and project site.

The drawing illustrates the Douglas-fir tree that is located furthest to the west in the group of trees and an 8-foot wide sidewalk installed along the north side of Burns Street. A 2:1 slope is used, which is the recognized standard maximum for maintained slopes. In addition to the sidewalk and curb, there is an 18-inch flat area at the bottom of the slope, which is needed for

**rolf olson**

---

**From:** Soppe, Tom [tsoppe@westlinnoregon.gov]

**Sent:** Monday, September 13, 2010 9:11 AM

**To:** 'rolf olson'


**Subject:** RE: Pre-App Conference ✓

The way to measure the gable height looks fine. Mike Perkins agrees the street improvements themselves would take out the significant group of trees, so the tree variance shouldn't be needed, and this will be discussed in the notes. Let me check up on the other two issues. I will get you draft notes this week as soon as I have them ready.

Tom Soppe  
Associate Planner  
City of West Linn  
22500 Salamo Road  
West Linn, OR 97068  
ph. (503) 742-8660  
fax (503) 656-4106  
[tsoppe@westlinnoregon.gov](mailto:tsoppe@westlinnoregon.gov)

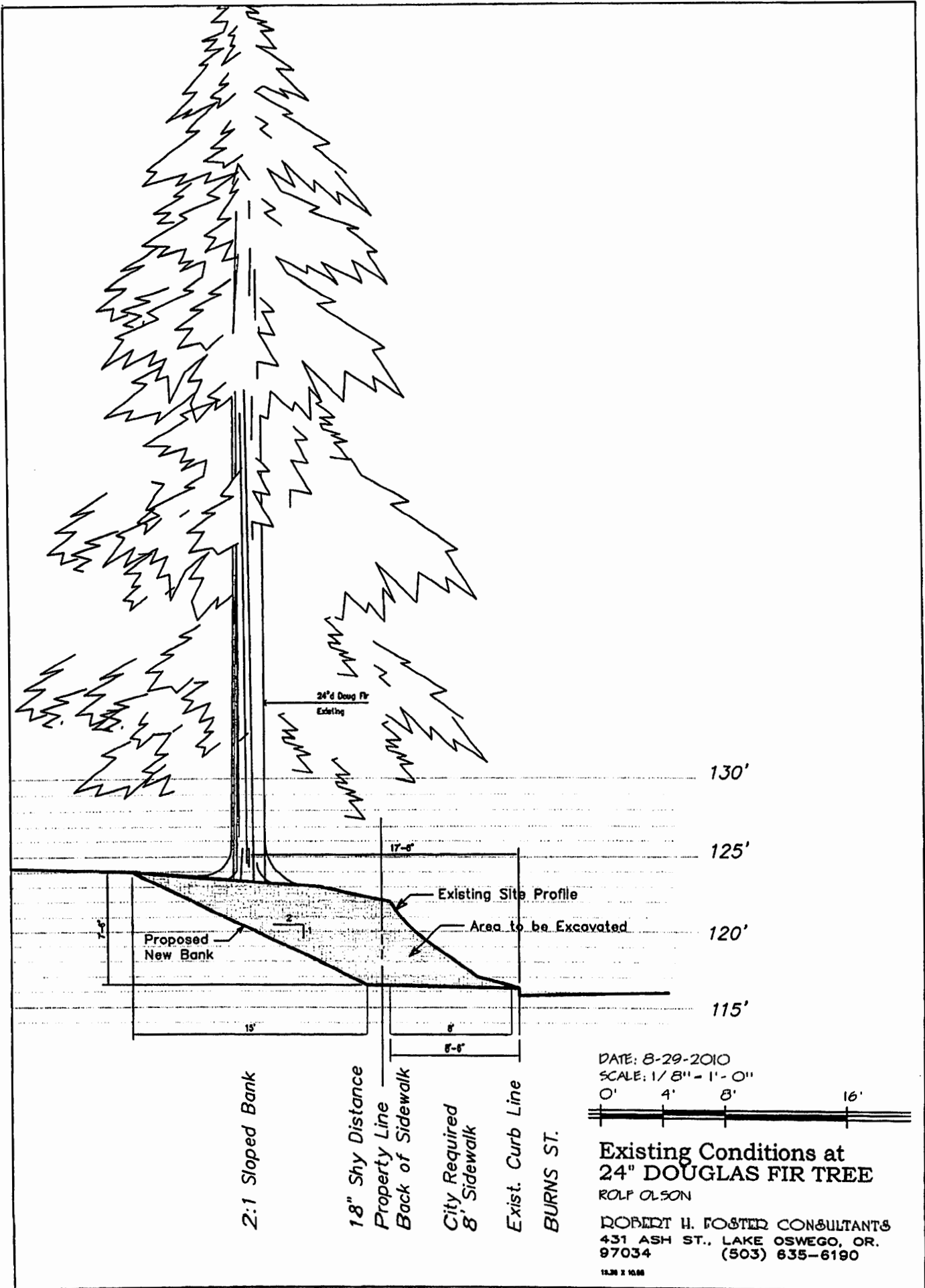
Tom Soppe  
[tsoppe@westlinnoregon.gov](mailto:tsoppe@westlinnoregon.gov)

*Associate Planner*

 22500 Salamo Rd  
West Linn, OR, 97068  
P: (503) 742-8660  
F: (503) 656-4106  
Web: [westlinnoregon.gov](http://westlinnoregon.gov)

**West Linn Sustainability** Please consider the impact on the environment before printing a paper copy of this email.

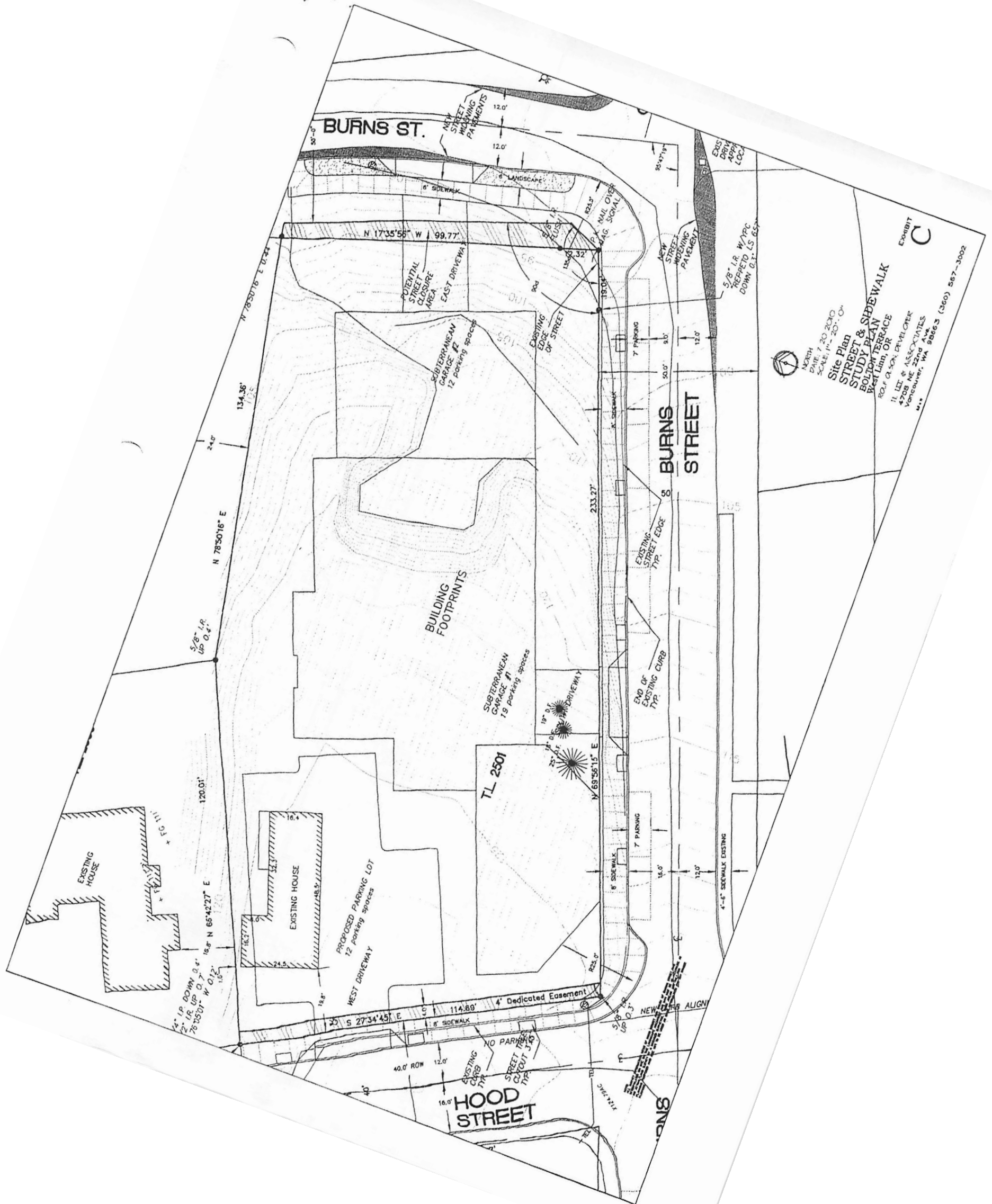
**Public Records Law Disclosure** This e-mail is subject to the State Retention Schedule and may be made available to the public.



DATE: 8-29-2010  
 SCALE: 1/8" = 1'-0"  
 0' 4' 8' 16'

**Existing Conditions at  
 24" DOUGLAS FIR TREE**  
 ROLF OLSON  
 ROBERT H. FOSTER CONSULTANTS  
 431 ASH ST., LAKE OSWEGO, OR.  
 97034 (503) 635-6190  
 12.26 X 10.68





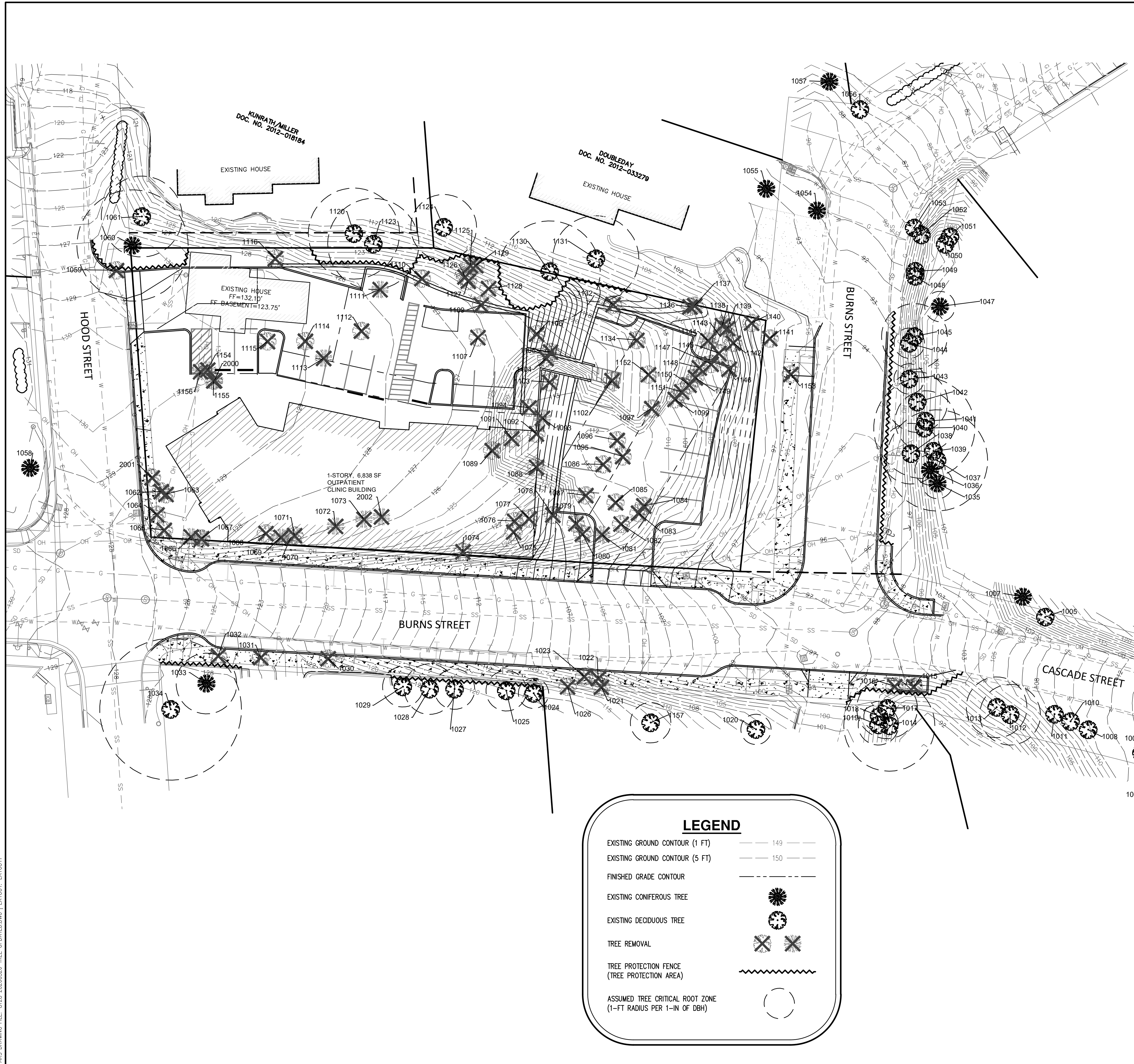
NORTH  
 DATE: 7/20/2010  
 SCALE: 1" = 20' 0"

**Site Plan  
 STREET & SIDEWALK  
 STUDY PLAN**  
 BOLTON TERRACE  
 WEST LUMB, OR  
 ROLF G. SMYKAL, DEVELOPER

ILLIUM & ASSOCIATES  
 4708 NE 22nd Ave.  
 Vancouver, WA 98663 (360) 567-3002  
 \*\*\*

EXHIBIT  
**C**

AKS DRAWING FILE: 8128\_20200526\_TREE\_UPDATED.DWG | LAYOUT: LAYOUT1



**LEGEND**

EXISTING GROUND CONTOUR (1 FT)	---	149
EXISTING GROUND CONTOUR (5 FT)	---	150
FINISHED GRADE CONTOUR	---	
EXISTING CONIFEROUS TREE		
EXISTING DECIDUOUS TREE		
TREE REMOVAL		
TREE PROTECTION FENCE (TREE PROTECTION AREA)		
ASSUMED TREE CRITICAL ROOT ZONE (1-FT RADIUS PER 1-IN OF DBH)		

THIS DETAIL DRAWING SHALL NOT BE ALTERED OR CHANGED IN ANY MANNER EXCEPT BY THE CITY ENGINEER. IT IS THE RESPONSIBILITY OF THE USER TO ACQUIRE THE MOST CURRENT VERSION OF THE DETAIL.

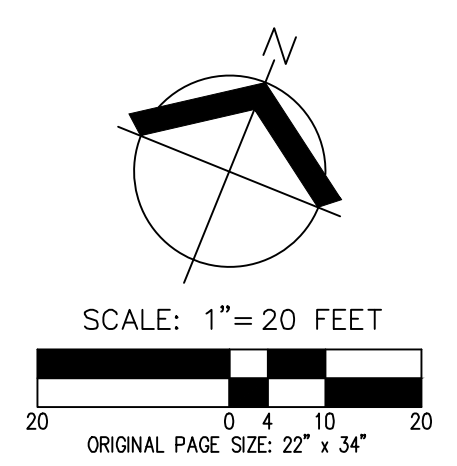
**TREE PROTECTION FENCE**

NOTE:

- 6" CHAIN LINK ON 2" POST AT 10' SPACING, DRIVEN 2" INTO GROUND
- RADIUS IS EITHER 1/2" PER CALIPER INCH OR 10' OUTSIDE OF DRIP LINE - SEE PLANS

	DATE: 2010
	DRAWING NO. WL-219
	FILE NO.

**TREE PROTECTION FENCE NOTE:**  
 TREE PROTECTION FENCE TO BE INSTALLED AS SHOWN ON THE PLANS. TREE PROTECTION FENCE IS SHOWN TO BE INSTALLED WITHIN THE ASSUMED DRIP LINE OF SOME TREES TO BE PRESERVED; HOWEVER, TREE PROTECTION FENCING LOCATIONS HAVE BEEN REVIEWED BY A CERTIFIED ARBORIST, AND THE TREE PROTECTION FENCING AS SHOWN SHOULD PROVIDE ADEQUATE PROTECTION FOR TREES TO BE PRESERVED BASED ON PROPOSED ADJACENT IMPACTS.



**AKS**  
 AKS ENGINEERING & FORESTRY, LLC  
 12965 SW HERMAN RD, STE 100  
 TUALATIN, OR 97062  
 503.563.6151  
 WWW.AKS-ENG.COM  
 ENGINEERING - SURVEYING - NATURAL RESOURCES  
 FORESTRY - PLANNING - LANDSCAPE ARCHITECTURE

**1575 BURNS STREET**  
 ADVANCED DENTAL ARTS CENTER  
**WEST LINN OREGON**  
 CLACKAMAS COUNTY TAX MAP 2 ZE 30BD  
 TAX LOT 02501

**TREE PROTECTION AND PRESERVATION PLAN**

DESIGNED BY: BRK  
 DRAWN BY: BRK  
 MANAGED BY: BRB  
 CHECKED BY: BRB  
 DATE: 06/02/2020



**BRUCE R. BALDWIN**  
 CERTIFICATE NUMBER: PA-46664  
 EXPIRATION DATE: 12/31/20

REVISIONS  
 JOB NUMBER  
**8128**  
 SHEET  
**01**



**Detailed Tree Inventory for 1575 Burns Street**

Tree #	DBH (in.)	Avg. Crown Radius (ft)	Tree Species Common Name (Scientific name)	Comments	Health Rating*	Structure Rating**	Exempt Tree***	Remove / Preserve
1001	14	17	Bigleaf Maple (Acer macrophyllum)	OFFSITE; High canopy	1	2	No	Preserve
1002	12	20	Bigleaf Maple (Acer macrophyllum)	OFFSITE; 1-sided canopy (W)	1	2	No	Preserve
1003	14	20	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Crooked; High canopy	1	2	No	Preserve
1004	6	6	Arbutus (Thuja sp.)	OFFSITE; Evaluated from Property Line; Suppressed	2	2	Yes (A)	Preserve
1005	20,14	30	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line; Lean (W); Dead codominant stem at base	2	2	No	Preserve
1007	14	19	Douglas-fir (Pseudotsuga menziesii)	OFFSITE; Evaluated from Property Line; Crooked bole	1	2	No	Preserve
1008	16,6	20	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Codominant base; Dead scaffold branches	2	2	No	Preserve
1010	12	0	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Snag	3	3	No	Preserve
1011	14	25	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Crooked bole; Cavities with decay; Dead top	2	3	No	Preserve
1012	12	25	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Crooked bole; Dead branches; Broken branches	2	2	No	Preserve
1013	12	25	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Crooked bole; Dead branches; Broken branches	2	2	No	Preserve
1014	18	25	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line	1	1	No	Preserve
1015	16,15	30	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Codominant base	1	2	No	Remove
1016	20	30	Red Alder (Alnus rubra)	OFFSITE; Lean (W); Dead branches	2	2	No	Remove
1017	12	25	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line	1	1	No	Preserve
1018	6	5	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line	1	1	Yes (A)	Preserve
1019	8	15	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line	1	1	Yes (A)	Preserve
1020	6,6	10	Cherry (Prunus sp.)	OFFSITE; Evaluated from Property Line	1	1	Yes (A)	Preserve
1021	10	15	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line	1	1	No	Remove
1022	40	31	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line; Dead codominant stem; Dead branches; Many codominant stems	2	2	No	Remove
1023	8	16	Willow (Salix sp.)	OFFSITE; Evaluated from Property Line; Dead branches; Codominant with included bark	2	2	Yes (A)	Remove
1024	6	7	Holly (Ilex sp.)	OFFSITE; Evaluated from Property Line; Crooked bole; Codominant	1	2	Yes (A)	Preserve
1025	8	7	Holly (Ilex sp.)	OFFSITE; Evaluated from Property Line	1	1	Yes (A)	Preserve
1026	14	18	Cherry (Prunus sp.)	OFFSITE; Evaluated from Property Line; Lean (SW); 1-sided canopy (SW)	1	2	No	Remove
1027	8	8	Holly (Ilex sp.)	OFFSITE; Evaluated from Property Line; Codominant	1	2	Yes (A)	Preserve
1028	10	7	Holly (Ilex sp.)	OFFSITE; Evaluated from Property Line	1	1	No	Preserve
1029	8	6	Holly (Ilex sp.)	OFFSITE; Evaluated from Property Line; Codominant	1	2	Yes (A)	Preserve
1030	20	17	European White Birch (Betula pendula)	OFFSITE; Many dead branches; Dead scaffold branches; Dead codominant stem	2	3	No	Remove
1031	20	22	European White Birch (Betula pendula)	OFFSITE; Dead branches; Codominant with included bark	2	2	No	Remove
1032	18	16	European White Birch (Betula pendula)	OFFSITE; Dead branches; Codominant with included bark	2	2	No	Remove
1033	6	6	Fir (Abies sp.)	OFFSITE; Evaluated from Property Line	1	1	Yes (A)	Preserve
1034	28	21	Maple (Acer sp.)	OFFSITE; Evaluated from Property Line; Exposed roots all around	1	2	No	Preserve
1035	6,6	10	Douglas-fir (Pseudotsuga menziesii)	OFFSITE; Evaluated from Property Line; Codominant with included bark	1	2	Yes (A)	Preserve
1036	6,6	10	Cypress (Cupressus sp.)	OFFSITE; Evaluated from Property Line; Suppressed	2	2	Yes (A)	Preserve
1037	20,10	20	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line	1	1	No	Preserve
1038	12	30	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line; Lean (W); 1-sided canopy (W)	1	2	No	Preserve
1039	15,12,12	30	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line; Dead branches; Codominant base	2	2	No	Preserve
1040	20,10	30	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line; Pruned codominant stem with decay; 1-sided canopy (W)	2	2	No	Preserve
1041	12	30	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line	1	1	No	Preserve
1042	12	30	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line; 1-sided canopy (W)	1	2	No	Preserve
1043	6	15	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line; Suppressed	2	2	Yes (A)	Preserve
1044	6	0	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line; Dead	3	3	Yes (A)	Preserve
1045	13,10,8	30	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line; Codominant base; 1-sided canopy (W)	1	2	No	Preserve
1047	6	8	Grand Fir (Abies grandis)	OFFSITE; Evaluated from Property Line	1	1	Yes (A)	Preserve
1048	8	20	Red Alder (Alnus rubra)	OFFSITE; Lean (W); Codominant top; Some dead branches	2	2	Yes (A)	Preserve
1049	12	0	Red Alder (Alnus rubra)	OFFSITE; Dead	3	3	No	Preserve
1050	12	25	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line; Some dead branches; Codominant with included bark	2	2	No	Preserve
1051	12	25	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line; 1-sided canopy (W)	1	2	No	Preserve
1052	12	18	Red Alder (Alnus rubra)	OFFSITE; Lean (W); Dead branches; Suppressed	2	2	No	Preserve
1053	30	24	Black Cottonwood (Populus trichocarpa)	OFFSITE	1	1	No	Preserve
1054	12	11	Douglas-fir (Pseudotsuga menziesii)	OFFSITE; Evaluated from Property Line	1	1	No	Preserve
1055	23	12	Giant Sequoia (Sequoiadendron giganteum)	OFFSITE; Evaluated from Property Line	1	1	No	Preserve
1056	17	27	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line	1	1	No	Preserve
1057	12	13	Douglas-fir (Pseudotsuga menziesii)	OFFSITE; Evaluated from Property Line	1	1	No	Preserve
1058	60	17	Giant Sequoia (Sequoiadendron giganteum)	OFFSITE; Evaluated from Property Line	1	1	No	Preserve
1059	6,6	15	Bay Laurel (Laurus nobilis)	OFFSITE	1	1	Yes (A)	Remove
1060	22	16	Douglas-fir (Pseudotsuga menziesii)	OFFSITE; Evaluated from Property Line	1	1	No	Preserve
1061	16	25	Ash (Fraxinus sp.)	OFFSITE; Evaluated from Property Line; Crooked bole; 1-sided canopy (NW)	1	2	No	Preserve
1062	6	17	Maple (Acer sp.)	Lean (W)	1	2	Yes (A)	Remove
1063	6	15	Maple (Acer sp.)		1	1	Yes (A)	Remove
1064	16	12	Cherry (Prunus sp.)	Topped for overhead wires; Dead branches; 100% Ivy coverage	3	3	No	Remove
1065	6	12	Cherry (Prunus sp.)	Topped for overhead wires; Epicormic leaders; 100% Ivy coverage	3	3	Yes (A)	Remove
1066	12	11	Pine (Pinus sp.)	1-sided canopy (N); Codominant top; Dead branches; 75% Ivy coverage	2	2	No	Remove
1067	12,10	10	Pine (Pinus sp.)	Topped for overhead wires; Dead	3	3	No	Remove
1068	9,9,6	18	Cherry (Prunus sp.)	Pruned for overhead wires; Epicormic sprouts; Codominant base	2	2	Yes (A)	Remove
1069	6	0	Western Red Cedar (Thuja plicata)	Dead	3	3	Yes (A)	Remove
1070	8	15	Western Red Cedar (Thuja plicata)	Topped for overhead wires	3	3	Yes (A)	Remove
1071	9,9	20	Cherry (Prunus sp.)	Lean (S); Codominant base; Broken branches; 100% Ivy coverage	2	2	Yes (A)	Remove
1072	32	25	Douglas-fir (Pseudotsuga menziesii)	Broken branches; South side pruned for overhead wires; 50% Ivy coverage	2	2	No	Remove
1073	30	20	Douglas-fir (Pseudotsuga menziesii)	Broken branches; South side pruned for overhead wires; 50% Ivy coverage	2	2	No	Remove
1074	10	0	Red Alder (Alnus rubra)	Snag	3	3	Yes (A)	Remove
1075	10	13	Red Alder (Alnus rubra)	Dead codominant stem with decay; Dead top	3	3	Yes (A)	Remove
1076	12	17	Red Alder (Alnus rubra)	100% Ivy coverage	1	1	No	Remove
1077	10	11	Red Alder (Alnus rubra)	High canopy; Dead branches; 100% Ivy coverage	2	2	Yes (A)	Remove
1078	6,6	17	Bigleaf Maple (Acer macrophyllum)	Codominant base	1	2	Yes (A)	Remove
1079	11	20	Red Alder (Alnus rubra)	Dead branches; 100% Ivy coverage	1	2	Yes (A)	Remove
1080	6,6	0	Bigleaf Maple (Acer macrophyllum)	Snag	3	3	Yes (A)	Remove

**Detailed Tree Inventory for 1575 Burns Street**

Tree #	DBH (in.)	Avg. Crown Radius (ft)	Tree Species Common Name (Scientific name)	Comments	Health Rating*	Structure Rating**	Exempt Tree***	Remove / Preserve
1081	18	17	Ponderosa Pine (Pinus ponderosa)	Dead branches; Broken branches; 100% Ivy coverage	2	1	No	Remove
1082	7	0	Bigleaf Maple (Acer macrophyllum)	Snag	3	3	Yes (A)	Remove
1083	14	20	Bigleaf Maple (Acer macrophyllum)	Broken primary stem	3	3	No	Remove
1084	7,14,14	30	Bigleaf Maple (Acer macrophyllum)	Lean (SE); Codominant base; Dead foliage; 100% Ivy coverage	2	2	No	Remove
1085	7	13	Red Alder (Alnus rubra)	High canopy; Dead branches; 50% Ivy coverage	2	2	Yes (A)	Remove
1086	10	17	Black Cottonwood (Populus trichocarpa)	Top lean (S)	1	2	Yes (A)	Remove
1087	13	19	Red Alder (Alnus rubra)	100% Ivy coverage	1	1	No	Remove
1088	30	20	Black Cottonwood (Populus trichocarpa)	Dead branches; 100% Ivy coverage	2	1	No	Remove
1089	6,10	20	Red Alder (Alnus rubra)	Lean (W)	1	2	Yes (A)	Remove
1091	9	14	Black Cottonwood (Populus trichocarpa)	Lean (W); Crooked bole	1	2	Yes (A)	Remove
1092	20	25	Black Cottonwood (Populus trichocarpa)	Dead branches; 100% Ivy coverage	2	1	No	Remove
1093	7	10	Grand Fir (Abies grandis)	Suppressed; 100% Ivy coverage	2	2	Yes (A)	Remove
1094	6	15	Willow (Salix sp.)		1	1	Yes (A)	Remove
1095	6	13	Red Alder (Alnus rubra)	Dead branches	2	1	Yes (A)	Remove
1096	31	25	Black Cottonwood (Populus trichocarpa)	100% Ivy coverage	1	1	No	Remove
1097	3,11	30	Bigleaf Maple (Acer macrophyllum)	Crooked; Dead branches; 1-sided (W); Codominant base	2	2	Yes (A)	Remove
1099	10	18	Red Alder (Alnus rubra)	1-sided canopy (E); Dead branches	2	2	No	Remove
1102	8	14	Red Alder (Alnus rubra)	Codominant top; Dead branches; 75% Ivy coverage	2	2	Yes (A)	Remove
1103	24	25	Black Cottonwood (Populus trichocarpa)	100% Ivy coverage	1	1	No	Remove
1104	12	20	Black Cottonwood (Populus trichocarpa)	Crooked bole; Top lean (W); 100% Ivy coverage	1	2	No	Remove
1105	6	10	Black Cottonwood (Populus trichocarpa)	Crooked; Dead branches; 100% Ivy coverage	2	2	Yes (A)	Remove
1106	8	12	Sweet cherry (Prunus Avium)	Dead branches; Crooked bole; 100% Ivy coverage	2	2	Yes (A)	Remove
1107	16,16	0	Bigleaf Maple (Acer macrophyllum)	Dead and broken	3	3	No	Remove
1109	11	20	Bigleaf Maple (Acer macrophyllum)	Dead and broken codominant stem; Sweep	2	2	Yes (A)	Remove
1110	22,22	0	Cherry (Prunus sp.)	Dead	3	3	No	Remove
1111	16	12	Grand Fir (Abies grandis)		1	1	No	Remove
1112	18	16	Cherry (Prunus sp.)	Broken with epicormic stems	3	3	No	Remove
1113	17	17	Pine (Pinus sp.)	Dead and broken scaffold branch; Codominant top; Lean (S)	2	2	No	Remove
1114	6	10	Bigleaf Maple (Acer macrophyllum)	Butt sweep	1	2	Yes (A)	Remove
1115	15,9	11	Magnolia (Magnolia sp.)	Codominant base; Girdling roots	1	2	No	Remove
1116	11	16	Sweet cherry (Prunus Avium)	Lean (S); Some dead branches	2	2	Yes (A)	Remove
1120	18,18,12	30	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line; 1-sided canopy (NW); Codominant base	1	2	No	Preserve
1123	18,16	30	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line; Codominant base	1	2	No	Preserve
1124	13	20	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line	1	1	No	Preserve
1125	11	20	Bigleaf Maple (Acer macrophyllum)	High canopy; 100% Ivy coverage	1	2	Yes (A)	Remove
1126	12	30	Bigleaf Maple (Acer macrophyllum)	Dead branches; 100% Ivy coverage	2	1	No	Remove
1127	10	0	Bigleaf Maple (Acer macrophyllum)	Dead	3	3	Yes (A)	Remove
1128	6	14	Cherry (Prunus sp.)	Crooked bole; High canopy; Dead branches	2	2	Yes (A)	Remove
1129	6	18	Bigleaf Maple (Acer macrophyllum)	Lean (W); Sweep; Dead branches	2	2	Yes (A)	Remove
1130	20	25	Bigleaf Maple (Acer macrophyllum)	OFFSITE; Evaluated from Property Line	1	1	No	Preserve
1131	17	20	Maple (Acer sp.)	OFFSITE; Evaluated from Property Line; 1-sided canopy (W)	1	2	No	Preserve
1132	20,14	30	Bigleaf Maple (Acer macrophyllum)	Crooked bole; Some dead branches; 100% Ivy coverage	2	2	No	Remove
1134	6	0	Red Alder (Alnus rubra)	Snag	3	3	Yes (A)	Remove
1136	17,11	28	Bigleaf Maple (Acer macrophyllum)	Codominant with included bark	1	2	No	Remove
1137	17	28	Bigleaf Maple (Acer macrophyllum)		1	1	No	Remove
1138	7	15	Red Alder (Alnus rubra)	Lean (N); Dead branches	2	2	Yes (A)	Remove
1139	15	20	Red Alder (Alnus rubra)	High canopy; Dead branches	2	2	No	Remove
1140	10	20	Red Alder (Alnus rubra)	Top lean (N); 1-sided (N); Dead branches	2	2	Yes (A)	Remove
1141	6	0	Red Alder (Alnus rubra)	OFFSITE; Snag	3	3	Yes (A)	Remove
1142	11	16	Red Alder (Alnus rubra)		1	1	Yes (A)	Remove
1143	9	12	Red Alder (Alnus rubra)		1	1	Yes (A)	Remove
1144	6	8	Pine (Pinus sp.)	Lean (S)	1	2	Yes (A)	Remove
1145	10	15	Red Alder (Alnus rubra)	High canopy; 100% Ivy coverage	1	2	Yes (A)	Remove
1146	10	11	Red Alder (Alnus rubra)	Dead top; 100% Ivy coverage	3	2	Yes (A)	Remove
1147	7	10	Red Alder (Alnus rubra)	Significant lean (E); Dead branches	2	2	Yes (A)	Remove
1148	10	16	Red Alder (Alnus rubra)	Lean (W); Sparse canopy; Dead branches; High canopy	2	2	Yes (A)	Remove
1149	10	18	Red Alder (Alnus rubra)	Sparse canopy; Dead scaffold branches; Lean (E); 100% Ivy coverage	2	2	Yes (A)	Remove
1150	12	15	Red Alder (Alnus rubra)	Dead top; 100% Ivy coverage	3	2	No	Remove
1151	11	0	Red Alder (Alnus rubra)	Snag	3	3	Yes (A)	Remove
1152	7	10	Holly (Ilex sp.)	Dead top	3	2	Yes (A)	Remove
1153	14	16	Red Alder (Alnus rubra)	OFFSITE; Dead branches; 100% Ivy coverage	2	1	No	Remove
1154	8	0	Ponderosa Pine (Pinus ponderosa)	Snag	3	3	Yes (A)	Remove
1155	6	0	Red Alder (Alnus rubra)	Snag	3	3	Yes (A)	Remove
1156	20	18	Ponderosa Pine (Pinus ponderosa)		1	1	No	Remove
1157	8	15	Purple Leaf Plum (Prunus cerasifera)	OFFSITE; Evaluated from Property Line; Dead branches	2	1	Yes (A)	Preserve
2000	20	14	Ponderosa Pine (Pinus ponderosa)	Dead branches; 1-sided canopy (SE)	2	2	No	Remove
2001	10,10	0	Willow (Salix sp.)	Snag	3	3	Yes (A)	Remove
2002	30	25	Douglas-fir (Pseudotsuga menziesii)	Broken Codominant stem at base; Pruned South side for overhead wires; 100% Ivy coverage	2	2	No	Remove

Total # of Existing Trees Inventoried = 145

Total # of Existing Onsite Trees Inventoried = 79  
 Total # of Existing Onsite Trees to be Preserved = 0  
 Total # of Existing Onsite Trees to be Removed = 79  
 Total # of Existing Onsite Trees to be Removed that are Exempt = 48  
 Total # of Existing Onsite Trees to be Removed that are Not Exempt = 31  
 Total # of Existing Onsite Trees to be Removed that are Not Exempt, but are in Poor Condition = 7

**\*Health Rating:**



# MEMORANDUM

DATE: June 27, 2019

TO: Josh Wells | Westech Engineering, Inc.

FROM: Lacy Brown, Ph.D., P.E. | DKS Associates  
Daniel Thompson, Intern | DKS Associates

SUBJECT: West Linn: 1575 Burns Street Trip Generation and TIA Determination

This memorandum provides a site plan review and trip generation analysis to determine the need for a traffic impact analysis. The following sections describe the average daily, AM peak hour and PM peak hour trip generation for the proposed office development in West Linn, Oregon. The proposed development is located at 1575 Burns Street and will consist of 8,500 square feet of office.

## TRIP GENERATION

The expected trip generation of the proposed office building was estimated using the ITE Trip Generation Manual, 10th Edition.<sup>1</sup> The trip generation estimates are summarized in Table 1.

**Table 1: Trip Generation**

Land Use [ITE Code]	Trip Generation Rate <sup>a</sup>		Units	AM Peak Hour			PM Peak Hour			Daily Trips
	AM Peak	PM Peak		In	Out	Total	In	Out	Total	
General Office [710]	4.0/KSF <sup>b</sup>	1.29/KSF <sup>b</sup>	8.5 KSF <sup>b</sup>	29	5	34	2	9	11	97

<sup>a</sup>Trip Generation Rate calculated using fitted curve equation.

<sup>b</sup>KSF = 1,000 Square Feet

As shown, the development is expected to generate 97 daily trips, 34 AM peak hour trips, and 11 PM peak hour trips. Based on section 5.0014 of the City of West Linn Public Works Design Standards, the proposed development will not require a full transportation impact analysis since it generates less than 1,000 vehicle trips per weekday.

## SITE PLAN REVIEW

The preliminary site plan was provided by Westech Engineering, Inc. and is attached in the appendix. Based on the site plan, the proposed project is expected to have vehicle access to Hood Street via a new driveway that is to be constructed. Sight distance and site access spacing requirements were evaluated for the new driveway. Hood Street is a local street with a posted speed limit of 25 miles per hour in the vicinity of the site.

<sup>1</sup> Trip Generation, 10th Edition, Institute of Transportation Engineers, 2017.

## Sight Distance

A preliminary sight distance evaluation was conducted at the proposed access on Hood Street. Based on AASHTO standards for 25 miles per hour speeds, 280 feet of intersection sight distance would be required in the north and south directions.<sup>2</sup> A preliminary sight distance review indicated that the available sight distance is adequate for vehicles traveling 25 miles per hour or less. Prior to occupancy, sight distance will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon.

## Access Spacing

The proposed office development plans to provide access onto Hood Street with a driveway placed approximately 65 feet north of Burns Street. Based on the City of West Linn access spacing standards, driveways on local streets should be spaced at least 35 feet from intersecting streets.<sup>3</sup> Hood Street is classified as a local road and the proposed driveway meets access spacing standards.

## Parking

The proposed site plan includes 25 off-street parking spaces (2 van-accessible, 8 compact, and 15 standard spaces). Based on the City of West Linn parking requirements, professional office buildings are required to provide one parking space per 370 square feet of building area.<sup>4</sup> For an 8,500 square foot office building, the minimum number of parking spaces required is 23, with a minimum of one accessible space. The parking provided meets the City's requirements.

## SUMMARY

Key findings for the proposed office development in West Linn, Oregon are as follows:

- The 8,500 square feet of office space would generate 97 daily trips, 34 AM peak hour trips, and 11 PM peak hour trips. Based on the City of West Linn Public Works Design Standards, the proposed development will not require a full transportation impact study since it generates less than 1,000 vehicle trips per weekday.
- A preliminary sight distance evaluation indicated that the existing sight distance at the proposed driveway located on Hood Street meets AASHTO requirements. Prior to occupancy, sight distance will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon.
- The preliminary site plan meets the City's requirements for access spacing and off-street parking.

Please let us know if you have any questions.

---

<sup>2</sup> *A Policy on Geometric Design of Highways and Streets, 6th Edition*, Table 9-6, AASHTO, 2011.

<sup>3</sup> *City of West Linn Public Works Design Standards*, Section 5 – Street Requirements.

<sup>4</sup> *City of West Linn Community Development Code*, Section 46.090.C and 46.150.B.



**APPENDIX A – SITE PLAN**

# MEMORANDUM

DATE: June 5, 2020

TO: Josh Wells | Westech Engineering, Inc.

FROM: Lacy Brown, Ph.D., P.E. | DKS Associates  
 Jenna Bogert, EI | DKS Associates



SUBJECT: 1575 Burns Street Trip Generation and TIA Determination

This memorandum provides a site plan review and trip generation analysis to determine the need for a traffic impact analysis. The following sections describe the average daily, AM peak hour and PM peak hour trip generation for the proposed office development in West Linn, Oregon. The proposed development is located at 1575 Burns Street and will consist of a 7,000-square-foot office building.

## TRIP GENERATION

The expected trip generation of the proposed office building was estimated using the ITE Trip Generation Manual, 10th Edition.<sup>1</sup> The trip generation estimates are summarized in Table 1.

**Table 1: Trip Generation**

Land Use [ITE Code]	Trip Generation Rate <sup>a</sup>		Units <sup>b</sup>	AM Peak Hour			PM Peak Hour			Daily Trips
	AM Peak	PM Peak		In	Out	Total	In	Out	Total	
Medical-Dental Office [720]	3 trips/KSF	3.71 trips/KSF	7.0 KSF	16	5	21	7	19	26	180

<sup>a</sup>Trip Generation Rate calculated using fitted curve equation.  
<sup>b</sup>KSF = 1,000 Square Feet

As shown, the development is expected to generate 180 daily trips, 21 AM peak hour trips, and 26 PM peak hour trips. Based on section 5.0014 of the City of West Linn Community Development Code, the proposed development will not require a full transportation impact analysis since it generates less than 250 vehicle trips per weekday.

<sup>1</sup> Trip Generation, 10th Edition, Institute of Transportation Engineers, 2017.

## SITE PLAN REVIEW

The most recent site plan was provided by Westech Engineering, Inc. and is attached in the appendix. Based on the site plan, the proposed development will have two parking lots, one with vehicle access to Hood Street and the other with vehicle access to Burns Street via full access driveways.

Sight distance and site access spacing requirements were evaluated for the two driveways and are discussed below. Both Hood Street and Burns Street are classified as local streets in the City TSP and have a posted speed limit of 25 miles per hour fronting the project site near the proposed driveway locations.

### Sight Distance

A preliminary sight distance evaluation was conducted at the proposed accesses on Hood Street and Burns Street. Based on AASHTO standards for 25 miles per hour speeds, 280 feet of intersection sight distance would be required in both directions.<sup>2</sup> A preliminary sight distance review indicated that the available sight distance is adequate for vehicles traveling 25 miles per hour or less. Prior to occupancy, sight distance will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon.

### Access Spacing

Based on the City of West Linn access spacing standards, driveways on local streets should be spaced at least 35 feet from intersecting streets.<sup>3</sup> The proposed development plans to provide access onto Hood Street with a driveway placed approximately 65 feet north of Burns Street. The site driveway on Burns Street is located approximately 35 feet from the nearest intersection (Burns Street/Cascade Street), meeting the City's access spacing requirements.

### Parking

Based on the City of West Linn parking requirements, medical-dental office buildings are required to provide one parking space per 250 square feet of building area.<sup>4</sup> For a 7,000 square foot building, the minimum number of parking spaces required is 28, with a minimum of two ADA accessible spaces. The City code also states that development sites within one-quarter mile of a transit corridor may reduce parking by up to 10%. If Willamette Drive is considered a transit corridor, the parking requirement would be 25 spaces.

The proposed site plan shows 26 off-street parking spaces including two ADA accessible spaces, which meets City parking requirements (assuming a reduction for transit corridor proximity). Additionally, on-street parking is available along Hood Street and Burns Street (west of Hood Street) which may provide the opportunity for overflow parking supply.

<sup>2</sup> *A Policy on Geometric Design of Highways and Streets, 6th Edition*, Table 9-6, AASHTO, 2011.

<sup>3</sup> *City of West Linn Public Works Design Standards*, Section 5 – Street Requirements.

<sup>4</sup> *City of West Linn Community Development Code*, Section 46.090.C and 46.150.B.

## SUMMARY

Key findings for the proposed office development in West Linn, Oregon are as follows:

- The 7,000 square feet of office space would generate 180 daily trips, 21 AM peak hour trips, and 26 PM peak hour trips. Based on the City of West Linn Community Development Code, the proposed development will not require a full transportation impact study since it generates less than 250 vehicle trips per weekday.
- The preliminary site plan meets the City's requirements for access spacing.
- The preliminary site plan meets the City's requirements for a 7,000 square foot office building in close proximity to a transit corridor.

Please let us know if you have any questions.

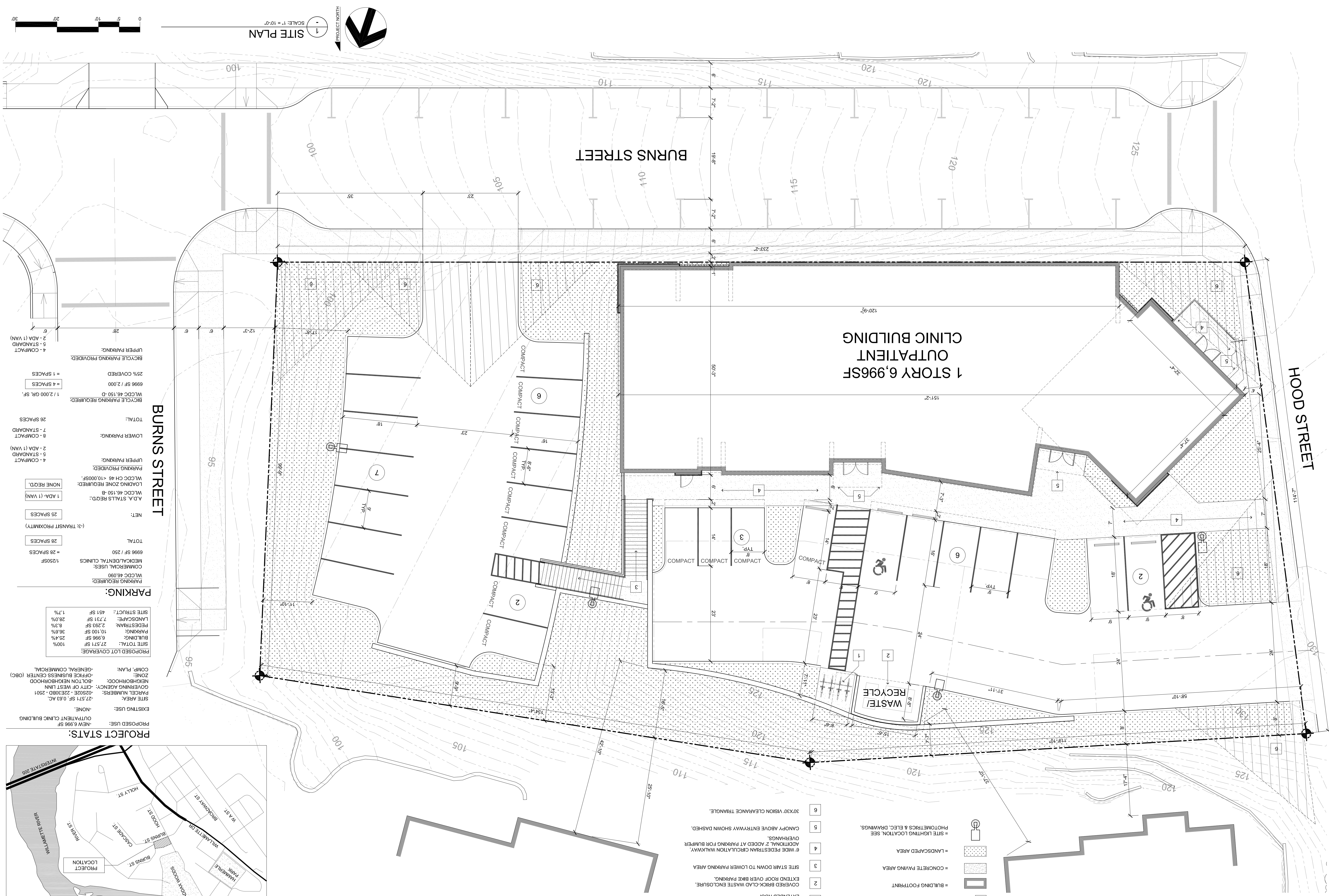
**APPENDIX A – SITE PLAN**



HOOD STREET

BURNS STREET

1 STORY 6,996SF  
OUTPATIENT  
CLINIC BUILDING



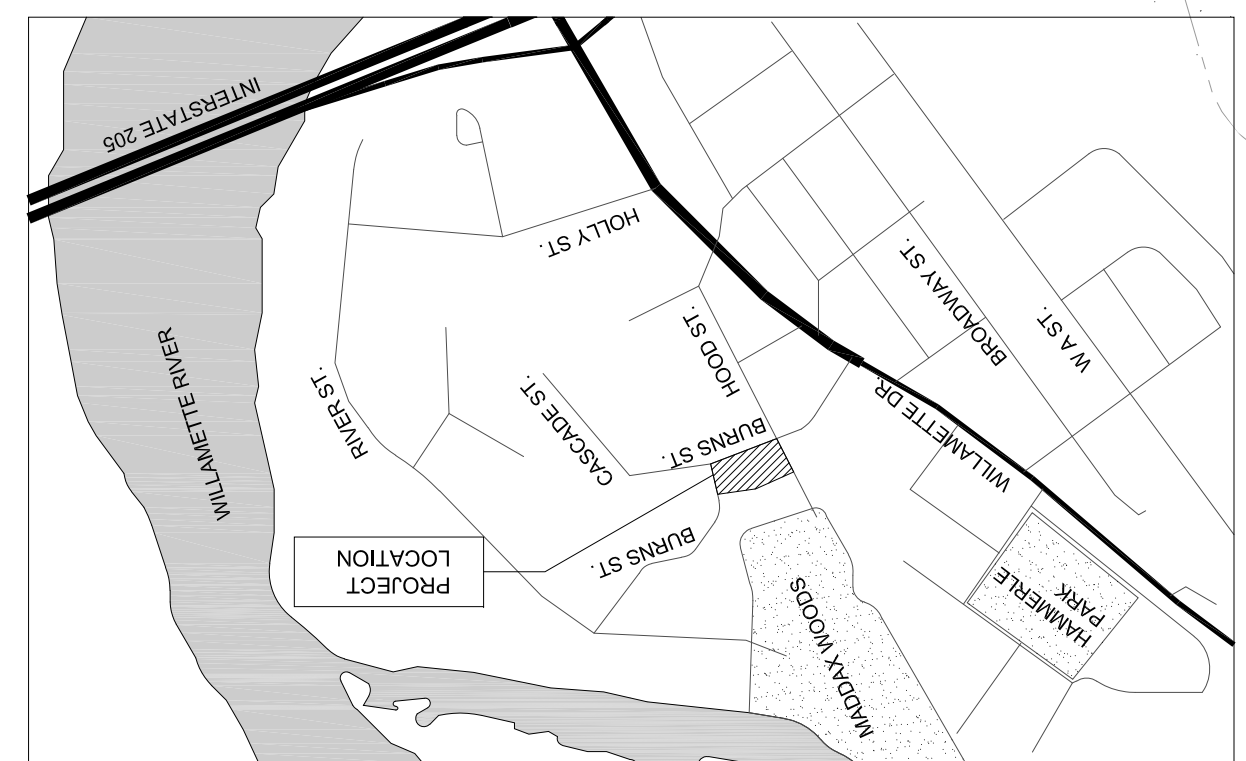
SITE PLAN LEGEND

SITE PLAN KEYNOTES

- # = KEYNOTE TAG
- [Building Footprint] = BUILDING FOOTPRINT
- [Concrete Paving Area] = CONCRETE PAVING AREA
- [Landscape Area] = LANDSCAPED AREA
- [Lighting Location] = SITE LIGHTING LOCATION. SEE PHOTOMETRICS & ELEC. DRAWINGS.
- [Canopy] = CANOPY ABOVE ENTRYWAY SHOWN DASHED.
- [30'x30' Vision Clearance Triangle] = 30'x30' VISION CLEARANCE TRIANGLE.

- 1 NEW BIKE RACK FOR 4 BIKES, 2 SPACES UNDER EXTENDED ROOF
- 2 COVERED BRICK-CLAD WASTE BIKE PARKING. EXTEND ROOF OVER BIKE PARKING.
- 3 SITE STAIR DOWN TO LOWER PARKING AREA
- 4 6' WIDE PEDESTRIAN CIRCULATION WALKWAY. ADDITIONAL 2' ADDED AT PARKING FOR BUMPER OVERHANGS.
- 5
- 6

VICINITY MAP N.T.S.



PROJECT STATS:

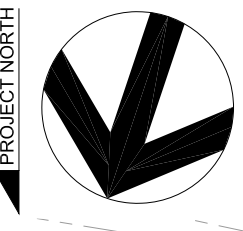
PROPOSED USE: OUTPATIENT CLINIC BUILDING  
 NEW 6,996 SF  
 EXISTING USE: NONE  
 SITE AREA: -27,571 SF, 0.63 AC.  
 PARCEL NUMBER: -422022 - 222380D - 2501  
 COVERING AGENCY: CITY OF WEST LINN  
 NEIGHBORHOOD: BOLTON NEIGHBORHOOD  
 ZONE: OFFICE BUSINESS CENTER (OBC)  
 COMP. PLAN: GENERAL COMMERCIAL

PROPOSED LOT COVERAGE:  
 SITE TOTAL: 27,571 SF 100%  
 BUILDING: 6,996 SF 25.4%  
 PARKING: 10,100 SF 36.6%  
 FUTURE: 2,293 SF 8.3%  
 LANDSCAPE: 7,731 SF 28.0%  
 SITE STRUCT.: 451 SF 1.7%

PARKING:  
 COMMERCIAL USES:  
 WLCD 46,090  
 1/250SF  
 TOTAL: 28 SPACES  
 (-3: TRANSIT PROXIMITY)  
 25 SPACES  
 NONE REQ'D.  
 A.D.A. STALLS REQ'D:  
 WLCD 46,150-48  
 1 ADA- (1 VAN)

NET: 28 SPACES  
 COMMERCIAL USES:  
 WLCD 46,150-D  
 1/2,000 GR. SF.  
 BICYCLE PARKING REQUIRED:  
 28 SPACES  
 LOWER PARKING:  
 9 - STANDARD  
 7 - STANDARD  
 2 - ADA (1 VAN)  
 UPPER PARKING:  
 4 - STANDARD  
 5 - STANDARD  
 2 - ADA (1 VAN)  
 BICYCLE PARKING PROVIDED:  
 28 SPACES  
 UPPER PARKING:  
 4 - COMPACT  
 5 - STANDARD  
 2 - ADA (1 VAN)  
 BICYCLE PARKING PROVIDED:  
 28 SPACES  
 LOWER PARKING:  
 9 - STANDARD  
 7 - STANDARD  
 2 - ADA (1 VAN)  
 UPPER PARKING:  
 4 - COMPACT  
 5 - STANDARD  
 2 - ADA (1 VAN)

SITE PLAN  
 SCALE: 1" = 10'-0"



DESIGN REVIEW SET  
 SHEET  
 A1.1

DATE: 2/14/2020

SITE PLAN

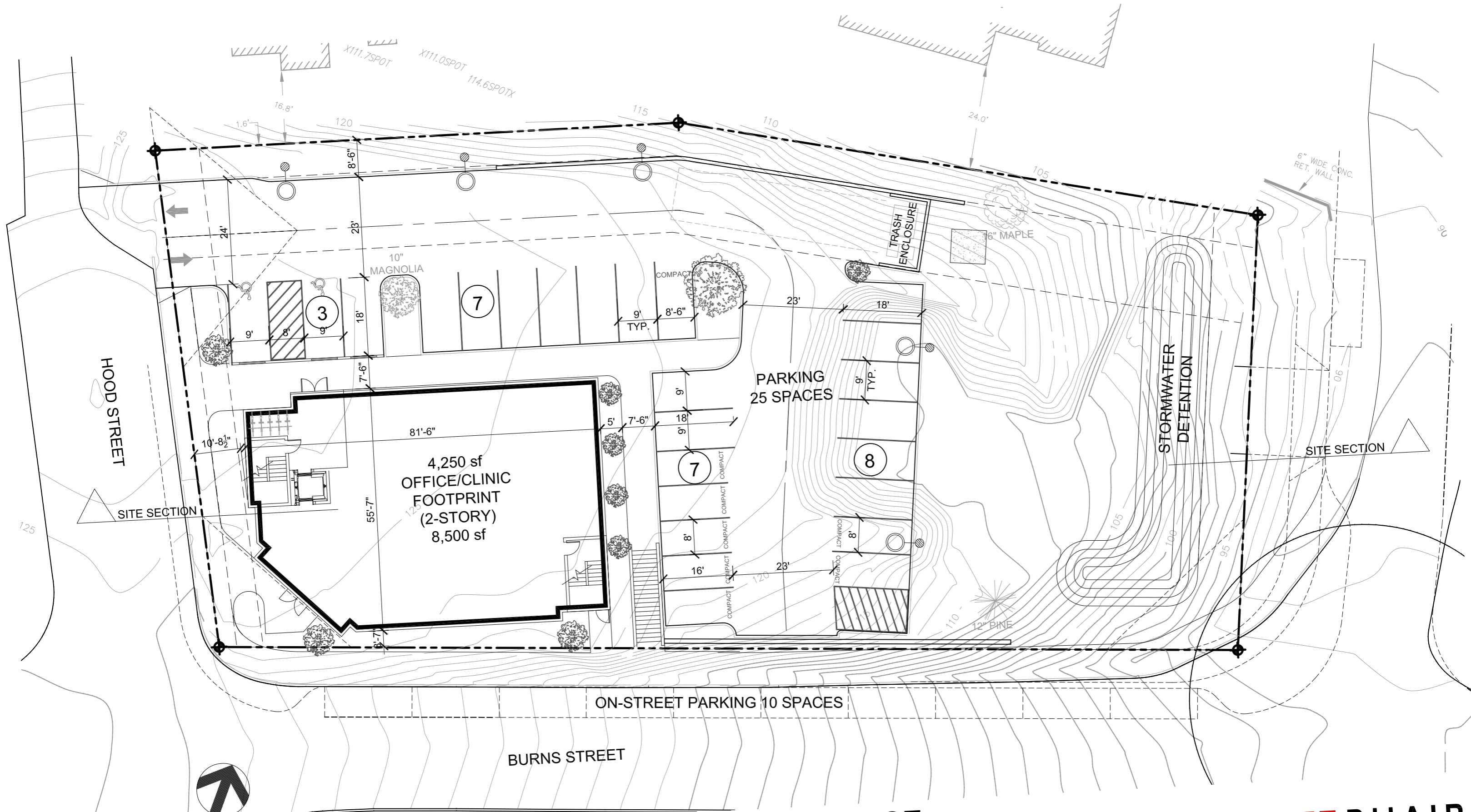
NEW BUILDING FOR ADVANCE DENTAL ARTS CENTER  
 1575 BURNS ST. WEST LINN, OR 97068

EMMETT PHAIR ARCHITECTURE, INC.  
 6305 SW ROSEWOOD ST. SUITE E,  
 LAKE OSWEGO, OR 97035  
 phone: 503-572-8606

lenity architecture, inc.  
 3150 KENNA COURT SE, SUITE 500  
 WASHINGTON, OR 97146  
 phone: 503-399-1990

PRELIMINARY NOT FOR CONSTRUCTION





**lenity**  
architecture

3150 Kettle Court SE, Salem, Oregon 97301  
P 503 399 1090 F 503 399 0565 w lenityarchitecture.com

**SITE PLAN**  
SCALE: 1" = 20'-0"

DATE: 5-28-19

**EMMETT PHAIR**  
CONSTRUCTION

NEIGHBORHOOD MEETING NOTICE  
AFFADAVIT OF MAILING

STATE OF OREGON )  
 )  
City of West Linn )

I, Carolyn A. Kellogg, being duly sworn, depose and say that on the 17<sup>th</sup>

Day of Sept 2019, I caused a written notice to be sent by regular U.S. Mail to property owners within 500 feet of the subject property to discuss a proposed development at 1575 Burns Street,

a copy of such notice is attached hereto and made a part hereof.

Signature: Carolyn A. Kellogg

ACKNOWLEDGEMENT

Subscribed and sworn to, or affirmed, before me this 18<sup>th</sup> day of September  
2019

STATE OF OREGON )  
County of Marion )

On 9/18/19, before me personally appeared

Whose identity was established to my satisfaction, and who executed the foregoing instrument, acknowledging to me that the same was executed freely and voluntarily,

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal on the date first written above.

Lisa M. Crouch  
Notary Public for Oregon  
My commission expires 5/8/23



7016 1370 0000 7294 2058

**U.S. Postal Service™**  
**CERTIFIED MAIL® RECEIPT**  
 Domestic Mail Only

For delivery information, visit our website at [www.usps.com](http://www.usps.com)

WEST LINN, OR 97068

Certified Mail Fee \$3.50

Extra Services & Fees (check box; add fee as appropriate)

<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00

Postage \$0.55

Total Postage and Fees \$6.85

Sent To: Bob McCarthy  
 Street and Apt. No. or PO Box: 1535 Burns St.  
 City, State, ZIP+4®: West Linn, OR 97068

Postmark: SEP 09 2019  
 05012011  
 USPS

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7016 1370 0000 7294 2065

**U.S. Postal Service™**  
**CERTIFIED MAIL® RECEIPT**  
 Domestic Mail Only

For delivery information, visit our website at [www.usps.com](http://www.usps.com)

WEST LINN, OR 97068

Certified Mail Fee \$3.50

Extra Services & Fees (check box; add fee as appropriate)

<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00

Postage \$0.55

Total Postage and Fees \$6.85

Sent To: Steve Miron  
 Street and Apt. No. or PO Box No.: 1535 Holmes St.  
 City, State, ZIP+4®: West Linn, OR 97068

Postmark: SEP 09 2019  
 05012011  
 USPS

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

## PROPERTY DEVELOPMENT PROPOSAL ANNOUNCEMENT

To: Neighbors in the Vicinity of 1575 Burns Street, West Linn, OR 97068

From: Lenity Architecture Inc., on behalf of Kim Wright, DMD

What: Proposed new medical/professional office at 1575 Burns Street

Please join us during the regular Bolton Neighborhood Association meeting to discuss the project with you in further detail.

Where: **Bolton Fire Station – 6050 Failing Street, West Linn, OR 97068**

When: **Tuesday, October 15<sup>th</sup> @ 7pm**

This meeting is open to the public and we welcome your participation and comments.

Please note that there may be other development proposals and/or Bolton Neighborhood Association business discussed at the meeting.

We encourage you to contact the Bolton Neighborhood Association President, or designee, with any questions you may want to relay to us.

You may also contact me with any questions: [samt@lenityarchitecture.com](mailto:samt@lenityarchitecture.com)

We look forward to meeting with you soon!

Sincerely,



Sam Thomas  
Senior Land Use Specialist  
Lenity Architecture, Inc.



# **PUBLIC MEETING NOTICE**

Design Review - Class II  
Medical/Professional Office

Site: 1575 Burns Street

**Meeting Location/Time:**

**Bolton Fire Station**

**6050 Failing Street**

**7:00 PM - October 15, 2019**

Contact Sam Thomas

for more information:

[samt@lenityarchitecture.com](mailto:samt@lenityarchitecture.com)


NEIGHBORHOOD MEETING  
AFFIDAVIT OF POSTING

STATE OF OREGON     )  
                                  )  
City of West Linn     )

I, Samuel A. Thomas, being duly sworn, depose and say that on the 17<sup>th</sup>

Day of September 2019, I caused to be posted a notice of a meeting to discuss a proposed development  
at 1575 Burns Street,

a copy of such posting is attached hereto and made a part hereof.

Signature: 

ACKNOWLEDGEMENT

Subscribed and sworn to, or affirmed, before me this 20<sup>th</sup> day of SEPTEMBER  
2019

STATE OF OREGON     )  
County of MARION     )

On 9/20/19 - SAMUEL THOMAS, before me personally appeared

Whose identity was established to my satisfaction, and who executed the foregoing instrument,  
acknowledging to me that the same was executed freely and voluntarily,

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal on the date  
first written above.

  
Notary Public for Oregon  
My commission expires 5/8/2023





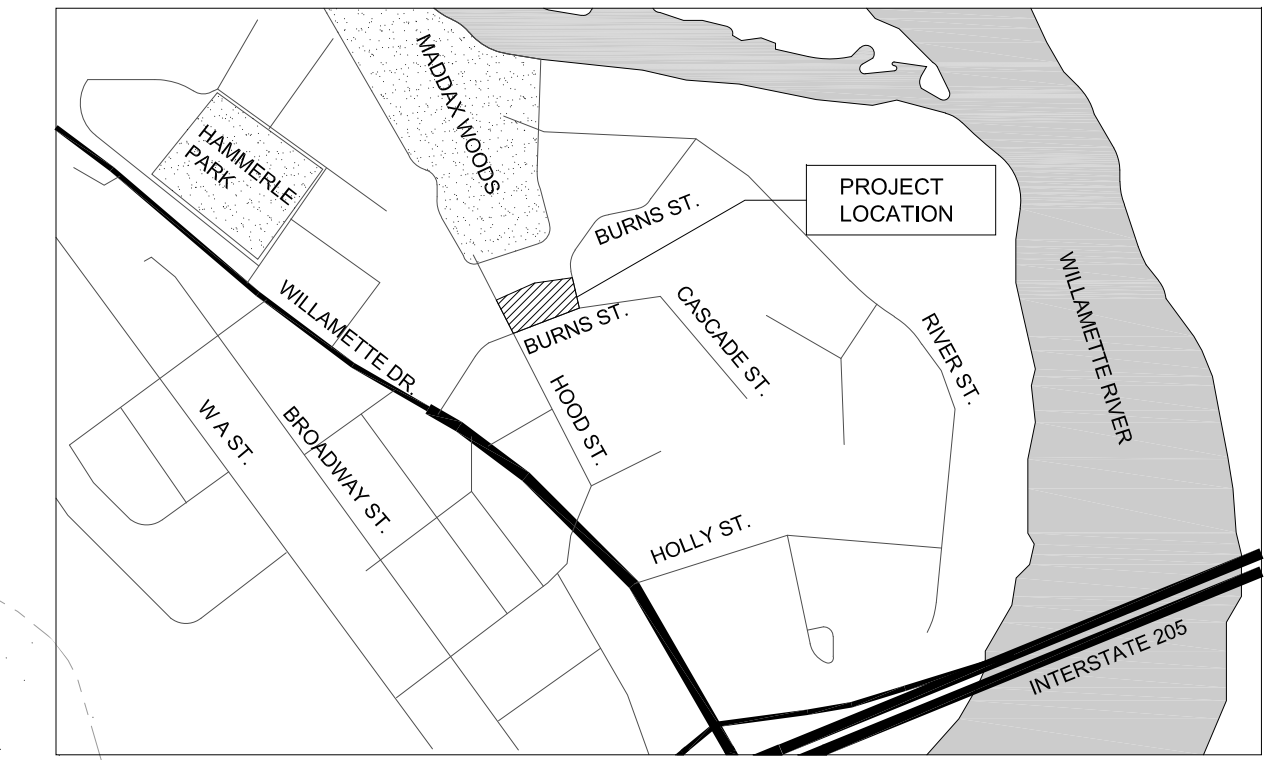
**SITE PLAN LEGEND**

- # = KEYNOTE TAG
- [Solid Line] = BUILDING FOOTPRINT
- [Dotted Pattern] = CONCRETE PAVING AREA
- [Stippled Pattern] = LANDSCAPED AREA
- [Light Dotted Pattern] = SITE LIGHTING LOCATION. SEE PHOTOMETRICS & ELEC. DRAWINGS.

**SITE PLAN KEYNOTES**

- 1 NEW BIKE RACK FOR 4 BIKES, 2 SPACES UNDER EXTENDED ROOF
- 2 COVERED BRICK-CLAD WASTE ENCLOSURE. EXTEND ROOF OVER BIKE PARKING.
- 3 SITE STAIR DOWN TO LOWER PARKING AREA
- 4 6' WIDE PEDESTRIAN CIRCULATION WALKWAY. ADDITIONAL 2' ADDED AT PARKING FOR BUMPER OVERHANGS.
- 5 CANOPY ABOVE ENTRYWAY SHOWN DASHED.
- 6 30'X30' VISION CLEARANCE TRIANGLE.

**VICINITY MAP** N.T.S.



**PROJECT STATS:**

PROPOSED USE: NEW 6,996 SF OUTPATIENT CLINIC BUILDING  
 EXISTING USE: NONE  
 SITE AREA: -27,571 SF, 0.63 AC.  
 PARCEL NUMBERS: -02502E - 22E30BD - 2501  
 GOVERNING AGENCY: CITY OF WEST Linn  
 NEIGHBORHOOD: -BOLTON NEIGHBORHOOD  
 ZONE: -OFFICE BUSINESS CENTER (OBC)  
 COMP. PLAN: -GENERAL COMMERCIAL

**PROPOSED LOT COVERAGE:**

SITE TOTAL:	27,571 SF	100%
BUILDING:	6,996 SF	25.4%
PARKING:	10,100 SF	36.6%
PEDESTRIAN:	2,266 SF	8.2%
LANDSCAPE:	7,758 SF	28.1%
SITE STRUCT.:	451 SF	1.7%

**PARKING:**

PARKING REQUIRED:  
 WLCDC 46.090  
 COMMERCIAL USES:  
 MEDICAL/DENTAL CLINICS  
 6996 SF / 250  
 TOTAL  
 28 SPACES  
 (-3: TRANSIT PROXIMITY)  
 25 SPACES  
 NET:  
 A.D.A. STALLS REQ'D:  
 WLCDC 46.150 - B  
 1 ADA - (1 VAN)  
 LOADING ZONE REQUIRED:  
 WLCDC CH 46 <10,000SF.  
 NONE REQ'D.  
 PARKING PROVIDED:  
 UPPER PARKING:  
 4 - COMPACT  
 5 - STANDARD  
 2 - ADA (1 VAN)  
 LOWER PARKING:  
 9 - COMPACT  
 7 - STANDARD  
 TOTAL:  
 26 SPACES  
 BICYCLE PARKING REQUIRED:  
 WLCDC 46.150 - D  
 6996 SF / 2,000  
 25% COVERED  
 1 / 2,000 GR. SF.  
 = 4 SPACES  
 = 1 SPACES  
 BICYCLE PARKING PROVIDED:  
 UPPER PARKING:  
 4 - COMPACT  
 5 - STANDARD  
 2 - ADA (1 VAN)

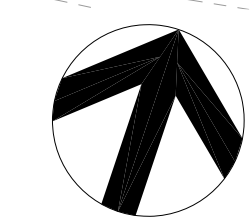
**1 STORY 6,996SF  
 OUTPATIENT  
 CLINIC BUILDING**

**WASTE/  
 RECYCLE**

**BURNS STREET**

**HOOD STREET**

**BURNS STREET**



**1 SITE PLAN**  
 SCALE: 1" = 10'-0"



PRELIMINARY  
 NOT FOR  
 CONSTRUCTION

**lenity**  
 architecture, inc.  
 3150 Kettle Court SE, Salem, Oregon 97301  
 P 503.399.1050 F 503.399.0365 W lenityarchitecture.com

**EMMETT PHAIR**  
 CONSTRUCTION  
 6305 SW ROSEWOOD ST. SUITE E,  
 LAKE OSWEGO, OR 97035  
 phone: 503-572-8606

**NEW BUILDING  
 FOR ADVANCE DENTAL  
 ARTS CENTER**  
 1575 BURNS ST., WEST LINN, OR 97068

**SITE  
 PLAN**

DATE  
 2/14/2020

REVISED DATE

SHEET

A1.1

DESIGN REVIEW SET



PRELIMINARY  
NOT FOR  
CONSTRUCTION

**lenity**  
architecture, inc.  
735 N. Kenton, Oregon 97031  
503-555-0565  
503-399-1090

**EMMETT PHAIR**  
CONSTRUCTION  
6305 SW ROSEWOOD ST. SUITE E,  
LAKE OSWEGO, OR. 97035  
phone: 503-572-8806

NEW BUILDING  
FOR ADVANCE DENTAL  
ARTS CENTER  
1575 BURNS ST., WEST LINN, OR 97068

EXTERIOR  
BUILDING  
ELEVATIONS

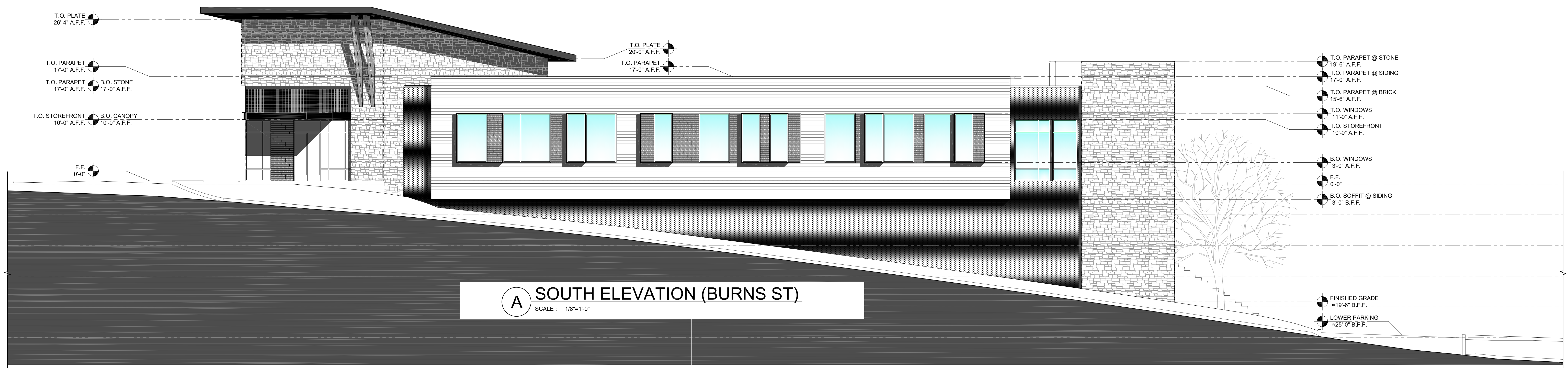
DATE  
2/14/2020

REVISED DATE

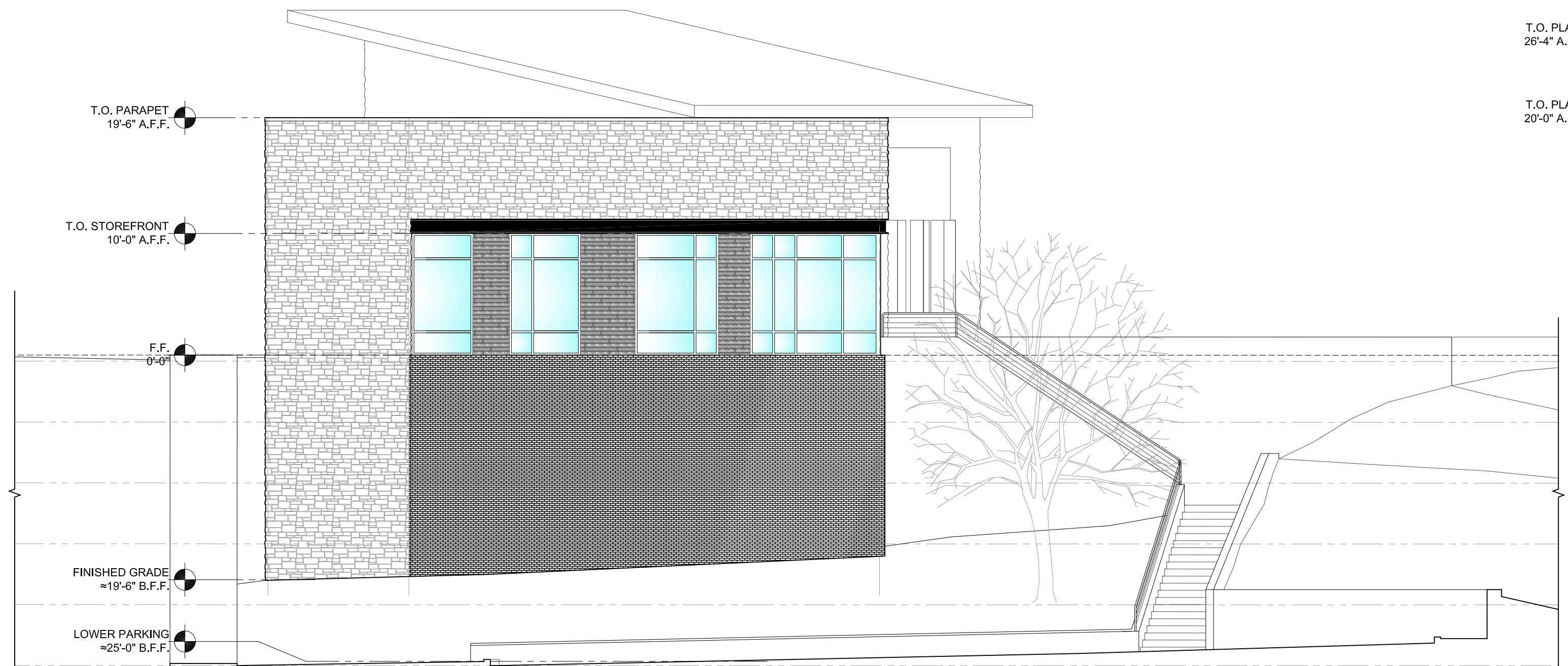
SHEET

A6.1

DESIGN REVIEW SET



**A SOUTH ELEVATION (BURNS ST)**  
SCALE: 1/8"=1'-0"



**B EAST ELEVATION (BURNS ST)**  
SCALE: 1/8"=1'-0"

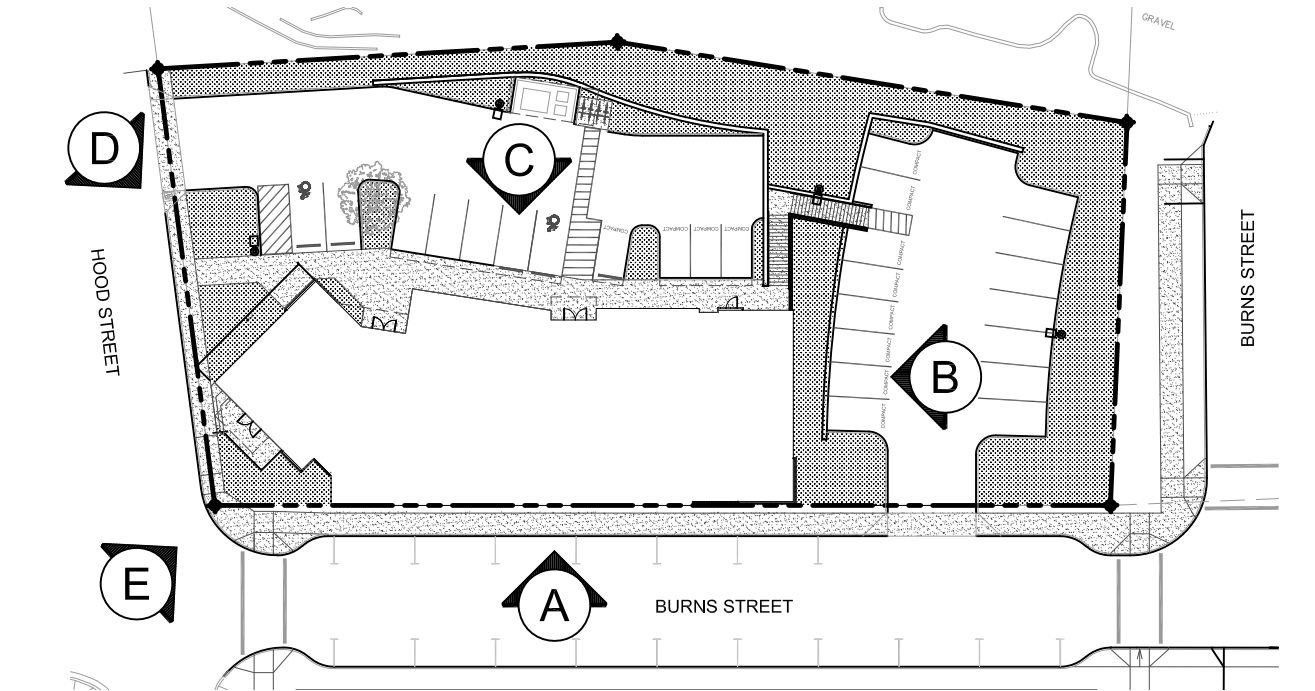


**D NW ELEVATION (HOOD ST)**  
SCALE: 1/8"=1'-0"

**E SW ELEVATION (CORNER)**  
SCALE: 1/8"=1'-0"

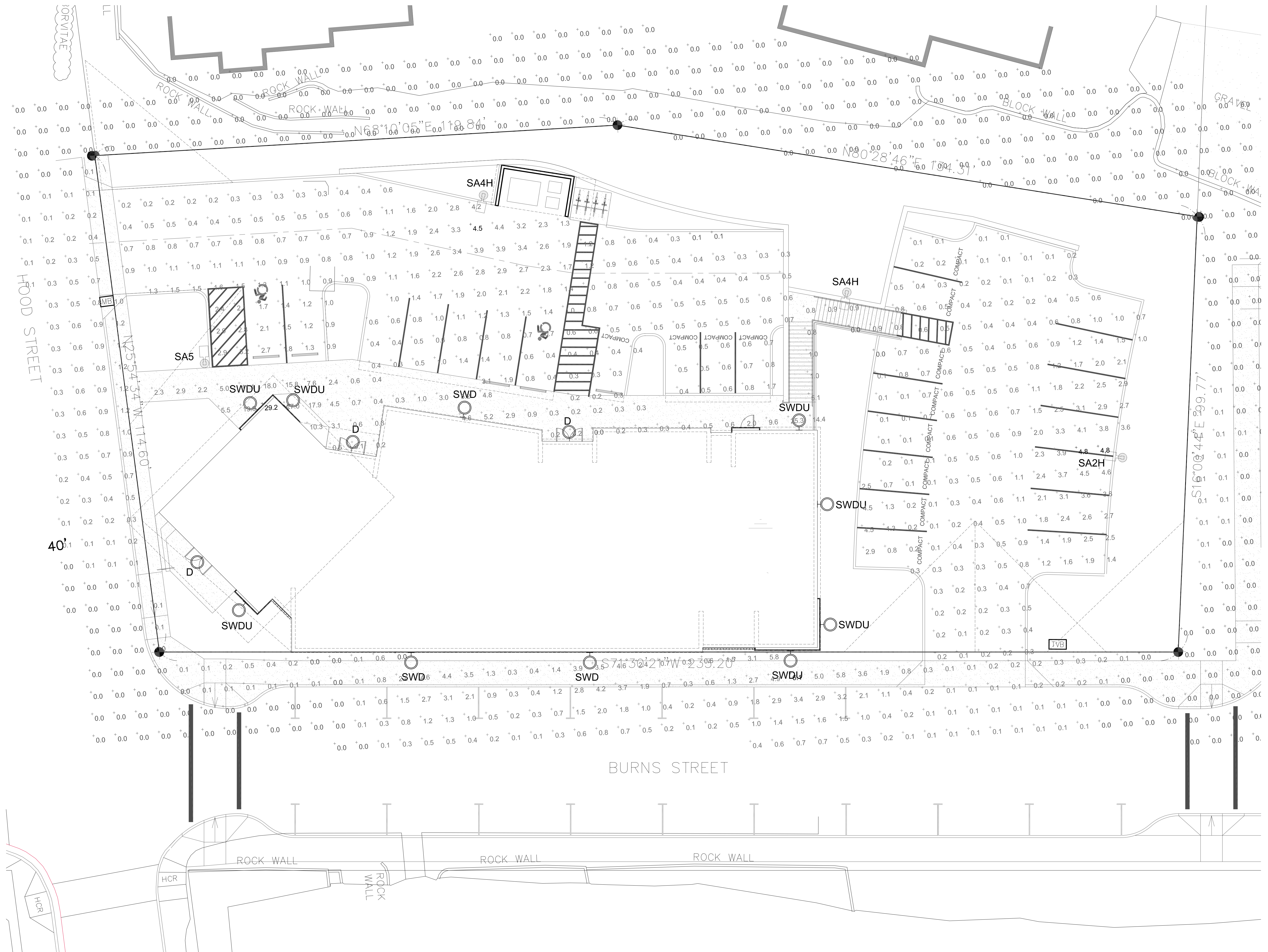


**C NORTH ELEVATION (PARKING LOT)**  
SCALE: 1/8"=1'-0"



KEY PLAN  
NTS





PRELIMINARY  
NOT FOR  
CONSTRUCTION

**lenity**  
architecture, inc.

3150 Kettle Court, SE, Salem, Oregon 97301  
#503.399.1050 #503.399.0365 lenityarchitecture.com

**EMMETT PHAIR**  
CONSTRUCTION

6305 SW ROSEWOOD ST., SUITE E,  
LAKE OSWEGO, OR, 97035  
phone: 503-572-8606

NEW BUILDING  
FOR ADVANCED DENTAL  
ARTS CENTER

1575 BURNS ST., WEST LINN, OR 97068

**ELECTRICAL SITE  
PLAN**

DATE  
2/14/2020

REVISED DATE

SHEET

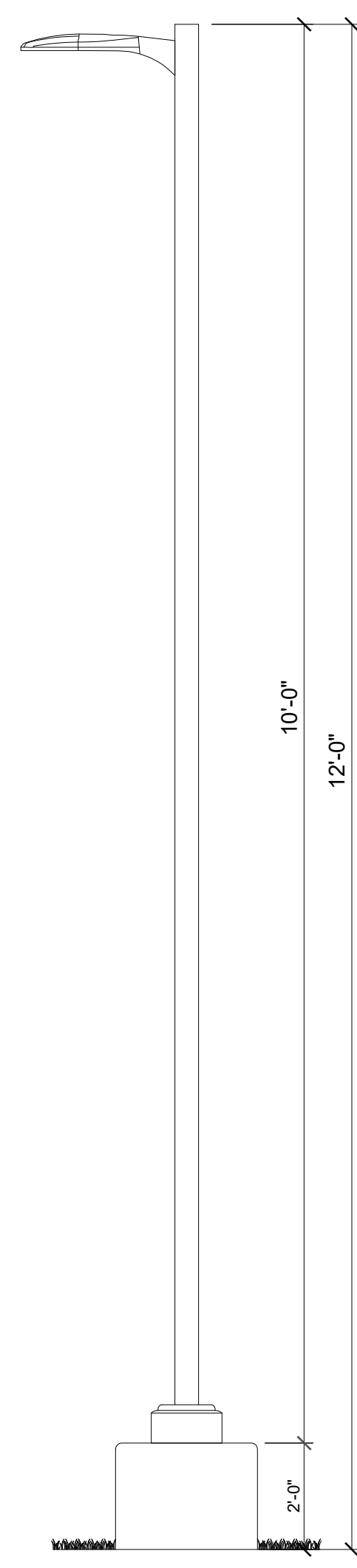
E1.1

DESIGN REVIEW SET

©2016 Lenity Architecture

www.20170209.4:57 PM edsmw plk02120200.1:34 PM edsmw wadl Bldg:30m wgn041575 Burns st - new dental site lighting





**TYPE SA\_**  
**PARKING LOT**  
**LED LIGHT POLE**

LUMINAIRE SCHEDULE			
TYPE	DESCRIPTION	LAMP	MANUFACTURE
D	CATEGORY: 7' SURFACE DOWNLIGHT HOUSING: ALUMINUM LENS/REFL: WAVESTREAM POLYMER BALLAST: ELECTRONIC VOLTAGE: 120 WATTAGE: 13 LISTING/STND: UL, L70/50,000 FINISH: WHITE MISC:	TYPE: LED QUANTITY: 3000 CCT (K): 80 CRI: 80 LUMENS: 1200 MISC: L70/50,000 LIFE:	JUNO LIGHTING JSF-7IN10LM-30K-90CRI-MVOLT-ZT-WH
SA2H	CATEGORY: LED SITE AREA LUMINAIRE, 10' POLE HOUSING: 26"x13"x7" (LxWxH) CAST ALUMINUM LENS/REFL: TYPE 2 MEDIUM BALLAST: ELECTRONIC VOLTAGE: MVOLT WATTAGE: 49 LISTING/STND: IP66 FINISH: BRONZE MISC: PROVIDE HOUSE SIDE SHIELD	TYPE: LED QUANTITY: 3000 CCT (K): 70 CRI: 70 LUMENS: 5,593 MISC: BUG - 101 LIFE: L85/100,000	LITHONIA LIGHTING DSXO LED-P230K-T2M-MVOLT-PIR -HS-DDBXD
SA4H	CATEGORY: LED SITE AREA LUMINAIRE, 10' POLE HOUSING: 26"x13"x7" (LxWxH) CAST ALUMINUM LENS/REFL: TYPE 4 MEDIUM BALLAST: ELECTRONIC VOLTAGE: MVOLT WATTAGE: 49 LISTING/STND: IP66 FINISH: BRONZE MISC: PROVIDE HOUSE SIDE SHIELD	TYPE: LED QUANTITY: 3000 CCT (K): 70 CRI: 70 LUMENS: 5,458 MISC: BUG - 102 LIFE: L85/100,000	LITHONIA LIGHTING DSXO LED-P230K-T4M-MVOLT-PIR -HS-DDBXD
SA5	CATEGORY: LED SITE AREA LUMINAIRE, 10' POLE HOUSING: 26"x13"x7" (LxWxH) CAST ALUMINUM LENS/REFL: TYPE 5 MEDIUM BALLAST: ELECTRONIC VOLTAGE: MVOLT WATTAGE: 49 LISTING/STND: IP66 FINISH: BRONZE MISC: PROVIDE HOUSE SIDE SHIELD	TYPE: LED QUANTITY: 3000 CCT (K): 70 CRI: 70 LUMENS: 5,789 MISC: BUG - 301 LIFE: L85/100,000	LITHONIA LIGHTING DSXO LED-P230K-T5M-MVOLT-PIR -HS-DDBXD
SWD	CATEGORY: WALL MOUNTED LED HOUSING: (4.5"x4.5"x7.125") ALUMINUM LENS/REFL: 33-DEGREE DOWNLIGHT FLOOD BALLAST: ELECTRONIC VOLTAGE: MVOLT WATTAGE: 25 LISTING/STND: IP65 FINISH: BRONZE MISC:	TYPE: LED QUANTITY: 3000 CCT (K): 85 CRI: 85 LUMENS: 2390 MISC: L70/60,000 LIFE:	WAC LIGHTING DC-WS05-F-830S-BZ
SWDU	CATEGORY: WALL MOUNTED LED HOUSING: (5.5"x5.5"x18") ALUMINUM LENS/REFL: 38-DEGREE UP/DOWN FLOOD BALLAST: ELECTRONIC VOLTAGE: MVOLT WATTAGE: 35 LISTING/STND: IP65 FINISH: BRONZE MISC:	TYPE: LED QUANTITY: 3000 CCT (K): 85 CRI: 85 LUMENS: 7090 MISC: L70/60,000 LIFE:	WAC LIGHTING DC-WD06-F-830S-BZ

PRELIMINARY  
 NOT FOR  
 CONSTRUCTION

**lenity**  
 architecture, inc.  
 2150 Kettle Court SE, Salem, Oregon 97301  
 phone: 503.399.0565 lenityarchitecture.com

**EMMETT PHAIR**  
 C O N S T R U C T I O N  
 6305 SW ROSEWOOD ST., SUITE E,  
 LAKE OSWEGO, OR 97035  
 phone: 503-572-8606

NEW BUILDING  
 FOR ADVANCE DENTAL  
 ARTS CENTER  
 1575 BURNS ST., WEST LINN, OR 97068

©2021 Lenity Architecture, Inc.  
**LUMINAIRE SCHEDULE**  
**& DETAIL SCHEDULE**

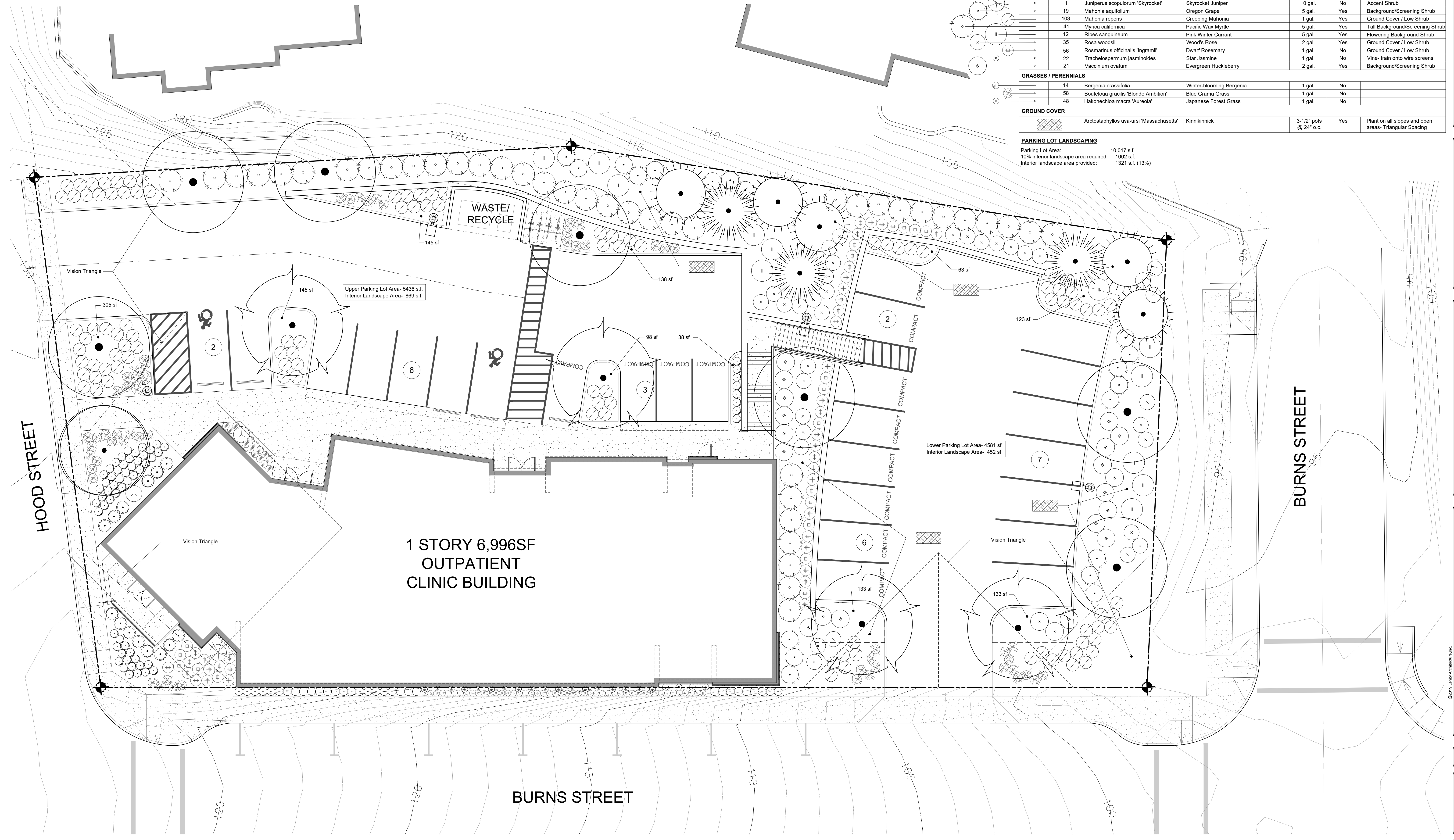
DATE  
 2/14/2020  
 REVISED DATE  
 SHEET  
**E1.2**  
 DESIGN REVIEW SET



- Notes-
- Soil Preparation for all building area planting beds (per 1000 s.f.):  
5 cu. yds. organic compost free of biosolids & harmful pathogens  
100 lbs. Gro-Power Plus w/M (mycorrhizae)  
Spread evenly and rototill into soil in two directions to a depth of 8"  
Do not disturb slopes (no soil preparation)
  - Backfill mixture for trees and shrubs (per cu. yd.):  
2/3 site soil  
1/3 organic compost free of biosolids & harmful pathogens  
10 lbs. Gro-Power 12-8-8 Controlled Release fertilizer  
3 lbs. Gro-Power Gro-Life granular fertilizer
  - All shrub/ground cover beds to receive a 2" layer of bark mulch, submit samples to Owner for selection.
  - All landscape areas shall be irrigated with a permanent automated irrigation system utilizing SMART Technology. Landscape Contractor shall submit a Design/Build Irrigation Plan and bid to Owner for approval. Provide additional irrigation bubblers or drip emitter assemblies for all trees.

PLANTING SCHEDULE						
SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	NATIVE	REMARKS
<b>TREES</b> Note-some tree symbols are reduced in scale in Planting Schedule						
→	4	<i>Cercis canadensis</i>	Eastern Redbud	2" cal. B&B	No	Standard- branching @ 7 ft.
→	1	<i>Styrax obassia</i>	Fragrant Snowbell Tree	1-1/2" cal. B&B	No	Accent Tree- natural form
→	5	<i>Thuja plicata 'Fastigiata'</i>	Hogan Cedar	6-7 ft. B&B	Yes	Low-branching
→	3	<i>Tsuga heterophylla</i>	Western Hemlock	6-7 ft. B&B	Yes	Low-branching
→	7	<i>Zeikova serrata 'City Sprite'</i>	City Sprite Sawleaf Zeikova	2" cal. B&B	No	Standard- branching @ 7 ft.
<b>SHRUBS</b>						
→	2	<i>Camellia sasanqua 'Setsugekka'</i>	Setsugekka Camellia	5 gal.	No	Accent Shrub
→	61	<i>Erica vagans 'Mrs D.F. Maxwell'</i>	Mrs D.F. Maxwell Cornish Heath	1 gal.	No	Ground Cover / Low Shrub
→	14	<i>Hebe pinguifolia 'Sutherlandii'</i>	Sutherland's Hebe	2 gal.	No	Foundation Shrub
→	32	<i>Ilex crenata 'Helleri'</i>	Heller's Japanese Holly	2 gal.	No	Foundation Shrub
→	1	<i>Juniperus scopulorum 'Skyrocket'</i>	Skyrocket Juniper	10 gal.	No	Accent Shrub
→	19	<i>Mahonia aquifolium</i>	Oregon Grape	5 gal.	Yes	Background/Screening Shrub
→	103	<i>Mahonia repens</i>	Creeping Mahonia	1 gal.	Yes	Ground Cover / Low Shrub
→	41	<i>Myrica californica</i>	Pacific Wax Myrtle	5 gal.	Yes	Tall Background/Screening Shrub
→	12	<i>Ribes sanguineum</i>	Pink Winter Currant	5 gal.	Yes	Flowering Background Shrub
→	35	<i>Rosa woodii</i>	Wood's Rose	2 gal.	Yes	Ground Cover / Low Shrub
→	56	<i>Rosmarinus officinalis 'Ingramii'</i>	Dwarf Rosemary	1 gal.	No	Ground Cover / Low Shrub
→	22	<i>Trachelospermum jasminoides</i>	Star Jasmine	1 gal.	No	Vine- train onto wire screens
→	21	<i>Vaccinium ovatum</i>	Evergreen Huckleberry	2 gal.	Yes	Background/Screening Shrub
<b>GRASSES / PERENNIALS</b>						
→	14	<i>Bergenia crassifolia</i>	Winter-blooming Bergenia	1 gal.	No	
→	58	<i>Bouteloua gracilis 'Blonde Ambition'</i>	Blue Grama Grass	1 gal.	No	
→	48	<i>Hakonechloa macra 'Aureola'</i>	Japanese Forest Grass	1 gal.	No	
<b>GROUND COVER</b>						
→		<i>Arcostaphylos uva-ursi 'Massachusetts'</i>	Kinnikinnick	3-1/2" pots @ 24" o.c.	Yes	Plant on all slopes and open areas- Triangular Spacing

**PARKING LOT LANDSCAPING**  
 Parking Lot Area: 10,017 s.f.  
 10% interior landscape area required: 1002 s.f.  
 Interior landscape area provided: 1321 s.f. (13%)



PRELIMINARY  
NOT FOR  
CONSTRUCTION

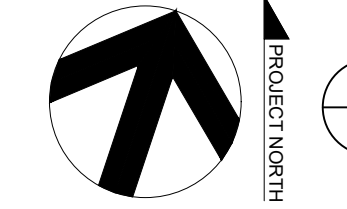
**lenity**  
 architecture, inc.  
 3150 Kettle Court SE, Salem, Oregon 97301  
 phone: 503.399.1050 lenityarchitecture.com

**EMMETT PHAIR**  
 CONSTRUCTION  
 6305 SW ROSEWOOD ST., SUITE E,  
 LAKE OSWEGO, OR 97035  
 phone: 503-572-8606

NEW BUILDING  
FOR ADVANCE DENTAL  
ARTS CENTER  
1575 BURNS ST., WEST LINN, OR 97068

**LANDSCAPE PLAN**

DATE: 2/14/2020  
 REVISED DATE:  
 SHEET: L1.1  
 DESIGN REVIEW SET



1 LANDSCAPE PLAN  
 SCALE: 1" = 10'





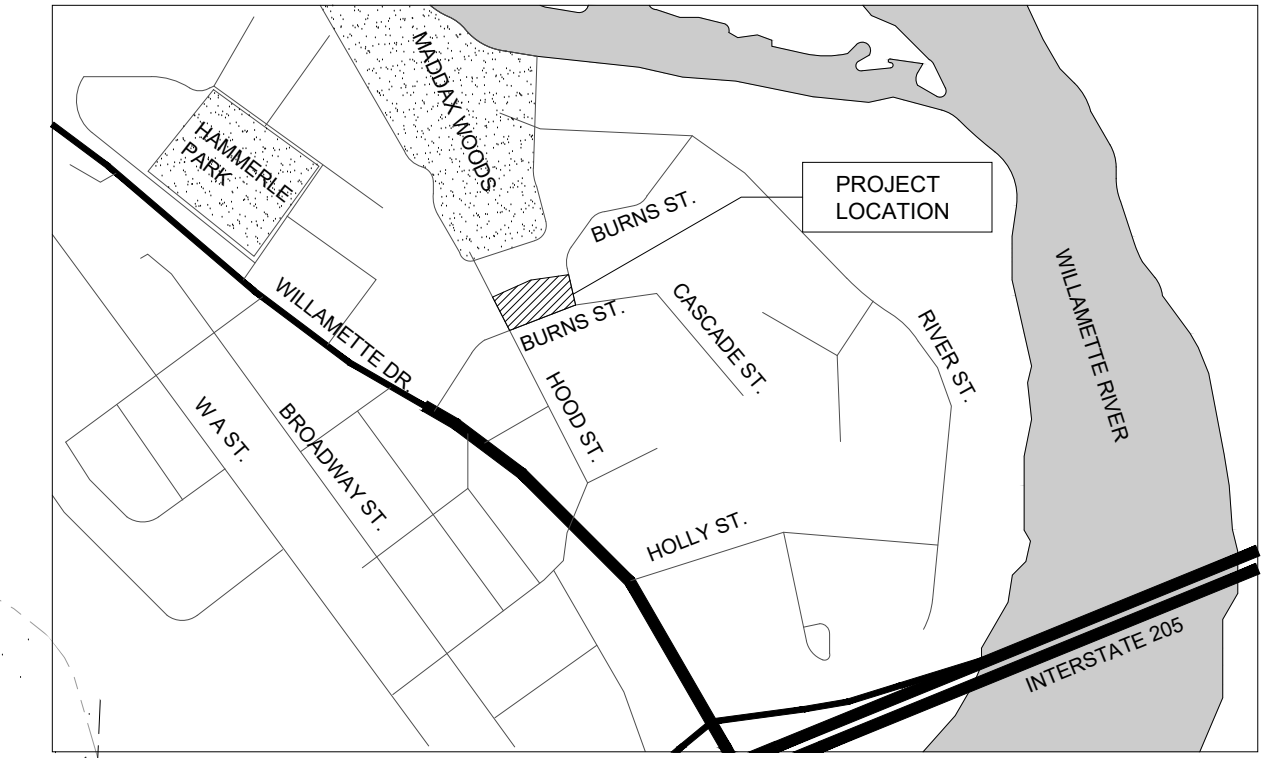
**SITE PLAN LEGEND**

- # = KEYNOTE TAG
- [Solid Line] = BUILDING FOOTPRINT
- [Dotted Pattern] = CONCRETE PAVING AREA
- [Stippled Pattern] = LANDSCAPED AREA
- [Lightning Bolt Symbol] = SITE LIGHTING LOCATION. SEE PHOTOMETRICS & ELEC. DRAWINGS.

**SITE PLAN KEYNOTES**

- 1 NEW BIKE RACK FOR 4 BIKES, 2 SPACES UNDER EXTENDED ROOF
- 2 COVERED BRICK-CLAD WASTE ENCLOSURE. EXTEND ROOF OVER BIKE PARKING.
- 3 SITE STAIR DOWN TO LOWER PARKING AREA
- 4 6' WIDE PEDESTRIAN CIRCULATION WALKWAY. ADDITIONAL 2' ADDED AT PARKING FOR BUMPER OVERHANGS.
- 5 CANOPY ABOVE ENTRYWAY SHOWN DASHED.
- 6 30'X30' VISION CLEARANCE TRIANGLE.
- 7 LITTER RECEPTACLE PER 55,100.0.6.c

**VICINITY MAP** N.T.S.



**PROJECT STATS:**

PROPOSED USE: -NEW 6,996 SF  
OUTPATIENT CLINIC BUILDING  
EXISTING USE: -NONE  
SITE AREA: -27,571 SF, 0.63 AC.  
PARCEL NUMBERS: -02802E -22E30BD -2501  
GOVERNING AGENCY: -CITY OF WEST LINN  
NEIGHBORHOOD: -BOLTON NEIGHBORHOOD  
ZONE: -OFFICE BUSINESS CENTER (OBC)  
COMP. PLAN: -GENERAL COMMERCIAL

**PROPOSED LOT COVERAGE:**

SITE TOTAL:	27,571 SF	100%
BUILDING:	6,996 SF	25.4%
PARKING:	10,100 SF	36.6%
PEDESTRIAN:	2,293 SF	8.3%
LANDSCAPE:	7,731 SF	28.0%
SITE STRUCT.:	451 SF	1.7%

**PARKING:**

PARKING REQUIRED:  
WLDCS 46.090  
COMMERCIAL USES:  
MEDICAL/DENTAL CLINICS 1/250SF  
6996 SF / 250 = 28 SPACES  
TOTAL = 28 SPACES

(-3 TRANSIT PROXIMITY)  
NET: = 25 SPACES  
A.D.A. STALLS REQ'D:  
WLDC 46.150-B = 1 ADA (1 VAN)  
LOADING ZONE REQUIRED:  
WLDC CH 46 <10,000SF. = NONE REQ'D.

PARKING PROVIDED:  
UPPER PARKING: 4 - COMPACT  
5 - STANDARD  
2 - ADA (1 VAN)  
LOWER PARKING: 8 - COMPACT  
7 - STANDARD  
TOTAL: 26 SPACES

BICYCLE PARKING REQUIRED:  
WLDC 46.150-D 1 / 2,000 GR. SF.  
6996 SF / 2,000 = 4 SPACES  
25% COVERED = 1 SPACES

BICYCLE PARKING PROVIDED:  
UPPER PARKING: 4 - COMPACT  
5 - STANDARD  
2 - ADA (1 VAN)



**1 STORY 6,838SF  
OUTPATIENT  
CLINIC BUILDING**

**BURNS STREET**

**HOOD STREET**

**BURNS STREET**

PRELIMINARY  
NOT FOR  
CONSTRUCTION

**Ienity**  
architecture, inc.  
3150 Ketta Court SE, Salem, Oregon 97301  
P: 503.399.1090 F: 503.399.0565  
www.ienityarchitecture.com

**EMMETT PHAIR**  
CONSTRUCTION  
6305 SW ROSEWOOD ST., SUITE E,  
LAKE OSWEGO, OR 97035  
phone: 503-572-8606

**NEW BUILDING  
FOR ADVANCE DENTAL  
ARTS CENTER**  
1575 BURNS ST., WEST LINN, OR 97068

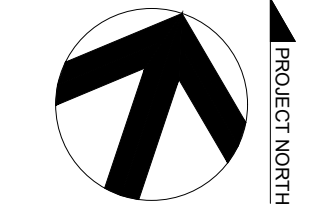
**SITE  
PLAN**

DATE  
2/14/2020

REVISED DATE  
4/28/2020

SHEET  
A1.1

DESIGN REVIEW SET



**1 SITE PLAN**  
SCALE: 1" = 10'-0"





PRELIMINARY  
NOT FOR  
CONSTRUCTION

**lenity**  
architecture, inc.  
3150 Kettle Court SE, Salem, Oregon 97301  
P: 503.399.1090 F: 503.399.0565 W: lenityarchitecture.com

**EMMETT PHAIR**  
CONSTRUCTION  
6305 SW ROSEWOOD ST., SUITE E,  
LAKE OSWEGO, OR 97035  
phone: 503-572-8606

NEW BUILDING  
FOR ADVANCE DENTAL  
ARTS CENTER  
1575 BURNS ST., WEST LINN, OR 97068

**FLOOR  
PLAN**

DATE  
2/14/2020  
REVISED DATE  
4/28/2020  
SHEET  
A3.1

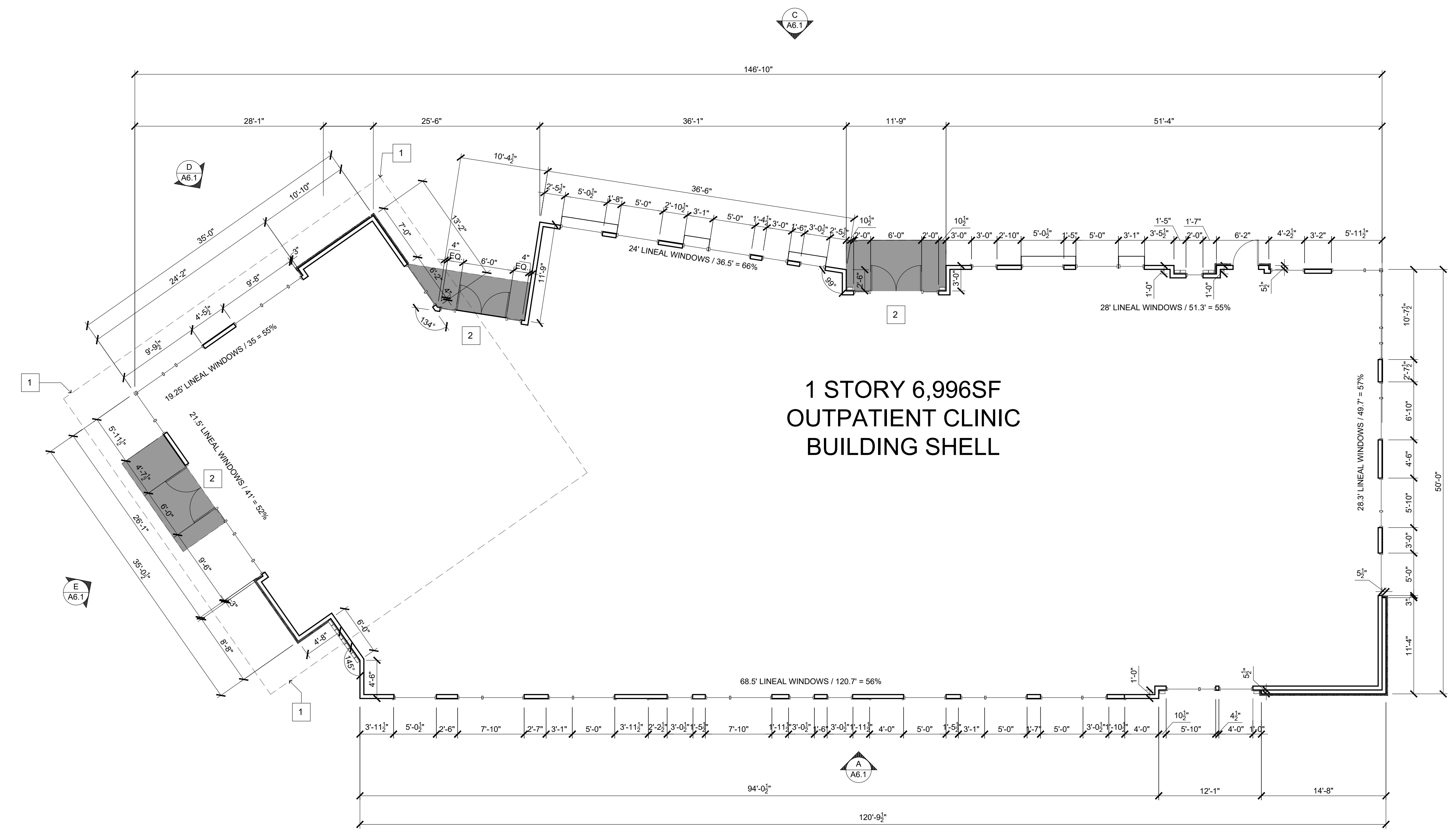
DESIGN REVIEW SET

FLOOR PLAN KEYNOTES:

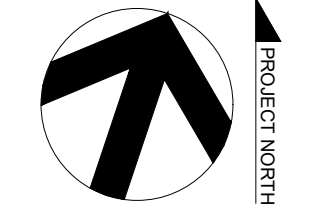
- 1 LINE OF ROOF OVERHANG ABOVE
- 2 PRIMARY BUILDING ENTRANCE

FLOOR PLAN LEGEND

- 1 KEYNOTE TAG
- X A6.1 ELEVATION TAG
- MASONRY VENEER WALL
- NEW CONSTRUCTION
- AREA UNDER CANOPY



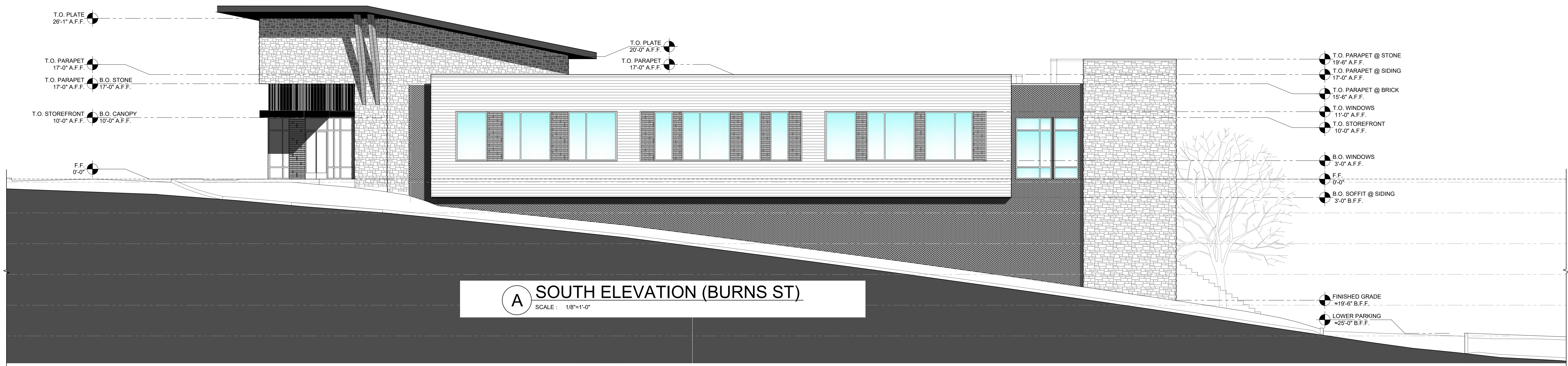
1 STORY 6,996SF  
OUTPATIENT CLINIC  
BUILDING SHELL



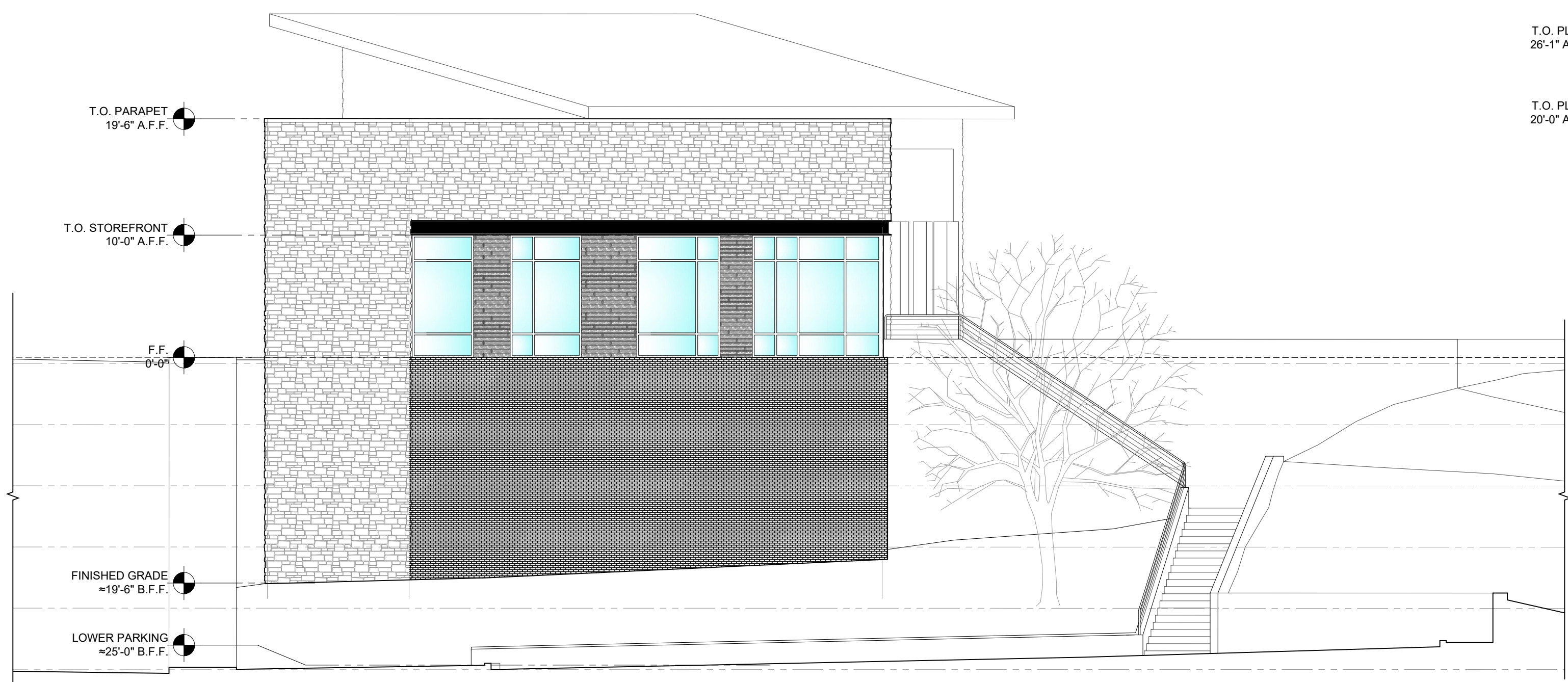
1 FLOOR PLAN  
SCALE: 1/8" = 1'-0"



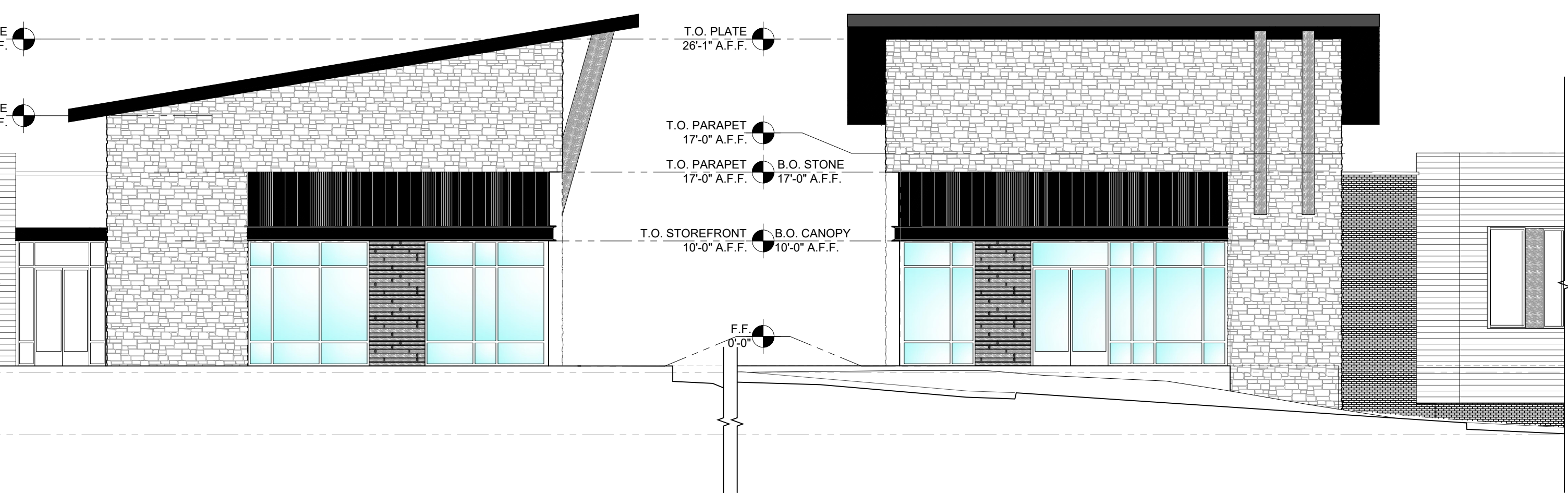




**A SOUTH ELEVATION (BURNS ST)**  
SCALE: 1/8"=1'-0"



**B EAST ELEVATION (BURNS ST)**  
SCALE: 1/8"=1'-0"



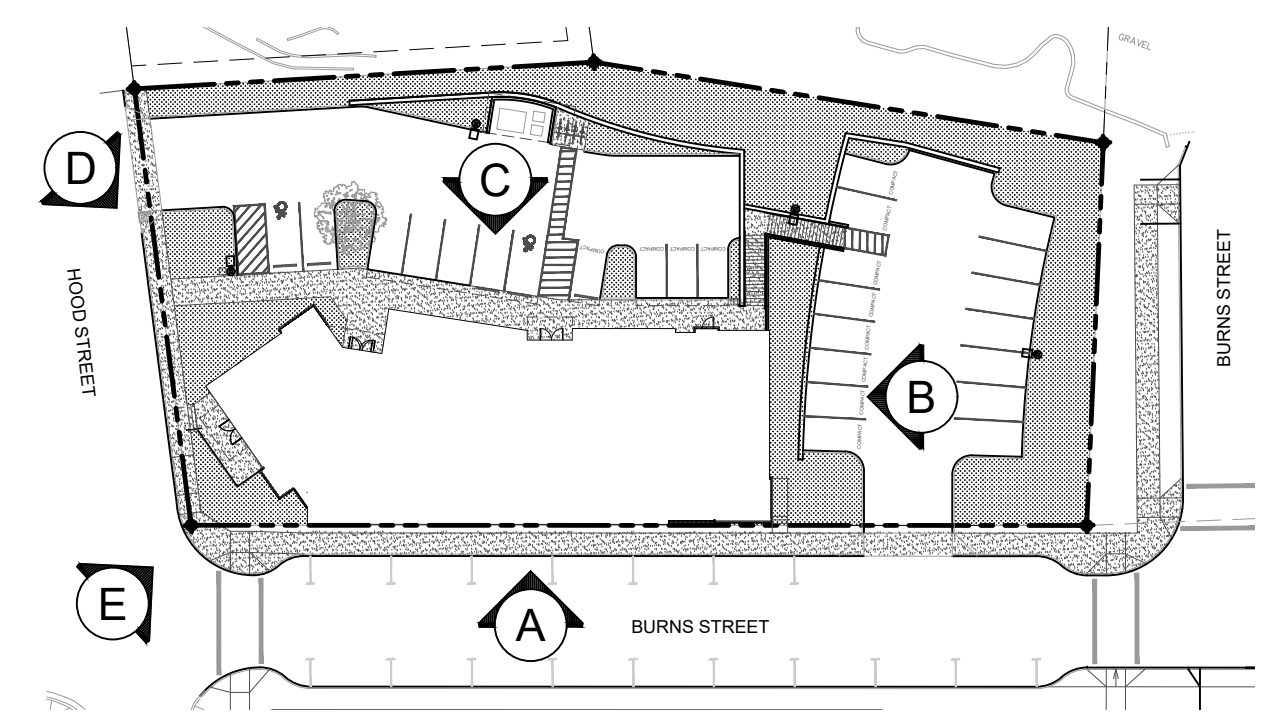
**D NW ELEVATION (HOOD ST)**  
SCALE: 1/8"=1'-0"



**E SW ELEVATION (CORNER)**  
SCALE: 1/8"=1'-0"



**C NORTH ELEVATION (PARKING LOT)**  
SCALE: 1/8"=1'-0"



**KEY PLAN**  
NTS

**LEGEND (SEE COLOR BOARD)**

	STONE VENEER SIDING
	BRICK VENEER SIDING
	JAMES HARDIE PAINTED LAP SIDING
	ALLURA WOOD LOOK LAP SIDING
	MORIN METAL PANELS

PRELIMINARY  
NOT FOR  
CONSTRUCTION

**lenity**  
architecture, inc.  
3150 Kettle Court SE, Salem, Oregon 97301  
#503.399.1050 #503.399.0565 #lenityarchitecture.com

**EMMETT PHAIR**  
CONSTRUCTION  
6305 SW ROSEWOOD ST., SUITE E,  
LAKE OSWEGO, OR 97035  
phone: 503-572-8606

NEW BUILDING  
FOR ADVANCE DENTAL  
ARTS CENTER  
1575 BURNS ST., WEST LINN, OR 97068

EXTERIOR  
BUILDING  
ELEVATIONS

DATE  
2/14/2020  
REVISED DATE  
4/28/2020  
**SHEET**  
**A6.1**

DESIGN REVIEW SET

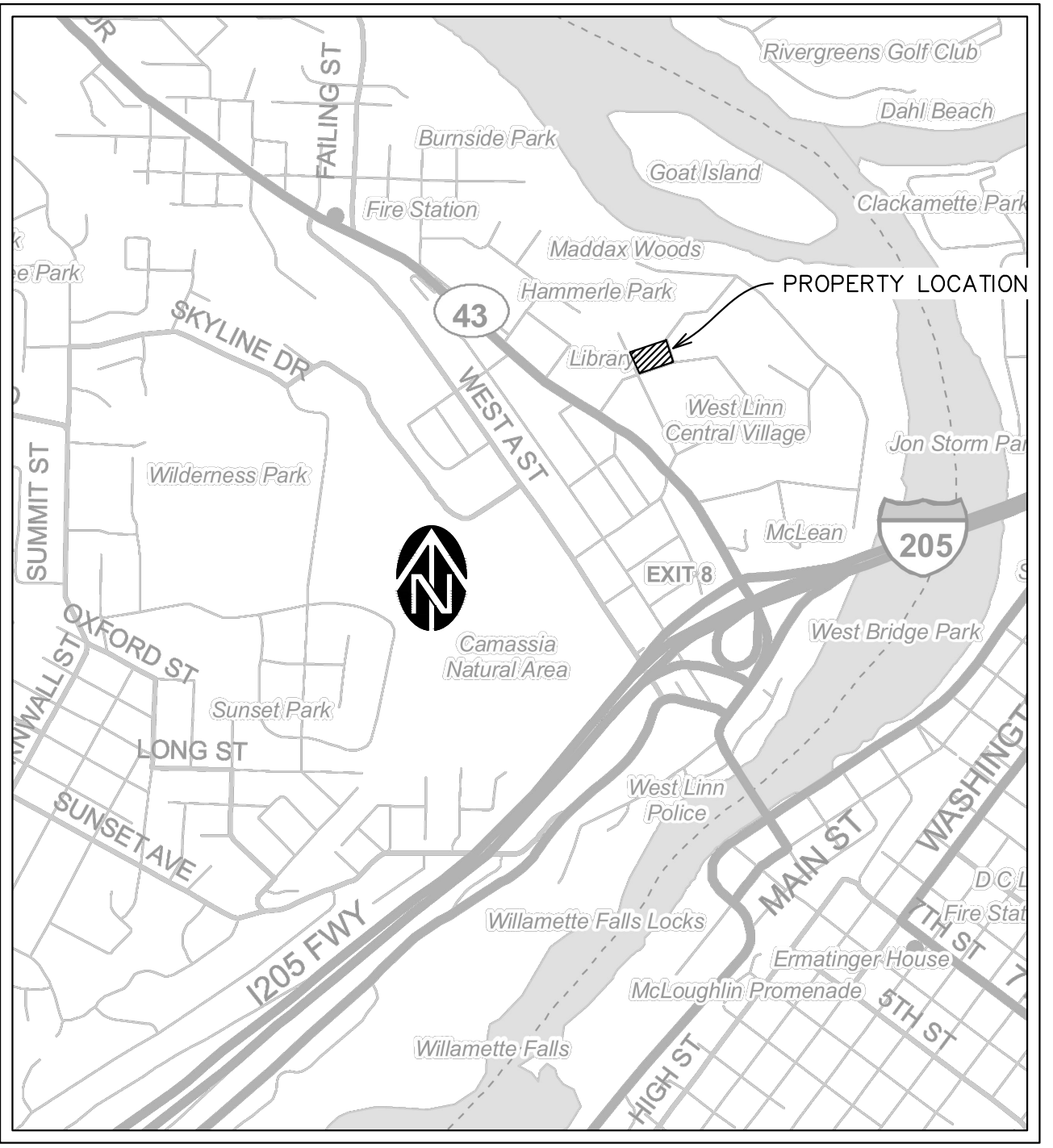
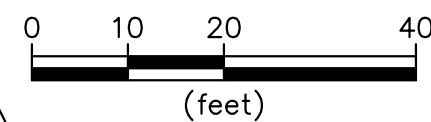
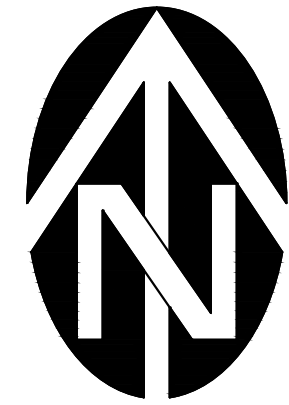


**LEGEND**

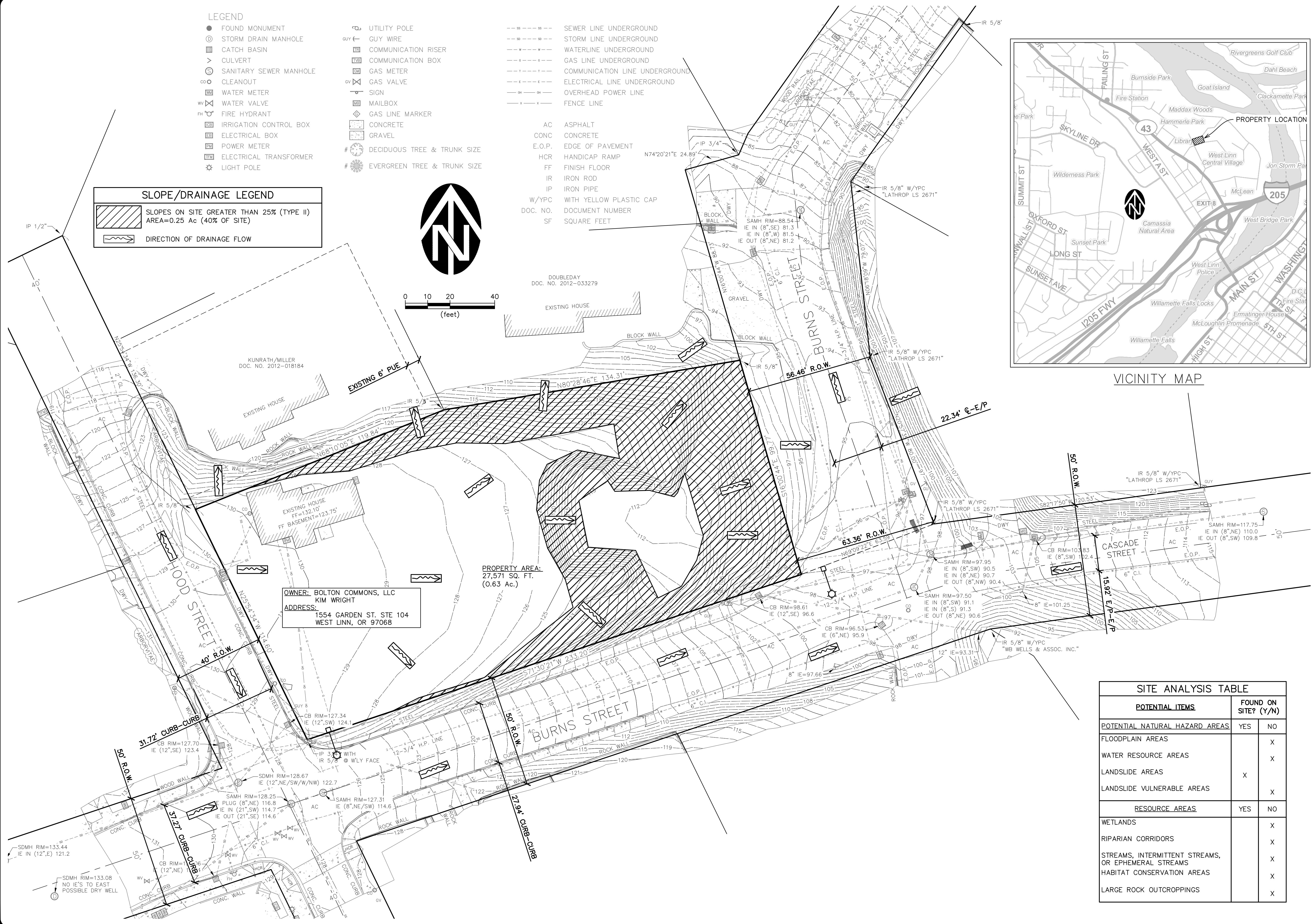
- FOUND MONUMENT
- ⊙ STORM DRAIN MANHOLE
- ▣ CATCH BASIN
- > CULVERT
- ⊙ SANITARY SEWER MANHOLE
- ∞ CLEANOUT
- ⊙ WATER METER
- wv WATER VALVE
- ⊙ FIRE HYDRANT
- ⊙ IRRIGATION CONTROL BOX
- ⊙ ELECTRICAL BOX
- ⊙ POWER METER
- ⊙ ELECTRICAL TRANSFORMER
- ☆ LIGHT POLE
- ⊙ UTILITY POLE
- GUY WIRE
- ⊙ COMMUNICATION RISER
- ⊙ COMMUNICATION BOX
- ⊙ GAS METER
- ⊙ GAS VALVE
- ⊙ SIGN
- ⊙ MAILBOX
- ⊙ GAS LINE MARKER
- ⊙ CONCRETE
- ⊙ GRAVEL
- # DECIDUOUS TREE & TRUNK SIZE
- # EVERGREEN TREE & TRUNK SIZE
- SEWER LINE UNDERGROUND
- STORM LINE UNDERGROUND
- WATERLINE UNDERGROUND
- GAS LINE UNDERGROUND
- COMMUNICATION LINE UNDERGROUND
- ELECTRICAL LINE UNDERGROUND
- OVERHEAD POWER LINE
- FENCE LINE
- AC ASPHALT
- CONC CONCRETE
- E.O.P. EDGE OF PAVEMENT
- HCR HANDICAP RAMP
- FF FINISH FLOOR
- IR IRON ROD
- IP IRON PIPE
- W/YPC WITH YELLOW PLASTIC CAP
- DOC. NO. DOCUMENT NUMBER
- SF SQUARE FEET

**SLOPE/DRAINAGE LEGEND**

- SLOPES ON SITE GREATER THAN 25% (TYPE II)  
AREA=0.25 Ac (40% OF SITE)
- DIRECTION OF DRAINAGE FLOW



VICINITY MAP



**OWNER:** BOLTON COMMONS, LLC  
**KIM WRIGHT**  
**ADDRESS:**  
 1554 GARDEN ST. STE 104  
 WEST LINN, OR 97068

**PROPERTY AREA:**  
 27,571 SQ. FT.  
 (0.63 Ac.)

SITE ANALYSIS TABLE		
POTENTIAL ITEMS	FOUND ON SITE? (Y/N)	
	YES	NO
<b>POTENTIAL NATURAL HAZARD AREAS</b>		
FLOODPLAIN AREAS		X
WATER RESOURCE AREAS		X
LANDSLIDE AREAS	X	
LANDSLIDE VULNERABLE AREAS		X
<b>RESOURCE AREAS</b>	YES	NO
WETLANDS		X
RIPARIAN CORRIDORS		X
STREAMS, INTERMITTENT STREAMS, OR EPHEMERAL STREAMS		X
HABITAT CONSERVATION AREAS		X
LARGE ROCK OUTCROPPINGS		X

VERIFY SCALE  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
 IF NOT ONE INCH ON SCALES ACCURACIES

DSN. JW  
 DRN. RS  
 CKD. JW

NO. 1  
 DATE  
 DATE: 05/20/2020

DESCRIPTION  
 REVISIONS

**WESTECH ENGINEERING, INC.**  
 CONSULTING ENGINEERS AND PLANNERS

3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 585-2474 Fax: (503) 585-3966  
 E-mail: westech@westech-eng.com

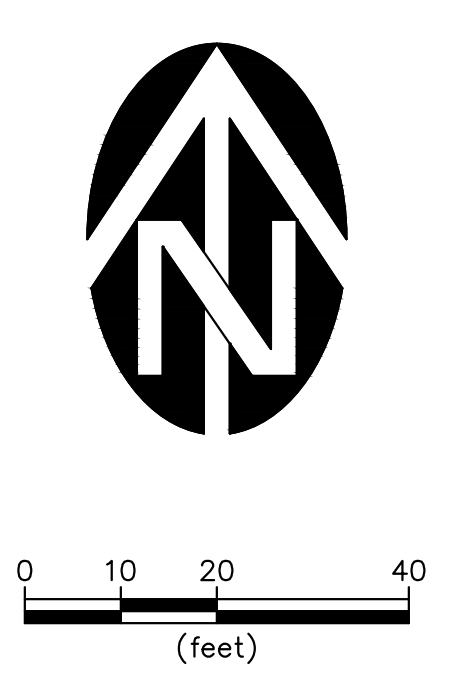
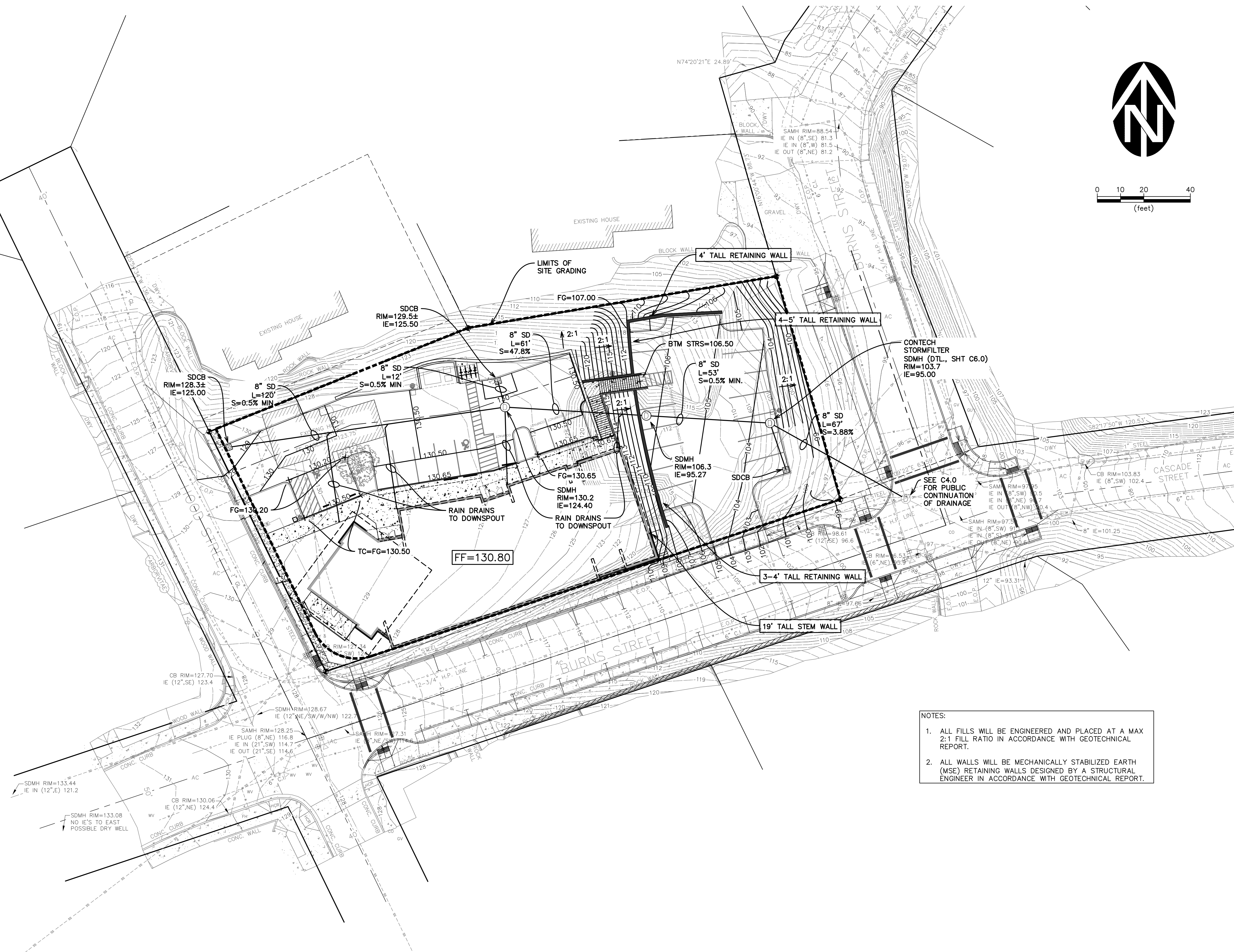
LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS

SITE ANALYSIS PLAN

DRAWING  
**C1.0**

JOB NUMBER  
**3132.0000.0**





- NOTES:
1. ALL FILLS WILL BE ENGINEERED AND PLACED AT A MAX 2:1 FILL RATIO IN ACCORDANCE WITH GEOTECHNICAL REPORT.
  2. ALL WALLS WILL BE MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS DESIGNED BY A STRUCTURAL ENGINEER IN ACCORDANCE WITH GEOTECHNICAL REPORT.

NO.	DATE	DESCRIPTION	BY
1			

VERIFY SCALE  
 1" = 40'  
 0 10 20 40  
 (feet)

DSN. JW  
 DRN. RS  
 CKD. JW  
 DATE: 05/20/20

REVIEW  
 WILLIAM J. WELLS  
 REGISTERED PROFESSIONAL ENGINEER  
 OREGON REG. NO. 12345  
 REVIEWS: 6/20/2020

**WE**  
 WESTTECH ENGINEERING, INC.  
 CONSULTING ENGINEERS AND PLANNERS  
 3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 565-2474 Fax: (503) 565-3966  
 E-mail: westtech@westtech-eng.com

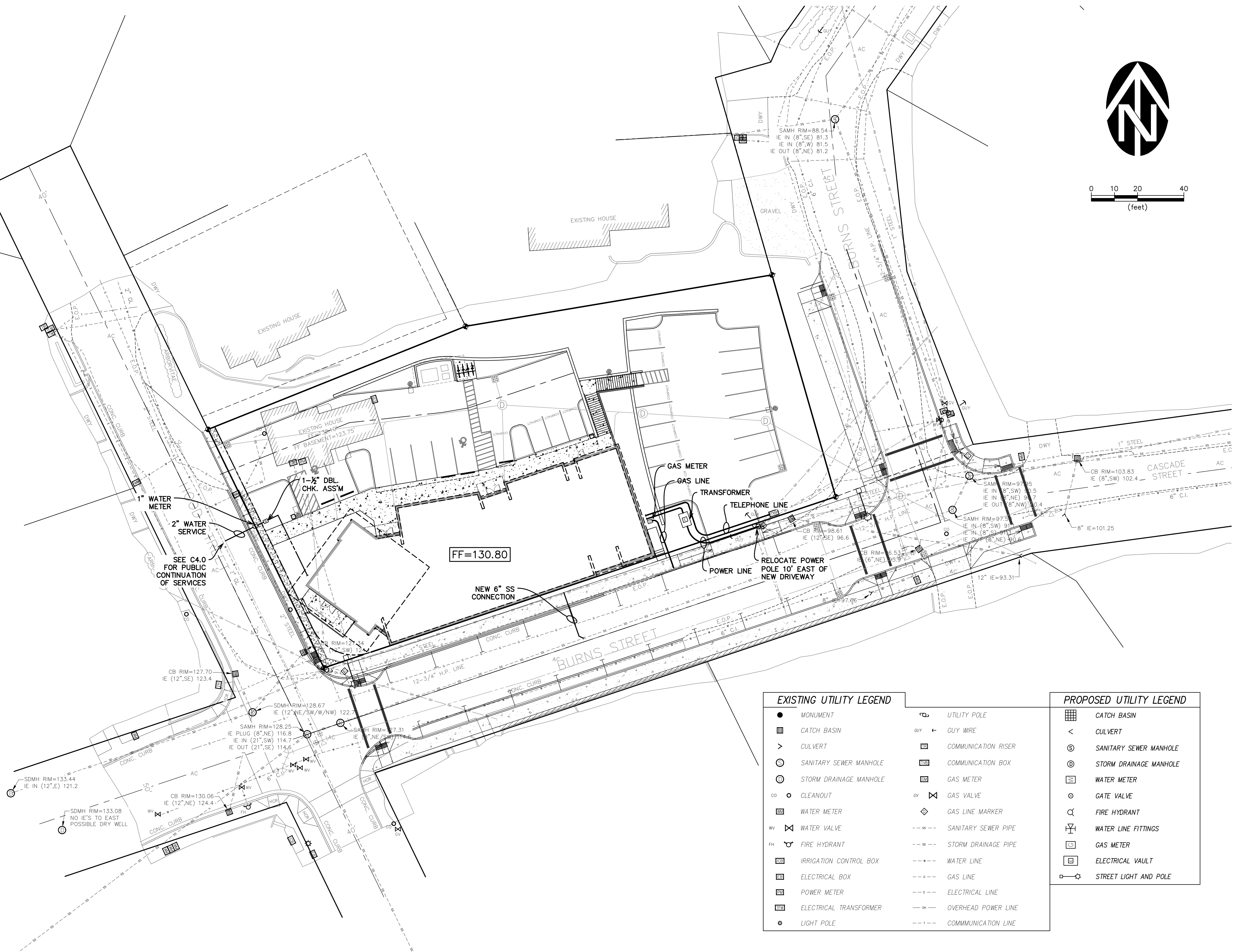
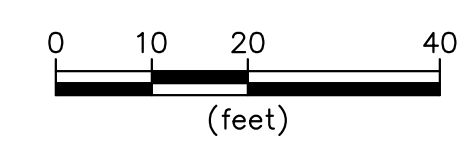
LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS

**PRELIMINARY GRADING & DRAINAGE PLAN**

DRAWING  
**C2.0**

JOB NUMBER  
**3132.0000.0**





**EXISTING UTILITY LEGEND**

- MONUMENT
- CATCH BASIN
- > CULVERT
- ⊙ SANITARY SEWER MANHOLE
- ⊙ STORM DRAINAGE MANHOLE
- ∞ ○ CLEANOUT
- ⊙ WATER METER
- wv ⊗ WATER VALVE
- ⊙ FIRE HYDRANT
- ⊙ IRRIGATION CONTROL BOX
- ⊙ ELECTRICAL BOX
- ⊙ POWER METER
- ⊙ ELECTRICAL TRANSFORMER
- ⊙ LIGHT POLE

- ⊙ UTILITY POLE
- guy ⊕ GUY WIRE
- ⊙ COMMUNICATION RISER
- ⊙ COMMUNICATION BOX
- ⊙ GAS METER
- gv ⊗ GAS VALVE
- ◇ GAS LINE MARKER
- - - - SANITARY SEWER PIPE
- - - - STORM DRAINAGE PIPE
- - - - WATER LINE
- - - - GAS LINE
- - - - ELECTRICAL LINE
- - - - OVERHEAD POWER LINE
- - - - COMMUNICATION LINE

**PROPOSED UTILITY LEGEND**

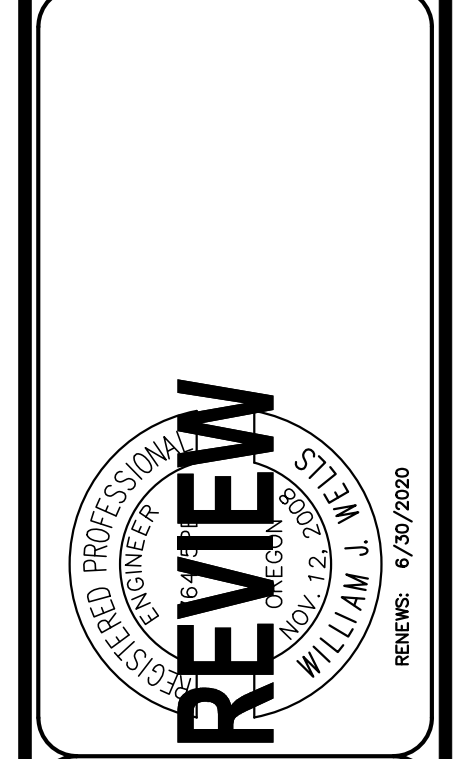
- ⊙ CATCH BASIN
- < CULVERT
- ⊙ SANITARY SEWER MANHOLE
- ⊙ STORM DRAINAGE MANHOLE
- ⊙ WATER METER
- ⊙ GATE VALVE
- ⊙ FIRE HYDRANT
- ⊙ WATER LINE FITTINGS
- ⊙ GAS METER
- ⊙ ELECTRICAL VAULT
- ⊙ STREET LIGHT AND POLE

NO.	DATE	DESCRIPTION	BY
1	05/20/2020		

VERIFY SCALE  
 SHALL BE ONE INCH ON ORIGINAL DRAWING  
 IF NOT ONE INCH ON SCALES ACCORDINGLY

0 1" = 40'

DSN. JW  
 DRN. RS  
 CKD. JW  
 DATE: 05/20/2020



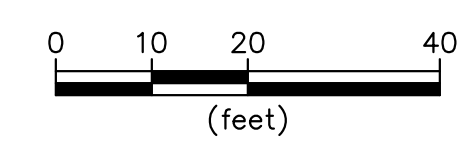
**WESTTECH ENGINEERING, INC.**  
 CONSULTING ENGINEERS AND PLANNERS

3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 585-2474 Fax: (503) 585-3966  
 E-mail: westtech@westtech-eng.com

LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS

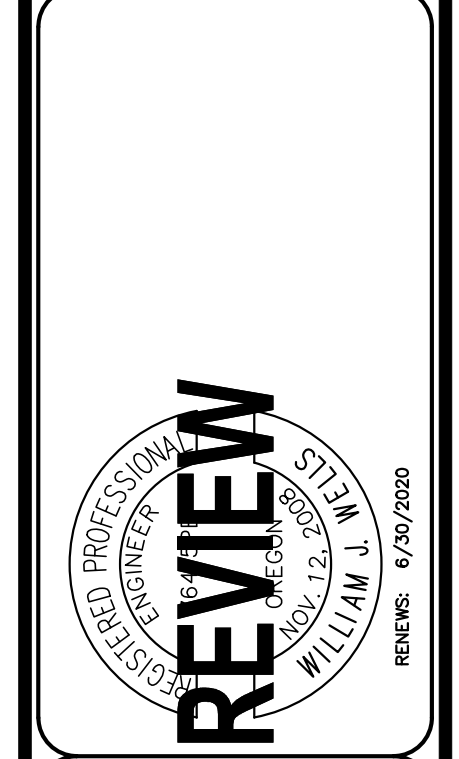
**UTILITY PLAN**

DRAWING  
**C3.0**  
 JOB NUMBER  
 3132.0000.0



PUBLIC UTILITY CALLOUT KEY	
①	RECONNECT EXISTING WATER SERVICES TO NEW WATER MAINS
②	ABANDON EXT'G WATER LINES AS SHOWN

VERIFY SCALE BASE IS ONE INCH ON ORIGINAL DRAWING IF NOT ONE INCH ON SCALES ACCURACELY	1"
DSN.	JW
DRN.	RS
CKD.	JW
DATE:	05/2020
NO.	1
DATE	
DESCRIPTION	
REVISIONS	
BY	



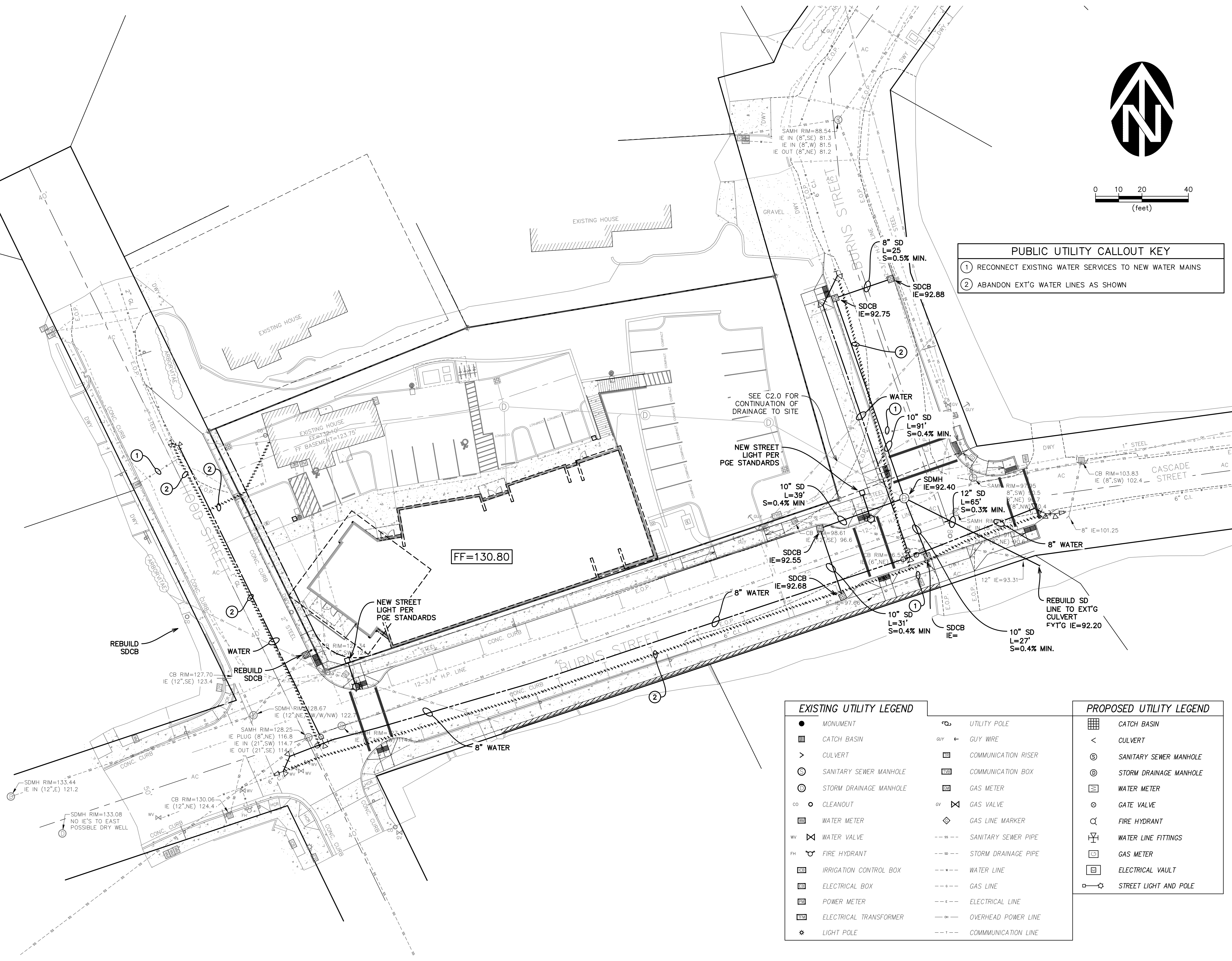
**WESTTECH ENGINEERING, INC.**  
CONSULTING ENGINEERS AND PLANNERS

3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
Phone: (503) 585-2474 Fax: (503) 585-3966  
E-mail: westtech@westtech-eng.com

LENITY ARCHITECTURE  
ADVANCE DENTAL ARTS

**PRELIMINARY PUBLIC UTILITY  
IMPROVEMENT PLAN**

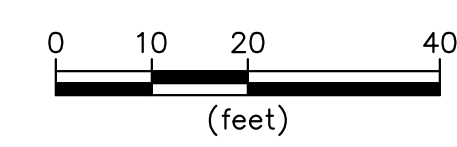
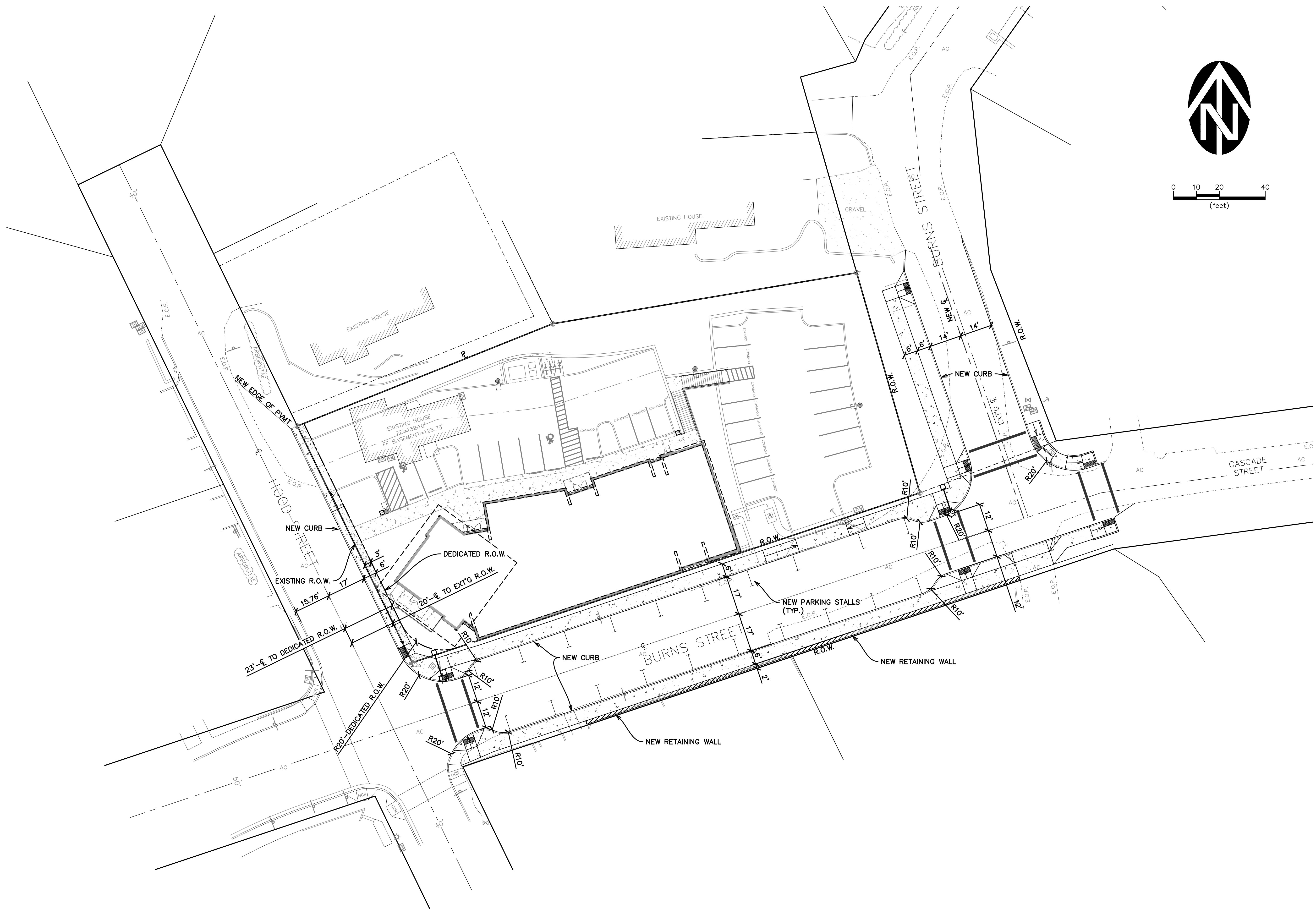
DRAWING  
**C4.0**  
JOB NUMBER  
3132.0000.0



EXISTING UTILITY LEGEND	
●	MONUMENT
■	CATCH BASIN
>	CULVERT
⊙	SANITARY SEWER MANHOLE
⊙	STORM DRAINAGE MANHOLE
⊙	CLEANOUT
⊙	WATER METER
⊙	WATER VALVE
⊙	FIRE HYDRANT
⊙	IRRIGATION CONTROL BOX
⊙	ELECTRICAL BOX
⊙	POWER METER
⊙	ELECTRICAL TRANSFORMER
⊙	LIGHT POLE
⊙	UTILITY POLE
⊙	GUY WIRE
⊙	COMMUNICATION RISER
⊙	COMMUNICATION BOX
⊙	GAS METER
⊙	GAS VALVE
⊙	GAS LINE MARKER
---	SANITARY SEWER PIPE
---	STORM DRAINAGE PIPE
---	WATER LINE
---	GAS LINE
---	ELECTRICAL LINE
---	OVERHEAD POWER LINE
---	COMMUNICATION LINE

PROPOSED UTILITY LEGEND	
■	CATCH BASIN
<	CULVERT
⊙	SANITARY SEWER MANHOLE
⊙	STORM DRAINAGE MANHOLE
⊙	WATER METER
⊙	GATE VALVE
⊙	FIRE HYDRANT
⊙	WATER LINE FITTINGS
⊙	GAS METER
⊙	ELECTRICAL VAULT
⊙	STREET LIGHT AND POLE



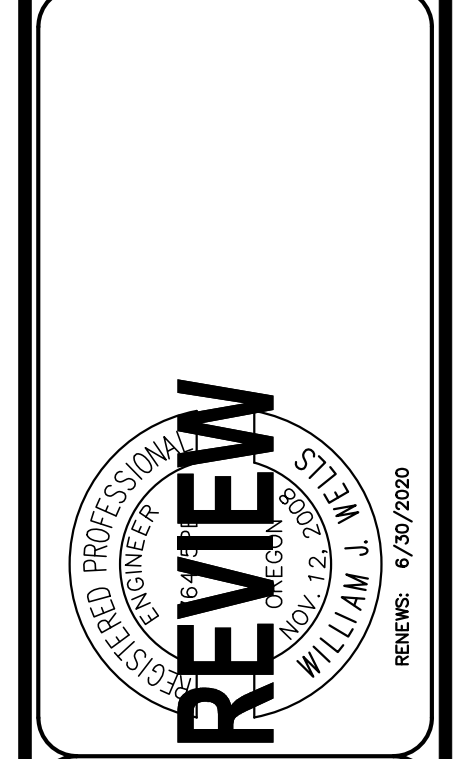


NO.	DATE	DESCRIPTION	BY
1			

VERIFY SCALE  
 BASIS ONE INCH ON  
 ORIGINAL DRAWING  
 IF NOT ONE INCH ON  
 SCALES ACCORDINGLY

0 1" 0

DSN. JW  
 DRN. RS  
 CKD. JW  
 DATE: 05/20/20



**WE**  
 WESTTECH ENGINEERING, INC.  
 CONSULTING ENGINEERS AND PLANNERS  
 3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 585-2474 Fax: (503) 585-3966  
 E-mail: westtech@westtech-eng.com

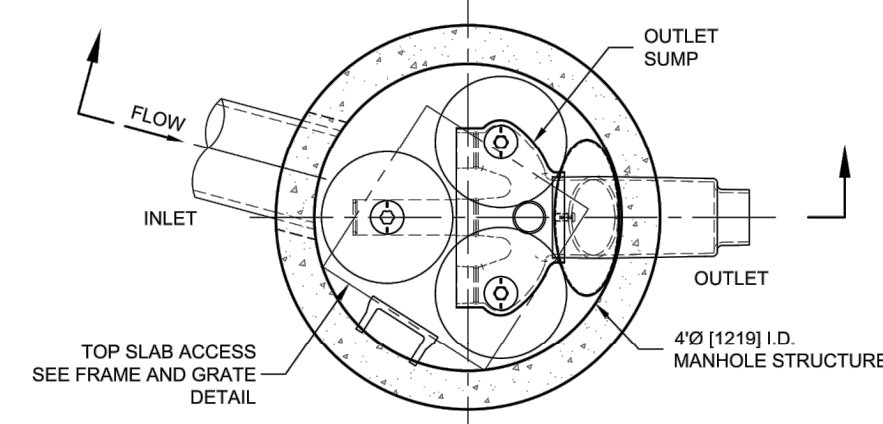
LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS  
**PRELIMINARY STREET PLAN**

DRAWING  
**C5.0**

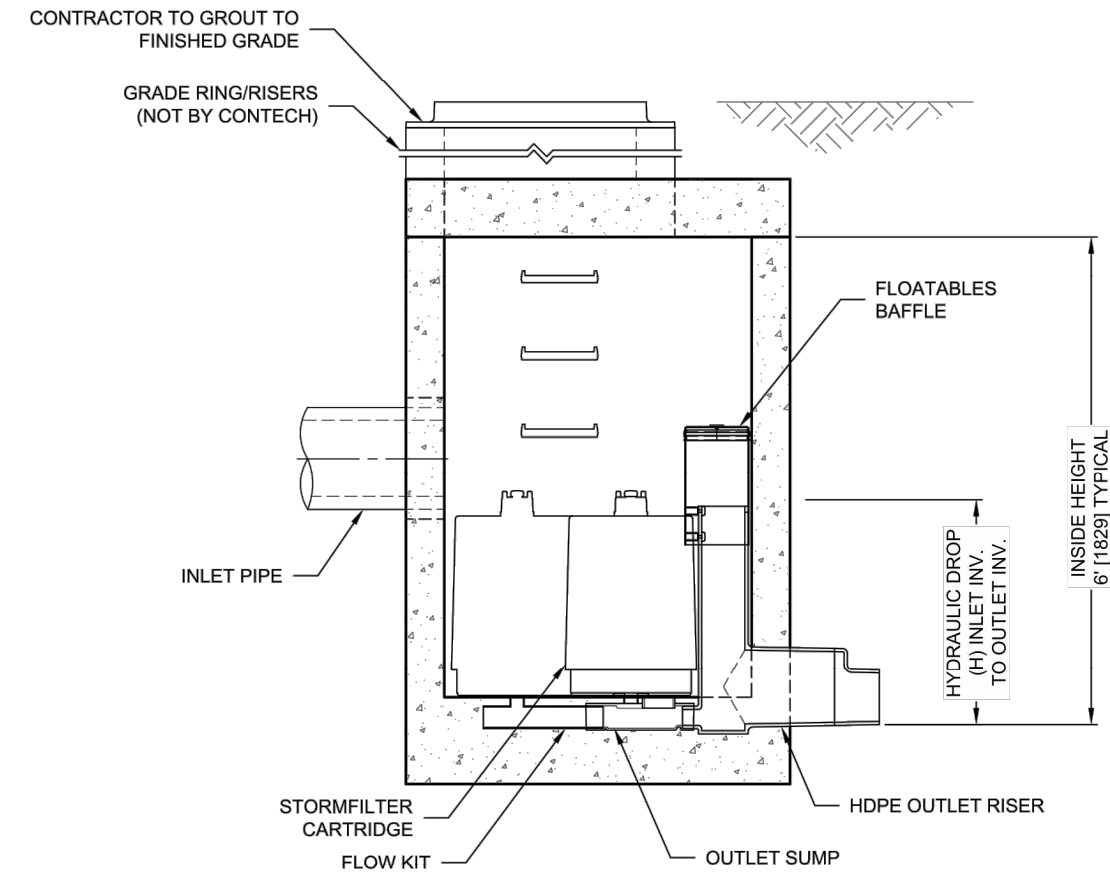
JOB NUMBER  
**3132.0000.0**



C:\Users\lypho\Desktop\_VB\Projects\Belton\_Terrace\_3132.0000\0\Civil\Plots\Civil\_DTL\_S.dwg 5/12/2020 10:50 AM



**PLAN VIEW**  
 STANDARD OUTLET RISER  
 FLOWKIT: 40A



**ELEVATION SECTION A-A**



**STORMFILTER DESIGN NOTES**

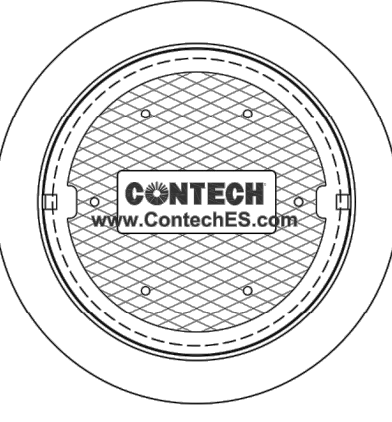
- STORMFILTER TREATMENT CAPACITY VARIES BY CARTRIDGE COUNT AND LOCALLY APPROVED SURFACE AREA SPECIFIC FLOW RATE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD
- A STANDARD 4\"/>

CARTRIDGE SIZE (in. [mm])	27 [686]		
RECOMMENDED MINIMUM HYDRAULIC DROP (H) (ft. [mm])	3.05 [930]		
SPECIFIC FLOW RATE (gpm/sf [L/s/m <sup>2</sup> ])	2 [1.38]	1.67* [1.13]*	1 [0.68]
CARTRIDGE FLOW RATE (gpm [L/s])	22.5 [1.42]	18.78 [1.19]	11.25 [0.71]

\* 1.67 gpm/sf [1.13 L/s/m<sup>2</sup>] SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY

**SITE SPECIFIC DATA REQUIREMENTS**

STRUCTURE ID	
WATER QUALITY FLOW RATE (cfs [L/s])	0.14 CFS
PEAK FLOW RATE (cfs [L/s])	0.53 CFS
RETURN PERIOD OF PEAK FLOW (yrs)	100 YRS
CARTRIDGE SIZE (SEE TABLE ABOVE)	27"
CARTRIDGE FLOW RATE	0.501 CFS
MEDIA TYPE (PERLITE, ZPG, PSORB)	
NUMBER OF CARTRIDGES REQUIRED	3
PIPE DATA:	
INLET PIPE 1	
INLET PIPE 2	
OUTLET PIPE	
NOTES/SPECIAL REQUIREMENTS:	



**FRAME AND COVER**  
 (DIAMETER VARIES)  
 NOT TO SCALE

**GENERAL NOTES**

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
- STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2' [610] AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M318 AND BE CAST WITH THE CONTECH LOGO.
- FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF-CLEANING. RADIAL MEDIA DEPTH SHALL BE 7" [178]. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
- SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) [L/s] DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft) [m<sup>2</sup>].
- STORMFILTER STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
- ALTERNATE UNITS ARE IN MILLIMETERS [mm], UNLESS NOTED OTHERWISE.

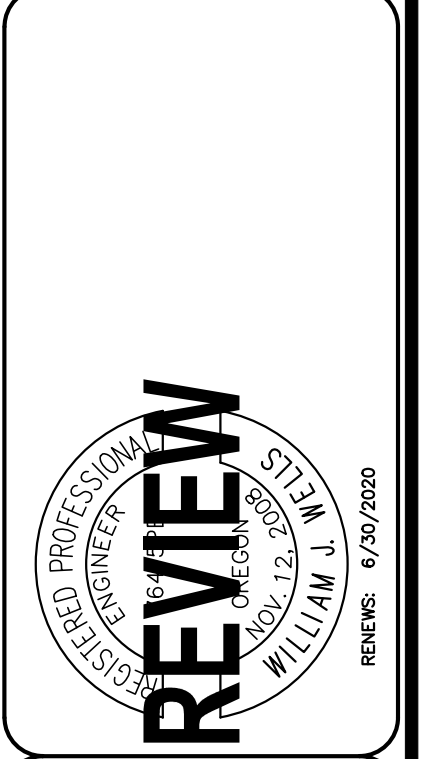
**INSTALLATION NOTES**

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE.
- CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL AND GROUT INLET PIPE(S).
- CONTRACTOR TO PROVIDE AND INSTALL CONNECTOR TO THE OUTLET RISER STUB. STORMFILTER EQUIPPED WITH A DUAL DIAMETER HDPE OUTLET STUB AND SAND COLLAR. IF OUTLET PIPE IS LARGER THAN 8" [200], CONTRACTOR TO REMOVE THE 8" [200] OUTLET STUB AT MOLDED-IN GUT LINE. COUPLING BY FERROCO OR EQUAL AND PROVIDED BY CONTRACTOR.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.



SFMH48  
 STORMFILTER  
 STANDARD DETAIL

NO.	DATE	DESCRIPTION	BY
1	05/20/2020		JW



**WE**  
**WESTTECH ENGINEERING, INC.**  
 CONSULTING ENGINEERS AND PLANNERS

3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 585-2474 Fax: (503) 585-3966  
 E-mail: westtech@westtech-eng.com

LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS  
 CIVIL DETAILS

DRAWING  
**C6.0**

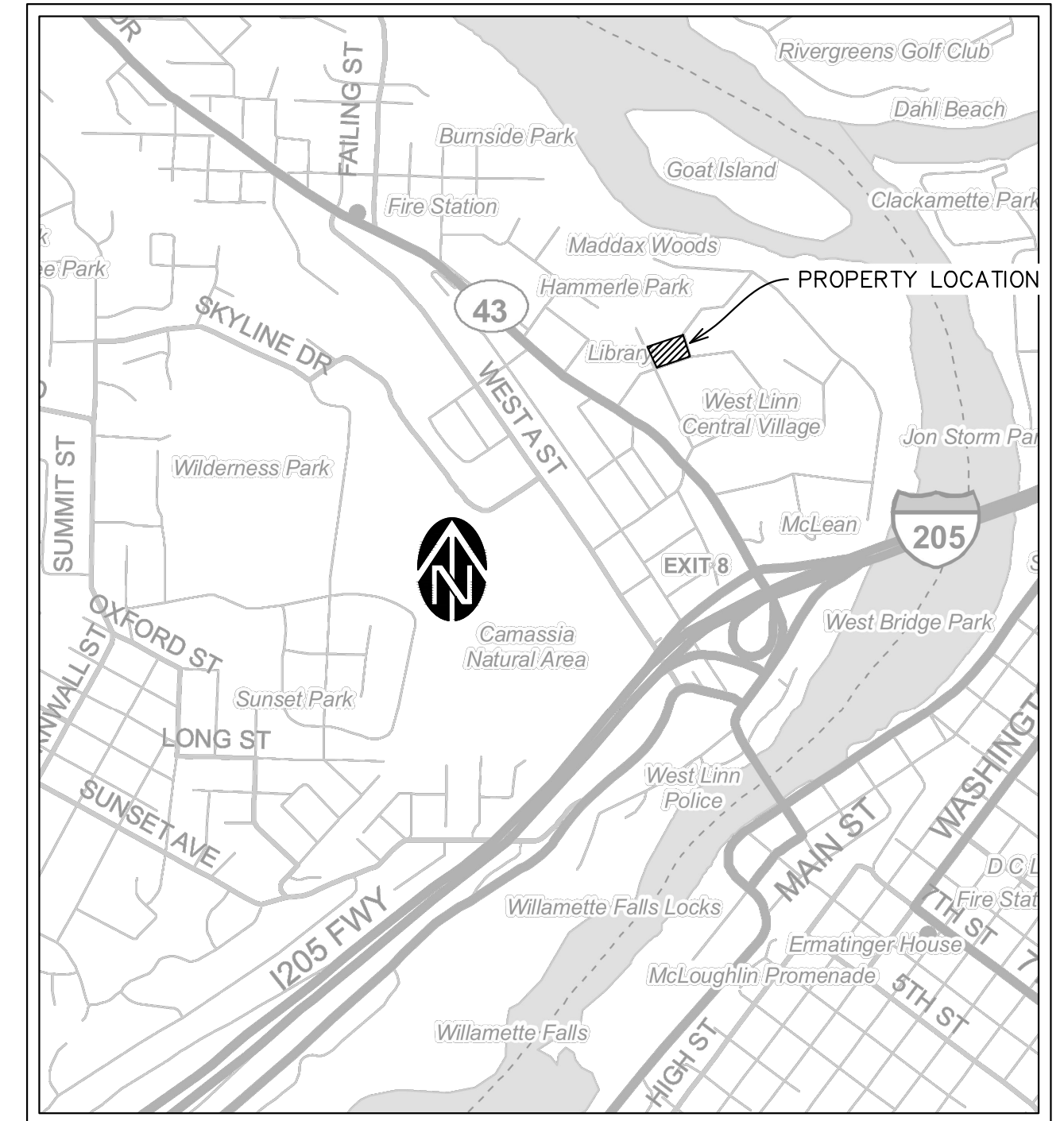
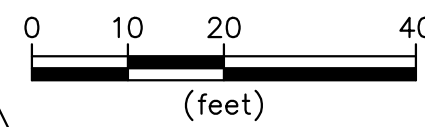
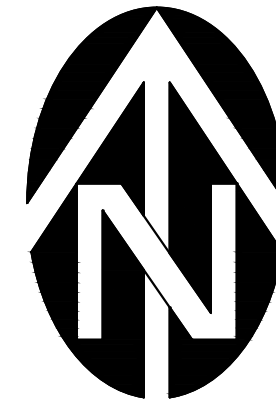
JOB NUMBER  
 3132.0000.0

**LEGEND**

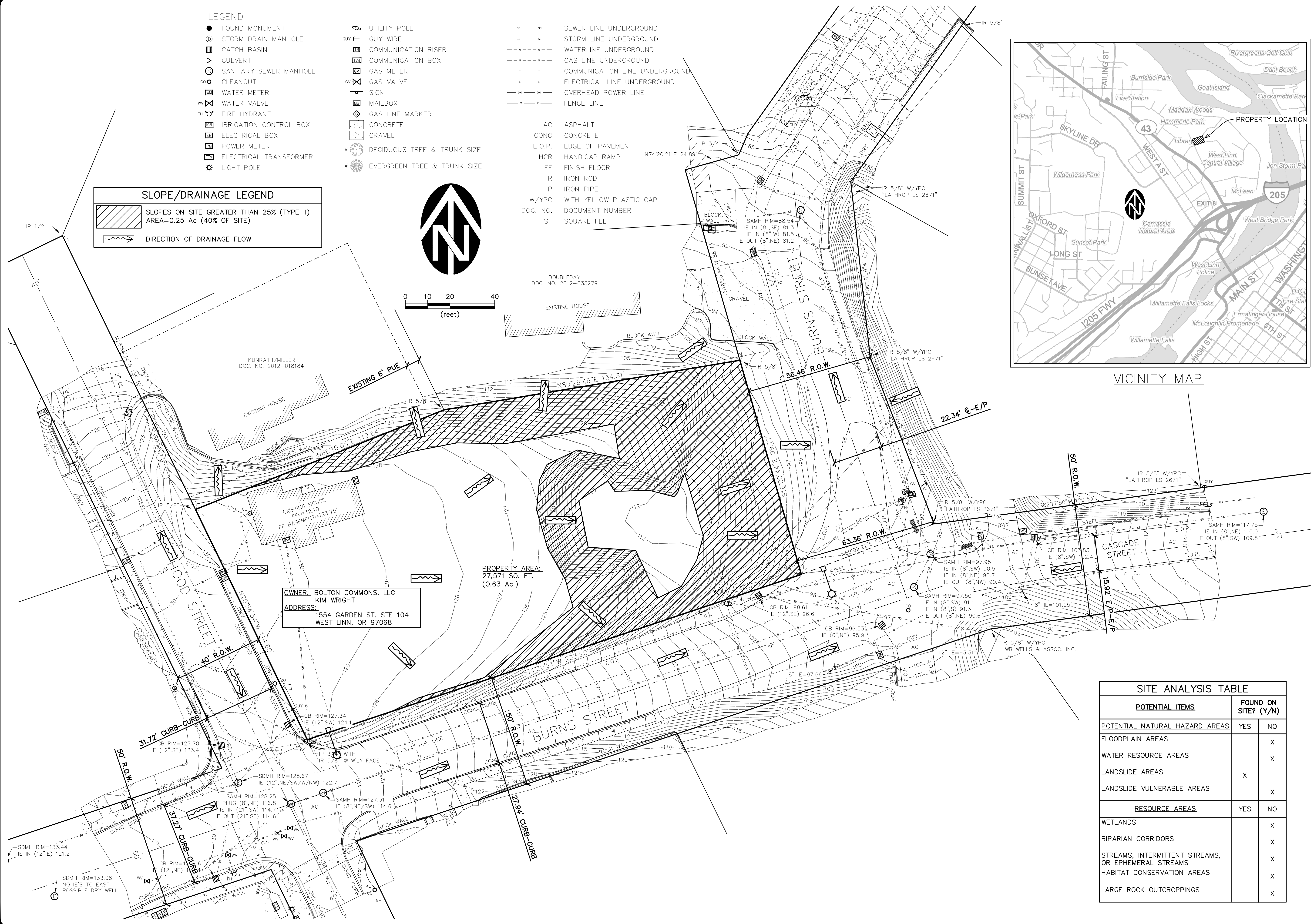
- FOUND MONUMENT
- ⊙ STORM DRAIN MANHOLE
- ▣ CATCH BASIN
- ∨ CULVERT
- ⊙ SANITARY SEWER MANHOLE
- ∞ CLEANOUT
- ⊙ WATER METER
- ⊙ WATER VALVE
- ⊙ FIRE HYDRANT
- ⊙ IRRIGATION CONTROL BOX
- ⊙ ELECTRICAL BOX
- ⊙ POWER METER
- ⊙ ELECTRICAL TRANSFORMER
- ⊙ LIGHT POLE
- ⊙ UTILITY POLE
- ⊙ GUY WIRE
- ⊙ COMMUNICATION RISER
- ⊙ COMMUNICATION BOX
- ⊙ GAS METER
- ⊙ GAS VALVE
- ⊙ SIGN
- ⊙ MAILBOX
- ⊙ GAS LINE MARKER
- ⊙ CONCRETE
- ⊙ GRAVEL
- ⊙ DECIDUOUS TREE & TRUNK SIZE
- ⊙ EVERGREEN TREE & TRUNK SIZE
- SEWER LINE UNDERGROUND
- STORM LINE UNDERGROUND
- WATERLINE UNDERGROUND
- GAS LINE UNDERGROUND
- COMMUNICATION LINE UNDERGROUND
- ELECTRICAL LINE UNDERGROUND
- OVERHEAD POWER LINE
- FENCE LINE
- AC ASPHALT
- CONC CONCRETE
- E.O.P. EDGE OF PAVEMENT
- HCR HANDICAP RAMP
- FF FINISH FLOOR
- IR IRON ROD
- IP IRON PIPE
- W/YPC WITH YELLOW PLASTIC CAP
- DOC. NO. DOCUMENT NUMBER
- SF SQUARE FEET

**SLOPE/DRAINAGE LEGEND**

- SLOPES ON SITE GREATER THAN 25% (TYPE II) AREA=0.25 Ac (40% OF SITE)
- DIRECTION OF DRAINAGE FLOW



VICINITY MAP



**OWNER:** BOLTON COMMONS, LLC  
**KIM WRIGHT**  
**ADDRESS:**  
 1554 GARDEN ST. STE 104  
 WEST LINN, OR 97068

**PROPERTY AREA:**  
 27,571 SQ. FT.  
 (0.63 Ac.)

SITE ANALYSIS TABLE		
POTENTIAL ITEMS	FOUND ON SITE? (Y/N)	
	YES	NO
<b>POTENTIAL NATURAL HAZARD AREAS</b>		
FLOODPLAIN AREAS		X
WATER RESOURCE AREAS		X
LANDSLIDE AREAS	X	
LANDSLIDE VULNERABLE AREAS		X
<b>RESOURCE AREAS</b>	YES	NO
WETLANDS		X
RIPARIAN CORRIDORS		X
STREAMS, INTERMITTENT STREAMS, OR EPHEMERAL STREAMS		X
HABITAT CONSERVATION AREAS		X
LARGE ROCK OUTCROPPINGS		X

8/5/2020 11:20:51 AM  
 C:\Users\lycho\Desktop\_VIE Projects\3132.0000\Civil\Plots\Site ANALYSIS.dwg (C1.0 tab)

<p><b>WESTECH ENGINEERING, INC.</b>                  CONSULTING ENGINEERS AND PLANNERS</p> <p>3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302                  Phone: (503) 585-2474 Fax: (503) 585-3966                  E-mail: westech@westech-eng.com</p>	<p>REGISTERED PROFESSIONAL ENGINEER                  WILLIAM J. WELLS                  REG. NO. 12345                  DATE: 6/30/2020</p>
---	--

LENTNY ARCHITECTURE ADVANCE DENTAL ARTS	SITE ANALYSIS PLAN DRAWING <b>C1.0</b> JOB NUMBER 3132.0000.0
--	---

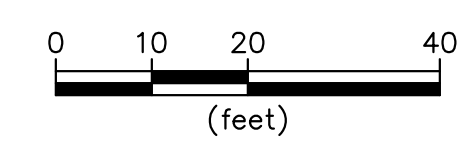
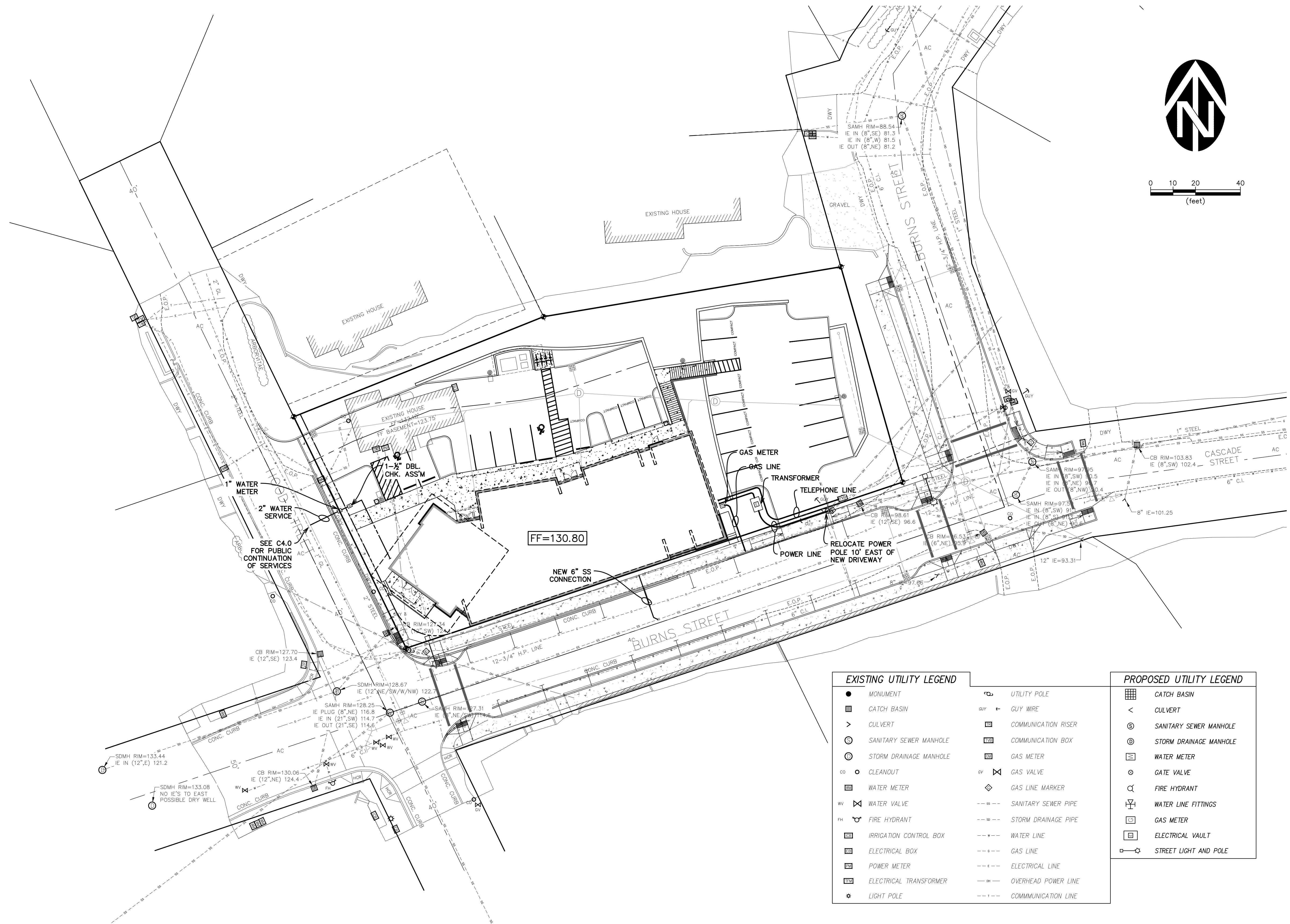
VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING IF NOT ONE INCH ON SCALES ACCURACIES	DSN. JW DRN. RS CKD. JW DATE: 05/20/20
NO. 1	DATE: 05/20/20
DESCRIPTION	REVISIONS







8/5/2020, 11:21:07 AM  
 C:\Users\lypho\Desktop\_VE Projects\Belton Terrace 3132.0000\Civil\Plots\Utility.dwg. (C3.0 tab)



**EXISTING UTILITY LEGEND**

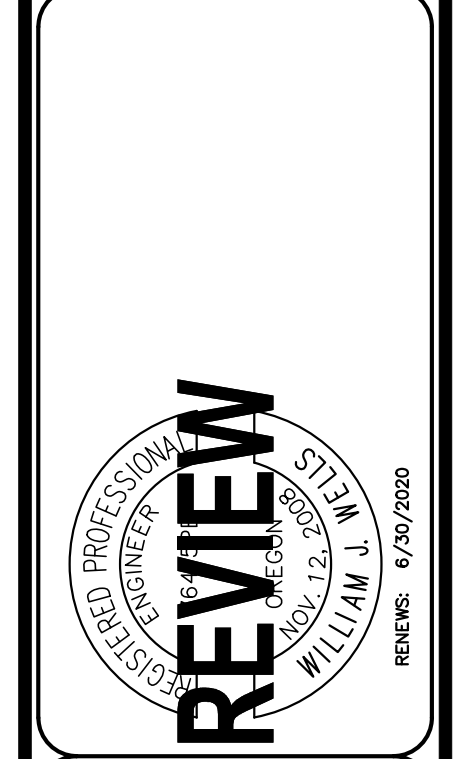
●	MONUMENT	⊕	UTILITY POLE
■	CATCH BASIN	guy	GUY WIRE
>	CULVERT	☐	COMMUNICATION RISER
⊙	SANITARY SEWER MANHOLE	☐	COMMUNICATION BOX
⊙	STORM DRAINAGE MANHOLE	⊕	GAS METER
∞	CLEANOUT	gv	GAS VALVE
⊕	WATER METER	◇	GAS LINE MARKER
wv	WATER VALVE	---	SANITARY SEWER PIPE
fh	FIRE HYDRANT	---	STORM DRAINAGE PIPE
☐	IRRIGATION CONTROL BOX	---	WATER LINE
☐	ELECTRICAL BOX	---	GAS LINE
⊕	POWER METER	---	ELECTRICAL LINE
⊕	ELECTRICAL TRANSFORMER	---	OVERHEAD POWER LINE
*	LIGHT POLE	---	COMMUNICATION LINE

**PROPOSED UTILITY LEGEND**

☐	CATCH BASIN
<	CULVERT
⊙	SANITARY SEWER MANHOLE
⊙	STORM DRAINAGE MANHOLE
⊕	WATER METER
⊕	GATE VALVE
⊕	FIRE HYDRANT
⊕	WATER LINE FITTINGS
⊕	GAS METER
⊕	ELECTRICAL VAULT
⊕	STREET LIGHT AND POLE

VERIFY SCALE  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
 IF NOT ONE INCH ON SCALES ACCURACELY

DSN.	JW	DRN.	RS	CKD.	JW	DATE	NO.	1	DESCRIPTION	REVISIONS
DATE:	05/20/2020									



**WESTTECH ENGINEERING, INC.**  
 CONSULTING ENGINEERS AND PLANNERS

3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 585-2474 Fax: (503) 585-3966  
 E-mail: westtech@westtech-eng.com

LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS

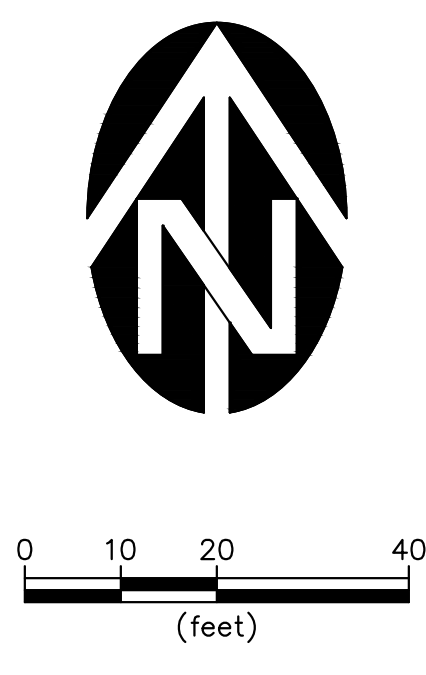
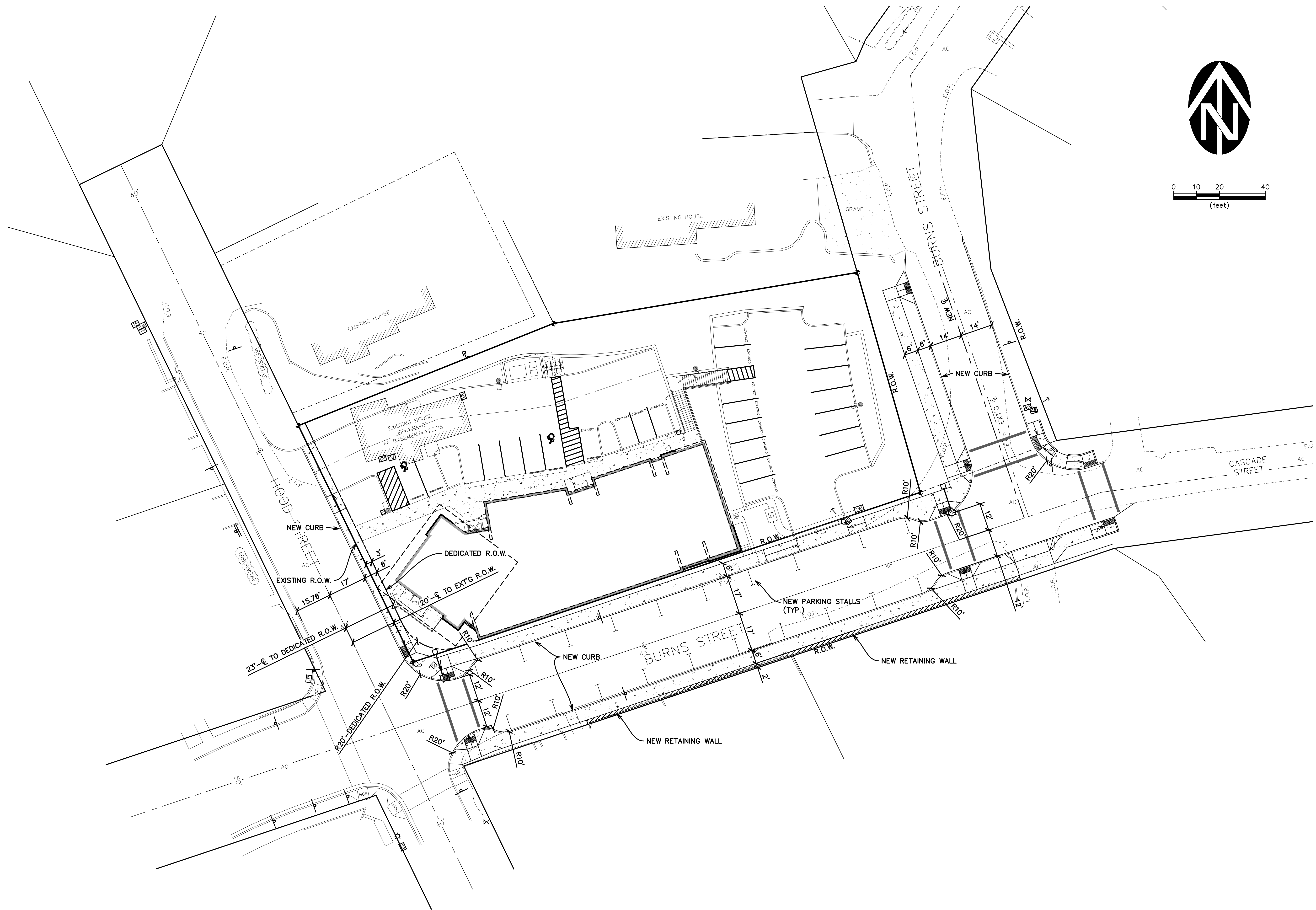
**UTILITY PLAN**

**DRAWING C3.0**

JOB NUMBER  
**3132.0000.0**







NO.	DATE	DESCRIPTION	BY
1	05/20/2020		

VERIFY SCALE  
 BASIS ONE INCH ON  
 ORIGINAL DRAWING  
 IF NOT ONE INCH ON  
 SCALES ACCORDINGLY

0 1" 0

DSN. JW  
 DRN. RS  
 CKD. JW  
 DATE: 05/20/2020

**REVIEW**  
 REGISTERED PROFESSIONAL ENGINEER  
 WILLIAM J. WELLS  
 REG. NO. 12,345  
 REVIEWS: 6/30/2020

**WE**  
**WESTECH ENGINEERING, INC.**  
 CONSULTING ENGINEERS AND PLANNERS

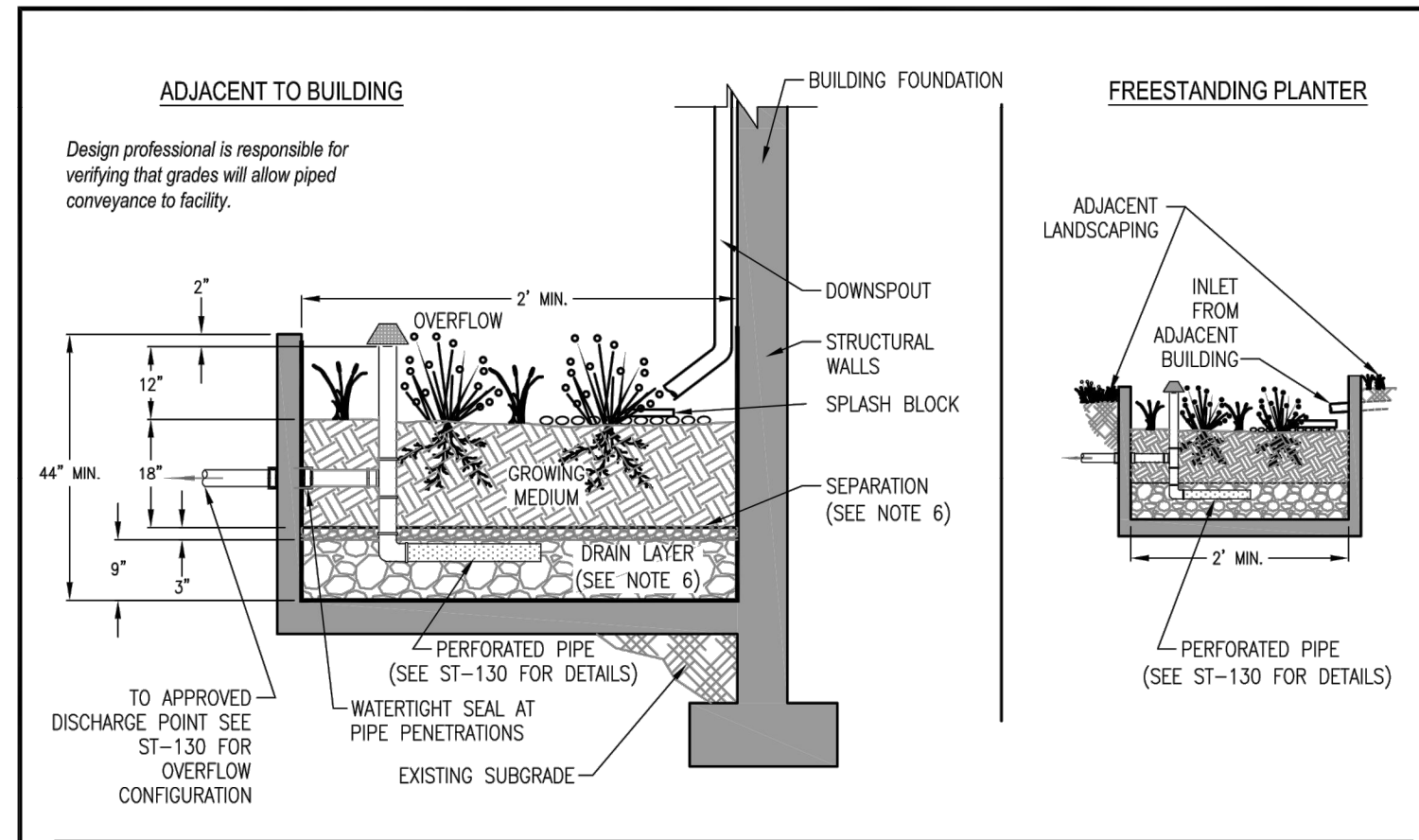
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 585-2474 Fax: (503) 585-3966  
 E-mail: westech@westech-eng.com

LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS

**PRELIMINARY STREET PLAN**

DRAWING  
**C5.0**

JOB NUMBER  
**3132.0000.0**



1. Dimensions:  
 Width of planter: 24" minimum.  
 Depth of planter (from top of growing medium to overflow elevation): 12".  
 Longitudinal slope of planter: 0.5% or less.
2. Setbacks:  
 Planters must be less than 30" in height above finish grade if within 5-feet of property line.
3. Planter Walls:  
 Material must be monolithically poured concrete. Walls must be included on foundation plans.
4. Waterproofing:  
 Monolithically poured planter, without joints is required. Check state structural requirements for foundations.
5. Piping must be cast iron, ABS or PVC. 3" pipe required for facilities draining up to 1500 s.f., otherwise 4" minimum pipe. Oregon Plumbing Specialty Code also applies.
6. Drain Layer:  
 3/4" - 1 1/2" washed round rock.  
 Depth: 9".  
 Separation between drain rock and growing medium:  
 1/2" - #10 rock, 2 to 3 inches deep.
7. Overflow:  
 Planters must connect to approved discharge point per detail ST-130. Overflow elevation must allow for 2" of freeboard, minimum. Protect from debris and sediment with strainer or grate.
8. Growing Medium:  
 18" minimum depth. Use sand/loam/compost 3-way mix, or approved mix that will support healthy plants.
9. Vegetation: Refer to plant list in Appendix G. Minimum container size is #1.  
 # of plantings per 100sf of facility area:  
 80 herbaceous plants OR;  
 72 herbaceous plants and 4 small shrubs.
10. Splash Block: Install 4-6" washed river rock or splash pad for erosion control at inlets and downspout.

- DRAWING NOT TO SCALE -  
 ORIGINAL DRAWING AND SPECIFICATIONS FROM PORTLAND BUREAU OF ENVIRONMENTAL SERVICES

CITY OF GRESHAM	FILTRATION PLANTER	DRAWN DRO
		DATE OCT 2019
		APPR.
		DWG. NO. ST-151

NO.	DATE	DESCRIPTION	BY
1			

VERIFY SCALE  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
 IF NOT ONE INCH ON SCALES ACCORDINGLY

DSN. JW  
 DRN. RS  
 CKD. JW

NO. 1  
 DATE: 05/2020



**WE**  
 WESTTECH ENGINEERING, INC.  
 CONSULTING ENGINEERS AND PLANNERS

3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302  
 Phone: (503) 585-2474 Fax: (503) 585-3966  
 E-mail: westtech@westtech-eng.com

LENITY ARCHITECTURE  
 ADVANCE DENTAL ARTS  
 CIVIL DETAILS

DRAWING  
**C6.0**  
 JOB NUMBER  
 3132.0000.0

EXTERIOR LIGHTING  
CUTSHEETS

New Building for Advance Dental Arts  
Center

1575 Burns St. West Linn, OR 97068



# JUNO SLIMFORM™ LED SURFACE MOUNT DOWNLIGHTS

FOR J-BOX INSTALLATION  
5", 7", 11", 13" ROUND

## JSF SERIES

Project: \_\_\_\_\_

Fixture Type: \_\_\_\_\_

Location: \_\_\_\_\_

Contact/Phone: \_\_\_\_\_



### PRODUCT DESCRIPTION

Sleek, ultra-low profile energy efficient LED surface mount downlights in multiple sizes from 5" to 13" • Provides economical installation by mounting directly over standard and fire-rated junction boxes • Optional finish trims and shrouds available for custom, designer look similar to standard recessed downlights • Provides general illumination in residential and commercial applications including multi-family and hospitality • Ideal for use in corridors, living spaces, closets, hallways, pantries, stairways, outdoor covered areas and much more.

### PRODUCT SPECIFICATIONS

**Construction** Shallow, less than 1", solid ring with white finish

• Non conductive fixture for shower light applications • Optional, field installable finish trims available for 5" and 7" versions to change the exterior finish of fixture • Optional, field installable decorative baffle and cone shrouds for 5" and 7" versions provide the aesthetic and source shielding similar to the experience of a fully recessed downlight.

**Optics** Light guide technology combined with diffusing lens conceals the LEDs from direct view and provides uniform lens luminance.

**LED Light Engine** LEDs mounted directly to heatsink designed to provide superior thermal management and ensure long life • 2700K, 3000K, 3500K or 4000K LED color temperature • LEDs binned for 4-step MacAdam ellipse color consistency • 90 CRI minimum.

**LED Driver** Choice of dedicated 120 volt (120) driver or universal voltage (MVOLT) driver that accommodates input voltages from 120-277 volts AC at 50/60Hz • Power factor > 0.9 at 120V input • 120 volt driver is dimmable with the use of most incandescent, magnetic low voltage and electronic low voltage wall box dimmers • Universal voltage driver is dimmable with the use of most 0-10V wall box dimmers • External driver is only available on 5" and 7" models • For a list of compatible dimmers, see [JUNOSLIMFORM-DIM](#).

**Emergency Battery Option** Available on fixture sizes 11" and larger • Battery factory assembled to fixture with integral test switch (EL option) • Drives LEDs for 90 minutes to meet Life Safety Code (NFPA-LSC), National Electrical Code (NEC), and UL requirements • Emergency battery not available in California due to Title 20 restrictions • EBX option provides back box without battery for consistent look when used in same space as fixtures with EL emergency option.

**Life** Rated for 50,000 hours at >70% lumen maintenance.

**Labels** ENERGY STAR® certified • Certified to the high efficacy requirements of California T24 JA8-2016 • CSA listed for US and Canada • Suitable for wet locations (covered ceilings).

**Testing** All reports are based on published industry procedures; actual performance may differ as a result of the end-user environment and applications. All values are design or typical values, measured under laboratory conditions at 25 °C.

**Warranty** 5-year limited warranty. Complete warranty terms located at [www.acuitybrands.com/CustomResources/Terms\\_and\\_conditions.aspx](http://www.acuitybrands.com/CustomResources/Terms_and_conditions.aspx)

Specifications subject to change without notice.

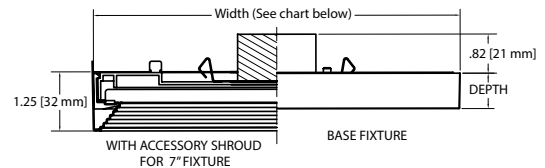
### INSTALLATION

**Junction Box Mounting** Fixture provided with leads for direct wire connection in j-box • Installs directly to industry standard junction boxes • Compatible boxes include 4" metal or plastic octagonal standard and fire-rated junction boxes (3 1/2" junction box screw-hole spacing required for installation) • Minimum 2 1/8" deep junction box required for 5" and 7" fixtures (no depth requirement for 11" and larger fixtures) • Quick mount bracket provides fast installation of fully assembled fixture to junction box • Suitable for ceiling mount • Suitable for use within closet storage spaces when installed per NEC requirements.

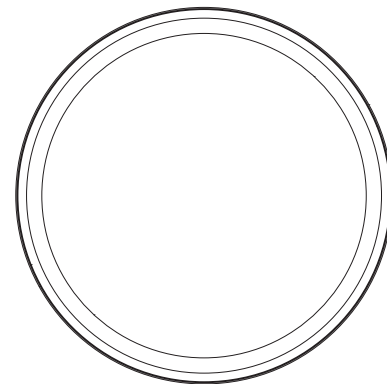
*Junction box sizes vary - Verify compatibility with fixture prior to installation*



### DIMENSIONS



External driver available on 5" and 7" models only.

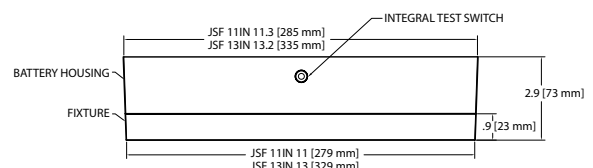


### ROUND SPECIFICATIONS

	Width	Depth
JSF 5IN	5.25 (13.34)	0.75 (1.91)
JSF 7IN	7.77 (19.74)	0.75 (1.91)
JSF 11IN	11.08 (28.14)	0.9 (2.29)
JSF 13IN	13.05 (33.15)	0.9 (2.29)

All dimensions are in inches (centimeters) unless otherwise indicated.

### EMERGENCY BATTERY FOR 11" AND 13"



# JUNO SLIMFORM™ LED SURFACE MOUNT DOWNLIGHTS

FOR J-BOX INSTALLATION  
5", 7", 11", 13" ROUND  
**JSF SERIES**

## PERFORMANCE DATA

	JSF 5IN		JSF 7IN		JSF 11IN		JSF 13IN	
	120V	MVOLT	120V	MVOLT	120V	MVOLT	120V	MVOLT
Lumens	700	700	1000	1000	1300	1300	1800	1800
CRI	90CRI		90CRI		90CRI		90CRI	
CCT	27K, 30K, 35K, 40K		27K, 30K, 35K, 40K		27K, 30K, 35K, 40K		27K, 30K, 35K, 40K	
Voltage	120V	120V-277V	120V	120V-277V	120V	120V-277V	120V	120V-277V
Input Power	10W	10W	13W	13W	15W	15W	20W	20W
Input Current	110MA	50MA	150MA	60MA	180MA	80MA	240MA	110MA
Frequency	50/60Hz		50/60Hz		50/60Hz		50/60Hz	
Power Factor	>0.9		>0.9		>0.9		>0.9	

## ORDERING INFORMATION

Example: JSF 5IN 07LM 27K 90CRI 120 FRPC WH

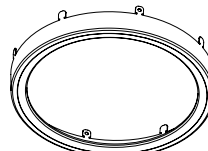
Series	Size/Lumens	Color Temperature	CRI	Voltage/Driver	Finish	Emergency Battery <sup>1,2,3</sup>
JSF SlimForm Surface Mount Downlight - Round	5IN 07LM 5", 700 Lumens	27K 2700K	90CRI 90+ CRI	120 FRPC Dedicated 120V, Forward Reverse Phase Dimmign MVOLT ZT Universal Voltage 120V-277V, 0-10V Dimming	WH White	EL <sup>3</sup> Battery Back-up Option EBX Empty Back Box for Aesthetics
	7IN 10LM 7", 1000 Lumens	30K 3000K				
	11IN 13LM 11", 1300 Lumens	35K 3500K				
	13IN 18LM 13", 1800 Lumens	40K 4000K				

## ACCESSORIES

**TRIM** – Optional, field installable finish trim rings available to change the exterior finish of fixture.

Example: JSFTRIM 5IN BL

Series	Size	Finish
JSFTRIM SlimForm Accessory- Trim	5IN 5 inches	BL Black
	7IN 7 inches	BZ Bronze
		SN Satin Nickel

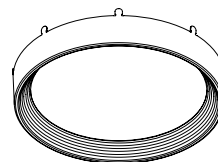


**TRIM**

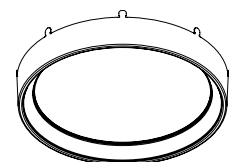
**SHROUD** – Optional, field installable decorative baffle and cone shrouds provides the aesthetic and source shielding similar to the experience of a fully recessed downlight.

Example: JSFSHROUD 5IN DB WWH

Series	Size	Shroud Style	Finish
JSFSHROUD SlimForm Accessory Shroud - Round	5IN 5 inches	DB Downlight Baffle	WWH White trim, white shroud
	7IN 7 inches	DC Downlight Cone	BWH <sup>4</sup> Black trim, white shroud
			HZWH Haze trim, white shroud
			WHZWH Wheat Haze trim, white shroud



**BAFFLE SHROUD**



**CONE SHROUD**

Note:

- Emergency battery available with 11IN and 13IN only.
- Emergency battery is only available with MVOLT ZT.
- Emergency battery option not available in California due to Title 20 restrictions.
- BWH only available with downlight baffle.



# JUNO SLIMFORM™ LED SURFACE MOUNT DOWNLIGHTS

FOR J-BOX INSTALLATION

5", 7", 11", 13" ROUND

**JSF SERIES**

## PHOTOMETRICS

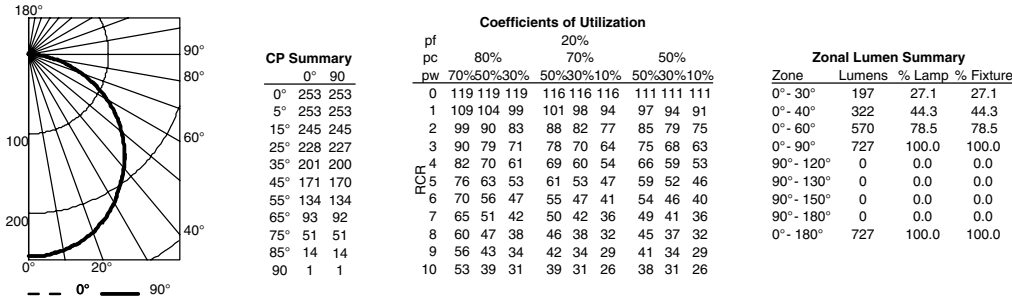
**Distribution Curve**

**Distribution Data**

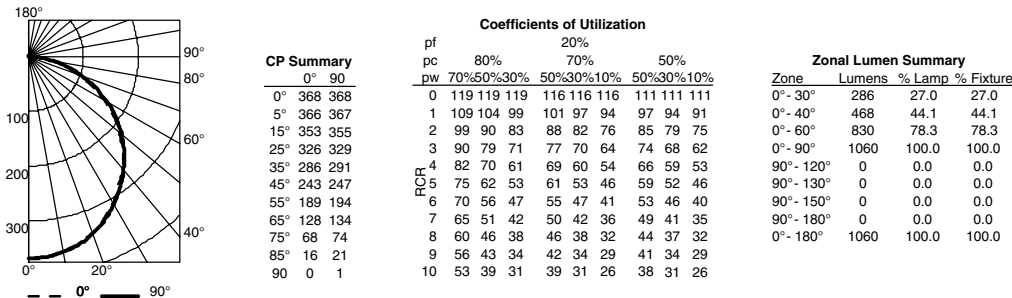
**Coefficient of Utilization**

**Illuminance Data at 30" Above Floor for a Single Luminaire**

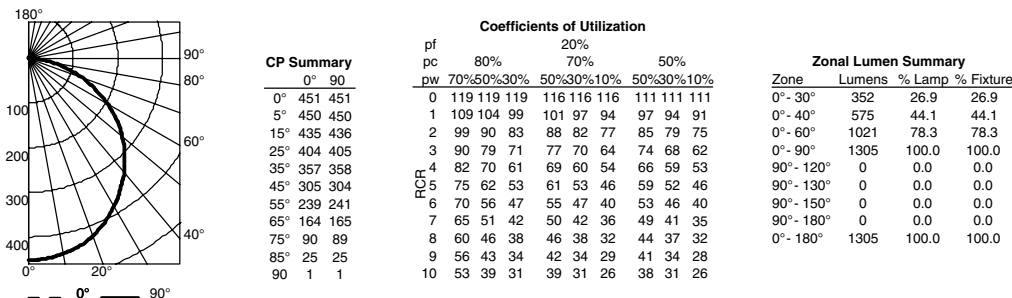
**JSF 5IN 27K**, 2700K LEDs, input watts: 9.72, delivered lumens: 727, LM/W = 74.8, test no. ISF 33599, tested in accordance to IESNA LM-79.



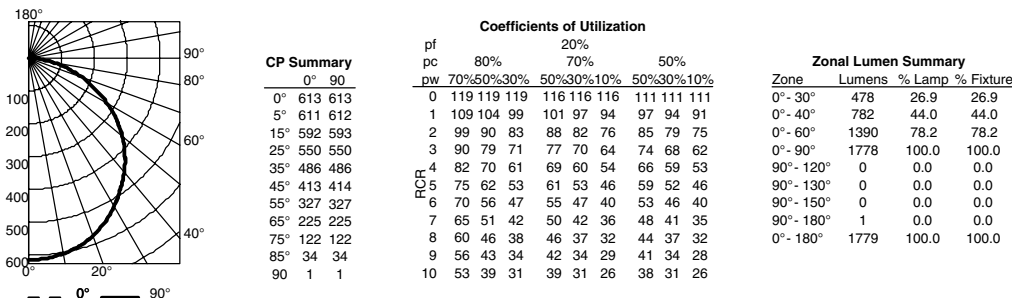
**JSF 7IN 27K**, 2700K LEDs, input watts: 12.8, delivered lumens: 1060, LM/W = 82.8, test no. ISF 33600, tested in accordance to IESNA LM-79.



**JSF 11IN 27K**, 2700K LEDs, input watts: 15.2, delivered lumens: 1305, LM/W = 85.9, test no. ISF 33661, tested in accordance to IESNA LM-79.



**JSF 13IN 27K**, 2700K LEDs, input watts: 20.2, delivered lumens: 1779, LM/W = 88, test no. ISF 33663, tested in accordance to IESNA LM-79.



For 30K fixtures, use 1.02 multiplier; For 35K fixtures, use 1.03 multiplier, For 40K fixtures, use 1.07 multiplier.



# D-Series Size 0 LED Area Luminaire



Catalog Number
Notes
Type

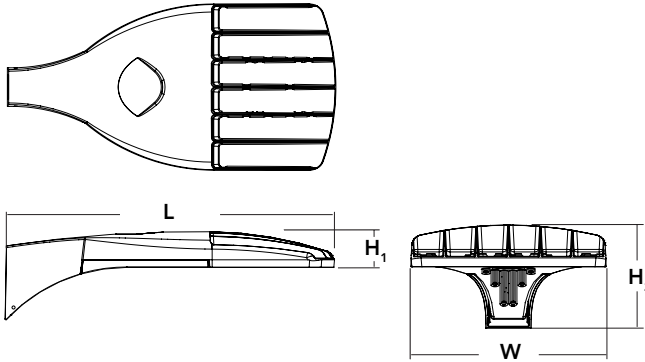
Hit the Tab key or mouse over the page to see all interactive elements.

## Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment. The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 400W metal halide with typical energy savings of 70% and expected service life of over 100,000 hours.

## Specifications

EPA:	0.95 ft <sup>2</sup> (.09 m <sup>2</sup> )
Length:	26" (66.0 cm)
Width:	13" (33.0 cm)
Height <sub>1</sub> :	3" (7.62 cm)
Height <sub>2</sub> :	7" (17.8 cm)
Weight (max):	16 lbs (7.25 kg)



A+ Capable options indicated by this color background.

## Ordering Information

**EXAMPLE:** DSX0 LED P6 40K T3M MVOLT SPA NLTAIR2 PIRHN DDBXD

DSX0 LED	Series	LEDs	Color temperature	Distribution	Voltage	Mounting	
	DSX0 LED	<b>Forward optics</b> P1 P4 P7 P2 P5 P3 P6 <b>Rotated optics</b> P10 <sup>1</sup> P12 <sup>1</sup> P11 <sup>1</sup> P13 <sup>1</sup>	30K 3000 K 40K 4000 K 50K 5000 K	T1S Type I short (Automotive) T2S Type II short T2M Type II medium T3S Type III short T3M Type III medium T4M Type IV medium TFTM Forward throw medium T5VS Type V very short <sup>2</sup>	T5S Type V short <sup>2</sup> T5M Type V medium <sup>2</sup> T5W Type V wide <sup>2</sup> BLC Backlight control <sup>3</sup> LCCO Left corner cutoff <sup>3</sup> RCCO Right corner cutoff <sup>3</sup>	MVOLT <sup>4,5</sup> 120 <sup>5</sup> 208 <sup>5</sup> 240 <sup>5</sup> 277 <sup>5</sup> 347 <sup>5,6</sup> 480 <sup>5,6</sup>	<b>Shipped included</b> SPA Square pole mounting RPA Round pole mounting WBA Wall bracket <sup>2</sup> SPUMBA Square pole universal mounting adaptor <sup>7</sup> RPUMBA Round pole universal mounting adaptor <sup>7</sup> <b>Shipped separately</b> KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish) <sup>8</sup>

Control options	Other options	Finish (required)
<b>Shipped installed</b> NLTAIR2 nLight AIR generation 2 enabled <sup>9,10</sup> PIRHN Network, high/low motion/ambient sensor <sup>11</sup> PER NEMA twist-lock receptacle only (control ordered separate) <sup>12</sup> PER5 Five-pin receptacle only (control ordered separate) <sup>12,13</sup> PER7 Seven-pin receptacle only (leads exit fixture) (control ordered separate) <sup>12,13</sup> DMG 0-10V dimming extend out back of housing for external control (control ordered separate) <sup>14</sup>	PIR High/low, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 5fc <sup>15,16</sup> PIRH High/low, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 5fc <sup>15,16</sup> PIR1FC3V High/low, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 1fc <sup>15,16</sup> PIRH1FC3V High/low, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 1fc <sup>15,16</sup> FAO Field adjustable output <sup>17</sup>	<b>Shipped installed</b> HS House-side shield <sup>18</sup> SF Single fuse (120, 277, 347V) <sup>5</sup> DF Double fuse (208, 240, 480V) <sup>5</sup> L90 Left rotated optics <sup>1</sup> R90 Right rotated optics <sup>1</sup> DDL Diffused drop lens <sup>18</sup> <b>Shipped separately</b> BS Bird spikes <sup>19</sup> EGS External glare shield
		DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white



## Ordering Information

### Accessories

Ordered and shipped separately.

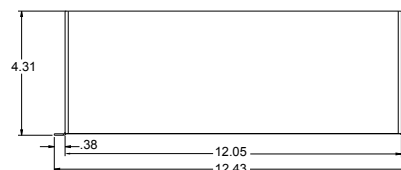
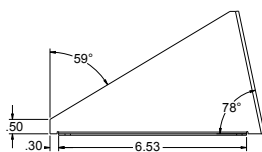
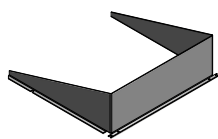
DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V) <sup>20</sup>
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V) <sup>20</sup>
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V) <sup>20</sup>
DSHORT SBK U	Shorting cap <sup>23</sup>
DSXOHS 20C U	House-side shield for P1,P2,P3 and P4 <sup>18</sup>
DSXOHS 30C U	House-side shield for P10,P11,P12 and P13 <sup>18</sup>
DSXOHS 40C U	House-side shield for P5,P6 and P7 <sup>18</sup>
DSXODDL U	Diffused drop lens (polycarbonate) <sup>18</sup>
PUMBA DDBXD U*	Square and round pole universal mounting bracket adaptor (specify finish) <sup>21</sup>
KMA8 DDBXD U	Mast arm mounting bracket adaptor (specify finish) <sup>17</sup>
DSXOEGS (FINISH) U	External glare shield

For more control options, visit [DTL](#) and [ROAM](#) online. Link to [nLight Air 2](#)

### NOTES

- 1 P10, P11, P12 and P13 and rotated options (L90 or R90) only available together.
- 2 Any Type 5 distribution with photocell, is not available with WBA.
- 3 Not available with HS or DDL.
- 4 MVOLT driver operates on any line voltage from 120-277V (50/60 Hz).
- 5 Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
- 6 Not available with BL30, BL50 or PNMT options.
- 7 Universal mounting brackets intended for retrofit on existing pre-drilled poles only. 1.5 G vibration load rating per ANCI C136.31.
- 8 Must order fixture with SPA mounting. Must be ordered as a separate accessory; see Accessories information. For use with 2-3/8" mast arm (not included).
- 9 Must be ordered with PIRHN.
- 10 Sensor cover available only in dark bronze, black, white and natural aluminum colors.
- 11 Must be ordered with NLTAIR2. For more information on nLight Air 2 visit [this link](#).
- 12 Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories. Shorting Cap included.
- 13 If ROAM<sup>®</sup> node required, it must be ordered and shipped as a separate line item from Acuity Brands Controls. Shorting Cap included.
- 14 DMG not available with PIRHN, PER5, PER7, PIR, PIRH, PIR1FC3V or PIRH1FC3V.
- 15 Reference Motion Sensor table on page 3.
- 16 Reference PER Table on page 3 to see functionality.
- 17 Not available with other dimming controls options.
- 18 Not available with BLC, LCCO and RCCO distribution.
- 19 Must be ordered with fixture for factory pre-drilling.
- 20 Requires luminaire to be specified with PER, PER5 or PER7 option. See PER Table on page 3.
- 21 For retrofit use only.

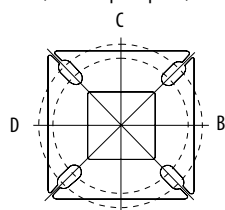
## EGS – External Glare Shield



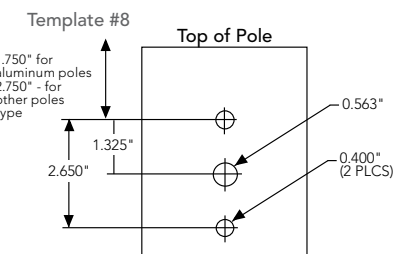
## Drilling

### HANDHOLE ORIENTATION

(from top of pole)



A Handhole



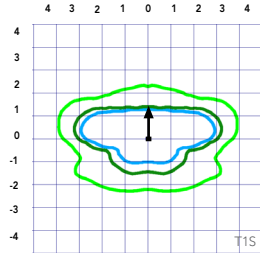
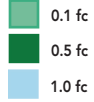
### Tenon Mounting Slipfitter

Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8"	AST20-190	AST20-280	AST20-290	AST20-320	AST20-390	AST20-490
2-7/8"	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4"	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

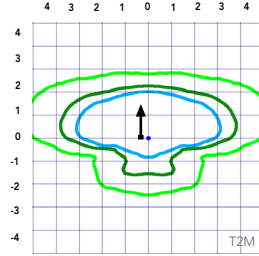
Mounting Option	Drilling Template	Single	2 @ 180	2 @ 90	3 @ 90	3 @ 120	4 @ 90
Head Location		Side B	Side B & D	Side B & C	Side B, C & D	Round Pole Only	Side A, B, C & D
Drill Nomenclature	#8	DM19AS	DM28AS	DM29AS	DM39AS	DM32AS	DM49AS
<b>Minimum Acceptable Outside Pole Dimension</b>							
SPA	#8	2-7/8"	2-7/8"	3.5"	3.5"		3.5"
RPA	#8	2-7/8"	2-7/8"	3.5"	3.5"	3"	3.5"
SPUMBA	#5	2-7/8"	3"	4"	4"		4"
RPUMBA	#5	2-7/8"	3.5"	5"	5"	3.5"	5"

Isofootcandle plots for the DSX0 LED 40C 1000 40K. Distances are in units of mounting height (20').

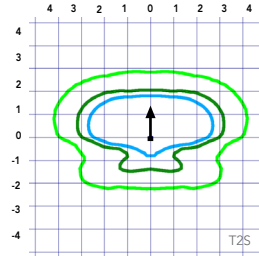
**LEGEND**



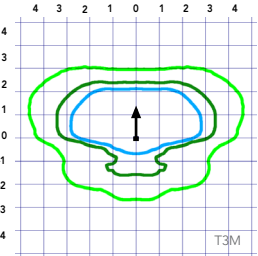
Test No.



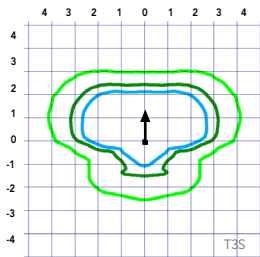
Test No.



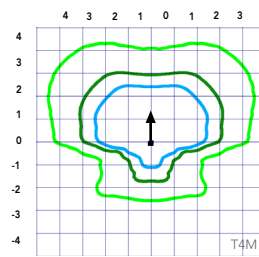
Test No. LTL23457P25 tested in accordance with IESNA LM-79-08.



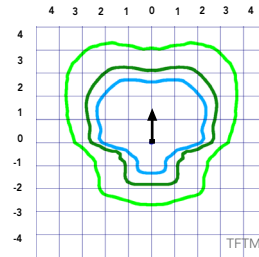
Test No. LTL23457P25 tested in accordance with IESNA LM-79-08.



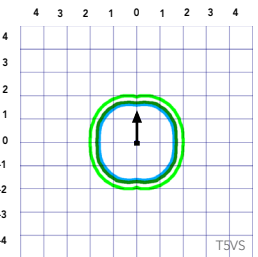
Test No. LTL23457P25 tested in accordance with IESNA LM-79-08.



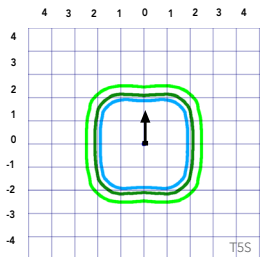
Test No.



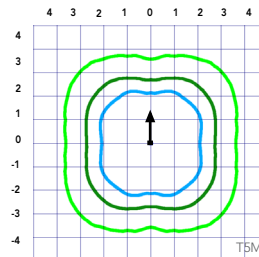
Test No.



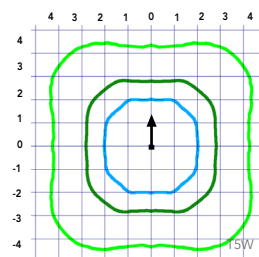
Test No.



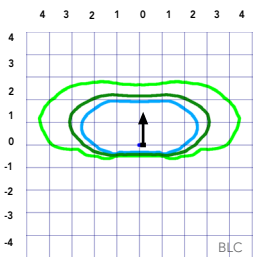
Test No.



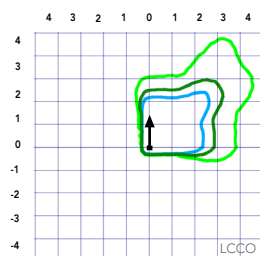
Test No.



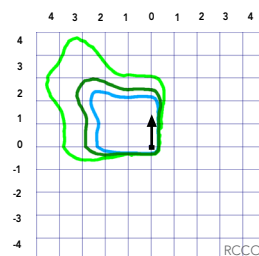
Test No. LTL23451P25 tested in accordance with IESNA LM-79-08.



Test No.



Test No.



Test No.

## Performance Data

### Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.04
5°C	41°F	1.04
10°C	50°F	1.03
15°C	59°F	1.02
20°C	68°F	1.01
<b>25°C</b>	<b>77°C</b>	<b>1.00</b>
30°C	86°F	0.99
35°C	95°F	0.98
40°C	104°F	0.97

### Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	Lumen Maintenance Factor
25,000	0.96
50,000	0.92
100,000	0.85

#### Motion Sensor Default Settings

Option	Dimmed State	High Level (when triggered)	Photocell Operation	Dwell Time	Ramp-up Time	Ramp-down Time
PIR or PIRH	3V (37%) Output	10V (100%) Output	Enabled @ 5FC	5 min	3 sec	5 min
*PIR1FC3V or PIRH1FC3V	3V (37%) Output	10V (100%) Output	Enabled @ 1FC	5 min	3 sec	5 min

\*for use with separate Dusk to Dawn or timer.

### Electrical Load

					Current (A)					
	Performance Package	LED Count	Drive Current	Wattage	120	208	240	277	347	480
Forward Optics (Non-Rotated)	P1	20	530	38	0.32	0.18	0.15	0.15	0.10	0.08
	P2	20	700	49	0.41	0.23	0.20	0.19	0.14	0.11
	P3	20	1050	71	0.60	0.37	0.32	0.27	0.21	0.15
	P4	20	1400	92	0.77	0.45	0.39	0.35	0.28	0.20
	P5	40	700	89	0.74	0.43	0.38	0.34	0.26	0.20
	P6	40	1050	134	1.13	0.65	0.55	0.48	0.39	0.29
	P7	40	1300	166	1.38	0.80	0.69	0.60	0.50	0.37
Rotated Optics (Requires L90 or R90)	P10	30	530	53	0.45	0.26	0.23	0.21	0.16	0.12
	P11	30	700	72	0.60	0.35	0.30	0.27	0.20	0.16
	P12	30	1050	104	0.88	0.50	0.44	0.39	0.31	0.23
	P13	30	1300	128	1.08	0.62	0.54	0.48	0.37	0.27

### Controls Options

Nomenclature	Description	Functionality	Primary control device	Notes
FAO	Field adjustable output device installed inside the luminaire; wired to the driver dimming leads.	Allows the luminaire to be manually dimmed, effectively trimming the light output.	FAO device	Cannot be used with other controls options that need the 0-10V leads
DS	Drivers wired independently for 50/50 luminaire operation	The luminaire is wired to two separate circuits, allowing for 50/50 operation.	Independently wired drivers	Requires two separately switched circuits. Consider nLight AIR as a more cost effective alternative.
PERS or PER7	Twist-lock photocell receptacle	Compatible with standard twist-lock photocells for dusk to dawn operation, or advanced control nodes that provide 0-10V dimming signals.	Twist-lock photocells such as DLL Elite or advanced control nodes such as ROAM.	Pins 4 & 5 to dimming leads on driver, Pins 6 & 7 are capped inside luminaire
PIR or PIRH	Motion sensors with integral photocell. PIR for 8-15' mounting; PIRH for 15-30' mounting	Luminaires dim when no occupancy is detected.	Acuity Controls SBGR	Also available with PIRH1FC3V when the sensor photocell is used for dusk-to-dawn operation.
NLTAIR2 PIRHN	nLight AIR enabled luminaire for motion sensing, photocell and wireless communication.	Motion and ambient light sensing with group response. Scheduled dimming with motion sensor over-ride when wirelessly connected to the nLight Eclipse.	nLight Air rSDGR	nLight AIR sensors can be programmed and commissioned from the ground using the CIAIRity Pro app.



# Performance Data

## Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics																			
Power Package	LED Count	Drive Current	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P1	20	530	38W	T1S	4,369	1	0	1	115	4,706	1	0	1	124	4,766	1	0	1	125
				T2S	4,364	1	0	1	115	4,701	1	0	1	124	4,761	1	0	1	125
				T2M	4,387	1	0	1	115	4,726	1	0	1	124	4,785	1	0	1	126
				T3S	4,248	1	0	1	112	4,577	1	0	1	120	4,634	1	0	1	122
				T3M	4,376	1	0	1	115	4,714	1	0	1	124	4,774	1	0	1	126
				T4M	4,281	1	0	1	113	4,612	1	0	2	121	4,670	1	0	2	123
				TFTM	4,373	1	0	1	115	4,711	1	0	2	124	4,771	1	0	2	126
				TSVS	4,548	2	0	0	120	4,900	2	0	0	129	4,962	2	0	0	131
				TSS	4,552	2	0	0	120	4,904	2	0	0	129	4,966	2	0	0	131
				TSM	4,541	3	0	1	120	4,891	3	0	1	129	4,953	3	0	1	130
				TSW	4,576	3	0	2	120	4,929	3	0	2	130	4,992	3	0	2	131
				BLC	3,586	1	0	1	94	3,863	1	0	1	102	3,912	1	0	1	103
				LCCO	2,668	1	0	1	70	2,874	1	0	2	76	2,911	1	0	2	77
				RCCO	2,668	1	0	1	70	2,874	1	0	2	76	2,911	1	0	2	77
P2	20	700	49W	T1S	5,570	1	0	1	114	6,001	1	0	1	122	6,077	2	0	2	124
				T2S	5,564	1	0	2	114	5,994	1	0	2	122	6,070	2	0	2	124
				T2M	5,593	1	0	1	114	6,025	1	0	1	123	6,102	1	0	1	125
				T3S	5,417	1	0	2	111	5,835	1	0	2	119	5,909	2	0	2	121
				T3M	5,580	1	0	2	114	6,011	1	0	2	123	6,087	1	0	2	124
				T4M	5,458	1	0	2	111	5,880	1	0	2	120	5,955	1	0	2	122
				TFTM	5,576	1	0	2	114	6,007	1	0	2	123	6,083	1	0	2	124
				TSVS	5,799	2	0	0	118	6,247	2	0	0	127	6,327	2	0	0	129
				TSS	5,804	2	0	0	118	6,252	2	0	0	128	6,332	2	0	1	129
				TSM	5,789	3	0	1	118	6,237	3	0	1	127	6,316	3	0	1	129
				TSW	5,834	3	0	2	119	6,285	3	0	2	128	6,364	3	0	2	130
				BLC	4,572	1	0	1	93	4,925	1	0	1	101	4,987	1	0	1	102
				LCCO	3,402	1	0	2	69	3,665	1	0	2	75	3,711	1	0	2	76
				RCCO	3,402	1	0	2	69	3,665	1	0	2	75	3,711	1	0	2	76
P3	20	1050	71W	T1S	7,833	2	0	2	110	8,438	2	0	2	119	8,545	2	0	2	120
				T2S	7,825	2	0	2	110	8,429	2	0	2	119	8,536	2	0	2	120
				T2M	7,865	2	0	2	111	8,473	2	0	2	119	8,580	2	0	2	121
				T3S	7,617	2	0	2	107	8,205	2	0	2	116	8,309	2	0	2	117
				T3M	7,846	2	0	2	111	8,452	2	0	2	119	8,559	2	0	2	121
				T4M	7,675	2	0	2	108	8,269	2	0	2	116	8,373	2	0	2	118
				TFTM	7,841	2	0	2	110	8,447	2	0	2	119	8,554	2	0	2	120
				TSVS	8,155	3	0	0	115	8,785	3	0	0	124	8,896	3	0	0	125
				TSS	8,162	3	0	1	115	8,792	3	0	1	124	8,904	3	0	1	125
				TSM	8,141	3	0	2	115	8,770	3	0	2	124	8,881	3	0	2	125
				TSW	8,204	3	0	2	116	8,838	4	0	2	124	8,950	4	0	2	126
				BLC	6,429	1	0	2	91	6,926	1	0	2	98	7,013	1	0	2	99
				LCCO	4,784	1	0	2	67	5,153	1	0	2	73	5,218	1	0	2	73
				RCCO	4,784	1	0	2	67	5,153	1	0	2	73	5,218	1	0	2	73
P4	20	1400	92W	T1S	9,791	2	0	2	106	10,547	2	0	2	115	10,681	2	0	2	116
				T2S	9,780	2	0	2	106	10,536	2	0	2	115	10,669	2	0	2	116
				T2M	9,831	2	0	2	107	10,590	2	0	2	115	10,724	2	0	2	117
				T3S	9,521	2	0	2	103	10,256	2	0	2	111	10,386	2	0	2	113
				T3M	9,807	2	0	2	107	10,565	2	0	2	115	10,698	2	0	2	116
				T4M	9,594	2	0	2	104	10,335	2	0	3	112	10,466	2	0	3	114
				TFTM	9,801	2	0	2	107	10,558	2	0	2	115	10,692	2	0	2	116
				TSVS	10,193	3	0	1	111	10,981	3	0	1	119	11,120	3	0	1	121
				TSS	10,201	3	0	1	111	10,990	3	0	1	119	11,129	3	0	1	121
				TSM	10,176	4	0	2	111	10,962	4	0	2	119	11,101	4	0	2	121
				TSW	10,254	4	0	3	111	11,047	4	0	3	120	11,186	4	0	3	122
				BLC	8,036	1	0	2	87	8,656	1	0	2	94	8,766	1	0	2	95
				LCCO	5,979	1	0	2	65	6,441	1	0	2	70	6,523	1	0	3	71
					5,979	1	0	2	65	6,441	1	0	2	70	6,523	1	0	3	71

# Performance Data

## Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics																			
Power Package	LED Count	Drive Current	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P5	40	700	89W	T1S	10,831	2	0	2	122	11,668	2	0	2	131	11,816	2	0	2	133
				T2S	10,820	2	0	2	122	11,656	2	0	2	131	11,803	2	0	2	133
				T2M	10,876	2	0	2	122	11,716	2	0	2	132	11,864	2	0	2	133
				T3S	10,532	2	0	2	118	11,346	2	0	2	127	11,490	2	0	2	129
				T3M	10,849	2	0	2	122	11,687	2	0	2	131	11,835	2	0	2	133
				T4M	10,613	2	0	3	119	11,434	2	0	3	128	11,578	2	0	3	130
				TFTM	10,842	2	0	2	122	11,680	2	0	2	131	11,828	2	0	2	133
				TSVS	11,276	3	0	1	127	12,148	3	0	1	136	12,302	3	0	1	138
				T5S	11,286	3	0	1	127	12,158	3	0	1	137	12,312	3	0	1	138
				T5M	11,257	4	0	2	126	12,127	4	0	2	136	12,280	4	0	2	138
				TSW	11,344	4	0	3	127	12,221	4	0	3	137	12,375	4	0	3	139
				BLC	8,890	1	0	2	100	9,576	1	0	2	108	9,698	1	0	2	109
				LCCO	6,615	1	0	3	74	7,126	1	0	3	80	7,216	1	0	3	81
				RCCO	6,615	1	0	3	74	7,126	1	0	3	80	7,216	1	0	3	81
				P6	40	1050	134W	T1S	14,805	3	0	3	110	15,949	3	0	3	119	16,151
T2S	14,789	3	0					3	110	15,932	3	0	3	119	16,134	3	0	3	120
T2M	14,865	3	0					3	111	16,014	3	0	3	120	16,217	3	0	3	121
T3S	14,396	3	0					3	107	15,509	3	0	3	116	15,705	3	0	3	117
T3M	14,829	2	0					3	111	15,975	3	0	3	119	16,177	3	0	3	121
T4M	14,507	2	0					3	108	15,628	3	0	3	117	15,826	3	0	3	118
TFTM	14,820	2	0					3	111	15,965	3	0	3	119	16,167	3	0	3	121
TSVS	15,413	4	0					1	115	16,604	4	0	1	124	16,815	4	0	1	125
T5S	15,426	3	0					1	115	16,618	4	0	1	124	16,828	4	0	1	126
T5M	15,387	4	0					2	115	16,576	4	0	2	124	16,786	4	0	2	125
TSW	15,506	4	0					3	116	16,704	4	0	3	125	16,915	4	0	3	126
BLC	12,151	1	0					2	91	13,090	1	0	2	98	13,255	1	0	2	99
LCCO	9,041	1	0					3	67	9,740	1	0	3	73	9,863	1	0	3	74
RCCO	9,041	1	0					3	67	9,740	1	0	3	73	9,863	1	0	3	74
P7	40	1300	166W					T1S	17,023	3	0	3	103	18,338	3	0	3	110	18,570
				T2S	17,005	3	0	3	102	18,319	3	0	3	110	18,551	3	0	3	112
				T2M	17,092	3	0	3	103	18,413	3	0	3	111	18,646	3	0	3	112
				T3S	16,553	3	0	3	100	17,832	3	0	3	107	18,058	3	0	3	109
				T3M	17,051	3	0	3	103	18,369	3	0	3	111	18,601	3	0	3	112
				T4M	16,681	3	0	3	100	17,969	3	0	3	108	18,197	3	0	3	110
				TFTM	17,040	3	0	3	103	18,357	3	0	4	111	18,590	3	0	4	112
				TSVS	17,723	4	0	1	107	19,092	4	0	1	115	19,334	4	0	1	116
				T5S	17,737	4	0	2	107	19,108	4	0	2	115	19,349	4	0	2	117
				T5M	17,692	4	0	2	107	19,059	4	0	2	115	19,301	4	0	2	116
				TSW	17,829	5	0	3	107	19,207	5	0	3	116	19,450	5	0	3	117
				BLC	13,971	2	0	2	84	15,051	2	0	2	91	15,241	2	0	2	92
				LCCO	10,396	1	0	3	63	11,199	1	0	3	67	11,341	1	0	3	68
					10,396	1	0	3	63	11,199	1	0	3	67	11,341	1	0	3	68

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Rotated Optics																			
Power Package	LED Count	Drive Current	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P10	30	530	53W	T1S	6,727	2	0	2	127	7,247	3	0	3	137	7,339	3	0	3	138
				T2S	6,689	3	0	3	126	7,205	3	0	3	136	7,297	3	0	3	138
				T2M	6,809	3	0	3	128	7,336	3	0	3	138	7,428	3	0	3	140
				T3S	6,585	3	0	3	124	7,094	3	0	3	134	7,183	3	0	3	136
				T3M	6,805	3	0	3	128	7,331	3	0	3	138	7,424	3	0	3	140
				T4M	6,677	3	0	3	126	7,193	3	0	3	136	7,284	3	0	3	137
				TFTM	6,850	3	0	3	129	7,379	3	0	3	139	7,472	3	0	3	141
				TSVS	6,898	3	0	0	130	7,431	3	0	0	140	7,525	3	0	0	142
				T5S	6,840	2	0	1	129	7,368	2	0	1	139	7,461	2	0	1	141
				TSM	6,838	3	0	1	129	7,366	3	0	2	139	7,460	3	0	2	141
				TSW	6,777	3	0	2	128	7,300	3	0	2	138	7,393	3	0	2	139
				BLC	5,626	2	0	2	106	6,060	2	0	2	114	6,137	2	0	2	116
				LCCO	4,018	1	0	2	76	4,328	1	0	2	82	4,383	1	0	2	83
				RCCO	4,013	3	0	3	76	4,323	3	0	3	82	4,377	3	0	3	83
				P11	30	700	72W	T1S	8,594	3	0	3	119	9,258	3	0	3	129	9,376
T2S	8,545	3	0					3	119	9,205	3	0	3	128	9,322	3	0	3	129
T2M	8,699	3	0					3	121	9,371	3	0	3	130	9,490	3	0	3	132
T3S	8,412	3	0					3	117	9,062	3	0	3	126	9,177	3	0	3	127
T3M	8,694	3	0					3	121	9,366	3	0	3	130	9,484	3	0	3	132
T4M	8,530	3	0					3	118	9,189	3	0	3	128	9,305	3	0	3	129
TFTM	8,750	3	0					3	122	9,427	3	0	3	131	9,546	3	0	3	133
TSVS	8,812	3	0					0	122	9,493	3	0	0	132	9,613	3	0	0	134
T5S	8,738	3	0					1	121	9,413	3	0	1	131	9,532	3	0	1	132
TSM	8,736	3	0					2	121	9,411	3	0	2	131	9,530	3	0	2	132
TSW	8,657	4	0					2	120	9,326	4	0	2	130	9,444	4	0	2	131
BLC	7,187	3	0					3	100	7,742	3	0	3	108	7,840	3	0	3	109
LCCO	5,133	1	0					2	71	5,529	1	0	2	77	5,599	1	0	2	78
RCCO	5,126	3	0					3	71	5,522	3	0	3	77	5,592	3	0	3	78
P12	30	1050	104W					T1S	12,149	3	0	3	117	13,088	3	0	3	126	13,253
				T2S	12,079	4	0	4	116	13,012	4	0	4	125	13,177	4	0	4	127
				T2M	12,297	3	0	3	118	13,247	3	0	3	127	13,415	3	0	3	129
				T3S	11,891	4	0	4	114	12,810	4	0	4	123	12,972	4	0	4	125
				T3M	12,290	3	0	3	118	13,239	4	0	4	127	13,407	4	0	4	129
				T4M	12,058	4	0	4	116	12,990	4	0	4	125	13,154	4	0	4	126
				TFTM	12,369	4	0	4	119	13,325	4	0	4	128	13,494	4	0	4	130
				TSVS	12,456	3	0	1	120	13,419	3	0	1	129	13,589	4	0	1	131
				T5S	12,351	3	0	1	119	13,306	3	0	1	128	13,474	3	0	1	130
				TSM	12,349	4	0	2	119	13,303	4	0	2	128	13,471	4	0	2	130
				TSW	12,238	4	0	3	118	13,183	4	0	3	127	13,350	4	0	3	128
				BLC	10,159	3	0	3	98	10,944	3	0	3	105	11,083	3	0	3	107
				LCCO	7,256	1	0	3	70	7,816	1	0	3	75	7,915	1	0	3	76
				RCCO	7,246	3	0	3	70	7,806	4	0	4	75	7,905	4	0	4	76
				P13	30	1300	128W	T1S	14,438	3	0	3	113	15,554	3	0	3	122	15,751
T2S	14,355	4	0					4	112	15,465	4	0	4	121	15,660	4	0	4	122
T2M	14,614	3	0					3	114	15,744	4	0	4	123	15,943	4	0	4	125
T3S	14,132	4	0					4	110	15,224	4	0	4	119	15,417	4	0	4	120
T3M	14,606	4	0					4	114	15,735	4	0	4	123	15,934	4	0	4	124
T4M	14,330	4	0					4	112	15,438	4	0	4	121	15,633	4	0	4	122
TFTM	14,701	4	0					4	115	15,836	4	0	4	124	16,037	4	0	4	125
TSVS	14,804	4	0					1	116	15,948	4	0	1	125	16,150	4	0	1	126
T5S	14,679	3	0					1	115	15,814	3	0	1	124	16,014	3	0	1	125
TSM	14,676	4	0					2	115	15,810	4	0	2	124	16,010	4	0	2	125
TSW	14,544	4	0					3	114	15,668	4	0	3	122	15,866	4	0	3	124
BLC	7919	3	0					3	62	8531	3	0	3	67	8639	3	0	3	67
LCCO	5145	1	0					2	40	5543	1	0	2	43	5613	1	0	2	44
	5139	3	0					3	40	5536	3	0	3	43	5606	3	0	3	44

## Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and system-level interoperability.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is A+ Certified when ordered with DTL® controls marked by a shaded background. DTL DLL equipped luminaires meet the A+ specification for luminaire to photocontrol interoperability<sup>1</sup>
- This luminaire is part of an A+ Certified solution for ROAM® or XPoint™ Wireless control networks, providing out-of-the-box control compatibility with simple commissioning, when ordered with drivers and control options marked by a shaded background<sup>1</sup>

To learn more about A+, visit [www.acuitybrands.com/aplus](http://www.acuitybrands.com/aplus).

1. See ordering tree for details.
2. A+ Certified Solutions for ROAM require the order of one ROAM node per luminaire.  
Sold Separately: [Link to Roam](#); [Link to DTL DLL](#)

## FEATURES & SPECIFICATIONS

### INTENDED USE

The sleek design of the D-Series Size 0 reflects the embedded high performance LED technology. It is ideal for many commercial and municipal applications, such as parking lots, plazas, campuses, and pedestrian areas.

### CONSTRUCTION

Single-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance and future light engine upgrades. The LED driver is mounted in direct contact with the casting to promote low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65). Low EPA (0.95 ft<sup>2</sup>) for optimized pole wind loading.

### FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in both textured and non-textured finishes.

### OPTICS

Precision-molded proprietary acrylic lenses are engineered for superior area lighting distribution, uniformity, and pole spacing. Light engines are available in 3000 K, 4000 K or 5000 K (70 CRI) configurations. The D-Series Size 0 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

### ELECTRICAL

Light engine(s) configurations consist of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L85/100,000 hours at 25°C). Class 1 electronic drivers are designed to have a power factor >90%, THD <20%, and an expected life of 100,000 hours with <1% failure rate. Easily serviceable 10kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

### STANDARD CONTROLS

The DSX0 LED area luminaire has a number of control options. Dusk to dawn controls can be utilized via optional NEMA twist-lock photocell receptacles. Integrated motion sensors with on-board photocells feature field-adjustable programming and are suitable for mounting heights up to 30 feet.

### nLIGHT AIR CONTROLS

The DSX0 LED area luminaire is also available with nLight® AIR for the ultimate in wireless control. This powerful controls platform provides out-of-the-box basic motion sensing and photocontrol functionality and is suitable for mounting heights up to 40 feet. Once commissioned using a smartphone and the easy-to-use CLAIRITY app, nLight AIR equipped luminaires can be grouped, resulting in motion sensor and photocell group response without the need for additional equipment. Scheduled dimming with motion sensor over-ride can be achieved when used with the nLight Eclipse. Additional information about nLight Air can be found [here](#).

### INSTALLATION

Included mounting block and integral arm facilitate quick and easy installation. Stainless steel bolts fasten the mounting block securely to poles and walls, enabling the D-Series Size 0 to withstand up to a 3.0 G vibration load rating per ANSI C136.31. The D-Series Size 0 utilizes the AERIS™ series pole drilling pattern (template #8). Optional terminal block and NEMA photocell receptacle are also available.

### LISTINGS

UL Listed for wet locations. Light engines are IP66 rated; luminaire is IP65 rated. Rated for -40°C minimum ambient. U.S. Patent No. D672,492 S. International patent pending.

DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at [www.designlights.org/QPL](http://www.designlights.org/QPL) to confirm which versions are qualified.

International Dark-Sky Association (IDA) Fixture Seal of Approval (FSA) is available for all products on this page utilizing 3000K color temperature only.

### WARRANTY

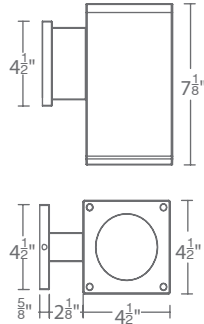
5-year limited warranty. Complete warranty terms located at: [www.acuitybrands.com/support/customer-support/terms-and-conditions](http://www.acuitybrands.com/support/customer-support/terms-and-conditions)

**Note:** Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.





Fixture Type:

**SWD**

Catalog Number:

Project:

Location:

### PRODUCT DESCRIPTION

The latest energy efficient LED technology in an appealing cubical profile delivers accent and wall wash lighting. Comes in various light distribution and beam angle options.

### FEATURES

- High performance exterior rated LED wall mount light
- Fixture can install upside down to alter light distribution
- Solid aluminum construction
- 5 year warranty

### SPECIFICATIONS

- Input:** Universal voltage 120V - 277VAC, 50/60Hz
- Dimming:** Electronic low voltage (ELV) : 100% - 5%  
0-10V: 100% - 1%
- Light Source:** High output 3 Step Mac Adam Ellipse COB  
Rated life of 60,000 hours at L70
- Finish:** Electrostatically powder coated, white, black, bronze and graphite
- Standards:** IP65 rated, UL & cUL wet location listed, Energy Star® 2.2 rated Title 24 JA8-2016 Compliant
- Operating Temp:** -13°F to 122°F (-25°C to 50°C)

### ORDERING NUMBER

Diameter	Watt	Beam	Beam Angle	Color Temp	CRI	Reference Output <sup>1</sup> Lumen	CBCP	Efficacy (lm/w)	Light Distribution	Finish			
DC-WS05	5"	S Straight up or down	16°	927S	2700K	90	1825	10050	73		BK Black WT White BZ Bronze GH Graphite		
				827S	2700K	85	2190	12057	88				
				930S	3000K	90	1895	10427	76				
				830S	3000K	85	2300	12644	92				
				835S	3500K	85	2350	12937	94				
		840S	4000K	85	2375	13062	95						
		N Straight up or down	25°	927S	2700K	90	1810	5280	72				
				827S	2700K	85	2170	6335	87				
				930S	3000K	90	1880	5478	75				
				830S	3000K	85	2275	6643	91				
				835S	3500K	85	2330	6797	93				
		840S	4000K	85	2350	6863	94						
		DC-WS0517	5"	F Straight up or down	33°	927S	2700K	90	1900	4515		76	
						827S	2700K	85	2280	5417		91	
						930S	3000K	90	1970	4685		79	
830S	3000K					85	2390	5681	96				
835S	3500K					85	2445	5812	98				
840S	4000K	85	2470	5870	99								
F Away from the wall	N/A	927A	2700K	90	2000		80						
		827A	2700K	85	2400		96						
		930A	3000K	90	2075	N/A	83						
		830A	3000K	85	2520	N/A	101						
		835A	3500K	85	2575		103						
840A	4000K	85	2600		104								
F Towards the wall	N/A	927B	2700K	90	2000		80						
		827B	2700K	85	2400		96						
		930B	3000K	90	2075	N/A	83						
		830B	3000K	85	2520	N/A	101						
		835B	3500K	85	2575		103						
840B	4000K	85	2600		104								

**DC-WS05-** \_\_\_\_\_ - \_\_\_\_\_ <sup>1</sup>Reference output shows 25W output. Multiply by 0.7 to determine output for 17W combinations.

Example: **DC-WS05-F930A-WT**

wacighting.com  
Phone (800) 526.2588  
Fax (800) 526.2585

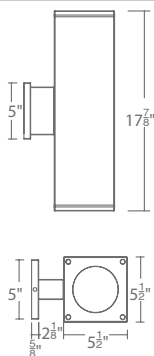
Headquarters/Eastern Distribution Center  
44 Harbor Park Drive  
Port Washington, NY 11050

Central Distribution Center  
1600 Distribution Ct  
Lithia Springs, GA 30122

Western Distribution Center  
1750 Archibald Avenue  
Ontario, CA 91760



## LED Wall Mounts



Fixture Type:

**SWDU**

Catalog Number:

Project:

Location:

### PRODUCT DESCRIPTION

The latest energy efficient LED technology in an appealing cubical profile delivers accent and wall wash lighting. Comes in various light distribution and beam angle options.

### FEATURES

- High performance exterior rated LED wall mount light
- Fixture can install upside down to alter light distribution
- Solid aluminum construction
- 5 year warranty

### SPECIFICATIONS

<b>Input:</b>	Universal voltage 120V - 277VAC, 50/60Hz
<b>Dimming:</b>	Electronic low voltage (ELV) : 100% - 5% 0-10V: 100% - 1%
<b>Light Source:</b>	High output 3 Step Mac Adam Ellipse COB Rated life of 60,000 hours at L70
<b>Finish:</b>	Electrostatically powder coated, white, black, bronze and graphite
<b>Standards:</b>	IP65 rated, UL & cUL wet location listed Title 24 JA8-2016 Compliant
<b>Operating Temp:</b>	-13°F to 122°F (-25°C to 50°C)

### ORDERING NUMBER

Diameter	Watt	Beam	Beam Angle	Color Temp	CRI	Reference Output <sup>1</sup>			Light Distribution	Finish	
						Lumen	CBCP	Efficacy (lm/w)			
<b>DC-WD06</b>	6" 35W x 2	<b>S</b> Straight up and down	16°	<b>927S</b>	2700K	90	2820 x 2	18842 x 2	81 x 2		<b>BK</b> Black <b>WT</b> White <b>BZ</b> Bronze <b>GH</b> Graphite
				<b>827S</b>	2700K	85	3385 x 2	22608 x 2	97 x 2		
				<b>930S</b>	3000K	90	2925 x 2	19543 x 2	84 x 2		
				<b>830S</b>	3000K	85	3535 x 2	23632 x 2	101 x 2		
				<b>835S</b>	3500K	85	3630 x 2	24255 x 2	104 x 2		
		<b>840S</b>	4000K	85	3665 x 2	24490 x 2	105 x 2				
		<b>N</b> Straight up and down	28°	<b>927S</b>	2700K	90	2800 x 2	7992 x 2	80 x 2		
				<b>827S</b>	2700K	85	3360 x 2	9589 x 2	96 x 2		
				<b>930S</b>	3000K	90	2900 x 2	8290 x 2	83 x 2		
				<b>830S</b>	3000K	85	3510 x 2	10024 x 2	100 x 2		
				<b>835S</b>	3500K	85	3600 x 2	10288 x 2	103 x 2		
		<b>840S</b>	4000K	85	3635 x 2	10388 x 2	104 x 2				
		<b>F</b> Straight up and down	38°	<b>927S</b>	2700K	90	2825 x 2	5451 x 2	81 x 2		
				<b>827S</b>	2700K	85	3390 x 2	6540 x 2	97 x 2		
				<b>930S</b>	3000K	90	2930 x 2	5654 x 2	84 x 2		
<b>830S</b>	3000K			85	3545 x 2	6836 x 2	101 x 2				
<b>835S</b>	3500K			85	3640 x 2	7017 x 2	104 x 2				
<b>840S</b>	4000K	85	3675 x 2	7085 x 2	105 x 2						
<b>DC-WD0644</b>	6" 22W x 2	<b>F</b> Away from the wall	N/A	<b>927A</b>	2700K	90	2860 x 2	N/A	82 x 2		
				<b>827A</b>	2700K	85	3435 x 2	N/A	98 x 2		
				<b>930A</b>	3000K	90	2970 x 2	N/A	85 x 2		
				<b>830A</b>	3000K	85	3590 x 2	N/A	103 x 2		
				<b>835A</b>	3500K	85	3685 x 2	N/A	105 x 2		
<b>840A</b>	4000K	85	3720 x 2	N/A	106 x 2						
<b>F</b> Towards the wall	N/A	<b>927B</b>	2700K	90	2860 x 2	N/A	82 x 2				
		<b>827B</b>	2700K	85	3435 x 2	N/A	98 x 2				
		<b>930B</b>	3000K	90	2970 x 2	N/A	85 x 2				
		<b>830B</b>	3000K	85	3590 x 2	N/A	103 x 2				
		<b>835B</b>	3500K	85	3685 x 2	N/A	105 x 2				
<b>840B</b>	4000K	85	3720 x 2	N/A	106 x 2						
<b>F</b> One side each	N/A	<b>927C</b>	2700K	90	2860 x 2	N/A	82 x 2				
		<b>827C</b>	2700K	85	3435 x 2	N/A	98 x 2				
		<b>930C</b>	3000K	90	2970 x 2	N/A	85 x 2				
		<b>830C</b>	3000K	85	3590 x 2	N/A	103 x 2				
		<b>835C</b>	3500K	85	3685 x 2	N/A	105 x 2				
<b>840C</b>	4000K	85	3720 x 2	N/A	106 x 2						

**DC-WD06-** \_\_\_\_\_ - \_\_\_\_\_ Example: **DC-WD06-F930A-WT** <sup>1</sup>Reference output shows 35W output. Multiply by 0.7 to determine output for 22W combinations.

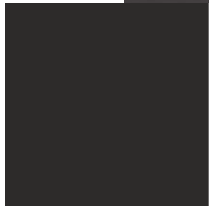
wacighting.com  
Phone (800) 526.2588  
Fax (800) 526.2585

Headquarters/Eastern Distribution Center  
44 Harbor Park Drive  
Port Washington, NY 11050

Central Distribution Center  
1600 Distribution Ct  
Lithia Springs, GA 30122

Western Distribution Center  
1750 Archibald Avenue  
Ontario, CA 91760

# MATERIAL AND COLOR BOARD

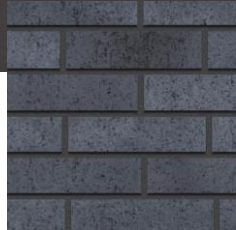


**Metal Siding**

MFR: Morin

Color: Bristol Black

Trim/Fascia to match

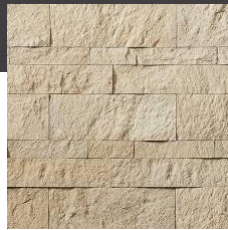


**Brick**

MFR: Pacific Clay

Color: Dark Iron Spot

Texture: Modular Smooth



**Stone**

MFR: Boral

Series: Talus

Color: Hewn Stone



**Siding**

MFR: James Hardie

Color: Dovetail - SW 7108



**Wood Lap**

MFR: Woodtone on Allura

Style: Rustic Series

Colors: Aspen Ridge/Maple/Old Cherry

New Building for Advance Dental Arts Center - 1575 Burns Street

**PC-4**  
**Public Testimony**

**From:** [Mike Gates](#)  
**To:** [Arnold, Jennifer](#)  
**Subject:** File No. DR-20-02  
**Date:** Saturday, August 29, 2020 5:20:54 PM

---

**CAUTION:** This email originated from an External source. Do not click links, open attachments, or follow instructions from this sender unless you recognize the sender and know the content is safe. If you are unsure, please contact the Help Desk immediately for further assistance.

City staff [including the Public Works Department] and West Linn Planning Commission:

Please accept the following as questions to be considered for the virtual public hearing on September 16, 2020 for File No. DR-20-02:

1) Because Burns St is a heavily used street for its small size and is without sidewalks in the curves, will the ingress and egress from any parking at the property considered in this Design Review be placed in such a fashion that it is safe for both vehicles and pedestrians?

2) Will there be consideration by the Public Works department to replace the "pornographic" sign on the downslope of Burns Street? It was probably a cause for humor as it was being prepared, but residents along that area have grown tired of the image, and the need to explain its usage to our children and grandchildren. We know of an effort to have it used as an image of humor in social media. West Linn does not need or want that sign as its representation in any media form.

3) Will placement of "traffic mirrors" be considered or placed at the entrance to Cascade Street and at the beginning and end of the "S" curve on Burns St? The number of near misses by cars (of other cars and pedestrians) has increased dramatically in recent months because of the dramatic increase in delivery trucks (USPS/Fedex/UPS/Amazon Prime and others) stopping in the curves in front of various houses.

(Thankfully, there is plenty of room to pull into our own driveway so delivery trucks on our part of the downslope do not have to add to the problem.)

Consideration of these questions by City staff and the Planning Commission would be deeply appreciated.

Best regards,  
Michael and Geri Gates  
1471 Burns Street, West Linn, Oregon 97068  
[gates1588@gmail.com](mailto:gates1588@gmail.com)  
(cell phone) 503-956-1510

**PC-5**

**ODOT Traffic Impact Analysis Letters**





# Oregon

Kate Brown, Governor

## Department of Transportation

Region 1 Headquarters  
123 NW Flanders Street  
Portland, Oregon 97209  
(503) 731.8200  
FAX (503) 731.8259

March 27, 2020

ODOT #10616

## ODOT Response

<b>Project Name:</b> Dental & Physical Therapy Clinic	<b>Applicant:</b> Sam Thomas, Lenity Architecture
<b>Jurisdiction:</b> City of West Linn	<b>Jurisdiction Case #:</b> DR-20-02
<b>Site Address:</b> 1575 Burns Street West Linn, OR 97068	<b>Legal Description:</b> 02S 02E 30BD <b>Tax Lot(s):</b> 02501
<b>State Highway:</b> OR 43	<b>Mileposts:</b> 10.8

The site of this proposed land use action is in the vicinity of OR 43 (Willamette Drive). ODOT has permitting authority for this facility and an interest in ensuring that this proposed land use is compatible with its safe and efficient operation.

### COMMENTS/FINDINGS

ODOT has reviewed the submitted application materials for the proposed clinic at 1575 Burns Street. The proposal includes demolishing an existing single-family dwelling and constructing a new 6,922 square foot medical office building. The new clinic would house a dental clinic and physical therapy clinic.

ODOT recommends that the applicant be required to submit a Traffic Impact Analysis to assess the impacts of the proposed use to the intersection of OR 43 (Willamette Dr.) and Burns Street. Please contact the ODOT traffic representative below to participate in the scoping process.

### ODOT RECOMMENDED LOCAL CONDITIONS OF APPROVAL

#### Traffic Impacts

- The applicant shall submit a traffic impact analysis to assess the impacts of the proposed use on the State highway system. The analysis must be conducted by a Professional Engineer registered in Oregon. **Contact the ODOT Traffic representative identified below and the local jurisdiction to scope the study.**

**Please send a copy of the Staff Report and/or Notice of Decision including conditions of approval to:**

ODOT Region 1 Planning  
Development Review  
123 NW Flanders St  
Portland, OR 97209

[ODOT\\_R1\\_DevRev@odot.state.or.us](mailto:ODOT_R1_DevRev@odot.state.or.us)

Development Review Planner: Kate Hawkins	503.731.3049 kate.w.hawkins@odot.state.or.us
Traffic Contact: Avi Tayar, P.E.	503.731.8221 abraham.tayar@odot.state.or.us
District Contact: District 2B	d2bup@odot.state.or.us



# Oregon

Kate Brown, Governor

## Department of Transportation

Region 1 Headquarters  
123 NW Flanders Street  
Portland, Oregon 97209  
(503) 731.8200  
FAX (503) 731.8259

April 30, 2020

ODOT #10616

## ODOT Response

<b>Project Name:</b> Dental & Physical Therapy Clinic	<b>Applicant:</b> Sam Thomas, Lenity Architecture
<b>Jurisdiction:</b> City of West Linn	<b>Jurisdiction Case #:</b> DR-20-02
<b>Site Address:</b> 1575 Burns Street West Linn, OR 97068	<b>Legal Description:</b> 02S 02E 30BD <b>Tax Lot(s):</b> 02501
<b>State Highway:</b> OR 43	<b>Mileposts:</b> 10.8

The site of this proposed land use action is in the vicinity of OR 43 (Willamette Drive). ODOT has permitting authority for this facility and an interest in ensuring that this proposed land use is compatible with its safe and efficient operation.

### COMMENTS/FINDINGS

ODOT has reviewed the submitted application materials for the proposed clinic at 1575 Burns Street. The proposal includes demolishing an existing single-family dwelling and constructing a new 6,922 square foot medical office building. The new clinic would house a dental clinic and physical therapy clinic.

In our comment letter dated March 27, 2020, ODOT recommended that the applicant be required to submit a Traffic Impact Analysis (TIA) to assess the impacts of the proposed use to the intersection of OR 43 (Willamette Dr.) and Burns Street.

Upon subsequent correspondence with the applicant and City of West Linn, we have determined that a TIA is not currently feasible due to atypical traffic patterns and a lack of recent traffic counts or forecasted intersection operations at the intersection of OR 43 and Burns Street. As such, ODOT no longer recommends the applicant submit a traffic study. Alternatively, we recommend the City of West Linn require the applicant to contribute a proportionate share towards transportation improvements in the form of System Development Charges.

**Please send a copy of the Staff Report and/or Notice of Decision including conditions of approval to:**

ODOT Region 1 Planning  
Development Review  
123 NW Flanders St  
Portland, OR 97209

[ODOT\\_R1\\_DevRev@odot.state.or.us](mailto:ODOT_R1_DevRev@odot.state.or.us)

Development Review Planner: Kate Hawkins	503.731.3049 kate.w.hawkins@odot.state.or.us
Traffic Contact: Avi Tayar, P.E.	503.731.8221 abraham.tayar@odot.state.or.us
District Contact: District 2B	d2bup@odot.state.or.us