City of Sherwood
Oregon
Home of the Tualatin River National Wildlife Refuge

RECEIVED
JAN 18 2023
City of Sherwood
Planning Dept.

Case No. LU2023-001
Fee 7446.00
Receipt 045176
Date 1-18-2023
Application Type IV

Application for Land Use Action
Check All That Apply

- ☐ Annexation
- ☐ Conditional Use
- ☐ Plan Amendment / Map Amendment
- ☐ Site Plan Type II -- Fast Track*
- ☐ Site Plan Type II -- Design Upgraded*
- ☐ Site Plan Type III 15,000 – 40,000 Sq ft. Building + Parking
- ☑ Site Plan Type IV – 40,000+ Sq ft or in Old Town Overlay
- ☐ Modification / Major / Minor
- ☐ Medical / Recreational Marijuana Site Plan Review
- ☐ Planned Unit Development
- ☐ Partition (Subdivision no more than 3 lot)
- ☐ Subdivision Proposed # of Lots _____
- ☐ Lot Line Adjustment
- ☐ Variance

*Fast-track -- Site Plan review, defined as those site plan applications which propose less than 15,000 square feet of floor area, parking or seating capacity of public, institutional, commercial or industrial use permitted by the underlying zone, or up to a total of 20% increase in floor area, parking or seating capacity for a land use or structure subject to a Conditional Use Permit, except as follows: auditoriums, theaters, stadiums, and those applications subject to Section SZCDC16.72.010.A.4.

*Design Upgraded -- Site Plan review, defined as those site plan applications which propose between 15,001 and 40,000 square feet of floor area, parking or seating capacity and which propose a minimum of eighty percent (80%) of the total possible points of design criteria in the "Commercial Design Review Matrix" found in Section SZCDC 16.90.020.D.6.d.

☑ **Publication Fee:** $466.00 See City of Sherwood current Fee Schedule, which includes the "Publication/Distribution of Notice" fee, at www.sherwoodoregon.gov. Click on Government/Finance/Fee Schedule.

By submitting this form the Owner, or Owner's authorized agent/ representative, acknowledges and agrees that City of Sherwood employees, and appointed or elected City Officials, have authority to enter the project site at all reasonable times for the purpose of inspecting project site conditions and gathering information related specifically to the project site.

Owner/Applicant Information

Applicant: DD Sherwood One, LLC; Attn: Annie Carlton Phone: 503.297.8791

Applicant Address: 901 NE Glisan Street, Suite 100, Portland, OR 97232 Email: annie.carlton@deacon.com

Owner: Steve Deacon, President Phone: _____

Owner Address: 901 NE Glisan Street, Suite 100, Portland, OR 97232 Email: _____

Contact for Additional Information: DOWL; Attn: Mike Towle; 971.280.8641; mtowle@dowl.com

Property Information

Street Location: 16864 SW Edy Road

Tax Lot and Map No: 2S130DA 02200

Size of Property(ies) 1.73 acres

Proposed Action:

Purpose and Description of Proposed Action:

Two new commercial retail buildings (7,200 and 5,800 SF)

Proposed Use: Retail Commercial

Proposed No. of Phases (one year each): N/A

Authorizing Signatures:

I am the owner/authorized agent of the owner empowered to submit this application and affirm that the information submitted with this application is correct to the best of my knowledge.

I further acknowledge that I have read the applicable standards for review of the land use action I am requesting and understand that I must demonstrate to the City review authorities compliance with these standards prior to approval of my request.

Applicant's Signature — Date: 12/20/2022

Owner's Signature, MGR. — Date: 12/21/22

THE FOLLOWING MATERIALS ARE REQUIRED TO BE SUBMITTED WITH YOUR APPLICATION, OR IT WILL NOT BE ACCEPTED AT THE COUNTER

Once taken at the counter, the City has up to 30 days to review the materials submitted to determine if we have everything we need to complete the review. Applicant can verify submittal includes specific materials necessary for the application per checklist.

☐ **THREE (3) Copies of Application Form:** Completely filled out and signed by the property owner and/or person with authority to make decisions on the property

☐ **Copy of Deed:** Verifying ownership, easements, etc.

☐ **THREE (3) Folded Sets of Plans**

☐ **THREE (3) Copies* of Narrative:** Addressing Application Criteria

☐ **SERVICE PROVIDER LETTERS**

1) **Clean Water Services:** https://www.cleanwaterservices.org/permits-development/step-by-step-process/environmental-review/
2) **Tualatin Valley Fire & Rescue:** https://www.tvfr.com/399/Service-Provider-Permit

☐ **Fee** (Along with calculations utilized to determine fee if applicable)

☐ **Neighborhood Meeting Verification:** including affidavit, sign-in sheet and meeting summary (required for Type III, IV and V projects)

* **Note:** Upon initial submittal, *prior to completeness,* applicants are encouraged to submit only 3 copies for review. Once the application is deemed completed (FILL IN)

EXHIBIT Q

CEDAR CREEK LOT 2

SHERWOOD, OREGON

Application For:

Type II Development Review

January 2023

Applicant:
DOWL
309 SW 6th Ave Suite 700
Portland, Oregon 97204
Contact: Mike Towle
Phone: 971-280-8645

DOWL

#2322.14505.02

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INTRODUCTION

GENERAL INFORMATION

Applicant's Representative:	**DOWL** 309 SW 6th Ave Suite 700 Portland, Oregon 97204 Contact: Mike Towle Phone: (971) 280-8645 Email: Mtowle@dowl.com
Applicant/ Property Owner:	DD Sherwood One, LLC 901 NE Glisan Street, Suite 100 Portland, Oregon 97232 Contact: Annie Carlton Email: Annie.Carlton@deacon.com
Project Location:	16864 SW Edy Road, Sherwood OR 97140
Parcel Information:	2S130DA 02200
Current Zoning District:	Retail Commercial (RC)
Project Site Area:	+/- 1.73 acres / 75,359 square feet (SF)

II. PROJECT SUMMARY

Existing Conditions

The subject site is an approximate 1.73 acres section of Lot 2 of Cedar Creek Plaza, located on tax lot 2S130AD 02200 north of Highway 99W in Sherwood as reflected on the Existing Conditions Plan (Sheet C1.0) of Exhibit A. The Cedar Creek Plaza is comprised of seven commercial lots which were subdivided from the original parent parcel, Tax Lot 900, in 2017 (SUB 17-02). Development of the other six parcels (Lots 1 and 3-7) of Cedar Creek Plaza were approved under prior land use decisions (SP 16-10, CUP 16-06, VAR 17-01, MMSP 18-01, and MMSP 18-03); those parcels are currently developed with mixed retail and restaurant uses which operate collectively as a multiple-building retail shopping center with shared access, utilities, and parking. The site is located on a western portion of the existing subdivision and the site does not have frontage on a public street. The subdivision is located on the north side of SW Pacific Highway 99W, west of SW Edy Road. The Cedar Creek Plaza is accessible by existing driveways from SW Pacific Highway/Highway 99W, and to SW Edy Road. The site and surrounding developed properties are zoned RC Retail Commercial. The site abuts High Density Residential PUD properties to the northwest.

The development has frontage along SW Pacific Highway, a Principal Arterial under ODOT jurisdiction, and SW Edy Road is a Collector under City of Sherwood jurisdiction. Frontage improvements along both streets were completed with prior phases of site development. These improvements were designed consistent with the functional classification of each roadway as stipulated in the City of Sherwood Transportation System Plan.

The subdivision, which includes the subject site, is surrounded largely by other Retail Commercial (RC) lands, as well as High Density Residential PUD. The table below identifies adjacent uses and zoning. A vicinity map is provided in Exhibit B.

Surrounding Uses

	Zoning	Use
North	RC Retail Commercial	Health Care Center Assisted Living Facility
East	RC Retail Commercial	Commercial Retail Restaurant
South	RC Retail Commercial	Fitness Center
West	High Density Residential PUD	Single Family Residential

Project Description

This application proposes to develop Lot 2 of Cedar Creek Plaza to include two new commercial buildings and associated on-site parking, landscaping, and other site improvements. The buildings, proposed to be 7,200 square feet and 5,800 square feet, are shown on the Site Plan, included in Exhibit A, Sheet C2.0. The buildings will be used for all uses, which are permitted uses in the RC zone. The proposed building elevations are shown in Exhibit L. This narrative demonstrates project compliance with applicable code standards for the proposed site development and uses.

The site will be accessible from existing internal circulation aisles developed with prior phases of the Cedar Creek Plaza. Existing driveways at SW Pacific Highway and SW Edy Road serve the Cedar Creek Plaza and all associated lots. All public improvements required to serve the site, including right-of-way improvements and utilities were completed as part of the subdivision. A pedestrian walkway is proposed along the northwestern and southeastern sides of the new buildings which will connect to the existing pedestrian circulation system within the commercial development,

which connects to public sidewalks on abutting streets.

Site design features include:

- Two buildings (7,200 square feet and 5,800 square feet)
- 94 vehicle parking spaces, including 3 standard ADA-compliant stalls and 1 van accessible stall.
- 5 bike parking spaces
- Approximately 12,127 SF of landscaped area

Requested Approval

Per Sherwood Municipal Code 16.90.020, Site Plan Review is required for any development activity that requires a building permit. Compliance with applicable code criteria is demonstrated for the site and, where applicable, for each use. Site Plan Review approval is requested for this proposal.

III. SHERWOOD TITLE 16 ZONING AND COMMUNITY DEVELOPMENT CODE

The applicable Sherwood Zoning and Community Development Code provisions are set forth below along with findings demonstrating the project's consistency with these provisions. Code language that is not applicable to this proposal is not included.

Division II. - LAND USE AND DEVELOPMENT

Chapter 16.22 - COMMERCIAL LAND USE DISTRICTS

16.22.020 - Uses

A. The table below identifies the land uses that are permitted outright (P), permitted conditionally (C), and not permitted (N) in the Commercial Districts. The specific land use categories are described and defined in Chapter 16.88 Use Classifications and Interpretations.

B. Uses listed in other sections of this code, but not within this specific table are prohibited.

C. Any use not otherwise listed that can be shown to be consistent or associated with the uses permitted outright or conditionally in the commercial zones or contribute to the achievement of the objectives of the commercial zones may be permitted outright or conditionally, utilizing the provisions of Chapter 16.88 Use Classifications and Interpretations.

D. Additional limitations for specific uses are identified in the footnotes of this table.

Response: The proposed buildings will be used for those allowed within the RC zone and for the purposes of this narrative discussed by example as either a healthcare facility or as general retail space. The proposed buildings will be 7,200 and 5,800 square feet in size. General retail trade greater or less than 10,000 square feet of gross square footage and healthcare facilities are both permitted uses in the RC zone, per the Use Table in Section 16.22.020.

16.22.030 - Development Standards

A. Generally

No lot area, setback, yard, landscaped area, open space, off-street parking or loading area, or other site dimension or requirement, existing on, or after, the effective date of this Code shall be reduced below the minimum required by this Code. Nor shall the conveyance of any portion of a lot for other than a public use or right-of-way, leave a lot or structure on the remainder of said lot with less than minimum Code dimensions, area, setbacks or other requirements, except as permitted by Chapter 16.84. (Variance and Adjustments)

Response: The proposed development has been designed in accordance with applicable Sherwood Municipal code standards. Compliance is demonstrated in the narrative responses below and associated documents.

B. Development Standards

Except as otherwise provided, required minimum lot areas, dimensions and setbacks shall be provided in the following table

Development Standard	Requirement	Proposed
Lot area	5,000 sq. ft	75,359 sq. ft.

Lot width at front property line	40 ft	268 ft
Lot width at building line	40 ft	267 ft
Front yard setback [9]	0	112 ft
When abutting residential zone	Same as abutting residential zone	N/A
Side yard setback [9]	0	0-120 ft
when abutting residential zone or public park	10 ft	60 ft
Rear yard setback [9]	0	60 ft
when abutting residential zone or public park	10 ft	60 ft
Corner lot [9]		N/A
Height [10,11]	50 ft [13,14]	28.7 ft

[9] Existing residential uses shall maintain setbacks specified in the High Density Residential Zone (16.12.030).

[10] Maximum height is the lessor of feet or stories.

[11] Solar and wind energy devices and similar structures attached to buildings and accessory buildings, may exceed this height limitation by up to twenty (20) feet.

[13] Structures within one-hundred (100) feet of a residential zone shall be limited to the height requirements of that residential area.

[14] Structures over fifty (50) feet in height may be permitted as conditional uses, subject to Chapter 16.82.

Response: Lot 2 complies with development standards for parcels in the RC as demonstrated in the table above and reflected on the Site Plan, Sheet C2.0 of Exhibit A.

16.22.040 - Community Design

A. For standards relating to off-street parking and loading, energy conservation, historic resources, environmental resources, landscaping, access and egress, signs, parks and open space, on-site storage, and site design, see Divisions V, VIII and IX.

Response: Compliance with applicable community design standards is demonstrated in the corresponding sections of this narrative.

16.22.060 - Floodplain

Except as otherwise provided, Section 16.134.020 shall apply.

Response: Per FEMA flood map, panel 41067C0601F, the site is in an area of minimal flood hazard. Section 16.134.020 does not apply.

Chapter 16.58 - CLEAR VISION AND FENCE STANDARDS

16.58.010 - Clear Vision Areas

A. A clear vision area shall be maintained on the corners of all property at the intersection of two (2) streets, intersection of a street with a railroad, or intersection of a street with an alley or private driveway.

Response: As shown on the Site Plan, Sheet C2.0 of Exhibit A, the site contains on-site drive aisles which connect to private drive aisles within the Cedar Creek Plaza development. Access across these drive aisles is granted through an easement (Exhibit H). A clear vision area is required at the east portion of the site where an on-site drive aisle connects with a perpendicular off-site drive aisle in the neighboring lot. The south on-site access point runs continuously with an off-site drive aisle within the commercial center, therefore a clear vision area is not required in that location.

B. A clear vision area shall consist of a triangular area, two (2) sides of which are lot lines measured from the corner intersection of the street lot lines for a distance specified in this regulation; or, where the lot lines have rounded corners, the lot lines extended in a straight line to a point of intersection, and so measured, and the third side of which is a line across the corner of the lot joining the non-intersecting ends of the other two (2) sides.

Response: A clear vision area, as defined by subsection 16.58.010.B, is provided at the southeast portion of the site where an on-site drive aisle connects with a perpendicular off-site drive aisle in the neighboring lot.

C. A clear vision area shall contain no planting, sight obscuring fence, wall, structure, or temporary or permanent obstruction exceeding two and one-half (2½) feet in height, measured from the top of the curb, or where no curb exists, from the established street center line grade, except that trees exceeding this height may be located in this area, provided all branches and foliage are removed to the height of seven (7) feet above the ground on the sidewalk side and ten (10) feet on the street side.

The following requirements shall govern clear vision areas:

1. In all zones, the minimum distance shall be twenty (20) feet.

2. In all zones, the minimum distance from corner curb to any driveway shall be twenty-five(25) feet.

3. Where no setbacks are required, buildings may be constructed within the clear vision area.

Response: Landscaping in the required clear vision area at the southeast portion of the site will be maintained as required by subsection 16.58.010.C.

16.58.020 - Fences, Walls and Hedges.

C. Applicability: The following standards apply to walls, fences, hedges, lattice, mounds, and decorative toppers. These standards do not apply to sound walls and landscape features that are not hedges.

E. Location—Non-Residential Zone:

1. Fences up to eight (8) feet high are allowed along front, rear and side property lines, subject to Section 16.58.010. (Clear Vision) and building department requirements.

2. A sound wall is permitted when required as a part of a development review or concurrent with a road improvement project. A sound wall may not be taller than twenty (20) feet.

3. Hedges up to twelve (12) feet tall are allowed, however, when the non-residential zone abuts a residential zone the requirements of section 16.58.030.d.6. shall apply.

Response: This application proposes to keep the existing 6-foot-high wooden fence along the northwest property boundary; this will function to screen the development from the adjacent residential uses to the north. No hedges or sound walls are proposed.

F. General Conditions—All Fences:

1. Retaining, masonry, concrete, and modular retaining walls may not be constructed within the eight-foot public utility easement (PUE) located on the front and corner street side yards, without approval from the City Engineer.

2. Fences must be structurally sound and maintained in good repair. A fence may not be propped up in any way from the exterior side.

3. Chain link fencing is not allowed in any required residential front yard setback.

4. The finished side of the fence must face the street or the neighboring property. This does not preclude finished sides on both sides.

5. Buffering: If a proposed development is adjacent to a dissimilar use such as a commercial use adjacent to a residential use, or development adjacent to an existing farming operation, a buffer plan that includes, but is not limited to, setbacks, fencing, landscaping, and maintenance via a homeowner's association or managing company must be submitted and approved as part of the preliminary plat or site plan review process per Section 16.90.020 and Chapter 16.122.

6. In the event of a conflict between this Section and the clear vision standards of Section 16.58.010, the standards in Section 16.58.010 prevail.

7. The height of a fence or wall is measured from the actual adjoining level of finished grade measured six (6) inches from the fence. In the event the ground is sloped, the lowest grade within six (6) inches of the fence is used to measure the height.

8. Call before you dig (811) if placing a fence within the public utility easement (PUE) to have your utility lines located. This easement area is usually located eight (8) feet across the front yard and the side yard setback on a corner lot. Utility lines can be buried just beneath the surface.

Response: The existing wooden fence along the north property line was constructed under the permit for the prior development of the first six lots and will be maintained in compliance with subsection 16.58.010.F. No chain link fencing is proposed. A buffer plan addressing subsection 16.58.02(F)(4) is shown on the Planting Plan, Sheet L1.0 of Exhibit A.

Chapter 16.60 - YARD REQUIREMENTS

16.60.030 - Yards

A. Except for landscaping, every part of a required yard (also referred to as minimum setback) shall be open and unobstructed from its lowest point to the sky, except that architectural features such as awnings, fire escapes, open stairways, chimneys, or accessory structures permitted in accordance with Chapter 16.50 (Accessory Structures) may be permitted when so placed as not to obstruct light and ventilation.

B. Where a side or rear yard is not required, and a primary structure is not erected directly on the property line, a primary structure must be set back at least three (3) feet.

Response: The site is located within the RC zone, there are no front or side yard setback requirements. A 10-foot landscaped rear yard setback is provided where the site abuts residential property to the northwest. As shown on the Planting Plan, Sheet L1.0 of Exhibit A, the setback meets the requirements of subsections 16.60.030.A and B.

16.60.040 - Lot Sizes and Dimensions

A. If a lot or parcel, or the aggregate of contiguous lots or parcels, recorded or platted prior to the effective date of this Code, has an area or dimension which does not meet the requirements of this Code, the lot or aggregate lots may be put to a use permitted outright, subject to the other requirements of the zone in which the property is located.

B. Exceptions

1. Residential uses are limited to a single-family dwelling, or to the number of dwelling units consistent with the density requirements of the zone. However, a dwelling cannot be built on a lot with less area than thirty-two hundred (3,200) square feet, except as provided in Chapter 16.68.

2. Yard requirements of the underlying zone may be modified for infill developments as provided in Chapter 16.68 (Infill Development).

Response: The minimum lot area for the RC zone is 5,000 square feet. As shown on Sheet C0.0 of Exhibit A, Lot 2 is 1.73 acres or 75,359 square feet thus exceeding the minimum lot area established by this section.

Division III. – ADMINISTRATIVE PROCEDURES

Chapter 16.72 - PROCEDURES FOR PROCESSING DEVELOPMENT PERMITS

16.72.010 - Generally

A. Classifications

Except for Final Development Plans for Planned Unit Developments, which are reviewed per Section 16.40.030, all ministerial, administrative, and quasi-judicial development permit applications and legislative land use actions shall be classified as one of the following:

3. Type II

The following administrative actions shall be subject to a Type II review process:

a. Land Partitions (creation of 3 or fewer lots within 1 calendar year)

b. Expedited Land Divisions - The Community Development Director shall make a decision based on the information presented, and shall issue a development permit if the applicant has complied with all of the relevant requirements of the Zoning and Community Development Code. Conditions may be imposed by the Community Development Director if necessary to fulfill the requirements of the adopted Comprehensive Plan, Transportation System Plan or the Zoning and Community Development Code.

c. "Fast-track" Site Plan review, defined as those site plan applications which propose less than 15,000 square feet of floor area, parking or seating capacity of public, institutional, commercial or industrial use permitted by the underlying zone, or up to a total of 20% increase in floor area, parking or seating capacity for a land use or structure subject to a Conditional Use Permit, except as follows: auditoriums, theaters, stadiums, and those applications subject to Section 16.72.010.A.4.

d. "Design Upgraded" Site Plan review, defined as those site plan applications which propose between 15,001 and 40,000 square feet of floor area, parking or seating capacity and which propose a minimum of eighty percent (80%) of the total possible points of design criteria in the "Commercial Design Review Matrix" found in Section 16.90.020.D.6.d.

e. Industrial "Design Upgraded" projects, defined as those site plan applications which propose between 15,001 and 60,000 square feet of floor area, parking or seating capacity and which meet all of the criteria in Section 16.90.020.D.7.b.

f. Homeowner's association street tree removal and replacement program extension.

g. Class B Variance.

h. Street Design Modification.

i. Subdivisions between 4—10 lots.

j. Medical marijuana dispensary permit.

k. Residential Design Checklist Review with Class B Variance

Response: This application proposes new development that totals less than 15,000 square feet of total floor area. Therefore, a Type II site plan review approval is required. Additionally, the Commercial Design Review Matrix is attached as Exhibit M.

Division V. - COMMUNITY DESIGN

Chapter 16.90 - SITE PLANNING

16.90.020 - Site Plan Review

A. Site Plan Review Required

Site Plan review is required prior to any substantial change to a site or use that does not meet the criteria of a minor or major modification, issuance of building permits for a new building or structure, or for the substantial alteration of an existing structure or use.

For the purposes of Section 16.90.020, the terms "substantial change" and "substantial alteration" mean any development activity as defined by this Code that generally requires a building permit and may exhibit one or more of the following characteristics:

1. The activity alters the exterior appearance of a structure, building or property and is not considered a modification.

2. The activity involves changes in the use of a structure, building, or property from residential to commercial or industrial and is not considered a modification.

3. The activity involves non-conforming uses as defined in Chapter 16.48.

4. The activity constitutes a change in a City approved plan, per Section 16.90.020 and is not considered a modification.

5. The activity is subject to site plan review by other requirements of this Code.

6. The activity increases the size of the building by more than 100% (i.e. the building more than doubles in size), regardless of whether it would be considered a major or minor modification.

Response: This application proposes new development of two buildings, which will require a building permit, therefore consistent with this section an application for Site Plan Review has been prepared and submitted.

B. Exemption to Site Plan Requirement

1. Single and two family uses

2. Manufactured homes located on individual residential lots per Section 16.46.010, but including manufactured home parks.

Response: This project is not exempt from site plan review.

D. Required Findings

No site plan approval will be granted unless each of the following is found:

1. The proposed development meets applicable zoning district standards and design standards in Division II, and all provisions of Divisions V, VI, VIII and IX.

Response: Compliance with applicable zoning district and design standards is demonstrated in this narrative and the associated documents.

2. The proposed development can be adequately served by services conforming to the Community Development Plan, including but not limited to water, sanitary facilities, storm water, solid waste, parks and open space, public safety, electric power, and communications.

Response: The Pre-Application Conference Notes, included as Exhibit B, and the Storm and Utility Plans, Sheets C4.0 and C5.0 of Exhibit A, demonstrate how the site is adequately served by public services.

3. Covenants, agreements, and other specific documents are adequate, in the City's determination, to assure an acceptable method of ownership, management, and maintenance of structures, landscaping, and other on-site features.

Response: Following construction, ongoing maintenance of the site and related improvements will be provided by the applicant.

4. The proposed development preserves significant natural features to the maximum extent feasible, including but not limited to natural drainage ways, wetlands, trees, vegetation (including but not limited to environmentally sensitive lands), scenic views, and topographical features, and conforms to the applicable provisions of Division VIII of this Code and Chapter 5 of the Community Development Code.

Response: There are no natural drainageways, wetlands, scenic views, or topographical features on site. Existing trees will be maintained as shown on the Planting Plan, Sheet L1.0 of Exhibit A.

5. For developments that are likely to generate more than 400 average daily trips (ADTs), or at the discretion of the City Engineer, the applicant must provide adequate information, such as a traffic impact analysis (TIA) or traffic counts, to demonstrate the level of impact to the surrounding transportation system. The developer is required to mitigate for impacts attributable to the project, pursuant to TIA requirements in Section 16.106.080 and rough proportionality requirements in Section 16.106.090. The determination of impact or effect and the scope of the impact study must be coordinated with the provider of the affected transportation facility.

Response: A Traffic Impact Analysis was prepared by Mackenzie, dated December 2016, which evaluated traffic impacts for the entire Cedar Creek Plaza development, including a 94-room hotel on Lot 2, the subject site. Mackenzie has provided a Trip Generation Letter, dated January 2023, in which they address the change in trips from the hotel use to the proposed retail uses. The memo indicates that the site will generate approximately 667 average daily trips, a slight reduction in trips from what was estimated with the hotel use. No further traffic analysis is required based upon the reduction in anticipated trips. The Trip Generation Letter is included as Exhibit C.

6. The proposed commercial, multi-family, institutional or mixed-use development is oriented to the pedestrian and bicycle, and to existing and planned transit facilities. Urban design standards include the following:

a. Primary, front entrances are located and oriented to the street, and have significant articulation and treatment, via facades, porticos, arcades, porches, portal, forecourt, or stoop to identify the entrance for pedestrians. Additional entrance/exit points for buildings, such as a postern, are allowed from secondary streets or parking areas.

Response: The applicant is applying the Commercial Design Review Matrix, included as Exhibit M, as an alternative to meeting the standards in Section 16.90.020.D.6.a. Therefore, this standard is not applicable.

b. Buildings are located adjacent to and flush to the street, subject to landscape corridor and setback standards of the underlying zone.

Response: The applicant is applying the Commercial Design Review Matrix, included as Exhibit M, as an alternative to meeting the standards in Section 16.90.020.D.6.b. Therefore, this standard is not applicable.

c. The architecture of buildings are oriented to the pedestrian and designed for the long term and be adaptable to other uses. Aluminum, vinyl, and T-111 siding are prohibited. Street facing elevations have windows, transparent fenestration, and divisions to break up the mass of any window. Roll up and sliding doors are acceptable. Awnings that provide a minimum 3 feet of shelter from rain are required unless other architectural elements are provided for similar protection, such as an arcade.

Response: The applicant is applying the Commercial Design Review Matrix, included as Exhibit M, as an alternative to meeting the standards in Section 16.90.020.D.6.c. Therefore, this standard is not applicable.

d. As an alternative to the standards in Section 16.90.020.D.6.a—c, the following Commercial Design Review Matrix may be applied to any commercial, multi-family, institutional or mixed use development (this matrix may not be utilized for developments within the Old Town Overlay). A development must propose a minimum of 60 percent of the total possible points to be eligible for exemption from the standards in Section 16.90.020.D.6.a—c. In addition, a development proposing between 15,001 and 40,000 square feet of floor area, parking or seating capacity and proposing a minimum of 80 percent of the total possible points from the matrix below may be reviewed as a Type II administrative review, per the standards of Section 16.72.010.A.2.

Response: The applicant is applying the Commercial Design Review Matrix, included as Exhibit M as an alternative to meeting the standards in Section 16.90.020.D.6.a-c. The matrix provided 51 out of a possible 74 points which amounts to approximately 69 percent of the total possible points. According to Section 16.90.020.D.6.d, a development that proposes a minimum of 60 percent of the total possible points of the Commercial Design Matrix is eligible for exemption from the standards in Section 16.90.020.D.6.a-c. Therefore, the proposal is exempt from these standards due to providing over 60 percent of the total possible points.

e. As an alternative to the standards in Sections 16.90.020.D.6.a—c, the Old Town Design Standards (Chapter 16.162) may be applied to achieve this performance measure.

Response: This narrative and the associated submittal materials demonstrate compliance with the design standards outlined in Section 16.90.020.D.6.a-c.

f. As an alternative to the standards in Sections 16.90.020.D.6.a.—e, an applicant may opt to have a design review hearing before the Planning Commission to demonstrate how the

proposed development meets or exceeds the objectives in Section 16.90.010.B of this Code. This design review hearing will be processed as a Type IV review with public notice and a public hearing.

Response: This narrative and the associated submittal materials demonstrate compliance with the design standards of Section 16.90.020.D.6.d. Therefore, this standard is not applicable.

7. Industrial developments provide employment opportunities for citizens of Sherwood and the region as a whole. The proposed industrial development is designed to enhance areas visible from arterial and collector streets by reducing the "bulk" appearance of large buildings. Industrial design standards include the following:....

Response: No industrial developments are proposed with this application.

8. Driveways that are more than twenty-four (24) feet in width shall align with existing streets or planned streets as shown in the Local Street Connectivity Map in the adopted Transportation System Plan (Figure 17), except where prevented by topography, rail lines, freeways, pre-existing development, or leases, easements, or covenants.

Response: The proposed buildings are located within an existing commercial development and will utilize existing driveways to Highway 99W and SW Edy Road. No changes are proposed to existing driveways with this application.

Chapter 16.92 - LANDSCAPING

16.92.010 - Landscaping Plan Required

All proposed developments for which a site plan is required pursuant to Section 16.90.020 shall submit a landscaping plan that meets the standards of this Chapter. All areas not occupied by structures, paved roadways, walkways, or patios shall be landscaped or maintained according to an approved site plan.

Response: A Planting Plan has been included with this application as Sheet L1.0 of Exhibit A. Landscaping consistent with this chapter is proposed in all areas not occupied by structures, paved roadways, and walkways.

16.92.020 - Landscaping Materials

A. Type of Landscaping

Required landscaped areas shall include an appropriate combination of native evergreen or deciduous trees and shrubs, evergreen ground cover, and perennial plantings. Trees to be planted in or adjacent to public rights-of-way shall meet the requirements of this Chapter. Plants may be selected from the City's "Suggested Plant Lists for Required Landscaping Manual" or suitable for the Pacific Northwest climate and verified by a landscape architect or certified landscape professional.

1. Ground Cover Plants

a. All of the landscape that is not planted with trees and shrubs must be planted in ground cover plants, which may include grasses. Mulch is not a substitute for ground cover, but is allowed in addition to the ground cover plants.

b. Ground cover plants other than grasses must be at least the four-inch pot size and spaced at distances appropriate for the plant species. Ground cover plants must be planted at a density that will cover the entire area within three (3) years from the time of planting.

Response: The required landscape areas have been designed to be consistent with Sherwood Code requirements. Landscape areas include a combination of evergreen and deciduous trees and shrubs, evergreen ground cover, and perennial plantings, as shown on the Planting Plan, Sheet L1.0 of Exhibit A. Proposed trees are suitable for the Pacific Northwest climate and verified by a landscape architect. No trees are proposed or required to be planted in or adjacent to public rights-of-way with this application. Ground cover plants will be one-gallon containers spaced 18 inches on center and will occupy all areas not occupied by trees and shrubs. Ground cover plants will be planted at a density that will cover the entire area within three years from the time of planting.

2. Shrubs

a. All shrubs must be of sufficient size and number to be at full growth within three (3) years of planting.

b. Shrubs must be at least the one-gallon container size at the time of planting.

Response: As shown on the Planting Plan, Sheet L1.0 of Exhibit A, shrubs will be planted from at least one-gallon container size at the time of planting and will be of sufficient size to be at full growth within three years of planting.

3. Trees

a. Trees at the time of planting must be fully branched and must be a minimum of two (2) caliper inches and at least six (6) feet in height.

b. Existing trees may be used to meet the standards of this chapter, as described in Section 16.92.020.C.2.

Response: As shown on the Planting Plan, Sheet L1.0 of Exhibit A, trees, a minimum of two-inch caliper for deciduous species and a minimum of six feet in height for conifers will be planted on site. Existing trees in the previously approved buffer area will be retained to maintain existing buffer requirements.

B. Plant Material Selection and Preparation

1. Required landscaping materials shall be established and maintained in a healthy condition and of a size sufficient to meet the intent of the approved landscaping plan. Specifications shall be submitted showing that adequate preparation of the topsoil and subsoil will be undertaken.

Response: The proposed landscaping materials will be planted and maintained in a healthy condition as required by 16.92.020.B.1.

2. Landscape materials should be selected and sited to produce a hardy and drought-resistant landscape area. Selection of the plants should include consideration of soil type, and depth, the amount of maintenance required, spacing, exposure to sun and wind, the slope and contours of the site, and compatibility with existing native vegetation preserved on the site.

Response: As shown on the Planting Plan, Sheet L1.0 of Exhibit A, the proposed landscape materials have been selected to be consistent with this standard.

C. Existing Vegetation

1. *All developments subject to site plan review per Section 16.90.020 and required to submit landscaping plans per this section shall preserve existing trees, woodlands and vegetation on the site to the maximum extent possible, as determined by the Review Authority, in addition to complying with the provisions of Section 16.142.(Parks, Trees and Open Space) and Chapter 16.144 (Wetland, Habitat, and Natural Resources).*

2. *Existing vegetation, except those plants on the Nuisance Plants list as identified in the "Suggested Plant Lists for Required Landscaping Manual" may be used to meet the landscape standards, if protected and maintained during the construction phase of the development.*

    a. *If existing trees are used, each tree six (6) inches or less in diameter counts as one (1) medium tree.*

    b. *Each tree that is more than six (6) inches and up to nine (9) inches in diameter counts as two (2) medium trees.*

    c. *Each additional three (3) inch diameter increment above nine (9) inches counts as an additional medium tree.*

Response: Existing vegetation will be maintained to the greatest extent possible; though adjustment of some existing buffer plant materials will likely be needed to match new grades in some areas. No trees are proposed for removal. Existing vegetation is counted towards meeting landscaping requirements, in accordance with this Code, as shown on the Planting Plan, Sheet L1.0 of Exhibit A. No nuisance plants are proposed to meet landscape standards.

D. Non-Vegetative Features

1. *Landscaped areas as required by this Chapter may include architectural features interspersed with planted areas, such as sculptures, benches, masonry or stone walls, fences, rock groupings, bark dust, semi-pervious decorative paving, and graveled areas.*

2. *Impervious paving shall not be counted toward the minimum landscaping requirements unless adjacent to at least one (1) landscape strip and serves as a pedestrian pathway.*

3. *Artificial plants are prohibited in any required landscaped area.*

Response: No architectural features, impervious paving or artificial plants are proposed to be counted towards the required landscape area.

16.92.030 - Site Area Landscaping and Perimeter Screening Standards

A. Perimeter Screening and Buffering

1. *Perimeter Screening Separating Residential Zones:*

    A minimum six-foot high sight-obscuring wooden fence, decorative masonry wall, or evergreen screen, shall be required along property lines separating single and two-family uses from multi-family uses, and along property lines separating residential zones from commercial, institutional/public or industrial zones subject to the provisions of Chapter 16.48.020 (Fences, Walls and Hedges).

    a. *For new uses adjacent to inventoried environmentally sensitive areas, screening requirements shall be limited to vegetation only to preserve wildlife mobility. In addition, the Review Authority may require plants and other landscaping features in locations and sizes necessary to protect the privacy of residences and buffer any adverse effects of adjoining uses.*

b. The required screening shall have breaks, where necessary, to allow pedestrian access to the site. The design of the wall or screening shall also provide breaks or openings for visual surveillance of the site and security.

c. Evergreen hedges used to comply with this standard shall be a minimum of thirty-six (36) inches in height at maturity, and shall be of such species, number and spacing to provide the required screening within one (1) year after planting.

Response: As shown on the Planting Plan, Sheet L1.0 of Exhibit A, there is an existing six-foot high wooden fence along the north property line, where the site abuts a residential area. The existing fence will remain in place to meet screening requirements.

2. Perimeter Landscaping Buffer

a. A minimum ten (10) foot wide landscaped strip comprised of trees, shrubs and ground cover shall be provided between off-street parking, loading, or vehicular use areas on separate, abutting, or adjacent properties.

b. The access drives to a rear lots in the residential zone (i.e. flag lot) shall be separated from abutting property(ies) by a minimum of forty-two-inch sight-obscuring fence or a forty-two-inch to an eight (8) feet high landscape hedge within a four-foot wide landscape buffer. Alternatively, where existing mature trees and vegetation are suitable, Review Authority may waive the fence/buffer in order to preserve the mature vegetation.

Response: As shown on the Planting Plan, Sheet L1.0 of Exhibit A, a ten-foot-wide landscape strip comprised of trees, shrubs and ground cover will be provided along the north property line where parking abuts a neighboring property. The parking along the east, west and south property lines abut adjacent commercial properties within the Cedar Creek Plaza, which share parking and vehicle circulation facilities at the center of the development. Perimeter landscape buffers in these scenarios do not match the intent of the code which is designed to create buffers between adjacent site of differing uses, particularly commercial and residential uses. Placement of buffers along these lot lines that are internal to the overall shopping center would create a broken and non-functional circulation pattern and would not create the cohesive development plan as approved under previous land use decisions.

In the previous Site Plan approval for Cedar Creek Plaza Phase II (SP16-10/CUP 16-06/VAR 17-01), a 10-foot perimeter landscape buffer was approved along SW Edy Road, SW Pacific Highway, and along shared property lines along the west, south, and east boundaries of the site. As part of the subsequent Subdivision approval (SUB 17-02) that subdivided Cedar Creek Plaza into seven commercial lots, including Lot 2, no additional landscape requirements along interior lot lines were required. This applies to the present-day interior lot lines in Cedar Creek Plaza Lot 2.

Additionally, a prior approval in 2005 for a Red Robin restaurant within the Langer Farms Shopping Center set a precedent for perimeter landscaping adjacent to off-street parking. City of Sherwood staff made the interpretation that the perimeter landscaping adjacent to off-street parking did not apply because of the shared ingress and egress and parking for the entire shopping center. These are considered shared because there is an existing joint parking agreement for Cedar Creek Plaza (included with this application as Exhibit N). Because the parking is shared, no landscaped strip is required between the parking areas of Cedar Creek Lot 2 and the abutting developments within Cedar Creek Plaza.

3. Perimeter Landscape Buffer Reduction

If the separate, abutting property to the proposed development contains an existing perimeter landscape buffer of at least five (5) feet in width, the applicant may reduce the proposed site's required perimeter landscaping up to five (5) feet maximum, if the development is not adjacent to a residential zone. For example, if the separate abutting perimeter landscaping is five (5) feet, then applicant may reduce the perimeter landscaping to five (5) feet in width on their site so there is at least five (5) feet of landscaping on each lot.

Response: No reduction in perimeter landscaping is requested.

B. Parking Area Landscaping

3. Required Landscaping

There shall be at least forty-five (45) square feet parking area landscaping for each parking space located on the site. The amount of required plant materials are based on the number of spaces as identified below.

Response: The project includes the installation of 94 parking stalls therefore, 4,230 square feet of parking area landscaping is required. As shown on the Planting Plan, Sheet L1.0 of Exhibit A, the plan proposes 7,014 square feet of parking area landscaping, which exceeds the standard.

4. Amount and Type of Required Parking Area Landscaping

a. Number of Trees required based on Canopy Factor

Small trees have a canopy factor of less than forty (40), medium trees have a canopy factor from forty (40) to ninety (90), and large trees have a canopy factor greater than ninety (90);

(1) Any combination of the following is required:

(i) One (1) large tree is required per four (4) parking spaces;

(ii) One (1) medium tree is required per three (3) parking spaces; or

(iii) One (1) small tree is required per two (2) parking spaces.

(iv) At least five (5) percent of the required trees must be evergreen.

(2) Street trees may be included in the calculation for the number of required trees in the parking area.

Response: As shown on the Planting Plan, Sheet L1.0 of Exhibit A, twenty-two (22) large trees and two (2) small trees are proposed within the parking area landscaping. Additionally, approximately nine percent of the proposed trees are evergreen species; therefore meeting the requirement of 16.92.030.B.4.a.

b. Shrubs:

(1) Two (2) shrubs are required per each space.

(2) For spaces where the front two (2) feet of parking spaces have been landscaped instead of paved, the standard requires one (1) shrub per space. Shrubs may be evergreen or deciduous.

Response: There are 94 parking stalls; therefore 188 shrubs are required. As shown on the Planting Plan, Sheet L1.0 of Exhibit A, 470 shrubs are proposed within the parking area.

c. Ground cover plants:

(1) Any remainder in the parking area must be planted with ground cover plants.

(2) The plants selected must be spaced to cover the area within three (3) years. Mulch does not count as ground cover.

Response: Landscaping areas within the parking area not occupied by trees or shrubs will be planted with groundcover plants that will cover the area within three years.

5. Individual Landscape Islands Requirements

a. Individual landscaped areas (islands) shall be at least ninety (90) square feet in area and a minimum width of five (5) feet and shall be curbed to protect the landscaping.

b. Each landscape island shall be planted with at least one (1) tree.

c. Landscape islands shall be evenly spaced throughout the parking area.

d. Landscape islands shall be distributed according to the following:

(2) Multi or mixed-uses, institutional and commercial uses: one (1) island for every ten (10) contiguous parking spaces.

e. Storm water bio-swales may be used in lieu of the parking landscape areas and may be included in the calculation of the required landscaping amount.

f. Exception to Landscape Requirement

Linear raised or marked sidewalks and walkways within the parking areas connecting the parking spaces to the on-site buildings may be included in the calculation of required site landscaping provide that it:

(1) Trees are spaced a maximum of thirty (30) feet on at least one (1) side of the sidewalk.

(2) The minimum unobstructed sidewalk width is at least six (6) feet wide.

(3) The sidewalk is separated from the parking areas by curbs, bollards, or other means on both sides.

Response: As shown on the Planting Plan, Sheet L1.0 of Exhibit A, the parking area landscape islands have been designed in compliance with these standards including size and plant composition. Landscape islands measure at minimum 90 square feet, have at least one tree, and are distributed evenly throughout the parking area. Stormwater bioswales are not proposed in lieu of landscape islands. No exceptions to the landscape requirements outlined above are requested.

6. Landscaping at Points of Access

When a private access-way intersects a public right-of-way or when a property abuts the intersection of two (2) or more public rights-of-way, landscaping shall be planted and maintained so that minimum sight distances shall be preserved pursuant to Section 16.58.010.

Response: The proposed development does not intersect a public right-of-way. Therefore, this standard is not applicable.

7. Exceptions

a. For properties with an environmentally sensitive area and/or trees or woodlands that merit protection per Chapters 16.142 (Parks, Trees and Open Space) and 16.144 (Wetland, Habitat and Natural Areas) the landscaping standards may be reduced, modified or "shifted" on-site where necessary in order to retain existing vegetation that would otherwise be removed to meet the above referenced landscaping requirements.

b. The maximum reduction in required landscaping buffer permitted through this exception process shall be no more than fifty (50) percent. The resulting landscaping buffer after reduction may not be less than five (5) feet in width unless otherwise permitted by the underlying zone. Exceptions to the required landscaping may only be permitted when reviewed as part of a land use action application and do not require a separate variance permit.

Response: No exceptions to parking area landscaping are requested.

C. Screening of Mechanical Equipment, Outdoor Storage, Service and Delivery Areas

All mechanical equipment, outdoor storage and manufacturing, and service and delivery areas, shall be screened from view from all public streets and any adjacent residential zones. If unfeasible to fully screen due to policies and standards, the applicant shall make efforts to minimize the visual impact of the mechanical equipment.

Response: Any proposed mechanical equipment will be screened as required by Sherwood Municipal Code requirements. The applicant is proposing roof mounted mechanical equipment that will be screen with either the parapets or a roof mounted screen, depending on the height of the mechanical equipment.

D. Visual Corridors

Except as allowed by subsection 6. above, new developments shall be required to establish landscaped visual corridors along Highway 99W and other arterial and collector streets, consistent with the Natural Resources and Recreation Plan Map, Appendix C of the Community Development Plan, Part II, and the provisions of Chapter 16.142(Parks, Trees, and Open Space). Properties within the Old Town Overlay are exempt from this standard.

Response: The development site does not directly abut Highway 99W or any public street. All landscaping along Highway 99W along the Cedar Creek Plaza development was approved and installed through prior project approvals.

16.92.040 - Installation and Maintenance Standards

A. Installation

All required landscaping must be in-ground, except when in raised planters that are used to meet minimum Clean Water Services storm water management requirements. Plant materials must be installed to current nursery industry standards. Plant materials must be properly supported to ensure survival. Support devices such as guy wires or stakes must not interfere with vehicular or pedestrian movement.

Response: Plant materials will be installed in accordance with Section 16.92.040.

B. Maintenance and Mitigation of Landscaped Areas

1. Maintenance of existing non-invasive native vegetation is encouraged within a development and required for portions of the property not being developed.

2. All landscaping shall be maintained in a manner consistent with the intent of the approved landscaping plan.

3. Any required landscaping trees removed must be replanted consistent with the approved landscaping plan and comply with § 16.142, (Parks, Trees and Open Space).

Response: Landscaping will be maintained in accordance with this section.

C. Irrigation

The intent of this standard is to ensure that plants will survive the critical establishment period when they are most vulnerable due to lack of watering. All landscaped areas must provide an irrigation system, as stated in Option 1, 2, or 3.

1. Option 1: A permanent built-in irrigation system with an automatic controller installed.

2. Option 2: An irrigation system designed and certified by a licensed landscape architect or other qualified professional as part of the landscape plan, which provides sufficient water to ensure that the plants become established. The system does not have to be permanent if the plants chosen can survive independently once established.

3. Option 3: Irrigation by hand. If the applicant chooses this option, an inspection will be required one (1) year after final inspection to ensure that the landscaping has become established.

Response: Landscaping will be irrigated using Option 1 in accordance with Section 16.92.040.

D. Deferral of Improvements

Landscaping shall be installed prior to issuance of occupancy permits, unless security equal to one hundred twenty-five (125) percent of the cost of the landscaping is filed with the City. "Security" may consist of a performance bond payable to the City, cash, certified check, or other assurance of completion approved by the City. If the installation of the landscaping is not completed within one (1) year, the security may be used by the City to complete the installation.

Response: Proposed landscaping will be installed prior to issuance of occupancy permits. A deferral is not requested at this time.

Chapter 16.94 - OFF-STREET PARKING AND LOADING

16.94.010 - General Requirements

A. Off-Street Parking Required

No site shall be used for the parking of vehicles until plans are approved providing for off-street parking and loading space as required by this Code. Any change in uses or structures that reduces the current off-street parking and loading spaces provided on site, or that increases the need for off-street parking or loading

requirements shall be unlawful and a violation of this Code, unless additional off-street parking or loading areas are provided in accordance with Section 16.94.020, or unless a variance from the minimum or maximum parking standards is approved in accordance with Chapter 16.84 Variances.

Response: On-site parking is proposed in accordance with Sherwood Municipal Code as demonstrated in the responses below and associated submittal materials.

B. Deferral of Improvements

Off-street parking and loading spaces shall be completed prior to the issuance of occupancy permits, unless the City determines that weather conditions, lack of available surfacing materials, or other circumstances beyond the control of the applicant make completion impossible. In such circumstances, security equal to one hundred twenty five (125) percent of the cost of the parking and loading area is provided the City. "Security" may consist of a performance bond payable to the City, cash, certified check, or other assurance of completion approved by the City. If the installation of the parking or loading area is not completed within one (1) year, the security may be used by the City to complete the installation.

Response: Off-street parking will be completed prior to the issuance of occupancy permits. A deferral is not requested at this time.

C. Options for Reducing the Required Parking Spaces

1. Two (2) or more uses or, structures on multiple parcels of land may utilize jointly the same parking and loading spaces when the peak hours of operation do not substantially overlap, provided that satisfactory evidence is presented to the City, in the form of deeds, leases, or contracts, clearly establishing the joint use.

a. Within commercial, institutional and public, or industrial zones, shared parking may be provided on lots that are within five hundred (500) feet of the property line of the use to be served.

b. Shared parking is allowed if the application can show that the combined peak use is available by a parking study that demonstrates:

(1) There is a sufficient number of parking spaces to accommodate the requirements of the individual businesses; or

(2) That the peak hours of operation of such establishments do not overlap, and

(3) That an exclusive permanent easement over a delineated area has been granted for parking space use.

Response: A reciprocal access and parking agreement was established as a part of the previous Site Plan Review application for the Cedar Creek Plaza (SP 16-10), which authorizes the use of the entire vehicle parking and circulation area by all property owners, tenants, residents, customers, guests, patients, and employees of the commercial development (Page 10 of Exhibit N). A reduction in required parking is not proposed. Occupants and customers of the new buildings will utilize the already agreed upon reciprocal access and parking agreement to access and use parking facilities within the Cedar Creek Plaza development.

2. Mixed use projects are developments where a variety of uses occupies a development project or complex. For example, an eating establishment, professional office building and movie theater are

all components of a mixed use site. It does not include a secondary use within a primary use such as an administrative office associated with a retail establishment. In mixed-use projects, the required minimum vehicle parking shall be determined using the following formula:

a. Primary use: i.e. that with the largest proportion of total floor area within the development at one hundred (100) percent of the minimum vehicle parking required for that use.

b. Secondary Use: i.e. that with the second largest percentage of total floor area within the development, at ninety (90) percent of the vehicle parking required for that use.

c. Subsequent use or uses, at eighty (80) percent of the vehicle parking required for that use.

Response: As discussed, tenants are not yet known for the buildings, however, the proposed development will be for commercial use. The development will rely upon the reciprocal access and parking agreement to utilize existing parking and vehicle circulation areas within Cedar Creek Plaza, which contains a mix of uses (Page 10 of Exhibit N). A detailed analysis of the minimum number of parking spaces required is provided below in Section 16.94.020. The analysis includes the previously approved use as well as a mix of possible uses proposed with this application. Percentage adjustments based on the square footage of each use are presented consistent with the criterion cited above. As reflected in the analysis, the proposed number of off-street parking spaces exceeds the overall minimum requirement and is less than the maximum allowed.

D. Prohibited Uses

Required parking, loading and maneuvering areas shall not be used for long-term storage or sale of vehicles or other materials, and shall not be rented, leased or assigned to any person or organization not using or occupying the building or use served.

Response: The proposed parking areas will not be used for long-term storage or sale of vehicles or other materials and will not be rented, leased or assigned to any person or organization not using or occupying the building or use served. Proposed parking areas will be used for parking and maneuvering by customers and employees of the proposed uses.

E. Location

1. Residential off-street parking spaces:

Response: No residential off-street parking spaces are proposed.

2. For other uses, required off-street parking spaces may include adjacent on-street parking spaces, nearby public parking and shared parking located within five hundred (500) feet of the use. The distance from the parking, area to the use shall be measured from the nearest parking space to a building entrance, following a sidewalk or other pedestrian route. The right to use private off-site parking must be evidenced by a recorded deed, lease, easement, or similar written notarized letter or instrument.

Response: The required parking for the site will be provided on-site or shared with adjacent uses within Cedar Creek Plaza. All of the lots within the Cedar Creek Plaza commercial center are located within 500 feet of lot 2 as allowed.

3. *Vehicle parking is allowed only on improved parking shoulders that meet City standards for public streets, within garages, carports and other structures, or on driveways or parking lots that have been developed in conformance with this code. Specific locations and types of spaces (car pool, compact, etc.) for parking shall be indicated on submitted plans and located to the side or rear of buildings where feasible.*

   a. *All new development with forty (40) employees or more shall include preferential spaces for carpool/vanpool designation. Carpool and vanpool parking spaces shall be located closer to the main employee entrance than all other parking spaces with the exception of ADA parking spaces. Carpool/vanpool spaces shall be clearly marked as reserved for carpool/vanpool only.*

   b. *Existing development may redevelop portions of designated parking areas for multi-modal facilities (transit shelters, park and ride, and bicycle parking), subject to meeting all other applicable standards, including minimum space standards.*

Response: No parking is proposed at parking shoulders along public streets, within garages, carports, or other structures. No compact stalls are proposed. The applicant would accept a condition of approval to clarify the number of spaces required for carpool and van pool parking spaces is acceptable given that the number of employees for businesses within the new buildings is not yet known.

F. Marking

All parking, loading or maneuvering areas shall be clearly marked and painted. All interior drives and access aisles shall be clearly marked and signed to show the direction of flow and maintain vehicular and pedestrian safety.

Response: All parking and maneuvering areas will be clearly marked, painted, and signed to show the direction of flow and to maintain vehicular and pedestrian safety.

G. Surface and Drainage

1. *All parking and loading areas shall be improved with a permanent hard surface such as asphalt, concrete or a durable pervious surface. Use of pervious paving material is encouraged and preferred where appropriate considering soils, location, anticipated vehicle usage and other pertinent factors.*

2. *Parking and loading areas shall include storm water drainage facilities approved by the City Engineer or Building Official. H. Repairs*

   Parking and loading areas shall be kept clean and in good repair. Breaks in paved surfaces shall be repaired. Broken or splintered wheel stops shall be replaced. Painted parking space boundaries and directional symbols shall be maintained in a readable condition.

Response: All portions of the proposed off-street parking and circulation area will be constructed with a permanent, durable hard surface, such as asphalt or concrete. Pervious paving is not proposed due to limited infiltration documented through the previous site plan review application (SP 16-10). Associated stormwater facilities have been located and sized appropriately to treat and detain run-off from the site prior to discharging to the public system.

I. Parking and Loading Plan

An off-street parking and loading plan, drawn to scale, shall accompany requests for building permits or site plan approvals, except for single and two-family dwellings, and manufactured homes on residential lots. The plan shall show but not be limited to:

1. *Delineation of individual parking and loading spaces and dimensions.*
2. *Circulation areas necessary to serve parking and loading spaces.*
3. *Location of accesses to streets, alleys and properties to be served, and any curb cuts.*
4. *Landscaping as required by Chapter 16.92.*
5. *Grading and drainage facilities.*
6. *Signing and bumper guard specifications.*
7. *Bicycle parking facilities as specified in Section 16.94.020.C.*
8. *Parking lots more than one (1) acre in size shall provide street-like features including curbs, sidewalks, and street trees or planting strips.*

Response: All the applicable information required by subsection 16.94.010.I is provided on Sheets C2.0, C2.1, C3.0 and L1.0 of Exhibit A.

J. Parking Districts

The City may establish a parking district (i.e., permits or signage) in residential areas in order to protect residential areas from spillover parking generated by adjacent commercial, employment or mixed-use areas, or other uses that generate a high demand for parking. The district request shall be made to the City Manager, who will forward a recommendation to the City Council for a decision.

Response: The proposed development site is not located within a residential area; therefore, this standard does not apply.

K. Structured parking and on-street parking are exempt from the parking space maximums in Section 16.94.020.A.

Response: No structured or on-street parking are proposed with this application.

16.94.020 - Off-Street Parking Standards

A. Generally

Where square feet are specified, the area measured shall be the gross building floor area primary to the functioning of the proposed use. Where employees are specified, persons counted shall be those working on the premises, including proprietors, during the largest shift at peak season. Fractional space requirements shall be counted as a whole space. The Review Authority may determine alternate off - street parking and loading requirements for a use not specifically listed in this Section based upon the requirements of comparable uses.

Response: The proposed use will share parking with the surrounding commercial development through a reciprocal access and parking agreement that was established through a prior land use approval (SP 16-10). The tables below demonstrate how the parking requirements for the overall development are affected based on if the proposed building were to include exclusively healthcare, restaurant or retail uses. The existing uses are included in the table to demonstrate how the Cedar Creek Plaza development overall will continue to meet requirements. Table 1

demonstrates minimum and maximum parking standards specifically for Lot 2. Tables 2, 3, and 4 show three different possibilities for the building if it were exclusively retail, office, or restaurant. The precise use or mix of uses is not determined for the proposed building, therefore the tables demonstrate that a range of scenarios would comply with parking requirements. Table 5 shows the proposed parking supply for the proposed lot 2 development. Therefore, if the building were to be used for a mix of healthcare, retail and restaurant uses, the overall Cedar Creek Plaza development and subdivision will continue to comply with parking requirements. The applicant recognizes that programming 13,000 square feet of solely restaurant use would create an imbalance for patron parking demand in the center. Therefore, the applicant plans to execute a balanced programming of uses all of which will be allowed in the RC zone. With the additional 94 parking spaces proposed, the total parking provided totals 599 spaces. See Exhibit O, Parking Map, for more information.

Table 1: Minimum and Maximum Parking Standards – LOT 2		
	Minimum Parking Standard	**Minimum Required Stalls (13,000 sf)**
General retail or personal service	4.1/1,000 sf (244 sf)	**53**
General office	2.7/1,000 sf (370 sf)	**35**
Eating or drinking establishment	15.3/1,000 sf (65 sf)	**199**

Response: The applicant proposes providing 94 parking spaces within Lot 2. If the proposed buildings include exclusively retail or office space or a mix of both, the parking requirement is met. It is unlikely that the proposed buildings will be exclusively restaurant. Therefore, the stalls provided on Lot 2 will adequately serve the likely mix of proposed uses. Additionally, as referenced above, since the Cedar Creek Plaza development site has a shared parking agreement, the overall parking ensures full compliance if the mix of uses changed in the future.

Table 2: Cedar Creek Plaza (Entire Development) Parking Requirements - EXCLUSIVELY HEALTHCARE FACILITY				
Use	**Floor Area**	**Minimum Parking Ratio**	**Minimum Required Stalls**	**Min Adjusted Per Criteria in SZCDC 16.94.010(C)(2)**
Assisted Living (Nursing Home)	143,400 sf	-	98	98 (100%)
Healthcare/Medical Office	**55,000 sf**	**2.7/1,000 sf**	**149**	**134 (90%)**
Retail	19,918 sf	4.1/1,000 sf	82	66 (80%)
Fitness	15,728 sf	4.3/1,000 sf	68	54 (80%)
Restaurant	9,782 sf	15.3/1,000 sf	150	120 (80%)
Drive-Thru Restaurant	2,250 sf	9.9/1,000 sf	22	18 (80%)
Total	**246,078 sf**	-	**569**	**490**

Table 3: Cedar Creek Plaza (Entire Development) Parking Requirements - EXCLUSIVELY RETAIL				
Use	**Floor Area**	**Minimum Parking Ratio**	**Minimum Required Stalls**	**Min Adjusted Per Criteria in SZCDC 16.94.010(C)(2)**

Assisted Living (Nursing Home)	143,400 sf	-	98	98 (100%)
Healthcare/Medical Office	42,000 sf	2.7/1,000 sf	113	102 (90%)
Retail	**32,918 sf**	**4.1/1,000 sf**	**135**	**108 (80%)**
Fitness	15,728 sf	4.3/1,000 sf	68	54 (80%)
Restaurant	9,782 sf	15.3/1,000 sf	150	120 (80%)
Drive-Thru Restaurant	2,250 sf	9.9/1,000 sf	22	18 (80%)
Total	**246,078 sf**	-	**586**	**500**

Table 4: Cedar Creek Plaza (Entire Development) Parking Requirements - EXCLUSIVELY RESTAURANT

Use	Floor Area	Minimum Parking Ratio	Minimum Required Stalls	Min Adjusted Per Criteria in SZCDC 16.94.010(C)(2)
Assisted Living (Nursing Home)	143,400 sf	-	98	98 (100%)
Healthcare/Medical Office	42,000 sf	2.7/1,000 sf	113	102 (90%)
Retail	19,918 sf	4.1/1,000 sf	82	66 (80%)
Fitness	15,728 sf	4.3/1,000 sf	68	54 (80%)
Restaurant	**22,782 sf**	**15.3/1,000 sf**	**349**	**279 (80%)**
Drive-Thru Restaurant	2,250 sf	9.9/1,000 sf	22	18 (80%)
Total	**246,078 sf**	-	**732**	**617**

Table 5: Overall Parking Summary

Required Minimum	Healthcare: 490 spaces Retail: 500 spaces Restaurant: 617 spaces
Proposed Parking Supply	598 spaces
Surplus/Deficit	**Healthcare: +108** **Retail: +98** **Restaurant: -19**

B. Dimensional and General Configuration Standards

1. Dimensions For the purpose of this Chapter, a "parking space" means a stall nine (9) feet in width and twenty (20) feet in length. Up to twenty five (25) percent of required parking spaces may have

a minimum dimension of eight (8) feet in width and eighteen (18) feet in length so long as they are signed as compact car stalls.

Response: The proposed parking areas have been designed consistent with the dimensional standards specified above. Parking stalls are nine feet wide and 20 feet long, except on the south and east property lines where vehicle overhang is utilized in accordance with subsection 16.94.020.B.3.c.

2. Layout

Parking space configuration, stall and access aisle size shall be of sufficient width for all vehicle turning and maneuvering. Groups of more than four (4) parking spaces shall be served by a driveway so as to minimize backing movements or other maneuvering within a street, other than an alley. All parking areas shall meet the minimum standards shown in the following table and diagram.

Response: As shown on the Site Dimensions Plan, Sheet C2.1 of Exhibit A, parking space configuration, stall and access aisle size are of sufficient width for all vehicle turning and maneuvering on-site. Parking areas meet minimum dimensional requirements. No backing movements or maneuvering on public streets will be required.

3. Wheel Stops

a. 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 (4) inches high, located three (3) feet back from the front of the parking stall as shown in the above diagram.

b. Wheel stops adjacent to landscaping, bio-swales or water quality facilities shall be designed to allow storm water runoff.

c. The paved portion of the parking stall length may be reduced by three (3) feet if replaced with three (3) feet of low lying landscape or hardscape in lieu of a wheel stop; however, a curb is still required. In other words, the traditional three-foot vehicle overhang from a wheel stop may be low-lying landscaping rather than an impervious surface.

Response: As shown on the Site Dimensions Plan, Sheet C2.1 of Exhibit A, all parking spaces will have curbing or wheel stops in compliance with this requirement.

4. Service Drives

Service drives shall be clearly and permanently marked and defined through use of rails, fences, walls, or other barriers or markers, and shall have minimum vision clearance area formed by the intersection of the driveway center line, the street right-of-way line, and a straight line joining said lines through points fifteen (15) feet from their intersection.

Response: No service drives are proposed.

5. Credit for On-Street Parking

Response: No credit for on-street parking is requested.

6. Reduction in Required Parking Spaces

Developments utilizing Engineered storm water bio-swales or those adjacent to environmentally constrained or sensitive areas may reduce the amount of required parking spaces by ten (10) percent when twenty-five (25) through forty-nine (49) parking spaces are required, fifteen (15) percent when fifty (50) and seventy-four (74) parking spaces are required and twenty (20) percent when more than seventy-five (75) parking spaces are required, provided the area that would have been used for parking is maintained as a habitat area or is generally adjacent to an environmentally sensitive or constrained area.

Response: The proposed plan complies with the parking requirements for mixed use developments, as demonstrated in subsection 16.94.020.A. No reduction in required parking spaces is requested.

C. Bicycle Parking Facilities

1. General Provisions

a. Applicability. Bicycle parking spaces shall be provided for new development, changes of use, and major renovations, defined as construction valued at twenty-five (25) percent or more of the assessed value of the existing structure.

Response: As shown on the Site Plan, Sheet C2.0 of Exhibit A, bicycle parking is proposed at the south side of the development near the entrance to each building. Additional bicycle parking is located between the two buildings to the north.

b. Types of Spaces. Bicycle parking facilities shall be provided in terms of short-term bicycle parking and long-term bicycle parking. Short-term bicycle parking is intended to encourage customers and other visitors to use bicycles by providing a convenient and readily accessible place to park bicycles. Long-term bicycle parking provides employees, students, residents, commuters, and others who generally stay at a site for at least several hours a weather-protected place to park bicycles.

Response: Bicycle parking spaces will be short-term use given the retail nature of the development which is more likely to have customers and other visitors that need short-term, readily accessible bicycle parking.

c. Minimum Number of Spaces. The required total minimum number of bicycle parking spaces for each use category is shown in Table 4, Minimum Required Bicycle Parking Spaces.

Response: Per Table 4 of this section, the minimum required bicycle parking for retail sales/service office is two, or one per 20 auto spaces, whichever is greater. The required number of parking stalls for retail sales is 49 vehicle stalls, therefore three bicycle parking spaces are required. The proposed use on-site is anticipated to be a mix of healthcare facilities, retail, and potential restaurant uses. Per Table 4, retail sales and service office have the same bicycle parking requirements. All three potential uses fall under this category; therefore, the bicycle requirements are the same regardless of the use mix anticipated.

d. Minimum Number of Long-term Spaces. If a development is required to provide eight (8) or more required bicycle parking spaces in Table 4, at least twenty-five (25) percent shall be provided as long-term bicycle with a minimum of one (1) long-term bicycle parking space.

Response: As indicated above, the project requires three bicycle parking spaces therefore this standard does not apply.

e. Multiple Uses. When there are two or more primary uses on a site, the required bicycle parking for the site is the sum of the required bicycle parking for the individual primary uses.

Response: The proposed use on-site is anticipated to be a mix of healthcare facilities, retail, and potential restaurant uses. Per Table 4, retail sales and service office have the same bicycle parking requirements. All three potential uses fall under this category; therefore, the bicycle requirements are the same regardless of the use mix anticipated.

2. Location and Design.

a. General Provisions

(1) Each space must be at least two (2) feet by six (6) feet in area, be accessible without moving another bicycle, and provide enough space between the rack and any obstructions to use the space properly.

(2) There must be an aisle at least five (5) feet wide behind all required bicycle parking to allow room for bicycle maneuvering. Where the bicycle parking is adjacent to a sidewalk, the maneuvering area may extend into the right-of-way.

(3) Lighting. Bicycle parking shall be at least as well lit as vehicle parking for security.

(4) Reserved Areas. Areas set aside for bicycle parking shall be clearly marked and reserved for bicycle parking only.

(5) Bicycle parking in the Old Town Overlay District can be located on the sidewalk within the right-of-way. A standard inverted "U shaped" or staple design is appropriate. Alternative, creative designs are strongly encouraged.

(6) Hazards. Bicycle parking shall not impede or create a hazard to pedestrians. Parking areas shall be located so as to not conflict with vision clearance standards.

Response: As shown on Sheet C2.0 of Exhibit A, bicycle parking has been designed in compliance with the applicable requirements of subsection 16.94.020.C.2. The site is not located in the Old Town Overlay District.

b. Short-term Bicycle Parking

(1) Provide lockers or racks that meet the standards of this section.

(2) Locate inside or outside the building within thirty (30) feet of the main entrance to the building or at least as close as the nearest vehicle parking space, whichever is closer.

Response: Short-term bicycle parking is proposed within approximately 25 feet of entrances to both buildings as shown on Sheet C2.0 of Exhibit A.

c. Long-term Bicycle Parking

(1) Provide racks, storage rooms, or lockers in areas that are secure or monitored (e.g., visible to employees or customers or monitored by security guards).

(2) Locate the outside bicycle parking spaces within one hundred (100) feet of the entrance that will be accessed by the intended users.

(3) All of the spaces shall be covered.

Response: Per subsection 16.94.020.C.1.d, no long-term bicycle parking spaces are required.

d. Covered Parking (Weather Protection)

(1) When required, covered bicycle parking shall be provided in one (1) of the following ways: inside buildings, under roof overhangs or awnings, in bicycle lockers, or within or under other structures.

(2) Where required covered bicycle parking is not within a building or locker, the cover must be permanent and designed to protect the bicycle from rainfall and provide seven-foot minimum overhead clearance.

(3) Where required bicycle parking is provided in lockers, the lockers shall be securely anchored.

Response: Per subsection 16.94.020.C.1.d, no long-term bicycle parking spaces are required, therefore no covered bicycle parking is required.

16.94.030 - Off-Street Loading Standards

A. Minimum Standards

1. A driveway designed for continuous forward flow of passenger vehicles for the purpose of loading and unloading passengers shall be located on the site of any school, or other public meeting place, which is designed to accommodate more than twenty five (25) persons at one time.

Response: No school or public meeting place is proposed on-site.

2. The minimum loading area for non-residential uses shall not be less than ten (10) feet in width by twenty-five (25) feet in length and shall have an unobstructed height of fourteen (14) feet.

3. Multiple uses on the same parcel or adjacent parcels may utilize the same loading area if it is shown in the development application that the uses will not have substantially overlapping delivery times.

4. The following additional minimum loading space is required for buildings in excess of twenty thousand (20,000) square feet of gross floor area:

a. Twenty thousand (20,000) to fifty (50,000) sq. ft. - five hundred (500) sq. ft.

b. Fifty (50,000) sq. ft. or more - seven hundred fifty (750) sq. ft.

Response: The proposed buildings total 13,000 square feet. Loading and unloading of deliveries will be completed during off hours when parking will not be fully utilized. Loading is anticipated in small style delivery trucks and can be offloaded from the drive aisle in short time periods that would not pose impacts to required parking. This is consistent with the current loading and deliveries system throughout the rest of the Cedar Creek Plaza shopping center.

B. Separation of Areas

Any area to be used for the maneuvering of delivery vehicles and the unloading or loading of materials shall be separated from designated off-street parking areas and designed to prevent the encroachment of delivery vehicles onto off-street parking areas or public streets. Off-street parking areas used to fulfill the requirements of this Chapter shall not be used for loading and unloading operations.

Response: No formal loading spaces are required for these buildings. Loading and unloading of deliveries will be completed during off hours when parking will not be fully utilized. Loading is anticipated in small style delivery trucks and can be offloaded from the drive aisle in short time periods that would not pose impacts to required parking. This is consistent with the current loading and deliveries system throughout the rest of the Cedar Creek Plaza shopping center.

C. Exceptions and Adjustments.

The review authority, through Site Plan Review, may approve loading areas within a street right-of-way in the Old Town Overlay District when all of the following conditions are met:

Response: The site is not located in the Old Town Overlay District. This standard does not apply.

Chapter 16.96 - ON-SITE CIRCULATION

16.96.010 - On-Site Pedestrian and Bicycle Circulation

B. Maintenance

No building permit or other City permit shall be issued until plans for ingress, egress and circulation have been approved by the City. Any change increasing any ingress, egress or circulation requirements, shall be a violation of this Code unless additional facilities are provided in accordance with this Chapter.

Response: The applicant will secure all necessary approvals and permits required for the proposed development.

C. Joint Access

Two (2) or more uses, structures, or parcels of land may utilize the same ingress and egress when the combined ingress and egress of all uses, structures, or parcels of land satisfied the other requirements of this Code, provided that satisfactory legal evidence is presented to the City in the form of deeds, easements, leases, or contracts to clearly establish the joint use.

Response: The proposed development will utilize existing previously approved access points in the commercial center available for use through a reciprocal access and parking agreement that applies to all of the properties within the development. No changes to these existing access points are proposed through this application.

D. Connection to Streets

1. Except for joint access per this Section, all ingress and egress to a use or parcel shall connect directly to a public street, excepting alleyways with paved sidewalk.

Response: The proposed development will utilize existing approved vehicle circulation and access points within the commercial center. Shared use and legal access is granted through a reciprocal access and parking agreement. No changes to these existing access points are proposed through this application.

2. Required private sidewalks shall extend from the ground floor entrances or the ground floor landing of stairs, ramps or elevators to the public sidewalk or curb of the public street which provides required ingress and egress.

Response: As shown on the Site Plan, Sheet C2.0 of Exhibit A, the proposed site design includes private sidewalks that connect proposed building entrances to the existing on-site pedestrian circulation system within the Cedar Creek Plaza, which connects to public sidewalks on Highway 99W and SW Edy Road.

E. Maintenance of Required Improvements

Required ingress, egress and circulation improvements shall be kept clean and in good repair.

Response: Required ingress, egress and circulation improvements will be maintained as required.

F. Access to Major Roadways

Points of ingress or egress to and from Highway 99W and arterials designated on the Transportation Plan Map, attached as Appendix C of the Community Development Plan, Part II, shall be limited as follows:

2. Other private ingress or egress from Highway 99W and arterial roadways shall be minimized. Where alternatives to Highway 99W or arterials exist or are proposed, any new or altered uses developed after the effective date of this Code shall be required to use the alternative ingress and egress.

3. All site plans for new development submitted to the City for approval after the effective date of this Code shall show ingress and egress from existing or planned local or collector streets, consistent with the Transportation Plan Map and Section VI of the Community Development Plan.

Response: No new access points to public streets, or changes to existing access points, are proposed with this application. The site will utilize existing shared access points and circulation areas within the development which are governed by a reciprocal access and parking agreement. The existing access points were approved by the City through prior land use applications.

G. Service Drives

Service drives shall be provided pursuant to Section 16.94.030.

Response: No service drives are proposed or required.

16.96.030 - Minimum Non-Residential Standards

Minimum standards for private, on-site circulation improvements in non-residential developments:

A. Driveways

Required		Minimum Width	
Parking Spaces	# Driveways	One-Way Pair	Two-Way
____			
1 - 49	1	15 feet	24 feet
50 & above	2	15 feet	24 feet

1. *Commercial: Improved hard surface driveways are required as follows:*

Response: The development proposes 94 new parking stalls, therefore two driveways are required. As shown on the Site Plan, Sheet C2.0 of Exhibit A, two driveways are proposed. Both driveways are two-way and will be over 24 feet in length.

3. *Surface materials are encouraged to be pervious when appropriate considering soils, anticipated vehicle usage and other pertinent factors.*

Response: Proposed driveways will be comprised of asphalt. Pervious paving is not proposed due to limited infiltration present at the site as documented through SP 16-10.

B. Sidewalks and Curbs

1. *A private pathway/sidewalk system extending throughout the development site shall be required to connect to existing development, to public rights-of-way with or without improvements, to parking and storage areas, and to connect all building entrances to one another. The system shall also connect to transit facilities within five hundred (500) feet of the site, future phases of development, and whenever possible to parks and open spaces.*
2. *Curbs shall also be required at a standard approved by the Hearing Authority. Private pathways/sidewalks shall be connected to public rights-of-way along driveways but may be allowed other than along driveways if approved by the Hearing Authority.*
3. *Private Pathway/Sidewalk Design. Private pathway surfaces shall be concrete, asphalt, brick/masonry pavers, or other pervious durable surface. Primary pathways connecting front entrances to the right of way shall be at least 6 feet wide and conform to ADA standards. Secondary pathways between buildings and within parking areas shall be a minimum of four (4) feet wide and/or conform to ADA standards. Where the system crosses a parking area, driveway or street, it shall be clearly marked with contrasting paving materials or raised crosswalk (hump). At a minimum all crosswalks shall include painted striping.*
4. *Exceptions. Private pathways/sidewalks shall not be required where physical or topographic conditions make a connection impracticable, where buildings or other existing development on adjacent lands physically preclude a connection now or in the future considering the potential for redevelopment; or pathways would violate provisions of leases, restrictions or other agreements.*

Response: Sidewalks and curbing have been provided throughout the site in accordance with 16.96.030.B, as shown on the Site Plan, Sheet C2.0 of Exhibit A. Proposed sidewalks connect proposed building entrances to the existing on-site pedestrian circulation system within the development, which connects to public sidewalks.

16.96.040 - On-Site Vehicle Circulation

A. Maintenance

No building permit or other City permit shall be issued until plans for ingress, egress and circulation have been approved by the City. Any change increasing any ingress, egress or circulation requirements, shall be a violation of this Code unless additional facilities are provided in accordance with this Chapter.

Response: The applicant will secure all necessary approvals and permits required for the proposed development.

B. Joint Access [See also Chapter 16.108]

Two (2) or more uses, structures, or parcels of land are strongly encouraged to utilize jointly the same ingress and egress when the combined ingress and egress of all uses, structures, or parcels of land satisfy the other requirements of this Code, provided that satisfactory legal evidence is presented to the City in the form of deeds, easements, leases, or contracts to clearly establish the joint use. In some cases, the City may require a joint access to improve safety, vision clearance, site distance, and comply with access spacing standards for the applicable street classification.

Response: The proposed development will utilize existing approved access points in the commercial development which have been established for shared use through a reciprocal access and parking agreement. No changes to these existing access points are proposed through this application.

C. Connection to Streets

1. Except for joint access per this Section, all ingress and egress to a use or parcel shall connect directly to a public street, excepting alleyways.

Response: The proposed development will utilize existing approved access points in the commercial center established through a reciprocal access and parking agreement. No changes to these existing access points are proposed through this application.

2. Required private sidewalks shall extend from the ground floor entrances or the ground floor landing of stairs, ramps or elevators to the public sidewalk or curb of the public street which provides required ingress and egress.

Response: As shown on the Site Plan, Sheet C2.0 of Exhibit A, the proposed site design includes private sidewalks that connect proposed building entrances to the existing on-site pedestrian circulation system within the development, which connects to public sidewalks.

D. Maintenance of Required Improvements

Required ingress, egress and circulation improvements shall be kept clean and in good repair.

Response: Required ingress, egress and circulation improvements will be maintained as required.

E. Service Drives

Service drives shall be provided pursuant to Section 16.94.030.

Response: No service drives are provided or required.

Chapter 16.98 - ON-SITE STORAGE

16.98.010 - Recreational Vehicles and Equipment

Recreational vehicles and equipment may be stored only within designated and improved off-street parking areas. Such areas shall meet the screening and landscaping requirements of Section 16.92.030.

Response: No recreational vehicles or equipment will be stored on site.

16.98.020 - Solid Waste and Recycling Storage

All uses shall provide solid waste and recycling storage receptacles which are adequately sized to accommodate all solid waste generated on site. All solid waste and recycling storage areas and receptacles shall be located out of public view. Solid waste and recycling receptacles for multi-family, commercial, industrial and institutional uses shall be screened by six (6) foot high sight-obscuring fence or masonry wall and shall be easily accessible to collection vehicles.

Response: The proposed development will include solid waste and recycling storage receptacles sized appropriately for the waste generated by the use on-site. The existing trash enclosure is in the northwest corner of the parking lot and is screened by a masonry enclosure.

16.98.030 - Material Storage

A. Generally. Except as otherwise provided herein, external material storage is prohibited, except in commercial and industrial zones where storage areas are approved by the Review Authority as part of a site plan or per Section 16.98.040.

Response: No external storage is proposed on site.

B. Standards. Except as per Section 16.98.040, all service, repair, storage, and merchandise display activities carried on in connection with any commercial or industrial activity, and not conducted within an enclosed building, shall be screened from the view of all adjacent properties and adjacent streets by a six (6) foot to eight (8) foot high, sight obscuring fence subject to chapter 16.58.020. In addition, unless adjacent parcels to the side and rear of the storage area have existing solid evergreen screening or sight-obscuring fencing in place, new evergreen screening no less than three (3) feet in height shall be planted along side and rear property lines. Where other provisions of this Code require evergreen screening, fencing, or a landscaped berm along side and rear property lines, the additional screening stipulated by this Section shall not be required.

Response: Besides typical vehicle circulation and parking, loading, and waste storage pick up, all activities associated with the proposed uses will be conducted indoors.

C. Hazardous Materials. Storage of hazardous, corrosive, flammable, or explosive materials, if such storage is otherwise permitted by this Code, shall comply with all local fire codes, and Federal and State regulations.

Response: No storage of hazardous, corrosive, flammable, or explosive materials is proposed.

16.98.040 - Outdoor Sales and Merchandise Display

A. Sales Permitted

Outdoor sales and merchandise display activities, including sales and merchandise display that is located inside when the business is closed but otherwise located outside, shall be permitted when such activities are deemed by the Commission to be a customary and integral part of a permitted commercial or industrial use.

Response: No outdoors sales or merchandise display is proposed with this application.

Chapter 16.100 - PERMANENT SIGNS

Response: No permanent signs are proposed with this application. Any signage for the proposed development will be requested through future sign permits.

Division VI. - PUBLIC INFRASTRUCTURE

Chapter 16.106 - TRANSPORTATION FACILITIES

16.106.010 - Generally

A. Creation

Public streets shall be created in accordance with provisions of this Chapter. Except as otherwise provided, all street improvements and rights-of-way shall conform to standards for the City's functional street classification, as shown on the Transportation System Plan (TSP) Map (Figure 17) and other applicable City standards. The following table depicts the guidelines for the street characteristics.

Response: No public streets or public street improvements are proposed with this application. All right-of-way improvements required for the Cedar Creek Plaza were approved through previous land use applications.

16.106.020 - Required Improvements

A. Generally

Except as otherwise provided, all developments containing or abutting an existing or proposed street, that is either unimproved or substandard in right-of-way width or improvement, shall dedicate the necessary right-of-way prior to the issuance of building permits and/or complete acceptable improvements prior to issuance of occupancy permits. Right-of-way requirements are based on functional classification of the street network as established in the Transportation System Plan, Figure 17.

B. Existing Streets

Except as otherwise provided, when a development abuts an existing street, the improvements requirement shall apply to that portion of the street right-of-way located between the centerline of the right-of-way and the property line of the lot proposed for development. In no event shall a required street improvement for an existing street exceed a pavement width of thirty (30) feet.

C. Proposed Streets

Response: The development site does not abut an existing or proposed street. All right-of-way improvements required for the Cedar Creek Plaza were approved and constructed with previous land use approvals. No right-of-way improvements are required.

16.106.030 - Location

D. Additional Setbacks

Generally additional setbacks apply when the width of a street right-of-way abutting a development is less than the standard width under the functional classifications in Section VI of the Community Development Plan. Additional setbacks are intended to provide unobstructed area for future street right-of-way dedication and improvements, in conformance with Section VI. Additional setbacks shall be measured at right angles from the centerline of the street.

Response: The development site does not abut an existing or proposed street. All right-of-way improvements required for the Cedar Creek Plaza were approved and constructed with previous land use applications. No additional setbacks are required.

16.106.060 - Sidewalks

A. Required Improvements

1. Except as otherwise provided, sidewalks shall be installed on both sides of a public street and in any special pedestrian way within new development.

2. For Highway 99W, arterials, or in special industrial districts, the City Manager or designee may approve a development without sidewalks if alternative pedestrian routes are available.

3. In the case of approved cul-de-sacs serving less than fifteen (15) dwelling units, sidewalks on one side only may be approved by the City Manager or designee.

Response: The development site does not abut an existing or proposed street. All right-of-way improvements, including sidewalks, required for the development were constructed with previous land use approvals.

16.106.070 - Bike Lanes

If shown in Figure 13 of the Transportation System Plan, bicycle lanes shall be installed in public rights-of-way, in accordance with City specifications. Bike lanes shall be installed on both sides of designated roads, should be separated from the road by a twelve-inch stripe or other means approved by Engineering Staff, and should be a minimum of five (5) feet wide.

Response: The development site does not abut an existing or proposed street. All right-of-way improvements, including bike lanes, required for the subdivision were approved through previous land use applications.

16.106.080 - Traffic Impact Analysis (TIA)

B. Applicability

A traffic impact analysis (TIA) shall be required to be submitted to the City with a land use application at the request of the City Engineer or if the proposal is expected to involve one (1) or more of the following:

Response: A TIA was provided for a previous site plan review for the subdivision (SP 16-10). Per the Pre-Application Conference Notes, Exhibit B, a memo updating the trip generation from the site will be required, due to the change of use for Lot 2 from its original assumption in the original traffic impact analysis. An updated Trip Generation Letter has been attached as Exhibit C.

Chapter 16.110 - SANITARY SEWERS

16.110.010 - Required Improvements

Sanitary sewers shall be installed to serve all new developments and shall connect to existing sanitary sewer mains. Provided, however, that when impractical to immediately connect to a trunk sewer system, the use of septic tanks may be approved, if sealed sewer laterals are installed for future connection and the temporary system meets all other applicable City, Clean Water Services, Washington County and State sewage disposal standards.

Response: Per the Pre-Application Conference Notes, Exhibit B, "An 8-inch diameter sanitary sewer lateral was constructed to serve the subject property at the northwest corner of the subject property. All surrounding properties in this area have public sanitary sewer service or access to public sanitary sewer service. Therefore, no extension of the existing sanitary sewer system is anticipated. Depending on the usage of the buildings, an appropriately sized grease interceptor may be required." Proposed sanitary sewer connections are shown on Sheet C5.0 of Exhibit A.

16.110.020 - Design Standards

A. Capacity

Sanitary sewers shall be constructed, located, sized, and installed at standards consistent with this Code, the Sanitary Sewer Service Plan Map in the Sanitary Sewer Master Plan, and other applicable Clean Water Services and City standards, in order to adequately serve the proposed development and allow for future extensions.

Response: As shown on Sheet C5.0 of Exhibit A, private sanitary sewer connections have been sized appropriately for the development, in accordance with applicable requirements. No public sanitary sewer improvements are required for this application.

B. Over-Sizing

1. When sewer facilities will, without further construction, directly serve property outside a proposed development, gradual reimbursement may be used to equitably distribute the cost of that over-sized system.

2. Reimbursement shall be in an amount estimated by the City to be a proportionate share of the cost for each connection made to the sewer by property owners outside of the development, for a period of ten (10) years from the time of installation of the sewers. The boundary of the reimbursement area and the method of determining proportionate shares shall be determined by the City. Reimbursement shall only be made as additional connections are made and shall be collected as a surcharge in addition to normal connection charges.

Response: No public sanitary sewer improvements are required for this application. All surrounding properties in this area have public sanitary sewer service or access to public sanitary sewer service. Therefore, no extension of the existing sanitary sewer system or over-sizing is anticipated.

16.110.030 - Service Availability

Approval of construction plans for new facilities pursuant to Chapter 16.106, and the issuance of building permits for new development to be served by existing sewer systems shall include certification by the City that existing or proposed sewer facilities are adequate to serve the development.

Response: The applicant will secure all necessary approvals and permits required for the proposed development.

Chapter 16.112 - WATER SUPPLY

16.112.010 - Required Improvements

Water lines and fire hydrants conforming to City and Fire District standards shall be installed to serve all building sites in a proposed development. All waterlines shall be connected to existing water mains or shall construct new mains appropriately sized and located in accordance with the Water System Master Plan.

Response: The Composite Utility plan, Sheet C5.0 of Exhibit A, demonstrates that water lines and fire hydrants will be provided to serve the proposed building. All water lines will be connected to existing water mains.

16.112.020 - Design Standards

A. Capacity

Water lines providing potable water supply shall be sized, constructed, located and installed at standards consistent with this Code, the Water System Master Plan, the City's Design and Construction Manual, and with other applicable City standards and specifications, in order to adequately serve the proposed development and allow for future extensions.

Response: As shown on Sheet C5.0 of Exhibit A, private water connections have been sized appropriately for the development, in accordance with applicable requirements. No improvements to public water lines are required for this application.

B. Fire Protection

All new development shall comply with the fire protection requirements of Chapter 16.116, the applicable portions of Chapter 7 of the Community Development Plan, and the Fire District.

Response: The Composite Utility plan, Sheet C5.0 of Exhibit A, demonstrates that the proposed development will comply with applicable fire protection requirements.

C. Over-Sizing

1. *When water mains will, without further construction, directly serve property outside a proposed development, gradual reimbursement may be used to equitably distribute the cost of that over-sized system.*
2. *Reimbursement shall be in an amount estimated by the City to be the proportionate share of the cost of each connection made to the water mains by property owners outside the development, for a period of ten (10) years from the time of installation of the mains. The boundary of the reimbursement area and the method of determining proportionate shares shall be determined by*

the City. Reimbursement shall only be made as additional connections are made and shall be collected as a surcharge in addition to normal connection charges.

3. *When over-sizing is required in accordance with the Water System Master Plan, it shall be installed per the Water System Master Plan. Compensation for over-sizing may be provided through direct reimbursement, from the City, after mainlines have been accepted. Reimbursement of this nature would be utilized when the cost of over-sizing is for system wide improvements.*

Response: No public water improvements are required for this application. All surrounding properties in this area have public water service or access to public water service. Therefore, no extension of the existing water system or over-sizing is anticipated.

16.112.030 - Service Availability

Approval of construction plans for new water facilities pursuant to Chapter 16.106, and the issuance of building permits for new development to be served by existing water systems shall include certification by the City that existing or proposed water systems are adequate to serve the development.

Response: The applicant will secure all necessary approvals and permits required for the proposed development.

Chapter 16.114 - STORM WATER

16.114.010 - Required Improvements

Storm water facilities, including appropriate source control and conveyance facilities, shall be installed in new developments and shall connect to the existing downstream drainage systems consistent with the Comprehensive Plan and the requirements of the Clean Water Services water quality regulations contained in their Design and Construction Standards R&O 04-9, or its replacement.

Response: A 12-inch diameter storm sewer lateral was constructed to serve the subject property on the south side of the subject property. The proposed development includes a mechanical treatment system with an underground detention chamber system that will connect to the existing storm stub provided with the previous phase. Sheet C4.0 of Exhibit A demonstrates storm water facilities have been designed in compliance with applicable requirements.

16.114.020 - Design Standards

A. Capacity

Storm water drainage systems shall be sized, constructed, located, and installed at standards consistent with this Code, the Storm Drainage Master Plan Map, attached as Exhibit E, Chapter 7 of the Community Development Plan, other applicable City standards, the Clean Water Services Design and Construction standards R&O 04-9 or its replacement, and hydrologic data and improvement plans submitted by the developer.

Response: Sheet C4.0 of Exhibit A demonstrates storm water facilities have been designed in compliance with applicable requirements.

B. On-Site Source Control

Storm water detention and groundwater recharge improvements, including but not limited to such facilities as dry wells, detention ponds, and roof top ponds shall be constructed according to Clean Water Services Design and Construction Standards.

Response: As shown on the Storm Plan, Sheet C4.0 of Exhibit A, the proposed development includes a mechanical treatment system with an underground detention chamber system that will connect to the existing storm stub provided with the previous phase.

C. Conveyance System

The size, capacity and location of storm water sewers and other storm water conveyance improvements shall be adequate to serve the development and accommodate upstream and downstream flow. If an upstream area discharges through the property proposed for development, the drainage system shall provide capacity to the receive storm water discharge from the upstream area. If downstream drainage systems are not sufficient to receive an increase in storm water caused by new development, provisions shall be made by the developer to increase the downstream capacity or to provide detention such that the new development will not increase the storm water caused by the new development.

Response: No public storm improvements are required for this application. All surrounding properties in this area have public storm sewer service or access to public storm sewer service. Therefore, no extension of the existing storm sewer system is anticipated. The proposed development will provide water quality treatment and detention in compliance with CWS standards. Sheet C4.0 of Exhibit A demonstrates storm water facilities have been sized appropriately to accommodate the proposed development.

16.114.030 - Service Availability

Approval of construction plans for new storm water drainage facilities pursuant to Chapter 16.106, and the issuance of building permits for new development to be served by existing storm water drainage systems shall include certification by the City that existing or proposed drainage facilities are adequate to serve the development.

Response: The applicant will secure all necessary approvals and permits required for the proposed development.

Chapter 16.116 - FIRE PROTECTION

16.116.010 - Required Improvements

When land is developed so that any commercial or industrial structure is further than two hundred and fifty (250) feet or any residential structure is further than five hundred (500) feet from an adequate water supply for fire protection, as determined by the Fire District, the developer shall provide fire protection facilities necessary to provide adequate water supply and fire safety.

Response: The Composite Utility plan, Sheet C5.0 of Exhibit A, shows proposed fire protection facilities that will provide adequate water supply.

16.116.020 - Standards

A. Capacity

All fire protection facilities shall be approved by and meet the specifications of the Fire District, and shall be sized, constructed, located, and installed consistent with this Code, Chapter 7 of the Community

Development Plan, and other applicable City standards, in order to adequately protect life and property in the proposed development.

Response: All fire protection facilities have been sized, constructed, located, and installed consistent with applicable requirements

B. Fire Flow

Standards published by the Insurance Services Office, entitled "Guide for Determination of Required Fire Flows" shall determine the capacity of facilities required to furnish an adequate fire flow. Fire protection facilities shall be adequate to convey quantities of water, as determined by ISO standards, to any outlet in the system, at no less than twenty (20) pounds per square inch residual pressure. Water supply for fire protection purposes shall be restricted to that available from the City water system. The location of hydrants shall be taken into account in determining whether an adequate water supply exists.

Response: Fire protection facilities have been designed, sized and located in order to provide adequate fire flow.

C. Access to Facilities

Whenever any hydrant or other appurtenance for use by the Fire District is required by this Chapter, adequate ingress and egress shall be provided. Access shall be in the form of an improved, permanently maintained roadway or open paved area, or any combination thereof, designed, constructed, and at all times maintained, to be clear and unobstructed. Widths, height clearances, ingress and egress shall be adequate for District firefighting equipment. The Fire District, may further prohibit vehicular parking along private accessways in order to keep them clear and unobstructed, and cause notice to that effect to be posted.

Response: As shown on Sheet C2.0, the site plan has been designed to provide adequate, ingress, egress, circulation and maneuvering space for emergency vehicles.

D. Hydrants

Hydrants located along private, accessways shall either have curbs painted yellow or otherwise marked prohibiting parking for a distance of at least fifteen (15) feet in either direction, or where curbs do not exist, markings shall be painted on the pavement, or signs erected, or both, given notice that parking is prohibited for at least fifteen (15) feet in either direction.

Response: The proposed hydrant is shown on Sheet C5.0. Curbing will be marked and kept clear from parking as required.

16.116.030 - Miscellaneous Requirements

A. Timing of Installation

When fire protection facilities are required, such facilities shall be installed and made serviceable prior to or at the time any combustible construction begins on the land unless, in the opinion of the Fire District, the nature or circumstances of said construction makes immediate installation impractical.

Response: Fire protection facilities will be installed in accordance with this standard.

B. Maintenance of Facilities

All on-site fire protection facilities, shall be maintained in good working order. The Fire District may conduct periodic tests and inspection of fire protection and may order the necessary repairs or changes be made within ten (10) days.

Response: Fire protection facilities will be maintained in good working order in accordance with this standard.

Chapter 16.118 - PUBLIC AND PRIVATE UTILITIES

16.118.010 - Purpose

Public telecommunication conduits as well as conduits for franchise utilities including, but not limited to, electric power, telephone, natural gas, lighting, and cable television shall be installed to serve all newly created lots and developments in Sherwood.

Response: No public telecommunications conduits or conduits for franchise utilities are proposed or required with this application. All public utility improvements and telecommunication/franchise utilities conduits and easements required for the development were approved through a previous land use application (SP16-10).

16.118.030 - Underground Facilities

Except as otherwise provided, all utility facilities, including but not limited to, electric power, telephone, natural gas, lighting, cable television, and telecommunication cable, shall be placed underground, unless specifically authorized for above ground installation, because the points of connection to existing utilities make underground installation impractical, or for other reasons deemed acceptable by the City.

Response: All public utility improvements required for the development were approved through a previous land use application (SP16-10). No undergrounding of utilities is required with this application.

16.118.040 - Exceptions

Surface-mounted transformers, surface-mounted connection boxes and meter cabinets, temporary utility service facilities during construction, high capacity electric and communication feeder lines, and utility transmission lines operating at fifty thousand (50,000) volts or more may be located above ground. The City reserves the right to approve location of all surface-mounted transformers.

Response: All public utility improvements required for the development were approved through a previous land use application (SP16-10). No undergrounding of utilities is required with this application. No exceptions are requested.

16.118.050 - Private Streets

The construction of new private streets, serving single-family residential developments shall be prohibited unless it provides principal access to two or fewer residential lots or parcels i.e. flag lots. Provisions shall be made to assure private responsibility for future access and maintenance through recorded easements. Unless otherwise specifically authorized, a private street shall comply with the same standards as a public street identified in the Community Development Code and the Transportation System Plan. A private street shall be distinguished from public streets and reservations or restrictions relating to the private street shall be described in land division documents and deed records. A private street shall also be signed differently from public streets and include the words "Private Street".

Response: No private streets are proposed with this application. On-site drive aisle will connect with drive aisles in the surrounding Cedar Creek Plaza, which connect to public streets.

Division VIII. - ENVIRONMENTAL RESOURCES

Chapter 16.142 - PARKS, TREES AND OPEN SPACES

16.142.060 - Street Trees

A. Installation of Street Trees on New or Redeveloped Property.

Trees are required to be planted to the following specifications along public streets abutting or within any new development or re-development. Planting of such trees shall be a condition of development approval. The City shall be subject to the same standards for any developments involving City-owned property, or when constructing or reconstructing City streets. After installing street trees, the property owner shall be responsible for maintaining the street trees on the owner's property or within the right-of-way adjacent to the owner's property.

Response: The site does not abut public streets. Street trees for the frontage along public streets were planted with prior development of the Cedar Creek Plaza.

16.142.070 - Trees on Property Subject to Certain Land Use Applications

B. Applicability

All applications including a Type II - IV land use review, shall be required to preserve trees or woodlands, as defined by this Section to the maximum extent feasible within the context of the proposed land use plan and relative to other codes, policies, and standards of the City Comprehensive Plan.

Response: No trees are proposed for removal with this application. No woodlands exist on site.

C. Inventory

1. To assist the City in making its determinations on the retention of trees and woodlands, land use applications including Type II - IV development shall include a tree and woodland inventory and report. The report shall be prepared by a qualified professional and must contain the following information:

a. Tree size (in DBH and canopy area)

b. Tree species

c. The condition of the tree with notes as applicable explaining the assessment

d. The location of the tree on the site e. The location of the tree relative to the planned improvements

f. Assessment of whether the tree must be removed to accommodate the development g. Recommendations on measures that must be taken to preserve trees during the construction that are not proposed to be removed.

2. In addition to the general requirements of this Section, the tree and woodland inventory's mapping and report shall also include, but is not limited to, the specific information outlined in the appropriate land use application materials packet.

3. *Definitions for the inventory purposes of this Section*

   a. *A tree is a living woody plant having a trunk diameter as specified below at Diameter at Breast Height (DBH). Trees planted for commercial agricultural purposes, and/or those subject to farm forest deferral, such as nut and fruit orchards and Christmas tree farms, are excluded from this definition and from regulation under this Section, as are any living woody plants under six (6) inches at DBH. All trees six (6) inches or greater shall be inventoried.*

   b. *A woodland is a biological community dominated by trees covering a land area of 20,000 square feet or greater at a density of at least fifty (50) trees per every 20,000 square feet with at least fifty percent (50%) of those trees of any species having a six (6) inches or greater at DBH. Woodlands planted for commercial agricultural purposes and/or subject to farm forest deferral, such as nut and fruit orchards and Christmas tree farms, are excluded from this definition, and from regulation under this Section.*

   c. *A large stature tree is over 20 feet tall and wide with a minimum trunk diameter of 30 inches at DBH.*

Response: The previous Site Plan Review application for the subdivision (SP 16-10) included a tree inventory and arborist report which provided information on the location, species, size, canopy, and condition of all existing trees located within the boundaries of the site, as well as trees located along the site's SW Edy Road and SW Pacific Highway frontages. No trees are proposed for removal through this application. As shown on the Planting Plan, Sheet L1.0 of Exhibit A, existing trees on-site will be protected in place.

D. Retention requirements

1. *Trees may be considered for removal to accommodate the development including buildings, parking, walkways, grading etc., provided the development satisfies of D.2 or D.3, below.*

Response: No trees are proposed for removal through this application. As shown on the Planting Plan, Sheet L1.0 of Exhibit A, existing trees on-site will be retained and protected in place during construction.

3. *Required Tree Canopy - Non-Residential and Multi-family Developments*

   Each net development site shall provide a variety of trees to achieve a minimum total tree canopy of 30 percent. The canopy percentage is based on the expected mature canopy of each tree by using the equation πr^2 to calculate the expected square footage of each tree. The expected mature canopy is counted for each tree even if there is an overlap of multiple tree canopies.

   The canopy requirement can be achieved by retaining existing trees or planting new trees. Required landscaping trees can be used toward the total on site canopy required to meet this standard. The expected mature canopy spread of the new trees will be counted toward the required canopy cover. A certified arborist or other qualified professional shall provide an estimated tree canopy for all proposed trees to the planning department for review as a part of the land use review process.

Response: Calculations for required Tree Canopy are shown on the Planting Plan, Sheet L1.0 of Exhibit A. The proposed landscape plan will result in a tree canopy of 70 percent of the site.

4. The City may determine that, regardless of D.1 through D.3, that certain trees or woodlands may be required to be retained. The basis for such a decision shall include; specific findings that retention of said trees or woodlands furthers the purposes and goals of this Section, is feasible and practical both within the context of the proposed land use plan and relative to other policies and standards of the City Comprehensive Plan, and are: a. Within a Significant Natural Area, 100-year floodplain, City greenway, jurisdictional wetland or other existing or future public park or natural area designated by the City Comprehensive Plan, or…

Response: No trees are proposed for removal with this application. The site does not contain a Significant Natural Area, 100-year floodplain, City greenway, jurisdictional wetland or other existing or future public park or natural area designated by the City Comprehensive Plan.

5. Tree retention requirements for properties located within the Old Town Overlay or projects subject to the infill standards of Chapter 16.68 are only subject to retention requirements identified in D.4. above.

Response: The site is not located within the Old Town Overlay.

7. All trees, woodlands, and vegetation located on any private property accepted for dedication to the City for public parks and open space, greenways, Significant Natural Areas, wetlands, floodplains, or for storm water management or for other purposes, as a condition of a land use approval, shall be retained outright, irrespective of size, species, condition or other factors. Removal of any such trees, woodlands, and vegetation prior to actual dedication of the property to the City shall be cause for reconsideration of the land use plan approval.

Response: No trees are proposed for removal through this application. The site does not contain areas accepted for dedication to the City for public parks and open space, greenways, Significant Natural Areas, wetlands, floodplains, or for storm water management.

E. Tree Preservation Incentive

Retention of existing native trees on site which are in good health can be used to achieve the required mature canopy requirement of the development. The expected mature canopy can be calculated twice for existing trees. For example, if one existing tree with an expected mature canopy of 10 feet (78.5 square feet) is retained it will count as twice the existing canopy (157 square feet).

Response: As shown on the Planting plan, Sheet L1.0 of Exhibit A, existing trees have been used in calculating required tree canopy in accordance with this standard.

F. Additional Preservation Incentives

1. General Provisions. To assist in the preservation of trees, the City may apply one or more of the following flexible standards as part of the land use review approval. To the extent that the standards in this section conflict with the standards in other sections of this Title, the standards in this section shall apply except in cases where the City determines there would be an unreasonable risk to public health, safety, or welfare. Flexibility shall be requested by the applicant with justification provided

within the tree preservation and protection report as part of the land use review process and is only applicable to trees that are eligible for credit towards the effective tree canopy cover of the site. A separate adjustment application as outlined in Section 16.84.030.A is not required.

2. *Flexible Development Standards. The following flexible standards are available to applicants in order to preserve trees on a development site. These standards cannot be combined with any other reductions authorized by this code.*

    a. *Lot size averaging. To preserve existing trees in the development plan for any Land Division under Division VII, lot size may be averaged to allow lots less than the minimum lot size required in the underlying zone as long as the average lot area is not less than that allowed by the underlying zone. No lot area shall be less than 80 percent of the minimum lot size allowed in the zone;*

    b. *Setbacks. The following setback reductions will be allowed for lots preserving existing trees using the criteria in subsection (1) below. The following reductions shall be limited to the minimum reduction necessary to protect the tree.*

        (1) Reductions allowed:

            (a.) Front yard - up to a 25 percent reduction of the dimensional standard for a front yard setback required in the base zone. Setback of garages may not be reduced by this provision.

            (b.) Interior setbacks - up to a 40 percent reduction of the dimensional standards for an interior side and/or rear yard setback required in the base zone.

            (c.) Perimeter side and rear yard setbacks shall not be reduced through this provision.

    c. *Approval criteria:*

        (1.) A demonstration that the reduction requested is the least required to preserve trees; and

        (2.) The reduction will result in the preservation of tree canopy on the lot with the modified setbacks; and

        (3.) The reduction will not impede adequate emergency access to the site and structure.

3. *Sidewalks. Location of a public sidewalk may be flexible in order to preserve existing trees or to plant new large stature street trees. This flexibility may be accomplished through a curb-tight sidewalk or a meandering public sidewalk easement recorded over private property and shall be reviewed on a case by case basis in accordance with the provisions of the Engineering Design Manual, Street and Utility Improvement Standards. For preservation, this flexibility shall be the minimum required to achieve the desired effect. For planting, preference shall be given to retaining the planter strip and separation between the curb and sidewalk wherever practicable. If a preserved tree is to be utilized as a street tree, it must meet the criteria found in the Street Tree section, 16.142.060.*

4. *Adjustments to Commercial and Industrial development Standards. Adjustments to Commercial or Industrial Development standards of up to 20 feet additional building height are permitted provided;*

a. *At least 50% of a Significant Tree stand's of canopy within a development site (and not also within the sensitive lands or areas that areas dedicated to the City) is preserved;*

b. *The project arborist or qualified professional certifies the preservation is such that the connectivity and viability of the remaining significant tree stand is maximized;*

c. *Applicable buffering and screening requirements are met;*

d. *Any height adjustments comply with state building codes; e. Significant tree stands are protected through an instrument or action subject to approval by the City Manager or the City manager's designee that demonstrates it will be permanently preserved and managed as such;*

(1.) *A conservation easement;*

(2.) *An open space tract;*

(3.) *A deed restriction; or*

(4.) *Through dedication and acceptance by the City.*

Response: None of the preservation incentives listed in subsection 16.142.070.F are requested to be utilized with this application.

G. Tree Protection During Development

The applicant shall prepare and submit a final Tree and Woodland Plan prior to issuance of any construction permits, illustrating how identified trees and woodlands will be retained, removed or protected as per the Notice of Decision. Such plan shall specify how trees and woodlands will be protected from damage or destruction by construction activities, including protective fencing, selective pruning and root treatments, excavation techniques, temporary drainage systems, and like methods. At a minimum, trees to be protected shall have the area within the drip line of the tree protected from grading, stockpiling, and all other construction related activity unless specifically reviewed and recommended by a certified arborist or other qualified professional. Any work within the dripline of the tree shall be supervised by the project arborist or other qualified professional onsite during construction.

Response: As shown on the Planting Plan, Sheet L1.0 of Exhibit A, existing trees within the project area will be retained and protected in place during construction.

16.142.090 - Recommended Street Trees

Response: The site does not abut a public street. All required street trees for the subdivision were provided with previous applications.

Chapter 16.146 - NOISE

16.146.010 - Generally

All otherwise permitted commercial, industrial, and institutional uses in the City shall comply with the noise standards contained in OAR 340-35-035. The City may require proof of compliance with OAR 340-35-035 in the form of copies

of all applicable State permits or certification by a professional acoustical engineer that the proposed uses will not cause noise in excess of State standards.

Response: The proposed commercial uses will comply with City of Sherwood noise standards.

16.146.020 - Noise Sensitive Uses

When proposed commercial and industrial uses do not adjoin land exclusively in commercial or industrial zones, or when said uses adjoin special care, institutional, or parks and recreational facilities, or other uses that are, in the City's determination, sensitive to noise impacts, then:

A. The applicant shall submit to the City a noise level study prepared by a professional acoustical engineer. Said study shall define noise levels at the boundaries of the site in all directions.

B. The applicant shall show that the use will not exceed the noise standards contained in OAR 340-35-035, based on accepted noise modeling procedures and worst case assumptions when all noise sources on the site are operating simultaneously.

C. If the use exceeds applicable noise standards as per subsection B of this Section, then the applicant shall submit a noise mitigation program prepared by a professional acoustical engineer that shows how and when the use will come into compliance with said standards.

Response: The proposed uses are expected to generate noise typical of a commercial use in a shopping center. The City of Sherwood staff has not indicated that the adjacent residential neighborhoods would constitute a use that is "sensitive to noise impacts" and has not requested submittal of a noise level study. Such an interpretation and request of a noise study was not made during the approval of the site plan review (SP 16-10); it is anticipated that it will not be required for this application.

16.146.030 - Exceptions

This Chapter does not apply to noise making devices which are maintained and utilized solely as warning or emergency signals, or to noise caused by automobiles, trucks, trains, aircraft, and other similar vehicles when said vehicles are properly maintained and operated and are using properly designated rights-of-way, travel ways, flight paths or other routes. This Chapter also does not apply to noise produced by humans or animals. Nothing in this Chapter shall preclude the City from abating any noise problem as per applicable City nuisance and public safety ordinances.

Response: The exceptions listed in this section do not apply to this site.

Chapter 16.154 - HEAT AND GLARE

16.154.010 - Generally

Except for exterior lighting, all otherwise permitted commercial, industrial, and institutional uses shall conduct any operations producing excessive heat or glare entirely within enclosed buildings. Exterior lighting shall be directed away from adjoining properties, and the use shall not cause such glare or lights to shine off site in excess of one-half (0.5) foot candle when adjoining properties are zoned for residential uses.

Response: Exterior lighting proposed for the site will not generate off-site glare in excess of one-half foot candle on adjacent residential properties. None of the proposed uses is anticipated to generate excessive heat or glare. See the Photometric Plan (Exhibit A) for more detailed lighting calculations.

Chapter 16.156 - ENERGY CONSERVATION

16.156.020 - Standards

A. Building Orientation - The maximum number of buildings feasible shall receive sunlight sufficient for using solar energy systems for space, water or industrial process heating or cooling. Buildings and vegetation shall be sited with respect to each other and the topography of the site so that unobstructed sunlight reaches the south wall of the greatest possible number of buildings between the hours of 9:00 AM and 3:00 PM, Pacific Standard Time on December 21st.

B. Wind - The cooling effects of prevailing summer breezes and shading vegetation shall be accounted for in site design. The extent solar access to adjacent sites is not impaired vegetation shall be used to moderate prevailing winter wind on the site.

Response: The proposed buildings' design will comply with the City of Sherwood's energy conservation standards to the greatest extent possible.

IV. CONCLUSION

As evidenced throughout this narrative and associated documents, the applicant's Site Plan Review request is consistent with the applicable local policies and regulations governing the allowance of the requested action and the applicant has provided all necessary information to deem the application complete.

EXHIBIT A

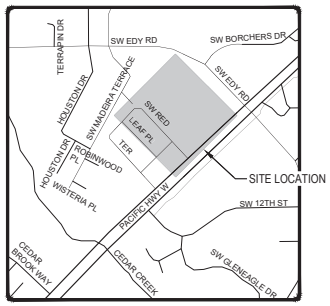
Plan Set

EXHIBIT A

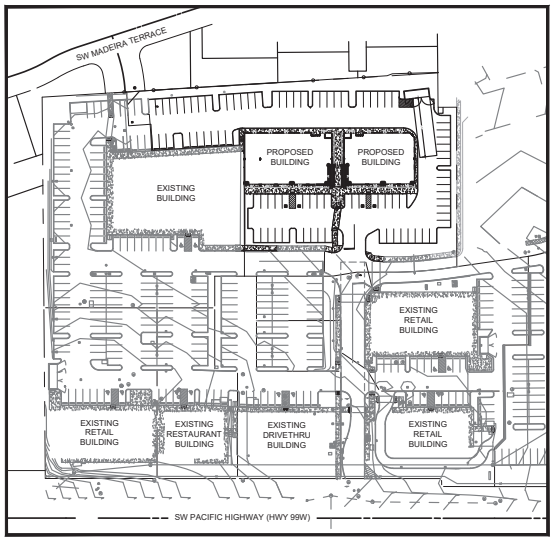
CEDAR CREEK PLAZA - LOT 2

16814 SW EDY ROAD
SHERWOOD, OREGON 97140
WASHINGTON COUNTY

PREPARED FOR:
DD SHERWOOD ONE, LLC



VICINITY MAP
SCALE: NTS



SITE MAP
SCALE: NTS

SHEET INDEX

PROJECT DESCRIPTION

MAP: S.E. QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, SHERWOOD, OREGON, WASHINGTON COUNTY

LOT#: 2S130DA00900 (LOT 2)

LOT AREA: 1.73 ACRES

ZONE: RC (RETAIL COMMERCIAL)

ADDRESS: 16814 SW EDY ROAD, SHERWOOD, OR 97140

SURVEY NOTES:

1) THE FIELD SURVEY FOR THIS MAP WAS COMPLETED ON SEPTEMBER 29, 2018.

2) ELEVATIONS AND CONTOURS ARE PER ENGINEERING PLANS BASED ON THE NGVD 1929 VERTICAL DATUM, PREPARED BY MACKENZIE, DATED OCTOBER 1, 2018.

3) THE BASIS OF BEARINGS FOR THIS SURVEY IS PER THE PLAT OF "CEDAR CREEK PLAZA".

4) THE EASEMENTS SHOWN ON THIS MAP ARE BASED ON THE PLAT OF "CEDAR CREEK PLAZA", RECORDED AUGUST 27, 2018.

5) THERE WERE NO UNDERGROUND UTILITY LOCATES PERFORMED IN CONJUNCTION WITH THIS SURVEY.

PROJECT TEAM

APPLICANT
DD SHERWOOD ONE, LLC
ATTN: RYAN SCHERA
901 NE GLISAN ST., SUITE 100
PORTLAND, OR, 97232
PHONE: (503)-297-8791

ARCHITECT
NOVAK ARCHITECTURE
ATTN: TERRY NOVAK
17020 SW UPPER BOONES FERRY RD,
SUITE 200
PORTLAND, OR 97224
PHONE: (503)-352-4987

CIVIL ENGINEER
DOWL
ATTN: MIKE TOWLE, PE
720 SW WASHINGTON STREET, STE. 750
PORTLAND, OREGON
PHONE: (971)-280-8645
FAX: (800)-865-9847

SURVEYOR
NORTHWEST SURVEYING, INC.
ATTN: SCOTT F. FIELD
1815 NW 169TH PLACE, SUITE 2090
BEAVERTON, OR 97006
PHONE: (503)-848-2127
FAX: (503)-848-2179

LANDSCAPE ARCHITECT
DOWL
ATTN: WAYNE IAZZETTI
720 SW WASHINGTON STREET, STE. 750
PORTLAND, OREGON
PHONE: (971)-280-8651
FAX: (800)-865-9847

OREGON UTILITY
NOTIFICATION CENTER
1-800-332-2344

CALL BEFORE YOU DIG

ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (503) 232-1987).

REVISIONS

REV	DATE	DESCRIPTION	BY

REGISTERED PROFESSIONAL ENGINEER
OREGON
JUNE 19, 2018
MICHAEL D. TOWLE
RENEWAL DATE 6/30/19

DOWL
WWW.DOWL.COM

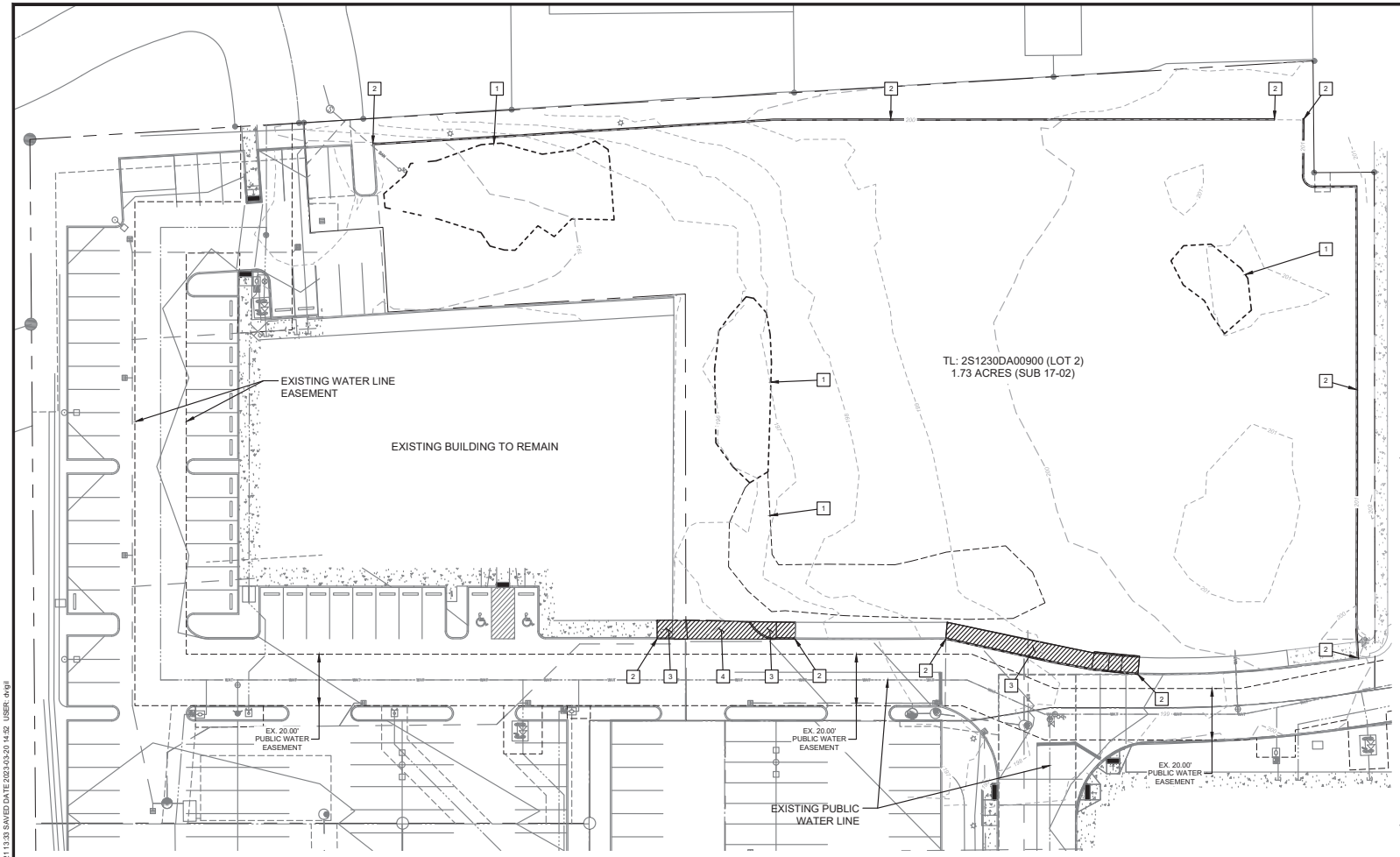
CEDAR CREEK PLAZA
16814 SW EDY ROAD, SHERWOOD, OR 97140
COVER SHEET
SE 1/4 S30, T2S, R1W W.M. TL900
WASHINGTON COUNTY, OR

PROJECT 14505.01
DATE 01/13/2023

©DOWL 2018

SHEET
C0.0

\\Bil-FS\Bil-Projects\22114505-01\6SCAD_DD\SC-CS-DD-COVER.dwg PLOT DATE 2023-3-21 13:32 SAVED DATE 2023-01-11 10:47 USER: dvgl



LEGEND

- RIGHT-OF-WAY LINE
- BOUNDARY LINE
- PROPERTY LINE
- CENTERLINE
- CURB
- EDGE OF PAVEMENT
- EASEMENT
- FENCE LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING CURB TO BE REMOVED
- EXISTING WATER LINE
- EXISTING SANITARY LINE
- EXISTING STORM LINE
- EXISTING WATER LINE EASEMENT
- WATER VALVE
- STORM SEWER CLEAN OUT
- STORM SEWER CATCH BASIN
- STORM SEWER MANHOLE
- SANITARY SEWER MANHOLE
- SANITARY SEWER CLEAN OUT
- GAS RISER
- STREET LIGHT
- FOUND SURVEY MONUMENT

DEMOLITION NOTES

1. REMOVE EXISTING GRAVEL STOCK PILE
2. REMOVE EXISTING CURB
3. REMOVE EXISTING SIDEWALK
4. REMOVE EXISTING ASPHALT

UTILITY STATEMENT

THE UNDERGROUND UTILITIES HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH THEY CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE.

TOPOGRAPHIC SURVEY NOTE

THE FIELD WORK SHOWN ON THIS EXISTING CONDITIONS PLAN WAS COMPLETED BY NORTHWEST SURVEYING, INC. DOWL HAS NOT VERIFIED THE ACCURACY OF THE FIELD DATA PROVIDED AND ALTHOUGH THE INFORMATION IS BELIEVED TO BE ACCURATE, DOWL DOES NOT GUARANTEE THE ACCURACY OF THE DATA SHOWN.

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REVISIONS

REV	DATE	DESCRIPTION	BY

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JUNE 19, 2018
MICHAEL D. TOWLE
RENEWAL DATE 6/30/24

DOWL
WWW.DOWL.COM

CEDAR CREEK PLAZA
16814 SW EDY ROAD, SHERWOOD, OR 97140

EXISTING CONDITIONS

SE 1/4 S30, T2S, R1W W.M. TL900
WASHINGTON COUNTY, OR

PROJECT	14505.01
DATE	01/13/2023

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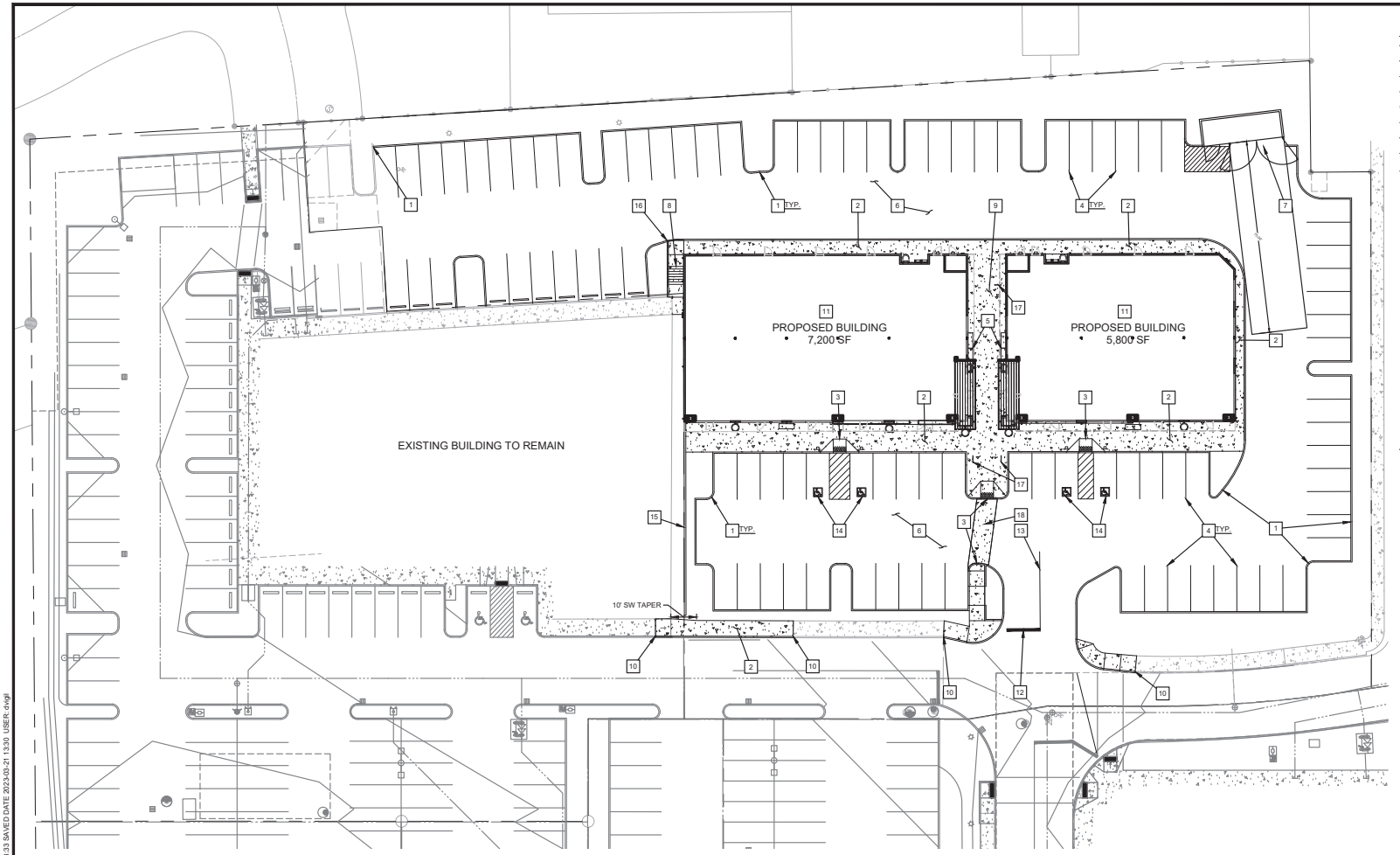

LEGEND

- RIGHT-OF-WAY LINE
- BOUNDARY LINE
- PROPERTY LINE
- CENTERLINE
- CURB
- EDGE OF PAVEMENT
- EASEMENT
- FENCE LINE
- PROPOSED SAWCUT LINE
- PROPOSED CONCRETE SIDEWALK
- PROPOSED LIGHT AC
- CONIFEROUS TREE
- WATER VALVE
- STORM SEWER CLEAN OUT
- STORM SEWER CATCH BASIN
- STORM SEWER MANHOLE
- SANITARY SEWER MANHOLE
- SANITARY SEWER CLEAN OUT
- GAS RISER
- STREET LIGHT
- FOUND SURVEY MONUMENT
- PROPOSED BIKE RACK

CONSTRUCTION NOTES

1. PROPOSED STANDARD CURB
2. PROPOSED CONCRETE SIDEWALK
3. PROPOSED ADA RAMP WITH TRUNCATED DOMES
4. PROPOSED 4" WIDE PAINTED WHITE STRIPE. 2 COATS MINIMUM
5. PROPOSED BIKE RACK (3-SPACES MIN.)
6. PROPOSED PAVING
7. PROPOSED TRASH ENCLOSURE. SEE ARCHITECTURAL PLANS FOR DETAILS
8. PROPOSED STAIRS
9. PROPOSED PEDESTRIAN WALKWAY. SEE ARCHITECTURAL / LANDSCAPE PLANS FOR DETAILS
10. CONNECT TO EXISTING SIDEWALK. MATCH GRADE AT EXISTING WALK. NOTIFY ENGINEER OF CONFLICTS
11. PROPOSED BUILDING. SEE ARCHITECTURAL PLANS FOR DETAILS
12. PROPOSED 12" WHITE STOP BAR
13. PROPOSED 4" WHITE PAINTED LINE
14. PROPOSED ADA PARKING STALL
15. PROPOSED CMU RETAINING WALL
16. PROPOSED WALL WITH RAILING
17. PROPOSED BIKE RACK
18. INSTALL CONCRETE CROSSWALK

PARKING INFORMATION

PROPOSED PARKING:

REQUIRED MIN. AND MAX. PARKING STALLS AS PER SHERWOOD MUNICIPAL CODE SECTION 16.94.020 (RETAIL)

TOTAL SITE DEVELOPMENT:

MINIMUM PARKING	496 SPACES
MAXIMUM PARKING	678 SPACES
PROPOSED PARKING	620 SPACES

LOT 2 DEVELOPMENT: GROSS LEASABLE AREA: 13,000 SF

MINIMUM PARKING	49 SPACES
MAXIMUM PARKING	81 SPACES
PROPOSED PARKING	94 SPACES

ADA PARKING:

REQUIRED ADA STALLS (4 PER 76-100 PARKING STALLS):	4
REQUIRED VAN ACCESSIBLE STALLS (1 PER 6 PROVIDED):	1
TOTAL ADA PARKING STALLS:	4
TOTAL STANDARD ADA PARKING STALLS:	3
TOTAL VAN ACCESSIBLE PARKING STALLS:	1

BICYCLE PARKING:

AS PER SHERWOOD MUNICIPAL CODE SECTION 16.94.020

BICYCLE PARKING REQUIRED	3
BICYCLE PARKING PROVIDED	4

LANDSCAPE INFORMATION

PROPOSED DEVELOPMENT:

PARKING TOTAL = 94 SPACES
PARKING AREA LANDSCAPE = 6,515 SF (4,320 SF REQ)
PARKING AREA TREES = 23 LG + 2 SM (98 SPACES)
PARKING EVERGREEN TREES = 8% (2 TREES)
PARKING SHRUBS = - SHRUBS (192 SHRUBS REQ)

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REGISTERED PROFESSIONAL ENGINEER
OREGON
JUNE 19, 2014
MICHAEL D. TOWLE
RENEWAL DATE 6/30/24

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CEDAR CREEK PLAZA
16814 SW EDY ROAD, SHERWOOD, OR 97140

SITE PLAN

SE 1/4 S30, T2S, R1W W.M. TL900
WASHINGTON COUNTY, OR

PROJECT	14505.01
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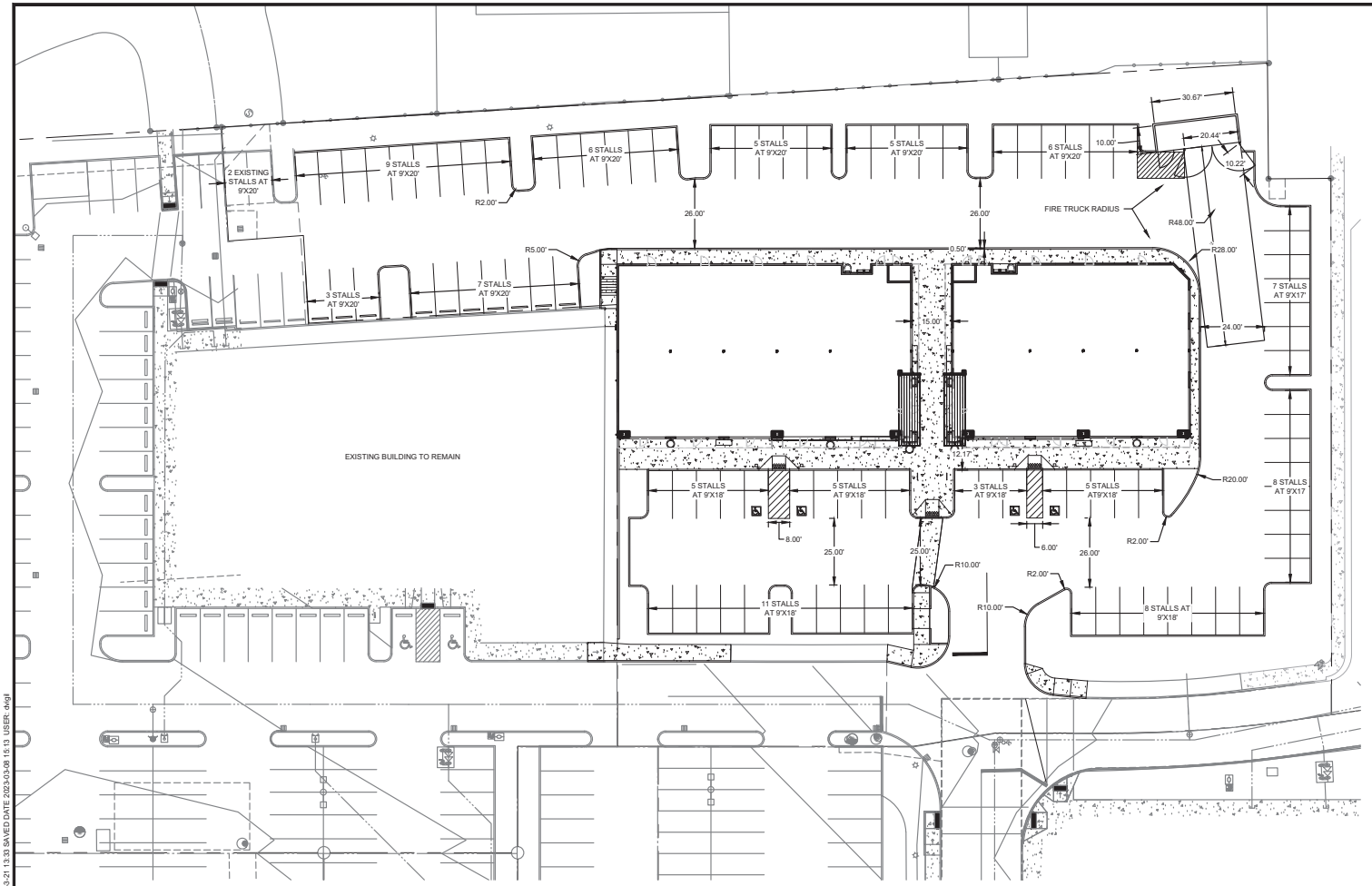

LEGEND

- RIGHT-OF-WAY LINE
- BOUNDARY LINE
- PROPERTY LINE
- CENTERLINE
- **CURB**
- EDGE OF PAVEMENT
- EASEMENT
- FENCE LINE
- PROPOSED SAWCUT LINE
- PROPOSED CONCRETE SIDEWALK
- PROPOSED LIGHT AC
- CONIFEROUS TREE
- WATER VALVE
- STORM SEWER CLEAN OUT
- STORM SEWER CATCH BASIN
- STORM SEWER MANHOLE
- SANITARY SEWER MANHOLE
- SANITARY SEWER CLEAN OUT
- GAS RISER
- STREET LIGHT
- FOUND SURVEY MONUMENT

GENERAL NOTES

1. ALL CURB RADII TO BE 3.0' UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.

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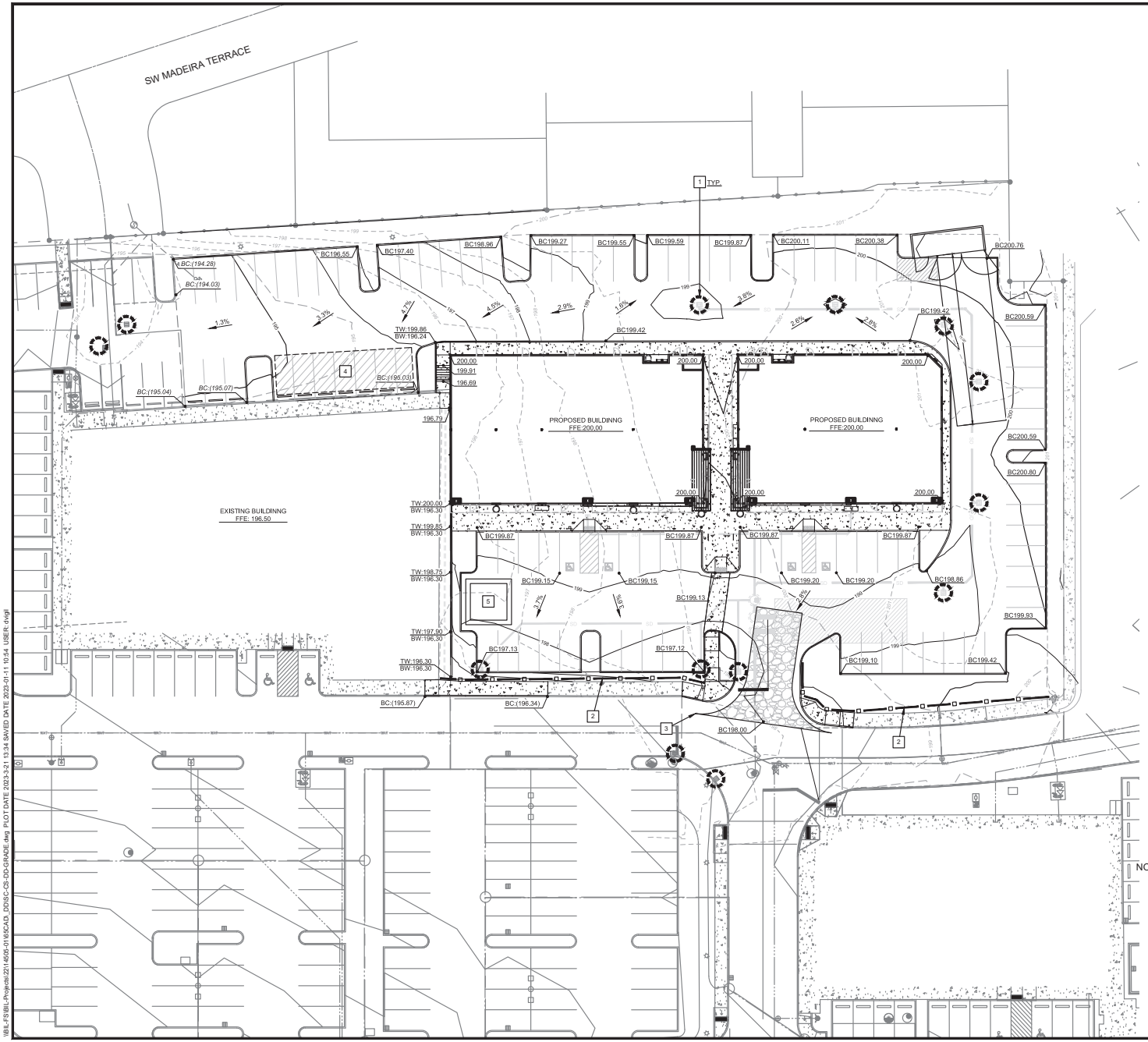

LEGEND

- EXISTING PROPERTY LINE
- EXISTING CENTERLINE
- EXISTING CURB
- PROPOSED CURB
- EXISTING EDGE OF PAVEMENT
- EXISTING EASEMENT
- 5.0% PROPOSED SLOPE
- (5.0%) EXISTING SLOPE
- 210 EXISTING MAJOR CONTOUR
- 209 EXISTING MINOR CONTOUR
- 205 PROPOSED MAJOR CONTOUR
- 204 PROPOSED MINOR CONTOUR
- PROPOSED STORM CATCH BASIN
- EXISTING STORM MANHOLE
- PROPOSED INLET PROTECTION
- PROPOSED SEDIMENT FENCE

ADA NOTE

PAVEMENT IN ADA PARKING AREA TO BE 2% MAXIMUM SLOPE IN ANY DIRECTION

EROSION CONTROL NOTES [#]

1. PROPOSED INLET PROTECTION
2. PROPOSED SEDIMENT FENCE
3. PROPOSED CONSTRUCTION ENTRANCE
4. PROPOSED STAGING AREA
5. PROPOSED CONCRETE WASHOUT

ABBREVIATIONS

BC	BOTTOM OF CURB *
TC	TOP OF CURB
R	RIM ELEVATION
S	SPOT ELEVATION
FF	FINISH FLOOR
TR	TOP OF RAMP
(XXX.XX)	EXISTING SPOT ELEVATION

* ALL CURB EXPOSURESS ARE 6" UNLESS OTHERWISE NOTED

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GRADING PLAN
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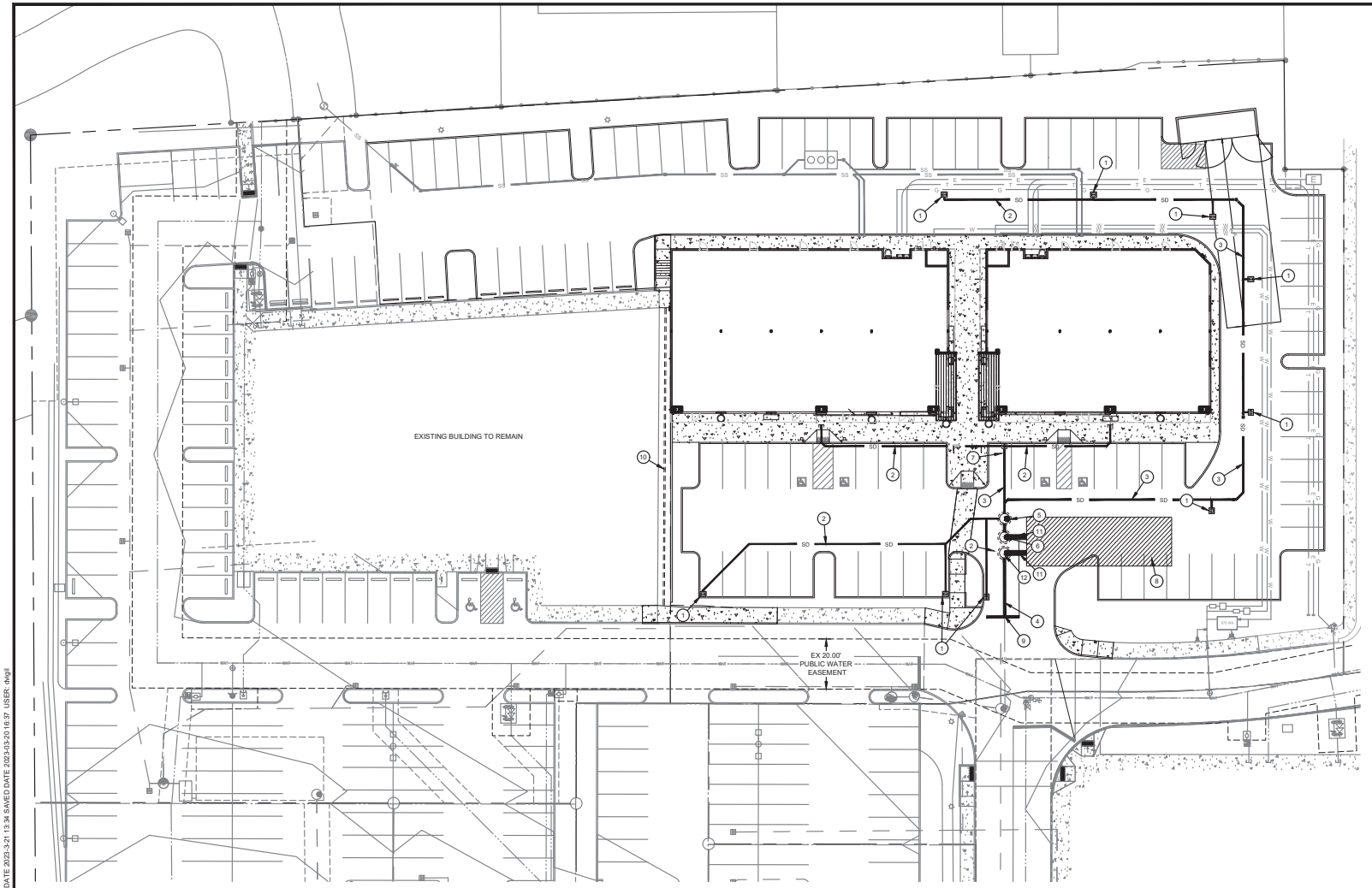

LEGEND

- PROPOSED STORM LINE
- EXISTING WATER LINE
- PROPOSED WATER LINE
- EXISTING SANITARY LINE
- PROPOSED SANITARY LINE
- EXISTING STORM LINE
- EXISTING GAS LINE
- PROPOSED GAS LINE
- PROPOSED POWER LINE
- PROPOSED COMMUNICATION LINE
- EXISTING CURB
- PROPOSED CURB
- EXISTING EDGE OF PAVEMENT
- EXISTING EASEMENT
- EXISTING STORM CATCH BASIN
- PROPOSED STORM CATCH BASIN
- PROPOSED STORM CLEANOUT
- EXISTING STORM MANHOLE
- EXISTING STORM SEWER CLEANOUT
- EXISTING STORM SEWER AREA DRAIN
- EXISTING GAS METER
- EXISTING GAS VALVE
- EXISTING POWER VAULT
- EXISTING POWER JUNCTION BOX
- EXISTING POWER PEDESTAL
- EXISTING COMMUNICATIONS VAULT
- EXISTING COMMUNICATIONS RISER
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING DOUBLE CHECK VALVE
- EXISTING SANITARY SEWER CLEANOUT
- EXISTING SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER CLEANOUT
- EXISTING SIGN
- EXISTING STREET LIGHT
- EXISTING DECIDUOUS TREE
- EXISTING CONIFEROUS TREE
- EXISTING CONCRETE
- PROPOSED FIRE VAULT
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT

STORM NOTES: (#)

1. PROPOSED LYNCH TRAPPED STYLE CATCH BASIN
2. PROPOSED 6" HDPE N-12 STORM PIPE
3. PROPOSED 8" HDPE N-12 STORM PIPE
4. PROPOSED 12" HDPE N-12 STORM PIPE
5. PROPOSED 48" STORMFILTER MANHOLE W/ (3) 27" CARTRIDGES
6. PROPOSED 48" STORM MANHOLE
7. PROPOSED CLEANOUT (TYPICAL)
8. PROPOSED DETENTION SYSTEM. (26) MC-4500 STORMTECH CHAMBERS
9. CONNECT TO EXISTING 12" STORM STUB (APPROXIMATE IE=188.00)
10. PROPOSED FRENCH DRAIN TO CONNECT TO EXISTING ROOF DRAIN LATERAL W/ BACKWATER CHECK VALVE
11. PROPOSED 24" HDPE N-12 STORM PIPE
12. PROPOSED 48" FLOW CONTROL MANHOLE

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ALL PRIVATE STORM CONNECTIONS NOT MADE AT A STRUCTURE TO BE MADE WITH A WYE FITTING UNLESS OTHERWISE NOTED.

STRUCTURES NOTE

ALL EXISTING STRUCTURES NOT BEING REMOVED SHALL BE ADJUSTED TO FINISH GRADE. SEE GRADING PLANS FOR DETAILED FINISH GRADES WITHIN DEVELOPMENT AREA.

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MICHAEL D. TOWLE
RENEWAL DATE 06/30/24

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STORM PLAN

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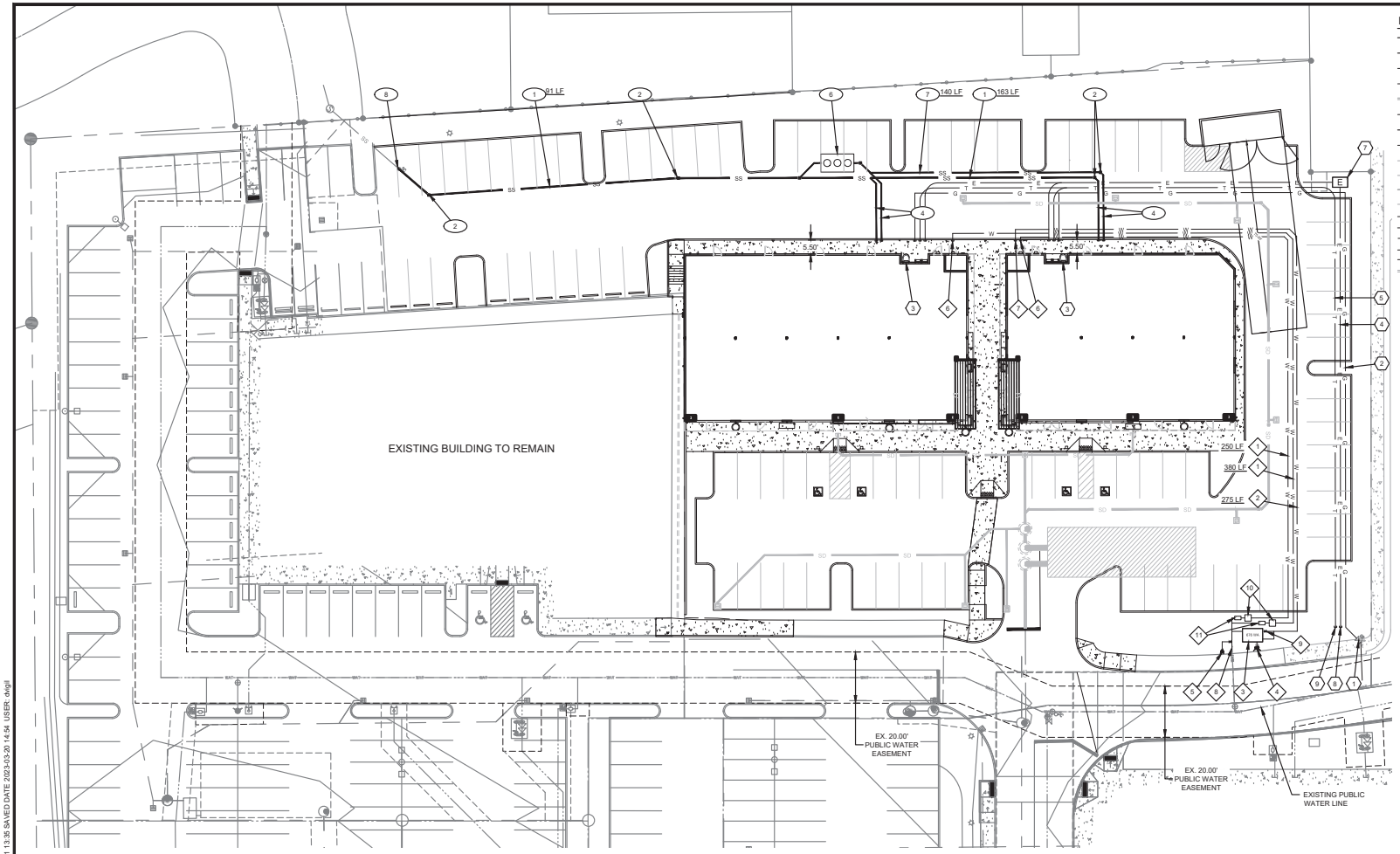

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- EXISTING WATER LINE
- ASSUMED GAS LINE
- PROPOSED WATER LINE
- PROPOSED SANITARY LINE
- PROPOSED GAS LINE
- PROPOSED POWER LINE
- PROPOSED COMMUNICATION LINE
- PROPOSED CURB
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- SANITARY SEWER MANHOLE
- SANITARY SEWER CLEAN OUT
- GAS RISER
- STREET LIGHT
- FOUND SURVEY MONUMENT
- PROPOSED STORM CATCH BASIN
- PROPOSED SANITARY SEWER CLEANOUT
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED FDC
- PROPOSED ELECTRIC VAULT
- PROPOSED COMMUNICATION PEDESTAL

WATER CONSTRUCTION NOTES

1. PROPOSED 2" DOMESTIC WATER LINE. SEE PLAN FOR LENGTH
2. PROPOSED 6" DR 18 C900 FIRE LINE
3. PROPOSED 6" DOUBLE CHECK DETECTOR ASSEMBLY IN 676-WA-FIRE SERVICE VAULT WITH FDC
4. PROPOSED FDC
5. PROPOSED PUBLIC FIRE HYDRANT
6. PROPOSED DOMESTIC WATER LINE STUB 5' FROM FACE OF BUILDING
7. PROPOSED FIRE LINE STUB 5' FROM FACE OF BUILDING
8. PROPOSED CONNECTION TO EXISTING 8" WATER LINE
9. PROPOSED WATER VALVE
10. PROPOSED REDUCED PRESSURE DOUBLE CHECK VALVE ASSEMBLY
11. PROPOSED 1.5" DOMESTIC WATER METER

FRANCHISE UTILITY CONSTRUCTION NOTES

1. PROPOSED CONNECTION TO EXISTING GAS SERVICE
2. PROPOSED GAS LINE. CONTRACTOR TO COORDINATE INSTALLATION WITH NW NATURAL
3. PROPOSED GAS METER. CONTRACTOR TO COORDINATE WITH NW NATURAL FOR INSTALLATION
4. PROPOSED UNDERGROUND ELECTRICAL LINE. CONTRACTOR TO COORDINATE INSTALLATION WITH PGE AND SITE ELECTRICAL PLANS
5. PROPOSED COMMUNICATIONS LINE. CONTRACTOR TO COORDINATE DESIGN WITH COMMUNICATIONS COMPANY
6. PROPOSED BUILDING ELECTRICAL & COMMUNICATIONS CONNECTION. COORDINATE WITH UTILITY PROVIDER FOR INSTALLATION OF COMMUNICATIONS
7. PROPOSED TRANSFORMER LOCATION. CONTRACTOR TO COORDINATE WITH PGE FOR INSTALLATION OF VAULT
8. PROPOSED CONNECTION TO EXISTING COMMUNICATION CONDUIT STUB
9. PROPOSED CONNECTION TO EXISTING ELECTRICAL CONDUIT STUB

SANITARY SEWER NOTES

1. PROPOSED 6" PVC D-3034 SANITARY SEWER PIPE AT 1.0%. SEE PLANS FOR LENGTH
2. PROPOSED SANITARY SEWER CLEANOUT
3. PROPOSED CONNECTION TO EXISTING 8" SANITARY LINE
4. PROPOSED SANITARY LINE STUB 5' FROM FACE OF BUILDING
5. PROPOSED 4" PVC D-3034 SANITARY SEWER PIPE. SEE PLANS FOR LENGTH
6. PROPOSED 2500 GALLON GREASE INTERCEPTOR

ALL PRIVATE SANITARY CONNECTIONS NOT MADE AT A STRUCTURE TO BE MADE WITH A WYE FITTING UNLESS OTHERWISE NOTED.

STRUCTURES NOTE

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REGISTERED PROFESSIONAL ENGINEER
OREGON
JUNE 10, 2014
MICHAEL D. TOWLE
EXPIRATION DATE: 06/30/24

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CEDAR CREEK PLAZA
16814 SW EDY ROAD, SHERWOOD, OR 97140
COMPOSITE UTILITY PLAN
SE 1/4 S30, T2S, R1W W.M. TL 900
WASHINGTON COUNTY, OR

PROJECT 14505.01
DATE 01/13/2023

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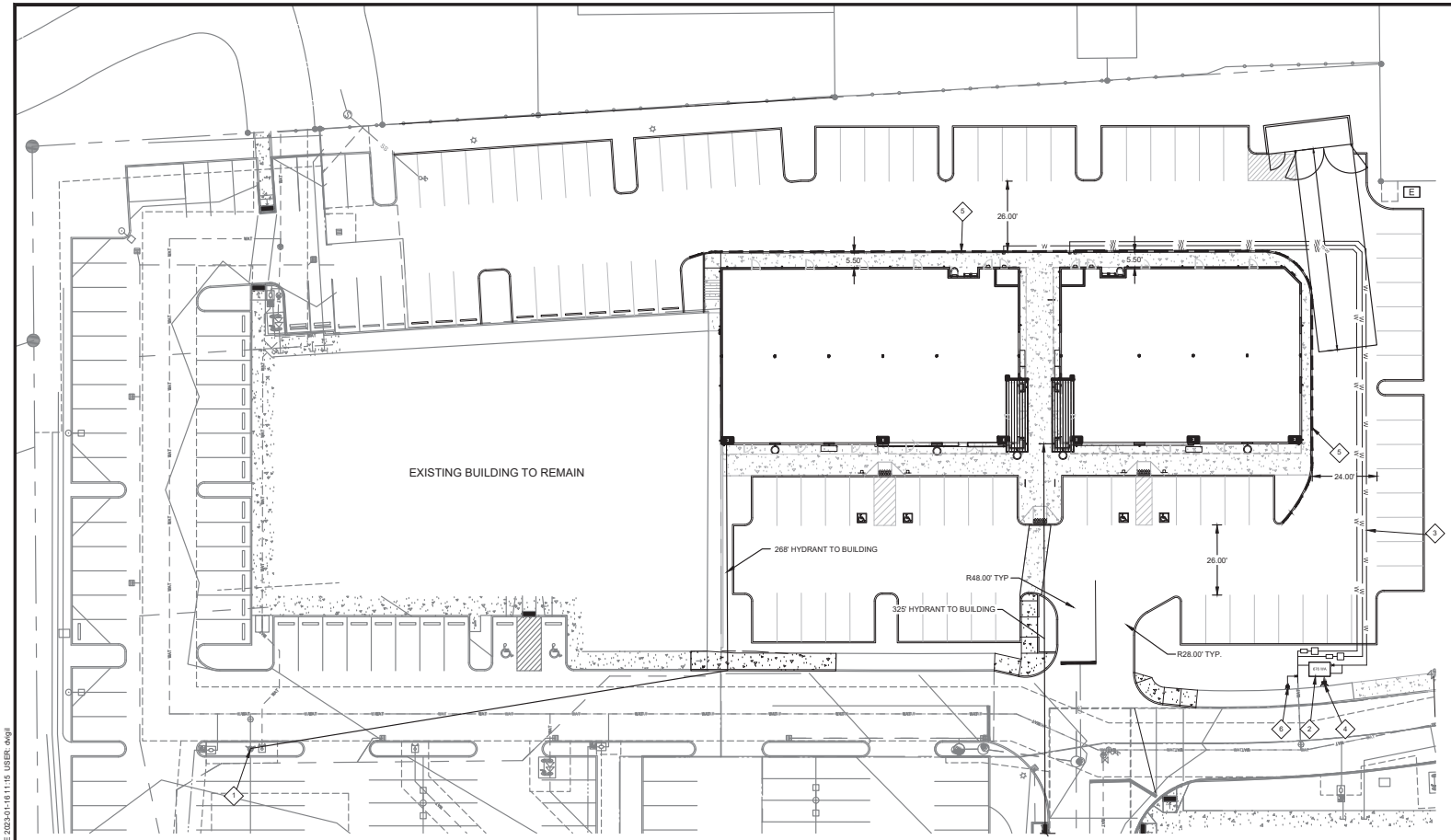

LEGEND

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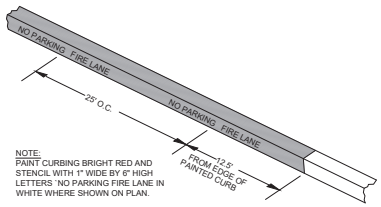
- PROPOSED STORM CATCH BASIN
- PROPOSED SANITARY SEWER CLEANOUT
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED FDC
- PROPOSED ELECTRIC VAULT
- PROPOSED COMMUNICATION PEDESTAL

KNOX BOXES TO BE INSTALLED ON BUILDING PER TVF&R STANDARDS. COORDINATE KNOX BOX LOCATION WITH TVF&R.

FIRE SERVICE CONSTRUCTION NOTES:

1. EXISTING PUBLIC FIRE HYDRANT
2. PROPOSED 6" DCDA WITH METER LOCATED IN 676-WA VAULT
3. PROPOSED 6" C900 DR18 FIRE WATER LINE
4. PROPOSED FDC
5. INSTALL PAINTED FIRE LANE CURB PER DETAIL ON THIS SHEET
6. PROPOSED PUBLIC FIRE HYDRANT



NOTE:
PAINT CURBING BRIGHT RED AND STENCIL WITH 1" WIDE BY 6" HIGH LETTERS 'NO PARKING FIRE LANE IN WHITE WHERE SHOWN ON PLAN.

NO PARKING FIRE LANE PAINTED CURB DETAIL
NOT TO SCALE

BUILDING DATA

BUILDING	SQUARE FOOTAGE	# OF FLOORS	CONST. TYPE	FIRE FLOW (GPM)
1	13,000 SQ FT	1	V-B	1,500*

*75% FLOW REDUCTION APPLIED DUE TO SPRINKLER SYSTEM (1,500 GPM MINIMUM) - OFC TABLE B105.1

HYDRANT DATA

FIRE FLOW PROVIDED BY CITY OF SHERWOOD FROM OCTOBER 2021 WITHIN CEDAR CREEK PLAZA

STATIC	76 PSI
RESIDUAL	65 PSI
TEST FLOW	1825 GPM
FLOW @ 20PSI*	4395 GPM

*PROJECTED AVAILABLE FLOW AT 20PSI

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OREGON
JUNE 10, 2014
MICHAEL D. TOWLE
EXPIRATION DATE: 06/30/24

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CEDAR CREEK PLAZA
16814 SW EDY ROAD, SHERWOOD, OR 97140
FIRE SERVICE AND ACCESS PLAN
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WASHINGTON COUNTY, OR

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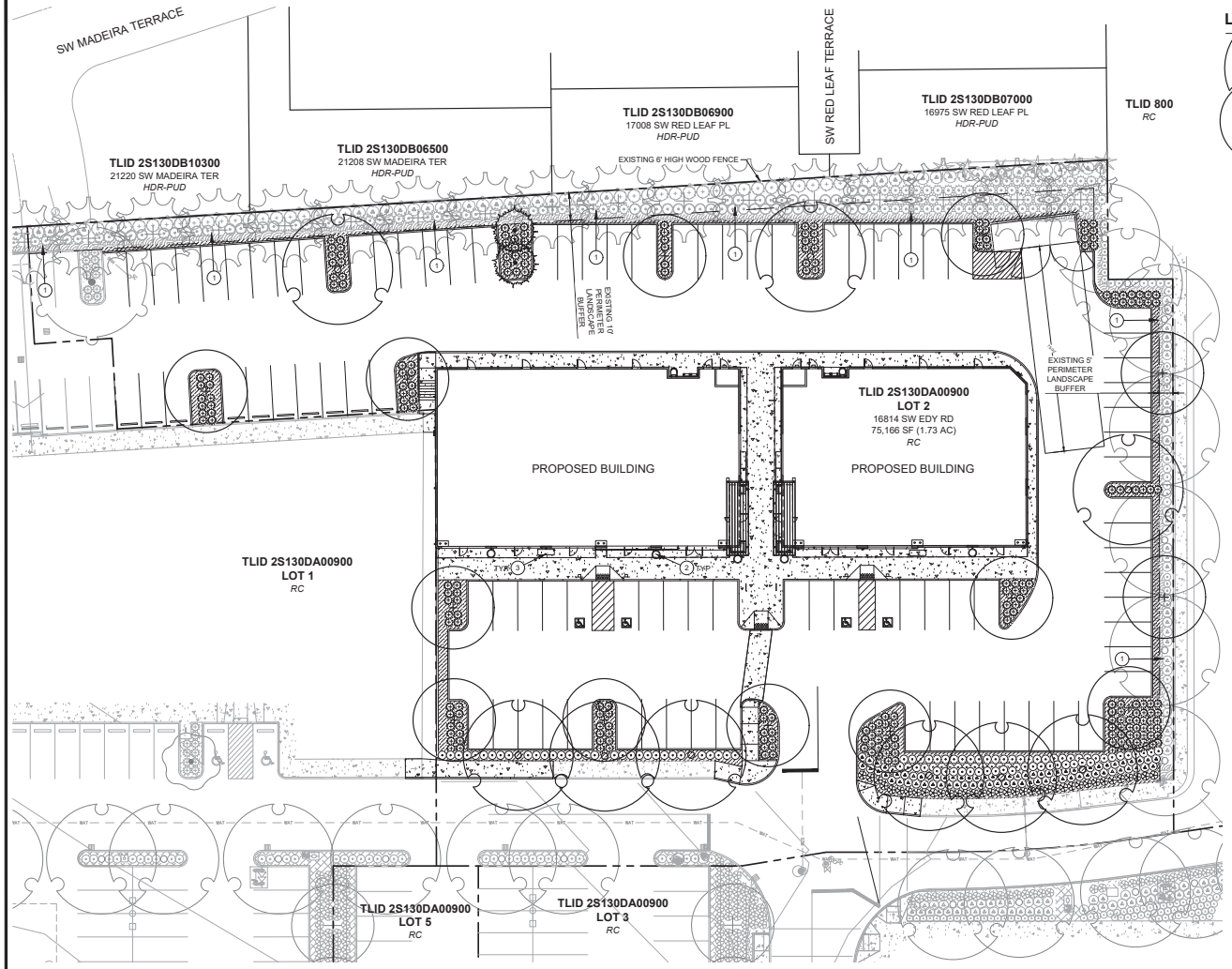
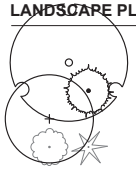


CONSTRUCTION NOTES

1. ADJUST OR RE-INSTALL EXISTING PLANT MATERIALS AS NECESSARY TO MEET AND MATCH PROPOSED GRADES. REPAIR EXISTING IRRIGATION SYSTEM TO PREVIOUS CONDITION.
2. INSTALL POTTED PLANTER.
3. INSTALL BENCH.

LANDSCAPE PLANT & MATERIALS LEGEND



TREES

ITEM	SIZE	QTY.	MATURE SIZE (H X W) / COMMENTS
FRAXINUS 'MARSHALL'S SEEDLESS' MARSHALL'S SEEDLESS ASH	2" CAL. / B&B AS SHOWN	9	50' H X 40' W / LARGE TREE
THUJA PLICATA 'HOGAN' HOGAN WESTERN RED CEDAR	8'-10' HT / B&B AS SHOWN	2	50' H. X 15' W / SMALL TREE EVERGREEN COLUMNAR
ZELKOVA SERRATA 'GREEN VASE' GREEN VASE ZELKOVA	2" CAL. / B&B AS SHOWN	13	45' H X 30' W / LARGE TREE
EXISTING TREE TO REMAIN			CONTRACTOR TO PROTECT IN PLACE

SHRUBS & ACCENTS

ITEM	SIZE	QTY.	MATURE SIZE (H X W) / COMMENTS
BERBERIS THUNBERGII 'GORUZAM' GOLDEN RUBY BARBERRY	3 GAL CONT 3'-0" O.C.	37	2' H X 2' W / DECIDUOUS
NANDINA DOMESTICA 'GULF STREAM' GULF STREAM HEAVENLY BAMBOO	5 GAL CONT 3'-0" O.C.	98	6' H X 3' W / EVERGREEN
PRUNUS L. 'OTTO LUYKEN' OTTO LUYKEN CHERRYLAUREL	5 GAL CONT 3'-0" O.C.	234	3' H X 4' W / EVERGREEN
VIBURNUM DAVIDII DAVID'S VIBURNUM	5 GAL CONT 3'-6" O.C.	72	3' H X 3'-6" W / EVERGREEN
EXISTING SHRUB TO REMAIN			CONTRACTOR TO PROTECT IN PLACE

GROUNDCOVERS & MISC

ITEM	SIZE	QTY.	MATURE SIZE (H X W)
ARCTOSTAPHYLOS UVA-URSI 'MASS.' MASS KINNIKINICK	1 GAL CONT 2'-0" O.C.	4,197 SF 1,217 PLANTS	9" H X 3' W / EVERGREEN NATIVE / DROUGHT TOLERANT

SITE TREE CANOPY COVERAGE - EXISTING & PROPOSED

30% SITE CANOPY COVERAGE REQUIRED

TREE SPECIES	QTY	SIZE CLASSIFICATION	MATURE SPREAD	MATURE CANOPY AREA (SF)	TOTAL CANOPY COVERAGE (SF)
CALOCEDRUS DECURRENS	16	MEDIUM	30'	706	11,296
CERCIDIPHYLLUM JAPONICUM	1	SMALL	40'	1256	1,256
FRAXINUS PENNSYLVANICA 'MARSHALL' S SEEDLESS	11	LARGE	40'	1256	13,816
PSEUDOTSUGA MENZIESII	6	LARGE	60'	2827	16,962
THUJA PLICATA 'HOGAN'	2	SMALL	15'	176	352
ZELKOVA SERRATA 'GREEN VASE'	13	LARGE	30'	706	9,178
			TOTAL QUALIFYING TREES		49
			TOTAL CANOPY COVERAGE AREA		52,860
			SITE AREA		75,166 SF
			% OF SITE		70%

LANDSCAPE CODE SUMMARY

TOTAL GROSS AREA: = 75,166 SF (1.73 AC)

DEVELOPMENT STANDARDS: CITY OF SHERWOOD
ZONING: RETAIL COMMERCIAL (RC) (*CHAPTER 16.22*)

LANDSCAPING: (*CHAPTER 16.92*)

TREES	= 2" CAL / 6' HT
SHRUBS	= 1 GAL MIN, FULL GROWTH W/I 3 YRS
GROUNDCOVER PLANTS	= 4" POT MIN, FULL COVER W/I 3 YRS
TREE RETAINED < 6" DIA	= MEDIUM TREE
TREE RETAINED 6" < 9"	= MEDIUM TREE X 2
TREE RETAINED 9" +	= ADD MEDIUM TREE + 3" INCREMENTS
PERIMETER SCREENING	= 10' WIDE (6' FENCE/ 3' EVERGREEN @ RESIDENTIAL)
PARKING LANDSCAPE	= 45 SF / SPACE
TREES	= LG / 4 SPACES, MD / 3 SPACES, SM / 2 SPACES
EVERGREEN	= 5% MIN
SHRUBS	= 2 SHRUBS / SPACE
GROUNDCOVER PLANTS	= FULL COVER W/I 3 YRS
ISLANDS	= 5' WIDE / 90 SF MIN (1 / 10 SPACES)

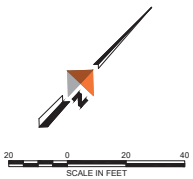
PARKS, TREES AND OPEN SPACES: (*CHAPTER 16.142*)
TREE CANOPY = 30% MIN

PROPOSED DEVELOPMENT:

PERIMETER BUFFER LANDSCAPE	= 5,113 SF
PARKING AREA LANDSCAPE	= 7,014 SF (4,230 SF REQ)
TOTAL LANDSCAPE AREA	= 12,127 SF (16%)
PARKING TOTAL	= 94 SPACES
PARKING AREA TREES	= 23 LG + 2 SM OR 98 SPACES (94 SPACES REQ)
PARKING EVERGREEN TREES	= 2 TREES OR 8% (5% REQ)
PARKING SHRUBS:	
EXISTING SHRUBS TO REMAIN	= 29 SHRUBS
PROPOSED SHRUBS	= 441 SHRUBS
TOTAL PARKING SHRUBS	= 470 SHRUBS (188 SHRUBS REQ)

LANDSCAPE PLAN GENERAL NOTES:

1. **SPECIFICATIONS & INSTALLATION DETAILS:** PLANT MATERIALS & INSTALLATION SHALL MEET STANDARDS OF . SEE SHEETS AND FOR DETAILS, NOTES AND SPECIFICATIONS.
2. **MULCH:** ALL PLANTING AREAS EXCEPT FOR STORM FACILITIES SHALL BE MULCHED WITH 3" MIN DEPTH BARK MULCH, FRESH FIR MEDIUM GRIND.
3. PLANT MATERIAL DELIVERED TO THE SITE SHALL MEET THE CURRENT VERSION OF THE AMERICAN NURSERYMAN'S SPECIFICATION ASSOCIATION STANDARDS FOR ALL SPECIFIED CONTAINER SIZES.
4. CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FROM THE PROJECT LANDSCAPE ARCHITECT FOR ALL PLANT MATERIAL SUBSTITUTIONS PRIOR TO PURCHASE. PLANT SUBSTITUTIONS THAT ARE NOT APPROVED IN WRITING, OR DO NOT COMPLY WITH THE PROJECT DRAWINGS AND SPECIFICATIONS WILL BE REJECTED BY THE LANDSCAPE ARCHITECT AT NO COST TO THE OWNER.
5. **IRRIGATION:** ALL PROPOSED PLANT MATERIALS SHALL BE WATERED (MAY TO OCTOBER) & MAINTAINED FOR A MINIMUM OF TWO (2) FULL GROWING SEASONS AFTER THE DATE OF PLANTING INSTALLATION. TREES SHALL BE WATERED AT A RATE OF 15 GALLONS PER TREE ONCE PER WEEK, SHRUBS & GROUNDCOVERS AT A RATE OF 1" PER WEEK TO MAINTAIN VIGOROUS HEALTHY GROWTH.



REVISIONS			
REV	DATE	DESCRIPTION	BY

REGISTERED
06257
Wayne Scott
WAYNE R. SCOTT
OREGON
05/11/07
LANDSCAPE ARCHITECT
EXPIRES: 06/31/2023

DOWL
WWW.DOWL.COM

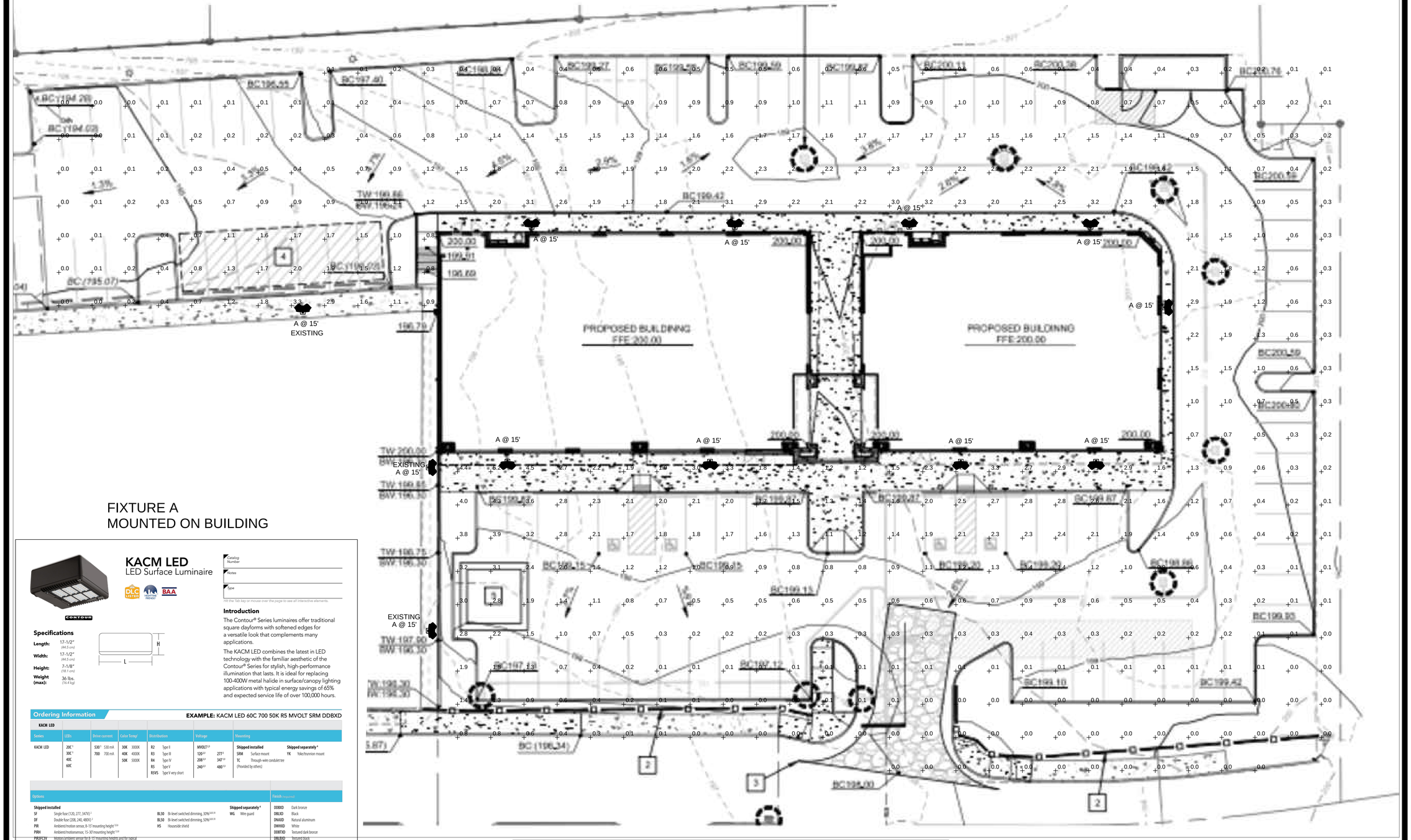
CEDAR CREEK PLAZA
16814 SW EDY ROAD, SHERWOOD, OR 97140

PLANTING PLAN

SE 1/4 S30, T2S, R1W W.M. TL900
WASHINGTON COUNTY, OR

PROJECT	14505.01
DATE	01/11/2023

SHEET
L1.0



FIXTURE A
MOUNTED ON BUILDING

KACM LED
LED Surface Luminaire

DLC PREMIUM · DESIGNLIGHTS CONSORTIUM · BAA

Catalog Number
Notes
Type

Hit the Tab key or mouse over the page to see all interactive elements.

Introduction

The Contour® Series luminaires offer traditional square dayforms with softened edges for a versatile look that complements many applications.

The KACM LED combines the latest in LED technology with the familiar aesthetic of the Contour® Series for stylish, high-performance illumination that lasts. It is ideal for replacing 100-400W metal halide in surface/canopy lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

Specifications

Length: 17-1/2" (44.5 cm)
Width: 17-1/2" (44.5 cm)
Height: 7-1/8" (18.1 cm)
Weight (max): 36 lbs. (16.4 kg)

Ordering Information

EXAMPLE: KACM LED 60C 700 50K R5 MVOLT SRM DDBXD

KACM LED

Series	LEDs	Drive current	Color Temp	Distribution	Voltage	Mounting
KACM LED	20C [1]	530 [2] 530 mA	30K 3000K	R2 Type II	MVOLT [2,3]	**Shipped installed**
	30C [1]	700 700 mA	40K 4000K	R3 Type III	120 [3,4] 277 [3]	SRM Surface mount
	40C		50K 5000K	R4 Type IV	208 [3,4] 347 [3,4]	TC Through-wire conduit tee
	60C			R5 Type V	240 [3,4] 480 [3,5]	(Provided by others)
				R5VS Type V very short		

Shipped separately [6]
YK Yoke/trunnion mount

Options

Shipped installed
SF Single fuse (120, 277, 347V) [3]
DF Double fuse (208, 240, 480V) [3]
PIR Ambient/motion sensor, 8-15' mounting height [7,8]
PIRH Ambient/motionsensor, 15-30' mounting height [7,8]
PIR1FC3V Motion/ambient sensor for 8-15' mounting heights and for typical applications requiring daylight harvesting and Title 24 compliance [7,8,9]
PIRH1FC3V Motion/ambient sensor for 15-30' mounting heights and typical applications requiring daylight harvesting and Title 24 compliance [7,8,9]
BL30 Bi-level switched dimming, 30% [8,9,10]
BL50 Bi-level switched dimming, 50% [8,9,10]
HS Houseside shield

Shipped separately [6]
WG Wire guard

Finish (required)
DDBXD Dark bronze
DBLXD Black
DNAXD Natural aluminum
DWHXD White
DDBTXD Textured dark bronze
DBLBXD Textured black
DNATXD Textured natural aluminum
DWHGXD Textured white

Accessories

Ordered and shipped separately.
KACMYK DDBXD U Yoke/trunnion accessory (specify finish)
KACWG U Wire guard accessory

NOTES
1 20C or 30C LED are not available with 530 Drive current and 347V or 480V.
2 MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
3 Any PIRs with BL30, BL50 or PIMT, is not available with 208V, 240V, 347V, 480V or MVOLT. It is only available in 120V or 277V specified.
4 Also available as a separate accessory; see Accessories information at left.
5 PIR & PIR3FC3V specifies the Acuity Controls ISBGR-10-DDT motion/ ambient sensor. PIR1FC3V or PIRH1FC3V specifies the Acuity Controls ISBGR-DDT motion/ambient sensor.
6 Reference Motion Sensor table.
7 PIR3FC3V and PIRH1FC3V are not available with bi-level, PNL or DCR. They all use the "DCM" module which requires the low voltage OEK motion sensor that only senses motion.
8 Requires an additional switched circuit.
9 Dimming driver standard. MVOLT only.
10 Not available with PIR3FC3V and PIRH1FC3V.

1 SITE PHOTOMETRICS
SCALE: NTS

NORTH

CEDAR CREEK PLAZA
16814 SW EDY RD.
SHERWOOD, OR 97140

REGISTERED PROFESSIONAL ENGINEER
61436PE
OREGON
JUNE 7, 2017
DAVID CHARLES BACHMEIER
EXPIRES: 12/31/2023

CBD ENGINEERING, LLC
35468 RIVERSIDE DR. SW
ALBANY, OREGON 97321
(541) 619-7287

SITE PHOTOMETRICS

DATE	DESCRIPTION

SP

EXHIBIT B

Pre-Application Conference Notes

Pre-Application Conference Notes

File # PAC 2022-009
Cedar Creek Plaza Lot 2 - Commercial Proposal
November 23, 2022
Staff Contact - Eric Rutledge
rutledgee@sherwoodoregon.gov
503-625-4242

During the pre-application conference, the applicant and City staff determined the best approach to the application is to comply with the approval criteria and development standard as a single lot (Lot 2). Other existing lots within the commercial center will not be used to meet development code standards unless specifically authorized by the code. A Major Modification to the original Site Plan approval is not proposed.

Type IV Site Plan Review

The pre-application conference and notes cannot cover all code requirements and aspects that apply to the proposal. Failure of staff to provide information required by the code does not constitute a waiver of the applicable standards or requirements. It is recommended that a prospective applicant obtain and read the Zoning and Community Development Code and/or ask any questions of City staff relative to code requirements prior to submitting an application.

PROJECT SUMMARY

Proposed Project Name:	Cedar Creek Plaza Lot 2 – Commercial
Proposal Description:	The applicant is proposing two new commercial buildings totaling 13,000 SF in the Retail Commercial (RC) zone. The subject lot is identified as Lot 2 of Cedar Creek Plaza. The commercial center is approximately 13-acres and received land use and subdivision approval in 2017 (SP 16-10 / VAR 17-01) and (SUB 17-02). The commercial center has been developed with the exception of Lot 2. Vacant Lot 2 is approximately 1.73 acres.
Applicant:	DD Sherwood One, LLC 901 NE Glisan St., Suite 100 Portland, OR 97232
Property Owner:	Same as above
Site Address:	16864 SW Edy Rd. (2S130DA02200)
Land Use Designation:	Retail Commercial

APPLICATION TYPE, TIMELINE & FEES

Full details on application type, noticing, and public hearing procedures listed under 16.72

Application Type and Hearing Authority
Type IV Site Plan Review

- The Type IV Hearing Authority is the Planning Commission and the Appeal Authority is City Council

NOTE: *Site Plan review type is determined by calculating the seating and parking square footage. Drive aisles and loading areas are included in the square footage.*

Estimated Approval Timeline

- 30 day completeness review
- 30-45 days for public hearing date after application is deemed complete
- 14 day appeal period for all land use decisions

Land Use Fees
Fees as of July 1, 2022. Please confirm fees with staff prior to submittal as fee schedule is revised annually. Engineering plan review, building permit, and SDC fees separate.

• Site Plan Review (Type IV)	$6,980.00
• Final Site Plan Review	$727.40
• Publication and Distribution of Type III-V Notice	$466

APPLICATION SUBMITTAL REQUIREMENTS

Form and Checklists - See attached "Application for Land Use Action" and "Site Plan Review Checklist".

Service Provider Letters – Clean Water Services and Tualatin Valley Fire & Rescue SPL's are required as completeness items for the Site Plan application

Neighborhood Meeting - A neighborhood meeting is required prior to submitting a Type III - V application. Please see the attached Neighborhood Meeting packet. **Emergency health orders are no longer in effect and an in-person Neighborhood Meeting is required.**

Note: Applicants are encouraged to submit 3 full and reduced size paper copies and one electronic copy for completeness review. The full number of paper copies and one updated electronic copy will be required after the application is deemed complete.

Paper application sets should be bound on left side or provided in 3-ring binder. A table of contents with tab separators is required. Full size plans can be folded or rolled but must be collated and bound on the left side.

SUMMARY OF APPLICABLE CODE CRITERIA (SZCDC Title 16)

*These sections **must** be addressed in the narrative submitted with the land use application*

Division II. - LAND USE AND DEVELOPMENT		**Division VI. - PUBLIC INFRASTRUCTURE**	
Chapter 16.12 - RESIDENTIAL LAND USE DISTRICTS		Chapter 16.104 - GENERAL PROVISIONS	
Chapter 16.22 - COMMERCIAL LAND USE DISTRICTS	**X**	Chapter 16.106 - TRANSPORTATION FACILITIES	**X**
Chapter 16.31 - INDUSTRIAL LAND USE DISTRICTS		Chapter 16.108 - IMPROVEMENT PLAN REVIEW	**X**
Chapter 16.36 - INSTITUTIONAL AND PUBLIC (IP) LAND USE DISTRICT		Chapter 16.110 - SANITARY SEWERS	**X**
Chapter 16.38 - SPECIAL USES		Chapter 16.112 - WATER SUPPLY	**X**
Chapter 16.40 - PLANNED UNIT DEVELOPMENT (PUD)		Chapter 16.114 - STORM WATER	**X**
Chapter 16.42 - HOME OCCUPATIONS		Chapter 16.116 - FIRE PROTECTION	**X**
Chapter 16.44 - TOWNHOMES		Chapter 16.118 - PUBLIC AND PRIVATE UTILITIES	**X**
Chapter 16.46 - MANUFACTURED HOMES			
Chapter 16.48 - NON-CONFORMING USES		**Division VII. - LAND DIVISIONS, SUBDIVISIONS, PARTITIONS, LOT LINE ADJUSTMENTS AND MODIFICATIONS**	
Chapter 16.50 - ACCESSORY STRUCTURES, ARCHITECTURAL FEATURES AND DECKS		Chapter 16.120 - SUBDIVISIONS	
Chapter 16.52 - ACCESSORY DWELLING UNITS		Chapter 16.122 - LAND PARTITIONS	
Chapter 16.54 - ADULT ENTERTAINMENT		Chapter 16.124 - PROPERTY LINE ADJUSTMENTS AND LOT CONSOLIDATIONS	
Chapter 16.56 - OTHER LAND USE ACTIONS		Chapter 16.126 - REPLATTING, LOT CONSOLIDATIONS AND VACATION OF PLATS	
Chapter 16.58 - CLEAR VISION AND FENCE STANDARDS		Chapter 16.128 - LAND DIVISION DESIGN STANDARDS	
Chapter 16.60 - YARD REQUIREMENTS			
Chapter 16.62 - CHIMNEYS, SPIRES, ANTENNAS, AND SIMILAR STRUCTURES		**Division VIII. - ENVIRONMENTAL RESOURCES**	
Chapter 16.64 - DUAL USE OF REQUIRED SPACE		Chapter 16.134 - FLOODPLAIN (FP) OVERLAY	
Chapter 16.66 - TRANSPORTATION FACILITIES AND IMPROVEMENTS		Chapter 16.136 - PROCEDURES	
Chapter 16.68 - INFILL DEVELOPMENT STANDARDS		Chapter 16.138 - MINERAL RESOURCES	
		Chapter 16.140 - SOLID WASTE	
Division III. - ADMINISTRATIVE PROCEDURES		Chapter 16.142 - PARKS, TREES AND OPEN SPACES	**X**
Chapter 16.70 - GENERAL PROVISIONS		Chapter 16.144 - WETLAND, HABITAT AND NATURAL AREAS	
Chapter 16.72 - PROCEDURES FOR PROCESSING DEVELOPMENT PERMITS	**X**	Chapter 16.146 - NOISE	
Chapter 16.76 - APPEALS		Chapter 16.148 - VIBRATIONS	
		Chapter 16.150 - AIR QUALITY	
Division IV. - PLANNING PROCEDURES		Chapter 16.152 - ODORS	
Chapter 16.80 - PLAN AMENDMENTS		Chapter 16.154 - HEAT AND GLARE	
Chapter 16.82 - CONDITIONAL USES		Chapter 16.156 - ENERGY CONSERVATION	**X**
Chapter 16.84 - VARIANCES			
Chapter 16.86 - TEMPORARY USES		**Division IX. - HISTORIC RESOURCES**	
Chapter 16.88 - INTERPRETATION OF SIMILAR USES		Chapter 16.160 - SPECIAL RESOURCE ZONES	
		Chapter 16.162 - OLD TOWN (OT) OVERLAY DISTRICT	
Division V. - COMMUNITY DESIGN		Chapter 16.164 - LANDMARK REVIEW	
Chapter 16.90 - SITE PLANNING	**X**	Chapter 16.166 - LANDMARK DESIGNATION	
Chapter 16.92 - LANDSCAPING	**X**	Chapter 16.168 - LANDMARK ALTERATION 16.168.010 - PROCEDURES	
Chapter 16.94 - OFF-STREET PARKING AND LOADING	**X**	16.168.020 - ALTERATION STANDARDS	
Chapter 16.96 - ON-SITE CIRCULATION	**X**	16.168.030 - VARIANCES TO ALTERATION STANDARDS	
Chapter 16.98 - ON-SITE STORAGE	**X**		
Chapter 16.100 - PERMANENT SIGNS			

STAFF COMMENTS ON APPLICABLE CRITERIA AND GENERAL REQUIREMENTS

The following comments are based on staff's review of the information provided on the pre-application form and accompanying attachments.

Summary of important issues / information:

Zoning & Proposed Land Uses

- Many commercial uses including general retail sales are permitted outright in the RC zone. Some commercial uses require a Conditional Use permit. The applicant can pursue a concurrent CUP for specific uses if desired.

Site Plan Review & Commercial Design Standards

- Site Plan approval criteria are located in SZCDC § 16.90. For demonstrating compliance with the Urban Design standards in subsection (6), staff recommends demonstrating compliance with the Commercial Design Review matrix as the property is an infill lot located at the rear of an existing commercial center. Demonstrating compliance with subsection (6)(a) – (c) may not be feasible as the criteria requires buildings to be located flush to the street. The building is not proposed at the access easement line serving Lot 2 and a Major Modification incorporating the entire site to meet this standard is not proposed.

Retail Commercial Development Standards

- The proposed structure appears to be within 100 ft. of an existing HDR zone to the north. The building height is limited to the height standards in the HDR zone. Based on the building elevations, the maximum building height with the tower feature is approximately 36 ft. The maximum building height allowed in the HDR zone is 40 ft.

Development Standards by Zone	RC
Lot area	10,000 SF
Lot width at front property line:	40 ft.
Lot width at building line:	40 ft.
Front yard setback	0 ft.
Side yard setback	0 ft.
When abutting residential zone	10 ft.
Rear yard setback	0 ft.

Development Standards by Zone	RC
Corner lot street side	20 ft.
Height	50 ft.[13]

[13]Structures within one-hundred (100) feet of a residential zone shall be limited to the height requirements of that residential area.

Landscaping

- A 10 ft. wide landscaped buffer is required between off-street parking, loading, and vehicular use areas on adjacent properties.
    - **The landscape strips along the east and south side of the property appear to be less than 10 ft.**
- 45 SF of parking area landscaping is required per stall. Commercial land uses require one (1) landscaped island for every ten (10) contiguous stalls. Specific planting requirements are listed under SZCDC § 16.92.030(B)(4).
- Commercial developments require 30% tree canopy over the development site. Specific tree canopy calculations apply. See SZCDC § 16.142.070(D).

Parking, Loading, and Maneuvering Areas

- Commercial parking ratios for common uses are provided below.
- Parking layout and dimensional standards are listed under SZCDC § 16.94.020(B).
- Parking stall is 9x20, up to 25% can be "compact" at 8x18
- The paved portion of a parking stall length may be reduced by three (3) feet if replaced with (3) feet of low lying landscape or hardscape in lieu of a wheel stop. If adjacent to a pedestrian pathway, the pathway must continue to meet ADA width standards.
- The two-way drive aisle width for 90° stalls is 26 ft. for compact stalls and 24 ft. for standard stalls
- Two (2) or more uses or, structures on multiple parcels of land may utilize jointly the same parking and loading spaces when the peak hours of operation do not substantially overlap, provided that satisfactory evidence is presented to the City, in the form of deeds, leases, or contracts, clearly establishing the joint use. (SZCDC § 16.94.010(C))
- A loading stall at 10 x 25 (minimum) is required. Any area to be used for the maneuvering of delivery vehicles and the unloading or loading of materials shall be separated from designated off-street parking areas and designed to prevent the encroachment of delivery vehicles onto off-street parking areas or public streets. **The proposed loading stall near the trash enclosure does not meet this encroachment standard.**

Use	Minimum	Maximum
Eating / drinking establishment	15.63 / 1,000 SF	23.00 / 1,000 SF
General retail / personal service	4.1 / 1,000 SF	6.2 / 1,000 SF

Pedestrian and Vehicle Circulation

- An on-site pedestrian circulation system is required with new development. The system "shall extend from the ground floor entrances or the ground floor landing of stairs, ramps or elevators to the public sidewalk or curb of the public street which provides required ingress and egress".
- Private Pathway/Sidewalk Design. Private pathway surfaces shall be concrete, brick/masonry pavers, or other durable surface, at least five (5) feet wide and conform to ADA standards. Where the system crosses a parking area, driveway or street, it shall be clearly marked with contrasting paving materials or raised crosswalk (hump).

Utilities, Transportation, and Public Improvements

- Utilities, Stormwater, Transportation, and Public Improvement Requirements – please refer to the City of Sherwood Engineering Comments (attached)

APPLICANT QUESTIONS

1. Please confirm all required applications, fees and submittal items.

Information provided above and in the Site Plan Review Checklist.

2. Will the City review the site development permit concurrent with the Site Plan Review application?

a. The applicant accepts the risks that could emerge out of land use review and would be willing to pay the review fee if an amendment is required as a result of the land use decision.

Concurrent review of building permits / engineering plans is not available. Land use approval is required prior to submitting building permits or engineering plans.

3. Please confirm that no public improvements will be required for the site development since they were all constructed with prior phases.

Refer to City of Sherwood Engineering comments.

4. Please confirm a full TIA will not be required and instead a trip generation letter document the change in anticipated trips for Lot 2 will suffice.

a. Please provide any preliminary comments on the attached trip generation estimate noted above.

5. Please confirm any special studies required with the application (traffic, geotechnical, stormwater, etc.).

> **a. Please provide comments that address the site's stormwater requirements and what standards the site is vested under.**
>
> **b. Is the site vested under any prior CWS stormwater standards or will the latest CWS hydromodification standards be required?**
>
> > **i. If so, please confirm that due to the site configuration and limited space, the proposed treatment and detention configuration shown on the attached storm plan will meet the requirements (pending final sizing) of the CWS requirements.**

Refer to City of Sherwood Engineering comments.

6. Please provide any preliminary comments on the attached plan set and attached

architectural elevations.

a. Please provide feedback on connection of the tower. If the tower connects the two separate buildings, are they considered a single structure? What if the tower is free standing?

Comments provided by Building Official during pre-app conference. Applicant will follow up with more detailed email to Building Official.

7. Please specify any code standards of concern or of note.

Code sections that are not met based on the preliminary plans are highlighted above. Landscaping buffer adjacent to parking and loading stall location.

8. Please confirm if there are pending code or review fee changes that may affect the project.

The City is currently undertaking a code cleanup effort, however, none of the changes are expected to impact the standards and criteria applicable to the project.

AGENCY COMMENTS

City of Sherwood Engineering Comments
Comments attached to packet. Contact Craig Christensen, P.E. – info below.

City of Sherwood Building Division
Comments provided during pre-application conference. Contact Scott McKie, Building Official – info below.

Tualatin Valley Fire & Rescue Comments
No comments provided. A Service Provider Letter is required as a Completeness item.

Oregon Department of Transportation
Written comments provided. See attached.

Contact Information and Helpful Links

PLANNING DEPARTMENT INFORMATION

Colleen Resch, Planning Technician	reschc@sherwoodoregon.gov / 503-625-4223
Eric Rutledge, Associate Planner	rutledgee@sherwoodoregon.gov / 503-625-4242
Joy Chang, Senior Planner	changj@sherwoodoregon.gov / 503-625-4214

Current Project Page:
https://www.sherwoodoregon.gov/projects?tid=All&field_project_status_value=All&field_project_type_tid=93&keys=&=Apply

Planning Applications and Checklists:
https://www.sherwoodoregon.gov/planning/page/land-use-applications-and-checklists

ENGINEERING DEPARTMENT INFORMATION

Jo Guediri, Engineering Program Associate	guedirij@sherwoodoregon.gov / 503-925-2309
Craig Christensen, Civil Engineer P.E.	christensenc@sherwoodoregon.gov / 503-925-2301

FOR WATER FLOW INFORMATION: RICH SATTLER sattlerr@sherwoodoregon.gov

Engineering Department Home Page: https://www.sherwoodoregon.gov/engineering

Permit Process Packet: www.sherwoodoregon.gov/engineering/page/eng-permit-process-packet-forms

System Development Charges (SDC) Information:
https://www.sherwoodoregon.gov/engineering/page/system-development-charges-sdc

BUILDING DEPARTMENT INFORMATION

Kirsten Allen, Lead Building Permit Specialist	allenk@sherwoodoreong.gov / 503-625-4215
Scott McKie, Building Official	mckies@sherwoodoregon.gov / 503-625-4217

Building Department Home Page: https://www.sherwoodoregon.gov/building

Building Permit Forms: https://www.sherwoodoregon.gov/building/page/permit-forms

Engineering
Land Use Application
Comments

Home of the Tualatin River National Wildlife Refuge

To:	Eric Rutledge, Associate Planner
From:	Craig Christensen P.E., Civil Engineer, Engineering Department
Project:	Cedar Creek Plaza (LU 2021-009)
Date:	April 29, 2022

Engineering staff has reviewed the information provided for the above referenced private development project. Final construction plans will need to meet the standards established by the City of Sherwood Engineering Department and Public Works Department, Clean Water Services (CWS) and Tualatin Valley Fire & Rescue (TVF&R), in addition to requirements established by other jurisdictional agencies providing land use comments. City of Sherwood Engineering Department comments are as follows:

Background Information

The subject property is an undeveloped lot in a commercial subdivision that was previously developed under the name of Cedar Creek Plaza.

Transportation

The subject property has no public street frontage. The site is interior to the Cedar Creek Plaza development. Access to the site is via a right in only from SW Pacific Highway and from the SW Edy Road/SW Borchers Drive intersection which has a traffic signal. All street frontage improvements along the Cedar Creek Plaza development were installed with the original development.

A traffic impact analysis performed by Mackenzie dated December 23, 2016 was performed with the original development with the trip analysis for the subject property being based upon a 94-unit hotel. A new trip analysis was submitted with the land use application for the subject development showing that the 67 dwelling unit complex proposed will generate less traffic than the 94-unit hotel in the original proposal. An analysis by the City of Sherwood engineering department concurred with the results of the submitted trip analysis. Therefore, no additional improvements to the public transportation system will be required unless dictated by ODOT.

Sanitary Sewer

The subject property has an existing sanitary sewer lateral stubbed into the property.

Since all needed public sanitary sewer facilities were installed with the original development, no extension of the public sanitary sewer system is required.

Condition: Prior to Issuance of a Plumbing Permit, any private sanitary sewer piping shall be installed in conformance with the current Oregon Plumbing Specialty Code.

Storm Sewer

The subject property has an existing storm sewer lateral stubbed into the property.

Since all needed public storm sewer facilities were installed with the original development, no extension of the public storm sewer system is required.

Water quality treatment and hydromodification/detention facilities were not installed for the subject parcel as part of the original development and will need to be designed and installed to

meet Clean Water Services standards. Detention is required due to discharging into ODOT right-of-way.

Condition: Prior to Approval of Engineering Public Improvement Plans, the proposed development shall design to provide on-site water quality treatment/hydro-modification/detention facilities in accordance with city and Clean Water Services standards unless otherwise approved by the city and Clean Water Services.

Condition: Prior to Acceptance of Public Improvements, private water quality/hydro-modification/detention facilities shall have a recorded Private Storm Water Facility Access and Maintenance Covenant. An Operation and Maintenance Plan for all private water quality/hydro-modification facilities is also required to be submitted to the Sherwood Engineering Department.

Condition: Prior to Issuance of a Plumbing Permit, any private storm sewer piping shall be installed in conformance with the current Oregon Plumbing Specialty Code.

Water

The subject property has an existing water service line stubbed into the property of adequate size to provide fire and domestic water service.

Per Municipal Code Section 13.05.030, the domestic water service for a multi-family building is required to have approved backflow protection.

Condition: Prior to Approval of the Engineering Public Improvement Plans, the developer shall design for the installation of backflow protection on the domestic water service meeting the approval of the City of Sherwood Public Works Department.

Condition: Prior to Approval of the Engineering Public Improvement Plans, if on-site fire protection is to be installed, the proposed development shall design for the installation of backflow protection meeting Sherwood Engineering Department standards.

Condition: Prior to Issuance of a Plumbing Permit, any private water piping shall be installed in conformance with the current Oregon Plumbing Specialty Code.

Condition: Prior to Final Acceptance of the Constructed Public Improvements, any public water facilities located on private property shall have a recorded public water line easement encompassing the related public water improvements meeting Sherwood Engineering standards.

Grading and Erosion Control

City policy requires that prior to grading, a permit is obtained from the Building Department for all grading on the private portion of the site.

The proposed disturbance area for the subject development is greater than 1 acre in area. DEQ now requires that a NPDES 1200-C permit be obtained for grading of lots where the original development was covered under a NPDES 1200-C. Therefore a DEQ NPDES 1200-C permit is required for this project.

Condition: Prior to Issuance of a Grading Permit, the subject development shall obtain a DEQ NPCES 1200-C permit.

Other Engineering Issues

A Clean Water Services Service Provider Letter has already been obtained for the proposed development.

Public utility easements were already dedicated along all street frontages as part of the original development.

Sherwood Broadband vaults and conduits were already installed along all street frontages as part of the original development.

Condition: Prior to Approval of the Engineering Public Improvement Plans, a Storm Water Connection Permit Authorization shall be obtained.

Condition: Prior to Approval of the Engineering Public Improvement Plans or Issuance of Building Permits, an Engineering Compliance Agreement shall be obtained from the City of Sherwood Engineering Department.

Condition: Prior to Occupancy, the subject development shall receive Final Acceptance of Public Improvements.

Oregon
Kate Brown, Governor

Department of Transportation
Region 1 Headquarters
123 NW Flanders Street
Portland, Oregon 97209
(503) 731.8200
FAX (503) 731.8259

December 12, 2022 ODOT #12819

ODOT Response

Project Name: Cedar Creek Plaza Lot Two-Commercial Buildings	**Applicant:** DD Sherwood One, LLC; Attn: Annie Carlton
Jurisdiction: City of Sherwood	**Jurisdiction Case #:** PAC 2022-009
Site Address: 16864 SW Edy Rd, Sherwood, OR 97140	**Legal Description:** 02S 01W 30DA **Tax Lot(s):** 00900
State Highway: OR 99W	

The site of this proposed land use action is in the vicinity of Pacific Highway West (OR 99W). 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. **Please direct the applicant to the District Contact indicated below to determine permit requirements and obtain application information.**

COMMENTS/FINDINGS

ODOT has reviewed the pre-application materials proposing construction of two new commercial buildings (7,200 SF and 5,800 SF) on a currently vacant site. The existing zoning designation is Retail Commercial (RC).

Due to the site's proximity to Pacific Highway, ODOT recommends a traffic study be conducted to assess the impacts of the proposed use on the state highway system including the following intersections:

- Pacific Highway and Edy Rd
- Borchers Dr and Edy Rd

The applicant should submit documentation of the anticipated change in trip generation in order for ODOT to determine whether the proposal constitutes a "Change of Use" of the ODOT Approach Road Permits. Please contact the ODOT Traffic Engineer identified below to scope the traffic study.

All alterations within the State highway right of way are subject to the ODOT Highway Design Manual (HDM) standards. Alterations along the State highway but outside of ODOT right-of-way may also be subject to ODOT review pending its potential impact to safe operation of the highway. If proposed alterations deviate from ODOT standards a Design Exception Request must be prepared by a licensed engineer for review by ODOT Technical Services. Preparation of a Design Exception request does not guarantee its ultimate approval. Until more detailed plans have been reviewed, ODOT cannot make a determination whether design elements will require a Design Exception.

Note: Design Exception Requests may take up to 3 months to process.

All ODOT permits and approvals must reach 100% plans before the District Contact will sign-off on a local jurisdiction building permit, or other necessary requirement prior to construction.

ODOT RECOMMENDED LOCAL CONDITIONS OF APPROVAL

Traffic Impacts

☒ The applicant shall submit a traffic impact analysis including the intersections of Pacific Highway/Edy Rd and Borchers Dr/Edy Rd 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.**

Permits and Agreements to Work in State Right of Way

☒ An ODOT Miscellaneous Permit is required for connection to state highway drainage facilities. Connection will only be considered if the site's drainage naturally enters ODOT right of way. The applicant must provide ODOT District with a preliminary drainage plan showing impacts to the highway right of way.

A drainage study prepared by an Oregon Registered Professional Engineer is usually required by ODOT if:

1. Total peak runoff entering the highway right of way is greater than 1.77 cubic feet per second; or
2. The improvements create an increase of the impervious surface area greater than 10,758 square feet.

Please send a copy of the Land Use Notice to:

ODOT Region 1 Planning
Development Review
123 NW Flanders St
Portland, OR 97209

ODOT_R1_DevRev@odot.oregon.gov

Development Review Planner: Diana Powers	Diana.Powers@odot.oregon.gov
Traffic Contact: John Russell, P.E.	John.Russell@odot.oregon.gov 503.731.8282
District Contact: District 2B	D2BUP@odot.oregon.gov

EXHIBIT C

Traffic Generation Letter

MACKENZIE.

January 10, 2023

City of Sherwood
Attention: Craig Christensen, PE
22560 SW Pine Street
Sherwood, OR 97140

Re: **Cedar Creek Plaza – Lot 2/Pad G**
Trip Update Letter
Project Number 2180586.00

Dear Craig:

Mackenzie has prepared this letter to present updated trip generation estimates with the proposed retail on Lot 2/Pad G of the Cedar Creek Plaza in Sherwood, Oregon.

INTRODUCTION

The Cedar Creek Plaza is located at the northwest corner of the Highway 99W/SW Edy Road intersection in Sherwood. Cedar Creek Plaza is proposing to add an additional 13,000 square feet (SF) of retail space in the plaza to the existing 46,878 SF of retail space, for a total of 59,878 SF of retail. The Cedar Creek Plaza was originally approved for up to 48,000 SF of retail, a 28-bed nursing home, a 137-bed assisted living facility, and a 94-room hotel on Lot 2/Pad G of the site. The proposed 13,000 SF of retail is now planned in place of the 94-room hotel on Lot 2/Pad G. This letter presents updated trip generation estimates with the proposed 13,000 SF of retail instead of the previously assumed hotel.

TRIP GENERATION

Trip generation estimates for the approved Cedar Creek Plaza were obtained from Mackenzie's December 23, 2016 Transportation Impact Analysis (TIA) prepared for the subject site. An excerpt from this report is enclosed with this letter for reference.

Trip generation estimates for the approved development were prepared using the Institute of Transportation Engineers' (ITE) *Trip Generation Manual,* 9th Edition. The *Trip Generation Manual,* 11th Edition is the most current source of trip rates and was therefore utilized to estimate trips for the proposed additional retail space.

Internal trip estimates for the approved site were prepared using data from ITE's *Trip Generation Handbook,* 3rd Edition, which relies on data compiled by the National Cooperative Highway Research Program's (NCHRP) *Report 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments*. The approved trip estimates included only 50% of the recommended internal trips as recommended per NCHRP as a conservative estimate. Therefore, this trip update also only includes 50% of the recommended internal capture trip estimates. An estimate of internal trips between the proposed use and the existing providence Sherwood Medical Plaza were also provided in the approved trip estimate summary. This trip update letter includes the same assumptions and methodology for internal trip capture estimates as applied to the approved trip estimates for the Cedar Creek Plaza. Internal trips for the proposed 13,000 SF of retail represent 4% of total AM peak hour trips, 4% of total PM peak hour trips, and 5% of total daily trips for Lot 2/Pad G.

Pass-by trip estimates for the approved site were prepared using data from ITE's *Trip Generation Handbook,* 3rd Edition, as documented in the December 2016 TIA. There were no pass-by trips assumed for the previously assumed hotel; however, a PM peak hour pass-by rate of 40% for a "Shopping Plaza (40-150 KSF)" (LUC 821) as published in ITE's *Trip Generation Manual,* 11th Edition was applied.

Lot 2/Pad G Net New

Because all uses within the development have already been constructed and are currently operational, only the difference between approved and proposed trips on Lot 2/Pad G are compared. The trip generation estimates reflect a shopping plaza between 40,000 and 150,000 SF without a supermarket. The plaza does not currently have a supermarket and the proposed 13,000 SF of retail space is not large enough to accommodate an anchor supermarket user. Table 1 presents the previous proposal, current proposal, and net new trip estimates for Lot 2/Pad G.

TABLE 1 – TRIP GENERATION SUMMARY FOR LOT 2/PAD G

Development Scenario	ITE Code	ITE Land Use	Size	Trip Type	AM Peak Hour			PM Peak Hour			Daily
					In	Out	Total	In	Out	Total	
Previous Proposal	310	Hotel	94 rooms	Total	30	20	50	29	27	56	768
				Internal	0	3	3	3	2	5	50
				External	30	17	47	26	25	51	718
				Pass-by	0	0	0	0	0	0	0
				Primary	30	17	47	26	25	51	718
Current Proposal	821	Shopping Plaza (40-150 KSF, w/o Supermarket)	13.00 KSF	Total	14	9	23	33	35	68	878
				Internal	1	0	1	2	1	3	44
				External	13	9	22	31	34	65	834
				Pass-by	0	0	0	13	13	26	167
				Primary	13	9	22	18	21	39	667
NET NEW				**Total**	**-16**	**-11**	**-27**	**4**	**8**	**12**	**110**
				Internal	**1**	**-3**	**-2**	**-1**	**-1**	**-2**	**-6**
				External	**-17**	**-8**	**-25**	**5**	**9**	**14**	**116**
				Pass-by	**0**	**0**	**0**	**13**	**13**	**26**	**167**
				Primary	**-17**	**-8**	**-25**	**-8**	**-4**	**-14**	**-51**

As presented in Table 1, the proposed additional 13.00 KSF retail plaza is estimated to generate 27 fewer AM peak hour, 12 additional PM peak hour, and 110 additional daily trips. When comparing primary trips, or new trips to the site, the retail plaza is estimated to generate 25 fewer AM peak hour, 14 fewer PM peak hour, and 51 fewer daily trips.

Applying the NCHRP internal trip methodology to the proposed retail plaza results in one internal trip during the AM peak hour and three during the PM peak hour. Daily internal trips are estimated to be 44, resulting in six fewer internal daily trips than the previously assumed hotel. We will also note the shopping center was approved for a minor modification to allow an additional 678 SF after the original approval for 46,200 SF. This minor modification resulted in an additional 30 average daily trips, not captured in the approved December 23, 2016 TIA, but documented in Mackenzie's May 21, 2018 Minor Modification report. An excerpt from this report is enclosed with this letter for reference.

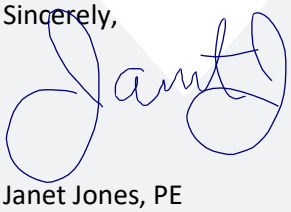
Because the proposed additional retail plaza space is estimated to generate fewer primary trips than the previously assumed hotel, off-site impacts are projected to be less significant than originally presented in the December 2016 TIA for the Cedar Creek Plaza, including queuing at the Highway 99W/SW Edy Road intersection.

CONCLUSION

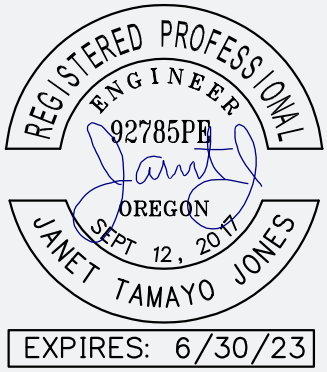
Traffic impacts for the approved Cedar Creek Plaza were originally reviewed for a 94-room hotel on Lot 2/Pad G but the applicant is now proposing an additional 13,000 SF of retail plaza. Trip generation estimates for the proposed project use were prepared using updated trip generation rates presented in ITE's *Trip Generation Manual,* 11th Edition, specifically looking at the proposed change on Lot 2/Pad G results in 27 fewer AM peak hour, 12 additional PM peak hour, and 110 additional daily trips. When comparing primary trips, or new trips to the site, the 13,000 SF of additional retail plaza space is estimated to generate 25 fewer AM peak hour, 14 fewer PM peak hour, and 51 fewer daily trips. Due to the decreased site trips associated with Lot 2/Pad G, off-site impacts are projected to be less significant than originally presented in the December 2016 TIA for the Cedar Creek Plaza, including queuing at the Highway 99W/SW Edy Road intersection.

Please contact me at jjones@mcknze.com or 971-346-3741 if you have any questions or comments regarding the information presented in this letter.

Sincerely,

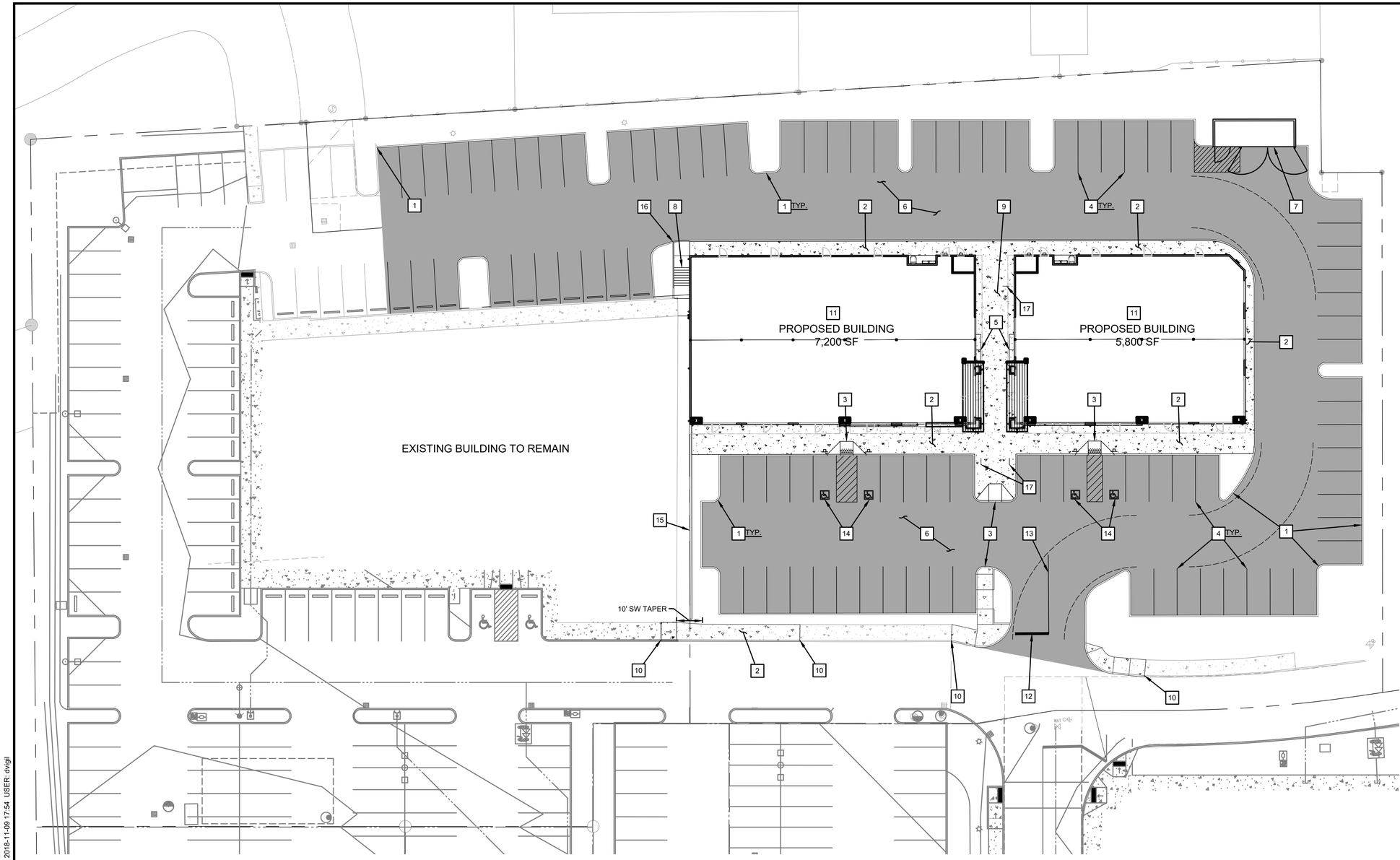


Janet Jones, PE
Senior Associate | Traffic Engineer



Enclosure(s): Site Plan
TIA Excerpt dated December 23, 2016
Minor Modification Report Excerpt dated May 21, 2018

c: Annie Carlton – Deacon Development, LLC
Mike Towle, Kenny Werth – DOWL, LLC
Brent Ahrend – Mackenzie



LEGEND

- RIGHT-OF-WAY LINE
- BOUNDARY LINE
- PROPERTY LINE
- CENTERLINE
- CURB
- EDGE OF PAVEMENT
- EASEMENT
- FENCE LINE
- PROPOSED SAWCUT LINE
- PROPOSED CONCRETE SIDEWALK
- PROPOSED LIGHT AC
- CONIFEROUS TREE
- WATER VALVE
- STORM SEWER CLEAN OUT
- STORM SEWER CATCH BASIN
- STORM SEWER MANHOLE
- SANITARY SEWER MANHOLE
- SANITARY SEWER CLEAN OUT
- GAS RISER
- STREET LIGHT
- FOUND SURVEY MONUMENT
- PROPOSED BIKE RACK

CONSTRUCTION NOTES [#]

1. PROPOSED STANDARD CURB
2. PROPOSED CONCRETE SIDEWALK
3. PROPOSED ADA RAMP WITH TRUNCATED DOMES
4. PROPOSED 4" WIDE PAINTED WHITE STRIPE. 2 COATS MINIMUM
5. PROPOSED BIKE RACK (3-SPACES MIN.)
6. PROPOSED PAVING
7. PROPOSED TRASH ENCLOSURE. SEE ARCHITECTURAL PLANS FOR DETAILS
8. PROPOSED STAIRS
9. PROPOSED PEDESTRIAN WALKWAY. SEE ARCHITECTURAL / LANDSCAPE PLANS FOR DETAILS
10. CONNECT TO EXISTING SIDEWALK. MATCH GRADE AT EXISTING WALK. NOTIFY ENGINEER OF CONFLICTS
11. PROPOSED BUILDING. SEE ARCHITECTURAL PLANS FOR DETAILS
12. PROPOSED 12" WHITE STOP BAR
13. PROPOSED 4" WHITE PAINTED LINE
14. PROPOSED ADA PARKING STALL
15. PROPOSED CMU RETAINING WALL
16. PROPOSED WALL WITH RAILING
17. PROPOSED BIKE RACK

OREGON UTILITY NOTIFICATION CENTER
1-800-332-2344

CALL BEFORE YOU DIG

ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (503) 232-1987).

20 0 20 40
SCALE IN FEET

PARKING INFORMATION

PROPOSED PARKING:

REQUIRED MIN. AND MAX. PARKING STALLS AS PER SHERWOOD MUNICIPAL CODE SECTION 16.94.020 (RETAIL)

TOTAL SITE DEVELOPMENT:

MINIMUM PARKING	496 SPACES
MAXIMUM PARKING	678 SPACES
PROPOSED PARKING	621 SPACES

LOT 2 DEVELOPMENT: GROSS LEASABLE AREA: 13,000 SF

MINIMUM PARKING	49 SPACES
MAXIMUM PARKING	81 SPACES
PROPOSED PARKING	95 SPACES

ADA PARKING:

REQUIRED ADA STALLS (4 PER 76-100 PARKING STALLS):	4
REQUIRED VAN ACCESSIBLE STALLS (1 PER 6 PROVIDED):	1
TOTAL ADA PARKING STALLS:	4
TOTAL STANDARD ADA PARKING STALLS:	3
TOTAL VAN ACCESSIBLE PARKING STALLS:	1

BICYCLE PARKING:

AS PER SHERWOOD MUNICIPAL CODE SECTION 16.94.020

BICYCLE PARKING REQUIRED	3
BICYCLE PARKING PROVIDED	4

LANDSCAPE INFORMATION

PROPOSED DEVELOPMENT:

PARKING TOTAL = 95 SPACES
PARKING AREA LANDSCAPE = 6,515 SF (4,320 SF REQ)
PARKING AREA TREES = 23 LG + 2 SM (98 SPACES)
PARKING EVERGREEN TREES = 8% (2 TREES)
PARKING SHRUBS = - SHRUBS (192 SHRUBS REQ)

REV	DATE	DESCRIPTION	BY

REVISIONS

REGISTERED PROFESSIONAL ENGINEER
82868 PE
OREGON
JUNE 10, 2014
MICHAEL D. TOWLE
EXPIRATION DATE: 06/30/24

DOWL
WWW.DOWL.COM

CEDAR CREEK PLAZA
16814 SW EDY ROAD, SHERWOOD, OR 97140

SITE PLAN

SE 1/4 S30, T2S, R1W W.M. TL900
WASHINGTON COUNTY, OR

PROJECT	14505.01
DATE	1/11/2023

SHEET
C2.0

MACKENZIE.

DESIGN DRIVEN I CLIENT FOCUSED

TRANSPORTATION IMPACT ANALYSIS

To
City of Sherwood

For
Deacon Development and
Rembold Properties

Submitted
December 23, 2016

Project Number
2150650.00

MACKENZIE
Since 1960

RiverEast Center | 1515 SE Water Ave, Suite 100, Portland, OR 97214
PO Box 14310, Portland, OR 97293 | T 503.224.9560 | www.mcknze.com

TABLE 4 – TRIP GENERATION SUMMARY								
Land Use (LUC)	Size and Units	AM Peak Hour			PM Peak Hour			Daily
		In	*Out*	*Total*	*In*	*Out*	*Total*	
TOTAL TRIPS								
Assisted Living (LUC 254)	137 occupied beds	17	8	25	20	20	40	375
Nursing Home (LUC 620)	28 beds	3	2	5	2	4	6	77
Hotel (LUC 310)	94 rooms	30	20	50	29	27	56	768
Shopping Center (LUC 820)	46.2 KSF	60	37	97	171	186	357	4,111
New Development Subtotal		**110**	**67**	**177**	**222**	**237**	**459**	**5,331**
INTERNAL TRIPS								
Assisted Living (LUC 254)	137 occupied beds	0	0	0	-5	-5	-10	-48
Nursing Home (LUC 620)	28 beds	0	0	0	-1	-1	-2	-10
Hotel (LUC 310)	94 rooms	0	-3	-3	-3	-2	-5	-50
Shopping Center (LUC 820)	46.2 KSF	-3	-2	-5	-12	-9	-21	-183
New Development Subtotal		**-3**	**-5**	**-8**	**-21**	**-17**	**-38**	**-291**
EXTERNAL TRIPS								
Assisted Living (LUC 254)	137 occupied beds	17	8	25	15	15	30	327
Nursing Home (LUC 620)	28 beds	3	2	5	1	3	4	67
Hotel (LUC 310)	94 rooms	30	17	47	26	25	51	718
Shopping Center (LUC 820)	46.2 KSF	57	35	92	159	177	336	3,928
New Development Subtotal		**107**	**62**	**169**	**201**	**220**	**421**	**5,040**
PASS-BY TRIPS								
Shopping Center (LUC 820)	46.2 KSF	0%			34%			17%
Shopping Center (LUC 820)	**46.2 KSF**	**0**	**0**	**0**	**57**	**57**	**114**	**668**
PRIMARY TRIPS								
Assisted Living (LUC 254)	137 occupied beds	17	8	25	15	15	30	327
Nursing Home (LUC 620)	28 beds	3	2	5	1	3	4	67
Hotel (LUC 310)	94 rooms	30	17	47	26	25	51	718
Shopping Center (LUC 820)	46.2 KSF	57	35	92	102	120	222	3,260
New Development Subtotal		**107**	**62**	**169**	**144**	**162**	**307**	**4,372**
SUMMARY OF NEW TRIPS								
Total Trip Estimate		110	67	177	222	237	459	5,331
Internal Trip Reduction		-3	-5	-8	-21	-17	-38	-291
External Trips		107	62	169	201	220	421	5,040
Pass-by Trips		0	0	0	57	57	114	668
Primary Trips		107	62	169	144	163	307	4,372
Internal Reduction at Providence Medical Plaza		-3	-1	-4	-2	-6	-8	-95
Primary Trips Added to Network		104	61	165	142	157	299	4,277

MACKENZIE.

DESIGN DRIVEN | CLIENT FOCUSED

MINOR MODIFICATION TO APPROVED SITE PLAN (BUILDINGS B AND C)

To
City of Sherwood

For
Deacon Development Group

Dated
May 17, 2018
Revised May 21, 2018

Project Number
2160618.17

MACKENZIE
Since 1960

RiverEast Center | 1515 SE Water Ave, Suite 100, Portland, OR 97214
PO Box 14310, Portland, OR 97293 | T 503.224.9560 | www.mcknze.com

(3) A change in setbacks or lot coverage by more than ten (10) percent, provided the resulting setback or lot coverage does not exceed that allowed by the land use district;

Response: Per Sheet C2.1A, there is a proposed net increase in building coverage of 678 square feet. Building C will continue to be set back from SW Pacific Highway by at least 25 feet (Sheet C2.1A). Phase III of Cedar Creek Plaza was reviewed as one lot, and Building C will not be set back closer or farther away from the property lines of the entire Phase III site than any other Phase III building.

The revised building footprints increase lot coverage by approximately 678 SF, bringing the total lot coverage to approximately 48,000 SF (17.3%) of the 277,962-SF Phase III site. The original lot coverage was approximately 47,000 SF (16.9%), so the difference in lot coverage is an increase of approximately 0.4%.

This standard is therefore not applicable.

(4) A change in the type and/or location of access-ways, drives or parking areas negatively affecting off-site traffic or increasing Average Daily Trips (ADT) by more than 100;

Response: No change in the type and/or location of access is proposed. Off-street parking areas will continue to meet the applicable development standards of Chapter 16.94 SMC, as analyzed below in this narrative. Per the Transportation Impact Analysis prepared by Mackenzie, dated December 23, 2016, and submitted for the original Site Plan Review approval (City file no. SP16-10), trip generation for the Phase III commercial uses were based on Institute of Transportation Engineers (ITE) Land Use Code 820 trip generation rates for shopping centers. The additional 678 SF of ITE 820 shopping center area will increase ADT by approximately 30 trips per the *ITE Trip Generation Manual*, 10th Edition. This standard is therefore not applicable.

(5) An increase in the floor area or height proposed for non-residential use by more than ten (10) percent;

Response: The total floor area for Phase III, which only contains non-residential uses, was 47,000 SF per the previously approved Minor Modification to Approved Site Plan (City file no. MMSP 18-01); the net increase of 678 SF for Building C is approximately 1.4% of 47,000 SF. Per Sheet A1.2, Building C is proposed for a reduction in building height from the approved Final Site Plan for Phase III of Cedar Creek Plaza (City file no. MMSP 18-01). No portion of Building C exceeds approximately 24 feet in height. Building C is located more than 100 feet from the residential zones to the northwest and southwest (Exhibit C, Sheet C2.1A). This standard is therefore not applicable.

(6) A reduction of more than ten (10) percent of the area reserved for common open space; or

Response: There is no net decrease in outdoor patio area from the originally approved Final Site Plan for Phase III of Cedar Creek Plaza (City file no. SP 16-10). There was an approved Minor Modification to Approved Site Plan (City file no. MMSP 18-01) that proposed an increase in outdoor patio area of 1,042 SF. This proposal seeks to remove 260 SF from that approved Minor Modification. Removing the proposed outdoor patio

EXHIBIT D

Preliminary Drainage Report

Preliminary Drainage Report

Cedar Creek Lot 2

2322.14505.01

EXPIRATION DATE: 06/30/20

Prepared for

DD Sherwood One, LLC

901 NE Glisan Street, Suite 100

Portland, OR 97232

Prepared for	DD Sherwood One, LLC
Project Name	Cedar Creek Lot 2
Job Number	2322.14505.01
Date	October 23, 2018

DOWL
720 SW Washington Street, Suite 750
Portland, Oregon
97205

Telephone: 971-280-8657
Fax: 800-865-9847
mbondar@dowl.com

Name	Title	Date	Revision	Reviewer
Max Bondar	Civil Designer	10/23/18	1	Mike Towle

Executive Summary

The proposed commercial development is located near the corner of Edy Road and Pacific Highway 99W in the City of Sherwood, Oregon (See Figure 1-1, Vicinity Map) and is identified as Lot 2 of the Cedar Creek Plaza development. The development will include construction of two retail buildings, associated parking, utilities, sidewalk connections and landscaping. The project is approximately 1.7 acres and will be completed in one phase.

The proposed storm design will meet the requirements of both the City of Sherwood as listed in the *Engineering Design and Standard Detail Manual* dated January 2018 and Clean Water Services as listed in the *Design and Construction Standards for Sanitary Sewer and Surface Water Management* issued in April 2017. The proposed private and public conveyance system will be designed using the 25-year storm event in the final Drainage Report.

Onsite water quality treatment will occur through a proposed Bayfilter manhole. Detention will be provided onsite within a StormTech Chambers. The detention system was designed to limit the 2, 10 and 25-year storms to pre-developed conditions. This is less than the flow rate in existing conditions and results in a decrease in flow for all storm events.

Downstream analysis and improvements were addressed in the previous phases of the Cedar Creek Plaza development; therefore no downstream analysis is required.

Table of Contents

Tables

Figures

1 Project Overview

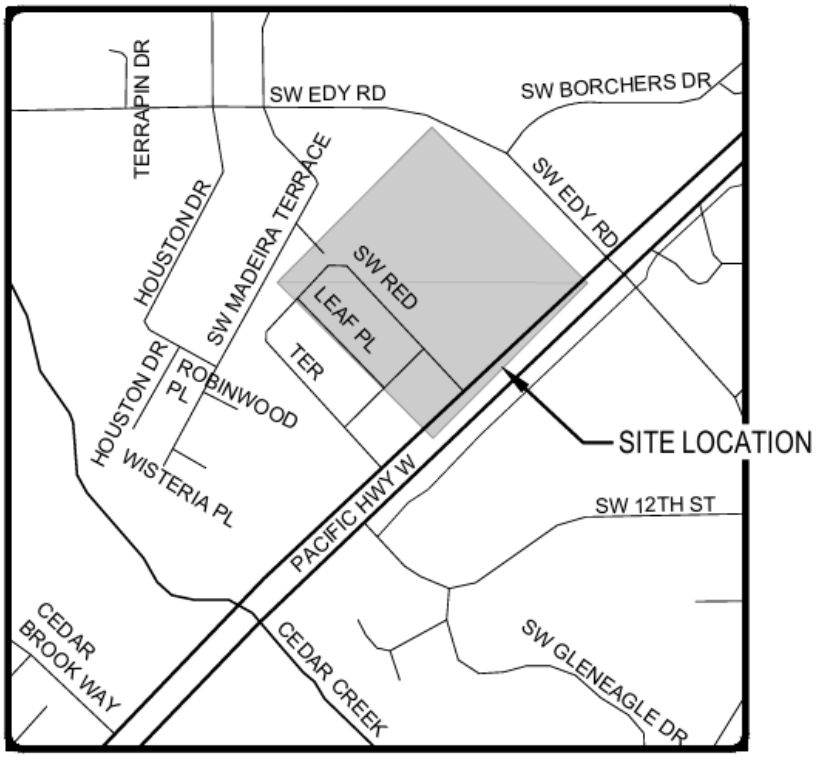
1.1 Project Overview

The proposed development will include construction of two retail buildings, associated parking, utilities, sidewalk connections and landscaping on “Lot 2” of the Cedar Creek Plaza development. All frontage improvements were installed in previous Cedar Creek Plaza development phases.

1.2 Location

The project is located at 16814 SW Edy Road, Sherwood, Oregon (See Figure 1-1, Vicinity Map).

Figure 1-1 Vicinity Map



1.3 Methodology

The proposed storm design will meet the requirements of both the City of Sherwood as listed in the *Engineering Design and Standard Detail Manual* dated January 2018 and Clean Water Services as listed in the *Design and Construction Standards for Sanitary Sewer and Surface Water Management* issued in April 2017.

2 Existing Conditions

2.1 Topography

Cedar Creek Plaza Lot 2 is undeveloped and contains several gravel stock piles. The lot is mostly flat at the north corner and general slopes southwest at the south corner, with gradual slopes between 1 and 3%.

The existing site is undeveloped and contains several gravel stock piles. The highest elevation of 201 is located in the north property corner. The lowest elevation of 195 is located in the southwestern property corner.

2.2 Climate

The site is in Sherwood, Oregon and is located approximately 50 miles inland from the Pacific Ocean. There is a gradual change in seasons with defined seasonal characteristics. Average daily temperatures range from 34°F to 80°F. Record temperatures recorded for this region of the state are 0°F and 106°F. Average annual rainfall recorded in this area is 41-inches. Average annual snowfall is approximately 1-inches.

2.3 Site Geology

The underlying soil types on the site, as classified by the United States Department of Agriculture Soil Survey of Washington County, Oregon are identified in Table 2-1 (See Technical Appendix: Hydrologic Soils Map - Washington County).

Table 2-1 Soil Characteristics

Soil Type	Hydrologic Group
Hillsboro loam	B

2.4 Curve Number

The curve number represents runoff potential from the soil. The major factors for determining the curve number values are hydrologic soil group, cover type, treatment, hydrologic condition and antecedent runoff condition. The pervious curve number of 79 representing Open Space in Poor Condition and an impervious curve number of 98 representing pavement and roofs was used at the site (See Technical Appendix: Table 2-2a – Technical Release 55-Urban Hydrology for Small Watersheds).

2.5 Time of Concentration

The time of concentration (T_C) as described in NEH-4 Chapter 15 is defined in two ways; the time for runoff to travel from the furthermost point of the watershed to the point in question, and the time from the end of excess rainfall to the point of inflection on the trailing limb of the unit hydrograph. Time of concentration can be estimated from several formulas. Clean Water Services guidelines which are based on the NRCS method were used in this analysis. The site is currently undeveloped and was assumed to have a T_C of 15 minutes.

2.6 Hydrology

Stormwater runoff is collected within a series of “Lynch-style” trapped stormwater catch basins and is then conveyed east to the public sewer system on Highway 99W. Lot 2 does not currently contain water quality, detention or infiltration facilities onsite.

2.7 Basin Area

Impervious and pervious surface areas for the existing conditions are shown in Table 2-2. The existing site is 11.0% impervious (See Technical Appendix: Figure 1 – Existing Basin Delineation).

Table 2-2 Existing Basin Areas

Existing Conditions Area Table	
Impervious Area (ac)	0.19
Pervious Area (ac)	1.53
Total Area (ac)	1.72

3 Proposed Conditions

3.1 Curve Number

The pervious curve number of 61 representing Open Space in Good Condition and an impervious curve number of 98 representing pavement and roofs was used at the site (See Technical Appendix: Table 2-2a – Technical Release 55-Urban Hydrology for Small Watersheds).

3.2 Time of Concentration

A time of concentration of 5 minutes was used for the delineated basins.

3.3 Hydrology

A proposed storm system will replace the existing storm system at the site. Onsite catch basins will flow to a Bayfilter treatment facility followed by underground detention chambers before releasing into the Highway 99W right-of-way.

3.4 Basin Area

Impervious and pervious surface areas for proposed conditions are shown in Table 3-1. The site is 84.9% impervious in proposed conditions. Direct runoff will be overdetained on-site (See Technical Appendix: Figure 2 – Proposed Basin Delineation).

Table 3-1 Proposed Basin Areas

Basin	Impervious Area (ac)	Pervious Area (ac)	Total Area (ac)
Site	1.274	0.218	1.492
Direct Runoff	0.186	0.042	0.228
Total	1.460	0.260	1.720

4 Hydrologic and Hydraulic Analysis

4.1 Design Guidelines

The analysis and design criteria used for stormwater management described in this section will follow the Clean Water Services *Design and Construction Standards for Sanitary Sewer and Surface Water Management* issued April 2017. Section 5.04.2 describes the allowable flow determination methods including the selected TR-55 NRCS method.

4.2 Hydrologic Method

Naturally occurring rainstorms dissipate over long periods of time. The most effective way of estimating storm rainfall is by using the hydrograph method. The NRCS Curve Number method is described in the *NRCS National Engineering Handbook* - Section 4. The NRCS runoff method equation is:

$$Q = \frac{(P - I_a)^2}{(P - I_a) + S}$$

Where:

Q = Runoff (cfs)
P = Rainfall (inches)
S = Potential maximum retention after runoff begins
I_a = Initial abstraction

During the development of a runoff hydrograph, the above equation is used to compute the incremental runoff depth for each time step from the incremental runoff depth given by the design storm hydrograph. XPSWMM 2018 was used for our hydrology and hydraulics analysis.

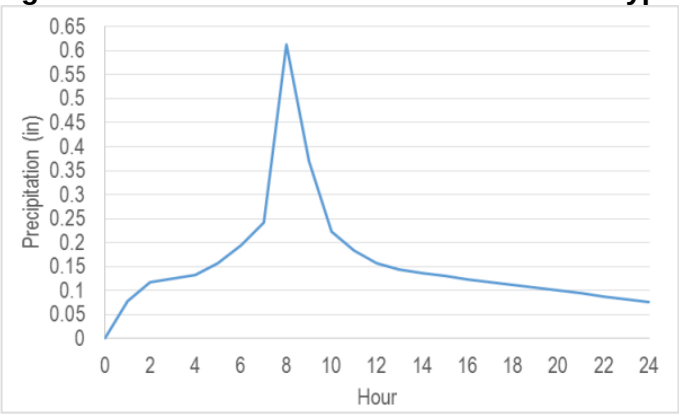
4.3 Design Storm

The rainfall distribution to be used within the Clean Water Services jurisdiction is the design storm of 24-hour duration based on the standard Type 1A rainfall distribution. Table 4-1 shows total precipitation depths for different storm events. The CWS Design Storm Distribution for a type 1A 24-hour rainfall distribution for a 25-year storm event is shown in Figure 4-1.

Table 4-1 Precipitation Depth

Recurrence Interval (years)	Total Precipitation Depth (in)
2	2.500
10	3.450
25	3.900
100	4.500

Figure 4-1 25-Year Clean Water Services Type 1A Rainfall Ditribution



4.4 Basin Runoff

Table 4-2 lists the runoff rates for existing and proposed conditions for the site during the 2, 10, and 25-year storm events. These values do not include onsite detention or runoff in the public ROW. (See Technical Appendix: XPSWMM Results).

Table 4-2 Runoff Rates

Proposed Flows Area Table			
Basin	2-year flow (cfs)	10-year flow (cfs)	25-year flow (cfs)
Existing	0.2521	0.482	0.600
Direct	0.0790	0.114	0.131
Allowable	0.1731	0.3680	0.4690
Proposed	0.1660	0.365	0.434

5 Conveyance Analysis

5.1 Design Guidelines

The analysis and design criteria described in this section will follow the Clean Water Service's *Design and Construction Standards for Sanitary Sewer and Surface Water Management*. The manual requires storm drainage system and facilities be designed to convey the 25-year storm event without surcharge.

5.2 System Capacity

Site storm lines are design to convey flow up to and including the 25-year storm events. The portion of the 100-year storm event that is greater than the 25-year storm event will utilize overflow outlets or escape routes to the public storm system. Conveyance calculations will be included with the site development and building permit applications.

5.3 System Performance

Maximum flow in a storm drainage pipe occurs at approximately 0.94do (Depth of flow section (do) – depth of flow normal to the direction of flow). At 94do the section factor of uniform flow has a maximum value which results in optimum flow for a section without surcharge conditions.

The conveyance capacity analysis found that the proposed conveyance systems can adequately convey the 10 and 25-year storm events. A minimum of one foot of freeboard is maintained within the system (see Technical Appendix: xpswmm Schematic Layout, Runoff and Conveyance Tables).

6 Water Quality

6.1 Design Guidelines

The proposed water quality facility was designed per Clean Water Services standards. The proposed facilities were designed using a rainfall depth of 0.36" over a 4-hour period with a return period of 96-hours as outlined in section 4.05.06 of *the Design and Construction Standards for Sanitary Sewer and Surface Water Management*.

6.2 Water Quality Facility

Per Section 4.05.5 of the Clean Water Services design manual, all created impervious area will be treated. Per Section 4.05.6 of the Clean Water Services design manual, the water quality volume and flow rate are calculated according to the equations below:

$$\text{Water Quality Volume (cf)} = \frac{0.36\text{ (in)} \times \text{Area (sf)}}{12\text{ (in/ft)}} \qquad \text{Water Quality Flow} = \frac{\text{WQV (cf)}}{14{,}400}$$

Onsite

The entire site is being developed as part of this project, therefore treatment will be provided for all impervious area on the site. The proposed site includes onsite landscaping that will help intercept stormwater runoff, slowing down and temporarily storing runoff and reducing the amount of pollutants leaving the site.

ADS Bayfilter is the selected water quality facility for the onsite project area. Each Bayfilter system will have the standard cartridge size (BayFilter 530) with a 30-inch drop and have a treatment capacity of 0.067 cfs.

- Site Impervious Area = 63,598 sq.-ft
- Water Quality Flow = 0.13 cfs
- # of Cartridges = 2 Cartridge(s) (0.13 cfs)

Offsite Improvements

No offsite improvements are required for this development.

7 Water Quantity

7.1 Design Guidelines

The water quantity facility was designed in accordance with Section 4.03.4 of the Clean Water Services as listed in the *Design and Construction Standards for Sanitary Sewer and Surface Water Management* issued in April 2017. The detention requirements per CWS require the post-developed runoff rates from the site do not exceed the pre-developed runoff rates based on the 2 through 25-year, 24-hour storm event. Storms to be evaluated shall include the 2, 10, and 25-year events. The maximum allowable release rate is 0.600 cfs per acre during the 25-year storm event. Due to direct discharge of 0.131 cfs, the maximum allowable cfs per acre during the 25-year storm is 0.469 cfs.

7.2 Water Quantity Facility

Table 7-1 lists the existing, direct and the design released flow rates generated at the site. In all cases, the design release rates are less than the allowable release rates calculated for this site.

Table 7-1 Existing, Direct, Allowable and Proposed Release Rates

Basin	2-year flow (cfs)	10-year flow (cfs)	25-year flow (cfs)
Existing	0.2521	0.482	0.600
Direct	0.0790	0.114	0.131
Allowable	0.1731	0.3680	0.4690
Proposed	0.1660	0.365	0.434

The proposed control structure is a 60-inch manhole with a standpipe. The bottom orifice was designed to control the 2 year storm, side orifice for the 10-year storm and top weir for the 25-year release rate (See Technical Appendix: Single Stormwater Detention Facility Data Sheet).

Table 7-2 Control Structure

	Orifice Size (in)	Orifice Area	Elevation
Bottom orifice	1.375	0.01031	188.50
Side orifice	2.125	0.0246	192.05
Overflow Weir	3.14		193.75

StormTech chambers will be used as the onsite underground detention system. The MC-4500 chamber system was designed as a 60-inch arched pipe with 9, 12, and 9-inches of gravel to the side, top, and bottom of the facility, respectively. The system is 80 lineal feet and includes 20 chambers. This provides approximately 6,650 cu-ft of storage. This volume was calculated using the minimum installed storage provided by ADS and assuming a 40% porosity of the stone used in the detention facility. Below is a summary of the storage calculation (foundation stone was excluded from the storage volume, as it is below the outlet of the flow control manhole):

Min. Storage per Chamber =	162.6 cu-ft	Footprint of Facility =	1,795 sq-ft
Min. Storage per End Cap =	108.6 cu-ft	Foundation Rock Depth =	10 ft

Detention Storage = **6,650 cu-ft**

8 Downstream Analysis

8.1 Design Guidelines

The previous phases of the Cedar Creek development assumed 85% impervious surface on Lot 2 for their downstream analysis design. Since the proposed Lot 2 development does not increase the amount of impervious area at the site (84.9%) downstream analysis is not required.

9 Summary

The proposed storm design will meet the requirements of both the City of Sherwood as listed in the *Engineering Design and Standard Detail Manual* dated January 2018 and Clean Water Services as listed in the *Design and Construction Standards for Sanitary Sewer and Surface Water Management* issued in April 2017.

The proposed treatment system includes a Bayfilter Manhole and detention will be provided within a StormTech Chamber system. The proposed storm conveyance system will be designed using the 25-year storm event.

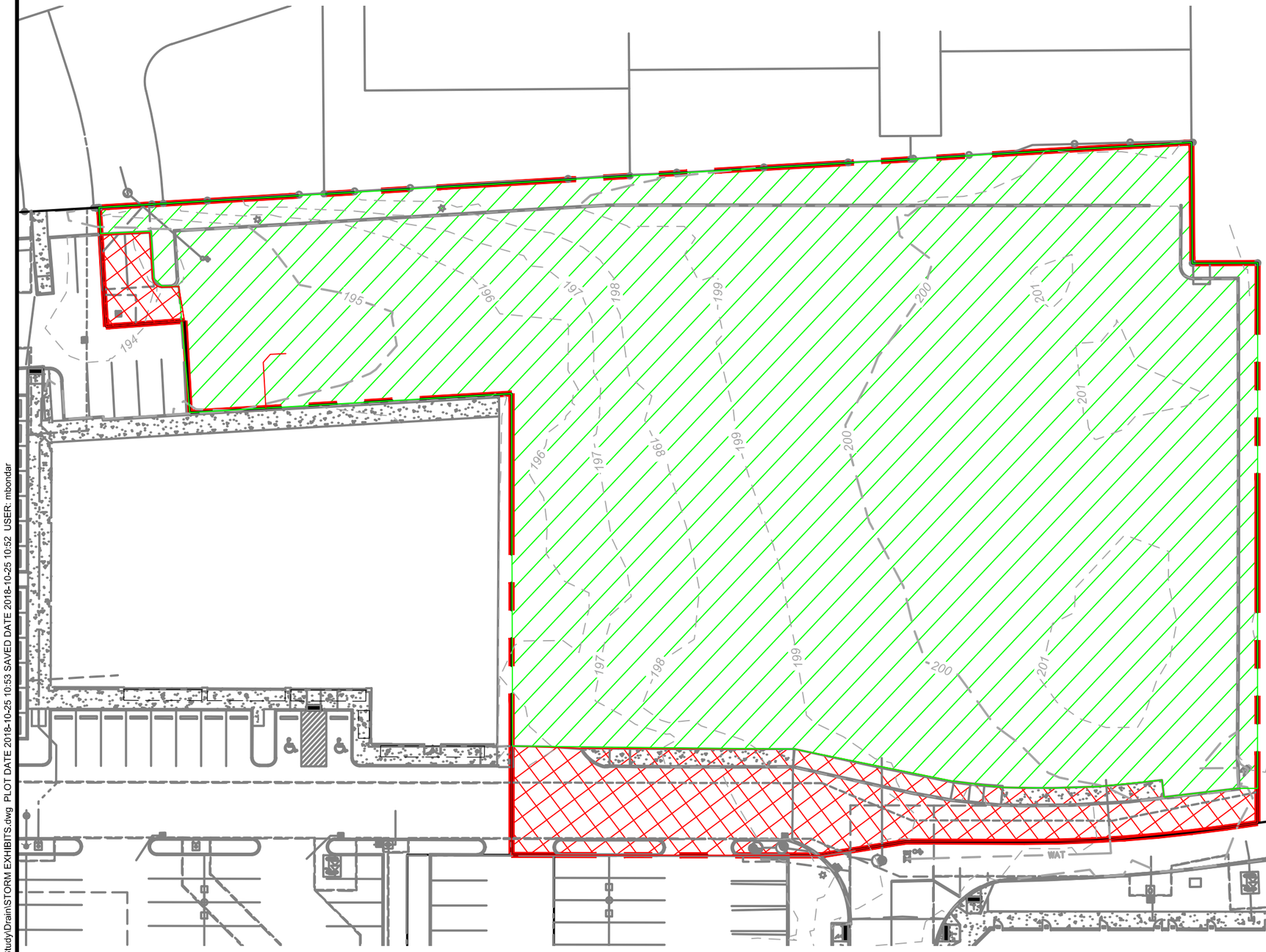
Technical Appendix

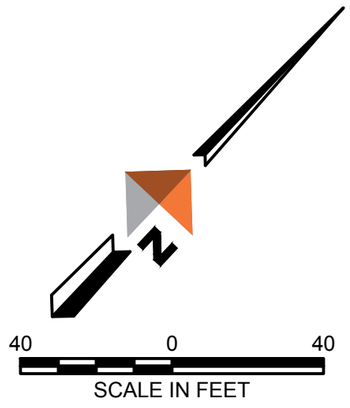
Technical Appendix

- Figure 1 – Existing Basin Delineation
- Figure 2 – Proposed Basin Delineation

- Hydrologic Soil Map – Washington County
- Table 2-2a – Runoff Curve Numbers for Urban Areas
- Xpswmm Results
    - Hydrographs

Existing Conditions Area Table	
Impervious Area (ac)	0.19
Pervious Area (ac)	1.53
Total Area (ac)	1.72





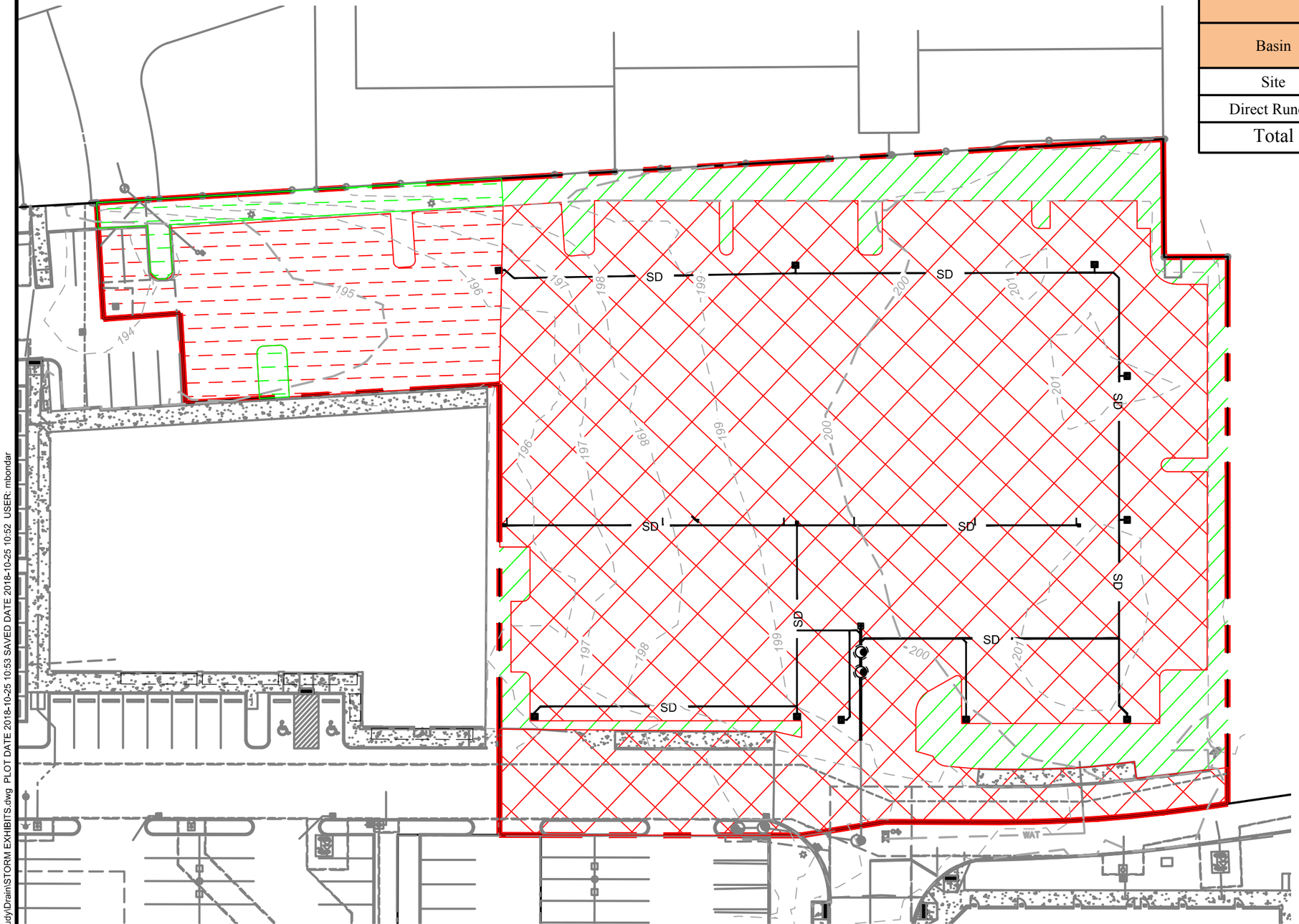
DOWL
WWW.DOWL.COM

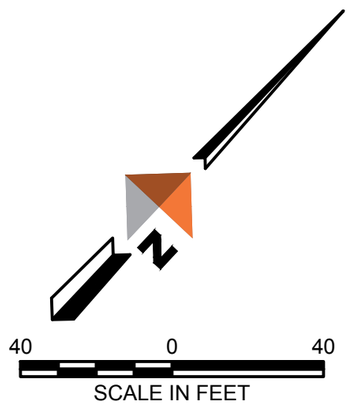
CEDAR CREEK LOT 2
EXISTING BASIN DELINEATION
SHERWOOD, OREGON

PROJECT	14505.01
DATE	10/25/2018

FIGURE #1

Proposed Conditions Area Table			
Basin	Impervious Area (ac)	Pervious Area (ac)	Total Area (ac)
Site	1.274	0.218	1.492
Direct Runoff	0.186	0.042	0.228
Total	1.460	0.260	1.720





DOWL
WWW.DOWL.COM

CEDAR CREEK LOT 2
PROPOSED BASIN DELINEATION
SHERWOOD, OREGON

PROJECT	14505.01
DATE	10/25/2018

FIGURE #2

\\BIL-FS\BIL-projects\22\14505-01\40Study\Drain\STORM EXHIBITS.dwg PLOT DATE 2018-10-25 10:53 SAVED DATE 2018-10-25 10:52 USER: mbondar

Custom Soil Resource Report
Soil Map

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: Washington County, Oregon
Survey Area Data: Version 16, Sep 18, 2018

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

Date(s) aerial images were photographed: Aug 19, 2015—Sep 13, 2016

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
21A	Hillsboro loam, 0 to 3 percent slopes	48.8	67.4%
21B	Hillsboro loam, 3 to 7 percent slopes	6.5	8.9%
21C	Hillsboro loam, 7 to 12 percent slopes	3.6	4.9%
21D	Hillsboro loam, 12 to 20 percent slopes	1.7	2.4%
30	McBee silty clay loam	1.1	1.5%
37B	Quatama loam, 3 to 7 percent slopes	1.5	2.0%
37D	Quatama loam, 12 to 20 percent slopes	0.8	1.1%
43	Wapato silty clay loam	5.7	7.9%
46F	Xerochrepts and Haploxerolls, very steep	2.0	2.7%
2225A	Huberly silt loam, 0 to 3 percent slopes	0.8	1.1%
Totals for Area of Interest		**72.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They

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

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

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

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

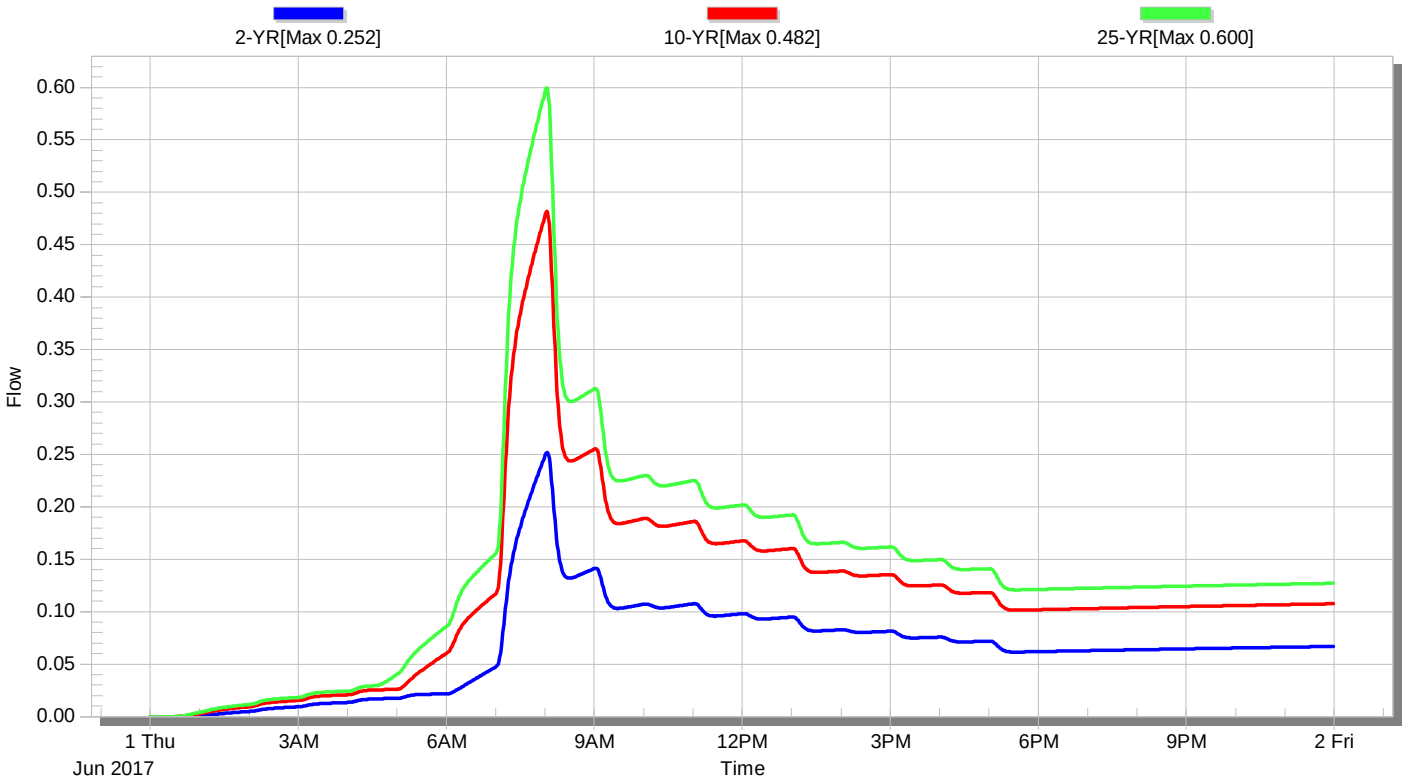
[3] CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

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

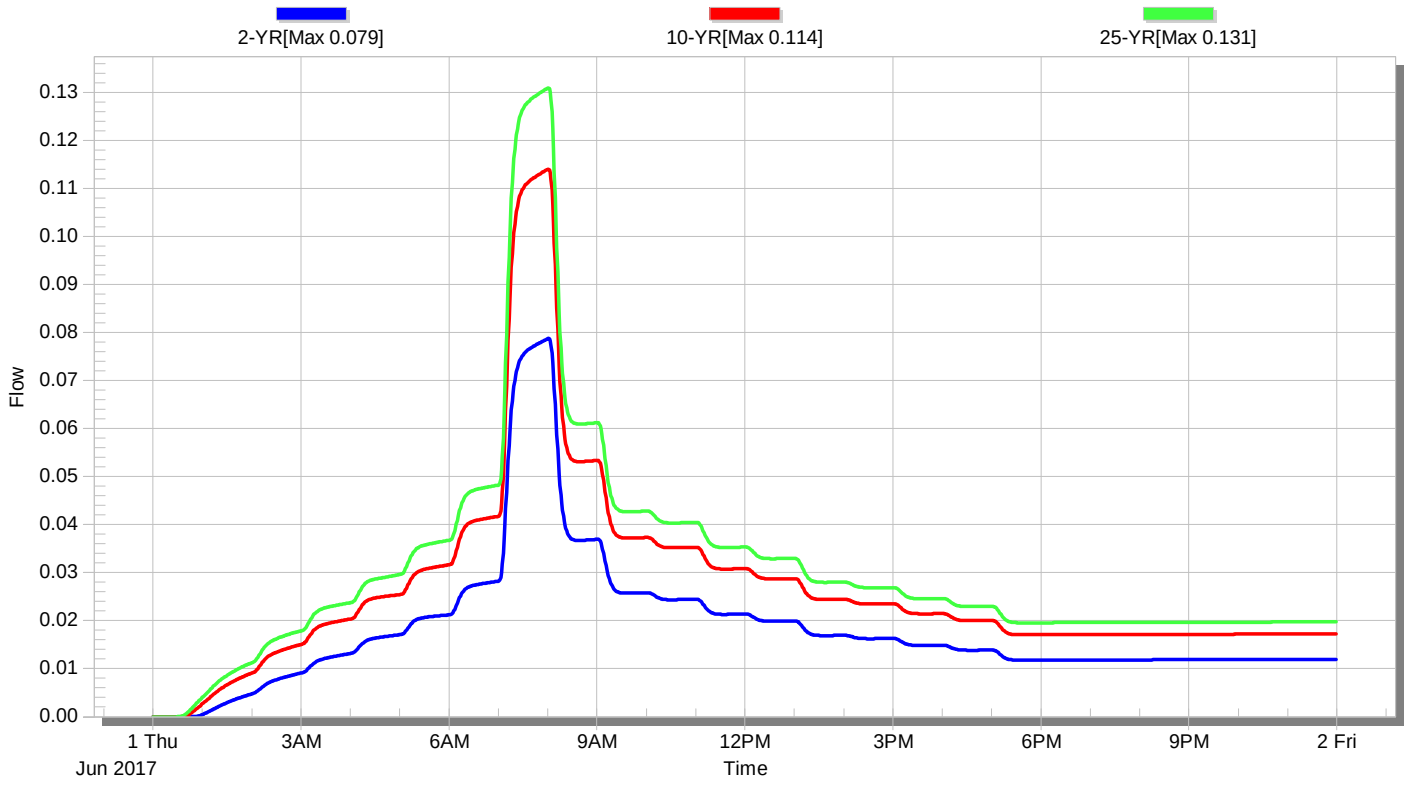
[5] Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Cedar Creek Lot 2 — Hydrographs

Pre-Developed

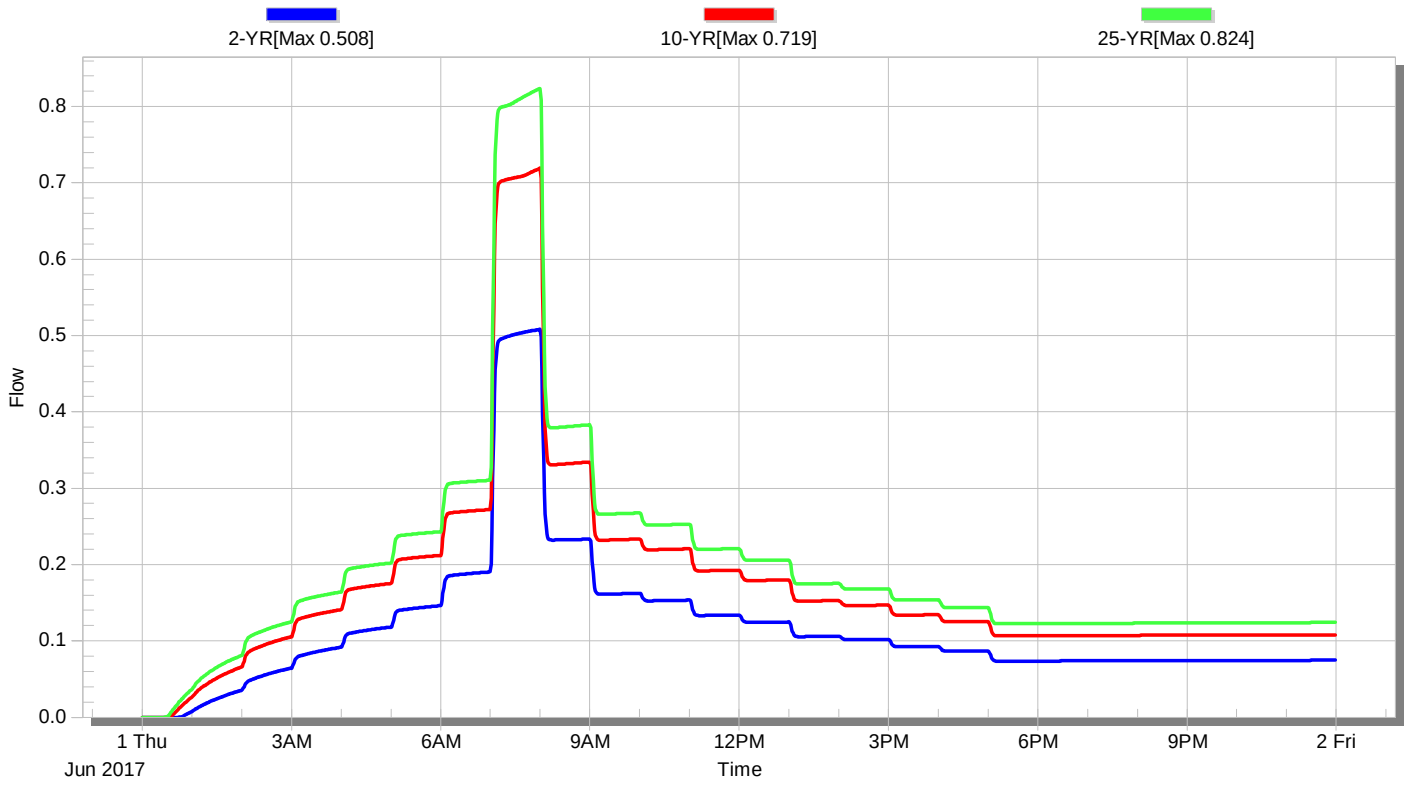


Proposed -Direct Runoff

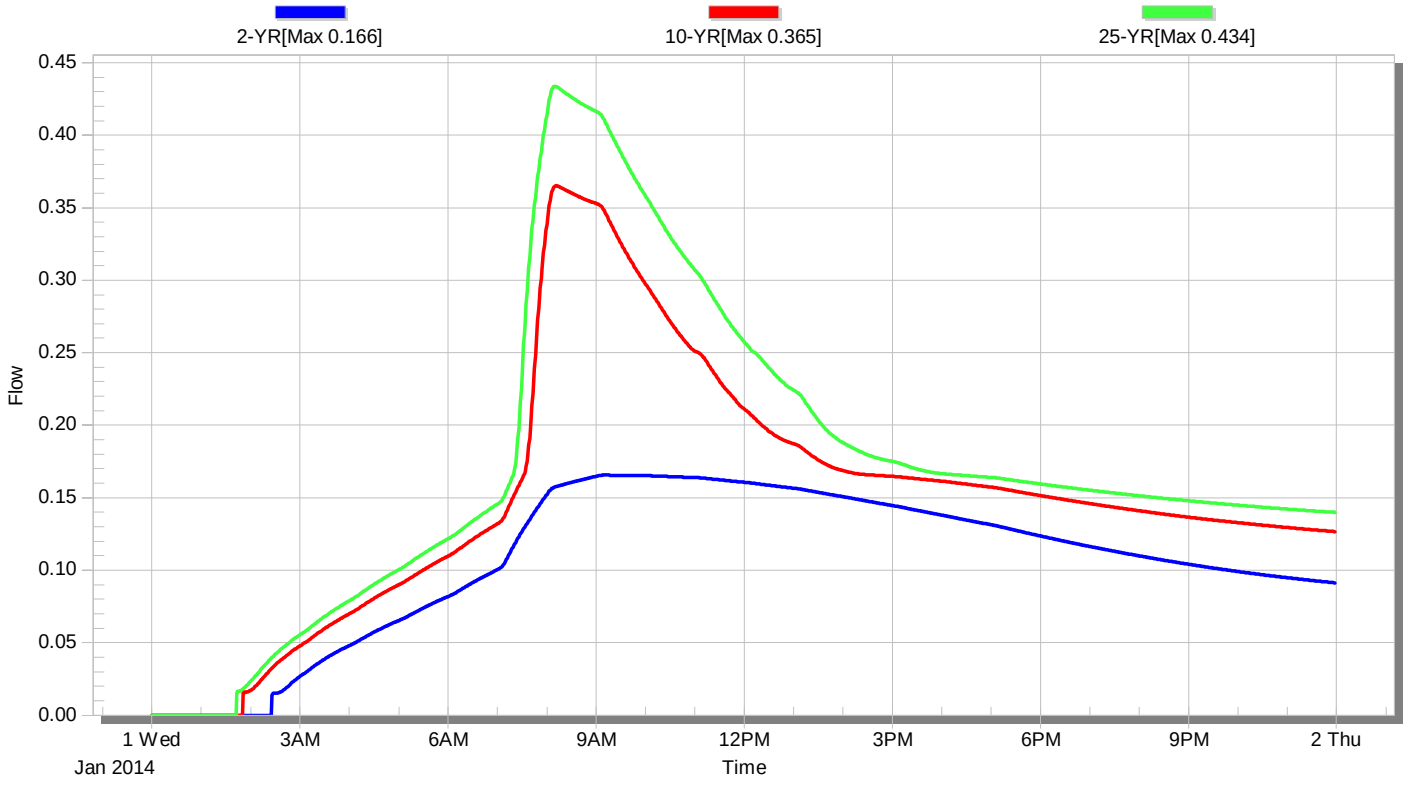


Cedar Creek Lot 2 — Hydrographs

Proposed - to Storage



Flow Control Flow Out



Cedar Creek Lot 2 — Hydrographs

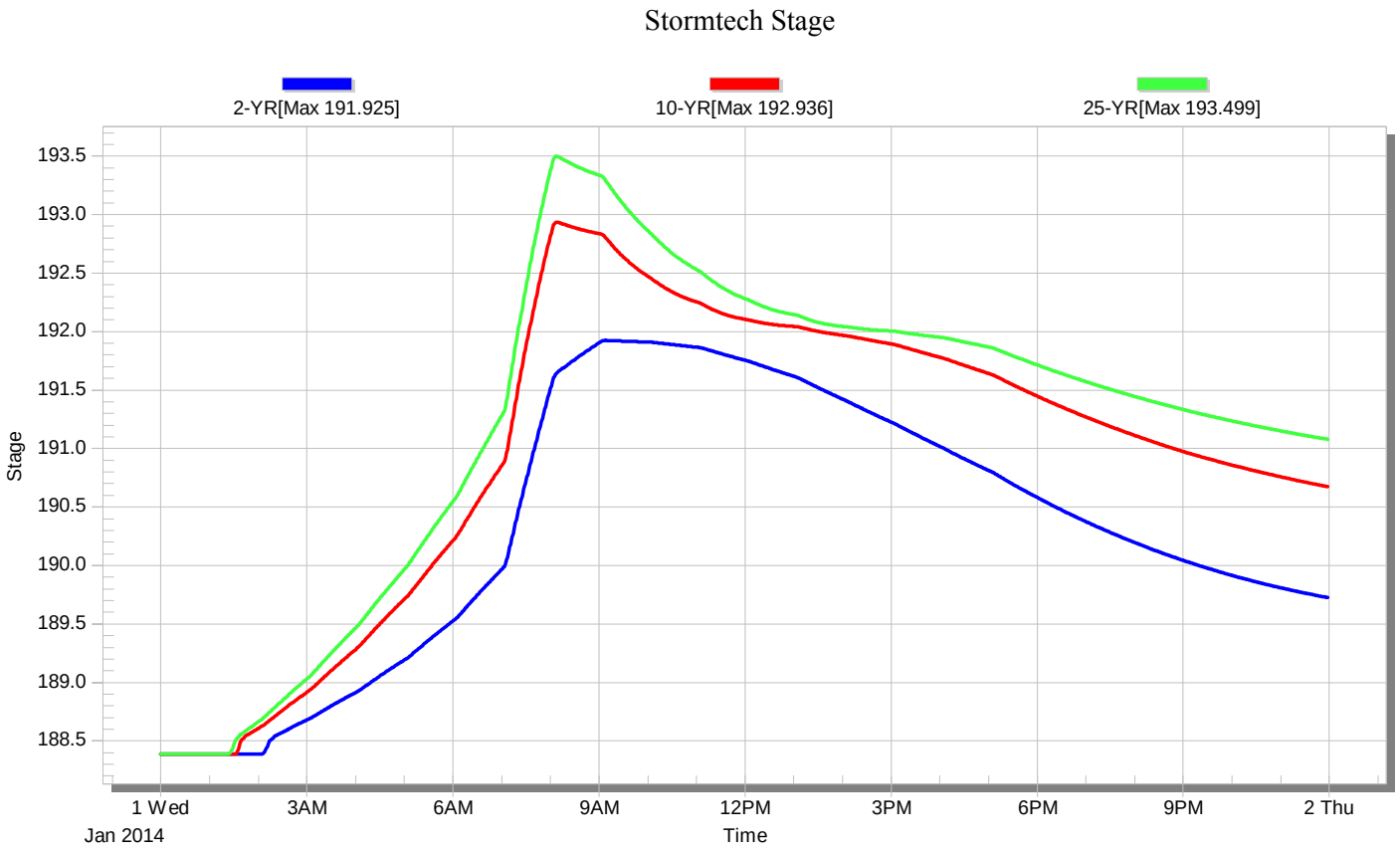
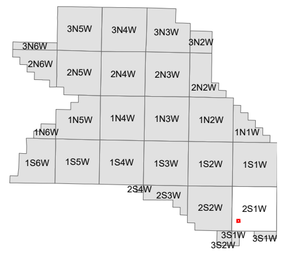


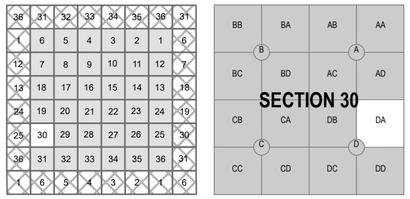
EXHIBIT E

Vicinity Map & Tax Map

2S130DA

WASHINGTON COUNTY OREGON
NE 1/4 SE 1/4 SECTION 30 T2S R1W
SCALE 1"= 100'





FOR ADDITIONAL MAPS VISIT OUR WEBSITE AT
www.co.washington.or.us

Cancelled Taxlots For: 2S130DA
900

Feet
0 50 100 200 300

Assessment CARTOGRAPHY Taxation

PLOT DATE: 4/8/2022
Rotation: 0

FOR ASSESSMENT PURPOSES ONLY - DO NOT RELY ON FOR OTHER USE

Map areas delineated by either gray shading or a cross-hatched pattern are for reference only and may not indicate the most current property boundaries. Please consult the appropriate map for the most current information.

Digmap

SHERWOOD
2S130DA

Location Map

Cedar Creek Lot 2
Sherwood, OR

DOWL

Date: November 2022

Figure 1

J:\22\14505-02\60GIS\Carto\Planning\14505 - Planning.aprx Nov 03, 2022 3:35 PM User: ssterling

EXHIBIT F

Geotechnical Report

GeoDesign Inc

REPORT OF GEOTECHNICAL ENGINEERING SERVICES

Deacon Sherwood Development
Sherwood, Oregon

For
Deacon Development Group
October 24, 2016

GeoDesign Project: DDG-8-01

GeoDesign Inc

October 24, 2016

Deacon Development Group
901 NE Glisan Street #100
Portland, OR 97232

Attention: Ryan Schera

Report of Geotechnical Engineering Services
Deacon Sherwood Development
Sherwood, Oregon
GeoDesign Project: DDG-8-01

GeoDesign, Inc. is pleased to submit this report of geotechnical engineering services for the proposed Deacon Sherwood Development project. Our services were conducted in accordance with our revised proposal dated March 18, 2016 and our change order dated October 24, 2016.

We appreciate the opportunity to be of continued service to you. Please contact us if you have questions regarding this report.

Sincerely,

GeoDesign, Inc.

George Saunders, P.E., G.E.
Principal Engineer

cc: Kali Bader, Rembold (via email only)

NAK:GPS:kt
Attachments
One copy submitted (via email only)
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EXECUTIVE SUMMARY

This section provides a summary of the main geotechnical considerations associated with the proposed Deacon Sherwood Development project in Sherwood, Oregon. Our conclusions are based on the proposed site development information provided by the design team. The main report should be referenced for a detailed description of the subsurface conditions and for a full understanding of our geotechnical recommendations.

- Grading plans were not available at the time of this report; however, site grades are relatively level and we anticipate minimal fills (likely less than 3 feet). Thick fills can induce settlement and GeoDesign should be retained to review the final grading plans once developed.
- The proposed buildings can be supported on conventional shallow foundations underlain by granular footing pads as provided in the report.
- The site soil is susceptible to liquefaction-induced ground settlement. Our liquefaction analysis indicates an average settlement of approximately 2 inches and differential settlement of approximately 1 inch. A detailed discussion is provided in the report.
- Undocumented fill associated with current and prior site developments was encountered in our explorations to depths of 1.5 to 3 feet BGS. We anticipate thicker fills may be present at the site, likely in the former mobile home park and prior building areas. The composition of the undocumented fill is variable and includes silt and clay with variable gravel. Documentation of pre-existing fill installation and compaction was not available for our review. The geotechnical considerations include the following:
  - To prevent excessive differential settlement, foundations should not bear on the undocumented fill. We recommend this material be removed from below the footings and the footings be underlain by granular pads underlain by native undisturbed soil as provided in the report.
  - The estimated floor slab distributed live load is 150 psf. There is some risk of differential settlement of the floor slab and pavement between cut and fill areas and associated maintenance given the variable conditions (thickness and composition) of the undocumented fill. Additional discussions and our recommendations are provided in the report.
- The moisture content of the site soil generally varied between 12 and 39 percent at the time of our explorations. Moisture conditioning will be required to use the material as structural fill.
- Due to the history of the site, the existing fill material may contain organic debris and other deleterious material. All such deleterious material must be removed prior to being used as structural fill.
- An agricultural topsoil zone will be encountered in the open field and vegetated areas (likely in the upper 12 to 18 inches) from past agricultural activities. In general, the topsoil zone is soft and unconsolidated, contains a high organic content, and will provide poor support for fill, foundations, floor slabs, and pavements. We recommend that the topsoil zone (where present) be removed or improved as recommended in the "Site Preparation" section of this report.
- The near-surface soil is sensitive to disturbance when at a moisture content that is above optimum. As discussed in the report, the subgrade should be protected from disturbance and damage by construction traffic.

- Groundwater was encountered as shallow as approximately 22.1 feet BGS at the time of our explorations. We anticipate perched groundwater will likely be present at shallower depths. The depth to groundwater could impact utility and footing excavations, which will likely require active dewatering during construction.
- Infiltration rates were measured at between 0.2 and 4.0 inch per hour at depths between 4.5 and 7.5 feet BGS. Negligible infiltration rates were measured in the infiltration tests completed at depths of more than 7.5 feet BGS. Discussions on the use of infiltration systems for the discharge of stormwater are provided in the report.

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1.0 INTRODUCTION

GeoDesign, Inc. has prepared this geotechnical engineering report for use in design and construction of the proposed Deacon Sherwood Development project in Sherwood, Oregon. The proposed site is located southwest of the intersection between SW Edy Road and Highway 99. Figure 1 shows the site relative to existing topographic and physical features. Existing conditions surrounding the site, proposed site layout, and approximate exploration locations are shown on Figure 2. Acronyms and abbreviations used herein are defined at the end of this document.

2.0 PROJECT UNDERSTANDING

Based on a preliminary site plan provided by Ryan Schera of Deacon Development Group, we understand development will include eight buildings: a four-story, 130,000-square-foot senior house building (with an approximate footprint of 32,500 square feet); a four-story hotel building (with an approximate footprint of 14,000 square feet); a one-story, 15,000-square-foot fitness building; and five (urgent care, bank, restaurant, drive thru, and retail), one-story buildings with footprints between approximately 3,400 and 8,000 square feet. Structural loads were not available at the time of this report. Based on our experience with similar structures, we anticipate that maximum column, wall, and floor loads for the one-story structures will be on the order of 120 kips, 3 kips per lineal foot, and 150 psf, respectively. For the four-story structures, we anticipate that maximum column, wall, and floor loads will be on the order of 450 kips, 6 kips per lineal foot, and 150 psf, respectively. Other improvements include pavement, utilities, and stormwater infiltration systems.

Off-site improvements will be required for the development. Additional field work and analysis will be required once the scope of these improvements is established. Accordingly, our recommendations for off-site improvements will be provided under separate cover.

Grading plans were not available at the time of this report. However, site grades are relatively level, and we anticipate minimal fills (likely less than 3 feet).

The site is currently occupied by open field, residential structures, paved parking lots, and a former mobile home park. The site has been exposed to several years of cultivation and past grading activities.

3.0 SCOPE OF SERVICES

The purpose of our geotechnical engineering services was to characterize site subsurface conditions and provide geotechnical engineering recommendations for use in design and construction of the proposed development. Our scope of work included the following:

- Reviewed readily available geotechnical and geological information and well log records for the site area.
- Coordinated and managed the field investigation, private and public utility locates, and scheduling of subcontractors and GeoDesign field staff.

- Conducted the following subsurface explorations at the site:
  - Three borings to depths of approximately 51.5 to 71.5 feet BGS
  - Six CPTs to depths of approximately 50.5to 71 feet BGS
  - Six hand-augered borings to a depth of approximately 5 feet BGS
- Completed nine infiltration tests in seven explorations at depths ranging between approximately 4.5 and 17.5 feet BGS.
- Obtained disturbed and undisturbed soil samples for laboratory testing at select depths from the explorations.
- Classified the materials encountered in the explorations. Maintained a detailed log of each exploration. Observed groundwater conditions in the explorations. Electronic logs of the CPT probes were provided by the CPT subcontractor.
- Completed the following laboratory tests:
  - Thirty-seven moisture content determinations in general accordance with ASTM D 2216
  - Two dry density determinations in general accordance with ASTM D 2937
  - Twelve particle-size analyses in general accordance with ASTM C 117 and ASTM D 1140
  - Two Atterberg limits tests in general accordance with ASTM D 4318
  - Two consolidation tests in general accordance with ASTM D 2435
- Provided recommendations for site preparation, grading and drainage, stripping depths, fill type for imported material, compaction criteria, trench excavation and backfill, use of on-site soil, and wet/dry weather earthwork.
- Evaluated the infiltration test results and provided an estimate of the infiltration rate appropriate for use in design.
- Provided recommendations for design and construction of shallow spread foundations, including allowable design bearing pressure and minimum footing depth and width.
- Provided recommendations for preparation of floor slab subgrade.
- Recommended design criteria for retaining walls, including lateral earth pressures, backfill, compaction, and drainage.
- Provided recommendations for permanent and temporary slopes.
- Provided recommendations for the management of identified groundwater conditions that may affect the performance of structures or pavements.
- Provided recommendations for construction of AC pavements for on-site access roads and parking areas, including subbase, base course, and AC paving thickness for light and heavy vehicle traffic.
- Provided recommendations for subsurface drainage of foundations and roadways, as necessary.
- Provided recommendations for the 2012 IBC seismic coefficients and evaluated the risk of liquefaction and lateral spread at the site.
- Provided this report summarizing the results of our geotechnical evaluation.

4.0 GEOLOGIC SETTING

The site is located on the southeast margin of the Tualatin basin physiographic province. The Tualatin basin is a northwest- to southeast-trending structural basin bound by the Portland Hills and Tualatin Mountains to the north and east and the Chehalem Mountains and Coast Range to the south and west (Wilson, 1998).

The geologic profile in the site vicinity is mapped as catastrophic flood deposits, specifically the fine-grained facies, and is associated with the Missoula Floods that occurred during the late Pleistocene Age (15,500 to 13,000 years before present). The unit consists of poorly consolidated sand to silt deposited as backwater flood sediments. Near the site vicinity, the deposits are reported to be approximately 30 feet thick (Madin, 1990). The flood deposits are underlain by the Pliocene Age (5 million to 2 million years before present) Sandy River Mudstone equivalent, which represents the majority of the basin fill deposits (Madin, 1990; Schlicker and Deacon 1967). The unit is described as moderately to poorly cemented siltstone, sandstone, mudstone, and claystone. Near the site vicinity, these materials are approximately 400 feet thick (Madin, 1990).

Underlying the Sandy River Mudstone is the Miocene Age (20 million to 10 million years before present) Columbia River Basalt Group that is a series of basalt flows that originated from southeastern Washington and northeastern Oregon. The Columbia River Basalt Group is considered the geologic basement unit for this report (Madin, 1990).

5.0 SITE CONDITIONS

5.1 SURFACE CONDITIONS

The site is relatively level with existing grades varying from approximately 188 and 204 feet. The site is currently occupied by open field, residential structures, paved parking lots, and s former mobile home park. The existing AC driveways at the former mobile home park are becoming overgrown with grass and weeds. The site is vegetated with mature trees, shrubs and blackberries, and grassy areas (including the former mobile home park and the open field). During our site reconnaissance, we observed abundant abandoned meter posts likely associated with underground utilities at the former mobile home park. Also, we observed an approximately 3- to 4-foot-tall mortar retaining wall that separates some of the old trailer lots on the western portion of the site. Two existing residential structures are present at the eastern site margin (southwest of the existing Providence medical building).

Based on a review of historical aerial photographs dated back to 1994, the site has been exposed to several years of cultivation and past grading activities. Also, multiple demolished structures previously occupied the eastern and southern site margins. Minor debris associated with prior developments was observed directly west of the site entrance from Highway 99.

5.2 SUBSURFACE CONDITIONS

5.2.1 General

Our field investigation consisted of drilling three borings (B-1 through B-3) to depths of approximately 51.5 to 71.5 feet BGS, advancing six hand-augered borings (I-1 through I-6) to a depth of approximately 5 feet BGS, and advancing six CPTs (CPT-1 through CPT-6) to depths of approximately 50.5 to 71 feet BGS. The approximate exploration locations are shown on Figure 2. Descriptions of our field explorations and laboratory testing and logs of the borings are presented in Appendix A. The results of the CPTs are presented in Appendix B.

Our explorations generally encountered pavement and aggregate base, undocumented fill, or topsoil/root mass underlain by silt and clay, silty sand to sandy silt, and sand to the maximum depth explored. The following sections summarize the subsurface units encountered.

5.2.2 Pavement Section

Probes CPT-2 and CPT-3 (existing parking lot) encountered approximately 3 inches of AC underlain by approximately 6 inches of aggregate base rock.

5.2.3 Topsoil

Borings B-1, B-2, and I-1 through I-6 (vegetated areas/undeveloped field) encountered a 3- to 4-inch-thick topsoil layer. A 3- to 4-inch-thick root zone was encountered in the topsoil and fill layers.

5.2.4 Undocumented Fill

Undocumented fill associated with prior grading activities was encountered in probes CPT-1 through CPT-4 and borings I-3 and I-4 to depths of approximately 1.5 to 3 feet BGS. The fill material is comprised of stiff to very stiff silt and clay with variable gravel.

5.2.5 Native Soil

The native soils at the site consist of variable layers of silt, clay, silty sand to sandy silt, and sand. The silt or clay layers were encountered in all explorations. The silt and clay is generally medium stiff to stiff with variable amounts of fine sand. In general, the clay layers have medium to high plasticity and silt layers have low plasticity.

All explorations encountered layers of loose to medium dense, silty sand to sandy silt and sand that includes interbedded layers of silt. In general, the sandy soil is loose to medium dense in the upper 30 to 50 feet and medium dense at greater depths to the maximum explored depth of approximately 71.5 feet.

At the time of our explorations the moisture content of the native soil generally varied between 12 and 39 percent. Fines content analyses of 12 native soil samples indicated fines content between 16 and 78 percent. In general, the silty sand/sandy silt layers are non-plastic to low plasticity.

5.2.6 Groundwater

Boring B-1 was drilled using hollow-stem auger drilling methods to a depth of 30 feet BGS. Borings B-2 and B-3 were completed using mud rotary drilling methods, and the presence of drilling fluid did not allow direct measurements of groundwater levels. Groundwater measurement in boring B-1 and pore water pressure dissipation tests completed in probes CPT-2, CPT-3, CPT-5, and CPT-6 indicate groundwater was present at depths between approximately 22.1 and 32.3 feet BGS at the time of our explorations. Moist to wet soil conditions were observed at depths between 28 and 28.5 feet BGS. Based on our prior work and review of well logs for the site vicinity, groundwater can be expected at depths between 20 and 25 feet BGS. We anticipate perched groundwater will likely be present at shallower depths

5.3 INFILTRATION TESTING

We understand that the proposed development includes stormwater infiltration systems. Nine infiltration tests were conducted in borings B-1 and I-1 through I-6 at depths ranging between approximately 4.5 and 17.5 feet BGS. The underlying soil was saturated by allowing the water to infiltrate into the subsurface. The infiltration rate was measured under low-hydrostatic head conditions after saturated conditions had been achieved. The infiltration testing locations and depths were based on correspondence with the project team. The infiltration rates are low in the upper 5 to 8 feet and negligible at tested depths below 12.5 feet BGS. The detailed discussion of the infiltration results and recommendations is presented in the "Infiltration Systems" section of this report. The infiltration testing procedures are described in Appendix A

5.4 SEISMIC HAZARDS

5.4.1 Liquefaction

Liquefaction is a phenomenon caused by a rapid increase in pore water pressure that reduces the effective stress between soil particles to near zero. The excessive buildup of pore water pressure results in the sudden loss of shear strength in a soil. Granular soil, which relies on interparticle friction for strength, is susceptible to liquefaction until the excess pore pressures can dissipate. Sand boils and flows observed at the ground surface after an earthquake are the result of excess pore pressures dissipating upwards, carrying soil particles with the draining water. In general, loose, saturated sand soil with low silt and clay content is the most susceptible to liquefaction. Low plasticity, silty sand and silt may be moderately susceptible to liquefaction under relatively higher levels of ground shaking. Liquefaction can cause seismically induced densification of subsurface soil, which can result in settlement at the ground surface. If the ground surface is sloped, or if there is an open face such as a ravine, the liquefied soil can also move horizontally in a process that is called lateral spreading.

We performed a liquefaction analysis for the site using the data collected from the field explorations and our laboratory testing program. We considered both subduction zone and crustal earthquake scenarios. For our analysis, we modeled a subduction zone earthquake as a magnitude 9.0 event with a PGA of 0.2 g. We modeled a crustal earthquake as a magnitude 7.0 event with a PGA of 0.41 g. We assumed groundwater was present at a depth of 25 feet BGS. In accordance with published literature, we assumed that fine-grained soil with a plasticity index of greater than 7 to 18 does not liquefy (Bray and Sancio, 2006; Boulanger and Idriss, 2006). We performed liquefaction calculations using CPT data from the site. We evaluated the liquefaction potential using the method proposed by Boulanger and Idriss (2014).

Our analysis indicates the silty sand and sand layers present below groundwater at depths between approximately 25 and 65 feet BGS will likely liquefy during a design-level earthquake.

In our opinion, the approximately 25-foot-thick cap of non-liquefiable soil present above groundwater will mitigate the effects of liquefaction that occurs between depths of 25 and 65 feet BGS. This conclusion is supported by the findings of researchers who have studied previous earthquakes and observed that a sufficiently thick layer of non-liquefiable soil will mitigate the effects of deeper liquefaction (Ishihara, 1985).

Our liquefaction analysis indicates an average settlement of approximately 2 inches and differential settlement of approximately 1 inch.

As discussed in the "Shallow Foundations" section of this report, the structural engineer should evaluate the foundation system to verify the structures can safely withstand the estimated settlements. If the structures cannot safely withstand the estimated settlements, then an alternative foundation system may be required and we should be contacted for further discussion.

5.4.2 Lateral Spread

Lateral spreading is a liquefaction-related seismic hazard. Areas subject to lateral spreading are typically gently sloping or flat sites underlain by liquefiable sediment adjacent to an open face, such as a riverbank. Due to the fact that there are no open faces in the site vicinity, it is our opinion that the potential for lateral spreading to occur at the site is low.

6.0 CONCLUSIONS

Based on our review of the proposed preliminary development plans and the results of our explorations, laboratory testing, and analyses, it is our opinion that the proposed development can be constructed at the site. The primary geotechnical considerations for the project are summarized in the Executive Summary.

Our specific recommendations are provided in the following sections.

7.0 DESIGN

7.1 GENERAL

The following sections provide our design recommendations for the buildings. All site preparation and structural fill should be prepared as recommended in the "Construction" section of this report.

7.2 SHALLOW FOUNDATIONS

7.2.1 General

Undocumented fill was encountered at several of the explorations. Where encountered, the undocumented fill extends 1.5 to 3 feet BGS and is comprised of silt and clay with variable gravel. We anticipate thicker fills may be present at the site, likely in the former mobile home park and prior building areas. Because of the unknown and variable properties of the undocumented fill, undocumented fill is not suitable for support of structural elements. If present, these materials should be removed and replaced with granular pads.

With the assumption that minimal fill of less than 3 feet will be required for site grading and based on the assumed foundation loads as previously stated, and assuming the site is prepared as recommended in the "Construction" section of this report, it is our opinion that the proposed buildings can be supported on conventional spread footings underlain by granular pads. The

granular pads can be underlain by native undisturbed soil or structural fill underlain by native undisturbed soil, provided the buildings can safely withstand the estimated settlements discussed below.

7.2.2 Granular Pads

We recommend that the footings for the four-story structures (i.e., senior housing and hotel buildings) with assumed foundation loads of less than 450 kips and 6 kips per lineal foot for columns and walls, respectively, be underlain by a minimum of 24-inch-thick granular footing pads. We recommend that the footings for the other one-story structures with assumed foundation loads of less than 120 kips and 3 kips per lineal foot for columns and walls, respectively, be underlain by a minimum of 12-inch-thick granular footing pads. The depth of the granular pads may need to be increased to remove undocumented fill material and, therefore, may vary. The granular pads should extend 6 inches beyond the margins of the foundations for every foot excavated below the foundations' base grade and should consist of imported granular material as described in the "Structural Fill" section of this report. The imported granular material should be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557, or until well keyed, as determined by one of our geotechnical staff. We recommend that a member of our geotechnical staff observe the prepared footing subgrade before placing granular pads as well.

7.2.3 Dimensions and Capacities

Continuous wall and isolated spread footings should be at least 18 and 24 inches wide, respectively. The bottom of exterior footings should be at least 18 inches below the lowest adjacent exterior grade. The bottom of interior footings should be established at least 12 inches below the base of the slab.

Footings bearing on subgrade prepared as recommended above should be sized based on an allowable bearing pressure of 2,000 psf. This is a net bearing pressure; the weight of the footing and overlying backfill can be ignored in calculating footing sizes. The recommended allowable bearing pressure applies to the total of dead plus long-term live loads and may be doubled for short-term loads such as those resulting from wind or seismic forces.

7.2.4 Settlement

Total post-construction settlement of footings founded as recommended above is anticipated to be less than 1½ inches. Differential settlement is estimated at one-half of the total settlement.

As discussed in the "Seismic Hazards" section of this report, the site soil is slightly susceptible to earthquake-induced settlement. The estimated total post-liquefaction settlement is presented in the "Seismic Hazards" section of this report. The structures can be supported on spread foundations if these settlements are within acceptable structural tolerances. If the buildings cannot safely withstand the estimated settlements, then an alternative foundation system will be required and we should be contacted for further discussion.

7.2.5 Resistance to Sliding

Lateral loads on footings can be resisted by passive earth pressure on the sides of the structures and by friction on the base of the footings. Our analysis indicates the available passive earth

pressure for footings confined by native soil and structural fill is 250 pcf modeled as an equivalent fluid pressure. Adjacent floor slabs, pavements, or the upper 12-inch depth of adjacent unpaved areas should not be considered when calculating passive resistance. In addition, in order to rely on passive resistance, a minimum of 10 feet of horizontal clearance must exist between the face of the footings and any adjacent down slopes.

For footings in contact with the granular footing pads, a coefficient of friction equal to 0.40 may be used when calculating resistance to sliding.

7.2.6 Subgrade Observation

All footing and floor subgrades should be evaluated by a representative of GeoDesign to evaluate the bearing conditions. Observations should also confirm that all loose or soft material, organics, unsuitable fill, prior topsoil zones, and softened subgrades (if present) have been removed. Localized deepening of footing excavations may be required to penetrate any deleterious material.

7.3 SEISMIC DESIGN CONSIDERATIONS

7.3.1 IBC Design Parameters

Based on our investigation, the parameters in Table 1 should be used to compute seismic base shear forces if the building is designed using the applicable provisions of the 2012 IBC and 2014 SOSSC. We selected the site coefficient "E" based on the results of our explorations.

Table 1. IBC Seismic Design Parameters

Seismic Design Parameter	Short Period (T_s = 0.2 second)	1 Second Period (T_1 = 1.0 second)
MCE Spectral Acceleration	S_s = 0.941 g	S_1 = 0.420 g
Site Class	E	
Site Coefficient	F_a = 0.971	F_v = 2.400
Adjusted Spectral Acceleration	S_{MS} = 0.914 g	S_{M1} = 1.009 g
Design Spectral Response Acceleration Parameters	S_{DS} = 0.609 g	S_{D1} = 0.673 g

7.4 FLOOR SLABS

Satisfactory subgrade support for building floor slabs supporting up to 150 psf area loading can be obtained provided the building pads are prepared as described in the "Construction" section of this report. To help reduce moisture transmission and slab shifting, we recommend a minimum 6-inch-thick layer of floor slab base rock be placed and compacted over a subgrade that has been prepared in conformance with the "Site Preparation" section of this report. The floor slab base rock should meet the requirements in the "Structural Fill" section of this report and be compacted to at least 95 percent of ASTM D 1557.

The near-surface soil is generally fine grained and will tend to maintain high moisture content. In the areas where moisture-sensitive floor slab and flooring will be installed, the installation of a

vapor barrier is warranted in order to reduce the potential for moisture transmission through, and efflorescence growth on, the slab and flooring. In addition, flooring manufacturers often require vapor barriers to protect flooring and flooring adhesives and will warrant their product only if a vapor barrier is installed according to their recommendations.

If the project includes highly moisture-sensitive flooring, then we recommend 10- or 15-mil vapor barriers, which are often required by flooring manufacturers. Selection and design of an appropriate vapor barrier should be based on discussions among members of the design team.

Slabs should be reinforced according to their proposed use and per the structural engineer's recommendations. Load-bearing concrete slabs may be designed assuming a modulus of subgrade reaction, k, of 125 pci. If the subgrade is cement amended, the subgrade reaction can be increased to 250 pci.

The design parameters provided above assume that the floor slabs are underlain by native soil, or compacted structural fill, or at least 12 inches of improved undocumented fill subgrade (by the means of scarification and compaction or by cement amendment as discussed in the "Site Preparation" section of this report). If encountered, deleterious material and oversized debris should be removed prior to compaction. If this approach is taken, it should be understood that a small risk of additional concrete distress and associated maintenance is acceptable. If this risk is not acceptable, then full removal of the undocumented fill and replacement with structural fill will be required.

7.5 RETAINING STRUCTURES

7.5.1 Assumptions

Our retaining wall design recommendations are based on the following assumptions: (1) the walls are cantilevered walls, (2) the walls are less than 10 feet in height, (3) drainage is provided behind walls, (4) the retained soil has a slope flatter than 4H:1V, and (5) the ground surface at the toe of the wall has an inclination of flatter than 5H:1V. Re-evaluation of our recommendations will be required if the retaining wall design criteria for the project varies from these assumptions.

7.5.2 Wall Design Parameters

Permanent retaining structures free to rotate slightly around the base should be designed for active earth pressures using an equivalent fluid unit pressure of 38 pcf. If retaining walls are restrained against rotation during backfilling, they should be designed for an at-rest earth pressure of 58 pcf.

Seismic lateral forces can be calculated using a dynamic force equal to $7H^2$ pounds per linear foot of wall, where H is the wall height. The seismic force should be applied as a distributed load with the centroid located at 0.6H from the wall base. Footings for retaining walls should be designed as recommended for shallow foundations.

The design equivalent fluid pressure should be increased for walls that retain sloping soil. We recommend the above lateral earth pressures be increased using the factors presented in Table 2 when designing walls that retain sloping soil.

Table 2. Lateral Earth Pressure Increase Factors for Sloping Soil

Slope of Retained Soil (degrees)	Lateral Earth Pressure Increase Factor
0	1.00
5	1.06
10	1.12
20	1.33
25	1.52
30	2.27

If other surcharges (i.e., slopes steeper than 2H:1V, foundations, vehicles, etc.) are located within a horizontal distance of twice the height of the wall from the back of the wall, then additional pressures will need to be accounted for in the wall design. Our office should be contacted for appropriate wall surcharges based on the actual magnitude and configuration of the applied loads.

7.5.3 Wall Drainage and Backfill

The above design parameters have been provided assuming that drains will be installed behind walls to prevent hydrostatic pressures from developing. If a drainage system is not installed, our office should be contacted for revised design forces.

The backfill material placed behind the walls and extending a horizontal distance of ½H, where H is the height of the retaining wall, should consist of retaining wall select backfill placed and compacted in conformance with the "Structural Fill" section of this report.

A minimum 6-inch-diameter perforated collector pipe should be placed at the base of the walls. The pipe should be embedded in a minimum 2-foot-wide zone of angular drain rock that is wrapped in a drainage geotextile fabric and extends up the back of the wall to within 1 foot of the finished grade. The drain rock and drainage geotextile fabric should meet specifications provided in the "Materials" section of this report. The perforated collector pipes should discharge at an appropriate location away from the base of the wall. The discharge pipe(s) should not be tied directly into stormwater drain systems, unless measures are taken to prevent backflow into the wall's drainage system.

Settlement of up to 1 percent of the wall height commonly occurs immediately adjacent to the wall as the wall rotates and develops active lateral earth pressures. Consequently, we recommend construction of flatwork adjacent to retaining walls be postponed at least four weeks after backfilling of the wall, unless survey data indicates that settlement is complete prior to that time.

7.6 PAVEMENTS

New AC pavements will be constructed for drive aisles and car parking at the proposed project. The pavement subgrades should be prepared in accordance with the "Site Preparation," "Construction Considerations," and Structural Fill" sections of this report. This includes improvement of the upper 1 foot of existing fill soil.

We have assumed that traffic at the site will consist of passenger cars only, with the exception of periodic service, delivery, and garbage trucks approximately twice a week. Our pavement recommendations are based on the following assumptions:

- A resilient modulus of 20,000 psi was estimated for the aggregate base
- Initial and terminal serviceability indices of 4.2 and 2.0, respectively
- Reliability of 75 percent and standard deviation and 0.45
- Structural coefficients of 0.42 and 0.10 for the AC and aggregate base, respectively
- No growth
- A resilient modulus of 4,000 psi for site subgrades assuming the surface 12 inches of subgrade is scarified and compacted to at least 92 percent of the maximum dry density, as defined by ASTM D 1557 (modified)

If any of these assumptions are incorrect, our office should be contacted with the appropriate information so that the pavement designs can be revised.

Based on the traffic assumptions, we recommend the AC pavement sections presented in Table 3.

Table 3. Recommended Standard Pavement Sections

Pavement Use	ESALs	AC Thickness (inches)	Aggregate Base Thickness (inches)
Drive Aisles	75,000	3.5	11.0
Automobile Parking Stalls	25,000	3.0	9.0

If the subgrade is cement amended to the thicknesses indicated below and the amended soil achieves a seven-day unconfined compressive strength of at least 100 psi, then the pavements can be constructed as recommended in Table 4.

Table 4. Recommended Standard Pavement Sections

Pavement Use	ESALs	AC Thickness (inches)	Aggregate Base Thickness (inches)	Cement Amendment (inches)
Drive Aisles	75,000	3.5	4.0	12.0
Automobile Parking	25,000	3.0	4.0	12.0

All thicknesses are intended to be the minimum acceptable. The design of the recommended pavement section is based on the assumption that construction will be completed during an extended period of dry weather. Wet weather construction could require an increased thickness of aggregate base. In addition, to prevent strength loss during curing, cement-amended soil should be allowed to cure for at least four days prior to construction traffic or placing the base rock. Lastly, the amended subgrade should be protected with a minimum of 4 inches of base rock prior to construction traffic access.

The AC, aggregate base, and cement amendment should meet the requirements outlined in the "Materials" section of this report.

Construction traffic should be limited to non-structural (building and pavement) portions of the site or haul roads. Construction traffic should not be allowed on new pavements. If construction traffic is to be allowed on newly constructed road sections, an allowance for this additional traffic will need to be made in the design pavement section.

7.7 DRAINAGE

Where possible, the finished ground surface around the buildings should be sloped away from the structures at a minimum 2 percent gradient for a distance of at least 5 feet. Downspouts or roof scuppers should discharge into a storm drain system that carries the collected water to an appropriate stormwater system. Trapped planter areas should not be created adjacent to the buildings without providing means for positive drainage (e.g., swales or catch basins).

7.8 INFILTRATION SYSTEMS

We understand the proposed development includes stormwater infiltration systems. The locations and configurations were conceptual at the time of this report. The infiltration tests were performed to evaluate the infiltration potential for the proposed infiltration systems. The results of our field infiltration testing and laboratory testing are presented in Table 5.

Table 5. Infiltration and Laboratory Testing Summary

Location	Depth (feet BGS)	Observed Infiltration Rate[1] (inches per hour)	Fines Content[2] (percent)	Field Soil Classification
B-1	7.5	4.0	47	Silty Sand
B-1	12.5	~0	Not Tested	Silty Sand
B-1	17.5	~0	Not Tested	Silt Sand
I-1	4.8	0.2	55	Silty Sand/Sandy Silt
I-2	4.5	0.7	47	Silty Sand
I-3	4.8	3.0	45	Silty Sand
I-4	4.7	0.5	28	Silty Sand
I-5	4.6	0.5	58	Silty Sand/Sandy Silt
I-6	4.5	0.2	42	Silty Sand

1. In situ infiltration rate observed in the field.
2. Fines content - material passing the U.S. Standard No. 200 sieve.

The infiltration rates shown in Table 5 are short-term field rates and factors of safety have not been applied. The infiltration test results indicate the silty sand and sandy silt soils have low infiltration capacity when tested under low-hydrostatic head conditions. Negligible infiltration rates were measured at depths below 7.5 feet BGS and groundwater can be expected at depths

between 20 and 25 feet BGS. We recommend all infiltration systems be less than 7.5 feet deep and installed in sandy soil below the upper silt and clay soil layer. We recommend unfactored field infiltration rate of 0.5 inch per hour.

The recommended infiltration rate is a measured rate and is unfactored. Correction factors should be applied to the recommended infiltration rate by the civil engineer during design to account for the degree of long-term maintenance and influent/pre-treatment control, as well as the potential for long-term clogging due to siltation and buildup of organic material, depending on the proposed length, location, and type of infiltration facility. We recommend a minimum factor of safety of at least 2 be applied to the unfactored rate.

The actual depths and estimated infiltration rates can vary significantly from the values presented above. We recommend the design infiltration values for the stormwater systems be confirmed by field testing completed during installation of the systems. The results of this field testing might necessitate that the stormwater system be enlarged to achieve the design infiltration rate. Also, we recommend subsequent infiltration testing be completed when development plans and stormwater management plans are developed.

8.0 CONSTRUCTION

8.1 SITE PREPARATION

8.1.1 Demolition

As discussed in the “Surface Conditions” section of this report, abundant underground utilities as well as relic AC pavement and PCC elements are present at the site. Demolition includes complete removal of existing site improvements within 5 feet of areas to receive new pavements, buildings, retaining walls, or engineered fills. Underground vaults, tanks, manholes, foundation elements, and other subsurface structures should be removed in areas of new foundation elements. Utility lines can be completely removed or grouted full if left in place. Soil disturbed during demolition should be removed and replaced in accordance with the recommendations in the "Structural Fill" section of this report.

Material generated during demolition should be transported off site for disposal or stockpiled in areas designated by the owner. In general, this material will not be suitable for re-use as engineered fill.

8.1.2 Grubbing and Stripping

Trees and shrubs should be removed from fill areas. In addition, root balls should be grubbed out to the depth of the roots, which could exceed 3 feet BGS. Depending on the methods used to remove the root balls, considerable disturbance and loosening of the subgrade could occur during site grubbing. We recommend soil disturbed during grubbing operations be removed to expose firm, undisturbed subgrade. The resulting excavations should be backfilled with structural fill.

The existing topsoil zone should be stripped and removed from all fill areas. Based on our explorations, the average depth of stripping will be approximately 3 to 4 inches, although greater stripping depths may be required to remove localized zones of loose or organic soil.

Greater stripping depths (approaching 12 inches) may be anticipated in areas with thicker vegetation and shrubs. The actual stripping depth should be based on field observations at the time of construction. Stripped material should be transported off site for disposal or used in landscaped areas.

8.1.3 Undocumented Fill

Undocumented fill associated with prior grading activities was encountered in several of the explorations to depths of approximately 1.5 to 3 feet BGS. We anticipate thicker fills may be present at the site, likely in the former mobile home park and prior building areas. The fill material is comprised of stiff to very silt and clay with variable gravel.

Documentation of pre-existing fill installation and compaction was not available for our review. To prevent excessive differential settlement, foundations should not bear on the undocumented fill. We recommend this material be removed from below the footings and the footings be underlain by granular pads as recommended in the “Shallow Foundations” section of this report.

Pavement or concrete slab performance can also be affected by poor subgrade performance, such as is possible with undocumented fill. However, provided a small risk of additional pavement and slab distress and associated maintenance is acceptable, there is an option to limit the excavation of these materials by scarifying and compacting the upper 12 inches of these materials within pavement and slab areas. If encountered, deleterious material and oversized debris should be removed prior to compaction.

As discussed in the "Structural Fill" section of this report, the on-site soil can be sensitive to small changes in moisture content and will be difficult, if not impossible, to compact adequately during wet weather. While scarification and compaction of the subgrade is the best option for subgrade improvement, it will likely only be possible during extended dry periods and following moisture conditioning of the soil. As discussed further on in this report, cement amendment is an option for conditioning the soil for use as structural fill during periods of wet weather or when drying the soil is not an option.

Undocumented fill should be evaluated at the time of construction. Removal of unsuitable material may be required from building areas. The resulting excavations should be backfilled with structural fill. The project budget may need to include a contingency for removal of undocumented fill materials from below buildings and foundation elements.

8.1.4 Topsoil Zone

Agricultural topsoil zone will be encountered in the open field and vegetated areas (likely in the upper 12 to 18 inches) from past agricultural activities. Reliable strength properties are extremely difficult to predict for the topsoil/tilled zone material. There is a high risk for poor performance of floor slabs and pavements established directly over loosened soil. In order to reduce the risk of settlement, we recommend the tilled zone be improved during site preparation in areas where planned cuts do not extend to the bottom of the topsoil zone. Prior to fill placement and construction, the topsoil zone should be improved by removing and replacing with structural fill or scarifying and re-compacting to structural fill requirements.

As discussed in the "Structural Fill" section of this report, the native soil can be sensitive to small changes in moisture content and will be difficult, if not impossible, to compact adequately during wet weather. While scarification and compaction of the subgrade is the best option for subgrade improvement, it will likely only be possible during extended dry periods and following moisture conditioning of the soil. As discussed further on in this report, cement amendment is an option for conditioning the soil for use as structural fill during periods of wet weather or when drying the soil is not an option.

8.1.5 Subgrade Evaluation

Upon completion of stripping and subgrade stabilization, and prior to the placement of fill or pavement improvements, the exposed subgrade should be evaluated by proof rolling. The subgrade should be proof rolled with a fully loaded dump truck or similarly heavy, rubber-tired construction equipment to identify soft, loose, or unsuitable areas. A member of our geotechnical staff should observe the proof rolling to evaluate yielding of the ground surface. During wet weather, subgrade evaluation should be performed by probing with a foundation probe rather than proof rolling. Areas that appear soft or loose should be improved in accordance with subsequent sections of this report.

8.2 SUBGRADE CONSIDERATIONS

The fine-grained soil present on this site is easily disturbed. If not carefully executed, site preparation, utility trench work, and roadway excavation can create extensive soft areas and significant repair costs can result. Earthwork planning, regardless of the time of year, should include considerations for minimizing subgrade disturbance.

If construction occurs during or extends into the wet season, or if the moisture content of the surficial soil is more than a couple percentage points above optimum, the subgrade will be susceptible to damage by construction trafficking. Site stripping and cutting may need to be accomplished using track-mounted equipment. Likewise, the use of granular haul roads and staging areas will be necessary for support of construction traffic during the rainy season or when the moisture content of the surficial soil is more than a few percentage points above optimum. The base rock thickness for pavement areas is intended to support post-construction design traffic loads. This design base rock thickness may not support construction traffic or pavement construction when the subgrade soil is wet. Accordingly, if construction is planned for periods when the subgrade soil is wet, staging and haul roads with increased thicknesses of base rock will be required. The amount of staging and haul road areas, as well as the required thickness of granular material, will vary with the contractor's sequencing of a project and type/frequency of construction equipment and should, therefore, be the responsibility of the contractor. Based on our experience, between 12 and 18 inches of imported granular material is generally required in staging areas and between 18 and 24 inches in haul roads areas. The contractor should also be responsible for selecting the type of material or construction of haul roads and staging areas. A geotextile fabric can be placed as a barrier between the subgrade and imported granular material in areas of repeated construction traffic. The imported granular material, stabilization material, and geotextile fabric should meet the specifications in the "Materials" section of this report.

As an alternative to thickened crushed rock sections, haul roads and utility work zones may be constructed using cement-amended subgrades overlain by a crushed rock wearing surface. If this approach is used, the thickness of granular material in staging areas and along haul roads can typically be reduced. The actual thickness of the amended material and imported granular material will depend on the contractor's means and methods and, accordingly, should be the contractor's responsibility. Cement amendment is discussed in the "Materials" section of this report.

8.3 PERMANENT SLOPES

Permanent cut and fill slopes should not exceed 2H:1V. Slopes within stormwater facilities should not exceed 3H:1V. Access roads and pavements should be located at least 5 feet from the top of cut and fill slopes. The setback should be increased to 10 feet for buildings. The slopes should be planted with appropriate vegetation to provide protection against erosion as soon as possible after grading. Surface water runoff should be collected and directed away from slopes to prevent water from running down the face of the slope.

8.4 EXCAVATION

8.4.1 Excavation and Shoring

Generally, the fill soil and the native silt, clay, and sand at the site should be readily excavatable with conventional grading equipment. Because of the potential presence of construction debris in the near-surface fill soil, we expect difficult excavation at shallow depths over portions of the site. Utility trenches may result in slowed excavation and larger backfill volumes due to the presence of debris and related caving.

Depending on the final development plans, the proposed building excavations near the existing improvements might require temporary shoring to maintain the stability of the adjacent improvements during construction. A variety of shoring systems are available; consequently, we recommend the contractor be responsible for selecting the appropriate shoring.

Temporary construction excavations adjacent to level ground (without adjacent structures) should stand vertical for short periods of time to a depth of approximately 4 feet, provided groundwater seepage is not observed in the trench walls. However, where retaining walls, soft fills, or sloping ground are located above the excavation, or the excavation is greater than 4 feet high or groundwater seepage is present, the cuts will need to be shored or trimmed back and should be carefully planned so as not to destabilize the excavation or nearby improvements. Open excavation techniques may be used to excavate trenches with depths between 4 and 8 feet, provided the walls of the excavation are cut at a slope of 1½H:1V or flatter and groundwater seepage is not present. We note that some sloughing or minor caving may occur due to the sandy nature of the soil and flatter slopes or shoring will be required. In lieu of large and open cuts, approved temporary shoring may be used for excavation support. Use of approved temporary shoring is recommended where the slopes cannot be cut back, within the influence area of structural elements, and for cuts below the water table. The influence area can be defined as a 1H:1V slope extending down from a 5-foot setback from the edge of a foundation element. A wide variety of shoring and dewatering systems are available. Consequently, we recommend that the contractor be responsible for selecting the appropriate shoring and dewatering systems.

If box shoring is used, it should be understood that box shoring is a safety feature used to protect workers and does not prevent caving. If the excavations are left open for extended periods of time, then caving of the sidewalls may occur. The presence of caved material will limit the ability to properly backfill and compact the trenches. The contractor should be prepared to fill voids between the box shoring and the sidewalls of the trenches with sand or gravel before caving occurs.

If shoring is used, we recommend that the type and design of the shoring system be the responsibility of the contractor, who is in the best position to choose a system that fits the overall plan of operation. All excavations should be made in accordance with applicable OSHA and state regulations.

8.4.2 Safety

All excavations should be made in accordance with applicable OSHA requirements and regulations of the state, county, and local jurisdiction. While this report describes certain approaches to excavation and dewatering, the contract documents should specify that the contractor is responsible for selecting excavation and dewatering methods, monitoring the excavations for safety, and providing shoring (as required) to protect personnel and adjacent structural elements.

8.5 DEWATERING

Groundwater measurement in boring B-1 and pore water pressure dissipation tests completed in probes CPT-2, CPT-3, CPT-5, and CPT-6 indicate groundwater is present at depths between approximately 22.1 and 32.3 feet BGS at the time of our explorations. However, perched groundwater levels may be encountered at much shallower depths following extended periods of wet weather.

The contractor should be responsible for temporary drainage of surface water, perched water, and groundwater as necessary to prevent standing water and/or erosion at the working surface.

Because of the instability of saturated, low plasticity silt and sand, sloughing and "running" conditions can occur if the excavation extends below groundwater seepage levels. Accordingly, positive control of groundwater will be required to maintain stable trench sides and base. The proposed dewatering plan should be capable of maintaining groundwater levels at least 2 feet below the base of the trench excavation (including the depth required for trench bedding and stabilization material). In addition to safety considerations, running soil, caving, or other loss of ground will increase backfill volumes and can result in damage to adjacent structures or utilities.

Flow rates for dewatering are likely to vary depending on location, soil type, and the season in which the excavation occurs. The dewatering systems should be capable of adapting to variable flows. Because of the tendency of saturated, low plasticity silt and sand to "run," we recommend that dewatering wells or well points be considered if trench excavations extend below groundwater levels. Tight-joint driven sheets in conjunction with a scaled-down dewatering program can also be an effective way to control groundwater seepage, provided the sheets are driven deep enough to control heaving conditions at the base of the excavation.

Trench dewatering will be required to maintain dry working conditions if the invert elevations of the proposed utilities encounter groundwater. Given the silt and sand present, pumping from sumps located within the trench may result in excessive sloughing, caving, or running conditions, and dewatering by well points may be required. If groundwater is present at the base of utility excavations, we recommend placing 1.5 to 2 feet of stabilization material at the base of the excavation. The use of a subgrade geotextile fabric may reduce the amount of stabilization material required. The actual thickness should be based on field observations during construction. Trench stabilization material and the subgrade geotextile fabric should meet the requirements described in the "Materials" section of this report. Trench stabilization material should be placed in one lift and compacted until well keyed.

While we have described certain approaches to the excavation dewatering, it is the contractor's responsibility to select the dewatering methods.

8.6 TEMPORARY DRAINAGE

In addition to the erosion control measures (see "Erosion Control" section of this report), during mass grading at the site, the contractor should be made responsible for temporary drainage of surface water as necessary to prevent standing water and/or erosion at the working surface. During rough and finished grading of the building site, the contractor should keep all footing excavations and building pads free of water.

8.7 MATERIALS

8.7.1 Structural Fill

8.7.1.1 General

Fill should be placed on subgrade that has been prepared in conformance with the "Site Preparation" section of this report. A variety of material may be used as structural fill at the site. However, all material used as structural fill should be free of organic matter or other unsuitable material. A brief characterization of some of the acceptable materials and our recommendations for their use as structural fill is provided below.

8.7.1.2 On-Site Soil

The material at the site should be suitable for use as general structural fill, provided it is properly moisture conditioned and free of debris, organic material, and particles over 6 inches in diameter.

Based on laboratory test results, the moisture content of the on-site soil generally varied from 12 to 39 percent at the time of our explorations. Based on our experience, we estimate the optimum moisture content for compaction to be approximately 14 to 17 percent for the on-site soil; therefore, significant moisture conditioning (drying) will be required to use on-site soil for structural fill. Accordingly, extended dry weather and sufficient area to dry the soil will be required to adequately condition the soil for use as structural fill.

When used as structural fill, the on-site soil should be placed in lifts with a maximum uncompacted thickness of 8 inches and compacted to not less than 92 percent of the maximum dry density, as determined by ASTM D 1557.

8.7.1.3 Imported Granular Material

Imported granular material used as structural fill should be pit- or quarry-run rock, crushed rock, or crushed gravel and sand. The imported granular material should also be angular, fairly well graded between coarse and fine material, have less than 5 percent fines (material passing the U.S. Standard No. 200 sieve) by dry weight, and have at least two mechanically fractured faces.

Imported granular material should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557. During the wet season or when wet subgrade conditions exists, the initial lift should be approximately 18 inches in uncompacted thickness and should be compacted by rolling with a smooth-drum roller without using vibratory action.

8.7.1.4 Stabilization Material

Stabilization material used in staging or haul road areas, or as trench stabilization material, should consist of 4- or 6-inch-minus pit- or quarry-run rock, crushed rock, or crushed gravel and sand. The material should have a maximum particle size of 6 inches, less than 5 percent by dry weight passing the U.S. Standard No. 4 sieve (washed analysis), and at least two mechanically fractured faces. The material should be free of organic matter and other deleterious material. Stabilization material should be placed in lifts between 12 and 24 inches thick and compacted to a firm condition.

8.7.1.5 Trench Backfill

Trench backfill placed beneath, adjacent to, and for at least 12 inches above utility lines (i.e., the pipe zone) should consist of well-graded granular material with a maximum particle size of 1½ inches and less than 7 percent fines by dry weight. The pipe zone backfill should be compacted to at least 90 percent of the maximum dry density, as determined by ASTM D 1557, or as required by the pipe manufacturer or local building department.

Within roadway alignments, the remainder of the trench backfill up to the subgrade elevation should consist of well-graded granular material with a maximum particle size of 2½ inches and less than 7 percent fines by dry weight. This material should be compacted to at least 92 percent of the maximum dry density, as determined by ASTM D 1557, or as required by the pipe manufacturer or local building department. The upper 3 feet of the trench backfill should be compacted to at least 95 percent of the maximum dry density, as determined by ASTM D 1557.

Outside of structural improvement areas (e.g., roadway alignments or building pads) trench backfill placed above the pipe zone may consist of general fill material that is free of organics and material over 6 inches in diameter. This general trench backfill should be compacted to at least 90 percent of the maximum dry density, as determined by ASTM D 1557, or as required by the pipe manufacturer or local building department.

8.7.1.6 Floor Slab Aggregate Base

Imported granular material used as base rock for building floor slabs should consist of ¾- or 1½-inch-minus material (depending on the application). In addition, the aggregate should have

less than 5 percent fines by dry weight (washed analysis) and have at least two fractured faces. The aggregate base should be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557.

8.7.1.7 Pavement Aggregate Base

Imported granular material used as base rock for pavements should consist of ¾- or 1½-inch-minus material (depending on the application). In addition, the aggregate should have less than 5 percent fines by dry weight (washed analysis) and have at least two fractured faces. The aggregate base should be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557.

8.7.1.8 Retaining Wall Select Backfill

Backfill material placed behind retaining walls and extending a horizontal distance of ½H, where H is the height of the retaining wall, should consist of select granular material. We recommend the select granular wall backfill be separated from general fill, native soil, and/or topsoil using a geotextile fabric that meets the specifications provided below for drainage geotextiles.

The wall backfill should be compacted to a minimum of 95 percent of the maximum dry density, as determined by ASTM D 1557. However, backfill located within a horizontal distance of 3 feet from a retaining wall should only be compacted to approximately 90 percent of the maximum dry density, as determined by ASTM D 1557. Backfill placed within 3 feet of the wall should be compacted in lifts less than 6 inches thick using hand-operated tamping equipment (such as a jumping jack or vibratory plate compactor). If flatwork (sidewalks or pavements) will be placed atop the wall backfill, we recommend that the upper 2 feet of material be compacted to 95 percent of the maximum dry density, as determined by ASTM D 1557.

8.7.1.9 Drain Rock Material

Drain rock should consist of angular granular material with a maximum particle size of 2 inches. The material should be free of roots, organic matter, and other unsuitable material; have less than 2 percent by dry weight passing the U.S. Standard No. 200 sieve (washed analysis); and have at least at least two mechanically fractured faces.

8.7.1.10 Retaining Wall Leveling Pad

Imported granular material placed at the base of retaining wall footings should consist of select granular material. The granular material should be 1¾-inch-minus aggregate size and have at least two mechanically fractured faces. The leveling pad material should be placed in a 6- to 12-inch lift and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557.

8.7.2 Geotextile Fabric

8.7.2.1 Subgrade Geotextile

Subgrade geotextile should conform to OSSC Table 02320-1 and OSSC 00350 (Geosynthetic Installation). The geotextile should have a Level "B" certification. A minimum initial aggregate base lift of 6 inches is required over geotextiles. All drainage aggregate and stabilization material should be underlain by a subgrade geotextile.

8.7.2.2 Drainage Geotextile

Drainage geotextile should conform to Type 2 material of OSSC Table 02320-1 and OSSC 00350 (Geosynthetic Installation). The geotextile should have a Level "B" certification. A minimum initial aggregate base lift of 6 inches is required over geotextiles.

8.7.3 Soil Amendment with Cement

8.7.3.1 General

As an alternative to the use of imported granular material for wet weather structural fill, an experienced contractor may be able to amend the on-site soil with portland cement to obtain suitable support properties. Successful use of soil amendment depends on the use of correct mixing techniques, soil moisture content, and amendment quantities. Soil amending should be conducted in accordance with the specifications provided in OSSC 00344 (Treated Subgrade). The amount of cement used during treatment should be based on an assumed soil dry unit weight of 100 pcf.

8.7.3.2 Subbase Stabilization

Specific recommendations based on exposed site conditions for soil amending can be provided if necessary. However, for preliminary design purposes, we recommend a target strength for cement-amended subgrade for building and pavement subbase (below base aggregate) soil of 100 psi. The amount of cement used to achieve this target generally varies with moisture content and soil type. It is difficult to predict field performance of soil to cement amendment due to variability in soil response, and we recommend laboratory testing to confirm expectations. Generally, 5 percent cement by weight of dry soil can be used when the soil moisture content does not exceed approximately 20 percent. If the soil moisture content is in the range of 25 to 35 percent, 6 to 8 percent by weight of dry soil is recommended. The amount of cement added to the soil may need to be adjusted based on field observations and performance. Moreover, depending on the time of year and moisture content levels during amendment, water may need to be applied during tilling to appropriately condition the soil moisture content.

The cement-amending contractor should be responsible for selecting the cement content. Typically, a minimum cement ratio of 6 percent by dry weight is suitable. If the soil moistures are in excess of 30 percent, a cement ratio of 7 percent may be needed.

We recommend cement-amending equipment be equipped with balloon tires to reduce rutting and disturbance of the fine-grained soil. A sheepsfoot or segmented pad roller with a minimum static weight of 40,000 pounds should be used for initial compaction of the fine-grained soil without the use of vibratory action. A smooth-drum roller with a minimum applied linear force of 700 pounds per inch should be used for final compaction. The amended soil should be compacted to at least 92 percent of the achievable dry density at the moisture content of the material, as defined in ASTM D 1557.

A minimum curing of four days is required between treatment and construction traffic access. Construction traffic should not be allowed on unprotected, cement-amended subgrade. To protect the cement-treated surfaces from abrasion or damage, the finished surface should be covered with 4 to 6 inches of imported granular material.

Treatment depths for subgrade beneath buildings and pavements, haul roads, and staging areas are typically on the order of 12, 16, and 12 inches, respectively. The crushed rock typically becomes contaminated with soil during construction. Contaminated base rock should be removed and replaced with clean rock in pavement areas. The actual thickness of the amended material and imported granular material for haul roads and staging areas will depend on the anticipated traffic, as well as the contractor's means and methods and, accordingly, should be the contractor's responsibility.

Cement amending should not be attempted when air temperature is below 40 degrees Fahrenheit or during moderate to heavy precipitation. Cement should not be placed when the ground surface is saturated or standing water exists.

8.7.3.3 Cement-Amended Structural Fill

On-site soil that would not otherwise be suitable for structural fill may be amended and placed as fill over a subgrade prepared in conformance with the "Site Preparation" section of this report. The cement ratio for general cement-amended fill can generally be reduced by 1 percent (by dry weight). Typically, a minimum curing of four days is required between treatment and construction traffic access. Consecutive lifts of fill may be treated immediately after the previous lift has been amended and compacted (e.g., the four-day wait period does not apply). However, where the final lift of fill is a building or roadway subgrade, then the four-day wait period is in effect.

8.7.3.4 Other Considerations

Portland cement-amended soil is hard and has low permeability. This soil does not drain well, nor is it suitable for planting. Future planted areas should not be cement amended, if practical, or accommodations should be made for drainage and planting. Moreover, cement amending soil within building areas must be done carefully to avoid trapping water under floor slabs. We should be contacted if this approach is considered. Cement amendment should not be used if runoff during construction cannot be directed away from adjacent wetlands.

8.7.4 AC

8.7.4.1 ACP

The AC should be Level 2, ½-inch, dense ACP according to OSSC 00744 (Asphalt Concrete Pavement) and compacted to 91 percent of the theoretical maximum density of the mix, as determined by AASHTO T 209. The minimum and maximum lift thickness is 2.0 and 3.0 inches, respectively, for ½-inch ACP. Lift thicknesses desired outside these limits should be discussed with the design team prior to design or construction. Asphalt binder should be performance graded and conform to PG 64-22 or better.

8.7.4.2 Cold Weather Paving Considerations

In general, AC paving is not recommended during the cold weather (temperatures less than 40 degrees Fahrenheit). Compacting under these conditions can result in low compaction and premature pavement distress.

Each AC mix design has a recommended compaction temperature range that is specific for the particular AC binder used. In colder temperatures, it is more difficult to maintain the

temperature of the AC mix as it can lose heat while stored in the delivery truck, as it is placed, and in the time between placement and compaction. In Oregon, the AC surface temperature during paving should be at least 40 degrees Fahrenheit for lift thickness greater than 2.5 inches and at least 50 degrees Fahrenheit for lift thickness between 2.0 and 2.5 inches.

If paving activities must take place during cold-weather construction as defined above, the project team should be consulted and a site meeting should be held to discuss ways to lessen low compaction risks.

8.8 EROSION CONTROL

The site soil is susceptible to erosion; therefore, erosion control measures should be carefully planned and in place before construction begins. Surface water runoff should be collected and directed away from slopes to prevent water from running down the slope face. Erosion control measures (such as straw bales, sediment fences, and temporary detention and settling basins) should be used in accordance with local and state ordinances.

9.0 OBSERVATION OF CONSTRUCTION

Satisfactory foundation and earthwork performance depends to a large degree on quality of construction. Sufficient observation of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. Subsurface conditions observed during construction should be compared with those encountered during the subsurface exploration. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect if subsurface conditions change significantly from those anticipated.

We recommend that GeoDesign be retained to observe earthwork activities, including stripping, proofrolling of the subgrade and repair of soft areas, infiltration systems installation, footing subgrade and granular pad preparation, performing laboratory compaction and field moisture-density tests, observing final proofrolling of the pavement subgrade and base rock, and asphalt placement and compaction.

10.0 LIMITATIONS

We have prepared this report for use by Deacon Development Group and members of the design and construction teams for the proposed project. The data and report can be used for bidding or estimating purposes, but our report, conclusions, and interpretations should not be construed as warranty of the subsurface conditions and are not applicable to other nearby building sites.

Exploration observations indicate soil conditions only at specific locations and only to the depths penetrated. They do not necessarily reflect soil strata or water level variations that may exist between exploration locations. If subsurface conditions differing from those described are noted during the course of excavation and construction, re-evaluation will be necessary.

The site development plans and design details were preliminary at the time this report was prepared. When the design has been finalized and if there are changes in the site grades or

location, configuration, design loads, or type of construction for the buildings, and walls, the conclusions and recommendations presented may not be applicable. If design changes are made, we request that we be retained to review our conclusions and recommendations and to provide a written modification or verification.

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

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in this area at the time the report was prepared. No warranty, express or implied, should be understood.

♦ ♦ ♦

We appreciate the opportunity to be of service to you. Please call if you have questions concerning this report or if we can provide additional services.

Sincerely,

GeoDesign, Inc.

Najib A. Kalas, P.E.
Senior Project Engineer

George Saunders, P.E., G.E.
Principal Engineer

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FIGURES

VICINITY MAP BASED ON AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH PRO®

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DDG-8-01	**VICINITY MAP**	
OCTOBER 2016	DEACON SHERWOOD DEVELOPMENT SHERWOOD, OR	**FIGURE 1**

Printed By: aday | Print Date: 10/19/2016 2:22:32 PM
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LEGEND:

B-1 ◕	BORING
I-1 ⊕	HAND-AUGERED BORING
CPT-1 △	CONE PENETROMETER
IR = 0.2 IN/HR AT 4.8 FEET	UNFACTORED INFILTRATION RATE

N

0 100 200

(SCALE IN FEET)

SITE PLAN BASED ON DRAWING PROVIDED BY DEACON DEVELOPMENT GROUP ON SEPTEMBER 22, 2016

SITE PLAN

DEACON SHERWOOD DEVELOPMENT
SHERWOOD, OR

FIGURE 2

DDG-8-01

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APPENDIX A

APPENDIX A

FIELD EXPLORATIONS

GENERAL

We explored subsurface conditions at the site by drilling three borings (B-1 through B-3) to depths of approximately 51.5 to 71.5 feet BGS, advancing six hand-augered borings (I-1 through I-6) to a depth of approximately 5 feet BGS, and advancing six CPTs (CPT-1 through CPT-6) to depths of approximately 50.5 to 71 feet BGS.

The borings were drilled by Western States Soil Conservation, Inc. of Hubbard, Oregon, on August 29 and 30, 2016 using a truck-mounted drill rig with hollow-stem auger and mud rotary methods. The hand-augered borings were completed on October 11, and 12, 2016. The CPT probes were completed by Oregon Geotechnical Explorations, Inc. of Keizer, Oregon, on August 13, 2016. Logs of the drilled borings and hand-augered borings are presented in this appendix, and logs of the CPT probes are presented in Appendix B.

The locations of the explorations are shown on Figure 2. The explorations were located in the field relative to existing site features and should be considered approximate. Member of our geology staff observed the explorations.

SOIL SAMPLING

Samples were obtained from the borings using 1½-inch-inner diameter SPT split-barrel sampler in general accordance with ASTM D 1586. The sampler was driven into the soil with a 140-pound hammer free-falling 30 inches. The sampler was driven a total distance of 18 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the exploration logs, unless otherwise noted. Samples were generally taken at 2.5- to 5-foot intervals throughout the depth of the borings. In addition, relatively undisturbed samples were obtained by pushing thin-walled standard Shelby tubes into the base of the explorations in general accordance with ASTM D 1587. Representative disturbed samples of soil observed in the hand-augered borings were obtained from the tip of the auger. Sampler types and sampling intervals are shown on the exploration logs.

The calibration factor for the SPT hammer used by Western States Soil Conservation was 89.3 percent. The calibration testing results are presented at the end of this appendix.

SOIL CLASSIFICATION

The soil samples were classified in accordance with the "Explorations Key" (Table A-1) and "Soil Classification System" (Table A-2), which are presented in this appendix. The exploration logs indicate the depths at which the soils or their characteristics change, although the change actually could be gradual. If the change occurred between sample locations, the depth was interpreted. Classifications are shown on the exploration logs.

INFILTRATION TESTING

Nine infiltration tests were conducted in boring B-1 and hand-augered borings I-1 through I-6 at depths ranging between approximately 4.5 and 17.5 feet BGS. The infiltration rates were

estimated by filling a 4.5-inch-inside diameter auger and a 3-inch-inside diameter pipe with water, allowing the area to saturate, and then measuring the drop in water with time. The tests were conducted under a hydrostatic head of generally less than approximately 12 to 18 inches. Representative soil samples were collected from at or below the infiltration test locations for grain-size distribution analyses, as described in this appendix.

LABORATORY TESTING

We visually examined soil samples obtained from the explorations to confirm field classifications. We also performed the following laboratory testing.

MOISTURE CONTENT

We tested the natural moisture content of 37 samples obtained from the explorations in general accordance with ASTM D 2216. The natural moisture content is a ratio of the weight of the water to soil in a test sample and is expressed as a percentage. The test results are presented in this appendix.

ATTERBERG LIMITS TESTING

The Atterberg limits (plastic and liquid limits) were performed on two samples in general accordance with ASTM D 4318. The plastic limit is defined as the moisture content where the soil becomes brittle. The liquid limit is defined as the moisture content where the soil begins to act similar to a liquid. The plasticity index is the difference between the liquid and plastic limits. The test results are presented in this appendix.

FINES CONTENT ANALYSIS

Fines content analyses were performed on 12 samples in general accordance with ASTM C 117 and ASTM D 1140. This test is a quantitative determination of the amount of material finer than the U.S. Standard No. 200 sieve expressed as a percentage of soil weight. The test results are presented in this appendix.

DRY DENSITY

We tested the in situ dry density of two soil samples in general accordance with ASTM D 2937. The dry density is the ratio between the mass of the soil (not including water) and the volume of the intact sample. The density is expressed in units of pcf. The test results are presented in this appendix.

CONSOLIDATION TESTING

Two one-dimensional consolidation tests were completed on two relatively undisturbed soil samples obtained from the borings in general accordance with ASTM D 2435. The test measures the volume change (consolidation) of a soil sample under predetermined loads. The test results are presented in this appendix.

APPENDIX B

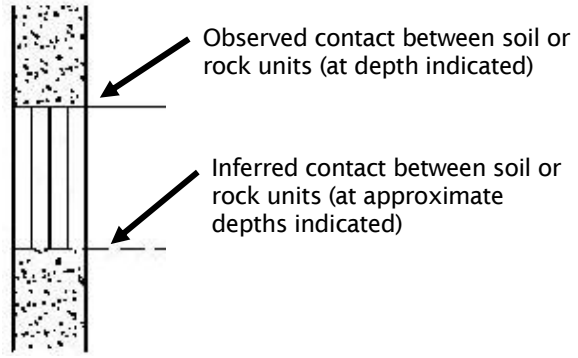
CONE PENETROMETER PROBE EXPLORATIONS

Our subsurface exploration program included six CPT probes (CPT-1 through CPT-6) to depths of approximately 50.5 to 71 feet BGS. Figure 2 shows the locations of the CPTs. The CPTs were performed in general accordance with ASTM D 5778 by Oregon Geotechnical Explorations, Inc. of Keizer, Oregon, on August 13, 2016.

The CPT is an in situ test that provides characterizes subsurface stratigraphy. The testing includes advancing a 35.6-millimeter-diameter cone equipped with a load cell and a friction sleeve through the soil profile. The cone is advanced at a rate of approximately 2 centimeters per second. Tip resistance, sleeve friction, and pore pressure at are typically recorded at 0.1 meter intervals. At selected depths, the CPT advancement can be suspended and pore water dissipation rates can be measured. Shear wave velocity of the subsurface soils can be measured, typically on increments of 1 to 2 meters. The results of the CPTs completed for this project are presented in this appendix.

SYMBOL	SAMPLING DESCRIPTION
	Location of sample obtained in general accordance with ASTM D 1586 Standard Penetration Test with recovery
	Location of sample obtained using thin-wall Shelby tube or Geoprobe® sampler in general accordance with ASTM D 1587 with recovery
	Location of sample obtained using Dames & Moore sampler and 300-pound hammer or pushed with recovery
	Location of sample obtained using Dames & Moore and 140-pound hammer or pushed with recovery
	Location of sample obtained using 3-inch-O.D. California split-spoon sampler and 140-pound hammer
	Location of grab sample
	Rock coring interval
	Water level during drilling
	Water level taken on date shown

Graphic Log of Soil and Rock Types



GEOTECHNICAL TESTING EXPLANATIONS

ATT	Atterberg Limits	PP	Pocket Penetrometer
CBR	California Bearing Ratio	P200	Percent Passing U.S. Standard No. 200 Sieve
CON	Consolidation		
DD	Dry Density	RES	Resilient Modulus
DS	Direct Shear	SIEV	Sieve Gradation
HYD	Hydrometer Gradation	TOR	Torvane
MC	Moisture Content	UC	Unconfined Compressive Strength
MD	Moisture-Density Relationship	VS	Vane Shear
OC	Organic Content	kPa	Kilopascal
P	Pushed Sample		

ENVIRONMENTAL TESTING EXPLANATIONS

CA	Sample Submitted for Chemical Analysis	ND	Not Detected
P	Pushed Sample	NS	No Visible Sheen
PID	Photoionization Detector Headspace Analysis	SS	Slight Sheen
		MS	Moderate Sheen
ppm	Parts per Million	HS	Heavy Sheen

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EXPLORATION KEY

TABLE A-1

RELATIVE DENSITY - COARSE-GRAINED SOILS

Relative Density	Standard Penetration Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)
Very Loose	0 – 4	0 - 11	0 - 4
Loose	4 – 10	11 - 26	4 - 10
Medium Dense	10 – 30	26 - 74	10 - 30
Dense	30 – 50	74 - 120	30 - 47
Very Dense	More than 50	More than 120	More than 47

CONSISTENCY - FINE-GRAINED SOILS

Consistency	Standard Penetration Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)	Unconfined Compressive Strength (tsf)
Very Soft	Less than 2	Less than 3	Less than 2	Less than 0.25
Soft	2 - 4	3 – 6	2 - 5	0.25 - 0.50
Medium Stiff	4 - 8	6 – 12	5 - 9	0.50 - 1.0
Stiff	8 - 15	12 – 25	9 - 19	1.0 - 2.0
Very Stiff	15 - 30	25 – 65	19 – 31	2.0 - 4.0
Hard	More than 30	More than 65	More than 31	More than 4.0

PRIMARY SOIL DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE-GRAINED SOILS (more than 50% retained on No. 200 sieve)	GRAVEL (more than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVELS (< 5% fines)	GW or GP	GRAVEL
		GRAVEL WITH FINES (≥ 5% and ≤ 12% fines)	GW-GM or GP-GM	GRAVEL with silt
			GW-GC or GP-GC	GRAVEL with clay
		GRAVELS WITH FINES (> 12% fines)	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND (50% or more of coarse fraction passing No. 4 sieve)	CLEAN SANDS (<5% fines)	SW or SP	SAND
		SANDS WITH FINES (≥ 5% and ≤ 12% fines)	SW-SM or SP-SM	SAND with silt
			SW-SC or SP-SC	SAND with clay
		SANDS WITH FINES (> 12% fines)	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOILS (50% or more passing No. 200 sieve)	SILT AND CLAY	Liquid limit less than 50	ML	SILT
			CL	CLAY
			CL-ML	silty CLAY
			OL	ORGANIC SILT or ORGANIC CLAY
		Liquid limit 50 or greater	MH	SILT
			CH	CLAY
			OH	ORGANIC SILT or ORGANIC CLAY
HIGHLY ORGANIC SOILS			PT	PEAT

MOISTURE CLASSIFICATION

Term	Field Test
dry	very low moisture, dry to touch
moist	damp, without visible moisture
wet	visible free water, usually saturated

ADDITIONAL CONSTITUENTS

Secondary granular components or other materials such as organics, man-made debris, etc.

Percent	Silt and Clay In: Fine-Grained Soils	Silt and Clay In: Coarse-Grained Soils	Percent	Sand and Gravel In: Fine-Grained Soils	Sand and Gravel In: Coarse-Grained Soils
< 5	trace	trace	< 5	trace	trace
5 – 12	minor	with	5 – 15	minor	minor
> 12	some	silty/clayey	15 – 30	with	with
			> 30	sandy/gravelly	Indicate %

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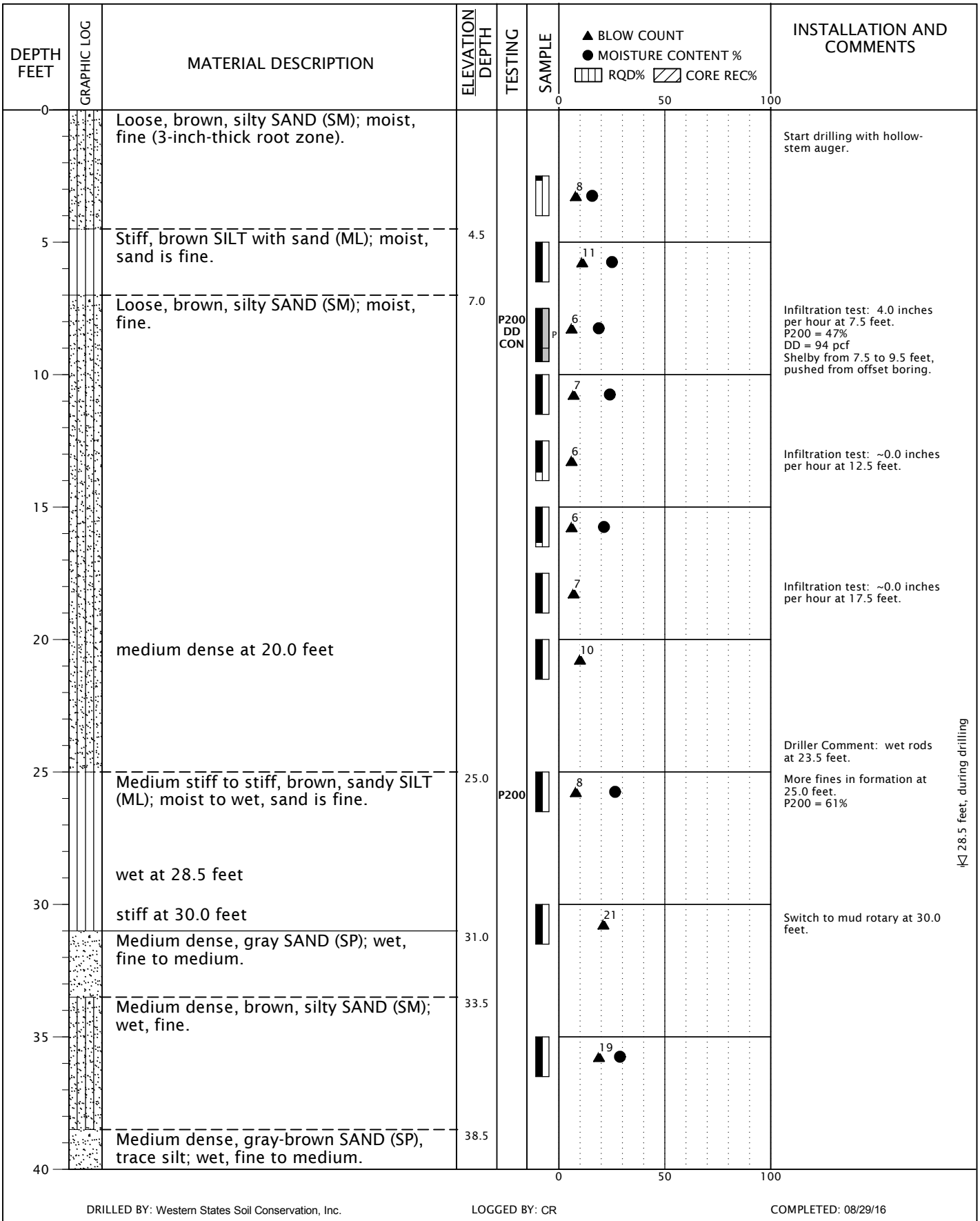
SOIL CLASSIFICATION SYSTEM

TABLE A-2



DRILLED BY: Western States Soil Conservation, Inc.

LOGGED BY: CR

COMPLETED: 08/29/16

BORING METHOD: hollow-stem auger and mud rotary (see document text)

BORING BIT DIAMETER: 4 1/2 inches/ 3 7/8 inches

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BORING B-1

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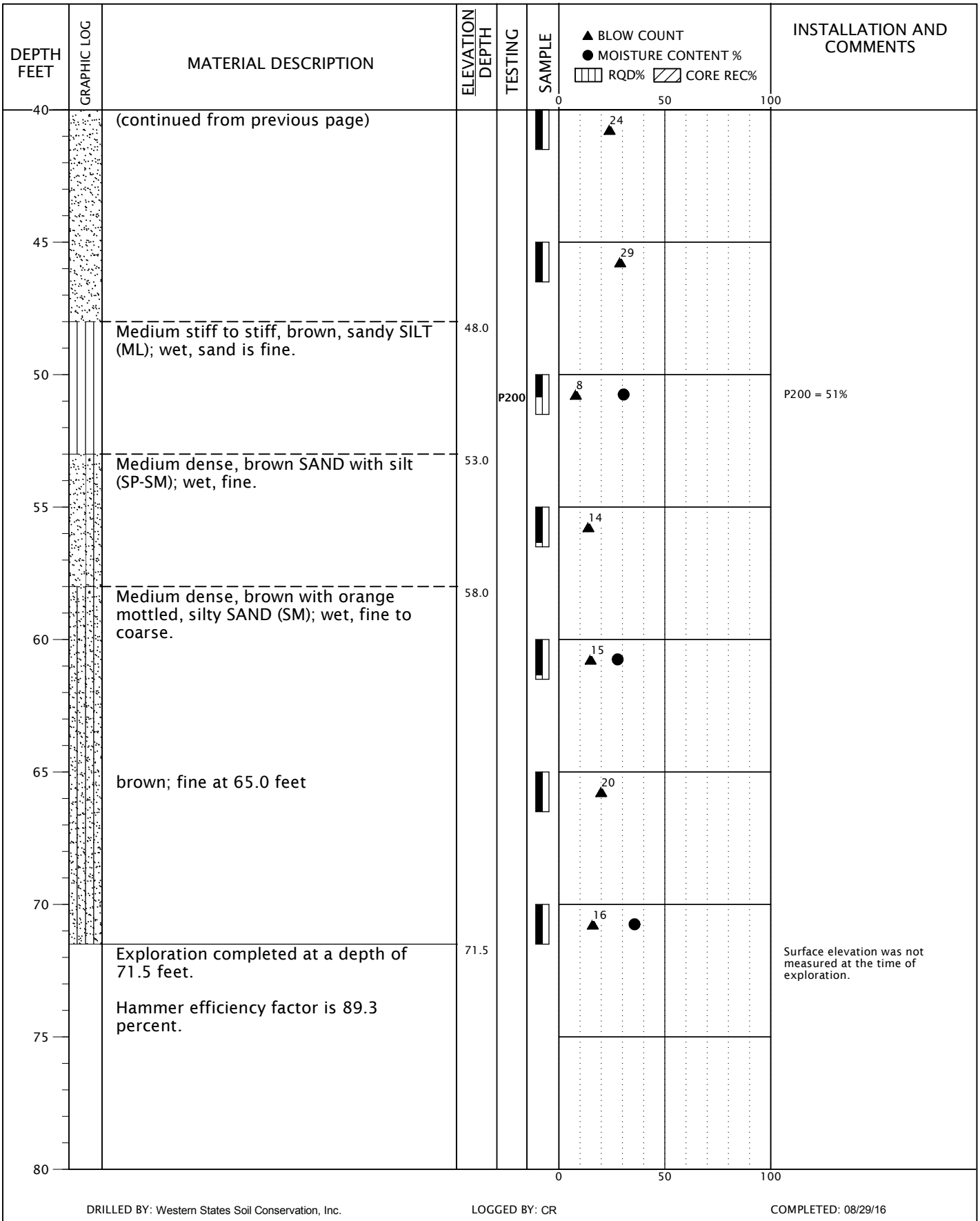
DEACON SHERWOOD DEVELOPMENT
SHERWOOD, OR

FIGURE A-1

BORING LOG DDG-8-01-B1_3_11_6.GPJ GEODESIGN.GDT PRINT DATE: 10/22/16:RC:KT



DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: CR COMPLETED: 08/29/16

BORING METHOD: hollow-stem auger and mud rotary (see document text) BORING BIT DIAMETER: 4 1/2 inches/ 3 7/8 inches

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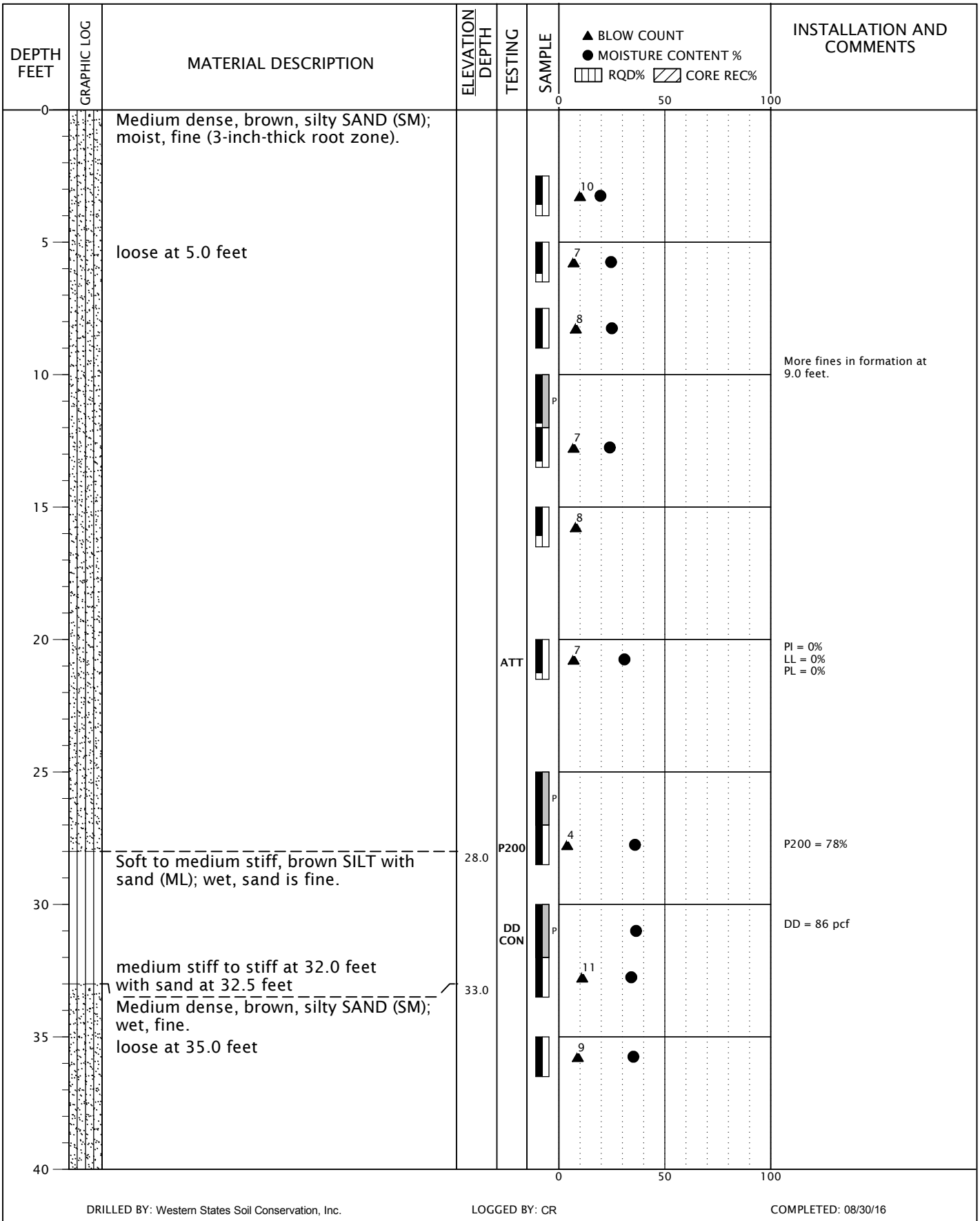
BORING B-1
(continued)

OCTOBER 2016

DEACON SHERWOOD DEVELOPMENT
SHERWOOD, OR

FIGURE A-1

BORING LOG DDG-8-01-B1_3_11_6.GPJ GEODESIGN.GDT PRINT DATE: 10/22/16:RC:KT



DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: CR COMPLETED: 08/30/16

BORING METHOD: mud rotary (see document text) BORING BIT DIAMETER: 3 7/8 inches

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BORING B-2

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DEACON SHERWOOD DEVELOPMENT
SHERWOOD, OR

FIGURE A-2

BORING LOG DDG-8-01-B1_3_11_6.GPJ GEODESIGN.GDT PRINT DATE: 10/22/16:RC:KT

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	SAMPLE / BLOW COUNT / MOISTURE CONTENT % / RQD% / CORE REC%	INSTALLATION AND COMMENTS
40	medium dense; moist to wet at 40.0 feet		15	
45	loose; wet at 45.0 feet		8	
50	medium dense; moist to wet at 50.0 feet		21	Less fines in formation at 50.0 feet.
55	wet, fine to medium at 55.0 feet		11	
60	moist to wet, fine at 60.0 feet		22	
	Stiff, brown SILT with sand (ML); wet, sand is fine.	62.0		
65	Medium dense, brown, silty SAND (SM); moist, fine.	66.0	19	
70			22	
	Exploration completed at a depth of 71.5 feet. Hammer efficiency factor is 89.3 percent.	71.5		Surface elevation was not measured at the time of exploration.
75				
80				

0 50 100

DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: CR COMPLETED: 08/30/16

BORING METHOD: mud rotary (see document text) BORING BIT DIAMETER: 3 7/8 inches

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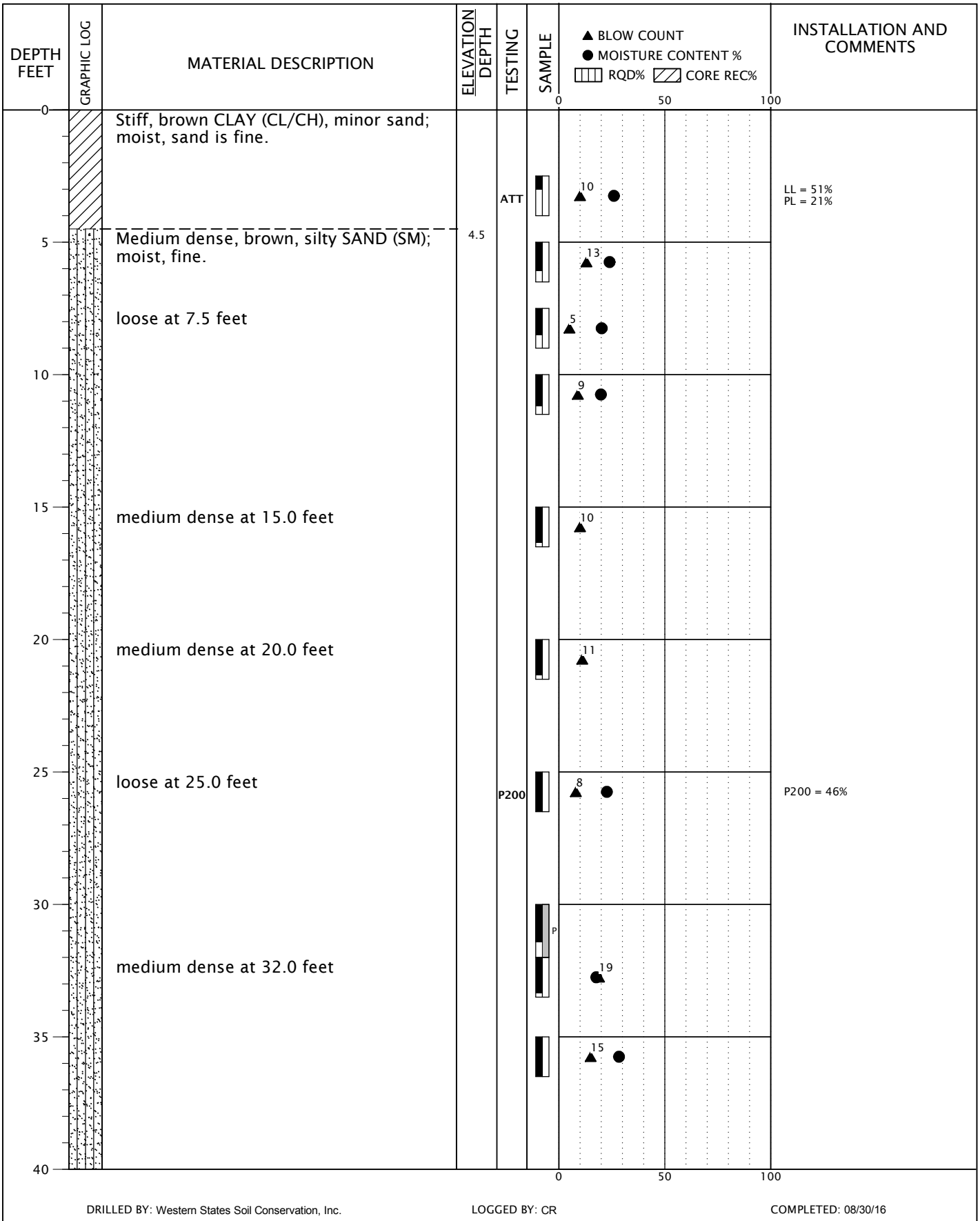
BORING B-2
(continued)

DEACON SHERWOOD DEVELOPMENT
SHERWOOD, OR

FIGURE A-2

BORING LOG DDG-8-01-B1_3_11_6.GPJ GEODESIGN.GDT PRINT DATE: 10/22/16:RC:KT



DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: CR COMPLETED: 08/30/16

BORING METHOD: mud rotary (see document text) BORING BIT DIAMETER: 3 7/8 inches

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BORING B-3

DEACON SHERWOOD DEVELOPMENT
SHERWOOD, OR

FIGURE A-3

BORING LOG DDG-8-01-B1_3_11_6.GPJ GEODESIGN.GDT PRINT DATE: 10/22/16:RC:KT

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	▲ BLOW COUNT ● MOISTURE CONTENT % RQD% CORE REC% (0 50 100)	INSTALLATION AND COMMENTS
40		loose at 40.0 feet		P200		8 ▲ ●	P200 = 16%
45		medium dense at 45.0 feet				17 ▲	More fines in formation at 45.0 feet.
50		Exploration completed at a depth of 51.5 feet. Hammer efficiency factor is 89.3 percent.	51.5			11 ▲ ●	Surface elevation was not measured at the time of exploration.
55							
60							
65							
70							
75							
80						0 50 100	

DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: CR COMPLETED: 08/30/16

BORING METHOD: mud rotary (see document text) BORING BIT DIAMETER: 3 7/8 inches

BORING LOG DDG-8-01-B1_3_I1_6.GPJ GEODESIGN.GDT PRINT DATE: 10/22/16:RC:KT

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OCTOBER 2016

BORING B-3
(continued)

DEACON SHERWOOD DEVELOPMENT
SHERWOOD, OR

FIGURE A-3

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	▲ BLOW COUNT ● MOISTURE CONTENT %	COMMENTS
I-1						0 50 100	
0.0		Stiff, brown SILT (ML), trace sand; moist, sand is fine (4-inch-thick root zone).					
2.5		Loose, brown, silty SAND (SM) to medium stiff, sandy SILT (ML); moist, sand is fine.	2.5				
5.0		Exploration completed at a depth of 5.0 feet.	5.0	P200	☒	●	Infiltration test: 0.2 inch per hour at 4.8 feet. P200 = 55% Surface elevation was not measured at the time of exploration.
7.5							
						0 50 100	
I-2						0 50 100	
0.0		Stiff, brown SILT (ML), trace sand; moist, sand is fine (3-inch-thick root zone).					
2.5		Loose, brown, silty SAND (SM); moist, fine.	2.0				Variable fines content observed throughout formation.
5.0		Exploration completed at a depth of 5.0 feet.	5.0	P200	☒	●	Infiltration test: 0.7 inch per hour at 4.5 feet. P200 = 47% Surface elevation was not measured at the time of exploration.
7.5							
						0 50 100	

DRILLED BY: GeoDesign, Inc. staff | LOGGED BY: CR | COMPLETED: 10/11/16

BORING METHOD: hand auger (see document text) | BORING BIT DIAMETER: 4 inches

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BORING

OCTOBER 2016

DEACON SHERWOOD DEVELOPMENT
SHERWOOD, OR

FIGURE A-4

BORING LOG - 2 PER PAGE DDG-8-01-B1_3_I1_6.GPJ GEODESIGN.GDT PRINT DATE: 10/20/16:RC

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	▲ BLOW COUNT ● MOISTURE CONTENT %	COMMENTS
I-3						0 50 100	
0.0		Stiff, brown SILT (ML), minor gravel; moist, gravel is subangular (3-inch-thick root zone) - **FILL**.					
		Loose, brown, silty SAND (SM); moist, fine.	2.0				Variable fines content observed throughout formation.
2.5							
5.0		Exploration completed at a depth of 5.0 feet.	5.0	P200	☒	●	P200 = 45% Infiltration test: 3.0 inches per hour at 4.8 feet. Surface elevation was not measured at the time of exploration.
7.5							
						0 50 100	
I-4						0 50 100	
0.0		Stiff, brown SILT (ML), trace gravel; moist (3-inch-thick root zone) - **FILL**.					
		Loose, brown, silty SAND (SM); moist, fine.	1.5				Less silty at 3.5 feet.
2.5							
5.0		Exploration completed at a depth of 5.0 feet.	5.0	P200	☒	●	Infiltration test: 0.5 inch per hour at 4.7 feet. P200 = 28% Surface elevation was not measured at the time of exploration.
7.5							
						0 50 100	

DRILLED BY: GeoDesign, Inc. staff | LOGGED BY: CR | COMPLETED: 10/12/16

BORING METHOD: hand auger (see document text) | BORING BIT DIAMETER: 4 inches

BORING LOG - 2 PER PAGE DDG-8-01-B1_3_I1_6.GPJ GEODESIGN.GDT PRINT DATE: 10/20/16:RC

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BORING
(continued)

OCTOBER 2016

DEACON SHERWOOD DEVELOPMENT
SHERWOOD, OR

FIGURE A-5

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	▲ BLOW COUNT ● MOISTURE CONTENT %	COMMENTS
I-5						0 50 100	
0.0		Stiff, brown SILT (ML), minor sand; moist, sand is fine (3-inch-thick root zone).					
2.5		Medium dense, brown, silty SAND (SM) to medium stiff, sandy SILT (ML); moist, sand is fine.	3.0				
5.0		Exploration completed at a depth of 5.0 feet.	5.0	P200	☒	●	Infiltration test: 0.5 inch per hour at 4.6 feet. P200 = 58% Surface elevation was not measured at the time of exploration.
7.5							
						0 50 100	
I-6						0 50 100	
0.0		Stiff, brown SILT (ML), trace sand; moist, sand is fine (4-inch-thick root zone).					
2.5		minor sand at 2.5 feet Medium dense, brown, silty SAND (SM); moist, fine.	3.0				
5.0		Exploration completed at a depth of 5.0 feet.	5.0	P200	☒	●	Infiltration test: 0.2 inch per hour at 4.5 feet. Less fines in formation at 4.5 feet. P200 = 42% Surface elevation was not measured at the time of exploration.
7.5							
						0 50 100	

DRILLED BY: GeoDesign, Inc. staff | LOGGED BY: CR | COMPLETED: 10/12/16

BORING METHOD: hand auger (see document text) | BORING BIT DIAMETER: 4 inches

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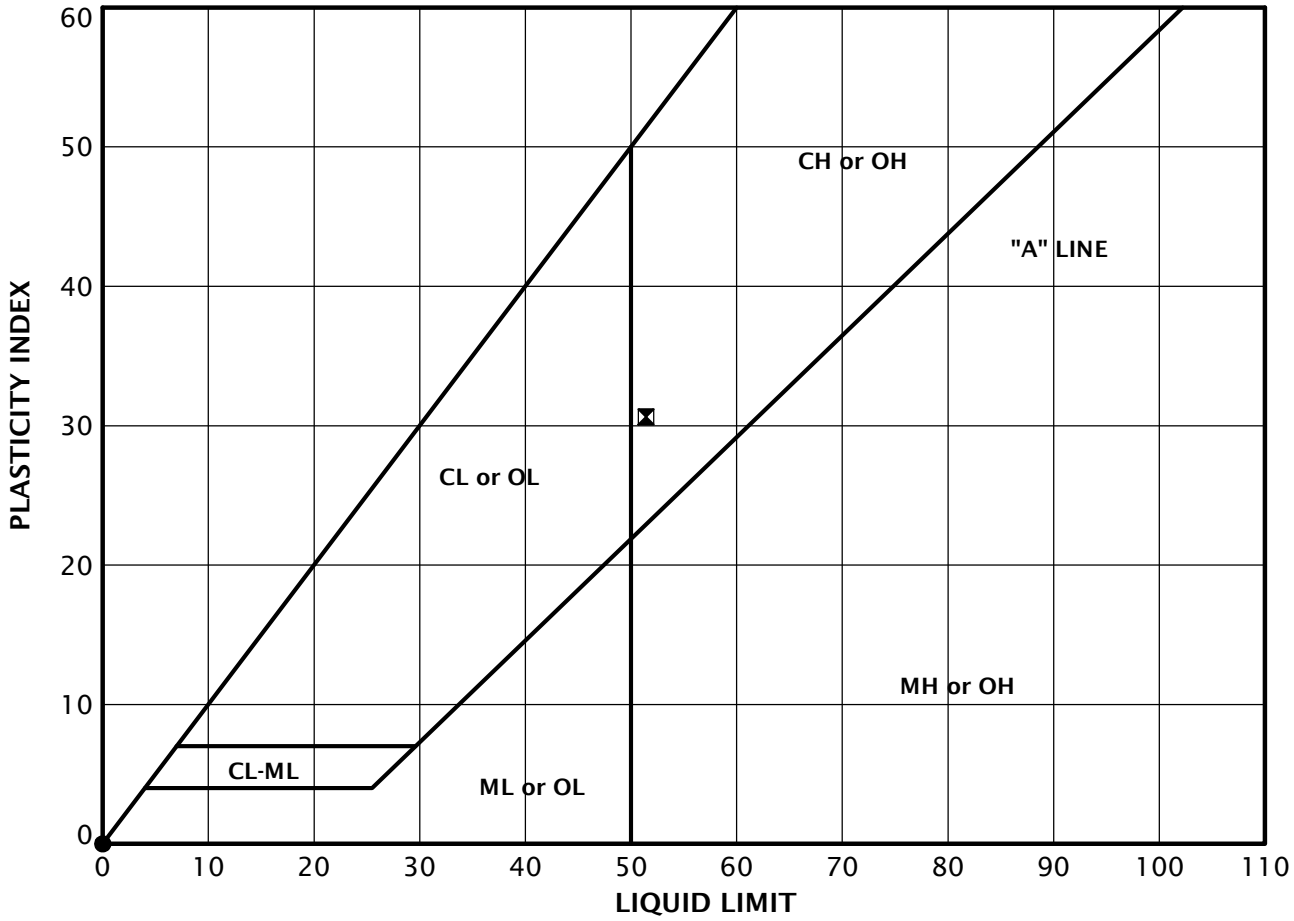
DDG-8-01

BORING
(continued)

OCTOBER 2016

DEACON SHERWOOD DEVELOPMENT
SHERWOOD, OR

FIGURE A-6



KEY	EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	MOISTURE CONTENT (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
●	B-2	20.0	31	NP	NP	NP
⊠	B-3	2.5	26	51	21	30

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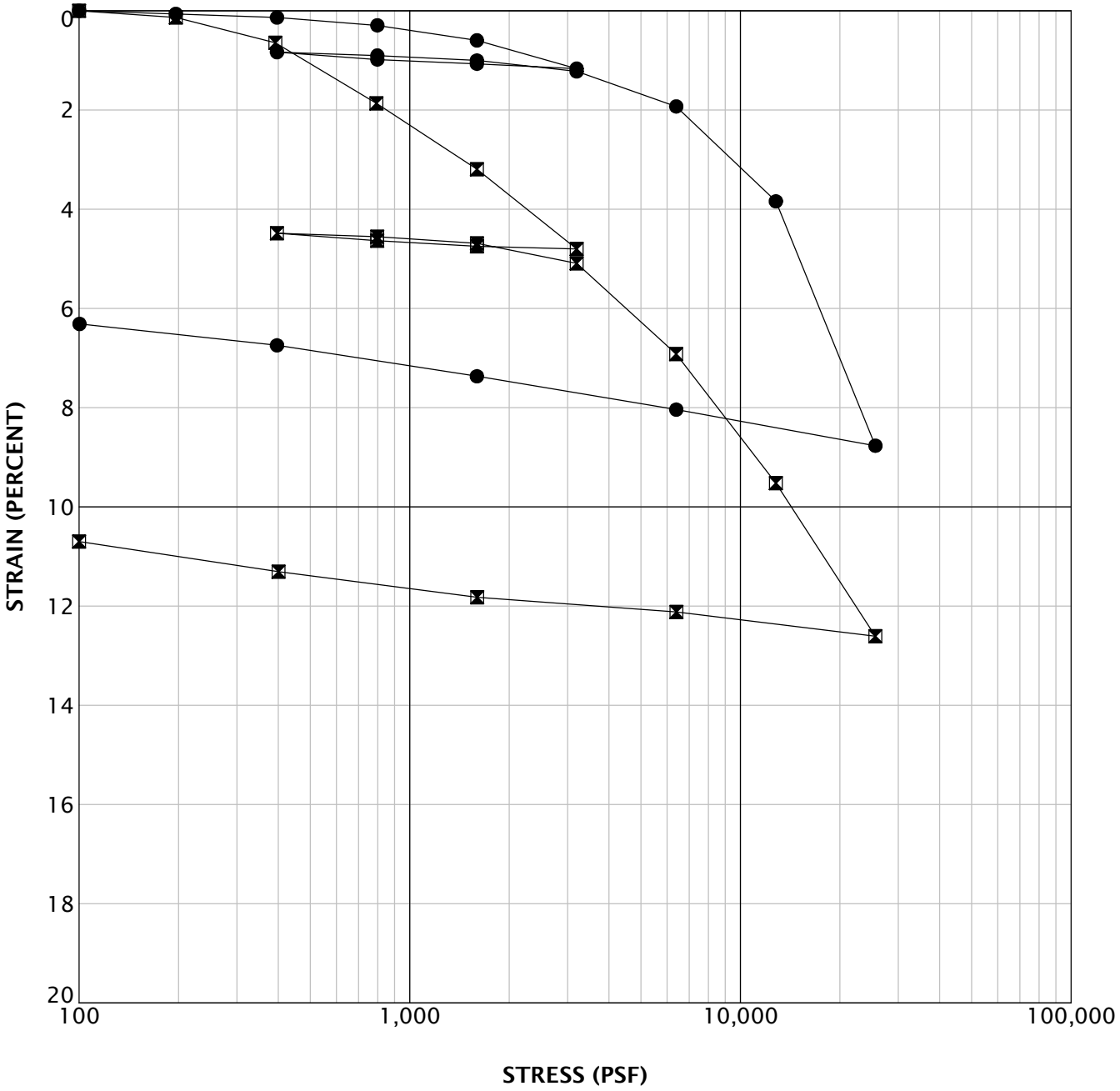
Portland OR 97224
Off 503.968.8787 Fax 503.968.3068

DDG-8-01	**ATTERBERG LIMITS TEST RESULTS**	
OCTOBER 2016	DEACON SHERWOOD DEVELOPMENT SHERWOOD, OR	**FIGURE A-7**



KEY	EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)
●	B-1	7.5	36	82
⊠	B-2	30.0	36	86

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DDG-8-01

CONSOLIDATION TEST RESULTS

OCTOBER 2016

DEACON SHERWOOD DEVELOPMENT
SHERWOOD, OR

FIGURE A-8

SAMPLE INFORMATION			MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	SIEVE			ATTERBERG LIMITS		
EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	ELEVATION (FEET)			GRAVEL (PERCENT)	SAND (PERCENT)	P200 (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
B-1	2.5		16							
B-1	5.0		25							
B-1	7.5		19	94			47			
B-1	10.0		24							
B-1	15.0		21							
B-1	25.0		27				61			
B-1	35.0		29							
B-1	50.0		31				51			
B-1	60.0		28							
B-1	70.0		36							
B-2	2.5		20							
B-2	5.0		25							
B-2	7.5		25							
B-2	12.0		24							
B-2	20.0		31					NP	NP	NP
B-2	27.0		36				78			
B-2	30.0		36	86						
B-2	32.0		34							
B-2	35.0		35							
B-2	45.0		39							
B-2	55.0		28							
B-2	65.0		36							
B-3	2.5		26					51	21	30
B-3	5.0		24							
B-3	7.5		20							
B-3	10.0		20							
B-3	25.0		23				46			

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DDG-8-01

SUMMARY OF LABORATORY DATA

OCTOBER 2016

DEACON SHERWOOD DEVELOPMENT
SHERWOOD, OR

FIGURE A-9

SAMPLE INFORMATION			MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	SIEVE			ATTERBERG LIMITS		
EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	ELEVATION (FEET)			GRAVEL (PERCENT)	SAND (PERCENT)	P200 (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
B-3	32.0		18							
B-3	35.0		28							
B-3	40.0		31				16			
B-3	50.0		34							
I-1	4.8		22				55			
I-2	4.5		18				47			
I-3	4.5		15				45			
I-4	4.8		12				28			
I-5	4.5		18				58			
I-6	4.5		14				42			

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DDG-8-01

SUMMARY OF LABORATORY DATA
(continued)

OCTOBER 2016

DEACON SHERWOOD DEVELOPMENT
SHERWOOD, OR

FIGURE A-9

WSSC-7-01 - TEST BORING B-2 25FT
OP: WMN

TRUCK NO. 4
Date: 30-May-2015

AR: 1.41 in²
LE: 28.10 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft³
EM: 30,000 ksi
JC: 0.00 []

ETR: Energy Transfer Ratio
EMX: Max Transferred Energy
CSB: Compression Stress at Bottom
BPM: Blows per Minute
FFS: Force Full Scale

DMX: Maximum Displacement
SFR: Skin friction w/ damping correction
MEX: Maximum Strain
VMX: Maximum Velocity

BL#	depth ft	BLC bl/ft	ETR (%)	EMX k-ft	CSB ksi	BPM bpm	FFS kips	DMX in	SFR kips	MEX µE	VMX f/s
9	25.14	7	89.1	0.3	0.0	43.4	60	1.42	0	973	16.1
11	25.42	7	89.1	0.3	0.0	43.5	60	1.10	0	984	16.3
13	25.69	7	88.4	0.3	0.0	43.4	60	1.26	0	957	16.0
15	25.97	7	90.5	0.3	0.0	43.4	60	1.14	0	972	15.9
17	26.25	7	87.7	0.3	0.0	43.5	60	0.98	0	941	15.2
19	26.53	7	86.6	0.3	0.0	43.5	60	0.91	0	930	15.3
21	26.81	7	89.2	0.3	0.0	43.6	60	0.84	0	983	15.9
23	27.08	7	87.3	0.3	0.0	43.6	60	0.76	0	932	15.2
25	27.36	7	87.5	0.3	0.0	43.6	60	1.08	0	916	15.2
27	27.64	7	90.5	0.3	0.0	43.7	60	0.88	0	954	15.6
29	27.92	7	91.0	0.3	0.0	43.6	60	0.88	0	948	16.1
31	28.19	7	89.0	0.3	0.0	43.6	60	0.66	0	967	16.0
33	28.47	7	88.4	0.3	0.0	43.7	60	0.75	0	931	15.9
44	30.00	7	86.3	0.3	0.0	43.0	60	0.88	0	908	13.7
46	30.21	10	90.8	0.3	0.0	43.1	60	0.81	0	992	15.4
48	30.42	10	90.1	0.3	0.0	43.1	60	0.64	0	1,002	15.5
50	30.63	10	89.8	0.3	0.0	43.1	60	0.61	0	977	15.6
52	30.83	10	90.3	0.3	0.0	43.2	60	0.64	0	980	15.5
54	31.04	10	90.3	0.3	0.0	43.2	60	0.57	0	995	15.5
56	31.25	10	88.6	0.3	0.0	43.3	60	0.63	0	972	14.8
58	31.46	10	90.2	0.3	0.0	43.3	60	0.41	0	1,011	15.7
60	31.67	10	91.2	0.3	0.0	43.2	60	0.81	0	994	15.7
62	31.88	10	89.2	0.3	0.0	43.1	60	0.35	0	1,019	15.2
64	32.08	10	91.8	0.3	0.0	43.3	60	0.58	0	1,006	16.0
66	32.29	10	90.2	0.3	0.0	43.3	60	0.47	0	970	15.7
68	32.50	10	90.9	0.3	0.0	43.3	60	0.54	0	999	16.0
70	32.71	10	91.0	0.3	0.0	43.4	60	0.52	0	1,017	15.7
72	32.92	10	90.9	0.3	0.0	43.3	60	0.56	0	1,009	16.0
74	33.13	10	89.8	0.3	0.0	43.3	60	0.49	0	967	15.4
76	33.33	10	89.6	0.3	0.0	43.4	60	0.64	0	975	15.8
78	33.54	10	90.8	0.3	0.0	43.3	60	0.63	0	989	15.4
80	33.75	10	90.9	0.3	0.0	43.2	60	0.63	0	984	15.9
92	35.00	10	90.9	0.3	0.0	41.7	60	1.06	0	980	15.4
94	35.24	8	89.7	0.3	0.0	41.8	60	0.89	0	972	15.6
96	35.48	8	90.1	0.3	0.0	41.7	60	0.94	0	971	16.0
98	35.71	8	89.6	0.3	0.0	41.7	60	0.89	0	969	15.8
100	35.95	8	92.0	0.3	0.0	41.9	60	0.98	0	971	15.7
102	36.19	8	91.3	0.3	0.0	41.9	60	1.07	0	974	15.6
104	36.43	8	91.2	0.3	0.0	41.8	60	0.67	0	969	15.6
106	36.67	8	90.9	0.3	0.0	41.9	60	0.54	0	969	16.0
108	36.90	8	91.6	0.3	0.0	41.9	60	0.83	0	974	15.7
110	37.14	8	91.2	0.3	0.0	41.9	60	0.81	0	979	15.6
112	37.38	8	89.2	0.3	0.0	41.9	60	0.51	0	985	15.8
114	37.62	8	91.1	0.3	0.0	41.8	60	0.81	0	963	15.4
116	37.86	8	92.1	0.3	0.0	42.0	60	0.62	0	995	15.5

WSSC-7-01 - TEST BORING B-2 25FT
OP: WMN

TRUCK NO. 4
Date: 30-May-2015

BL#	depth ft	BLC bl/ft	ETR (%)	EMX k-ft	CSB ksi	BPM bpm	FFS kips	DMX in	SFR kips	MEX µE	VMX f/s
118	38.10	8	91.0	0.3	0.0	42.0	60	0.60	0	986	15.3
120	38.33	8	89.3	0.3	0.0	41.9	60	0.61	0	972	14.8
122	38.57	8	89.9	0.3	0.0	42.0	60	0.56	0	954	15.2
124	38.81	8	90.8	0.3	0.0	42.1	60	0.48	0	956	15.3
134	40.00	8	89.5	0.3	0.0	40.9	60	1.33	0	887	14.5
136	40.24	8	89.5	0.3	0.0	40.9	60	1.31	0	892	13.7
138	40.48	8	89.3	0.3	0.0	41.0	60	1.17	0	913	14.4
140	40.71	8	89.6	0.3	0.0	41.0	60	0.85	0	890	14.4
142	40.95	8	89.7	0.3	0.0	41.0	60	1.06	0	900	14.6
144	41.19	8	90.0	0.3	0.0	41.0	60	0.93	0	899	14.7
146	41.43	8	89.4	0.3	0.0	41.1	60	0.52	0	922	14.7
148	41.67	8	89.3	0.3	0.0	41.0	60	0.88	0	923	14.4
150	41.90	8	89.2	0.3	0.0	41.0	60	0.67	0	939	14.2
152	42.14	8	90.7	0.3	0.0	41.0	60	0.77	0	958	14.5
154	42.38	8	88.7	0.3	0.0	41.1	60	0.80	0	936	14.3
156	42.62	8	88.5	0.3	0.0	41.1	60	0.78	0	925	14.1
158	42.86	8	89.2	0.3	0.0	41.2	60	0.72	0	917	14.5
160	43.10	8	88.3	0.3	0.0	41.1	60	0.65	0	909	14.2
162	43.33	8	88.0	0.3	0.0	40.9	60	0.62	0	920	14.1
	Average		89.3	0.3	0.0	42.3	60	0.77	0	957	15.3
	Std. Dev.		6.8	0.0	0.0	2.0	0	0.25	0	60	1.1

Total number of blows analyzed: 128

BL# Sensors

8-162 F3: [SPT B1] 217.8 (1.00); F4: [SPT B2] 218.9 (1.00); A3: [K0232] 290.0 (1.00); A4: [K0231] 325.0 (1.00)

BL# Comments

34 N:6,11,16
44 LE = 33.42 ft; WC = 16,766.5 f/s
81 N: 8,15,23
92 LE = 38.42 ft; WC = 16,800.0 f/s
125 N: 9,13,20
134 LE = 43.60 ft; WC = 16,782.6 f/s
162 N: 7,12,17

Time Summary

Drive	35 seconds	10:31 AM - 10:32 AM (5/30/2015) BN 8 - 34
Stop	18 minutes 15 seconds	10:32 AM - 10:50 AM
Drive	51 seconds	10:50 AM - 10:51 AM BN 44 - 81
Stop	21 minutes 2 seconds	10:51 AM - 11:12 AM
Drive	48 seconds	11:12 AM - 11:13 AM BN 92 - 125
Stop	15 minutes 50 seconds	11:13 AM - 11:28 AM
Drive	40 seconds	11:28 AM - 11:29 AM BN 134 - 162

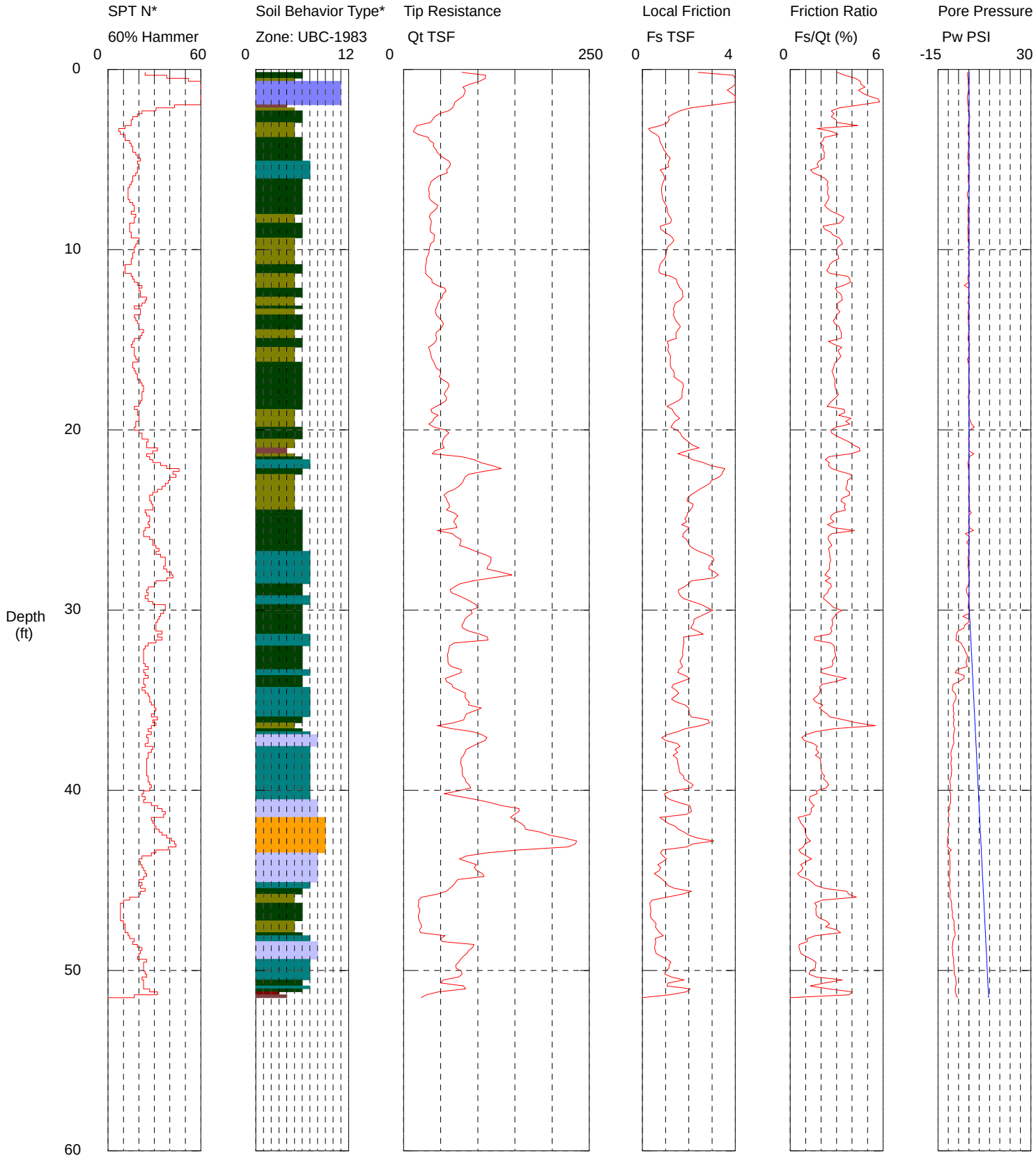
Total time [00:58:04] = (Driving [00:02:56] + Stop [00:55:08])

APPENDIX B

GeoDesign / CPT-1 / 16770 SW Edy Rd Sherwood

Operator: OGE TAJ
Sounding: CPT-1
Cone Used: DPG1211
GPS Data: NO GPS

CPT Date/Time: 8/13/2016 12:15:31 PM
Location: GeoDesign / CPT-1 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-1 / 16770 SW Edy Rd Sherwood



Maximum Depth = 51.51 feet

Depth Increment = 0.164 feet

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

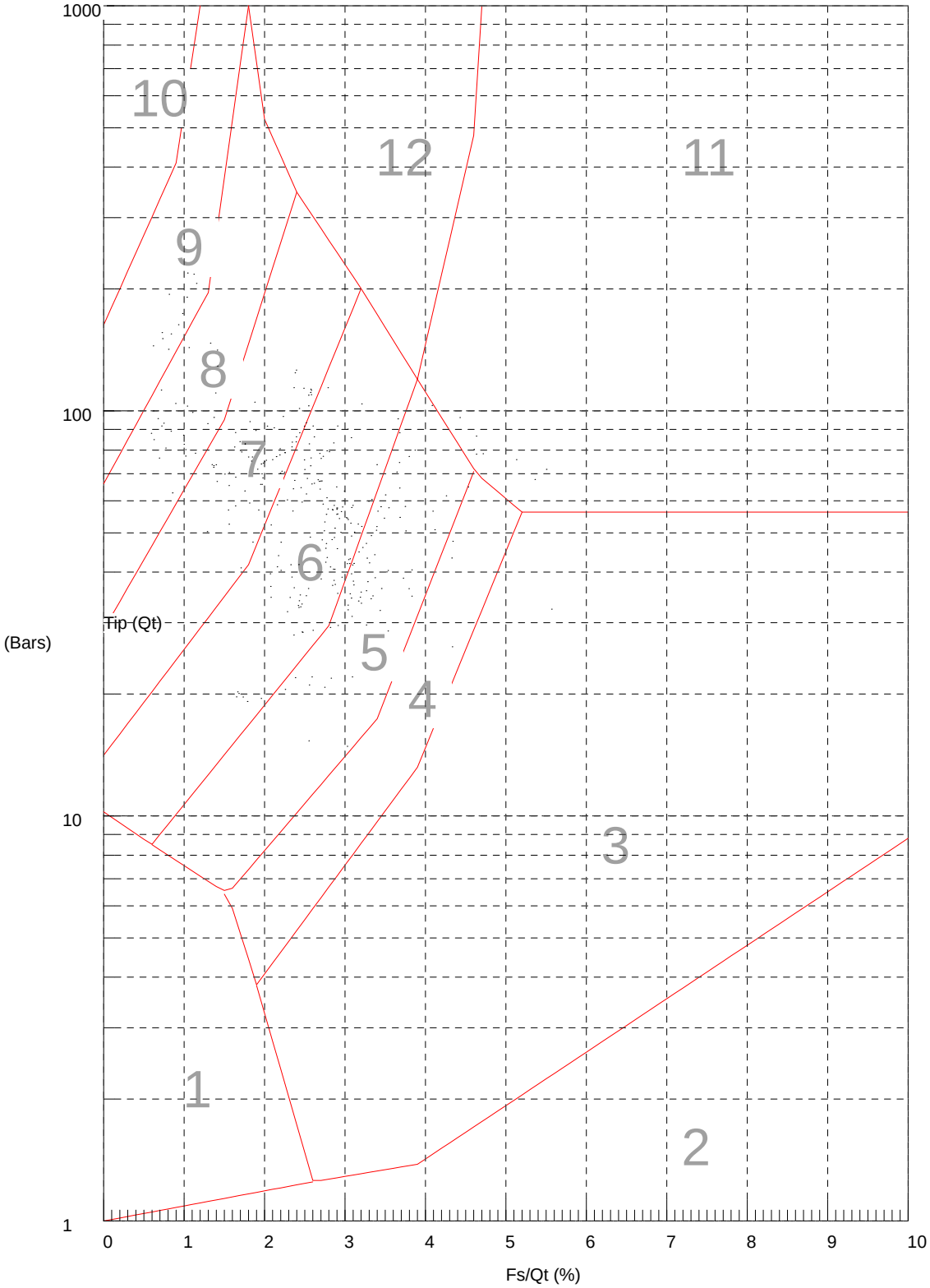
*Soil behavior type and SPT based on data from UBC-1983

GeoDesign / CPT-1 / 16770 SW Edy Rd Sherwood

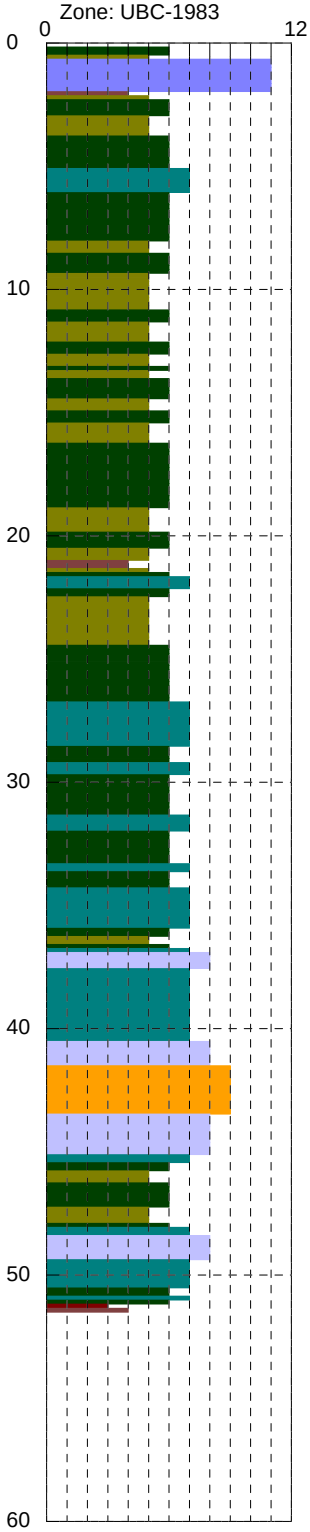
Operator: OGE TAJ
Sounding: CPT-1
Cone Used: DPG1211

CPT Date/Time: 8/13/2016 12:15:31 PM
Location: GeoDesign / CPT-1 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-1 / 16770 SW Edy Rd Sherwood

Classification Data:
Robertson and Campanella UBC-1983



Soil Behavior Type*
Zone: UBC-1983



1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

Data File:CPT-1 8/13/2016 12:15:31 PM
Operator:OGE TAJ Location:GeoDesign / CPT-1 / 16770 SW Edy Rd Sherwood
Cone ID:DPG1211 Job Number:16084 / GeoDesign / CPT-1 / 16770 SW Edy Rd Sherw
Customer: Units:English
GPS DATA:NO GPS

Depth (ft)	Qt TSF	Fs TSF	Fs/Qt (%)	Pw PSI	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
0.16	78.7	2.399	3.048	-0.65	24	6	sandy silt to clayey silt
0.33	110.6	3.908	3.533	-0.68	38	6	sandy silt to clayey silt
0.49	110.1	4.643	4.217	-0.45	52	5	clayey silt to silty clay
0.66	102.6	4.645	4.529	-0.32	96	11	very stiff fine grained (*)
0.82	89.0	4.072	4.575	-0.40	87	11	very stiff fine grained (*)
0.98	80.0	3.862	4.830	-0.25	80	11	very stiff fine grained (*)
1.15	82.9	3.656	4.412	-0.16	78	11	very stiff fine grained (*)
1.31	82.4	3.839	4.661	-0.52	78	11	very stiff fine grained (*)
1.48	80.4	4.087	5.085	-0.69	76	11	very stiff fine grained (*)
1.64	74.7	4.259	5.697	-0.69	72	11	very stiff fine grained (*)
1.80	69.5	4.017	5.778	-0.66	68	11	very stiff fine grained (*)
1.97	67.9	3.095	4.561	-0.48	43	4	silty clay to clay
2.13	66.0	2.100	3.184	-0.14	31	5	clayey silt to silty clay
2.30	60.5	1.610	2.661	-0.43	22	6	sandy silt to clayey silt
2.46	48.0	1.360	2.833	0.14	19	6	sandy silt to clayey silt
2.62	42.0	1.115	2.654	0.45	16	6	sandy silt to clayey silt
2.79	39.0	1.159	2.973	0.21	15	6	sandy silt to clayey silt
2.95	35.8	1.085	3.030	0.00	15	5	clayey silt to silty clay
3.12	18.0	0.785	4.358	-0.48	11	5	clayey silt to silty clay
3.28	15.3	0.265	1.736	-0.25	7	5	clayey silt to silty clay
3.44	13.2	0.358	2.706	-0.34	8	5	clayey silt to silty clay
3.61	19.5	0.601	3.082	-0.44	11	5	clayey silt to silty clay
3.77	33.3	0.727	2.188	0.27	11	6	sandy silt to clayey silt
3.94	34.8	0.741	2.127	-0.19	14	6	sandy silt to clayey silt
4.10	40.5	0.788	1.945	-0.35	15	6	sandy silt to clayey silt
4.27	40.2	0.869	2.163	-0.18	16	6	sandy silt to clayey silt
4.43	43.5	0.913	2.098	-0.16	16	6	sandy silt to clayey silt
4.59	45.5	1.003	2.208	-0.44	18	6	sandy silt to clayey silt
4.76	48.7	1.072	2.203	-0.57	19	6	sandy silt to clayey silt
4.92	54.5	1.199	2.201	-0.65	21	6	sandy silt to clayey silt
5.09	60.7	1.136	1.871	-0.24	19	7	silty sand to sandy silt
5.25	63.2	1.099	1.738	-0.43	20	7	silty sand to sandy silt
5.41	61.6	1.128	1.832	-0.07	19	7	silty sand to sandy silt
5.58	57.8	0.762	1.317	0.00	19	7	silty sand to sandy silt
5.74	59.0	0.871	1.478	0.15	18	7	silty sand to sandy silt
5.91	47.8	0.930	1.947	-0.47	16	7	silty sand to sandy silt
6.07	41.9	0.954	2.275	-0.31	16	6	sandy silt to clayey silt
6.23	36.9	0.904	2.450	-0.38	15	6	sandy silt to clayey silt
6.40	35.8	0.854	2.384	0.06	14	6	sandy silt to clayey silt
6.56	33.8	0.829	2.454	0.04	13	6	sandy silt to clayey silt
6.73	34.0	0.824	2.421	-0.21	13	6	sandy silt to clayey silt
6.89	34.7	0.833	2.402	-0.81	13	6	sandy silt to clayey silt
7.05	34.1	0.860	2.519	-0.68	13	6	sandy silt to clayey silt
7.22	35.7	0.880	2.467	-0.15	14	6	sandy silt to clayey silt
7.38	40.2	0.946	2.353	-0.12	16	6	sandy silt to clayey silt
7.55	45.9	1.022	2.226	-0.33	17	6	sandy silt to clayey silt
7.71	44.5	1.071	2.405	-0.43	17	6	sandy silt to clayey silt
7.87	40.3	1.076	2.671	-0.64	15	6	sandy silt to clayey silt
8.04	35.8	1.110	3.102	-0.35	18	5	clayey silt to silty clay
8.20	34.7	1.206	3.474	-0.41	17	5	clayey silt to silty clay
8.37	37.2	1.261	3.388	-0.50	17	5	clayey silt to silty clay
8.53	37.5	1.194	3.182	-0.15	14	6	sandy silt to clayey silt
8.69	36.3	0.772	2.128	-0.49	14	6	sandy silt to clayey silt
8.86	35.8	0.790	2.211	-0.58	14	6	sandy silt to clayey silt
9.02	36.5	0.949	2.603	-0.48	15	6	sandy silt to clayey silt
9.19	41.9	1.164	2.775	-0.37	15	6	sandy silt to clayey silt
9.35	41.2	1.308	3.179	-0.39	20	5	clayey silt to silty clay

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
9.51	41.1	1.350	3.287	-0.52	19	5	clayey silt to silty clay
9.68	36.5	1.237	3.390	0.17	18	5	clayey silt to silty clay
9.84	35.2	1.092	3.105	-0.44	17	5	clayey silt to silty clay
10.01	34.6	1.038	2.996	-0.05	17	5	clayey silt to silty clay
10.17	34.1	1.023	3.003	-0.35	16	5	clayey silt to silty clay
10.33	32.5	1.009	3.109	0.00	16	5	clayey silt to silty clay
10.50	30.9	0.972	3.147	-0.55	15	5	clayey silt to silty clay
10.66	30.7	0.845	2.754	0.01	15	5	clayey silt to silty clay
10.83	30.0	0.762	2.543	-0.27	11	6	sandy silt to clayey silt
10.99	29.4	0.734	2.500	0.02	11	6	sandy silt to clayey silt
11.15	29.8	0.703	2.356	-0.30	11	6	sandy silt to clayey silt
11.32	29.8	0.764	2.564	-0.04	15	5	clayey silt to silty clay
11.48	32.9	1.228	3.729	-0.48	16	5	clayey silt to silty clay
11.65	38.1	1.470	3.860	-0.50	17	5	clayey silt to silty clay
11.81	38.3	1.490	3.889	-0.13	19	5	clayey silt to silty clay
11.98	44.7	1.550	3.467	-2.27	22	5	clayey silt to silty clay
12.14	55.4	1.620	2.925	-0.14	20	6	sandy silt to clayey silt
12.30	57.2	1.730	3.025	-0.15	21	6	sandy silt to clayey silt
12.47	53.0	1.734	3.273	0.15	21	6	sandy silt to clayey silt
12.63	52.3	1.745	3.335	-0.40	25	5	clayey silt to silty clay
12.80	48.9	1.647	3.372	-0.13	24	5	clayey silt to silty clay
12.96	46.3	1.420	3.064	-0.56	22	5	clayey silt to silty clay
13.12	45.3	1.388	3.064	0.30	17	6	sandy silt to clayey silt
13.29	43.5	1.330	3.058	0.06	21	5	clayey silt to silty clay
13.45	42.8	1.376	3.213	-0.40	21	5	clayey silt to silty clay
13.62	44.2	1.329	3.010	-0.28	17	6	sandy silt to clayey silt
13.78	47.5	1.388	2.921	-0.49	18	6	sandy silt to clayey silt
13.94	51.5	1.439	2.793	-0.19	19	6	sandy silt to clayey silt
14.11	53.6	1.548	2.888	-0.27	20	6	sandy silt to clayey silt
14.27	52.0	1.640	3.154	-0.15	20	6	sandy silt to clayey silt
14.44	48.2	1.549	3.212	0.04	23	5	clayey silt to silty clay
14.60	43.9	1.451	3.306	-0.22	22	5	clayey silt to silty clay
14.76	43.5	1.440	3.310	-0.30	21	5	clayey silt to silty clay
14.93	44.6	1.469	3.291	-0.46	17	6	sandy silt to clayey silt
15.09	43.3	1.069	2.467	-0.22	16	6	sandy silt to clayey silt
15.26	39.4	1.117	2.838	0.45	15	6	sandy silt to clayey silt
15.42	33.5	1.119	3.336	-0.15	17	5	clayey silt to silty clay
15.58	35.2	1.090	3.100	-0.29	17	5	clayey silt to silty clay
15.75	36.3	1.152	3.175	0.11	17	5	clayey silt to silty clay
15.91	37.2	1.221	3.284	0.16	18	5	clayey silt to silty clay
16.08	38.4	1.203	3.133	-0.79	19	5	clayey silt to silty clay
16.24	41.0	1.197	2.923	-0.41	16	6	sandy silt to clayey silt
16.40	42.3	1.202	2.838	0.04	16	6	sandy silt to clayey silt
16.57	44.1	1.238	2.804	0.01	17	6	sandy silt to clayey silt
16.73	49.6	1.340	2.700	0.06	18	6	sandy silt to clayey silt
16.90	49.7	1.380	2.777	-0.03	19	6	sandy silt to clayey silt
17.06	48.2	1.359	2.822	-0.20	19	6	sandy silt to clayey silt
17.22	53.0	1.538	2.904	0.00	21	6	sandy silt to clayey silt
17.39	59.8	1.727	2.889	-0.02	22	6	sandy silt to clayey silt
17.55	61.3	1.773	2.893	0.26	23	6	sandy silt to clayey silt
17.72	59.2	1.734	2.927	-0.04	23	6	sandy silt to clayey silt
17.88	56.3	1.713	3.044	0.49	22	6	sandy silt to clayey silt
18.04	54.9	1.709	3.114	-0.16	22	6	sandy silt to clayey silt
18.21	57.8	1.708	2.953	-0.40	22	6	sandy silt to clayey silt
18.37	57.2	1.557	2.724	0.00	21	6	sandy silt to clayey silt
18.54	51.6	1.311	2.540	0.24	20	6	sandy silt to clayey silt
18.70	44.1	1.053	2.390	-0.14	17	6	sandy silt to clayey silt
18.86	36.9	1.291	3.501	0.19	19	5	clayey silt to silty clay
19.03	38.1	1.348	3.536	-0.12	19	5	clayey silt to silty clay
19.19	46.4	1.456	3.136	0.00	20	5	clayey silt to silty clay
19.36	40.9	1.607	3.931	0.09	20	5	clayey silt to silty clay
19.52	39.2	1.407	3.591	0.83	18	5	clayey silt to silty clay
19.69	34.0	1.312	3.860	1.24	18	5	clayey silt to silty clay

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
19.85	41.0	1.223	2.986	2.58	17	6	sandy silt to clayey silt
20.01	56.6	1.485	2.624	0.24	20	6	sandy silt to clayey silt
20.18	61.0	1.635	2.683	-0.13	22	6	sandy silt to clayey silt
20.34	56.4	1.693	3.001	0.33	22	6	sandy silt to clayey silt
20.51	53.5	1.822	3.407	-0.28	26	5	clayey silt to silty clay
20.67	52.4	1.992	3.802	0.11	25	5	clayey silt to silty clay
20.83	52.5	2.133	4.063	-0.03	25	5	clayey silt to silty clay
21.00	54.6	2.440	4.468	-0.09	32	4	silty clay to clay
21.16	42.2	1.907	4.519	-0.03	29	4	silty clay to clay
21.33	38.9	1.525	3.922	2.38	25	5	clayey silt to silty clay
21.49	77.9	1.957	2.512	0.32	27	6	sandy silt to clayey silt
21.65	95.0	2.156	2.270	-0.05	29	7	silty sand to sandy silt
21.82	103.8	2.622	2.526	-0.49	34	7	silty sand to sandy silt
21.98	118.9	2.942	2.474	-0.41	38	7	silty sand to sandy silt
22.15	131.7	3.557	2.700	-0.26	46	6	sandy silt to clayey silt
22.31	106.9	3.470	3.246	0.00	42	6	sandy silt to clayey silt
22.47	87.3	3.426	3.922	-0.03	44	5	clayey silt to silty clay
22.64	82.5	3.282	3.980	-0.29	40	5	clayey silt to silty clay
22.80	80.7	2.984	3.696	0.00	39	5	clayey silt to silty clay
22.97	78.6	2.909	3.701	-0.02	37	5	clayey silt to silty clay
23.13	74.4	2.695	3.624	0.09	35	5	clayey silt to silty clay
23.29	68.3	2.460	3.601	0.23	32	5	clayey silt to silty clay
23.46	59.4	2.278	3.834	0.23	29	5	clayey silt to silty clay
23.62	54.2	2.081	3.838	-0.24	27	5	clayey silt to silty clay
23.79	57.4	1.939	3.379	-0.16	27	5	clayey silt to silty clay
23.95	58.7	1.919	3.268	0.14	28	5	clayey silt to silty clay
24.11	61.1	2.179	3.568	0.14	29	5	clayey silt to silty clay
24.28	61.8	2.159	3.491	0.30	29	5	clayey silt to silty clay
24.44	57.8	2.065	3.574	0.27	24	6	sandy silt to clayey silt
24.61	67.8	1.950	2.877	1.16	25	6	sandy silt to clayey silt
24.77	73.0	1.922	2.633	-0.15	27	6	sandy silt to clayey silt
24.93	69.6	1.828	2.626	-0.01	27	6	sandy silt to clayey silt
25.10	67.5	1.908	2.825	-0.21	26	6	sandy silt to clayey silt
25.26	70.5	1.695	2.406	-0.06	27	6	sandy silt to clayey silt
25.43	71.9	2.018	2.806	0.35	24	6	sandy silt to clayey silt
25.59	45.5	1.887	4.150	2.19	23	6	sandy silt to clayey silt
25.75	65.7	1.764	2.686	-1.75	23	6	sandy silt to clayey silt
25.92	70.3	1.733	2.464	0.21	27	6	sandy silt to clayey silt
26.08	77.3	1.898	2.454	-0.01	29	6	sandy silt to clayey silt
26.25	76.8	1.978	2.573	-1.13	29	6	sandy silt to clayey silt
26.41	75.2	2.022	2.689	0.05	31	6	sandy silt to clayey silt
26.57	87.8	2.174	2.477	-0.15	33	6	sandy silt to clayey silt
26.74	96.8	2.433	2.515	-0.26	31	7	silty sand to sandy silt
26.90	108.3	2.761	2.551	-0.13	34	7	silty sand to sandy silt
27.07	117.4	3.016	2.568	-0.41	37	7	silty sand to sandy silt
27.23	117.9	3.088	2.620	-0.38	37	7	silty sand to sandy silt
27.40	116.7	2.979	2.553	-0.29	37	7	silty sand to sandy silt
27.56	113.3	2.876	2.539	-0.48	36	7	silty sand to sandy silt
27.72	112.5	2.865	2.546	-0.22	38	7	silty sand to sandy silt
27.89	130.7	3.121	2.388	0.26	41	7	silty sand to sandy silt
28.05	145.8	3.267	2.241	0.21	42	7	silty sand to sandy silt
28.22	118.5	3.066	2.586	-0.06	38	7	silty sand to sandy silt
28.38	93.1	2.115	2.270	0.29	31	7	silty sand to sandy silt
28.54	75.7	1.986	2.623	0.01	30	6	sandy silt to clayey silt
28.71	68.4	1.813	2.653	-0.77	26	6	sandy silt to clayey silt
28.87	62.7	1.548	2.468	-1.27	25	6	sandy silt to clayey silt
29.04	64.4	1.559	2.421	-1.08	26	6	sandy silt to clayey silt
29.20	74.1	1.632	2.203	-0.37	24	7	silty sand to sandy silt
29.36	82.8	1.779	2.149	0.08	26	7	silty sand to sandy silt
29.53	90.3	2.154	2.385	-0.23	29	7	silty sand to sandy silt
29.69	97.4	2.540	2.609	-0.19	37	6	sandy silt to clayey silt
29.86	99.8	2.782	2.788	-0.43	37	6	sandy silt to clayey silt
30.02	90.4	3.036	3.357	-0.02	36	6	sandy silt to clayey silt

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
30.18	92.4	2.758	2.985	0.00	34	6	sandy silt to clayey silt
30.35	86.3	2.486	2.880	-3.00	33	6	sandy silt to clayey silt
30.51	82.4	2.222	2.696	0.09	32	6	sandy silt to clayey silt
30.68	81.0	2.221	2.743	-0.20	31	6	sandy silt to clayey silt
30.84	78.5	2.154	2.742	-2.10	31	6	sandy silt to clayey silt
31.00	79.6	2.080	2.613	-2.43	31	6	sandy silt to clayey silt
31.17	88.0	2.372	2.696	-5.28	35	6	sandy silt to clayey silt
31.33	102.8	2.621	2.550	-6.04	32	7	silty sand to sandy silt
31.50	112.8	1.779	1.576	-6.18	35	7	silty sand to sandy silt
31.66	113.8	1.786	1.570	-6.33	31	7	silty sand to sandy silt
31.82	68.2	1.790	2.623	-3.79	26	7	silty sand to sandy silt
31.99	61.9	1.761	2.843	-3.12	24	6	sandy silt to clayey silt
32.15	61.0	1.748	2.866	-2.20	23	6	sandy silt to clayey silt
32.32	60.2	1.733	2.877	-1.73	23	6	sandy silt to clayey silt
32.48	59.1	1.740	2.944	-0.87	23	6	sandy silt to clayey silt
32.64	59.6	1.713	2.873	-0.73	23	6	sandy silt to clayey silt
32.81	59.6	1.621	2.719	-1.27	23	6	sandy silt to clayey silt
32.97	60.2	1.666	2.769	-1.31	24	6	sandy silt to clayey silt
33.14	64.6	1.736	2.687	-0.71	26	6	sandy silt to clayey silt
33.30	77.8	1.563	2.010	-5.68	23	7	silty sand to sandy silt
33.46	77.5	1.530	1.975	-6.61	24	7	silty sand to sandy silt
33.63	67.0	1.827	2.726	-2.23	26	6	sandy silt to clayey silt
33.79	56.3	2.040	3.623	-2.34	23	6	sandy silt to clayey silt
33.96	57.6	1.708	2.965	-4.76	23	6	sandy silt to clayey silt
34.12	65.0	1.334	2.054	-7.63	24	6	sandy silt to clayey silt
34.28	66.3	1.265	1.907	-7.93	22	7	silty sand to sandy silt
34.45	75.1	1.462	1.947	-8.07	24	7	silty sand to sandy silt
34.61	83.4	1.569	1.883	-6.74	26	7	silty sand to sandy silt
34.78	82.6	1.420	1.719	-6.31	27	7	silty sand to sandy silt
34.94	84.3	1.256	1.489	-6.33	27	7	silty sand to sandy silt
35.10	88.1	1.471	1.669	-7.19	28	7	silty sand to sandy silt
35.27	87.4	1.838	2.103	-7.70	30	7	silty sand to sandy silt
35.43	104.8	1.991	1.900	-7.52	31	7	silty sand to sandy silt
35.60	95.2	2.012	2.114	-7.58	30	7	silty sand to sandy silt
35.76	84.5	2.019	2.390	-7.20	28	7	silty sand to sandy silt
35.93	82.8	2.110	2.550	-7.62	32	6	sandy silt to clayey silt
36.09	81.1	2.833	3.495	-7.18	29	6	sandy silt to clayey silt
36.25	66.9	2.891	4.322	-7.52	31	5	clayey silt to silty clay
36.42	45.4	2.510	5.524	-7.42	28	5	clayey silt to silty clay
36.58	64.9	1.852	2.853	-6.87	26	6	sandy silt to clayey silt
36.75	93.1	1.524	1.637	-7.25	28	7	silty sand to sandy silt
36.91	105.1	1.077	1.025	-7.40	25	8	sand to silty sand
37.07	112.4	0.831	0.739	-7.61	26	8	sand to silty sand
37.24	109.5	1.012	0.925	-7.36	26	8	sand to silty sand
37.40	100.2	1.501	1.498	-7.38	24	8	sand to silty sand
37.57	92.2	1.624	1.760	-7.95	29	7	silty sand to sandy silt
37.73	84.5	1.408	1.666	-8.28	28	7	silty sand to sandy silt
37.89	82.6	1.525	1.847	-8.73	26	7	silty sand to sandy silt
38.06	80.9	1.320	1.632	-8.76	26	7	silty sand to sandy silt
38.22	77.5	1.490	1.922	-8.32	25	7	silty sand to sandy silt
38.39	77.2	1.518	1.967	-8.66	25	7	silty sand to sandy silt
38.55	77.1	1.533	1.988	-8.74	25	7	silty sand to sandy silt
38.71	78.7	1.570	1.994	-8.48	25	7	silty sand to sandy silt
38.88	78.9	1.588	2.013	-8.35	25	7	silty sand to sandy silt
39.04	79.0	1.620	2.051	-8.51	25	7	silty sand to sandy silt
39.21	79.7	1.775	2.228	-8.55	26	7	silty sand to sandy silt
39.37	83.0	1.793	2.159	-9.06	26	7	silty sand to sandy silt
39.53	84.1	1.993	2.369	-9.25	27	7	silty sand to sandy silt
39.70	88.2	2.185	2.476	-8.96	28	7	silty sand to sandy silt
39.86	90.4	2.099	2.323	-8.98	27	7	silty sand to sandy silt
40.03	74.1	1.254	1.693	-9.32	23	7	silty sand to sandy silt
40.19	54.7	0.953	1.743	-8.96	22	7	silty sand to sandy silt
40.35	76.2	0.982	1.288	-8.90	24	7	silty sand to sandy silt

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Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
40.52	98.5	1.203	1.221	-8.90	23	8	sand to silty sand
40.68	116.8	1.581	1.354	-8.91	28	8	sand to silty sand
40.85	131.8	2.044	1.550	-9.49	32	8	sand to silty sand
41.01	155.6	2.094	1.346	-9.20	35	8	sand to silty sand
41.17	155.5	2.118	1.362	-9.95	37	8	sand to silty sand
41.34	149.5	1.896	1.268	-9.71	36	8	sand to silty sand
41.50	144.0	0.747	0.519	-9.82	28	9	sand
41.67	151.2	0.944	0.624	-9.99	29	9	sand
41.83	158.2	1.102	0.696	-9.61	30	9	sand
41.99	162.9	1.413	0.867	-9.71	31	9	sand
42.16	164.0	1.548	0.944	-9.96	33	9	sand
42.32	184.4	1.798	0.975	-10.01	35	9	sand
42.49	196.3	1.997	1.018	-9.89	38	9	sand
42.65	217.0	2.387	1.100	-10.38	41	9	sand
42.81	233.3	3.075	1.318	-10.42	43	9	sand
42.98	231.2	2.171	0.939	-10.40	44	9	sand
43.14	221.5	1.909	0.862	-10.35	39	9	sand
43.31	155.0	0.858	0.553	-8.54	31	9	sand
43.47	112.3	0.780	0.695	-9.66	28	8	sand to silty sand
43.64	85.4	0.884	1.035	-9.31	22	8	sand to silty sand
43.80	75.1	1.040	1.384	-9.36	20	8	sand to silty sand
43.96	85.8	0.879	1.025	-9.13	21	8	sand to silty sand
44.13	98.1	0.666	0.679	-9.21	22	8	sand to silty sand
44.29	95.2	0.787	0.826	-9.14	23	8	sand to silty sand
44.46	98.7	0.727	0.736	-9.30	24	8	sand to silty sand
44.62	106.1	0.511	0.481	-9.37	25	8	sand to silty sand
44.78	108.5	0.703	0.648	-9.62	23	8	sand to silty sand
44.95	73.0	0.857	1.174	-9.16	20	8	sand to silty sand
45.11	69.9	1.004	1.436	-9.28	22	7	silty sand to sandy silt
45.28	66.9	1.093	1.634	-9.42	21	7	silty sand to sandy silt
45.44	62.1	1.391	2.239	-9.35	24	6	sandy silt to clayey silt
45.60	57.5	2.112	3.671	-9.01	21	6	sandy silt to clayey silt
45.77	45.0	1.705	3.787	-9.13	20	5	clayey silt to silty clay
45.93	24.4	1.048	4.288	-9.32	14	5	clayey silt to silty clay
46.10	20.2	0.417	2.060	-8.70	10	5	clayey silt to silty clay
46.26	20.4	0.324	1.585	-8.42	8	6	sandy silt to clayey silt
46.42	19.4	0.332	1.714	-8.43	8	6	sandy silt to clayey silt
46.59	21.8	0.362	1.656	-8.27	8	6	sandy silt to clayey silt
46.75	21.7	0.362	1.670	-7.94	8	6	sandy silt to clayey silt
46.92	20.0	0.334	1.671	-8.10	8	6	sandy silt to clayey silt
47.08	20.0	0.372	1.862	-7.89	8	6	sandy silt to clayey silt
47.24	21.2	0.490	2.315	-7.26	10	5	clayey silt to silty clay
47.41	23.2	0.590	2.541	-7.24	11	5	clayey silt to silty clay
47.57	24.4	0.557	2.287	-7.13	11	5	clayey silt to silty clay
47.74	21.5	0.640	2.981	-7.28	11	5	clayey silt to silty clay
47.90	22.7	0.740	3.261	-6.72	13	6	sandy silt to clayey silt
48.06	55.9	0.903	1.615	-6.67	14	7	silty sand to sandy silt
48.23	49.8	0.548	1.101	-7.39	17	7	silty sand to sandy silt
48.39	52.1	0.578	1.110	-7.75	16	8	sand to silty sand
48.56	94.8	0.556	0.587	-7.89	19	8	sand to silty sand
48.72	92.9	0.519	0.559	-8.12	22	8	sand to silty sand
48.88	88.1	0.553	0.628	-7.91	21	8	sand to silty sand
49.05	85.3	0.590	0.692	-7.85	20	8	sand to silty sand
49.21	80.3	0.812	1.011	-7.71	19	8	sand to silty sand
49.38	76.7	1.068	1.392	-7.33	25	7	silty sand to sandy silt
49.54	73.8	1.229	1.665	-7.52	23	7	silty sand to sandy silt
49.70	70.3	1.149	1.635	-7.22	23	7	silty sand to sandy silt
49.87	70.8	1.142	1.612	-7.22	23	7	silty sand to sandy silt
50.03	77.6	1.001	1.290	-7.15	24	7	silty sand to sandy silt
50.20	78.9	0.963	1.221	-7.11	25	7	silty sand to sandy silt
50.36	74.1	1.257	1.697	-6.56	22	7	silty sand to sandy silt
50.52	53.4	1.800	3.370	-6.33	23	6	sandy silt to clayey silt
50.69	49.8	1.109	2.225	-6.15	23	6	sandy silt to clayey silt

*Soil behavior type and SPT based on data from UBC-1983

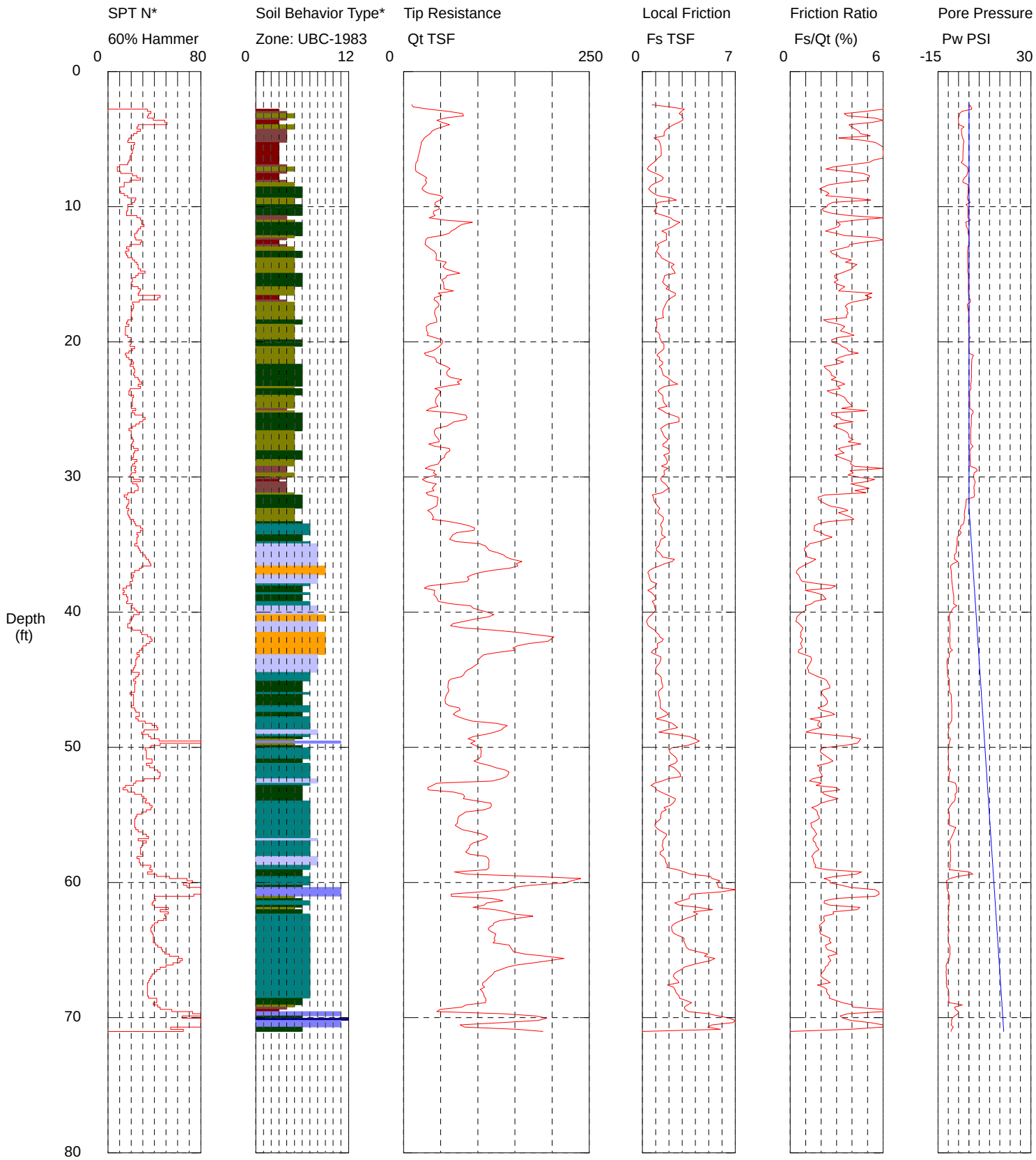
Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
50.85	80.6	1.055	1.309	-6.32	23	7	silty sand to sandy silt
51.02	83.6	2.067	2.473	-6.60	27	6	sandy silt to clayey silt
51.18	46.9	1.884	4.016	-6.58	32	3	clay
51.35	31.0	1.183	3.818	-6.14	17	4	silty clay to clay
51.51	23.6	-32768	-32768	-5.57	0	0	<out of range>

*Soil behavior type and SPT based on data from UBC-1983

GeoDesign / CPT-2 / 16770 SW Edy Rd Sherwood

Operator: OGE TAJ
Sounding: CPT-2
Cone Used: DPG1211
GPS Data: NO GPS

CPT Date/Time: 8/13/2016 10:40:49 AM
Location: GeoDesign / CPT-2 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-2 / 16770 SW Edy Rd Sherwood



Maximum Depth = 71.03 feet

Depth Increment = 0.164 feet

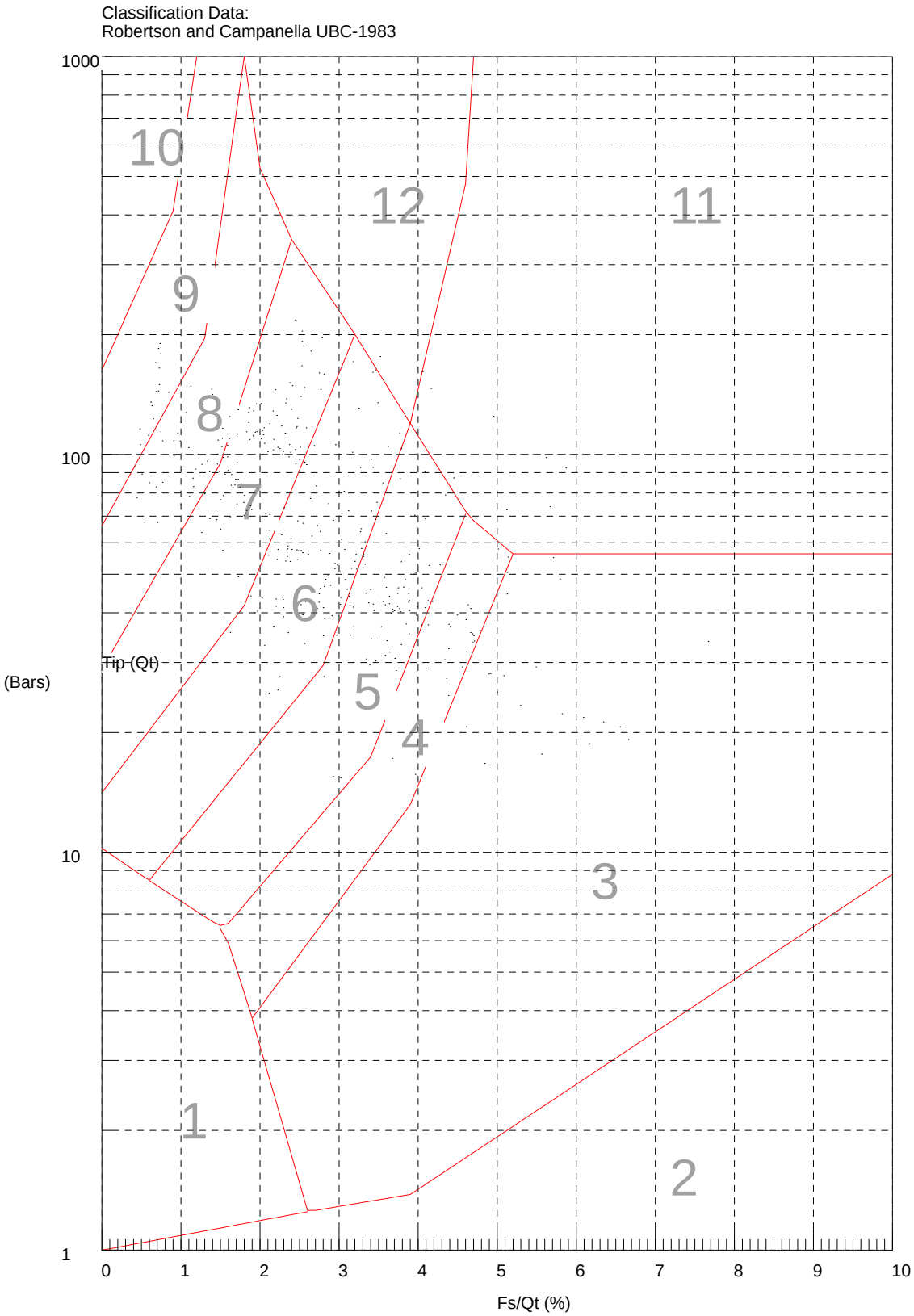
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

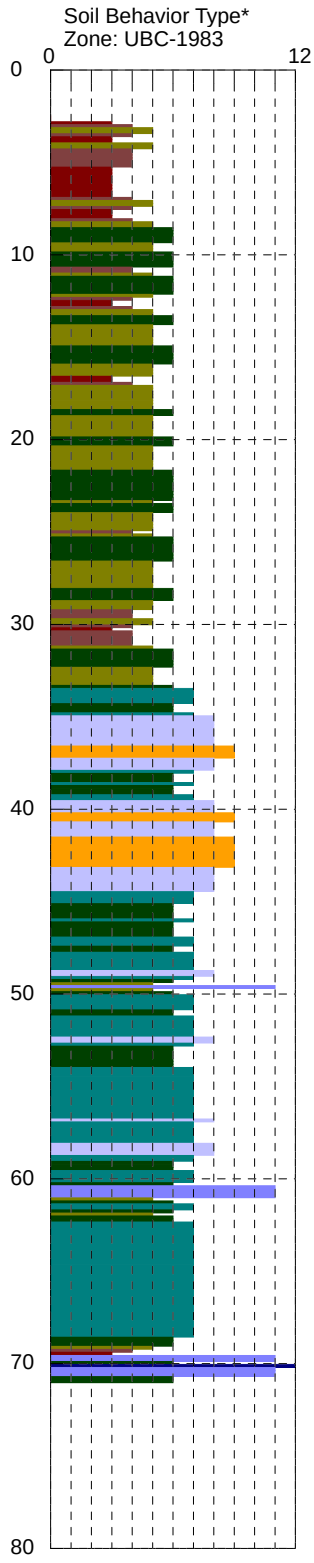
*Soil behavior type and SPT based on data from UBC-1983

GeoDesign / CPT-2 / 16770 SW Edy Rd Sherwood

Operator: OGE TAJ
Sounding: CPT-2
Cone Used: DPG1211

CPT Date/Time: 8/13/2016 10:40:49 AM
Location: GeoDesign / CPT-2 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-2 / 16770 SW Edy Rd Sherwood





1 sensitive fine grained
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8 sand to silty sand
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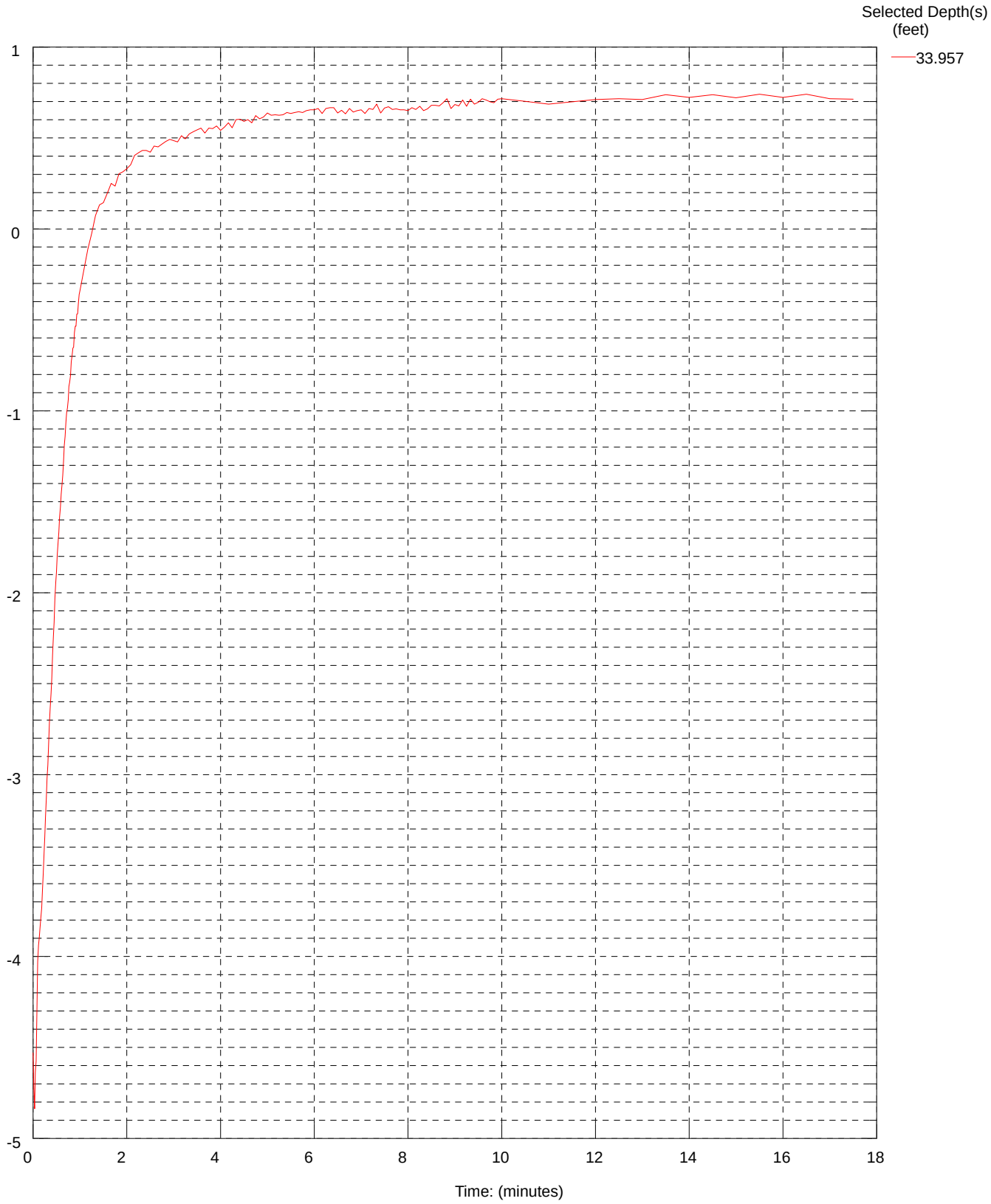
11 very stiff fine grained (*)
12 sand to clayey sand (*)

GeoDesign / CPT-2 / 16770 SW Edy Rd Sherwood

Operator OGE TAJ
Sounding: CPT-2
Cone Used: DPG1211
GPS Data: NO GPS

CPT Date/Time: 8/13/2016 10:40:49 AM
Location: GeoDesign / CPT-2 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-2 / 16770 SW Edy Rd Sherwood

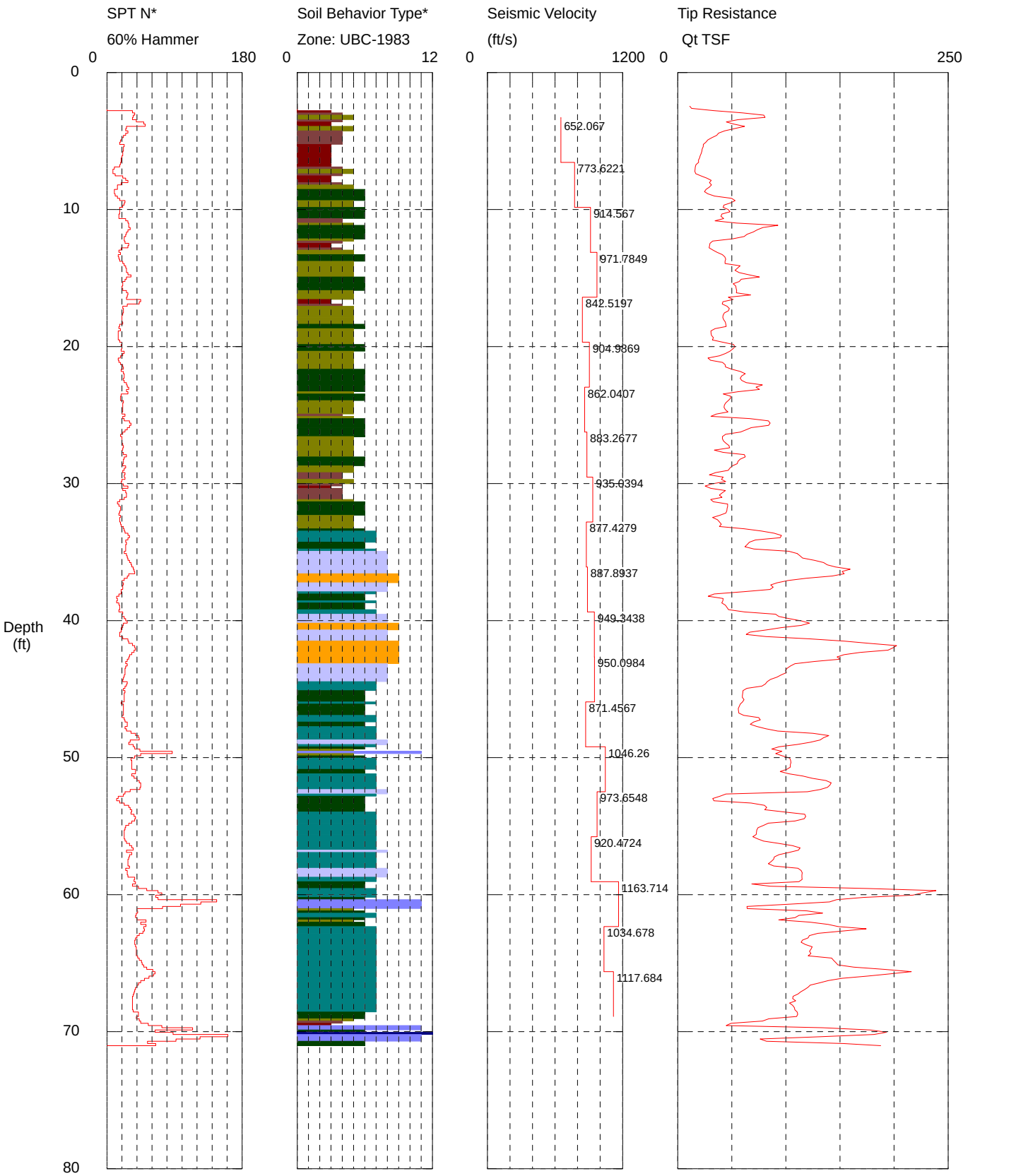


Maximum Pressure = 0.741 psi

GeoDesign / CPT-2 / 16770 SW Edy Rd Sherwood

Operator: OGE TAJ
Sounding: CPT-2
Cone Used: DPG1211
GPS Data: NO GPS

CPT Date/Time: 8/13/2016 10:40:49 AM
Location: GeoDesign / CPT-2 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-2 / 16770 SW Edy Rd Sherwood



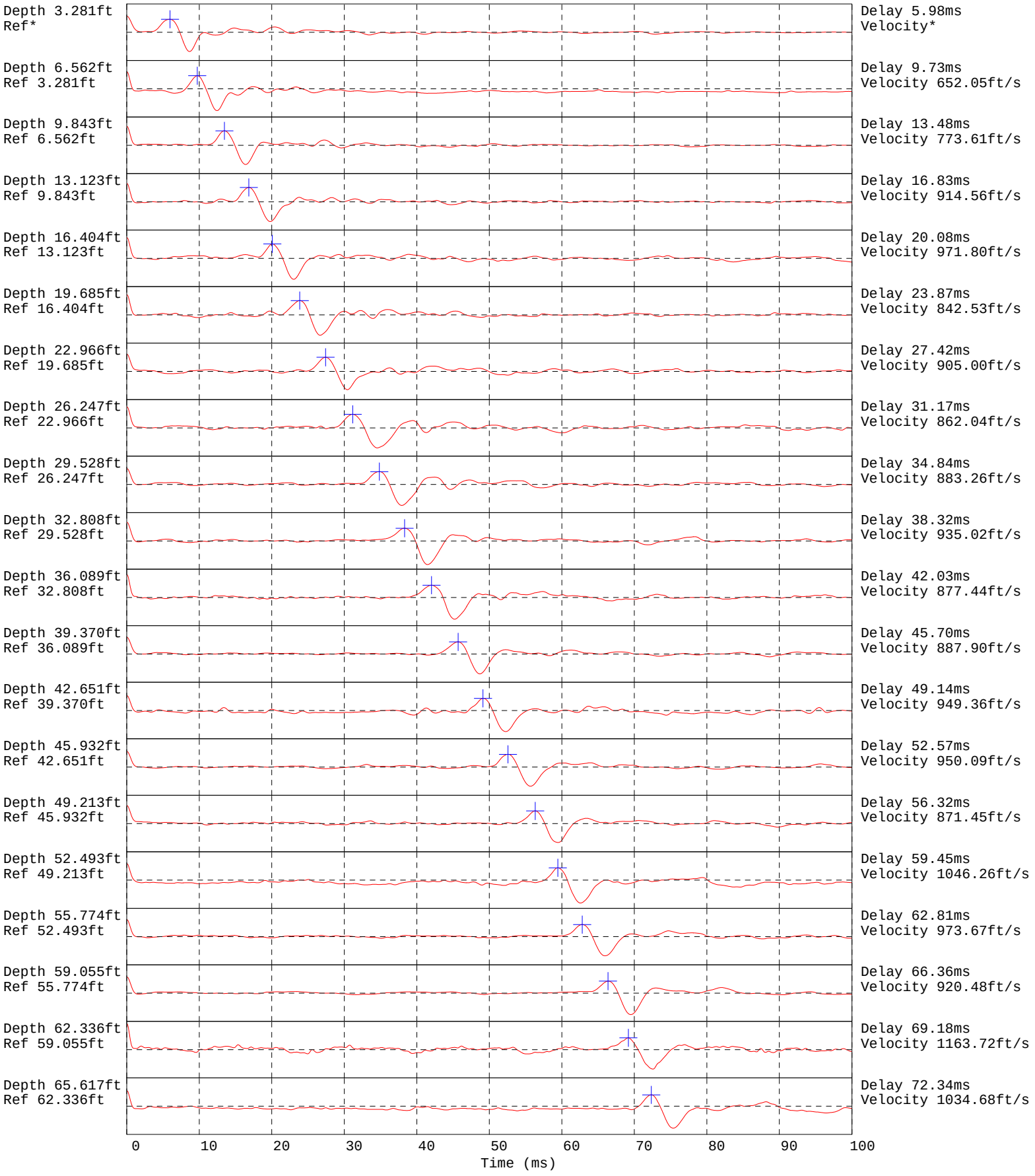
Maximum Depth = 71.03 feet

Depth Increment = 0.164 feet

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

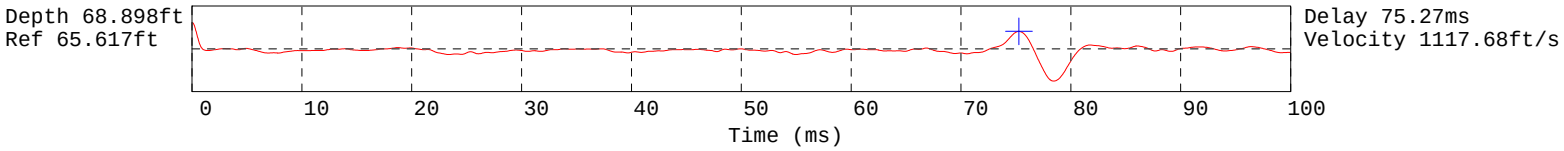
*Soil behavior type and SPT based on data from UBC-1983

GeoDesign / CPT-2 / 16770 SW Edy Rd Sherwood



Hammer to Rod String Distance 1.3(m)
* = Not Determined

GeoDesign / CPT-2 / 16770 SW Edy Rd Sherwood



Hammer to Rod String Distance 1.3 (m)
* = Not Determined

Data File:CPT-2 8/13/2016 10:40:49 AM
Operator:OGE TAJ Location:GeoDesign / CPT-2 / 16770 SW Edy Rd Sherwood
Cone ID:DPG1211 Job Number:16084 / GeoDesign / CPT-2 / 16770 SW Edy Rd Sherw
Customer: Units:English
GPS DATA:NO GPS

Depth (ft)	Qt TSF	Fs TSF	Fs/Qt (%)	Pw PSI	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
2.46	11.1	0.726	6.545	0.25	0	0	<out of range>
2.62	12.8	2.043	15.937	1.02	0	0	<out of range>
2.79	33.4	3.163	9.482	1.38	34	3	clay
2.95	60.0	2.939	4.897	-3.42	37	4	silty clay to clay
3.12	79.5	2.777	3.492	-4.56	35	5	clayey silt to silty clay
3.28	80.8	3.000	3.714	-4.64	34	5	clayey silt to silty clay
3.44	55.7	3.051	5.483	-5.21	39	4	silty clay to clay
3.61	44.9	3.037	6.765	-5.05	49	3	clay
3.77	51.8	2.737	5.287	-5.01	51	3	clay
3.94	61.8	2.348	3.803	-4.79	26	5	clayey silt to silty clay
4.10	52.5	2.075	3.952	-2.36	25	5	clayey silt to silty clay
4.27	43.3	1.829	4.221	-3.65	28	4	silty clay to clay
4.43	37.9	1.684	4.447	-3.59	25	4	silty clay to clay
4.59	36.0	1.630	4.523	-3.52	22	4	silty clay to clay
4.76	31.6	1.636	5.172	-3.38	20	4	silty clay to clay
4.92	27.9	0.875	3.138	-3.03	18	4	silty clay to clay
5.09	26.1	1.220	4.678	-2.56	17	4	silty clay to clay
5.25	23.7	1.309	5.519	-2.50	23	3	clay
5.41	23.5	1.353	5.750	-2.72	22	3	clay
5.58	22.6	1.405	6.209	-2.79	22	3	clay
5.74	22.3	1.411	6.326	-2.75	21	3	clay
5.91	21.7	1.411	6.500	-2.85	21	3	clay
6.07	20.7	1.423	6.859	-2.87	20	3	clay
6.23	20.3	1.407	6.944	-2.89	19	3	clay
6.40	19.2	1.179	6.146	-2.90	19	3	clay
6.56	19.3	1.037	5.380	-2.97	18	3	clay
6.73	16.9	0.860	5.103	-3.72	17	3	clay
6.89	16.3	0.641	3.939	-2.38	10	4	silty clay to clay
7.05	16.1	0.449	2.794	-0.89	8	5	clayey silt to silty clay
7.22	15.9	0.367	2.306	-0.55	8	5	clayey silt to silty clay
7.38	16.7	0.606	3.628	-0.52	11	4	silty clay to clay
7.55	21.4	1.010	4.727	-0.68	21	3	clay
7.71	26.8	1.374	5.129	-1.09	25	3	clay
7.87	31.1	1.578	5.080	-2.22	28	3	clay
8.04	29.3	1.476	5.042	-2.91	19	4	silty clay to clay
8.20	31.3	1.120	3.585	-2.90	14	5	clayey silt to silty clay
8.37	29.2	0.743	2.541	-0.40	14	5	clayey silt to silty clay
8.53	26.2	0.570	2.177	-0.37	10	6	sandy silt to clayey silt
8.69	24.7	0.470	1.898	-0.32	10	6	sandy silt to clayey silt
8.86	27.9	0.627	2.250	-0.43	11	6	sandy silt to clayey silt
9.02	34.0	0.852	2.506	-0.38	14	6	sandy silt to clayey silt
9.19	49.8	1.152	2.312	-0.54	17	6	sandy silt to clayey silt
9.35	53.1	2.128	4.009	-0.75	24	5	clayey silt to silty clay
9.51	49.0	2.552	5.207	-0.58	23	5	clayey silt to silty clay
9.68	42.7	1.177	2.753	0.68	21	5	clayey silt to silty clay
9.84	42.0	1.026	2.443	-1.39	17	6	sandy silt to clayey silt
10.01	46.7	1.102	2.361	-0.51	17	6	sandy silt to clayey silt
10.17	48.4	1.001	2.068	-0.49	17	6	sandy silt to clayey silt
10.33	40.8	0.888	2.179	-0.50	16	6	sandy silt to clayey silt
10.50	40.0	1.077	2.693	-0.57	16	6	sandy silt to clayey silt
10.66	42.4	1.617	3.813	-0.53	25	4	silty clay to clay
10.83	34.5	2.128	6.174	-0.46	28	4	silty clay to clay
10.99	54.5	2.333	4.285	0.76	29	5	clayey silt to silty clay
11.15	92.6	2.820	3.045	-1.55	29	6	sandy silt to clayey silt
11.32	78.8	2.548	3.232	-1.33	31	6	sandy silt to clayey silt
11.48	73.6	2.295	3.118	-1.34	28	6	sandy silt to clayey silt
11.65	69.8	1.898	2.719	-0.50	26	6	sandy silt to clayey silt

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
11.81	64.1	1.462	2.279	-0.44	25	6	sandy silt to clayey silt
11.98	61.4	1.828	2.976	-0.41	23	6	sandy silt to clayey silt
12.14	51.0	1.794	3.515	-0.06	23	5	clayey silt to silty clay
12.30	32.4	1.807	5.579	0.08	24	4	silty clay to clay
12.47	29.8	1.811	6.081	0.08	29	3	clay
12.63	29.4	1.409	4.792	0.10	28	3	clay
12.80	29.0	1.115	3.844	0.02	19	4	silty clay to clay
12.96	32.6	1.233	3.783	-0.48	16	5	clayey silt to silty clay
13.12	36.4	1.163	3.195	-0.52	18	5	clayey silt to silty clay
13.29	41.2	1.071	2.599	-0.65	15	6	sandy silt to clayey silt
13.45	43.6	1.176	2.700	-0.65	16	6	sandy silt to clayey silt
13.62	44.3	1.367	3.085	-0.65	17	6	sandy silt to clayey silt
13.78	43.8	1.424	3.255	-0.60	21	5	clayey silt to silty clay
13.94	43.8	1.730	3.954	-0.60	23	5	clayey silt to silty clay
14.11	57.6	2.063	3.579	-0.61	25	5	clayey silt to silty clay
14.27	55.3	2.391	4.322	-0.54	26	5	clayey silt to silty clay
14.44	52.9	2.167	4.094	-0.53	26	5	clayey silt to silty clay
14.60	56.7	2.266	3.994	-0.54	28	5	clayey silt to silty clay
14.76	66.0	2.392	3.623	-0.63	32	5	clayey silt to silty clay
14.93	75.5	2.469	3.268	-0.43	26	6	sandy silt to clayey silt
15.09	58.6	1.680	2.866	-0.31	24	6	sandy silt to clayey silt
15.26	56.9	1.644	2.887	-0.31	21	6	sandy silt to clayey silt
15.42	51.3	1.592	3.104	-0.26	21	6	sandy silt to clayey silt
15.58	53.7	1.530	2.850	-0.25	20	6	sandy silt to clayey silt
15.75	54.0	1.661	3.077	-0.29	21	6	sandy silt to clayey silt
15.91	54.4	1.924	3.534	-0.28	26	5	clayey silt to silty clay
16.08	54.2	1.792	3.306	-0.30	28	5	clayey silt to silty clay
16.24	67.4	2.105	3.125	-0.32	27	5	clayey silt to silty clay
16.40	46.8	2.478	5.291	-0.25	26	5	clayey silt to silty clay
16.57	51.2	2.487	4.861	-0.18	45	3	clay
16.73	41.7	2.196	5.261	-0.05	43	3	clay
16.90	41.1	1.966	4.781	0.75	27	4	silty clay to clay
17.06	45.6	1.828	4.008	0.67	21	5	clayey silt to silty clay
17.22	47.8	1.751	3.667	-0.75	22	5	clayey silt to silty clay
17.39	46.9	1.665	3.554	-0.76	22	5	clayey silt to silty clay
17.55	43.2	1.593	3.688	-0.56	21	5	clayey silt to silty clay
17.72	42.0	1.541	3.670	-0.28	20	5	clayey silt to silty clay
17.88	41.7	1.557	3.739	-0.10	20	5	clayey silt to silty clay
18.04	42.5	1.540	3.628	-0.14	20	5	clayey silt to silty clay
18.21	43.9	1.602	3.646	-0.15	21	5	clayey silt to silty clay
18.37	44.5	0.959	2.157	-0.26	17	6	sandy silt to clayey silt
18.54	44.8	1.098	2.448	-0.34	16	6	sandy silt to clayey silt
18.70	34.5	1.086	3.147	-0.05	18	5	clayey silt to silty clay
18.86	30.7	1.081	3.524	-0.05	15	5	clayey silt to silty clay
19.03	30.8	1.042	3.387	-0.07	15	5	clayey silt to silty clay
19.19	31.2	1.013	3.246	-0.08	15	5	clayey silt to silty clay
19.36	32.9	1.230	3.733	-0.06	15	5	clayey silt to silty clay
19.52	32.1	1.322	4.120	-0.03	17	5	clayey silt to silty clay
19.69	41.6	1.291	3.102	0.66	20	5	clayey silt to silty clay
19.85	51.5	1.380	2.679	0.00	19	6	sandy silt to clayey silt
20.01	52.9	1.432	2.708	-0.10	20	6	sandy silt to clayey silt
20.18	50.9	1.623	3.192	-0.07	19	6	sandy silt to clayey silt
20.34	48.3	1.620	3.356	-0.08	23	5	clayey silt to silty clay
20.51	44.2	1.625	3.676	-0.06	21	5	clayey silt to silty clay
20.67	38.7	1.453	3.751	0.00	18	5	clayey silt to silty clay
20.83	28.0	1.229	4.392	0.00	15	5	clayey silt to silty clay
21.00	30.3	1.090	3.596	2.24	16	5	clayey silt to silty clay
21.16	41.5	1.309	3.158	1.64	18	5	clayey silt to silty clay
21.33	43.9	1.280	2.918	1.43	21	5	clayey silt to silty clay
21.49	44.2	1.528	3.455	1.38	22	5	clayey silt to silty clay
21.65	50.0	1.507	3.016	1.30	19	6	sandy silt to clayey silt
21.82	57.9	1.267	2.189	1.28	22	6	sandy silt to clayey silt
21.98	62.5	1.442	2.307	1.23	23	6	sandy silt to clayey silt

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
22.15	59.1	1.485	2.512	1.28	23	6	sandy silt to clayey silt
22.31	57.8	1.531	2.648	1.18	22	6	sandy silt to clayey silt
22.47	59.0	1.572	2.662	1.25	23	6	sandy silt to clayey silt
22.64	63.4	1.879	2.965	1.24	26	6	sandy silt to clayey silt
22.80	78.2	2.081	2.660	1.10	27	6	sandy silt to clayey silt
22.97	72.4	2.304	3.182	1.12	29	6	sandy silt to clayey silt
23.13	75.6	2.669	3.529	0.86	26	6	sandy silt to clayey silt
23.29	55.8	1.708	3.059	0.84	28	5	clayey silt to silty clay
23.46	42.1	1.366	3.241	1.00	19	6	sandy silt to clayey silt
23.62	49.0	1.174	2.395	0.40	18	6	sandy silt to clayey silt
23.79	48.8	1.305	2.674	0.31	18	6	sandy silt to clayey silt
23.95	46.7	1.513	3.243	0.39	22	5	clayey silt to silty clay
24.11	44.3	1.557	3.512	0.40	21	5	clayey silt to silty clay
24.28	43.1	1.557	3.611	0.38	21	5	clayey silt to silty clay
24.44	42.8	1.592	3.719	0.44	21	5	clayey silt to silty clay
24.61	44.1	1.708	3.875	0.44	21	5	clayey silt to silty clay
24.77	46.4	1.868	4.022	0.42	20	5	clayey silt to silty clay
24.93	35.7	1.187	3.326	0.49	24	4	silty clay to clay
25.10	30.7	1.526	4.977	1.90	21	5	clayey silt to silty clay
25.26	66.5	1.765	2.655	1.99	23	6	sandy silt to clayey silt
25.43	83.8	2.260	2.697	1.28	30	6	sandy silt to clayey silt
25.59	85.5	2.728	3.190	1.24	32	6	sandy silt to clayey silt
25.75	84.0	2.768	3.297	1.13	30	6	sandy silt to clayey silt
25.92	68.0	2.761	4.062	1.18	27	6	sandy silt to clayey silt
26.08	63.0	1.906	3.024	1.16	24	6	sandy silt to clayey silt
26.25	58.0	1.621	2.793	1.16	21	6	sandy silt to clayey silt
26.41	44.3	1.391	3.143	0.90	18	6	sandy silt to clayey silt
26.57	41.3	1.441	3.488	0.88	20	5	clayey silt to silty clay
26.74	41.3	1.534	3.714	0.89	20	5	clayey silt to silty clay
26.90	42.4	1.599	3.773	0.86	20	5	clayey silt to silty clay
27.07	44.7	1.700	3.800	0.86	21	5	clayey silt to silty clay
27.23	47.4	1.930	4.069	0.83	22	5	clayey silt to silty clay
27.40	48.0	1.803	3.760	0.88	21	5	clayey silt to silty clay
27.56	33.8	1.548	4.573	0.94	20	5	clayey silt to silty clay
27.72	41.9	1.565	3.734	2.00	22	5	clayey silt to silty clay
27.89	61.6	1.923	3.122	1.00	26	5	clayey silt to silty clay
28.05	62.5	2.034	3.254	0.47	23	6	sandy silt to clayey silt
28.22	57.8	2.013	3.482	0.41	22	6	sandy silt to clayey silt
28.38	55.7	1.611	2.891	0.51	22	6	sandy silt to clayey silt
28.54	55.1	1.771	3.214	0.51	21	6	sandy silt to clayey silt
28.71	50.5	1.813	3.587	0.61	25	5	clayey silt to silty clay
28.87	48.2	1.912	3.967	0.64	23	5	clayey silt to silty clay
29.04	46.7	1.820	3.898	0.64	21	5	clayey silt to silty clay
29.20	35.0	1.449	4.134	0.69	24	4	silty clay to clay
29.36	29.2	1.933	6.614	3.39	23	4	silty clay to clay
29.53	42.1	1.628	3.865	4.11	24	4	silty clay to clay
29.69	40.4	1.646	4.077	2.55	20	5	clayey silt to silty clay
29.86	44.4	1.656	3.732	2.36	19	5	clayey silt to silty clay
30.02	32.0	1.420	4.432	2.15	22	4	silty clay to clay
30.18	25.4	1.385	5.458	2.56	28	3	clay
30.35	30.5	1.499	4.915	3.02	21	4	silty clay to clay
30.51	44.2	1.728	3.914	2.79	25	4	silty clay to clay
30.68	41.1	1.872	4.552	2.48	26	4	silty clay to clay
30.84	38.5	1.962	5.096	2.43	26	4	silty clay to clay
31.00	40.9	1.713	4.192	2.59	23	4	silty clay to clay
31.17	30.5	1.490	4.892	2.49	17	5	clayey silt to silty clay
31.33	33.0	0.745	2.259	2.71	14	6	sandy silt to clayey silt
31.50	46.2	0.834	1.804	2.38	16	6	sandy silt to clayey silt
31.66	46.2	0.848	1.835	-1.30	18	6	sandy silt to clayey silt
31.82	45.6	0.916	2.007	-1.40	18	6	sandy silt to clayey silt
31.99	45.4	1.035	2.278	-1.40	17	6	sandy silt to clayey silt
32.15	44.4	1.151	2.592	-1.63	16	6	sandy silt to clayey silt
32.32	38.8	1.313	3.385	-1.85	18	5	clayey silt to silty clay

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
32.48	32.3	1.207	3.736	-2.05	17	5	clayey silt to silty clay
32.64	36.8	1.152	3.135	-2.16	17	5	clayey silt to silty clay
32.81	38.6	1.357	3.514	-2.28	18	5	clayey silt to silty clay
32.97	40.3	1.576	3.911	-2.02	19	5	clayey silt to silty clay
33.14	38.6	1.586	4.113	-2.26	22	5	clayey silt to silty clay
33.30	61.4	1.518	2.471	-2.37	23	6	sandy silt to clayey silt
33.46	77.4	1.398	1.806	-2.74	24	7	silty sand to sandy silt
33.63	88.9	1.393	1.566	-4.02	28	7	silty sand to sandy silt
33.79	95.9	1.490	1.554	-4.00	30	7	silty sand to sandy silt
33.96	94.8	1.465	1.546	-4.63	28	7	silty sand to sandy silt
34.12	71.8	1.451	2.020	-3.72	25	7	silty sand to sandy silt
34.28	66.2	1.456	2.200	-4.44	26	6	sandy silt to clayey silt
34.45	64.3	1.740	2.707	-5.71	25	6	sandy silt to clayey silt
34.61	62.1	1.403	2.259	-5.69	25	6	sandy silt to clayey silt
34.78	70.4	1.326	1.885	-5.72	25	7	silty sand to sandy silt
34.94	102.8	1.283	1.249	-5.70	23	8	sand to silty sand
35.10	110.3	1.243	1.127	-5.93	26	8	sand to silty sand
35.27	113.0	1.050	0.929	-6.15	27	8	sand to silty sand
35.43	115.5	1.055	0.914	-6.17	28	8	sand to silty sand
35.60	126.3	1.294	1.025	-6.19	30	8	sand to silty sand
35.76	134.8	1.409	1.045	-7.05	32	8	sand to silty sand
35.93	138.2	1.532	1.108	-6.99	33	8	sand to silty sand
36.09	145.8	2.404	1.649	-7.04	35	8	sand to silty sand
36.25	159.4	2.256	1.416	-5.34	36	8	sand to silty sand
36.42	152.0	1.682	1.107	-7.78	37	8	sand to silty sand
36.58	153.9	1.283	0.834	-8.96	29	9	sand
36.75	142.9	0.815	0.571	-8.79	27	9	sand
36.91	118.8	0.527	0.444	-8.64	23	9	sand
37.07	101.8	0.401	0.393	-8.54	20	9	sand
37.24	91.9	0.493	0.536	-8.46	22	8	sand to silty sand
37.40	86.0	0.523	0.608	-8.43	21	8	sand to silty sand
37.57	88.3	0.580	0.657	-8.38	21	8	sand to silty sand
37.73	85.4	0.675	0.790	-8.27	19	8	sand to silty sand
37.89	60.7	1.081	1.780	-8.17	19	7	silty sand to sandy silt
38.06	33.7	0.987	2.929	-8.01	16	6	sandy silt to clayey silt
38.22	28.2	0.746	2.648	-7.91	13	6	sandy silt to clayey silt
38.39	42.0	0.404	0.961	-7.73	14	6	sandy silt to clayey silt
38.55	41.7	0.668	1.601	-7.66	13	7	silty sand to sandy silt
38.71	40.7	0.846	2.079	-7.41	16	6	sandy silt to clayey silt
38.88	44.0	0.968	2.200	-7.38	17	6	sandy silt to clayey silt
39.04	45.5	1.055	2.318	-7.37	17	6	sandy silt to clayey silt
39.21	47.0	0.739	1.573	-7.35	16	7	silty sand to sandy silt
39.37	61.9	0.870	1.406	-7.40	21	7	silty sand to sandy silt
39.53	90.5	0.901	0.996	-5.92	20	8	sand to silty sand
39.70	93.5	0.942	1.008	-7.63	23	8	sand to silty sand
39.86	103.0	1.042	1.012	-8.23	25	8	sand to silty sand
40.03	114.2	0.844	0.739	-8.91	27	8	sand to silty sand
40.19	121.7	0.710	0.584	-9.51	22	9	sand
40.35	114.2	0.500	0.438	-9.51	21	9	sand
40.52	95.6	0.396	0.414	-9.37	19	9	sand
40.68	82.0	0.302	0.368	-9.32	19	8	sand to silty sand
40.85	66.7	0.379	0.568	-9.20	17	8	sand to silty sand
41.01	63.3	0.439	0.694	-9.15	17	8	sand to silty sand
41.17	81.5	0.673	0.825	-9.17	21	8	sand to silty sand
41.34	121.8	0.936	0.768	-9.29	28	8	sand to silty sand
41.50	153.7	1.045	0.680	-9.27	29	9	sand
41.67	177.2	1.246	0.703	-9.28	34	9	sand
41.83	202.4	1.315	0.650	-9.42	37	9	sand
41.99	198.9	1.570	0.789	-9.17	38	9	sand
42.16	194.4	1.480	0.761	-9.11	36	9	sand
42.32	168.7	1.121	0.665	-9.41	33	9	sand
42.49	153.7	1.137	0.740	-9.15	30	9	sand
42.65	147.3	1.144	0.777	-9.07	29	9	sand

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
42.81	150.3	0.802	0.534	-8.01	27	9	sand
42.98	126.6	0.675	0.533	-9.37	25	9	sand
43.14	108.3	1.022	0.944	-9.51	27	8	sand to silty sand
43.31	104.3	1.384	1.327	-9.42	25	8	sand to silty sand
43.47	101.3	1.401	1.384	-10.45	24	8	sand to silty sand
43.64	99.7	1.339	1.343	-10.67	24	8	sand to silty sand
43.80	100.5	1.276	1.270	-10.63	24	8	sand to silty sand
43.96	95.6	1.121	1.172	-10.54	23	8	sand to silty sand
44.13	91.7	1.005	1.095	-10.51	22	8	sand to silty sand
44.29	85.8	1.016	1.185	-10.40	21	8	sand to silty sand
44.46	82.7	0.992	1.199	-10.43	27	7	silty sand to sandy silt
44.62	81.0	1.224	1.511	-10.32	26	7	silty sand to sandy silt
44.78	77.9	1.396	1.794	-10.25	24	7	silty sand to sandy silt
44.95	64.0	1.424	2.226	-9.58	22	7	silty sand to sandy silt
45.11	60.4	1.446	2.396	-9.54	24	6	sandy silt to clayey silt
45.28	60.1	1.469	2.445	-9.50	23	6	sandy silt to clayey silt
45.44	59.9	1.529	2.555	-9.48	23	6	sandy silt to clayey silt
45.60	59.7	1.527	2.559	-9.47	23	6	sandy silt to clayey silt
45.77	61.3	1.286	2.098	-9.42	23	6	sandy silt to clayey silt
45.93	59.9	1.211	2.020	-9.35	19	7	silty sand to sandy silt
46.10	57.9	1.208	2.086	-8.57	22	6	sandy silt to clayey silt
46.26	56.9	1.263	2.219	-8.55	22	6	sandy silt to clayey silt
46.42	55.9	1.310	2.342	-8.46	22	6	sandy silt to clayey silt
46.59	56.2	1.351	2.406	-8.49	22	6	sandy silt to clayey silt
46.75	56.5	1.352	2.393	-8.41	22	6	sandy silt to clayey silt
46.92	61.0	1.365	2.239	-8.36	20	7	silty sand to sandy silt
47.08	74.9	1.346	1.798	-8.36	23	7	silty sand to sandy silt
47.24	76.3	1.536	2.013	-8.35	24	7	silty sand to sandy silt
47.41	70.1	1.813	2.585	-8.39	27	6	sandy silt to clayey silt
47.57	67.0	1.932	2.882	-8.33	27	6	sandy silt to clayey silt
47.74	73.3	1.604	2.189	-8.30	24	7	silty sand to sandy silt
47.90	81.6	1.056	1.294	-8.33	26	7	silty sand to sandy silt
48.06	92.4	1.793	1.940	-8.45	32	7	silty sand to sandy silt
48.23	125.0	2.255	1.804	-9.15	38	7	silty sand to sandy silt
48.39	139.7	2.485	1.778	-9.82	42	7	silty sand to sandy silt
48.56	134.8	2.652	1.967	-9.65	43	7	silty sand to sandy silt
48.72	131.6	1.856	1.410	-9.82	31	8	sand to silty sand
48.88	122.6	1.246	1.016	-10.06	29	8	sand to silty sand
49.05	110.3	2.453	2.224	-10.01	35	7	silty sand to sandy silt
49.21	93.6	3.562	3.805	-10.00	37	6	sandy silt to clayey silt
49.38	86.9	3.956	4.554	-8.95	44	5	clayey silt to silty clay
49.54	96.2	4.298	4.466	-9.35	87	11	very stiff fine grained (*)
49.70	90.5	3.921	4.330	-9.58	45	5	clayey silt to silty clay
49.87	96.6	3.356	3.475	-9.74	37	6	sandy silt to clayey silt
50.03	103.5	2.226	2.150	-9.88	32	7	silty sand to sandy silt
50.20	104.3	2.022	1.938	-10.03	33	7	silty sand to sandy silt
50.36	104.6	2.058	1.968	-10.05	33	7	silty sand to sandy silt
50.52	104.0	2.255	2.168	-9.84	33	7	silty sand to sandy silt
50.69	104.1	2.459	2.362	-9.90	33	7	silty sand to sandy silt
50.85	100.8	2.589	2.569	-10.04	38	6	sandy silt to clayey silt
51.02	94.7	2.629	2.774	-9.93	38	6	sandy silt to clayey silt
51.18	102.7	2.484	2.417	-9.99	33	7	silty sand to sandy silt
51.35	115.6	2.031	1.756	-9.91	36	7	silty sand to sandy silt
51.51	124.3	2.390	1.923	-9.95	40	7	silty sand to sandy silt
51.67	137.1	2.576	1.880	-8.87	43	7	silty sand to sandy silt
51.84	141.9	2.753	1.940	-9.37	45	7	silty sand to sandy silt
52.00	140.7	2.864	2.035	-9.61	45	7	silty sand to sandy silt
52.17	138.5	2.878	2.079	-9.62	44	7	silty sand to sandy silt
52.33	131.8	1.923	1.459	-9.60	31	8	sand to silty sand
52.49	119.9	1.500	1.250	-9.80	24	8	sand to silty sand
52.66	44.6	0.899	2.016	-6.54	22	7	silty sand to sandy silt
52.82	39.0	0.653	1.675	-6.14	15	6	sandy silt to clayey silt
52.99	32.3	0.965	2.982	-6.05	13	6	sandy silt to clayey silt

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
53.15	33.5	1.073	3.201	-5.96	17	6	sandy silt to clayey silt
53.31	67.8	1.403	2.067	-5.85	23	6	sandy silt to clayey silt
53.48	80.1	1.784	2.227	-6.78	29	6	sandy silt to clayey silt
53.64	82.3	2.123	2.579	-6.60	31	6	sandy silt to clayey silt
53.81	80.4	2.494	3.102	-6.66	33	6	sandy silt to clayey silt
53.97	98.5	2.456	2.492	-7.01	32	7	silty sand to sandy silt
54.13	117.4	2.315	1.972	-8.12	36	7	silty sand to sandy silt
54.30	118.4	2.104	1.777	-8.85	38	7	silty sand to sandy silt
54.46	116.9	1.631	1.395	-9.56	37	7	silty sand to sandy silt
54.63	108.4	1.797	1.658	-9.98	33	7	silty sand to sandy silt
54.79	83.8	1.476	1.761	-9.60	29	7	silty sand to sandy silt
54.95	79.3	1.395	1.759	-9.54	25	7	silty sand to sandy silt
55.12	74.2	1.383	1.863	-9.51	24	7	silty sand to sandy silt
55.28	73.1	1.370	1.874	-9.52	23	7	silty sand to sandy silt
55.45	72.8	1.202	1.652	-9.49	23	7	silty sand to sandy silt
55.61	72.6	0.967	1.333	-9.48	23	7	silty sand to sandy silt
55.77	69.5	0.944	1.358	-9.38	23	7	silty sand to sandy silt
55.94	74.2	1.038	1.400	-6.31	24	7	silty sand to sandy silt
56.10	79.4	1.231	1.550	-6.94	26	7	silty sand to sandy silt
56.27	93.3	1.517	1.626	-7.33	30	7	silty sand to sandy silt
56.43	106.1	1.817	1.712	-7.79	33	7	silty sand to sandy silt
56.59	113.1	1.787	1.580	-8.26	35	7	silty sand to sandy silt
56.76	111.6	1.644	1.474	-8.79	26	8	sand to silty sand
56.92	103.0	1.535	1.490	-9.36	33	7	silty sand to sandy silt
57.09	93.5	1.542	1.648	-9.37	30	7	silty sand to sandy silt
57.25	89.3	1.481	1.658	-8.88	29	7	silty sand to sandy silt
57.41	88.7	1.561	1.761	-8.86	28	7	silty sand to sandy silt
57.58	86.5	1.607	1.857	-9.02	28	7	silty sand to sandy silt
57.74	83.7	1.351	1.614	-8.83	28	7	silty sand to sandy silt
57.91	88.8	1.325	1.492	-8.96	30	7	silty sand to sandy silt
58.07	111.2	1.543	1.388	-8.79	25	8	sand to silty sand
58.23	114.2	1.714	1.501	-8.87	27	8	sand to silty sand
58.40	115.1	1.739	1.510	-8.86	27	8	sand to silty sand
58.56	114.8	1.783	1.552	-9.35	28	8	sand to silty sand
58.73	114.8	1.895	1.652	-9.13	37	7	silty sand to sandy silt
58.89	115.0	1.842	1.601	-9.14	36	7	silty sand to sandy silt
59.06	112.0	2.653	2.369	-9.58	38	6	sandy silt to clayey silt
59.22	68.4	3.147	4.603	0.14	34	6	sandy silt to clayey silt
59.38	85.3	3.643	4.271	1.86	42	6	sandy silt to clayey silt
59.55	174.9	5.117	2.926	-5.31	53	7	silty sand to sandy silt
59.71	238.7	5.255	2.201	-9.29	68	7	silty sand to sandy silt
59.88	226.3	5.835	2.579	-10.83	73	7	silty sand to sandy silt
60.04	217.4	5.619	2.585	-10.85	65	7	silty sand to sandy silt
60.20	171.8	5.683	3.308	-10.68	68	6	sandy silt to clayey silt
60.37	146.8	5.736	3.907	-10.68	146	11	very stiff fine grained (*)
60.53	140.3	7.693	5.482	-10.46	125	11	very stiff fine grained (*)
60.70	103.4	5.916	5.722	-10.01	98	11	very stiff fine grained (*)
60.86	64.1	3.685	5.749	-9.83	74	11	very stiff fine grained (*)
61.02	64.2	3.534	5.502	-9.37	40	5	clayey silt to silty clay
61.19	119.4	3.538	2.964	-9.50	41	6	sandy silt to clayey silt
61.35	133.9	2.987	2.232	-9.52	39	7	silty sand to sandy silt
61.52	112.1	2.449	2.185	-9.75	38	7	silty sand to sandy silt
61.68	108.5	2.775	2.558	-9.59	40	6	sandy silt to clayey silt
61.84	93.4	4.209	4.507	-9.84	52	5	clayey silt to silty clay
62.01	122.2	5.289	4.328	-9.76	45	6	sandy silt to clayey silt
62.17	139.0	3.859	2.775	-9.98	52	6	sandy silt to clayey silt
62.34	148.3	4.156	2.803	-10.09	49	7	silty sand to sandy silt
62.50	174.3	3.804	2.183	-9.72	50	7	silty sand to sandy silt
62.66	151.9	3.302	2.173	-10.10	48	7	silty sand to sandy silt
62.83	129.5	2.892	2.233	-9.80	43	7	silty sand to sandy silt
62.99	121.7	2.529	2.078	-9.73	40	7	silty sand to sandy silt
63.16	120.6	2.282	1.893	-9.98	38	7	silty sand to sandy silt
63.32	115.3	2.186	1.896	-10.14	37	7	silty sand to sandy silt

*Soil behavior type and SPT based on data from UBC-1983

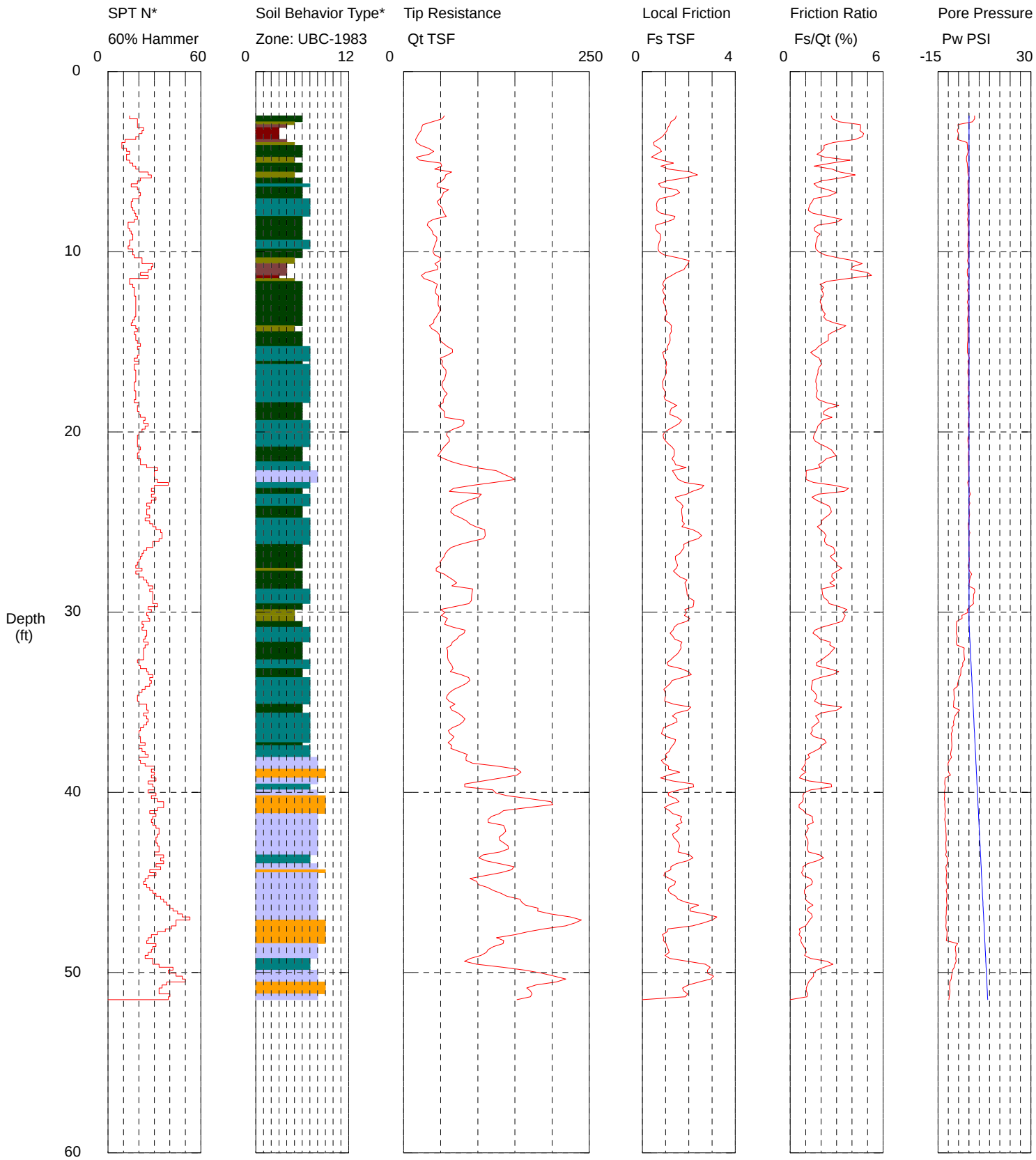
Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
63.48	114.0	2.220	1.947	-9.61	37	7	silty sand to sandy silt
63.65	118.1	2.257	1.911	-9.77	38	7	silty sand to sandy silt
63.81	124.3	2.426	1.952	-10.05	39	7	silty sand to sandy silt
63.98	123.3	2.816	2.284	-10.09	39	7	silty sand to sandy silt
64.14	121.8	3.146	2.583	-9.92	39	7	silty sand to sandy silt
64.30	123.2	3.114	2.527	-9.91	39	7	silty sand to sandy silt
64.47	120.5	3.188	2.645	-9.90	41	7	silty sand to sandy silt
64.63	142.3	3.254	2.286	-9.47	43	7	silty sand to sandy silt
64.80	144.1	3.325	2.307	-9.14	46	7	silty sand to sandy silt
64.96	146.1	3.514	2.405	-9.22	47	7	silty sand to sandy silt
65.12	148.0	4.192	2.832	-9.32	49	7	silty sand to sandy silt
65.29	162.7	4.934	3.033	-9.14	53	7	silty sand to sandy silt
65.45	191.3	4.671	2.441	-9.42	61	7	silty sand to sandy silt
65.62	216.0	5.467	2.531	-9.67	64	7	silty sand to sandy silt
65.78	195.8	5.130	2.620	-9.67	62	7	silty sand to sandy silt
65.94	175.7	4.386	2.497	-10.60	56	7	silty sand to sandy silt
66.11	151.8	3.708	2.443	-11.02	50	7	silty sand to sandy silt
66.27	139.1	3.150	2.264	-11.01	45	7	silty sand to sandy silt
66.44	131.2	2.943	2.243	-10.91	42	7	silty sand to sandy silt
66.60	122.6	2.595	2.118	-11.01	40	7	silty sand to sandy silt
66.77	120.4	2.398	1.992	-11.07	38	7	silty sand to sandy silt
66.93	117.3	2.328	1.985	-10.95	37	7	silty sand to sandy silt
67.09	113.7	2.450	2.155	-10.92	36	7	silty sand to sandy silt
67.26	111.2	2.660	2.392	-10.90	35	7	silty sand to sandy silt
67.42	106.7	2.750	2.578	-11.02	34	7	silty sand to sandy silt
67.59	106.2	1.880	1.770	-10.80	34	7	silty sand to sandy silt
67.75	109.1	2.345	2.150	-10.78	34	7	silty sand to sandy silt
67.91	103.4	2.455	2.375	-9.92	34	7	silty sand to sandy silt
68.08	106.3	2.502	2.354	-9.80	34	7	silty sand to sandy silt
68.24	107.8	2.615	2.426	-9.77	34	7	silty sand to sandy silt
68.41	108.3	2.773	2.560	-9.76	35	7	silty sand to sandy silt
68.57	110.5	2.793	2.528	-9.78	42	6	sandy silt to clayey silt
68.73	111.0	3.289	2.962	-9.79	42	6	sandy silt to clayey silt
68.90	109.9	3.711	3.376	-9.59	39	6	sandy silt to clayey silt
69.06	84.2	3.399	4.037	-3.16	43	5	clayey silt to silty clay
69.23	78.4	3.164	4.034	-6.92	45	4	silty clay to clay
69.39	49.3	3.216	6.519	-6.55	55	3	clay
69.55	44.8	3.473	7.751	-5.04	73	11	very stiff fine grained (*)
69.72	133.4	4.957	3.717	-5.36	114	11	very stiff fine grained (*)
69.88	178.0	5.743	3.227	-6.91	64	6	sandy silt to clayey silt
70.05	192.9	6.574	3.408	-8.03	88	12	sand to clayey sand (*)
70.21	181.5	7.122	3.923	-8.48	161	11	very stiff fine grained (*)
70.37	131.6	6.826	5.188	-8.34	124	11	very stiff fine grained (*)
70.54	76.1	5.261	6.910	-8.67	92	11	very stiff fine grained (*)
70.70	82.1	4.918	5.993	-7.60	54	6	sandy silt to clayey silt
70.87	153.1	5.891	3.849	-8.37	65	6	sandy silt to clayey silt
71.03	187.6	-32768	-32768	-8.69	0	0	<out of range>

*Soil behavior type and SPT based on data from UBC-1983

GeoDesign / CPT-3 / 16770 SW Edy Rd Sherwood

Operator: OGE TAJ
Sounding: CPT-3
Cone Used: DPG1211
GPS Data: NO GPS

CPT Date/Time: 8/13/2016 9:18:51 AM
Location: GeoDesign / CPT-3 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-3 / 16770 SW Edy Rd Sherwood



Maximum Depth = 51.51 feet

Depth Increment = 0.164 feet

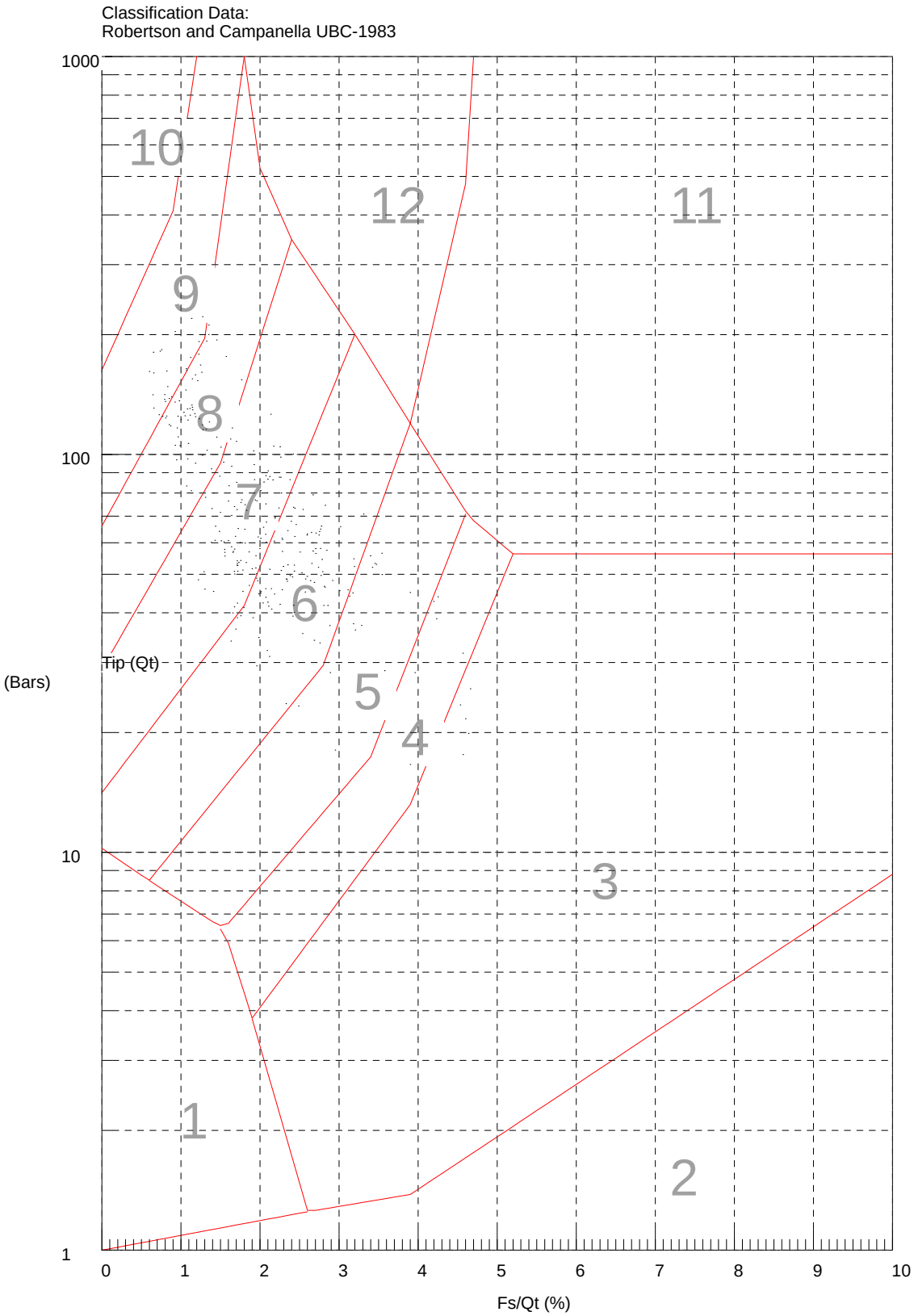
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

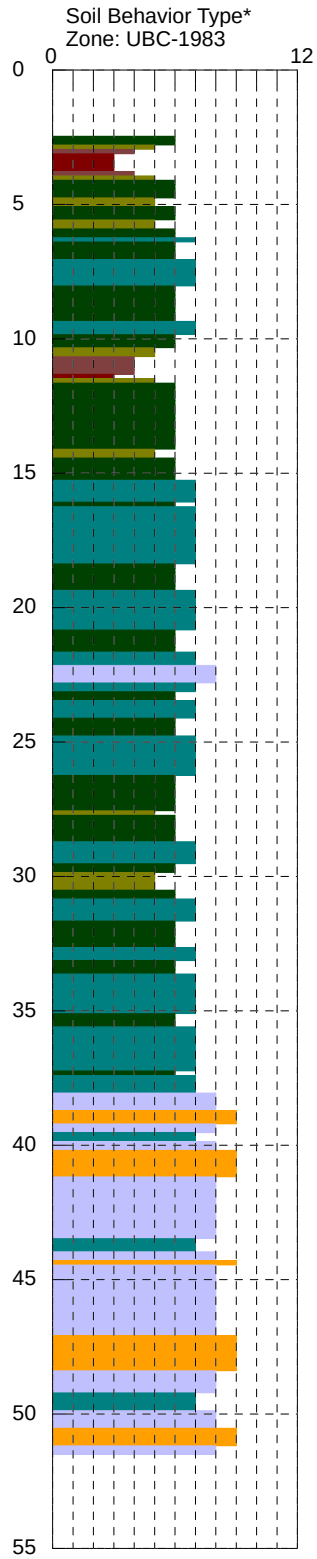
*Soil behavior type and SPT based on data from UBC-1983

GeoDesign / CPT-3 / 16770 SW Edy Rd Sherwood

Operator: OGE TAJ
Sounding: CPT-3
Cone Used: DPG1211

CPT Date/Time: 8/13/2016 9:18:51 AM
Location: GeoDesign / CPT-3 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-3 / 16770 SW Edy Rd Sherwood



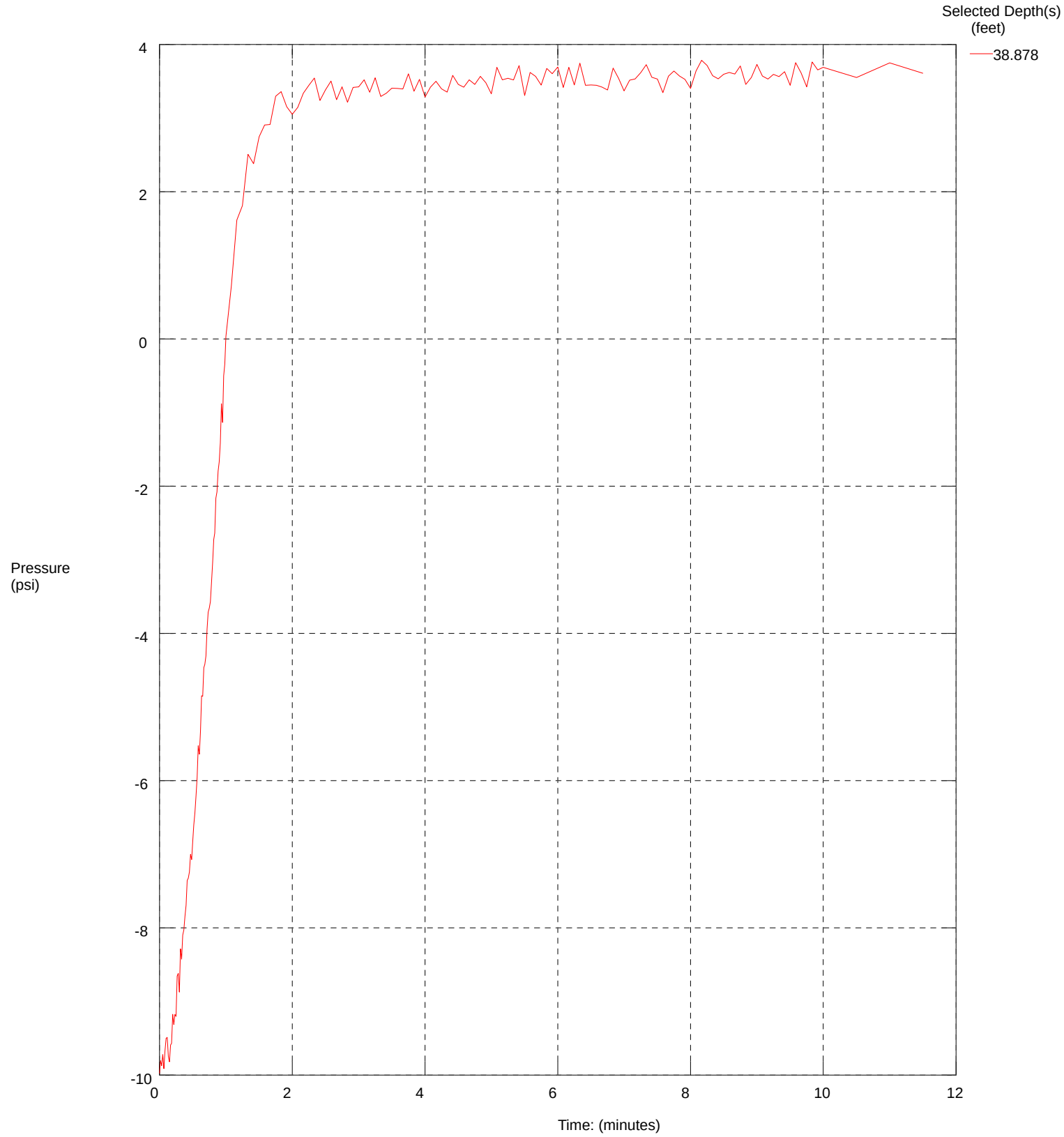


1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

GeoDesign / CPT-3 / 16770 SW Edy Rd Sherwood

Operator OGE TAJ
Sounding: CPT-3
Cone Used: DPG1211
GPS Data: NO GPS

CPT Date/Time: 8/13/2016 9:18:51 AM
Location: GeoDesign / CPT-3 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-3 / 16770 SW Edy Rd Sherwood



Maximum Pressure = 3.784 psi

Data File:CPT-3 8/13/2016 9:18:51 AM
Operator:OGE TAJ Location:GeoDesign / CPT-3 / 16770 SW Edy Rd Sherwood
Cone ID:DPG1211 Job Number:16084 / GeoDesign / CPT-3 / 16770 SW Edy Rd Sherw
Customer: Units:English
GPS DATA:NO GPS

Depth (ft)	Qt TSF	Fs TSF	Fs/Qt (%)	Pw PSI	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
2.46	55.0	1.460	2.653	2.78	14	6	sandy silt to clayey silt
2.62	51.9	1.413	2.721	2.74	19	6	sandy silt to clayey silt
2.79	38.5	1.228	3.193	1.67	19	5	clayey silt to silty clay
2.95	26.1	1.185	4.534	-5.40	19	4	silty clay to clay
3.12	24.0	1.096	4.558	-5.06	23	3	clay
3.28	23.4	1.055	4.505	-5.63	22	3	clay
3.44	20.4	0.971	4.756	-5.11	20	3	clay
3.61	18.5	0.863	4.669	-5.27	18	3	clay
3.77	16.3	0.685	4.213	-5.60	11	4	silty clay to clay
3.94	17.4	0.484	2.789	-0.94	9	5	clayey silt to silty clay
4.10	23.0	0.503	2.183	-0.77	9	6	sandy silt to clayey silt
4.27	33.7	0.737	2.190	-0.68	12	6	sandy silt to clayey silt
4.43	40.6	0.822	2.022	-0.32	14	6	sandy silt to clayey silt
4.59	34.3	0.595	1.732	-0.69	12	6	sandy silt to clayey silt
4.76	17.2	0.387	2.250	-1.20	12	5	clayey silt to silty clay
4.92	21.6	0.836	3.877	-1.18	14	5	clayey silt to silty clay
5.09	49.9	1.335	2.678	-0.82	16	6	sandy silt to clayey silt
5.25	51.5	0.795	1.543	-0.68	18	6	sandy silt to clayey silt
5.41	41.9	1.133	2.706	-0.57	20	6	sandy silt to clayey silt
5.58	64.7	2.067	3.197	-0.57	26	5	clayey silt to silty clay
5.74	56.5	2.374	4.200	-0.37	28	5	clayey silt to silty clay
5.91	55.7	1.819	3.268	0.20	21	6	sandy silt to clayey silt
6.07	51.6	1.038	2.010	-0.46	19	6	sandy silt to clayey silt
6.23	45.2	0.694	1.536	-0.45	15	7	silty sand to sandy silt
6.40	45.1	0.796	1.764	-0.35	19	6	sandy silt to clayey silt
6.56	60.7	1.480	2.438	-0.54	20	6	sandy silt to clayey silt
6.73	53.7	1.605	2.987	-0.51	21	6	sandy silt to clayey silt
6.89	52.3	1.341	2.564	-0.24	20	6	sandy silt to clayey silt
7.05	49.5	0.753	1.523	-0.53	16	7	silty sand to sandy silt
7.22	45.1	0.641	1.421	-0.27	15	7	silty sand to sandy silt
7.38	47.2	0.605	1.280	-0.70	15	7	silty sand to sandy silt
7.55	51.4	0.623	1.212	-0.48	16	7	silty sand to sandy silt
7.71	53.0	0.619	1.167	-0.39	17	7	silty sand to sandy silt
7.87	54.6	0.808	1.481	-0.59	18	7	silty sand to sandy silt
8.04	57.4	1.403	2.445	-0.34	19	6	sandy silt to clayey silt
8.20	40.2	1.348	3.348	-0.72	17	6	sandy silt to clayey silt
8.37	33.1	0.985	2.974	-0.36	13	6	sandy silt to clayey silt
8.53	32.0	0.570	1.783	-0.54	13	6	sandy silt to clayey silt
8.69	35.7	0.551	1.543	-0.25	14	6	sandy silt to clayey silt
8.86	38.7	0.616	1.592	-0.27	15	6	sandy silt to clayey silt
9.02	39.6	0.763	1.925	-0.44	16	6	sandy silt to clayey silt
9.19	44.8	0.782	1.747	-0.20	16	6	sandy silt to clayey silt
9.35	44.8	0.772	1.723	-0.39	14	7	silty sand to sandy silt
9.51	43.0	0.715	1.664	-0.48	14	7	silty sand to sandy silt
9.68	41.9	0.686	1.636	-0.66	13	7	silty sand to sandy silt
9.84	40.4	0.671	1.663	-0.33	16	6	sandy silt to clayey silt
10.01	39.6	0.728	1.838	-0.50	16	6	sandy silt to clayey silt
10.17	41.8	0.927	2.219	-0.30	17	6	sandy silt to clayey silt
10.33	49.5	1.516	3.063	-0.36	22	5	clayey silt to silty clay
10.50	49.4	2.018	4.089	-0.69	22	5	clayey silt to silty clay
10.66	42.1	1.962	4.656	-0.33	29	4	silty clay to clay
10.83	46.0	1.862	4.047	0.07	28	4	silty clay to clay
10.99	45.7	1.791	3.920	-0.75	26	4	silty clay to clay
11.15	29.4	1.472	5.006	-0.84	21	4	silty clay to clay
11.32	24.1	1.264	5.253	-0.71	26	3	clay
11.48	27.2	1.024	3.761	0.09	14	5	clayey silt to silty clay
11.65	38.4	0.919	2.394	-0.53	14	6	sandy silt to clayey silt

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
11.81	45.5	0.876	1.926	-0.41	16	6	sandy silt to clayey silt
11.98	44.2	0.952	2.153	-0.10	17	6	sandy silt to clayey silt
12.14	42.9	0.873	2.032	-0.77	17	6	sandy silt to clayey silt
12.30	43.0	0.919	2.136	-0.25	17	6	sandy silt to clayey silt
12.47	47.3	1.002	2.120	-0.32	18	6	sandy silt to clayey silt
12.63	46.8	0.921	1.967	-0.32	18	6	sandy silt to clayey silt
12.80	46.5	0.898	1.931	-0.82	18	6	sandy silt to clayey silt
12.96	46.6	0.956	2.050	-0.27	18	6	sandy silt to clayey silt
13.12	48.6	0.995	2.048	-0.60	18	6	sandy silt to clayey silt
13.29	49.0	1.035	2.112	-0.45	18	6	sandy silt to clayey silt
13.45	46.5	1.053	2.267	-0.24	18	6	sandy silt to clayey silt
13.62	44.2	0.958	2.168	-0.54	17	6	sandy silt to clayey silt
13.78	41.0	0.951	2.322	-0.76	16	6	sandy silt to clayey silt
13.94	40.5	1.147	2.828	-0.47	15	6	sandy silt to clayey silt
14.11	34.9	1.254	3.597	-0.38	18	5	clayey silt to silty clay
14.27	38.0	1.233	3.245	-0.55	19	5	clayey silt to silty clay
14.44	44.7	1.253	2.800	-0.52	17	6	sandy silt to clayey silt
14.60	48.1	1.184	2.463	-0.53	18	6	sandy silt to clayey silt
14.93	48.5	1.195	2.461	-0.48	19	6	sandy silt to clayey silt
15.09	53.8	1.147	2.132	-0.69	21	6	sandy silt to clayey silt
15.26	58.8	1.077	1.831	-0.74	19	7	silty sand to sandy silt
15.42	65.6	1.089	1.661	-0.78	20	7	silty sand to sandy silt
15.58	65.9	0.870	1.319	-0.75	20	7	silty sand to sandy silt
15.75	58.5	0.907	1.550	-0.20	19	7	silty sand to sandy silt
15.91	49.5	0.926	1.871	0.21	17	7	silty sand to sandy silt
16.08	52.4	1.024	1.953	-0.46	20	6	sandy silt to clayey silt
16.24	51.3	1.043	2.035	-0.30	17	7	silty sand to sandy silt
16.40	53.4	1.002	1.877	-0.07	17	7	silty sand to sandy silt
16.57	57.1	1.023	1.794	-0.54	18	7	silty sand to sandy silt
16.73	57.2	1.031	1.802	-0.54	18	7	silty sand to sandy silt
17.06	55.4	0.922	1.665	0.00	18	7	silty sand to sandy silt
17.22	52.5	0.866	1.651	-0.29	17	7	silty sand to sandy silt
17.39	51.4	0.878	1.707	-0.20	17	7	silty sand to sandy silt
17.55	52.9	0.887	1.675	-0.41	17	7	silty sand to sandy silt
17.72	55.0	0.969	1.761	-0.26	18	7	silty sand to sandy silt
17.88	58.7	0.994	1.694	-0.01	18	7	silty sand to sandy silt
18.04	55.5	0.930	1.674	-0.46	18	7	silty sand to sandy silt
18.21	53.5	0.978	1.828	-0.27	17	7	silty sand to sandy silt
18.37	53.4	1.251	2.342	-0.52	20	6	sandy silt to clayey silt
18.54	47.2	1.485	3.144	-0.14	19	6	sandy silt to clayey silt
18.70	50.3	1.244	2.473	-0.52	19	6	sandy silt to clayey silt
18.86	54.9	1.196	2.180	-0.04	20	6	sandy silt to clayey silt
19.03	54.9	1.189	2.164	0.22	21	6	sandy silt to clayey silt
19.19	55.6	1.502	2.703	-0.22	24	6	sandy silt to clayey silt
19.36	81.0	1.679	2.074	-0.05	23	7	silty sand to sandy silt
19.52	81.5	1.592	1.952	-0.33	26	7	silty sand to sandy silt
19.69	78.2	1.394	1.783	-0.41	24	7	silty sand to sandy silt
19.85	67.1	1.161	1.731	-0.02	22	7	silty sand to sandy silt
20.01	58.8	0.957	1.629	-0.12	20	7	silty sand to sandy silt
20.18	57.8	0.889	1.537	-0.05	19	7	silty sand to sandy silt
20.34	61.2	0.915	1.494	-0.46	19	7	silty sand to sandy silt
20.51	61.8	1.001	1.621	-0.52	19	7	silty sand to sandy silt
20.67	58.2	1.122	1.927	-0.23	19	7	silty sand to sandy silt
20.83	54.5	1.271	2.333	-0.32	21	6	sandy silt to clayey silt
21.00	51.3	1.369	2.668	-0.02	20	6	sandy silt to clayey silt
21.16	48.9	1.376	2.814	-0.23	19	6	sandy silt to clayey silt
21.33	45.9	1.362	2.966	-0.31	19	6	sandy silt to clayey silt
21.49	54.6	1.275	2.335	-0.25	21	6	sandy silt to clayey silt
21.65	64.6	1.378	2.132	-0.29	21	7	silty sand to sandy silt
21.82	78.1	1.429	1.830	-0.18	25	7	silty sand to sandy silt
21.98	96.9	1.888	1.948	-0.16	32	7	silty sand to sandy silt
22.15	124.6	1.290	1.036	-0.18	30	8	sand to silty sand
22.64	150.5	1.542	1.024	-0.07	32	8	sand to silty sand

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
22.80	121.9	1.824	1.496	-0.60	39	7	silty sand to sandy silt
22.97	92.9	2.650	2.852	-0.35	30	7	silty sand to sandy silt
23.13	67.3	2.538	3.771	0.21	28	6	sandy silt to clayey silt
23.29	61.6	2.154	3.495	0.24	30	6	sandy silt to clayey silt
23.46	104.6	1.904	1.819	0.66	28	7	silty sand to sandy silt
23.62	100.9	1.412	1.400	0.04	31	7	silty sand to sandy silt
23.79	87.2	1.480	1.696	-0.16	28	7	silty sand to sandy silt
23.95	78.5	1.647	2.096	0.46	25	7	silty sand to sandy silt
24.11	69.6	1.752	2.517	-0.05	27	6	sandy silt to clayey silt
24.28	64.7	1.693	2.616	-0.08	25	6	sandy silt to clayey silt
24.44	63.6	1.693	2.664	0.23	25	6	sandy silt to clayey silt
24.61	68.1	1.704	2.503	0.32	27	6	sandy silt to clayey silt
24.77	77.3	1.731	2.239	0.08	24	7	silty sand to sandy silt
24.93	84.7	1.713	2.021	-0.03	27	7	silty sand to sandy silt
25.10	89.0	1.810	2.034	-0.35	29	7	silty sand to sandy silt
25.26	97.2	1.699	1.748	-0.31	31	7	silty sand to sandy silt
25.43	109.2	2.171	1.988	-0.26	34	7	silty sand to sandy silt
25.59	109.7	2.417	2.203	0.47	35	7	silty sand to sandy silt
25.75	109.9	2.552	2.322	0.04	35	7	silty sand to sandy silt
25.92	107.8	2.406	2.232	-0.09	33	7	silty sand to sandy silt
26.08	90.8	2.017	2.221	-0.07	29	7	silty sand to sandy silt
26.25	75.9	1.783	2.349	-0.02	29	6	sandy silt to clayey silt
26.41	64.2	1.791	2.791	0.08	25	6	sandy silt to clayey silt
26.57	59.5	1.709	2.874	0.07	23	6	sandy silt to clayey silt
26.74	56.4	1.618	2.870	-0.09	22	6	sandy silt to clayey silt
26.90	54.8	1.423	2.595	0.06	21	6	sandy silt to clayey silt
27.07	51.9	1.423	2.744	0.20	20	6	sandy silt to clayey silt
27.23	48.9	1.463	2.992	0.12	19	6	sandy silt to clayey silt
27.40	50.3	1.519	3.021	-0.32	18	6	sandy silt to clayey silt
27.56	43.9	1.469	3.349	-0.14	22	5	clayey silt to silty clay
27.72	43.9	1.335	3.038	0.27	18	6	sandy silt to clayey silt
27.89	54.6	1.477	2.707	1.33	20	6	sandy silt to clayey silt
28.05	60.5	1.625	2.686	0.67	23	6	sandy silt to clayey silt
28.22	66.8	1.924	2.879	0.34	25	6	sandy silt to clayey silt
28.38	71.6	1.833	2.561	0.18	26	6	sandy silt to clayey silt
28.54	65.1	1.867	2.867	-0.24	29	6	sandy silt to clayey silt
28.71	93.0	1.901	2.043	2.62	27	7	silty sand to sandy silt
28.87	92.4	1.915	2.072	2.88	29	7	silty sand to sandy silt
29.04	91.8	1.928	2.101	2.24	29	7	silty sand to sandy silt
29.20	91.6	2.006	2.191	2.27	29	7	silty sand to sandy silt
29.36	91.4	2.222	2.431	2.03	29	7	silty sand to sandy silt
29.53	87.9	2.214	2.517	2.29	32	6	sandy silt to clayey silt
29.69	68.8	2.186	3.177	0.50	26	6	sandy silt to clayey silt
29.86	49.6	1.823	3.673	-0.88	28	5	clayey silt to silty clay
30.02	55.8	1.907	3.418	-0.41	25	5	clayey silt to silty clay
30.18	50.9	1.810	3.554	-3.38	26	5	clayey silt to silty clay
30.35	59.2	2.041	3.450	-3.31	27	5	clayey silt to silty clay
30.51	56.8	1.909	3.362	-5.90	22	6	sandy silt to clayey silt
30.68	55.4	1.507	2.720	-6.12	23	6	sandy silt to clayey silt
30.84	67.0	1.367	2.040	-6.03	22	7	silty sand to sandy silt
31.00	83.1	1.322	1.592	-6.05	25	7	silty sand to sandy silt
31.17	81.5	1.190	1.460	-6.13	25	7	silty sand to sandy silt
31.33	74.7	1.310	1.754	-5.69	24	7	silty sand to sandy silt
31.50	71.6	1.388	1.939	-5.93	23	7	silty sand to sandy silt
31.66	65.6	1.706	2.600	-6.19	26	6	sandy silt to clayey silt
31.82	64.4	1.642	2.549	-5.89	24	6	sandy silt to clayey silt
31.99	58.0	1.666	2.875	-2.28	23	6	sandy silt to clayey silt
32.15	59.3	1.601	2.699	-2.46	23	6	sandy silt to clayey silt
32.32	59.4	1.509	2.540	-2.43	23	6	sandy silt to clayey silt
32.48	59.3	1.348	2.274	-2.29	23	6	sandy silt to clayey silt
32.64	60.0	1.219	2.031	-2.07	19	7	silty sand to sandy silt
32.81	62.3	1.058	1.697	-3.06	20	7	silty sand to sandy silt
32.97	65.3	1.117	1.710	-2.98	21	7	silty sand to sandy silt

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
33.14	66.7	1.658	2.487	-3.88	25	6	sandy silt to clayey silt
33.30	63.0	1.976	3.138	-3.88	26	6	sandy silt to clayey silt
33.46	77.3	2.109	2.727	-4.03	29	6	sandy silt to clayey silt
33.63	87.6	1.710	1.952	-4.65	27	7	silty sand to sandy silt
33.79	89.2	1.282	1.437	-5.13	28	7	silty sand to sandy silt
33.96	84.5	1.203	1.423	-5.49	27	7	silty sand to sandy silt
34.12	76.7	1.057	1.378	-5.61	24	7	silty sand to sandy silt
34.28	67.8	0.923	1.361	-7.36	22	7	silty sand to sandy silt
34.45	62.3	0.987	1.585	-7.21	20	7	silty sand to sandy silt
34.61	58.8	1.006	1.710	-7.23	19	7	silty sand to sandy silt
34.78	57.6	0.974	1.690	-6.88	19	7	silty sand to sandy silt
34.94	61.4	0.963	1.569	-7.37	20	7	silty sand to sandy silt
35.10	69.2	1.351	1.952	-7.42	25	6	sandy silt to clayey silt
35.27	62.5	2.079	3.327	-7.49	25	6	sandy silt to clayey silt
35.43	64.9	1.968	3.032	-4.57	26	6	sandy silt to clayey silt
35.60	73.2	1.473	2.013	-5.76	23	7	silty sand to sandy silt
35.76	78.4	1.290	1.645	-6.78	25	7	silty sand to sandy silt
35.93	82.7	1.473	1.782	-7.08	26	7	silty sand to sandy silt
36.09	79.9	1.494	1.871	-7.51	25	7	silty sand to sandy silt
36.25	74.8	1.202	1.607	-7.32	23	7	silty sand to sandy silt
36.42	65.6	0.912	1.391	-8.33	21	7	silty sand to sandy silt
36.58	60.3	0.865	1.434	-7.90	20	7	silty sand to sandy silt
36.75	62.5	0.823	1.318	-8.60	20	7	silty sand to sandy silt
36.91	67.9	1.039	1.530	-8.38	21	7	silty sand to sandy silt
37.07	64.8	1.430	2.207	-8.44	21	7	silty sand to sandy silt
37.24	60.0	1.398	2.329	-8.36	24	6	sandy silt to clayey silt
37.40	64.9	1.304	2.010	-8.26	20	7	silty sand to sandy silt
37.57	63.6	1.213	1.906	-8.39	22	7	silty sand to sandy silt
37.73	74.7	1.153	1.544	-8.72	24	7	silty sand to sandy silt
37.89	85.8	0.990	1.153	-8.96	26	7	silty sand to sandy silt
38.06	84.1	1.058	1.258	-8.46	20	8	sand to silty sand
38.22	84.2	0.820	0.974	-9.47	21	8	sand to silty sand
38.39	93.0	0.918	0.986	-10.12	24	8	sand to silty sand
38.55	126.6	1.125	0.889	-10.09	30	8	sand to silty sand
38.71	152.7	1.119	0.733	-9.94	28	9	sand
38.88	158.3	1.612	1.019	-9.83	30	9	sand
39.04	152.9	1.116	0.730	-8.96	28	9	sand
39.21	131.8	0.779	0.591	-11.49	31	8	sand to silty sand
39.37	106.8	1.302	1.219	-11.67	26	8	sand to silty sand
39.53	82.4	2.183	2.648	-11.72	29	7	silty sand to sandy silt
39.70	82.4	2.212	2.685	-11.45	30	7	silty sand to sandy silt
39.86	120.2	1.594	1.326	-11.70	26	8	sand to silty sand
40.03	124.1	1.104	0.890	-11.92	31	8	sand to silty sand
40.19	139.2	1.136	0.816	-11.73	28	9	sand
40.35	170.0	1.443	0.849	-11.98	32	9	sand
40.52	198.4	1.576	0.794	-11.65	36	9	sand
40.68	201.0	1.169	0.582	-11.74	36	9	sand
40.85	166.8	0.943	0.565	-11.62	32	9	sand
41.01	134.6	1.169	0.868	-11.33	27	9	sand
41.17	129.4	1.296	1.002	-11.65	31	8	sand to silty sand
41.34	118.5	1.691	1.427	-11.45	29	8	sand to silty sand
41.50	113.8	1.628	1.431	-11.76	28	8	sand to silty sand
41.67	114.1	1.703	1.493	-11.47	29	8	sand to silty sand
41.83	134.6	1.441	1.071	-11.26	31	8	sand to silty sand
41.99	136.4	1.599	1.172	-11.14	33	8	sand to silty sand
42.16	137.6	1.502	1.091	-11.19	33	8	sand to silty sand
42.32	133.8	1.301	0.972	-11.12	32	8	sand to silty sand
42.49	128.6	1.339	1.041	-11.05	31	8	sand to silty sand
42.65	129.4	1.475	1.140	-11.01	31	8	sand to silty sand
42.81	135.3	1.567	1.158	-11.23	32	8	sand to silty sand
42.98	140.8	1.603	1.139	-11.13	33	8	sand to silty sand
43.14	141.1	1.567	1.111	-11.15	33	8	sand to silty sand
43.31	129.8	1.531	1.179	-10.92	30	8	sand to silty sand

*Soil behavior type and SPT based on data from UBC-1983

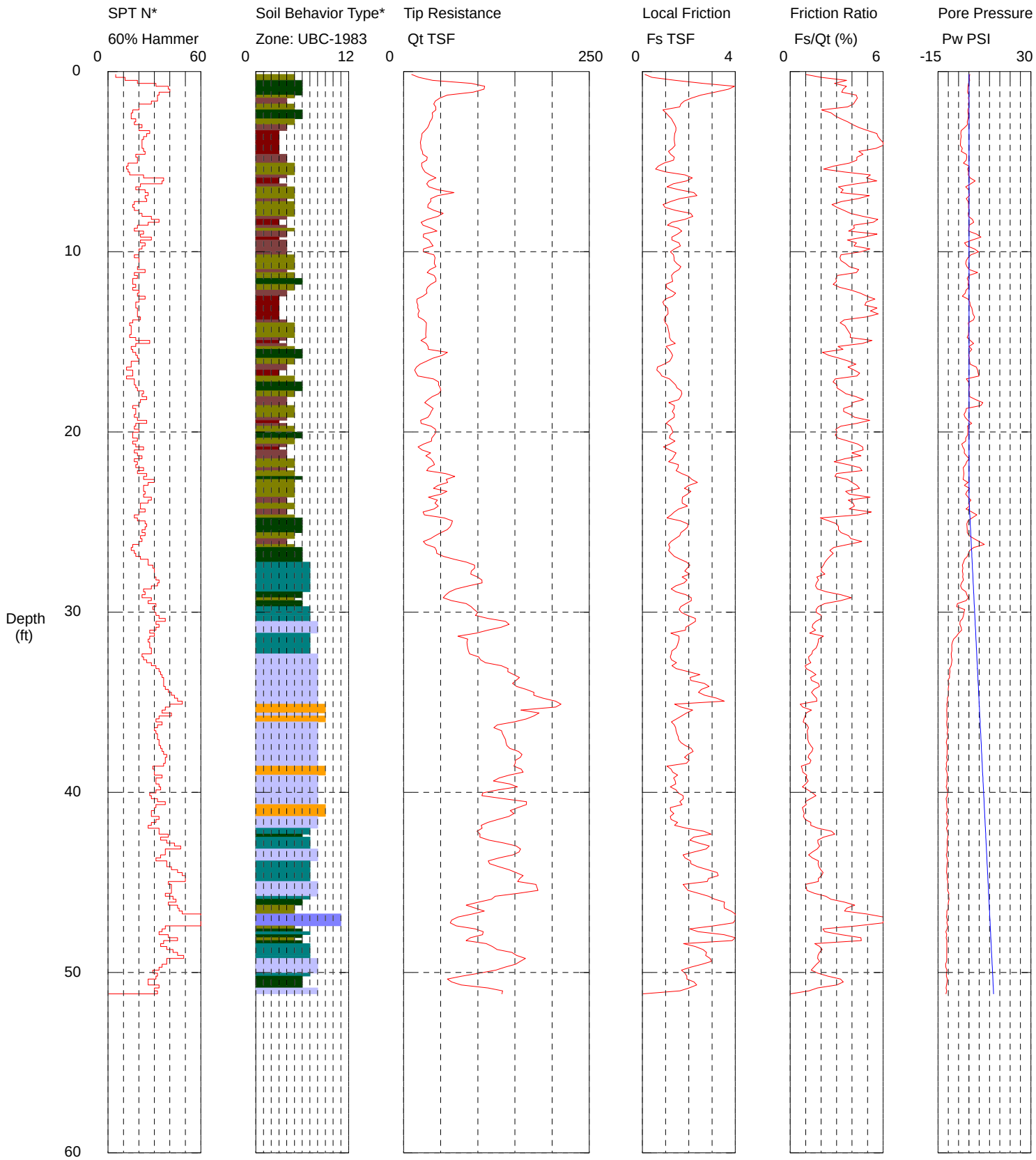
Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
43.47	107.0	2.033	1.900	-11.35	36	7	silty sand to sandy silt
43.64	101.2	2.180	2.153	-10.46	34	7	silty sand to sandy silt
43.80	111.5	1.921	1.722	-10.47	36	7	silty sand to sandy silt
43.96	129.7	1.465	1.130	-10.48	31	8	sand to silty sand
44.13	148.6	1.226	0.825	-11.18	34	8	sand to silty sand
44.29	145.7	1.223	0.839	-11.02	27	9	sand
44.46	131.4	0.966	0.735	-10.69	31	8	sand to silty sand
44.62	109.8	0.922	0.840	-10.91	26	8	sand to silty sand
44.78	89.4	1.171	1.310	-11.05	24	8	sand to silty sand
44.95	98.7	1.428	1.447	-11.06	23	8	sand to silty sand
45.11	100.1	1.386	1.385	-10.69	25	8	sand to silty sand
45.28	113.1	1.151	1.018	-10.39	27	8	sand to silty sand
45.44	120.8	1.109	0.917	-11.07	29	8	sand to silty sand
45.60	131.4	1.212	0.923	-10.69	31	8	sand to silty sand
45.77	139.0	1.436	1.032	-10.65	34	8	sand to silty sand
45.93	156.9	1.530	0.975	-10.91	36	8	sand to silty sand
46.10	159.1	1.861	1.170	-10.85	38	8	sand to silty sand
46.26	164.3	2.418	1.472	-10.65	40	8	sand to silty sand
46.42	181.1	2.080	1.149	-10.93	42	8	sand to silty sand
46.59	180.5	2.047	1.134	-10.95	45	8	sand to silty sand
46.75	198.2	2.727	1.376	-10.96	48	8	sand to silty sand
46.92	224.8	3.210	1.428	-11.20	53	8	sand to silty sand
47.08	239.5	3.012	1.258	-11.09	44	9	sand
47.24	231.2	2.634	1.139	-10.99	44	9	sand
47.41	218.0	2.157	0.989	-11.21	41	9	sand
47.57	188.8	1.108	0.587	-10.99	37	9	sand
47.74	168.0	1.071	0.637	-10.62	32	9	sand
47.90	149.7	0.858	0.573	-10.67	28	9	sand
48.06	125.2	0.921	0.736	-10.77	26	9	sand
48.23	135.0	0.905	0.670	-10.96	25	9	sand
48.39	134.1	1.020	0.760	-5.49	31	8	sand to silty sand
48.56	121.4	1.065	0.877	-6.51	29	8	sand to silty sand
48.72	114.1	1.121	0.982	-6.58	28	8	sand to silty sand
48.88	111.4	1.155	1.037	-6.33	26	8	sand to silty sand
49.05	104.2	0.975	0.936	-6.24	24	8	sand to silty sand
49.21	90.0	1.180	1.310	-6.47	29	7	silty sand to sandy silt
49.38	82.1	1.956	2.384	-6.14	29	7	silty sand to sandy silt
49.54	98.5	2.715	2.758	-6.80	33	7	silty sand to sandy silt
49.70	133.5	2.921	2.188	-7.11	42	7	silty sand to sandy silt
49.87	163.2	2.803	1.717	-7.95	39	8	sand to silty sand
50.03	186.0	2.801	1.506	-8.18	44	8	sand to silty sand
50.20	203.0	3.064	1.509	-8.46	48	8	sand to silty sand
50.36	218.5	2.946	1.348	-8.58	50	8	sand to silty sand
50.52	205.7	2.453	1.192	-9.32	38	9	sand
50.69	178.1	1.979	1.111	-9.29	35	9	sand
50.85	165.9	1.732	1.044	-9.38	33	9	sand
51.02	170.8	1.774	1.038	-9.23	33	9	sand
51.18	173.1	1.954	1.129	-9.35	40	8	sand to silty sand
51.35	170.8	1.848	1.082	-9.59	39	8	sand to silty sand
51.51	152.7	-32768	-32768	-9.77	0	0	<out of range>

*Soil behavior type and SPT based on data from UBC-1983

GeoDesign / CPT-4 / 16770 SW Edy Rd Sherwood

Operator: OGE TAJ
Sounding: CPT-4
Cone Used: DPG1211
GPS Data: NO GPS

CPT Date/Time: 8/13/2016 2:49:26 PM
Location: GeoDesign / CPT-4 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-4 / 16770 SW Edy Rd Sherwood



Maximum Depth = 51.18 feet

Depth Increment = 0.164 feet

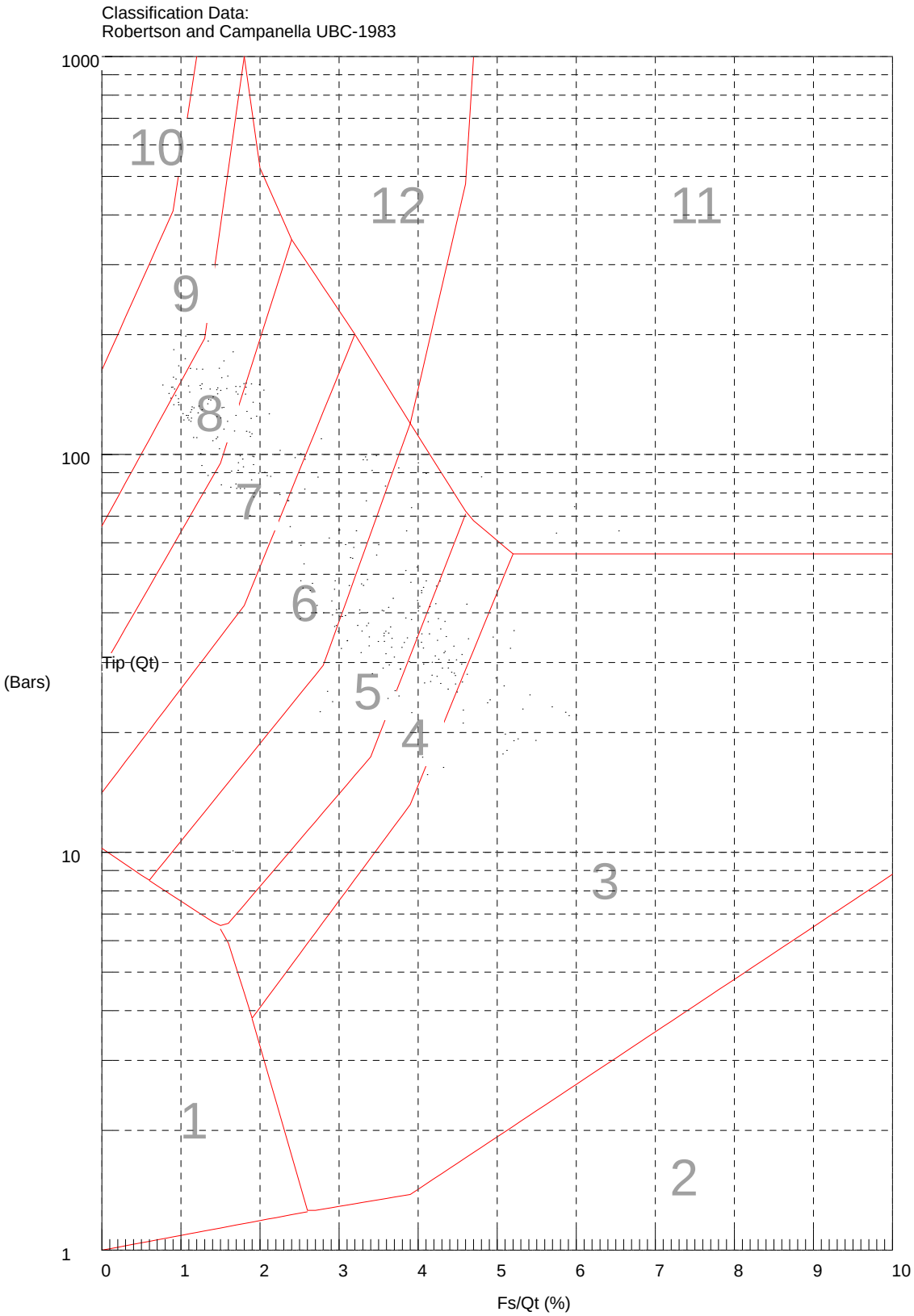
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

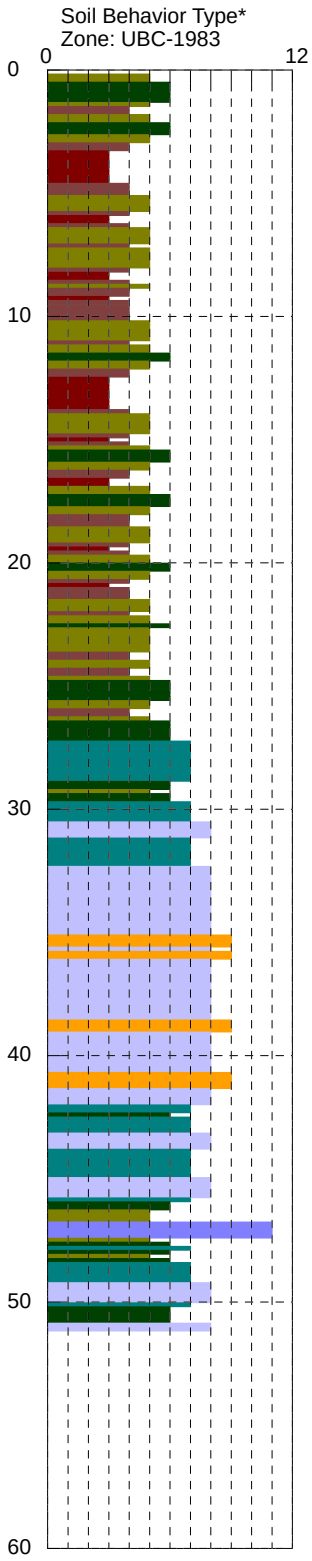
*Soil behavior type and SPT based on data from UBC-1983

GeoDesign / CPT-4 / 16770 SW Edy Rd Sherwood

Operator: OGE TAJ
Sounding: CPT-4
Cone Used: DPG1211

CPT Date/Time: 8/13/2016 2:49:26 PM
Location: GeoDesign / CPT-4 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-4 / 16770 SW Edy Rd Sherwood





1 sensitive fine grained
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6 sandy silt to clayey silt
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Data File:CPT-4 8/13/2016 2:49:26 PM
Operator:OGE TAJ Location:GeoDesign / CPT-4 / 16770 SW Edy Rd Sherwood
Cone ID:DPG1211 Job Number:16084 / GeoDesign / CPT-4 / 16770 SW Edy Rd Sherw
Customer: Units:English
GPS DATA:NO GPS

Depth (ft)	Qt TSF	Fs TSF	Fs/Qt (%)	Pw PSI	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
0.16	11.0	0.111	1.009	0.45	5	5	clayey silt to silty clay
0.33	20.6	0.412	2.000	0.09	11	5	clayey silt to silty clay
0.49	39.1	1.426	3.648	0.37	19	6	sandy silt to clayey silt
0.66	91.2	2.612	2.862	-0.22	31	6	sandy silt to clayey silt
0.82	109.4	3.970	3.630	-0.44	39	6	sandy silt to clayey silt
0.98	108.3	3.709	3.425	-0.50	40	6	sandy silt to clayey silt
1.15	93.6	3.121	3.333	-0.65	33	6	sandy silt to clayey silt
1.31	59.1	2.522	4.270	-0.02	32	5	clayey silt to silty clay
1.48	48.7	2.112	4.339	-0.30	32	4	silty clay to clay
1.64	42.8	1.800	4.207	0.06	28	4	silty clay to clay
1.80	40.6	1.661	4.090	-0.33	20	5	clayey silt to silty clay
1.97	43.3	1.606	3.709	-0.06	20	5	clayey silt to silty clay
2.13	43.5	0.883	2.032	-0.48	16	6	sandy silt to clayey silt
2.30	38.5	1.020	2.646	-0.42	15	6	sandy silt to clayey silt
2.46	39.1	1.132	2.896	-0.22	15	6	sandy silt to clayey silt
2.62	38.2	1.254	3.285	-0.42	18	5	clayey silt to silty clay
2.79	35.5	1.319	3.719	-0.84	17	5	clayey silt to silty clay
2.95	34.4	1.390	4.039	-0.69	22	4	silty clay to clay
3.12	32.4	1.447	4.467	-2.15	20	4	silty clay to clay
3.28	28.7	1.441	5.026	-3.80	27	3	clay
3.44	24.9	1.394	5.600	-3.94	25	3	clay
3.61	24.3	1.381	5.671	-3.70	23	3	clay
3.77	23.5	1.366	5.814	-4.03	22	3	clay
3.94	22.6	1.385	6.121	-4.09	22	3	clay
4.10	23.2	1.406	6.065	-4.19	22	3	clay
4.27	23.3	1.292	5.543	-3.21	23	3	clay
4.43	25.3	1.122	4.436	-3.77	24	3	clay
4.59	25.8	1.215	4.705	-1.23	18	4	silty clay to clay
4.76	31.9	1.375	4.308	-1.08	19	4	silty clay to clay
4.92	31.1	1.339	4.305	-1.30	19	4	silty clay to clay
5.09	24.3	0.931	3.830	-2.68	13	5	clayey silt to silty clay
5.25	24.4	0.688	2.819	0.00	12	5	clayey silt to silty clay
5.41	26.3	0.567	2.159	-0.64	13	5	clayey silt to silty clay
5.58	28.9	1.013	3.511	-0.25	14	5	clayey silt to silty clay
5.74	35.4	1.834	5.184	-0.35	23	4	silty clay to clay
5.91	43.6	2.152	4.930	0.59	36	3	clay
6.07	34.0	1.903	5.597	2.99	35	3	clay
6.23	31.2	1.331	4.261	0.85	21	4	silty clay to clay
6.40	34.1	1.064	3.117	-1.54	18	5	clayey silt to silty clay
6.56	46.0	1.577	3.426	-0.14	24	5	clayey silt to silty clay
6.73	68.0	2.221	3.264	-0.04	26	5	clayey silt to silty clay
6.89	46.0	2.350	5.110	0.23	24	5	clayey silt to silty clay
7.05	36.7	1.607	4.385	-1.35	25	4	silty clay to clay
7.22	36.6	1.213	3.318	-0.38	17	5	clayey silt to silty clay
7.38	33.0	0.888	2.694	-0.14	16	5	clayey silt to silty clay
7.55	32.5	0.985	3.035	-0.19	17	5	clayey silt to silty clay
7.71	41.3	1.438	3.485	0.02	20	5	clayey silt to silty clay
7.87	53.4	2.080	3.896	-0.35	22	5	clayey silt to silty clay
8.04	46.2	2.174	4.708	-0.24	28	4	silty clay to clay
8.20	32.2	1.823	5.666	1.64	33	3	clay
8.37	23.7	1.273	5.372	2.33	26	3	clay
8.53	26.2	1.078	4.113	0.18	19	4	silty clay to clay
8.69	37.2	1.543	4.144	-0.07	17	5	clayey silt to silty clay
8.86	45.0	1.694	3.767	-0.21	23	4	silty clay to clay
9.02	27.0	1.517	5.620	3.66	21	4	silty clay to clay
9.19	26.4	1.267	4.796	5.82	28	3	clay
9.35	34.4	1.269	3.692	1.58	21	4	silty clay to clay

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
9.51	36.8	1.577	4.286	-2.09	24	4	silty clay to clay
9.68	39.7	1.638	4.125	-1.03	22	4	silty clay to clay
9.84	26.9	1.385	5.148	2.69	20	4	silty clay to clay
10.01	26.4	1.208	4.570	4.68	20	4	silty clay to clay
10.17	40.8	1.337	3.279	0.99	17	5	clayey silt to silty clay
10.33	42.4	1.363	3.214	-0.50	20	5	clayey silt to silty clay
10.50	41.7	1.368	3.280	-1.27	20	5	clayey silt to silty clay
10.66	41.4	1.484	3.586	-1.61	20	5	clayey silt to silty clay
10.83	43.6	1.660	3.810	-0.98	19	5	clayey silt to silty clay
10.99	35.6	1.574	4.423	0.11	24	4	silty clay to clay
11.15	31.8	1.358	4.277	4.19	17	5	clayey silt to silty clay
11.32	41.1	1.253	3.052	0.03	19	5	clayey silt to silty clay
11.48	43.5	1.280	2.945	-0.90	16	6	sandy silt to clayey silt
11.65	43.7	1.307	2.993	-0.15	16	6	sandy silt to clayey silt
11.81	36.6	1.017	2.778	-0.42	18	5	clayey silt to silty clay
11.98	32.2	1.034	3.208	-0.11	16	5	clayey silt to silty clay
12.14	30.7	1.211	3.940	-1.42	20	4	silty clay to clay
12.30	31.5	1.430	4.536	-1.78	19	4	silty clay to clay
12.47	26.1	1.295	4.960	-3.21	24	3	clay
12.63	18.1	0.992	5.481	-0.41	20	3	clay
12.80	17.9	0.880	4.916	0.42	18	3	clay
12.96	19.4	0.936	4.829	0.56	18	3	clay
13.12	19.3	1.080	5.608	1.39	19	3	clay
13.29	21.1	1.098	5.192	1.71	19	3	clay
13.45	19.5	1.106	5.686	1.95	19	3	clay
13.62	19.9	0.977	4.919	2.72	21	3	clay
13.78	26.9	0.940	3.497	2.25	16	4	silty clay to clay
13.94	30.7	0.990	3.226	-0.33	14	5	clayey silt to silty clay
14.11	30.6	1.083	3.542	-0.12	15	5	clayey silt to silty clay
14.60	29.8	1.162	3.903	-0.20	14	5	clayey silt to silty clay
14.76	30.2	1.168	3.874	-0.88	18	4	silty clay to clay
14.93	23.3	1.235	5.297	0.64	27	3	clay
15.09	30.5	1.421	4.664	2.27	18	4	silty clay to clay
15.26	33.0	1.020	3.090	-0.01	15	5	clayey silt to silty clay
15.42	33.5	1.142	3.412	1.41	16	6	sandy silt to clayey silt
15.58	59.1	1.234	2.088	0.16	18	6	sandy silt to clayey silt
15.75	52.2	1.301	2.494	-0.14	19	6	sandy silt to clayey silt
15.91	39.6	1.254	3.170	0.15	20	5	clayey silt to silty clay
16.08	31.0	1.172	3.780	0.29	15	5	clayey silt to silty clay
16.24	22.1	0.937	4.250	0.62	15	4	silty clay to clay
16.40	17.3	0.645	3.736	3.56	12	4	silty clay to clay
16.57	15.0	0.620	4.132	4.23	16	3	clay
16.73	16.9	0.758	4.492	4.50	16	3	clay
16.90	19.3	0.834	4.311	4.90	12	5	clayey silt to silty clay
17.06	40.1	1.168	2.911	-1.24	17	5	clayey silt to silty clay
17.22	47.1	1.302	2.764	-0.29	17	6	sandy silt to clayey silt
17.39	47.1	1.430	3.039	0.35	18	6	sandy silt to clayey silt
17.55	49.4	1.487	3.013	0.03	19	6	sandy silt to clayey silt
17.72	50.3	1.670	3.322	-0.13	23	5	clayey silt to silty clay
17.88	47.3	1.700	3.597	0.28	22	5	clayey silt to silty clay
18.04	38.8	1.648	4.251	0.32	25	4	silty clay to clay
18.21	32.9	1.559	4.733	3.32	21	4	silty clay to clay
18.37	28.5	1.139	4.002	6.71	20	4	silty clay to clay
18.54	34.3	1.378	4.014	5.79	16	5	clayey silt to silty clay
18.70	39.8	1.373	3.451	-1.22	18	5	clayey silt to silty clay
18.86	37.3	1.289	3.453	-1.56	18	5	clayey silt to silty clay
19.03	35.5	1.379	3.886	-2.41	17	5	clayey silt to silty clay
19.19	32.7	1.366	4.177	-1.83	19	4	silty clay to clay
19.36	22.8	1.173	5.138	-0.54	25	3	clay
19.52	23.7	1.022	4.304	1.34	18	4	silty clay to clay
19.69	36.9	1.211	3.277	-0.69	17	5	clayey silt to silty clay
19.85	42.8	1.263	2.949	-0.48	20	5	clayey silt to silty clay
20.01	43.7	1.324	3.033	-0.51	16	6	sandy silt to clayey silt

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
20.18	41.1	1.196	2.908	-0.66	16	6	sandy silt to clayey silt
20.34	37.8	1.167	3.086	-1.55	19	5	clayey silt to silty clay
20.51	37.6	1.405	3.736	-1.56	16	5	clayey silt to silty clay
20.67	27.2	1.187	4.355	-3.44	18	4	silty clay to clay
20.83	19.4	0.908	4.681	-3.00	23	3	clay
21.00	24.7	1.166	4.717	-2.17	17	4	silty clay to clay
21.16	36.4	1.452	3.984	-2.26	19	4	silty clay to clay
21.33	29.9	1.370	4.581	-1.19	22	4	silty clay to clay
21.49	36.6	1.296	3.543	0.07	17	5	clayey silt to silty clay
21.65	39.8	1.129	2.836	-1.10	19	5	clayey silt to silty clay
21.82	41.6	1.551	3.727	-1.66	18	5	clayey silt to silty clay
21.98	34.0	1.531	4.502	-2.78	23	4	silty clay to clay
22.15	31.2	1.451	4.646	-2.57	19	5	clayey silt to silty clay
22.31	56.4	1.691	2.997	-2.45	25	5	clayey silt to silty clay
22.47	69.0	1.997	2.894	-2.58	23	6	sandy silt to clayey silt
22.64	57.5	2.132	3.709	-2.80	30	5	clayey silt to silty clay
22.80	59.4	2.374	3.996	-0.45	26	5	clayey silt to silty clay
22.97	46.5	2.003	4.308	-2.21	23	5	clayey silt to silty clay
23.13	40.4	1.810	4.480	0.30	23	5	clayey silt to silty clay
23.29	58.4	2.091	3.582	-0.90	24	5	clayey silt to silty clay
23.46	50.8	1.939	3.821	-1.54	23	5	clayey silt to silty clay
23.62	33.4	1.729	5.170	-0.43	28	4	silty clay to clay
23.79	45.5	1.711	3.757	0.97	26	4	silty clay to clay
23.95	42.2	1.714	4.060	-0.21	21	5	clayey silt to silty clay
24.11	46.8	1.942	4.154	0.27	21	5	clayey silt to silty clay
24.28	41.1	1.568	3.815	-1.40	24	4	silty clay to clay
24.44	26.2	1.376	5.243	1.39	20	4	silty clay to clay
24.61	28.0	1.241	4.433	3.84	17	5	clayey silt to silty clay
24.77	54.8	1.065	1.944	1.55	19	6	sandy silt to clayey silt
24.93	65.9	1.647	2.501	-0.47	24	6	sandy silt to clayey silt
25.10	64.7	1.945	3.009	-1.05	25	6	sandy silt to clayey silt
25.26	62.8	1.958	3.120	-0.92	24	6	sandy silt to clayey silt
25.43	58.6	1.828	3.117	-0.83	22	6	sandy silt to clayey silt
25.59	50.4	1.657	3.287	-0.84	24	5	clayey silt to silty clay
25.75	42.8	1.612	3.766	0.10	21	5	clayey silt to silty clay
25.92	36.2	1.420	3.924	2.42	22	4	silty clay to clay
26.08	26.7	1.235	4.629	4.99	20	4	silty clay to clay
26.25	30.3	1.133	3.744	7.51	16	5	clayey silt to silty clay
26.41	42.0	1.182	2.818	2.39	15	6	sandy silt to clayey silt
26.57	44.2	1.132	2.562	0.40	17	6	sandy silt to clayey silt
26.74	44.7	1.243	2.781	-0.19	18	6	sandy silt to clayey silt
26.90	53.6	1.376	2.567	-0.77	21	6	sandy silt to clayey silt
27.07	68.1	1.629	2.393	-2.10	26	6	sandy silt to clayey silt
27.23	84.8	1.906	2.249	-2.61	26	7	silty sand to sandy silt
27.40	95.6	2.050	2.145	-3.20	29	7	silty sand to sandy silt
27.56	95.7	1.932	2.019	-2.97	30	7	silty sand to sandy silt
27.72	91.1	1.827	2.006	-3.21	30	7	silty sand to sandy silt
27.89	90.5	2.028	2.241	-2.85	30	7	silty sand to sandy silt
28.05	99.5	1.710	1.719	-3.06	31	7	silty sand to sandy silt
28.22	105.5	1.920	1.820	-2.70	33	7	silty sand to sandy silt
28.38	105.8	1.798	1.700	-3.59	32	7	silty sand to sandy silt
28.54	87.6	1.435	1.639	-4.08	28	7	silty sand to sandy silt
28.71	70.7	1.238	1.749	-3.41	23	7	silty sand to sandy silt
28.87	61.9	1.446	2.337	-1.48	24	6	sandy silt to clayey silt
29.04	57.1	1.867	3.271	-1.05	22	6	sandy silt to clayey silt
29.20	53.4	2.102	3.936	-0.30	28	5	clayey silt to silty clay
29.36	64.5	2.106	3.265	-1.36	26	6	sandy silt to clayey silt
29.53	84.5	1.874	2.217	-5.56	31	6	sandy silt to clayey silt
29.69	90.9	1.652	1.817	-5.98	29	7	silty sand to sandy silt
29.86	95.1	1.587	1.670	-2.05	30	7	silty sand to sandy silt
30.02	99.9	1.682	1.683	-2.43	31	7	silty sand to sandy silt
30.18	96.7	1.945	2.011	-2.70	33	7	silty sand to sandy silt
30.35	113.5	2.282	2.010	-3.08	37	7	silty sand to sandy silt

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
30.51	137.4	2.289	1.667	-4.25	31	8	sand to silty sand
30.68	142.0	2.078	1.463	-4.39	33	8	sand to silty sand
30.84	131.5	1.866	1.419	-3.80	31	8	sand to silty sand
31.00	113.6	1.857	1.635	-3.54	27	8	sand to silty sand
31.17	97.8	1.228	1.256	-4.98	30	7	silty sand to sandy silt
31.33	73.3	1.575	2.148	-6.00	27	7	silty sand to sandy silt
31.50	86.4	1.580	1.829	-7.43	26	7	silty sand to sandy silt
31.66	85.4	1.549	1.814	-8.01	27	7	silty sand to sandy silt
31.82	85.7	1.507	1.759	-8.33	27	7	silty sand to sandy silt
31.99	86.4	1.446	1.674	-8.25	28	7	silty sand to sandy silt
32.15	87.3	1.268	1.452	-8.26	28	7	silty sand to sandy silt
32.32	88.9	1.245	1.400	-8.60	22	8	sand to silty sand
32.48	101.2	1.205	1.191	-8.47	23	8	sand to silty sand
32.64	103.7	1.255	1.210	-8.22	25	8	sand to silty sand
32.81	110.2	1.472	1.335	-8.41	28	8	sand to silty sand
32.97	131.8	1.272	0.965	-8.69	31	8	sand to silty sand
33.14	140.6	1.454	1.034	-9.33	33	8	sand to silty sand
33.30	140.4	1.971	1.404	-9.23	34	8	sand to silty sand
33.46	148.4	2.474	1.667	-9.38	35	8	sand to silty sand
33.63	156.1	2.053	1.316	-9.45	36	8	sand to silty sand
33.79	151.4	2.083	1.376	-10.23	36	8	sand to silty sand
33.96	146.7	2.673	1.822	-9.68	36	8	sand to silty sand
34.12	152.2	2.871	1.887	-9.90	37	8	sand to silty sand
34.28	165.0	2.543	1.541	-10.07	39	8	sand to silty sand
34.45	175.6	2.418	1.377	-9.85	41	8	sand to silty sand
34.61	175.4	2.682	1.529	-9.93	43	8	sand to silty sand
34.78	187.6	3.194	1.703	-10.45	45	8	sand to silty sand
34.94	204.5	3.527	1.724	-10.36	48	8	sand to silty sand
35.10	212.2	1.388	0.654	-10.79	40	9	sand
35.27	204.8	1.660	0.811	-10.61	37	9	sand
35.43	158.0	2.169	1.373	-10.81	35	9	sand
35.60	182.5	1.905	1.044	-10.70	41	8	sand to silty sand
35.76	175.4	1.686	0.961	-10.70	33	9	sand
35.93	165.4	1.477	0.893	-10.56	31	9	sand
36.09	149.1	1.251	0.839	-10.80	35	8	sand to silty sand
36.25	126.2	1.376	1.091	-10.74	32	8	sand to silty sand
36.42	121.6	1.432	1.178	-10.54	30	8	sand to silty sand
36.58	131.9	1.451	1.100	-10.29	31	8	sand to silty sand
36.75	133.3	1.490	1.118	-10.62	32	8	sand to silty sand
36.91	135.2	1.542	1.141	-10.15	32	8	sand to silty sand
37.07	137.3	1.563	1.138	-10.72	33	8	sand to silty sand
37.24	138.0	1.664	1.206	-10.96	33	8	sand to silty sand
37.40	139.1	1.848	1.329	-10.62	34	8	sand to silty sand
37.57	143.3	2.104	1.469	-10.54	35	8	sand to silty sand
37.73	154.8	2.182	1.410	-10.61	36	8	sand to silty sand
37.89	159.4	1.962	1.230	-10.61	38	8	sand to silty sand
38.06	157.3	1.817	1.155	-10.87	37	8	sand to silty sand
38.22	150.5	2.019	1.341	-10.54	37	8	sand to silty sand
38.39	150.3	1.901	1.265	-10.97	36	8	sand to silty sand
38.55	148.6	1.055	0.710	-10.89	29	9	sand
38.71	158.5	1.235	0.779	-11.14	30	9	sand
38.88	161.1	1.307	0.811	-10.69	30	9	sand
39.04	142.6	1.519	1.065	-10.41	35	8	sand to silty sand
39.21	128.7	1.348	1.047	-10.58	31	8	sand to silty sand
39.37	121.1	1.410	1.164	-10.78	31	8	sand to silty sand
39.53	143.0	1.436	1.004	-10.65	33	8	sand to silty sand
39.70	153.4	1.200	0.782	-10.99	34	8	sand to silty sand
39.86	127.2	1.451	1.141	-10.57	31	8	sand to silty sand
40.03	106.6	1.541	1.445	-10.35	27	8	sand to silty sand
40.19	105.4	1.757	1.667	-10.45	28	8	sand to silty sand
40.35	134.6	1.765	1.311	-11.10	32	8	sand to silty sand
40.52	165.6	1.613	0.974	-10.85	37	8	sand to silty sand
40.68	165.3	1.713	1.036	-10.72	31	9	sand

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
40.85	153.9	1.205	0.783	-10.64	30	9	sand
41.01	143.6	1.215	0.847	-10.30	28	9	sand
41.17	148.6	1.354	0.911	-11.06	28	9	sand
41.34	141.9	1.203	0.848	-10.55	33	8	sand to silty sand
41.50	127.3	1.234	0.969	-10.79	31	8	sand to silty sand
41.67	113.5	1.516	1.336	-10.75	28	8	sand to silty sand
41.83	104.5	1.381	1.322	-10.27	26	8	sand to silty sand
41.99	105.8	1.906	1.801	-10.93	33	7	silty sand to sandy silt
42.16	98.9	2.650	2.679	-10.51	33	7	silty sand to sandy silt
42.32	102.9	2.956	2.874	-10.16	39	6	sandy silt to clayey silt
42.49	102.8	2.212	2.151	-10.21	34	7	silty sand to sandy silt
42.65	115.0	2.050	1.782	-10.58	38	7	silty sand to sandy silt
42.81	135.3	2.430	1.796	-10.60	43	7	silty sand to sandy silt
42.98	151.6	2.882	1.901	-10.42	47	7	silty sand to sandy silt
43.14	157.7	2.751	1.745	-10.59	37	8	sand to silty sand
43.31	155.4	2.225	1.432	-10.60	37	8	sand to silty sand
43.47	147.3	1.754	1.191	-10.97	34	8	sand to silty sand
43.64	128.7	1.836	1.427	-10.66	31	8	sand to silty sand
43.80	114.1	2.077	1.821	-10.29	38	7	silty sand to sandy silt
43.96	115.8	2.094	1.807	-10.60	38	7	silty sand to sandy silt
44.13	128.3	2.374	1.850	-10.68	41	7	silty sand to sandy silt
44.29	142.0	2.810	1.979	-10.81	45	7	silty sand to sandy silt
44.46	151.6	3.224	2.127	-10.86	48	7	silty sand to sandy silt
44.62	161.1	3.266	2.027	-10.48	50	7	silty sand to sandy silt
44.78	156.6	2.843	1.816	-10.59	50	7	silty sand to sandy silt
44.95	153.7	2.797	1.819	-10.31	39	8	sand to silty sand
45.11	178.4	1.755	0.984	-10.32	41	8	sand to silty sand
45.44	181.0	1.970	1.088	-10.35	41	8	sand to silty sand
45.60	154.3	2.416	1.566	-9.75	37	8	sand to silty sand
45.77	123.6	2.850	2.306	-9.86	42	7	silty sand to sandy silt
45.93	118.4	3.116	2.631	-9.62	44	6	sandy silt to clayey silt
46.10	100.9	3.540	3.509	-9.98	39	6	sandy silt to clayey silt
46.26	84.3	3.518	4.174	-10.09	45	5	clayey silt to silty clay
46.42	96.7	3.529	3.652	-10.04	46	5	clayey silt to silty clay
46.59	108.8	3.821	3.513	-10.68	48	5	clayey silt to silty clay
46.75	93.1	4.587	4.927	-10.72	88	11	very stiff fine grained (*)
46.92	73.5	4.803	6.536	-10.95	74	11	very stiff fine grained (*)
47.08	64.9	4.444	6.842	-10.54	64	11	very stiff fine grained (*)
47.24	62.9	3.911	6.222	-10.71	63	11	very stiff fine grained (*)
47.41	71.0	3.068	4.323	-10.28	37	5	clayey silt to silty clay
47.57	96.5	2.037	2.110	-10.61	35	6	sandy silt to clayey silt
47.74	107.3	2.400	2.236	-11.19	33	7	silty sand to sandy silt
47.90	106.4	3.517	3.305	-10.78	39	6	sandy silt to clayey silt
48.06	90.1	4.117	4.568	-11.01	45	5	clayey silt to silty clay
48.23	84.2	3.870	4.597	-10.69	36	6	sandy silt to clayey silt
48.39	111.3	1.768	1.589	-10.79	34	7	silty sand to sandy silt
48.56	119.5	2.276	1.904	-10.68	38	7	silty sand to sandy silt
48.72	125.9	2.609	2.072	-10.79	42	7	silty sand to sandy silt
48.88	145.8	2.761	1.894	-10.73	45	7	silty sand to sandy silt
49.05	152.2	2.727	1.792	-10.79	49	7	silty sand to sandy silt
49.21	164.2	2.918	1.777	-10.72	38	8	sand to silty sand
49.38	157.2	2.985	1.899	-10.84	38	8	sand to silty sand
49.54	150.9	2.570	1.703	-11.29	35	8	sand to silty sand
49.70	136.3	2.077	1.524	-11.21	33	8	sand to silty sand
49.87	124.2	1.683	1.355	-10.67	29	8	sand to silty sand
50.03	102.3	1.830	1.789	-10.94	32	7	silty sand to sandy silt
50.20	78.5	1.912	2.436	-10.91	31	6	sandy silt to clayey silt
50.36	59.0	1.917	3.250	-10.53	26	6	sandy silt to clayey silt
50.52	64.8	2.223	3.432	-10.60	26	6	sandy silt to clayey silt
50.69	77.7	2.340	3.010	-10.88	33	6	sandy silt to clayey silt
50.85	113.8	2.007	1.764	-11.09	30	8	sand to silty sand
51.02	133.4	1.615	1.211	-10.80	32	8	sand to silty sand
51.18	132.5	-32768	-32768	-11.16	0	0	<out of range>

*Soil behavior type and SPT based on data from UBC-1983

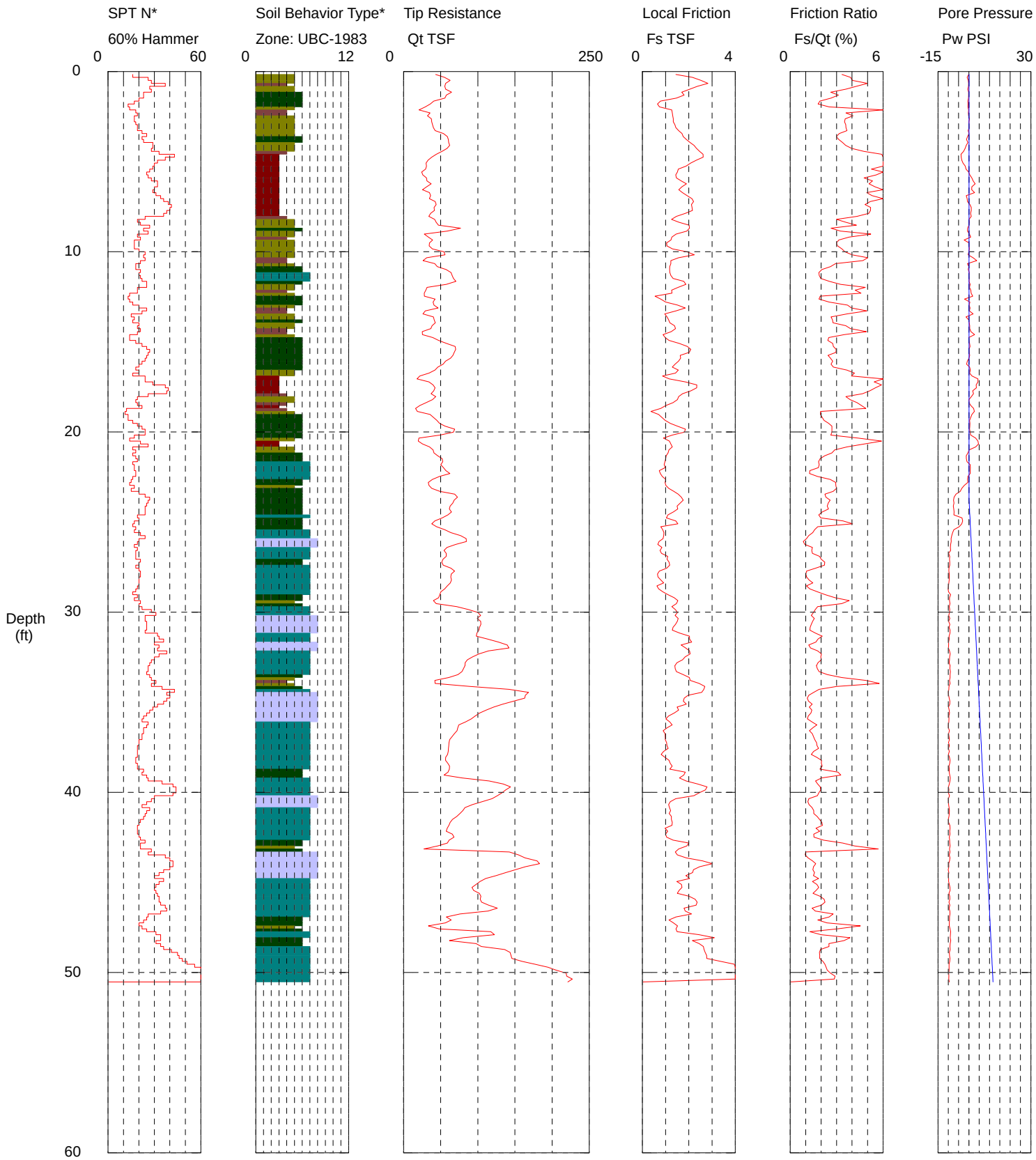
Depth	Qt	Fs	Fs/Qt	Pw	SPT N*	Soil Behavior Type

*Soil behavior type and SPT based on data from UBC-1983

GeoDesign / CPT-5 / 16770 SW Edy Rd Sherwood

Operator: OGE TAJ
Sounding: CPT-5
Cone Used: DPG1211
GPS Data: NO GPS

CPT Date/Time: 8/13/2016 1:51:26 PM
Location: GeoDesign / CPT-5 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-5 / 16770 SW Edy Rd Sherwood



Maximum Depth = 50.52 feet

Depth Increment = 0.164 feet

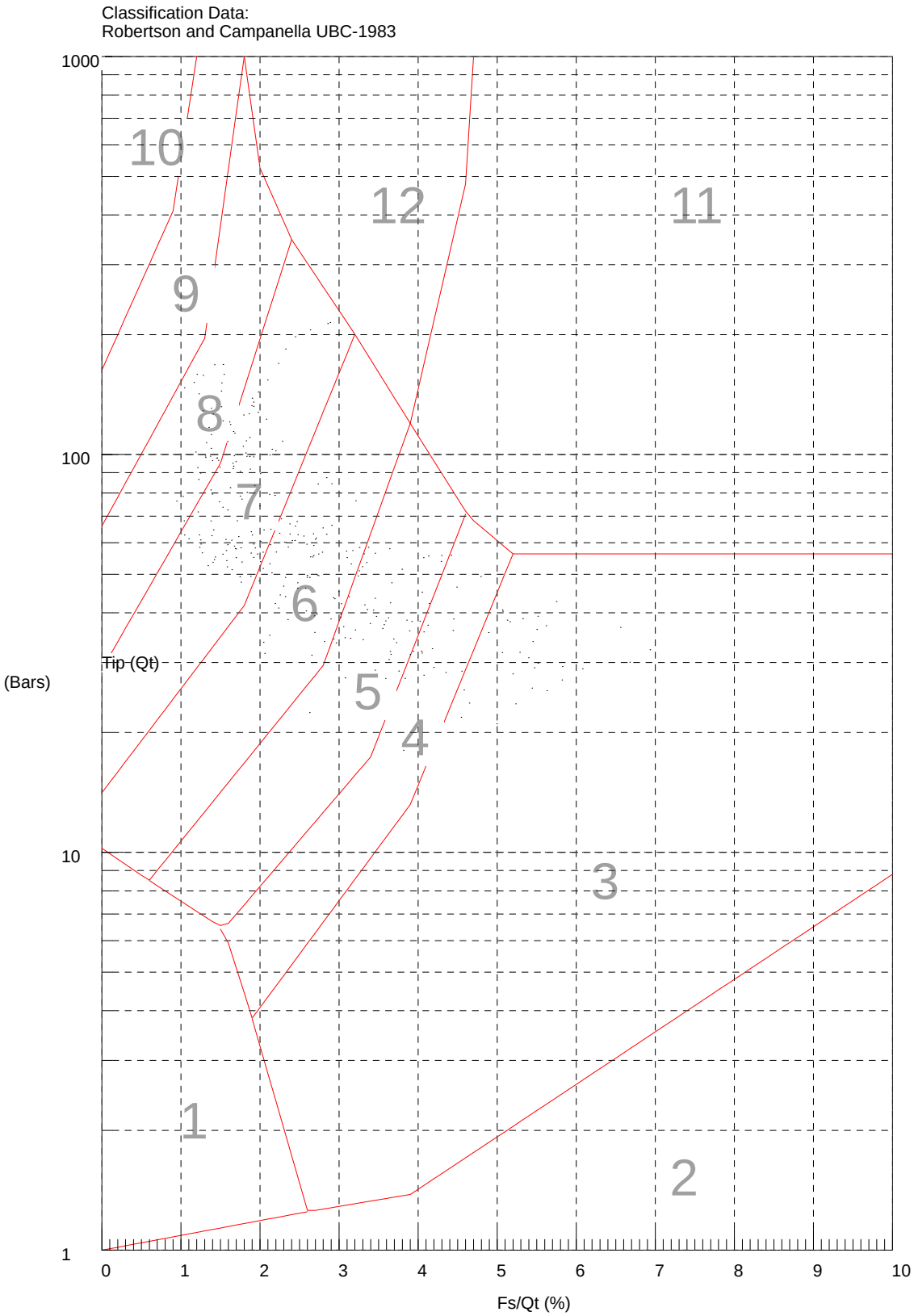
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

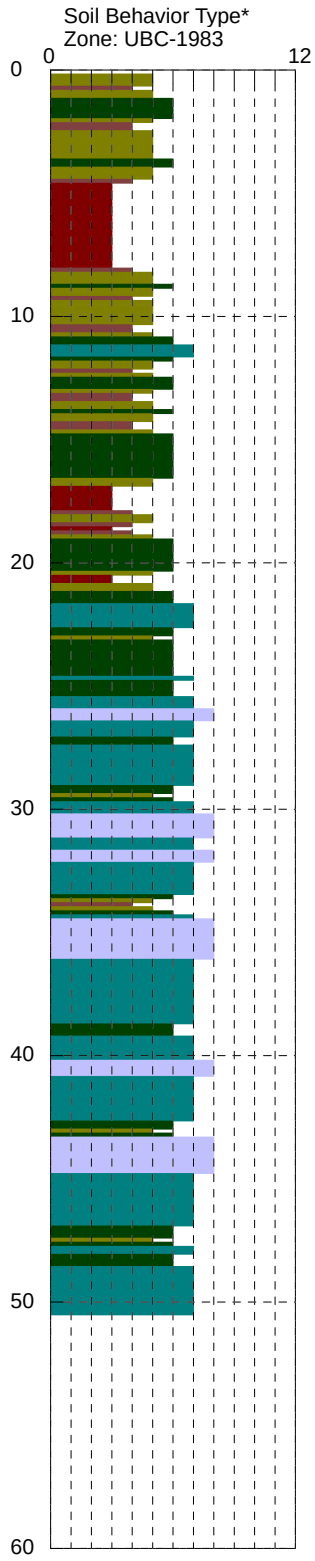
*Soil behavior type and SPT based on data from UBC-1983

GeoDesign / CPT-5 / 16770 SW Edy Rd Sherwood

Operator: OGE TAJ
Sounding: CPT-5
Cone Used: DPG1211

CPT Date/Time: 8/13/2016 1:51:26 PM
Location: GeoDesign / CPT-5 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-5 / 16770 SW Edy Rd Sherwood



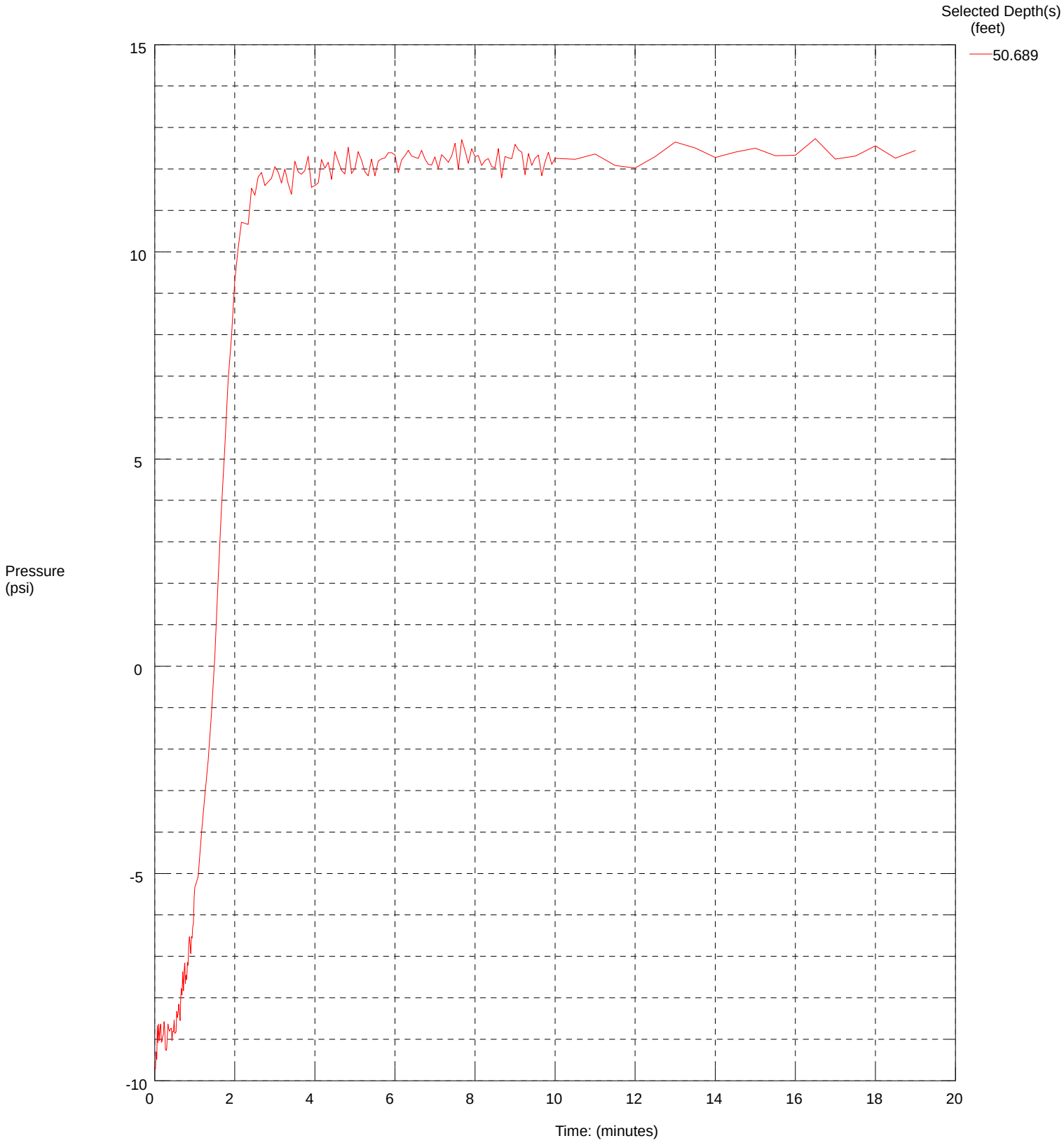


1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

GeoDesign / CPT-5 / 16770 SW Edy Rd Sherwood

Operator OGE TAJ
Sounding: CPT-5
Cone Used: DPG1211
GPS Data: NO GPS

CPT Date/Time: 8/13/2016 1:51:26 PM
Location: GeoDesign / CPT-5 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-5 / 16770 SW Edy Rd Sherwood



Maximum Pressure = 12.733 psi

Data File:CPT-5 8/13/2016 1:51:26 PM
Operator:OGE TAJ Location:GeoDesign / CPT-5 / 16770 SW Edy Rd Sherwood
Cone ID:DPG1211 Job Number:16084 / GeoDesign / CPT-5 / 16770 SW Edy Rd Sherw
Customer: Units:English
GPS DATA:NO GPS

Depth (ft)	Qt TSF	Fs TSF	Fs/Qt (%)	Pw PSI	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
0.16	43.3	1.445	3.340	-0.13	16	5	clayey silt to silty clay
0.33	55.3	2.155	3.900	-0.89	26	5	clayey silt to silty clay
0.49	62.8	2.522	4.017	-0.34	28	5	clayey silt to silty clay
0.66	56.6	2.826	4.996	-0.14	37	4	silty clay to clay
0.82	55.4	2.374	4.282	-0.24	27	5	clayey silt to silty clay
0.98	56.7	2.042	3.598	-0.55	28	5	clayey silt to silty clay
1.15	64.7	1.697	2.624	-0.18	23	6	sandy silt to clayey silt
1.31	57.6	1.795	3.115	-0.14	23	6	sandy silt to clayey silt
1.48	55.7	1.468	2.638	-0.21	20	6	sandy silt to clayey silt
1.64	40.6	0.780	1.921	-0.46	17	6	sandy silt to clayey silt
1.80	36.0	0.648	1.802	-0.41	13	6	sandy silt to clayey silt
1.97	29.2	0.733	2.513	-0.53	14	5	clayey silt to silty clay
2.13	20.8	1.265	6.067	-0.15	18	4	silty clay to clay
2.30	35.7	1.288	3.608	-0.29	19	4	silty clay to clay
2.46	32.2	1.308	4.060	-0.17	17	5	clayey silt to silty clay
2.62	37.5	1.333	3.551	0.23	17	5	clayey silt to silty clay
2.79	37.9	1.331	3.509	-0.04	18	5	clayey silt to silty clay
2.95	39.0	1.401	3.589	-0.03	19	5	clayey silt to silty clay
3.12	40.1	1.444	3.604	0.10	19	5	clayey silt to silty clay
3.28	42.6	1.563	3.669	-0.38	22	5	clayey silt to silty clay
3.44	53.6	1.702	3.175	0.04	25	5	clayey silt to silty clay
3.61	58.8	1.758	2.988	-0.64	22	6	sandy silt to clayey silt
3.77	60.2	1.891	3.141	-1.21	23	6	sandy silt to clayey silt
3.94	60.8	2.053	3.378	-0.52	29	5	clayey silt to silty clay
4.10	62.1	2.226	3.583	-1.27	29	5	clayey silt to silty clay
4.27	58.6	2.327	3.968	-1.88	28	5	clayey silt to silty clay
4.43	51.7	2.463	4.764	-2.60	33	4	silty clay to clay
4.59	44.1	2.613	5.919	-3.86	43	3	clay
4.76	38.0	2.616	6.890	-3.71	37	3	clay
4.92	33.0	2.322	7.037	-3.44	32	3	clay
5.09	30.3	2.081	6.876	-2.84	30	3	clay
5.25	30.9	1.885	6.099	-1.80	29	3	clay
5.41	29.5	1.550	5.245	-1.40	27	3	clay
5.58	24.5	1.509	6.160	-0.17	25	3	clay
5.74	25.8	1.434	5.563	0.45	26	3	clay
5.91	30.8	1.469	4.769	1.43	28	3	clay
6.07	31.5	1.673	5.316	2.06	32	3	clay
6.23	37.3	1.898	5.093	2.98	32	3	clay
6.40	31.0	1.699	5.488	1.36	30	3	clay
6.56	25.4	1.568	6.166	1.32	29	3	clay
6.73	34.8	1.722	4.946	2.77	31	3	clay
6.89	36.4	1.926	5.289	-1.26	34	3	clay
7.05	34.8	2.130	6.127	-0.86	36	3	clay
7.22	42.6	2.203	5.173	-0.71	39	3	clay
7.38	43.8	2.118	4.835	0.47	41	3	clay
7.55	41.1	2.139	5.198	1.16	40	3	clay
7.71	41.5	2.157	5.195	1.09	38	3	clay
7.87	36.4	1.849	5.083	0.80	36	3	clay
8.04	33.9	1.463	4.315	1.10	24	4	silty clay to clay
8.20	41.9	1.255	2.997	0.00	19	5	clayey silt to silty clay
8.37	43.8	1.574	3.592	0.25	21	5	clayey silt to silty clay
8.53	47.0	2.012	4.279	-0.04	27	5	clayey silt to silty clay
8.69	76.8	2.027	2.640	-0.61	23	6	sandy silt to clayey silt
8.86	59.0	1.914	3.245	-0.70	26	5	clayey silt to silty clay
9.02	27.8	1.450	5.210	0.23	19	5	clayey silt to silty clay
9.19	33.3	1.268	3.806	0.85	21	4	silty clay to clay
9.35	39.1	1.232	3.147	-2.31	17	5	clayey silt to silty clay

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
9.51	34.9	1.045	2.997	0.05	17	5	clayey silt to silty clay
9.68	34.5	1.058	3.067	0.00	17	5	clayey silt to silty clay
9.84	38.9	1.300	3.346	0.20	20	5	clayey silt to silty clay
10.01	54.3	1.925	3.543	-0.05	24	5	clayey silt to silty clay
10.17	55.8	2.234	4.003	-0.40	23	5	clayey silt to silty clay
10.33	31.2	1.564	5.018	2.01	24	4	silty clay to clay
10.50	26.2	1.228	4.692	3.75	21	4	silty clay to clay
10.66	41.9	1.227	2.926	-0.70	18	5	clayey silt to silty clay
10.83	45.4	1.181	2.603	-0.07	18	6	sandy silt to clayey silt
10.99	57.3	1.170	2.043	-0.34	21	6	sandy silt to clayey silt
11.15	63.8	1.183	1.853	0.14	20	7	silty sand to sandy silt
11.32	65.4	1.227	1.874	-0.04	21	7	silty sand to sandy silt
11.48	67.3	1.325	1.970	0.15	22	7	silty sand to sandy silt
11.65	70.5	1.785	2.531	0.08	25	6	sandy silt to clayey silt
11.81	57.6	1.877	3.257	0.57	25	5	clayey silt to silty clay
11.98	31.6	1.535	4.860	0.26	19	5	clayey silt to silty clay
12.14	30.0	1.260	4.204	0.91	19	4	silty clay to clay
12.30	27.9	1.276	4.579	1.07	14	5	clayey silt to silty clay
12.47	27.9	0.541	1.938	1.80	13	6	sandy silt to clayey silt
12.63	42.3	0.786	1.858	-2.10	14	6	sandy silt to clayey silt
12.80	39.8	1.004	2.525	0.47	16	6	sandy silt to clayey silt
12.96	41.0	1.520	3.706	0.13	20	5	clayey silt to silty clay
13.12	46.5	1.843	3.968	0.50	25	4	silty clay to clay
13.29	29.2	1.446	4.955	0.22	22	4	silty clay to clay
13.45	26.2	0.962	3.680	2.05	15	5	clayey silt to silty clay
13.62	40.3	1.062	2.637	-1.41	17	5	clayey silt to silty clay
13.78	41.2	1.128	2.737	-0.10	16	6	sandy silt to clayey silt
13.94	42.7	1.184	2.770	0.15	20	5	clayey silt to silty clay
14.11	38.4	1.384	3.603	0.40	19	5	clayey silt to silty clay
14.27	36.7	1.429	3.895	0.40	21	4	silty clay to clay
14.44	25.3	1.243	4.919	0.95	19	4	silty clay to clay
14.60	25.4	0.886	3.486	2.75	14	5	clayey silt to silty clay
14.76	39.2	0.979	2.495	-0.09	14	6	sandy silt to clayey silt
14.93	47.3	1.147	2.426	0.07	18	6	sandy silt to clayey silt
15.09	57.9	1.592	2.749	0.27	22	6	sandy silt to clayey silt
15.26	69.4	1.936	2.788	0.53	25	6	sandy silt to clayey silt
15.42	70.2	2.082	2.968	0.08	27	6	sandy silt to clayey silt
15.58	68.2	2.018	2.959	0.16	26	6	sandy silt to clayey silt
15.75	66.5	1.626	2.444	0.37	25	6	sandy silt to clayey silt
15.91	63.3	1.649	2.606	0.07	24	6	sandy silt to clayey silt
16.08	56.5	1.554	2.748	-0.74	22	6	sandy silt to clayey silt
16.24	53.2	1.406	2.641	-1.14	20	6	sandy silt to clayey silt
16.40	46.2	1.289	2.790	0.36	18	6	sandy silt to clayey silt
16.57	42.2	1.546	3.660	0.72	20	5	clayey silt to silty clay
16.73	34.4	1.427	4.151	0.31	16	5	clayey silt to silty clay
16.90	21.8	0.865	3.962	1.53	24	3	clay
17.06	18.1	1.160	6.417	4.33	24	3	clay
17.22	34.0	1.847	5.425	4.37	29	3	clay
17.39	39.7	2.345	5.900	3.49	37	3	clay
17.55	42.5	2.342	5.512	3.61	39	3	clay
17.72	40.6	2.086	5.141	1.84	38	3	clay
17.88	37.0	1.731	4.674	2.23	26	4	silty clay to clay
18.04	43.3	1.561	3.603	1.20	19	5	clayey silt to silty clay
18.21	39.0	1.509	3.871	-0.03	18	5	clayey silt to silty clay
18.37	30.5	1.319	4.321	0.07	19	4	silty clay to clay
18.54	21.8	1.006	4.605	0.94	22	3	clay
18.70	16.1	0.786	4.887	2.25	12	4	silty clay to clay
18.86	18.6	0.365	1.960	2.64	11	5	clayey silt to silty clay
19.03	35.7	0.698	1.956	1.47	13	6	sandy silt to clayey silt
19.36	44.9	0.980	2.184	0.29	16	6	sandy silt to clayey silt
19.52	48.4	1.204	2.488	0.47	19	6	sandy silt to clayey silt
19.69	55.9	1.509	2.700	0.43	22	6	sandy silt to clayey silt
19.85	68.9	1.856	2.693	0.35	24	6	sandy silt to clayey silt

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
20.01	67.0	1.809	2.701	0.54	24	6	sandy silt to clayey silt
20.18	49.1	1.288	2.624	0.89	17	6	sandy silt to clayey silt
20.34	20.7	0.908	4.383	3.22	14	5	clayey silt to silty clay
20.51	19.7	1.165	5.910	4.34	21	3	clay
20.67	25.5	1.221	4.785	4.67	26	3	clay
20.83	35.0	1.288	3.680	3.29	16	5	clayey silt to silty clay
21.00	39.7	1.143	2.880	0.11	18	5	clayey silt to silty clay
21.16	41.0	1.105	2.692	-0.52	16	6	sandy silt to clayey silt
21.33	45.9	1.024	2.228	-1.27	18	6	sandy silt to clayey silt
21.49	52.0	1.004	1.931	-1.26	19	6	sandy silt to clayey silt
21.65	52.8	0.969	1.836	-0.91	16	7	silty sand to sandy silt
21.82	50.1	0.940	1.878	0.59	17	7	silty sand to sandy silt
21.98	53.8	0.979	1.821	0.69	17	7	silty sand to sandy silt
22.15	57.0	0.725	1.272	0.64	18	7	silty sand to sandy silt
22.31	62.3	0.775	1.243	0.60	18	7	silty sand to sandy silt
22.47	48.5	0.856	1.763	-0.52	16	7	silty sand to sandy silt
22.64	38.8	1.004	2.585	-0.66	15	6	sandy silt to clayey silt
22.80	33.2	0.976	2.939	-0.55	14	6	sandy silt to clayey silt
22.97	34.2	1.008	2.951	-2.23	17	5	clayey silt to silty clay
23.13	37.9	1.137	2.997	-3.45	15	6	sandy silt to clayey silt
23.29	48.8	1.357	2.778	-4.21	20	6	sandy silt to clayey silt
23.46	68.9	1.545	2.243	-6.27	24	6	sandy silt to clayey silt
23.62	72.6	1.676	2.309	-7.17	27	6	sandy silt to clayey silt
23.79	68.2	1.758	2.579	-7.47	26	6	sandy silt to clayey silt
23.95	66.2	1.627	2.457	-7.25	25	6	sandy silt to clayey silt
24.11	62.6	1.497	2.391	-7.61	24	6	sandy silt to clayey silt
24.28	61.6	1.523	2.472	-7.35	24	6	sandy silt to clayey silt
24.44	64.5	1.333	2.066	-7.18	24	6	sandy silt to clayey silt
24.61	59.7	1.100	1.845	-7.33	19	7	silty sand to sandy silt
24.77	52.0	1.031	1.982	-3.34	20	6	sandy silt to clayey silt
24.93	42.2	1.437	3.409	-3.04	17	6	sandy silt to clayey silt
25.10	37.9	1.528	4.038	-3.47	16	6	sandy silt to clayey silt
25.26	44.4	0.790	1.779	-4.70	18	6	sandy silt to clayey silt
25.43	55.4	0.876	1.579	-7.33	17	7	silty sand to sandy silt
25.59	63.6	0.925	1.454	-7.92	21	7	silty sand to sandy silt
25.75	76.8	0.920	1.197	-8.38	24	7	silty sand to sandy silt
25.92	84.2	0.887	1.053	-8.67	20	8	sand to silty sand
26.08	84.7	0.713	0.842	-8.62	19	8	sand to silty sand
26.25	70.2	0.663	0.944	-8.87	17	8	sand to silty sand
26.41	58.5	0.840	1.436	-8.97	19	7	silty sand to sandy silt
26.57	54.5	0.759	1.392	-8.85	18	7	silty sand to sandy silt
26.74	57.5	0.824	1.433	-9.84	18	7	silty sand to sandy silt
26.90	57.6	1.090	1.894	-9.30	18	7	silty sand to sandy silt
27.07	53.1	1.062	2.001	-9.46	21	6	sandy silt to clayey silt
27.23	51.4	1.149	2.236	-9.32	20	6	sandy silt to clayey silt
27.40	53.4	1.181	2.210	-9.31	18	7	silty sand to sandy silt
27.56	63.7	1.046	1.641	-9.64	20	7	silty sand to sandy silt
27.72	68.8	0.730	1.060	-9.77	21	7	silty sand to sandy silt
27.89	64.2	0.650	1.012	-9.52	21	7	silty sand to sandy silt
28.05	63.7	0.675	1.060	-9.51	20	7	silty sand to sandy silt
28.22	64.5	0.789	1.223	-9.55	20	7	silty sand to sandy silt
28.38	63.0	0.920	1.462	-9.74	20	7	silty sand to sandy silt
28.54	59.0	0.623	1.055	-9.89	19	7	silty sand to sandy silt
28.71	55.4	0.705	1.272	-10.09	18	7	silty sand to sandy silt
28.87	50.2	0.881	1.754	-9.89	16	7	silty sand to sandy silt
29.04	48.8	1.109	2.274	-8.91	19	6	sandy silt to clayey silt
29.20	47.2	1.367	2.897	-9.45	17	6	sandy silt to clayey silt
29.36	40.1	1.529	3.818	-9.45	21	5	clayey silt to silty clay
29.53	44.0	1.465	3.332	-9.23	20	6	sandy silt to clayey silt
29.69	71.5	1.267	1.772	-9.52	22	7	silty sand to sandy silt
29.86	87.2	1.418	1.626	-9.30	28	7	silty sand to sandy silt
30.02	99.9	1.512	1.513	-9.45	31	7	silty sand to sandy silt
30.18	103.7	1.408	1.357	-9.81	24	8	sand to silty sand

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
30.35	99.1	1.542	1.556	-9.25	24	8	sand to silty sand
30.51	103.8	1.504	1.449	-9.83	25	8	sand to silty sand
30.68	104.2	1.427	1.369	-9.27	25	8	sand to silty sand
30.84	102.3	1.322	1.293	-9.63	25	8	sand to silty sand
31.00	101.4	1.287	1.269	-9.17	24	8	sand to silty sand
31.17	98.7	1.614	1.634	-9.23	32	7	silty sand to sandy silt
31.33	97.9	2.029	2.072	-9.62	33	7	silty sand to sandy silt
31.50	113.2	2.030	1.794	-9.59	36	7	silty sand to sandy silt
31.66	127.8	2.125	1.663	-9.85	30	8	sand to silty sand
31.82	139.6	1.669	1.196	-9.84	33	8	sand to silty sand
31.99	141.9	1.864	1.313	-9.92	32	8	sand to silty sand
32.15	114.4	2.034	1.777	-9.40	38	7	silty sand to sandy silt
32.32	101.5	2.054	2.024	-9.10	33	7	silty sand to sandy silt
32.48	92.9	1.838	1.979	-9.36	30	7	silty sand to sandy silt
32.64	86.0	1.726	2.007	-9.43	28	7	silty sand to sandy silt
32.81	83.0	1.492	1.798	-9.55	27	7	silty sand to sandy silt
32.97	82.6	1.401	1.696	-9.14	26	7	silty sand to sandy silt
33.14	80.7	1.410	1.748	-9.26	26	7	silty sand to sandy silt
33.30	78.6	1.466	1.865	-8.99	25	7	silty sand to sandy silt
33.46	73.2	1.759	2.403	-9.15	27	6	sandy silt to clayey silt
33.63	60.9	2.025	3.324	-9.16	28	5	clayey silt to silty clay
33.79	42.1	2.059	4.894	-9.45	31	4	silty clay to clay
33.96	42.5	2.444	5.755	-9.13	28	5	clayey silt to silty clay
34.12	89.5	2.688	3.003	-9.68	35	6	sandy silt to clayey silt
34.28	142.0	2.649	1.865	-9.75	43	7	silty sand to sandy silt
34.45	168.3	2.558	1.520	-10.04	38	8	sand to silty sand
34.61	163.9	1.972	1.203	-9.86	40	8	sand to silty sand
34.78	163.1	1.802	1.105	-9.56	38	8	sand to silty sand
34.94	148.4	1.763	1.188	-9.24	36	8	sand to silty sand
35.10	133.6	1.894	1.417	-9.31	32	8	sand to silty sand
35.27	121.4	1.497	1.233	-9.91	29	8	sand to silty sand
35.43	111.3	1.560	1.402	-9.57	27	8	sand to silty sand
35.60	102.6	1.377	1.341	-9.44	25	8	sand to silty sand
35.76	96.5	1.125	1.167	-9.75	23	8	sand to silty sand
35.93	91.1	1.012	1.111	-9.69	22	8	sand to silty sand
36.09	83.6	1.179	1.411	-9.77	26	7	silty sand to sandy silt
36.25	74.4	1.282	1.723	-9.95	25	7	silty sand to sandy silt
36.42	73.0	1.070	1.466	-9.97	23	7	silty sand to sandy silt
36.58	72.0	0.893	1.241	-9.46	23	7	silty sand to sandy silt
36.75	68.3	0.974	1.425	-9.83	22	7	silty sand to sandy silt
37.07	62.1	0.987	1.590	-9.48	20	7	silty sand to sandy silt
37.24	61.3	1.043	1.702	-9.88	20	7	silty sand to sandy silt
37.40	60.9	1.056	1.735	-9.49	19	7	silty sand to sandy silt
37.57	60.5	1.110	1.835	-9.87	19	7	silty sand to sandy silt
37.73	60.1	0.909	1.514	-9.54	19	7	silty sand to sandy silt
37.89	59.2	0.809	1.365	-9.99	19	7	silty sand to sandy silt
38.06	56.7	0.972	1.715	-9.38	18	7	silty sand to sandy silt
38.22	56.5	1.146	2.027	-9.15	18	7	silty sand to sandy silt
38.39	59.5	1.195	2.008	-9.30	19	7	silty sand to sandy silt
38.55	61.9	1.282	2.072	-9.65	19	7	silty sand to sandy silt
38.71	61.7	1.184	1.920	-9.51	23	6	sandy silt to clayey silt
38.88	59.9	1.853	3.093	-9.58	22	6	sandy silt to clayey silt
39.04	54.5	1.785	3.278	-9.29	25	6	sandy silt to clayey silt
39.21	78.9	1.597	2.024	-9.03	26	7	silty sand to sandy silt
39.37	115.3	1.886	1.635	-9.19	35	7	silty sand to sandy silt
39.53	134.3	2.381	1.774	-9.53	42	7	silty sand to sandy silt
39.70	144.1	2.789	1.936	-9.88	44	7	silty sand to sandy silt
39.86	137.6	2.713	1.972	-9.68	44	7	silty sand to sandy silt
40.03	132.3	2.442	1.845	-9.98	42	7	silty sand to sandy silt
40.19	126.3	2.219	1.757	-9.41	30	8	sand to silty sand
40.35	119.2	1.435	1.204	-9.99	28	8	sand to silty sand
40.52	105.8	1.202	1.136	-9.89	25	8	sand to silty sand
40.68	92.7	1.131	1.220	-9.86	22	8	sand to silty sand

*Soil behavior type and SPT based on data from UBC-1983

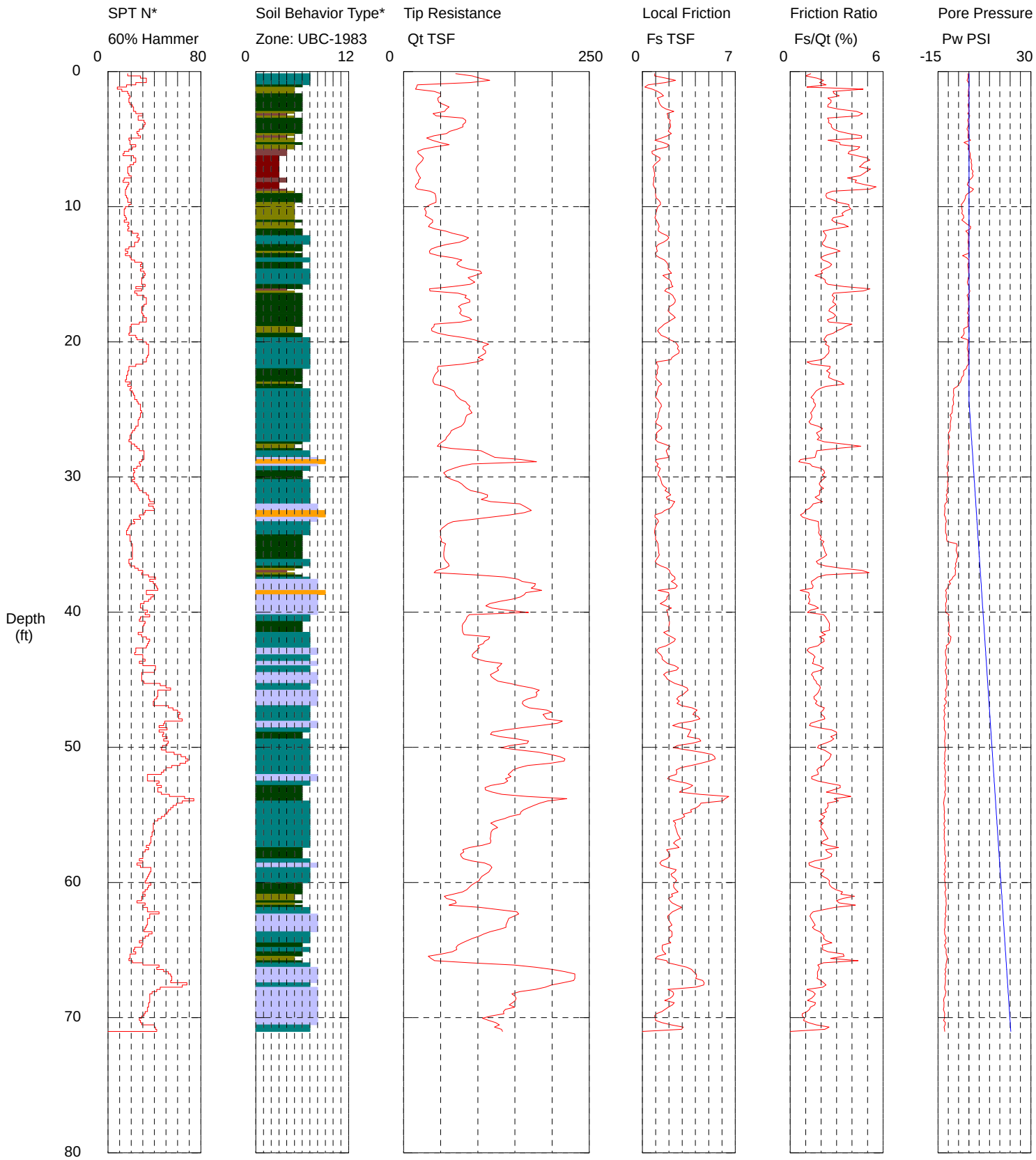
Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
40.85	82.6	1.169	1.415	-9.63	27	7	silty sand to sandy silt
41.01	79.8	1.214	1.522	-9.50	25	7	silty sand to sandy silt
41.17	75.8	1.155	1.523	-9.53	24	7	silty sand to sandy silt
41.34	71.6	1.246	1.739	-9.71	23	7	silty sand to sandy silt
41.50	65.9	1.249	1.896	-10.02	21	7	silty sand to sandy silt
41.67	62.7	1.285	2.049	-9.83	20	7	silty sand to sandy silt
41.83	61.0	1.272	2.086	-9.27	19	7	silty sand to sandy silt
41.99	58.7	0.977	1.664	-9.17	19	7	silty sand to sandy silt
42.16	57.4	1.090	1.900	-9.32	19	7	silty sand to sandy silt
42.32	65.6	0.999	1.523	-9.21	20	7	silty sand to sandy silt
42.49	67.8	1.042	1.537	-9.54	21	7	silty sand to sandy silt
42.65	61.3	1.325	2.161	-9.35	24	6	sandy silt to clayey silt
42.81	59.0	2.005	3.396	-9.31	21	6	sandy silt to clayey silt
42.98	45.9	1.913	4.166	-9.16	21	5	clayey silt to silty clay
43.14	27.4	1.559	5.695	-9.42	28	6	sandy silt to clayey silt
43.31	142.5	1.421	0.997	-9.21	26	8	sand to silty sand
43.47	154.7	1.503	0.971	-9.54	37	8	sand to silty sand
43.64	163.6	1.889	1.155	-9.23	40	8	sand to silty sand
43.80	179.8	2.595	1.443	-9.43	42	8	sand to silty sand
43.96	183.1	3.017	1.648	-9.80	42	8	sand to silty sand
44.13	164.3	2.469	1.503	-9.75	40	8	sand to silty sand
44.29	150.7	2.202	1.461	-10.05	36	8	sand to silty sand
44.46	137.6	2.161	1.571	-9.74	33	8	sand to silty sand
44.62	124.7	1.871	1.501	-9.98	30	8	sand to silty sand
44.78	110.6	2.031	1.836	-9.86	36	7	silty sand to sandy silt
44.95	102.9	1.482	1.441	-9.83	33	7	silty sand to sandy silt
45.11	97.6	1.686	1.726	-9.53	31	7	silty sand to sandy silt
45.28	92.2	1.704	1.849	-9.23	30	7	silty sand to sandy silt
45.44	94.4	1.580	1.674	-9.11	31	7	silty sand to sandy silt
45.60	102.1	1.504	1.473	-9.68	32	7	silty sand to sandy silt
45.77	104.1	2.007	1.928	-9.29	33	7	silty sand to sandy silt
45.93	103.3	2.271	2.198	-9.26	33	7	silty sand to sandy silt
46.10	105.1	2.361	2.247	-9.68	34	7	silty sand to sandy silt
46.26	114.5	2.315	2.022	-9.26	37	7	silty sand to sandy silt
46.42	126.3	1.791	1.417	-9.61	38	7	silty sand to sandy silt
46.59	113.7	1.845	1.623	-9.27	34	7	silty sand to sandy silt
46.75	76.0	2.113	2.779	-9.23	26	7	silty sand to sandy silt
46.92	57.6	1.447	2.515	-9.40	25	6	sandy silt to clayey silt
47.08	64.1	1.142	1.780	-9.40	23	6	sandy silt to clayey silt
47.24	56.4	1.337	2.372	-9.53	20	6	sandy silt to clayey silt
47.41	33.4	1.514	4.537	-9.52	22	5	clayey silt to silty clay
47.57	47.7	1.449	3.036	-9.11	25	6	sandy silt to clayey silt
47.74	117.4	1.497	1.275	-8.91	31	7	silty sand to sandy silt
47.90	122.5	2.442	1.993	-8.99	34	7	silty sand to sandy silt
48.06	80.2	3.098	3.862	-9.08	34	6	sandy silt to clayey silt
48.23	61.8	2.150	3.482	-8.79	31	6	sandy silt to clayey silt
48.39	97.6	2.444	2.503	-9.10	34	6	sandy silt to clayey silt
48.56	104.8	2.627	2.506	-9.19	36	7	silty sand to sandy silt
48.72	136.1	2.657	1.952	-9.08	41	7	silty sand to sandy silt
48.88	143.4	2.706	1.887	-9.47	45	7	silty sand to sandy silt
49.05	144.7	2.768	1.913	-9.42	46	7	silty sand to sandy silt
49.21	145.8	2.772	1.901	-9.20	48	7	silty sand to sandy silt
49.38	159.3	3.363	2.111	-9.31	51	7	silty sand to sandy silt
49.54	177.0	3.967	2.242	-9.63	56	7	silty sand to sandy silt
49.70	194.5	4.521	2.324	-9.60	61	7	silty sand to sandy silt
49.87	205.4	4.915	2.393	-9.61	66	7	silty sand to sandy silt
50.03	219.0	5.698	2.602	-9.78	69	7	silty sand to sandy silt
50.20	219.8	6.364	2.896	-9.77	71	7	silty sand to sandy silt
50.36	227.2	6.474	2.849	-9.78	72	7	silty sand to sandy silt
50.52	221.2	-32768	-32768	-9.53	0	0	<out of range>

*Soil behavior type and SPT based on data from UBC-1983

GeoDesign / CPT-6 / 16770 SW Edy Rd Sherwood

Operator: OGE TAJ
Sounding: CPT-6
Cone Used: DPG1211
GPS Data: NO GPS

CPT Date/Time: 8/13/2016 3:28:17 PM
Location: GeoDesign / CPT-6 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-6 / 16770 SW Edy Rd Sherwood



Maximum Depth = 71.03 feet

Depth Increment = 0.164 feet

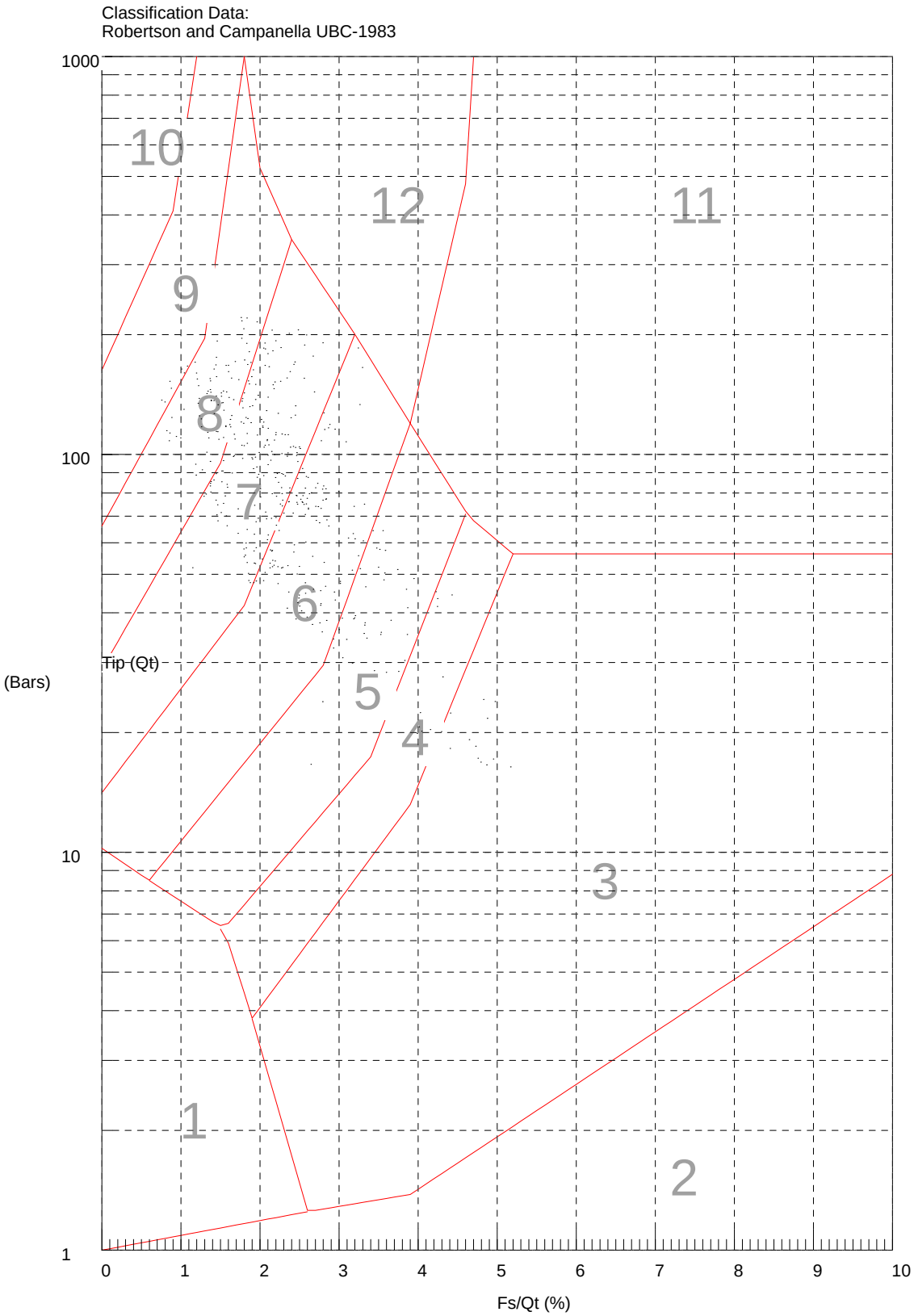
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

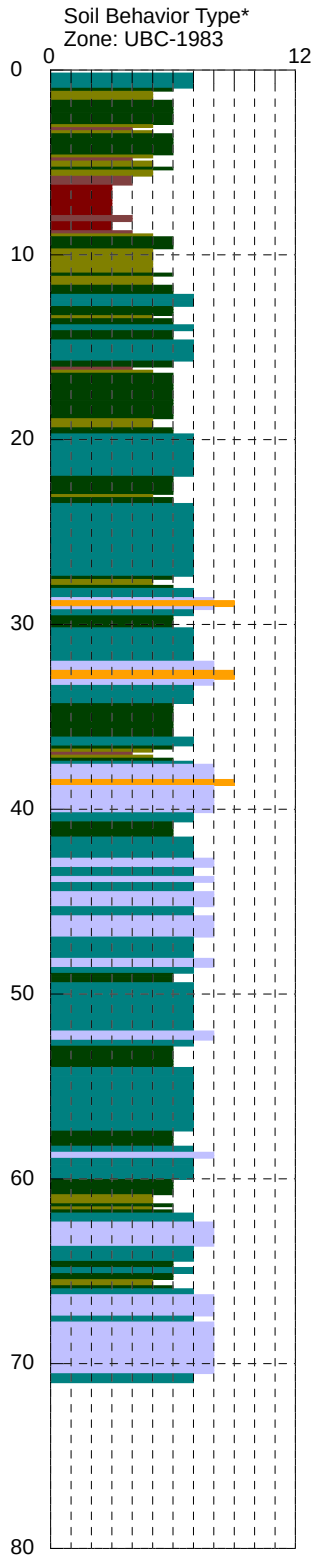
*Soil behavior type and SPT based on data from UBC-1983

GeoDesign / CPT-6 / 16770 SW Edy Rd Sherwood

Operator: OGE TAJ
Sounding: CPT-6
Cone Used: DPG1211

CPT Date/Time: 8/13/2016 3:28:17 PM
Location: GeoDesign / CPT-6 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-6 / 16770 SW Edy Rd Sherwood



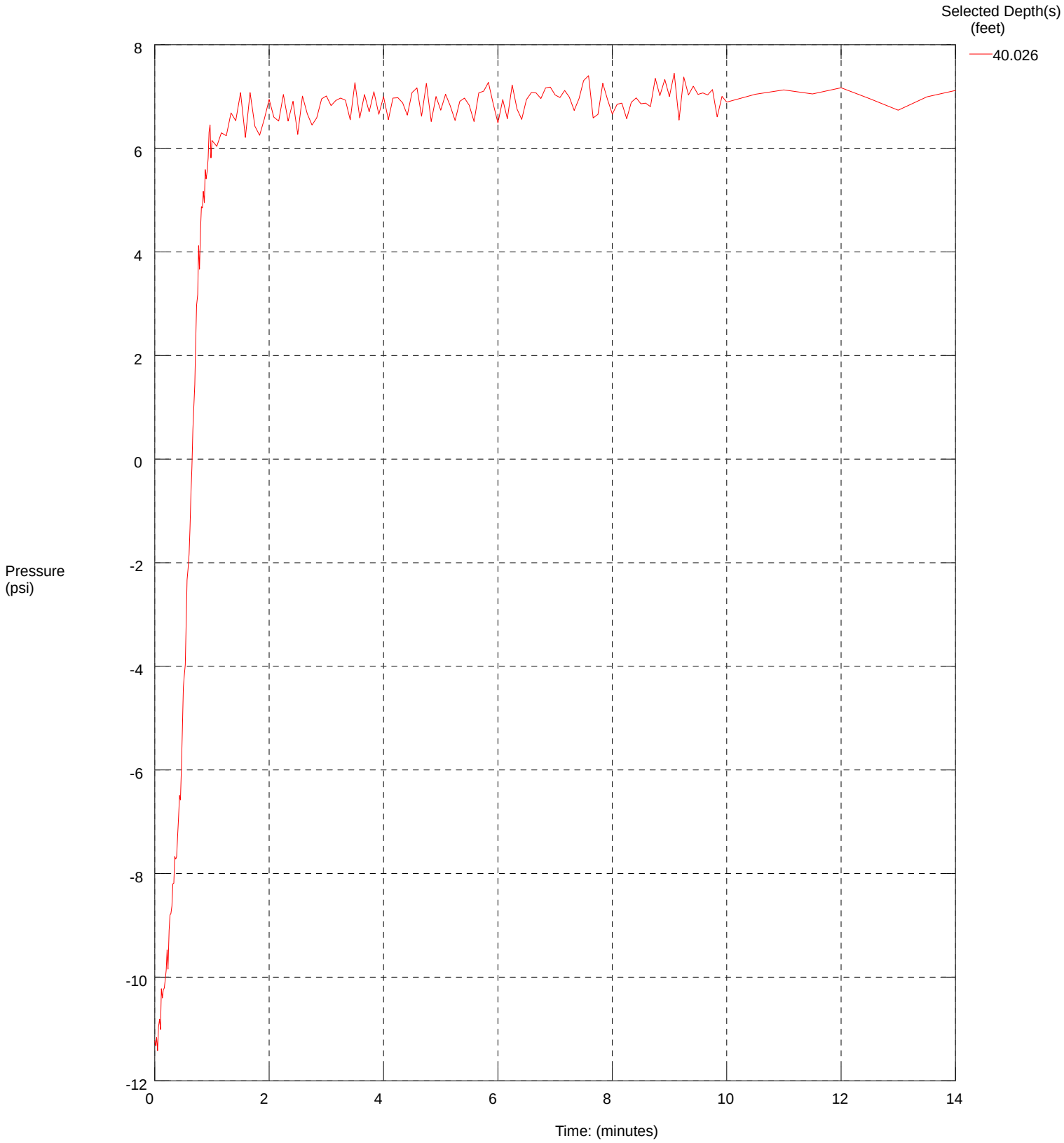


1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

GeoDesign / CPT-6 / 16770 SW Edy Rd Sherwood

Operator OGE TAJ
Sounding: CPT-6
Cone Used: DPG1211
GPS Data: NO GPS

CPT Date/Time: 8/13/2016 3:28:17 PM
Location: GeoDesign / CPT-6 / 16770 SW Edy Rd Sherwood
Job Number: 16084 / GeoDesign / CPT-6 / 16770 SW Edy Rd Sherwood



Maximum Pressure = 7.448 psi

Data File:CPT-6 8/13/2016 3:28:17 PM
Operator:OGE TAJ Location:GeoDesign / CPT-6 / 16770 SW Edy Rd Sherwood
Cone ID:DPG1211 Job Number:16084 / GeoDesign / CPT-6 / 16770 SW Edy Rd Sherw
Customer: Units:English
GPS DATA:NO GPS

Depth (ft)	Qt TSF	Fs TSF	Fs/Qt (%)	Pw PSI	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
0.16	70.2	0.936	1.333	-0.46	17	7	silty sand to sandy silt
0.33	92.5	0.930	1.006	-0.37	28	7	silty sand to sandy silt
0.49	102.5	1.770	1.727	-0.46	33	7	silty sand to sandy silt
0.66	116.2	2.501	2.152	-0.93	33	7	silty sand to sandy silt
0.82	89.8	1.713	1.908	-0.25	24	7	silty sand to sandy silt
0.98	18.6	0.431	2.321	0.00	16	6	sandy silt to clayey silt
1.15	17.5	0.188	1.075	0.04	8	5	clayey silt to silty clay
1.31	16.1	0.759	4.712	-0.16	12	5	clayey silt to silty clay
1.48	41.3	1.144	2.768	-0.30	17	5	clayey silt to silty clay
1.64	50.0	1.420	2.842	-0.21	18	6	sandy silt to clayey silt
1.80	50.0	1.589	3.175	-0.47	19	6	sandy silt to clayey silt
1.97	46.1	1.122	2.435	0.21	18	6	sandy silt to clayey silt
2.13	46.3	1.227	2.648	-0.14	18	6	sandy silt to clayey silt
2.30	47.9	1.262	2.636	0.00	19	6	sandy silt to clayey silt
2.46	54.8	1.342	2.449	-0.46	21	6	sandy silt to clayey silt
2.62	61.3	1.487	2.426	-0.31	22	6	sandy silt to clayey silt
2.79	57.6	1.797	3.118	-0.07	22	6	sandy silt to clayey silt
2.95	55.4	2.371	4.280	0.13	24	5	clayey silt to silty clay
3.12	39.7	1.859	4.679	-0.62	30	4	silty clay to clay
3.28	43.8	1.923	4.385	0.43	26	5	clayey silt to silty clay
3.44	79.6	1.924	2.417	-0.16	26	6	sandy silt to clayey silt
3.61	83.8	2.096	2.501	-0.59	31	6	sandy silt to clayey silt
3.77	83.3	2.057	2.468	-0.30	32	6	sandy silt to clayey silt
3.94	79.7	2.121	2.660	-0.22	31	6	sandy silt to clayey silt
4.10	80.0	2.127	2.659	-0.56	30	6	sandy silt to clayey silt
4.27	72.4	2.024	2.796	-0.98	27	6	sandy silt to clayey silt
4.43	62.2	1.949	3.132	-0.28	25	6	sandy silt to clayey silt
4.59	57.8	2.185	3.778	-0.36	26	5	clayey silt to silty clay
4.76	40.9	1.886	4.606	-0.46	28	4	silty clay to clay
4.92	31.2	1.444	4.622	-0.41	18	5	clayey silt to silty clay
5.09	38.4	0.940	2.447	0.80	19	5	clayey silt to silty clay
5.25	48.7	1.554	3.191	-2.39	19	6	sandy silt to clayey silt
5.41	61.4	1.981	3.225	-0.37	24	5	clayey silt to silty clay
5.58	41.5	1.871	4.504	-0.19	21	5	clayey silt to silty clay
5.74	26.1	1.137	4.354	-0.41	18	4	silty clay to clay
5.91	18.8	0.721	3.825	0.23	14	4	silty clay to clay
6.07	19.8	0.740	3.739	0.59	13	4	silty clay to clay
6.23	23.7	1.024	4.325	0.55	22	3	clay
6.40	26.7	1.329	4.977	0.70	24	3	clay
6.56	25.5	1.311	5.136	1.22	24	3	clay
6.73	22.8	1.091	4.786	1.08	22	3	clay
6.89	19.7	0.914	4.637	1.41	19	3	clay
7.05	17.7	0.790	4.477	1.34	17	3	clay
7.22	16.6	0.864	5.192	1.22	17	3	clay
7.38	17.7	0.877	4.947	2.05	17	3	clay
7.55	19.4	0.923	4.748	1.60	18	3	clay
7.71	20.8	0.938	4.519	2.03	20	3	clay
7.87	22.8	0.844	3.701	1.42	14	4	silty clay to clay
8.04	20.2	0.866	4.287	0.25	13	4	silty clay to clay
8.20	20.1	0.844	4.189	-0.36	18	3	clay
8.37	16.8	0.808	4.801	-0.81	17	3	clay
8.53	15.8	0.880	5.550	0.16	16	3	clay
8.69	18.7	0.969	5.177	2.17	15	4	silty clay to clay
8.86	35.7	0.982	2.748	1.39	15	5	clayey silt to silty clay
9.02	42.1	0.988	2.344	-0.57	15	6	sandy silt to clayey silt
9.19	43.1	0.996	2.312	-1.54	16	6	sandy silt to clayey silt
9.35	43.6	1.031	2.368	-1.72	17	6	sandy silt to clayey silt

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
9.51	43.8	1.231	2.815	-2.16	17	6	sandy silt to clayey silt
9.68	43.6	1.354	3.108	-2.84	20	5	clayey silt to silty clay
9.84	36.0	1.365	3.792	-3.69	18	5	clayey silt to silty clay
10.01	30.9	1.174	3.796	-3.46	15	5	clayey silt to silty clay
10.17	28.2	1.104	3.912	-3.39	14	5	clayey silt to silty clay
10.33	30.1	1.069	3.553	-3.19	14	5	clayey silt to silty clay
10.50	30.5	1.021	3.347	-3.48	14	5	clayey silt to silty clay
10.66	29.1	1.000	3.434	-2.60	15	5	clayey silt to silty clay
10.83	34.1	0.946	2.777	-2.49	16	5	clayey silt to silty clay
10.99	39.0	1.047	2.681	-3.51	14	6	sandy silt to clayey silt
11.15	39.1	1.133	2.894	-2.05	18	5	clayey silt to silty clay
11.32	35.5	1.231	3.466	-0.81	17	5	clayey silt to silty clay
11.48	33.6	1.262	3.758	0.82	18	5	clayey silt to silty clay
11.65	42.1	1.191	2.832	0.69	17	6	sandy silt to clayey silt
11.81	56.5	1.204	2.132	-1.52	21	6	sandy silt to clayey silt
11.98	66.0	1.470	2.225	-0.44	26	6	sandy silt to clayey silt
12.14	79.3	1.844	2.325	-0.22	25	7	silty sand to sandy silt
12.30	87.3	1.992	2.281	-0.14	27	7	silty sand to sandy silt
12.47	83.2	1.851	2.225	-0.33	26	7	silty sand to sandy silt
12.63	75.3	1.580	2.097	-0.52	23	7	silty sand to sandy silt
12.80	57.9	1.205	2.081	-0.19	23	6	sandy silt to clayey silt
12.96	46.0	1.062	2.310	-0.22	18	6	sandy silt to clayey silt
13.12	37.5	1.071	2.859	-0.39	15	6	sandy silt to clayey silt
13.29	34.8	1.123	3.228	-0.05	17	5	clayey silt to silty clay
13.45	35.5	0.958	2.699	-0.26	15	6	sandy silt to clayey silt
13.62	46.9	1.037	2.211	-3.09	19	6	sandy silt to clayey silt
13.78	66.0	1.307	1.980	-1.12	20	7	silty sand to sandy silt
13.94	78.4	1.658	2.114	-0.06	23	7	silty sand to sandy silt
14.11	73.2	1.819	2.486	-0.11	29	6	sandy silt to clayey silt
14.27	71.7	1.921	2.679	-0.60	28	6	sandy silt to clayey silt
14.44	76.5	1.948	2.547	-0.47	30	6	sandy silt to clayey silt
14.60	86.7	1.936	2.233	-0.27	28	7	silty sand to sandy silt
14.76	103.4	2.066	1.998	-0.21	31	7	silty sand to sandy silt
14.93	105.1	2.196	2.088	-0.18	32	7	silty sand to sandy silt
15.09	96.5	1.545	1.601	0.14	31	7	silty sand to sandy silt
15.26	86.9	1.783	2.052	-0.33	29	7	silty sand to sandy silt
15.42	91.3	2.059	2.257	-0.48	29	7	silty sand to sandy silt
15.58	95.9	2.172	2.264	-0.73	29	7	silty sand to sandy silt
15.75	89.5	2.179	2.435	-0.55	32	6	sandy silt to clayey silt
15.91	65.7	2.300	3.502	0.17	24	6	sandy silt to clayey silt
16.08	35.0	1.802	5.155	0.02	29	4	silty clay to clay
16.24	35.5	1.675	4.721	0.49	23	5	clayey silt to silty clay
16.40	73.2	2.052	2.804	0.10	25	6	sandy silt to clayey silt
16.57	84.5	2.291	2.710	-0.92	31	6	sandy silt to clayey silt
16.73	82.7	2.373	2.870	-0.41	33	6	sandy silt to clayey silt
16.90	89.1	2.482	2.788	-0.37	33	6	sandy silt to clayey silt
17.06	89.3	2.460	2.756	-0.15	33	6	sandy silt to clayey silt
17.22	78.5	2.329	2.965	-0.20	31	6	sandy silt to clayey silt
17.39	74.0	2.053	2.773	-0.07	29	6	sandy silt to clayey silt
17.55	76.7	1.968	2.565	-0.38	29	6	sandy silt to clayey silt
17.72	77.5	1.935	2.495	-0.32	29	6	sandy silt to clayey silt
17.88	75.6	2.093	2.769	-0.79	30	6	sandy silt to clayey silt
18.04	78.7	2.309	2.935	0.12	31	6	sandy silt to clayey silt
18.21	88.2	2.474	2.805	-0.59	33	6	sandy silt to clayey silt
18.37	91.6	2.198	2.399	-0.44	33	6	sandy silt to clayey silt
18.54	77.9	1.953	2.506	-0.55	27	6	sandy silt to clayey silt
18.70	41.4	1.651	3.989	-0.47	20	6	sandy silt to clayey silt
18.86	41.0	1.469	3.583	-0.39	19	5	clayey silt to silty clay
19.03	37.6	1.264	3.366	-2.50	19	5	clayey silt to silty clay
19.19	38.1	1.144	2.998	-2.49	19	5	clayey silt to silty clay
19.36	45.8	1.282	2.800	-2.28	18	6	sandy silt to clayey silt
19.52	59.6	1.411	2.368	-2.71	24	6	sandy silt to clayey silt
19.69	80.3	1.820	2.266	-3.79	25	7	silty sand to sandy silt

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
19.85	95.3	2.074	2.176	-0.57	30	7	silty sand to sandy silt
20.01	105.0	2.483	2.364	-0.52	33	7	silty sand to sandy silt
20.18	114.4	2.601	2.273	-0.57	35	7	silty sand to sandy silt
20.34	107.5	2.705	2.517	-0.65	35	7	silty sand to sandy silt
20.51	106.5	2.639	2.477	-0.89	35	7	silty sand to sandy silt
20.67	110.5	2.784	2.521	-0.50	35	7	silty sand to sandy silt
20.83	110.4	2.742	2.484	-0.24	35	7	silty sand to sandy silt
21.00	105.5	2.459	2.332	-0.51	34	7	silty sand to sandy silt
21.16	100.4	2.232	2.224	-0.26	33	7	silty sand to sandy silt
21.33	107.4	2.140	1.993	-0.40	33	7	silty sand to sandy silt
21.49	98.4	1.068	1.086	-0.20	30	7	silty sand to sandy silt
21.65	79.1	1.107	1.398	-0.21	24	7	silty sand to sandy silt
21.82	46.4	1.197	2.581	-1.02	18	7	silty sand to sandy silt
21.98	45.6	1.163	2.548	-1.29	18	6	sandy silt to clayey silt
22.15	46.8	1.102	2.352	-2.60	17	6	sandy silt to clayey silt
22.31	44.0	1.134	2.575	-2.54	17	6	sandy silt to clayey silt
22.47	42.0	1.055	2.510	-2.59	16	6	sandy silt to clayey silt
22.64	40.6	1.007	2.478	-3.53	16	6	sandy silt to clayey silt
22.80	39.6	1.108	2.798	-3.71	15	6	sandy silt to clayey silt
22.97	39.7	1.292	3.255	-4.08	19	5	clayey silt to silty clay
23.13	41.8	1.452	3.476	-4.95	17	6	sandy silt to clayey silt
23.29	53.6	1.239	2.313	-5.57	20	6	sandy silt to clayey silt
23.46	61.5	1.180	1.917	-7.38	19	7	silty sand to sandy silt
23.62	67.6	1.141	1.687	-7.44	21	7	silty sand to sandy silt
23.79	69.3	1.092	1.577	-7.47	22	7	silty sand to sandy silt
23.95	70.6	1.046	1.482	-7.25	23	7	silty sand to sandy silt
24.11	73.5	0.989	1.345	-7.60	23	7	silty sand to sandy silt
24.28	76.8	1.170	1.524	-7.73	25	7	silty sand to sandy silt
24.44	83.7	1.265	1.511	-7.49	26	7	silty sand to sandy silt
24.61	86.1	1.406	1.633	-7.40	28	7	silty sand to sandy silt
24.77	89.4	1.441	1.611	-7.99	28	7	silty sand to sandy silt
24.93	88.0	1.319	1.500	-8.00	28	7	silty sand to sandy silt
25.10	90.2	1.290	1.430	-8.06	29	7	silty sand to sandy silt
25.26	92.2	1.214	1.317	-8.15	28	7	silty sand to sandy silt
25.43	85.4	1.186	1.388	-9.13	28	7	silty sand to sandy silt
25.59	83.6	1.175	1.405	-8.61	27	7	silty sand to sandy silt
25.75	83.1	1.106	1.331	-8.70	26	7	silty sand to sandy silt
25.92	82.4	0.998	1.211	-8.94	26	7	silty sand to sandy silt
26.08	80.6	1.069	1.328	-9.09	26	7	silty sand to sandy silt
26.25	77.7	1.401	1.802	-9.01	24	7	silty sand to sandy silt
26.41	70.4	1.468	2.084	-9.09	23	7	silty sand to sandy silt
26.57	64.1	1.265	1.972	-9.22	21	7	silty sand to sandy silt
26.74	63.0	1.071	1.701	-9.91	20	7	silty sand to sandy silt
26.90	60.5	1.081	1.785	-9.78	19	7	silty sand to sandy silt
27.07	57.8	1.100	1.903	-9.34	19	7	silty sand to sandy silt
27.23	56.6	0.986	1.742	-9.90	18	7	silty sand to sandy silt
27.40	52.2	1.143	2.190	-9.80	20	6	sandy silt to clayey silt
27.56	47.9	1.640	3.420	-9.71	23	5	clayey silt to silty clay
27.72	45.4	2.072	4.560	-9.64	25	5	clayey silt to silty clay
27.89	64.4	1.931	2.997	-9.68	27	6	sandy silt to clayey silt
28.05	104.1	1.792	1.722	-10.13	31	7	silty sand to sandy silt
28.54	123.0	1.979	1.609	-9.91	31	8	sand to silty sand
28.71	157.8	1.055	0.668	-9.87	29	9	sand
28.87	179.0	0.989	0.553	-10.12	27	9	sand
29.04	92.1	1.194	1.296	-10.29	28	8	sand to silty sand
29.20	76.6	1.084	1.415	-10.73	25	7	silty sand to sandy silt
29.36	67.3	1.349	2.004	-10.47	22	7	silty sand to sandy silt
29.53	59.1	1.289	2.183	-10.01	23	6	sandy silt to clayey silt
29.69	53.9	1.203	2.230	-10.49	22	6	sandy silt to clayey silt
29.86	56.8	1.172	2.064	-10.31	22	6	sandy silt to clayey silt
30.02	58.4	1.328	2.275	-10.25	23	6	sandy silt to clayey silt
30.18	64.7	1.371	2.120	-10.15	21	7	silty sand to sandy silt
30.35	73.5	1.433	1.948	-10.53	23	7	silty sand to sandy silt

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
30.51	78.3	1.471	1.879	-10.11	25	7	silty sand to sandy silt
30.68	81.5	1.600	1.964	-10.34	26	7	silty sand to sandy silt
30.84	85.1	1.838	2.161	-10.32	27	7	silty sand to sandy silt
31.00	90.4	1.709	1.890	-10.75	30	7	silty sand to sandy silt
31.17	103.8	1.983	1.910	-10.28	33	7	silty sand to sandy silt
31.33	113.2	2.135	1.886	-11.01	35	7	silty sand to sandy silt
31.50	112.7	1.808	1.605	-10.61	35	7	silty sand to sandy silt
31.66	104.5	1.897	1.815	-10.93	36	7	silty sand to sandy silt
31.82	117.2	2.436	2.078	-10.58	40	7	silty sand to sandy silt
31.99	156.5	2.322	1.484	-11.51	35	8	sand to silty sand
32.15	162.3	2.243	1.382	-11.83	39	8	sand to silty sand
32.32	167.5	2.076	1.240	-11.58	40	8	sand to silty sand
32.48	172.1	1.676	0.974	-11.72	32	9	sand
32.64	162.8	1.476	0.907	-11.72	31	9	sand
32.81	143.5	0.949	0.662	-11.96	27	9	sand
32.97	118.0	0.950	0.805	-11.44	28	8	sand to silty sand
33.14	93.1	1.144	1.229	-11.20	22	8	sand to silty sand
33.30	66.8	1.216	1.819	-10.90	23	7	silty sand to sandy silt
33.46	59.6	1.088	1.826	-11.28	19	7	silty sand to sandy silt
33.63	56.0	1.022	1.824	-11.29	18	7	silty sand to sandy silt
33.79	52.0	0.964	1.854	-11.27	17	7	silty sand to sandy silt
33.96	49.4	0.927	1.878	-11.39	16	7	silty sand to sandy silt
34.12	49.7	0.913	1.836	-11.27	16	7	silty sand to sandy silt
34.28	50.1	0.956	1.908	-10.90	19	6	sandy silt to clayey silt
34.45	49.4	0.995	2.014	-10.81	19	6	sandy silt to clayey silt
34.61	51.0	0.985	1.929	-10.88	19	6	sandy silt to clayey silt
34.78	50.5	1.104	2.185	-10.53	20	6	sandy silt to clayey silt
34.94	56.6	1.173	2.071	-5.96	21	6	sandy silt to clayey silt
35.10	55.5	1.177	2.122	-5.73	21	6	sandy silt to clayey silt
35.27	54.9	1.198	2.182	-6.07	21	6	sandy silt to clayey silt
35.43	54.7	1.213	2.220	-6.23	21	6	sandy silt to clayey silt
35.60	54.1	1.229	2.271	-5.85	21	6	sandy silt to clayey silt
35.76	54.1	1.280	2.365	-5.47	21	6	sandy silt to clayey silt
35.93	54.3	1.182	2.176	-5.44	21	6	sandy silt to clayey silt
36.09	55.3	1.068	1.930	-5.95	18	7	silty sand to sandy silt
36.25	57.5	0.968	1.684	-5.99	18	7	silty sand to sandy silt
36.42	60.4	1.079	1.785	-6.55	19	7	silty sand to sandy silt
36.58	61.4	1.399	2.280	-6.30	23	6	sandy silt to clayey silt
36.75	56.3	1.842	3.271	-6.82	26	5	clayey silt to silty clay
36.91	44.2	2.045	4.627	-6.50	30	4	silty clay to clay
37.07	41.0	2.092	5.097	-6.62	29	5	clayey silt to silty clay
37.24	95.6	2.215	2.317	-6.61	35	6	sandy silt to clayey silt
37.40	136.1	2.435	1.790	-7.73	41	7	silty sand to sandy silt
37.57	154.1	2.462	1.597	-8.29	36	8	sand to silty sand
37.73	159.7	2.189	1.371	-9.62	39	8	sand to silty sand
37.89	177.7	2.464	1.387	-8.94	41	8	sand to silty sand
38.06	176.6	2.628	1.488	-10.03	42	8	sand to silty sand
38.22	172.0	2.480	1.442	-10.48	43	8	sand to silty sand
38.39	186.0	1.185	0.637	-11.30	33	9	sand
38.55	164.8	1.979	1.201	-10.90	33	9	sand
38.71	162.7	2.006	1.233	-11.17	39	8	sand to silty sand
38.88	157.5	1.854	1.177	-11.14	37	8	sand to silty sand
39.04	146.5	1.837	1.254	-10.88	35	8	sand to silty sand
39.21	129.4	1.633	1.262	-10.90	31	8	sand to silty sand
39.37	115.9	1.351	1.166	-11.35	28	8	sand to silty sand
39.53	110.8	1.774	1.601	-11.26	28	8	sand to silty sand
39.70	119.2	2.188	1.836	-11.03	30	8	sand to silty sand
39.86	140.0	1.829	1.306	-11.28	34	8	sand to silty sand
40.03	168.3	1.886	1.121	-11.23	32	8	sand to silty sand
40.19	88.7	1.916	2.161	-9.72	36	7	silty sand to sandy silt
40.35	85.5	1.955	2.286	-10.05	28	7	silty sand to sandy silt
40.52	84.5	2.002	2.370	-9.77	27	7	silty sand to sandy silt
40.68	82.6	2.035	2.463	-9.86	32	6	sandy silt to clayey silt

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
40.85	80.2	2.037	2.539	-9.76	31	6	sandy silt to clayey silt
41.01	78.9	2.003	2.538	-9.48	30	6	sandy silt to clayey silt
41.17	79.1	1.990	2.515	-9.70	30	6	sandy silt to clayey silt
41.34	79.3	2.027	2.556	-9.66	30	6	sandy silt to clayey silt
41.50	79.8	1.607	2.014	-9.68	26	7	silty sand to sandy silt
41.67	81.5	1.860	2.282	-9.92	29	7	silty sand to sandy silt
41.83	115.9	2.199	1.898	-8.72	33	7	silty sand to sandy silt
41.99	114.7	2.489	2.171	-8.89	36	7	silty sand to sandy silt
42.16	109.1	2.400	2.200	-9.18	35	7	silty sand to sandy silt
42.32	107.4	2.099	1.954	-9.70	34	7	silty sand to sandy silt
42.49	100.3	1.796	1.791	-11.00	33	7	silty sand to sandy silt
42.65	101.9	1.250	1.226	-10.77	24	8	sand to silty sand
42.81	98.9	1.078	1.090	-11.36	24	8	sand to silty sand
42.98	95.2	1.181	1.241	-11.44	23	8	sand to silty sand
43.14	92.6	1.377	1.487	-11.29	30	7	silty sand to sandy silt
43.31	92.7	1.488	1.604	-10.96	30	7	silty sand to sandy silt
43.47	99.5	1.488	1.496	-10.97	32	7	silty sand to sandy silt
43.64	110.3	1.668	1.513	-11.16	27	8	sand to silty sand
43.80	132.4	1.899	1.434	-11.23	30	8	sand to silty sand
43.96	129.7	2.447	1.886	-11.16	41	7	silty sand to sandy silt
44.13	126.0	2.720	2.159	-10.77	41	7	silty sand to sandy silt
44.29	127.9	2.562	2.003	-11.46	40	7	silty sand to sandy silt
44.46	122.7	1.813	1.477	-11.32	29	8	sand to silty sand
44.62	116.9	1.602	1.370	-11.01	29	8	sand to silty sand
44.78	118.4	1.765	1.490	-10.76	29	8	sand to silty sand
44.95	122.3	1.868	1.528	-11.07	29	8	sand to silty sand
45.11	127.3	2.126	1.670	-10.69	31	8	sand to silty sand
45.28	143.2	2.447	1.708	-10.76	45	7	silty sand to sandy silt
45.44	156.0	2.975	1.906	-10.67	50	7	silty sand to sandy silt
45.60	172.4	3.364	1.951	-10.81	54	7	silty sand to sandy silt
45.77	182.8	3.444	1.884	-11.44	43	8	sand to silty sand
45.93	178.5	3.238	1.814	-11.01	43	8	sand to silty sand
46.10	179.7	3.070	1.708	-11.15	43	8	sand to silty sand
46.26	178.3	2.730	1.531	-11.07	42	8	sand to silty sand
46.42	166.9	2.588	1.550	-11.83	40	8	sand to silty sand
46.59	160.9	2.784	1.730	-10.96	39	8	sand to silty sand
46.75	159.8	2.606	1.631	-11.07	39	8	sand to silty sand
46.92	162.5	2.961	1.822	-12.05	52	7	silty sand to sandy silt
47.08	169.4	3.736	2.206	-11.49	56	7	silty sand to sandy silt
47.24	192.9	4.120	2.136	-12.12	60	7	silty sand to sandy silt
47.41	199.3	3.926	1.970	-11.93	62	7	silty sand to sandy silt
47.57	187.8	3.808	2.028	-11.59	61	7	silty sand to sandy silt
47.74	190.4	4.196	2.204	-12.05	61	7	silty sand to sandy silt
47.90	192.8	4.328	2.245	-12.19	64	7	silty sand to sandy silt
48.06	214.0	3.775	1.764	-11.84	49	8	sand to silty sand
48.23	207.0	2.734	1.321	-11.86	48	8	sand to silty sand
48.39	183.4	2.289	1.248	-11.86	44	8	sand to silty sand
48.56	159.5	2.925	1.835	-12.02	51	7	silty sand to sandy silt
48.72	136.6	3.661	2.679	-11.80	44	7	silty sand to sandy silt
48.88	119.2	3.580	3.003	-11.30	48	6	sandy silt to clayey silt
49.05	117.0	3.496	2.988	-11.39	47	6	sandy silt to clayey silt
49.21	129.6	3.396	2.621	-11.50	51	6	sandy silt to clayey silt
49.38	152.2	4.292	2.820	-11.66	48	7	silty sand to sandy silt
49.54	168.2	4.405	2.618	-11.81	52	7	silty sand to sandy silt
49.70	166.6	3.755	2.254	-11.69	51	7	silty sand to sandy silt
49.87	143.7	2.644	1.840	-11.75	47	7	silty sand to sandy silt
50.03	131.1	2.319	1.769	-11.48	46	7	silty sand to sandy silt
50.20	155.7	3.394	2.181	-11.26	50	7	silty sand to sandy silt
50.36	182.1	4.431	2.433	-11.70	57	7	silty sand to sandy silt
50.52	197.8	5.247	2.652	-11.75	63	7	silty sand to sandy silt
50.69	210.5	5.446	2.587	-11.70	67	7	silty sand to sandy silt
50.85	217.4	5.487	2.524	-11.85	69	7	silty sand to sandy silt
51.02	216.3	5.060	2.339	-11.51	67	7	silty sand to sandy silt

*Soil behavior type and SPT based on data from UBC-1983

Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
51.18	198.0	4.413	2.229	-12.03	62	7	silty sand to sandy silt
51.35	167.3	3.687	2.203	-11.59	55	7	silty sand to sandy silt
51.51	155.4	2.906	1.870	-11.82	50	7	silty sand to sandy silt
51.67	147.4	2.545	1.726	-11.55	48	7	silty sand to sandy silt
51.84	144.6	2.595	1.794	-11.34	46	7	silty sand to sandy silt
52.00	140.9	2.555	1.813	-11.52	34	8	sand to silty sand
52.17	144.7	2.010	1.389	-11.72	34	8	sand to silty sand
52.33	137.3	1.903	1.386	-11.17	34	8	sand to silty sand
52.49	140.4	2.481	1.768	-11.64	44	7	silty sand to sandy silt
52.66	135.5	3.339	2.464	-11.59	42	7	silty sand to sandy silt
52.82	117.4	3.794	3.231	-11.55	46	6	sandy silt to clayey silt
52.99	109.6	3.549	3.237	-11.27	43	6	sandy silt to clayey silt
53.15	110.3	3.068	2.783	-11.33	43	6	sandy silt to clayey silt
53.31	119.4	2.790	2.337	-11.78	46	6	sandy silt to clayey silt
53.48	132.4	4.334	3.274	-11.40	53	6	sandy silt to clayey silt
53.64	166.3	6.511	3.916	-11.69	66	6	sandy silt to clayey silt
53.81	219.9	6.234	2.835	-12.00	74	6	sandy silt to clayey silt
53.97	194.3	6.056	3.117	-12.12	64	7	silty sand to sandy silt
54.13	183.6	4.413	2.404	-12.28	59	7	silty sand to sandy silt
54.30	175.7	4.314	2.455	-12.15	56	7	silty sand to sandy silt
54.46	168.6	4.080	2.420	-12.01	54	7	silty sand to sandy silt
54.63	161.6	3.639	2.252	-12.01	52	7	silty sand to sandy silt
54.79	157.9	3.702	2.344	-11.79	51	7	silty sand to sandy silt
54.95	157.0	3.080	1.961	-12.02	49	7	silty sand to sandy silt
55.12	143.5	3.191	2.223	-11.94	46	7	silty sand to sandy silt
55.28	135.9	2.894	2.130	-11.94	43	7	silty sand to sandy silt
55.45	124.5	2.321	1.864	-11.55	40	7	silty sand to sandy silt
55.61	117.3	2.503	2.134	-12.10	39	7	silty sand to sandy silt
55.77	122.4	2.447	1.999	-11.98	39	7	silty sand to sandy silt
55.94	126.7	2.503	1.976	-11.54	39	7	silty sand to sandy silt
56.10	120.1	2.551	2.125	-12.03	39	7	silty sand to sandy silt
56.27	118.0	2.609	2.212	-11.93	38	7	silty sand to sandy silt
56.43	117.6	2.661	2.262	-11.99	38	7	silty sand to sandy silt
56.59	117.3	2.762	2.355	-11.96	37	7	silty sand to sandy silt
56.76	116.6	2.853	2.448	-12.05	37	7	silty sand to sandy silt
56.92	117.7	2.521	2.142	-11.73	37	7	silty sand to sandy silt
57.09	116.9	2.342	2.003	-11.75	36	7	silty sand to sandy silt
57.25	106.0	2.561	2.415	-11.55	33	7	silty sand to sandy silt
57.41	88.6	2.765	3.120	-11.87	35	6	sandy silt to clayey silt
57.58	79.7	1.827	2.291	-11.78	32	6	sandy silt to clayey silt
57.74	81.2	1.954	2.407	-11.64	30	6	sandy silt to clayey silt
57.91	76.6	2.071	2.702	-11.73	30	6	sandy silt to clayey silt
58.07	77.7	2.059	2.651	-11.26	30	6	sandy silt to clayey silt
58.23	80.4	1.862	2.315	-11.40	27	7	silty sand to sandy silt
58.40	91.6	1.451	1.583	-11.18	30	7	silty sand to sandy silt
58.56	109.3	1.313	1.202	-11.81	25	8	sand to silty sand
58.73	116.5	1.439	1.235	-11.66	28	8	sand to silty sand
58.89	119.0	1.899	1.596	-11.38	37	7	silty sand to sandy silt
59.06	116.6	2.550	2.186	-11.81	37	7	silty sand to sandy silt
59.22	114.8	2.434	2.121	-11.42	36	7	silty sand to sandy silt
59.38	110.2	2.155	1.956	-12.11	35	7	silty sand to sandy silt
59.55	105.6	2.226	2.108	-11.49	34	7	silty sand to sandy silt
59.71	103.2	2.463	2.386	-11.72	33	7	silty sand to sandy silt
59.88	101.5	2.577	2.539	-11.79	32	7	silty sand to sandy silt
60.04	96.1	2.407	2.505	-11.47	37	6	sandy silt to clayey silt
60.20	91.5	2.343	2.562	-11.55	35	6	sandy silt to clayey silt
60.37	88.2	2.373	2.691	-11.27	34	6	sandy silt to clayey silt
60.53	85.3	2.510	2.944	-11.10	32	6	sandy silt to clayey silt
60.70	79.5	2.687	3.378	-11.67	30	6	sandy silt to clayey silt
60.86	67.2	2.200	3.272	-11.49	32	5	clayey silt to silty clay
61.02	54.9	2.278	4.153	-11.33	29	5	clayey silt to silty clay
61.19	57.8	1.969	3.404	-11.05	29	5	clayey silt to silty clay
61.35	69.5	2.081	2.993	-11.16	25	6	sandy silt to clayey silt

*Soil behavior type and SPT based on data from UBC-1983

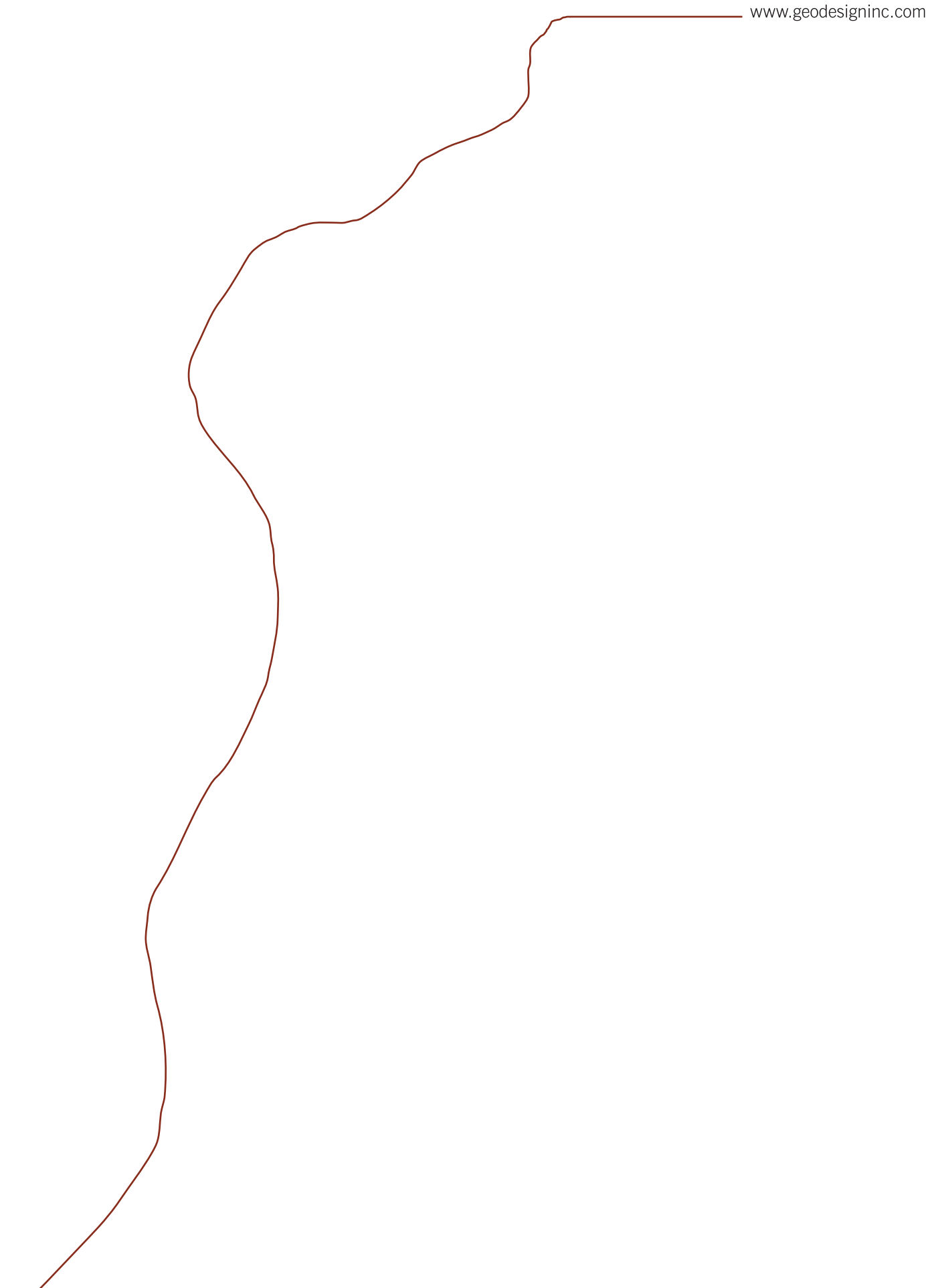
Depth	Qt	Fs	Fs/Qt	Pw	SPT N*		Soil Behavior Type
61.52	70.9	2.249	3.170	-11.08	32	5	clayey silt to silty clay
61.68	61.2	2.579	4.218	-11.00	30	6	sandy silt to clayey silt
61.84	102.9	2.968	2.885	-11.24	34	7	silty sand to sandy silt
62.17	152.6	2.258	1.479	-11.21	44	7	silty sand to sandy silt
62.34	155.1	2.087	1.345	-11.58	36	8	sand to silty sand
62.50	148.6	1.900	1.278	-11.05	36	8	sand to silty sand
62.66	141.8	1.923	1.357	-11.59	34	8	sand to silty sand
63.16	137.9	2.235	1.621	-11.64	33	8	sand to silty sand
63.32	138.0	1.974	1.431	-11.50	32	8	sand to silty sand
63.48	128.8	2.021	1.569	-11.89	31	8	sand to silty sand
63.65	116.8	2.231	1.909	-11.74	38	7	silty sand to sandy silt
63.81	108.3	2.238	2.067	-11.79	35	7	silty sand to sandy silt
63.98	101.7	2.226	2.189	-11.26	32	7	silty sand to sandy silt
64.14	93.1	2.001	2.150	-10.96	30	7	silty sand to sandy silt
64.30	85.9	1.989	2.316	-11.64	27	7	silty sand to sandy silt
64.47	79.2	2.138	2.699	-11.10	30	6	sandy silt to clayey silt
64.63	73.4	1.510	2.056	-11.83	29	6	sandy silt to clayey silt
64.80	70.7	1.487	2.103	-11.60	23	7	silty sand to sandy silt
64.96	71.8	1.495	2.082	-10.96	22	7	silty sand to sandy silt
65.12	65.6	1.604	2.447	-11.09	24	6	sandy silt to clayey silt
65.29	51.5	1.768	3.433	-11.07	19	6	sandy silt to clayey silt
65.45	33.2	1.157	3.479	-10.63	19	5	clayey silt to silty clay
65.62	36.9	0.963	2.607	-10.47	18	5	clayey silt to silty clay
65.78	41.7	1.832	4.390	-10.79	21	6	sandy silt to clayey silt
65.94	89.0	1.917	2.153	-10.99	30	7	silty sand to sandy silt
66.11	148.6	2.648	1.783	-11.14	44	7	silty sand to sandy silt
66.27	177.9	3.347	1.881	-11.03	42	8	sand to silty sand
66.44	200.7	3.713	1.850	-11.57	48	8	sand to silty sand
66.60	217.5	3.849	1.770	-11.19	52	8	sand to silty sand
66.77	230.7	4.063	1.761	-11.68	54	8	sand to silty sand
66.93	230.7	4.090	1.773	-11.23	55	8	sand to silty sand
67.09	230.7	4.016	1.741	-11.45	55	8	sand to silty sand
67.26	229.0	4.550	1.987	-11.39	54	8	sand to silty sand
67.42	214.8	4.657	2.168	-11.43	68	7	silty sand to sandy silt
67.59	199.4	4.622	2.317	-11.54	64	7	silty sand to sandy silt
67.75	190.8	4.022	2.107	-11.76	45	8	sand to silty sand
67.91	177.5	1.925	1.085	-11.64	42	8	sand to silty sand
68.08	156.3	2.285	1.461	-11.11	38	8	sand to silty sand
68.24	145.8	2.368	1.624	-11.35	36	8	sand to silty sand
68.41	150.0	2.288	1.525	-11.62	36	8	sand to silty sand
68.57	151.5	2.085	1.376	-12.08	36	8	sand to silty sand
68.73	150.4	1.681	1.117	-12.29	36	8	sand to silty sand
68.90	146.8	2.405	1.638	-12.04	35	8	sand to silty sand
69.06	142.3	2.263	1.591	-12.09	35	8	sand to silty sand
69.23	149.7	1.955	1.306	-12.10	34	8	sand to silty sand
69.39	137.2	1.707	1.244	-12.36	34	8	sand to silty sand
69.55	134.5	1.460	1.086	-12.00	32	8	sand to silty sand
69.72	135.1	1.051	0.777	-11.73	31	8	sand to silty sand
69.88	118.3	0.914	0.773	-11.82	29	8	sand to silty sand
70.05	106.1	0.976	0.920	-11.86	27	8	sand to silty sand
70.21	114.7	0.992	0.865	-12.27	28	8	sand to silty sand
70.37	124.0	1.467	1.183	-11.40	29	8	sand to silty sand
70.54	129.0	2.167	1.681	-11.58	40	7	silty sand to sandy silt
70.70	122.5	3.087	2.521	-12.04	41	7	silty sand to sandy silt
70.87	131.9	2.952	2.239	-11.88	42	7	silty sand to sandy silt
71.03	133.1	-32768	-32768	-11.72	0	0	<out of range>

*Soil behavior type and SPT based on data from UBC-1983

ACRONYMS AND ABBREVIATIONS

ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
AC	asphalt concrete
ACP	Asphalt Concrete Pavement
ASTM	American Society for Testing and Materials
BGS	below ground surface
CPT	cone penetrometer test
ESAL	equivalent single-axle load
g	gravitational acceleration (32.2 feet/second^2)
H:V	horizontal to vertical
IBC	International Building Code
MCE	maximum considered earthquake
OSHA	Occupational Safety and Health Administration
OSSC	Oregon Standard Specifications for Construction (2015)
PCC	portland cement concrete
pcf	pounds per cubic foot
pci	pounds per cubic inch
PG	performance grade
PGA	peak ground acceleration
psf	pounds per square foot
psi	pounds per square inch
SOSSC	State of Oregon Structural Specialty Code
SPT	standard penetration test



GEODESIGN INC

Addendum Transmittal

To:	Ryan Schera	From:	Najib Kalas
Company:	Deacon Development Group	Date:	December 19, 2016
Address:	901 NE Glisan Street #100 Portland, OR 97232		

cc:	Kali Bader, Rembold (via email only) Ralph Henderson, Mackenzie (via email only)

GDI Project:	DDG-8-01
RE:	Deacon Sherwood Development

Original File Name	Date	Document Title
DDG-8-01-102416-geor	10/24/16	Report of Geotechnical Engineering Services; Deacon Sherwood Development; Sherwood, Oregon

Addendum Number	Date	Description
1	12/19/16	Preload Recommendations (attached)

kt

Attachment

One copy submitted (via email only)

Document ID: DDG-8-01-121916-geoat-1.docx

GEODESIGN INC

Memorandum

To:	Ryan Schera	From:	Najib A. Kalas, P.E. and George Saunders, P.E., G.E.
Company:	Deacon Development Group	Date:	December 19, 2016
Address:	901 NE Glisan Street #100 Portland, OR 97232		

cc:	Kali Bader, Rembold (via email only) Ralph Henderson, Mackenzie (via email only)

GDI Project:	DDG-8-01
RE:	Addendum 1 Preload Recommendations Deacon Sherwood Development Sherwood, Oregon

INTRODUCTION

GeoDesign, Inc. is pleased to submit this addendum providing preload recommendations for the proposed Deacon Sherwood Development project in Sherwood, Oregon. The proposed site is located southwest of the intersection between SW Edy Road and Highway 99. GeoDesign prepared a geotechnical engineering report[1] for the proposed project dated October 24, 2016.

PRELOAD RECOMMENDATIONS

Mackenzie provided us with the preliminary grading plans (Sheet C2.2 - Job No. 2150650.00 dated November 23, 2016 and Sheet C2.2 - Job No.2150650.04 dated October 13, 2016). A summary of the proposed buildings' preliminary mass grading (cut/fill) is provided in Table 1.

[1] GeoDesign, Inc., 2016. *Report of Geotechnical Engineering Services; Deacon Sherwood Development; Sherwood, Oregon,* dated October 24, 2016. GeoDesign Project: DDG-8-01

Table 1. Building Mass Grading Summary

Building	Finished Floor Elevation (feet)	Maximum Cut (feet)	Maximum Fill (feet)
A	196.5	3	0.5
B	200	0.5	3.5
C	199	0.5	3.5
D	194.5	0	3
E	192	0	4
F	191	0	6
Senior Housing	202.5	1.5	5.5

Based on our review and engineering analyses, we recommend that a preload program be completed for Building F and the Senior Housing building to control post-construction settlement within typical structural tolerances. We recommend slab construction for Building F and the Senior Housing building be postponed at least one month after all fill is placed within the buildings' footprint.

NAK:GPS:kt
One copy submitted (via email only)
Document ID: DDG-8-01-121916-geoa-1.docx

EXHIBIT G

CWS Service Provider Letter

Clean Water Services

SENSITIVE AREA PRE-SCREENING SITE ASSESSMENT

Clean Water Services File Number 22-003253

1. **Jurisdiction:** Washington County

2. **Property Information** (example: 1S234AB01400)
   Tax lot ID(s): 2S130DA02200

   ***OR* Site Address:** 16864 SW Edy Road
   City, State, Zip: Sherwood,Oregon,97140
   Nearest cross street:

3. **Owner Information**
   Name: Annie Carlton
   Company: DD Sherwood One, LLC; Attn: Annie Carlton
   Address: 901 NE Glisan Street, Suite 100
   City, State, Zip: Portland,OR,97232
   Phone/fax: 5032978791
   Email:

4. **Development Activity** (check **all** that apply)
   - ☐ Addition to single family residence (rooms, deck, garage)
   - ☐ Lot line adjustment
   - ☐ Minor land partition
   - ☐ Residential condominium
   - ☐ Commercial condominium
   - ☐ Residential subdivision
   - ☐ Commercial subdivision
   - ☒ Single lot commercial
   - ☐ Multi lot commercial

   Other

4. **Applicant Information**
   Name: Mike Towle
   Company: DOWL
   Address: 309 SW 6th Avenue, Suite 700
   City, State, Zip: Portland,OR,97204
   Phone/fax: 9712808641
   Email: mtowle@dowl.com

6. **Will the project involve any off-site work?** ☐ Yes ☒ No ☐ Unknown
   Location and description of off-site work:

7. **Additional comments or information that may be needed to understand your project:**
   Expired Site Assessment: CWS File Number 18-003122

This application does NOT replace Grading and Erosion Control Permits, Connection Permits, Building Permits, Site Development Permits, DEQ 1200-C Permit or other permits as issued by the Department of Environmental Quality, Department of State Lands and/or Department of the Army COE. All required permits and approvals must be obtained and completed under applicable local, state, and federal law.

By signing this form, the Owner or Owner's authorized agent or representative, acknowledges and agrees that employees of Clean Water Services have authority to enter the project site at all reasonable times for the purpose of inspecting project site conditions and gathering information related to the project site. I certify that I am familiar with the information contained in this document, and to the best of my knowledge and belief, this information is true, complete, and accurate.

Print/type name Mike Towle Print/type title

Signature ONLINE SUBMITTAL Date 12/9/2022

FOR DISTRICT USE ONLY

- ☐ Sensitive areas potentially exist on site or within 200' of the site. **THE APPLICANT MUST PERFORM A SITE ASSESSMENT PRIOR TO ISSUANCE OF A SERVICE PROVIDER LETTER.** If Sensitive Areas exist on the site or within 200 feet on adjacent properties, a Natural Resources Assessment Report may also be required.
- ☒ Based on review of the submitted materials and best available information sensitive areas do not appear to exist on site or within 200' of the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider Letter as required by Resolution and Order 19-5, Section 3.02.1, as amended by Resolution and Order 19-22. All required permits and approvals must be obtained and completed under applicable local, State and federal law.
- ☐ Based on review of the submitted materials and best available information the above referenced project will not significantly impact the existing or potentially sensitive area(s) found near the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect additional water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider Letter as required by Resolution and Order 19-5, Section 3.02.1, as amended by Resolution and Order 19-22. All required permits and approvals must be obtained and completed under applicable local, state and federal law.
- ☐ **THIS SERVICE PROVIDER LETTER IS NOT VALID UNLESS _____ CWS APPROVED SITE PLAN(S) ARE ATTACHED.**
- ☐ The proposed activity does not meet the definition of development or the lot was platted after 9/9/95 ORS 92.040(2). **NO SITE ASSESSMENT OR SERVICE PROVIDER LETTER IS REQUIRED.**

Reviewed by Jessica Chaplen Date 12/9/2022

Once complete, email to: **SPLReview@cleanwaterservices.org** • Fax: **(503) 681-4439**
OR mail to: SPL Review, Clean Water Services, 2550 SW Hillsboro Highway, Hillsboro, Oregon 97123

Revised 2/2020

EXHIBIT H

Plat

RECORDED AS DOCUMENT NO. 2018 059232

CEDAR CREEK PLAZA

A REPLAT OF A PORTION OF PARCEL 2, PARTITION PLAT NO. 2003-55 AND OTHER LANDS, LOCATED IN THE SOUTHEAST ONE-QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 1 WEST, W.M., CITY OF SHERWOOD, WASHINGTON COUNTY, OREGON

DATE: AUGUST 8, 2018

SHEET INDEX

REGISTERED PROFESSIONAL LAND SURVEYOR

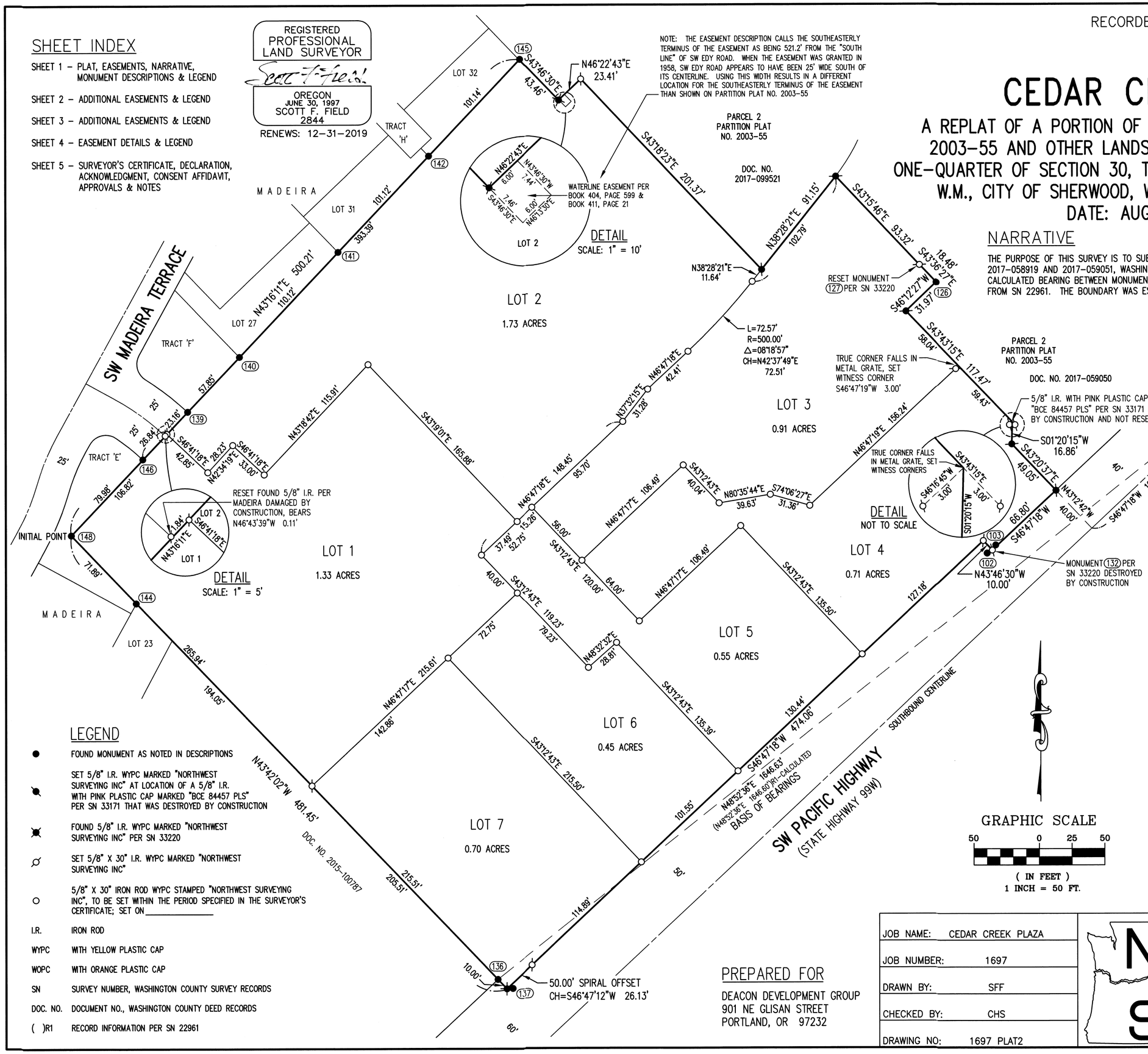
OREGON
JUNE 30, 1997
SCOTT F. FIELD
2844

RENEWS: 12-31-2019

NARRATIVE

THE PURPOSE OF THIS SURVEY IS TO SUBDIVIDE THAT PROPERTY DESCRIBED IN DOCUMENT NO. DOC. NO. 2017-058919 AND 2017-059051, WASHINGTON COUNTY DEED RECORDS. THE BASIS OF BEARINGS IS A CALCULATED BEARING BETWEEN MONUMENT 136 AND THE ONE-QUARTER CORNER HOLDING RECORD INFORMATION FROM SN 22961. THE BOUNDARY WAS ESTABLISHED PER SN 33220.

NOTE: THE EASEMENT DESCRIPTION CALLS THE SOUTHEASTERLY TERMINUS OF THE EASEMENT AS BEING 521.2' FROM THE "SOUTH LINE" OF SW EDY ROAD. WHEN THE EASEMENT WAS GRANTED IN 1958, SW EDY ROAD APPEARS TO HAVE BEEN 25' WIDE SOUTH OF ITS CENTERLINE. USING THIS WIDTH RESULTS IN A DIFFERENT LOCATION FOR THE SOUTHEASTERLY TERMINUS OF THE EASEMENT THAN SHOWN ON PARTITION PLAT NO. 2003-55



LEGEND

●	FOUND MONUMENT AS NOTED IN DESCRIPTIONS
	SET 5/8" I.R. WYPC MARKED "NORTHWEST SURVEYING INC" AT LOCATION OF A 5/8" I.R. WITH PINK PLASTIC CAP MARKED "BCE 84457 PLS" PER SN 33171 THAT WAS DESTROYED BY CONSTRUCTION
	FOUND 5/8" I.R. WYPC MARKED "NORTHWEST SURVEYING INC" PER SN 33220
	SET 5/8" X 30" I.R. WYPC MARKED "NORTHWEST SURVEYING INC"
○	5/8" X 30" IRON ROD WYPC STAMPED "NORTHWEST SURVEYING INC", TO BE SET WITHIN THE PERIOD SPECIFIED IN THE SURVEYOR'S CERTIFICATE; SET ON _____
I.R.	IRON ROD
WYPC	WITH YELLOW PLASTIC CAP
WOPC	WITH ORANGE PLASTIC CAP
SN	SURVEY NUMBER, WASHINGTON COUNTY SURVEY RECORDS
DOC. NO.	DOCUMENT NO., WASHINGTON COUNTY DEED RECORDS
( )R1	RECORD INFORMATION PER SN 22961

MONUMENT DESCRIPTIONS

(102) FOUND 5/8" I.R. WOPC MARKED "CES NW INC" PER PARTITION PLAT NO. 2003-55; S59°49'31"W 0.44' (DOWN 1.3')

(103) FOUND 5/8" I.R. (NO CAP) AS FOUND PER SN 9214; N33°33'08"E 0.38' (DOWN 1.5')

(126) FOUND & HELD 5/8" I.R. WITH PINK PLASTIC CAP MARKED "BCE 84457 PLS" PER SN 33171

(127) FOUND & HELD 5/8" I.R. WITH PINK PLASTIC CAP MARKED "BCE 84457 PLS" (SN 33171 SHOWS NO MONUMENT SET AT THIS POINT

(132) FOUND 5/8" I.R. WOPC MARKED "BCE 75480" PER SN 32258; S43°46'30"E 0.35' FROM SET MONUMENT

(136) FOUND & HELD 5/8" I.R. WYPC MARKED "DRINKWATER PLS 926" PER SN 22961

(137) FOUND 5/8" I.R. WOPC MARKED "BCE 75480" PER SN 32258; N86°39'59"E 1.00'

(139) FOUND 5/8" I.R. WOPC MARKED "CES NW INC" PER MADEIRA; N46°43'39"W 0.10'

(140) FOUND 5/8" I.R. WOPC MARKED "CES NW INC" PER MADEIRA; N46°43'39"W 0.10'

(141) FOUND 5/8" I.R. WOPC MARKED "CES NW INC" PER MADEIRA; N46°43'39"W 0.04'

(142) FOUND 5/8" I.R. WOPC MARKED "CES NW INC" PER MADEIRA

(144) FOUND 5/8" I.R. WOPC MARKED "CES NW INC" PER MADEIRA; S46°17'58"W 0.21'

(145) FOUND 5/8" IR. (NO CAP) PER SN 9214 IN NORTHEAST BASE OF TREE; N47°55'12"E 0.54'

(146) FOUND 5/8" I.R. WOPC MARKED "CES NW INC" PER MADEIRA; N46°43'31"W 0.14'

(148) FOUND & HELD 1-1/2" IRON PIPE PURPORTEDLY DRIVEN OVER 5/8" I.R. SET PER SN 9214 (SEE SN 22961)

GRAPHIC SCALE

50 0 25 50

(IN FEET)
1 INCH = 50 FT.

PREPARED FOR

DEACON DEVELOPMENT GROUP
901 NE GLISAN STREET
PORTLAND, OR 97232

JOB NAME:	CEDAR CREEK PLAZA
JOB NUMBER:	1697
DRAWN BY:	SFF
CHECKED BY:	CHS
DRAWING NO:	1697 PLAT2

NORTHWEST SURVEYING, Inc.
BOUNDARY TOPOGRAPHIC CONSTRUCTION CADASTRAL
1815 NW 169th PLACE, SUITE 2090
BEAVERTON, OR 97006
PHONE: 503-848-2127 FAX: 503-848-2179
www.nwsrvy.com

RECORDED AS DOCUMENT NO. 2018059232

CEDAR CREEK PLAZA

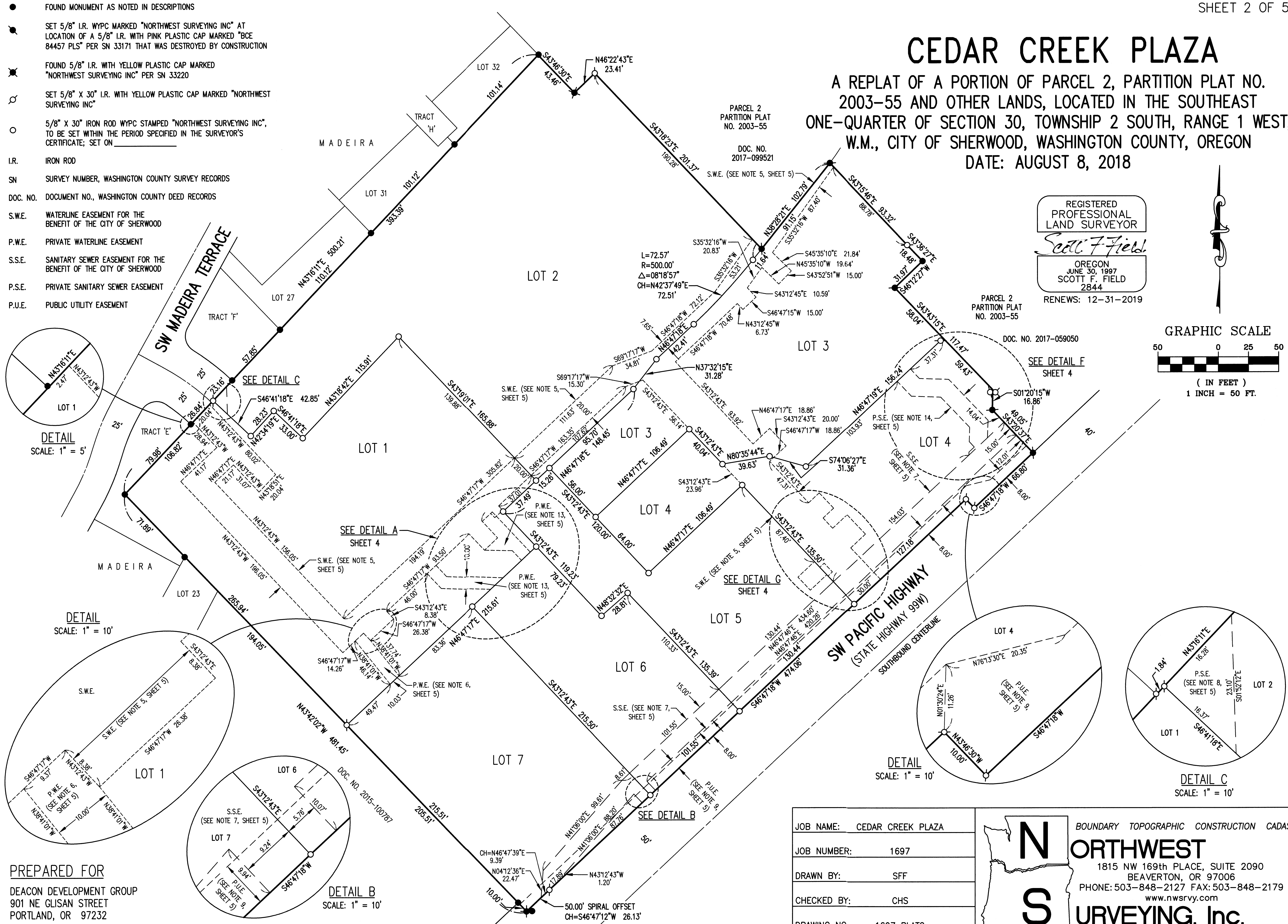
A REPLAT OF A PORTION OF PARCEL 2, PARTITION PLAT NO. 2003-55 AND OTHER LANDS, LOCATED IN THE SOUTHEAST ONE-QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 1 WEST, W.M., CITY OF SHERWOOD, WASHINGTON COUNTY, OREGON

DATE: AUGUST 8, 2018

REGISTERED PROFESSIONAL LAND SURVEYOR
Scott F. Field
OREGON
JUNE 30, 1997
SCOTT F. FIELD
2844
RENEWS: 12-31-2019

LEGEND

●	FOUND MONUMENT AS NOTED IN DESCRIPTIONS
● (with slash)	SET 5/8" I.R. WYPC MARKED "NORTHWEST SURVEYING INC" AT LOCATION OF A 5/8" I.R. WITH PINK PLASTIC CAP MARKED "BCE 84457 PLS" PER SN 33171 THAT WAS DESTROYED BY CONSTRUCTION
● (with cross)	FOUND 5/8" I.R. WITH YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC" PER SN 33220
○ (with slash)	SET 5/8" X 30" I.R. WITH YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC"
○	5/8" X 30" IRON ROD WYPC STAMPED "NORTHWEST SURVEYING INC", TO BE SET WITHIN THE PERIOD SPECIFIED IN THE SURVEYOR'S CERTIFICATE; SET ON ______________
I.R.	IRON ROD
SN	SURVEY NUMBER, WASHINGTON COUNTY SURVEY RECORDS
DOC. NO.	DOCUMENT NO., WASHINGTON COUNTY DEED RECORDS
S.W.E.	WATERLINE EASEMENT FOR THE BENEFIT OF THE CITY OF SHERWOOD
P.W.E.	PRIVATE WATERLINE EASEMENT
S.S.E.	SANITARY SEWER EASEMENT FOR THE BENEFIT OF THE CITY OF SHERWOOD
P.S.E.	PRIVATE SANITARY SEWER EASEMENT
P.U.E.	PUBLIC UTILITY EASEMENT



PREPARED FOR

DEACON DEVELOPMENT GROUP
901 NE GLISAN STREET
PORTLAND, OR 97232

JOB NAME:	CEDAR CREEK PLAZA
JOB NUMBER:	1697
DRAWN BY:	SFF
CHECKED BY:	CHS
DRAWING NO:	1697 PLAT2

BOUNDARY TOPOGRAPHIC CONSTRUCTION CADASTRAL
NORTHWEST SURVEYING, Inc.
1815 NW 169th PLACE, SUITE 2090
BEAVERTON, OR 97006
PHONE: 503-848-2127 FAX: 503-848-2179
www.nwsrvy.com

RECORDED AS DOCUMENT NO. 2018 059 232

CEDAR CREEK PLAZA

A REPLAT OF A PORTION OF PARCEL 2, PARTITION PLAT NO. 2003-55 AND OTHER LANDS, LOCATED IN THE SOUTHEAST ONE-QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 1 WEST, W.M., CITY OF SHERWOOD, WASHINGTON COUNTY, OREGON

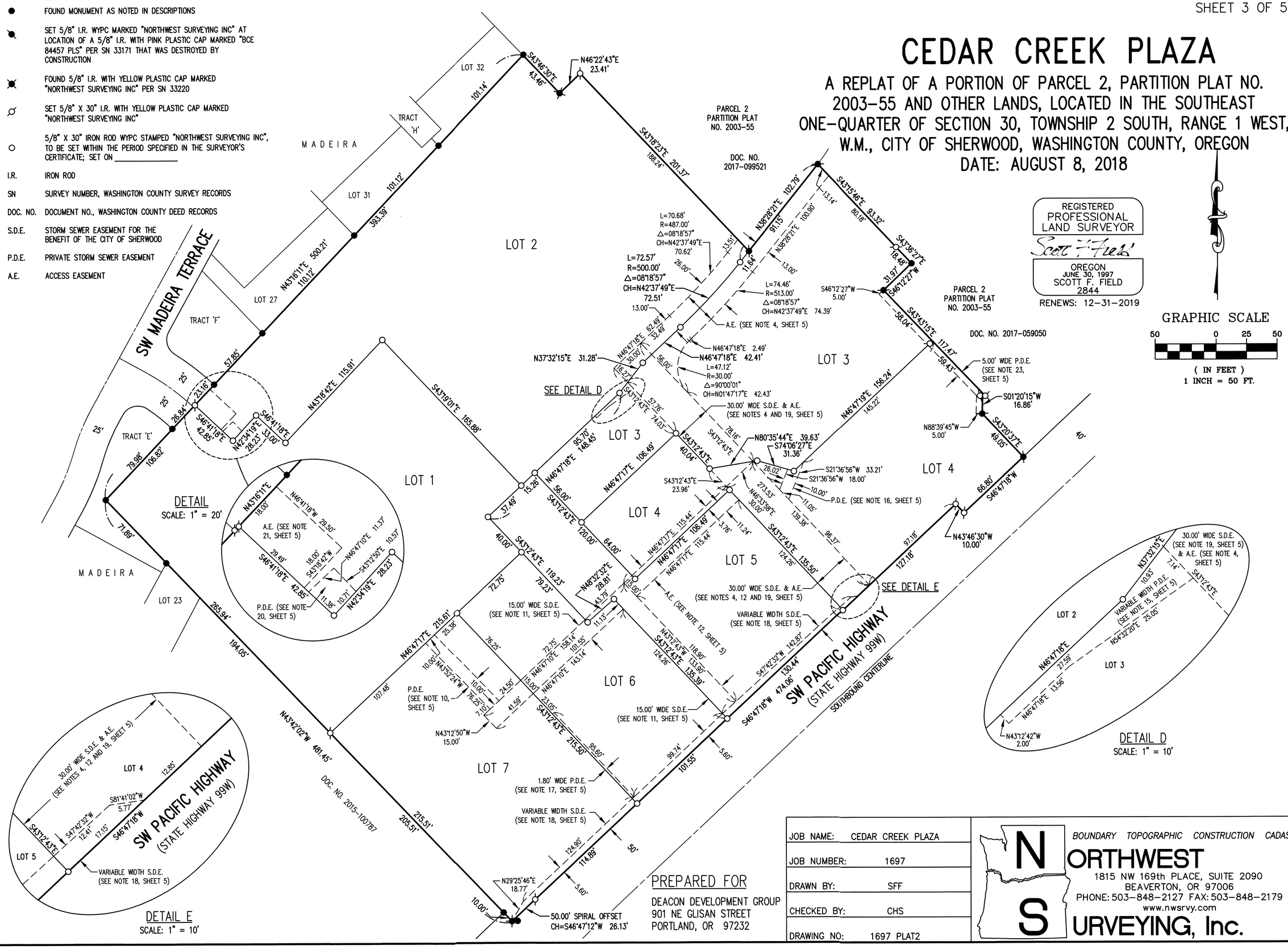
DATE: AUGUST 8, 2018

LEGEND

●	FOUND MONUMENT AS NOTED IN DESCRIPTIONS
⊗	SET 5/8" I.R. WYPC MARKED "NORTHWEST SURVEYING INC" AT LOCATION OF A 5/8" I.R. WITH PINK PLASTIC CAP MARKED "BCE 84457 PLS" PER SN 33171 THAT WAS DESTROYED BY CONSTRUCTION
✱	FOUND 5/8" I.R. WITH YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC" PER SN 33220
⊘	SET 5/8" X 30" I.R. WITH YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC"
○	5/8" X 30" IRON ROD WYPC STAMPED "NORTHWEST SURVEYING INC", TO BE SET WITHIN THE PERIOD SPECIFIED IN THE SURVEYOR'S CERTIFICATE; SET ON _____
I.R.	IRON ROD
SN	SURVEY NUMBER, WASHINGTON COUNTY SURVEY RECORDS
DOC. NO.	DOCUMENT NO., WASHINGTON COUNTY DEED RECORDS
S.D.E.	STORM SEWER EASEMENT FOR THE BENEFIT OF THE CITY OF SHERWOOD
P.D.E.	PRIVATE STORM SEWER EASEMENT
A.E.	ACCESS EASEMENT

REGISTERED PROFESSIONAL LAND SURVEYOR
Scott F. Field
OREGON
JUNE 30, 1997
SCOTT F. FIELD
2844
RENEWS: 12-31-2019

GRAPHIC SCALE
50 0 25 50
(IN FEET)
1 INCH = 50 FT.



PREPARED FOR
DEACON DEVELOPMENT GROUP
901 NE GLISAN STREET
PORTLAND, OR 97232

JOB NAME:	CEDAR CREEK PLAZA
JOB NUMBER:	1697
DRAWN BY:	SFF
CHECKED BY:	CHS
DRAWING NO:	1697 PLAT2

NORTHWEST SURVEYING, Inc.
BOUNDARY TOPOGRAPHIC CONSTRUCTION CADASTRAL
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PHONE: 503-848-2127 FAX: 503-848-2179
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RECORDED AS DOCUMENT NO. 2018 059232

CEDAR CREEK PLAZA

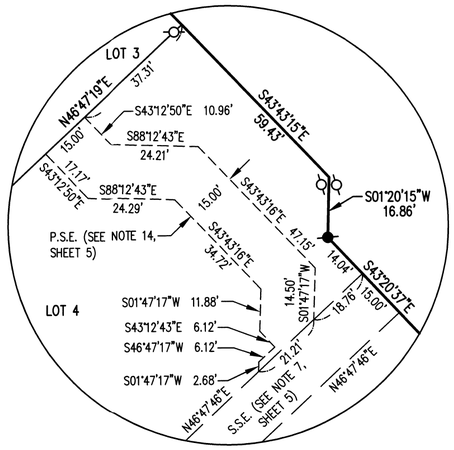
A REPLAT OF A PORTION OF PARCEL 2, PARTITION PLAT NO. 2003-55 AND OTHER LANDS, LOCATED IN THE SOUTHEAST ONE-QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 1 WEST, W.M., CITY OF SHERWOOD, WASHINGTON COUNTY, OREGON

DATE: AUGUST 8, 2018

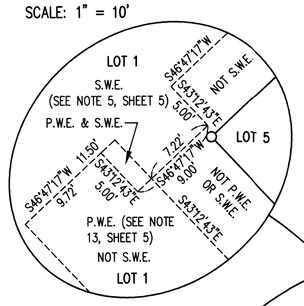
LEGEND

●	FOUND MONUMENT AS NOTED IN DESCRIPTIONS
⊗	SET 5/8" I.R. WYPC MARKED "NORTHWEST SURVEYING INC" AT LOCATION OF A 5/8" I.R. WITH PINK PLASTIC CAP MARKED "BCE 84457 PLS" PER SN 33171 THAT WAS DESTROYED BY CONSTRUCTION
✱	FOUND 5/8" I.R. WITH YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC" PER SN 33220
⊙	SET 5/8" X 30" I.R. WITH YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC"
○	5/8" X 30" IRON ROD WYPC STAMPED "NORTHWEST SURVEYING INC", TO BE SET WITHIN THE PERIOD SPECIFIED IN THE SURVEYOR'S CERTIFICATE; SET ON _____
I.R.	IRON ROD
SN	SURVEY NUMBER, WASHINGTON COUNTY SURVEY RECORDS
S.W.E.	WATERLINE EASEMENT FOR THE BENEFIT OF THE CITY OF SHERWOOD
P.W.E.	PRIVATE WATERLINE EASEMENT
S.S.E.	SANITARY SEWER EASEMENT FOR THE BENEFIT OF THE CITY OF SHERWOOD
P.S.E.	PRIVATE SANITARY SEWER EASEMENT

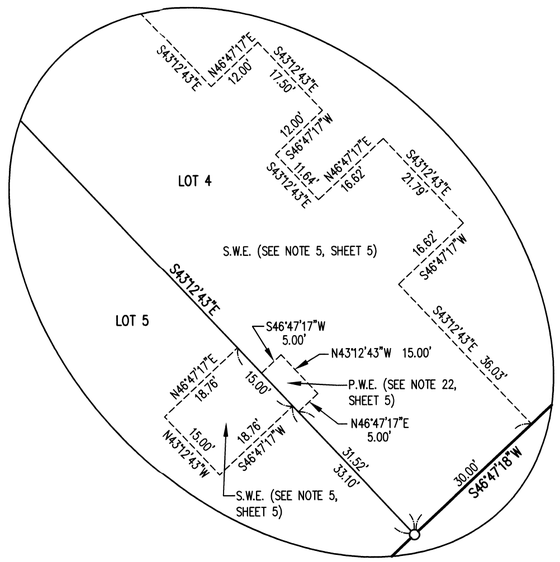
DETAIL F
SCALE: 1" = 30'



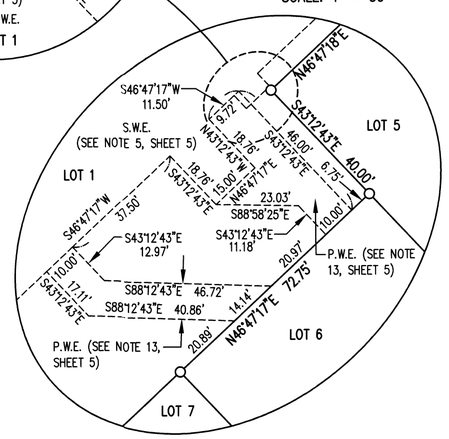
DETAIL
SCALE: 1" = 10'



DETAIL G
SCALE: 1" = 20'



DETAIL A
SCALE: 1" = 30'



SCALE: AS NOTED

REGISTERED PROFESSIONAL LAND SURVEYOR

Scott F. Field

OREGON
JUNE 30, 1997
SCOTT F. FIELD
2844

RENEWS: 12-31-2019

PREPARED FOR

DEACON DEVELOPMENT GROUP
901 NE GLISAN STREET
PORTLAND, OR 97232

JOB NAME:	CEDAR CREEK PLAZA
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CEDAR CREEK PLAZA

A REPLAT OF A PORTION OF PARCEL 2, PARTITION PLAT NO. 2003-55 AND OTHER LANDS, LOCATED IN THE SOUTHEAST ONE-QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 1 WEST, W.M., CITY OF SHERWOOD, WASHINGTON COUNTY, OREGON
DATE: AUGUST 8, 2018

RECORDED AS DOCUMENT NO. 2018059232

SURVEYOR'S CERTIFICATE

I, SCOTT F. FIELD, A REGISTERED LAND SURVEYOR IN THE STATE OF OREGON, DO HEREBY CERTIFY THAT I HAVE CORRECTLY SURVEYED AND MARKED WITH PROPER MONUMENTS THE LAND REPRESENTED ON THE ATTACHED MAP OF "CEDAR CREEK PLAZA", BEING A REPLAT OF A PORTION OF PARCEL 2 OF PARTITION PLAT NO. 2003-55 TOGETHER WITH OTHER LANDS AND BEING LOCATED IN THE SOUTHEAST ONE-QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF SHERWOOD, WASHINGTON COUNTY, OREGON, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE INITIAL POINT, BEING A 1-1/2 INCH IRON PIPE LOCATED AT THE MOST WESTERLY CORNER OF THAT PROPERTY CONVEYED TO DD SHERWOOD ONE, LLC BY DEED RECORDED JULY 26, 2017 AS DOCUMENT NO. 2017-099521, WASHINGTON COUNTY DEED RECORDS, SAID POINT BEING LOCATED AT AN ANGLE POINT ON THE EASTERLY BOUNDARY OF TRACT 'E' OF MADEIRA; THENCE ALONG THE MOST NORTHERLY EAST LINE OF MADEIRA, NORTH 43°16'11" EAST A DISTANCE OF 500.21 FEET TO THE MOST NORTHERLY NORTHEAST CORNER THEREOF, SAID POINT BEING ON THE SOUTHWESTERLY LINE OF PARCEL 2 OF PARTITION PLAT NO. 2003-55 AND FROM WHICH A 5/8 INCH IRON ROD BEARS NORTH 47°55'12" EAST A DISTANCE OF 0.54 FEET; THENCE ALONG THE SOUTHWESTERLY LINE OF SAID PARCEL 2, SOUTH 43°46'30" EAST A DISTANCE OF 43.46 FEET TO A 5/8 INCH IRON ROD WITH A YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC" LOCATED AT AN ANGLE POINT ON THE SOUTHWESTERLY BOUNDARY OF THAT PROPERTY CONVEYED TO SHERWOOD SENIOR LIVING LLC BY DEED RECORDED DECEMBER 21, 2017 AS DOCUMENT NO. 2017-099521, WASHINGTON COUNTY DEED RECORDS; THENCE ALONG THE SOUTHWESTERLY BOUNDARY OF SAID SHERWOOD SENIOR LIVING LLC PROPERTY, NORTH 46°22'43" EAST A DISTANCE OF 23.41 FEET TO A 5/8 INCH IRON ROD WITH A YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC" LOCATED AT AN ANGLE POINT THEREON; THENCE CONTINUING ALONG SAID SOUTHWESTERLY BOUNDARY, SOUTH 43°18'23" EAST A DISTANCE OF 201.37 FEET TO A 5/8 INCH IRON ROD WITH A YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC" LOCATED AT THE MOST SOUTHERLY CORNER OF SAID SHERWOOD SENIOR LIVING LLC PROPERTY; THENCE ALONG THE SOUTHEASTERLY BOUNDARY OF SAID SHERWOOD SENIOR LIVING LLC PROPERTY, NORTH 38°28'21" EAST A DISTANCE OF 91.15 FEET TO A 5/8 INCH IRON ROD WITH A YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC" LOCATED AT THE MOST WESTERLY CORNER OF THAT PROPERTY CONVEYED TO PROVIDENCE HEALTH & SERVICES - OREGON BY DEED RECORDED JULY 26, 2017 AS DOCUMENT NO. 2017-059050, WASHINGTON COUNTY DEED RECORDS; THENCE ALONG THE SOUTHWESTERLY BOUNDARY OF SAID PROVIDENCE HEALTH & SERVICES - OREGON PROPERTY, SOUTH 43°15'46" EAST A DISTANCE OF 93.32 FEET TO A 5/8 INCH IRON ROD WITH A YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC" LOCATED AN ANGLE POINT THEREON; THENCE CONTINUING ALONG SAID SOUTHWESTERLY BOUNDARY, SOUTH 43°36'27" EAST A DISTANCE OF 18.48 FEET TO A 5/8 INCH IRON ROD WITH A PINK PLASTIC CAP MARKED "BCE 84457 PLS" LOCATED AT AN ANGLE POINT THEREON; THENCE CONTINUING ALONG SAID SOUTHWESTERLY BOUNDARY, SOUTH 46°12'27" WEST A DISTANCE OF 31.97 FEET TO A 5/8 INCH IRON ROD WITH A YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC" LOCATED AT AN ANGLE POINT THEREON; THENCE CONTINUING ALONG SAID SOUTHWESTERLY BOUNDARY, SOUTH 43°43'15" EAST A DISTANCE OF 117.47 FEET TO AN ANGLE POINT THEREON; THENCE CONTINUING ALONG SAID SOUTHWESTERLY BOUNDARY, SOUTH 01°20'15" WEST A DISTANCE OF 16.86 FEET TO A 5/8 INCH IRON ROD WITH A YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC" LOCATED AT AN ANGLE POINT THEREON; THENCE CONTINUING ALONG SAID SOUTHWESTERLY BOUNDARY, SOUTH 43°20'37" EAST A DISTANCE OF 49.05 FEET TO A 5/8 INCH IRON ROD WITH A YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC" LOCATED AT THE MOST SOUTHERLY CORNER OF SAID PROVIDENCE HEALTH & SERVICES - OREGON PROPERTY, SAID POINT BEING ON THE NORTHWESTERLY RIGHT-OF-WAY LINE OF SW PACIFIC HIGHWAY, 40.00 FEET NORTHWESTERLY OF THE SOUTHBOUND CENTERLINE THEREOF, WHEN MEASURED AT RIGHT ANGLES; THENCE ALONG SAID NORTHWESTERLY RIGHT-OF-WAY LINE, SOUTH 46°47'18" WEST A DISTANCE OF 66.80 FEET TO A 5/8 INCH IRON ROD WITH A YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC" LOCATED AN ANGLE POINT THEREON; THENCE CONTINUING ALONG SAID NORTHWESTERLY RIGHT-OF-WAY LINE, NORTH 43°46'30" WEST A DISTANCE OF 10.00 FEET TO A 5/8 INCH IRON ROD WITH A YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC" LOCATED AT AN ANGLE POINT THEREON, SAID POINT BEING 50.00 FEET NORTHWESTERLY OF THE SOUTHBOUND CENTERLINE OF SW PACIFIC HIGHWAY, WHEN MEASURED AT RIGHT ANGLES; THENCE CONTINUING ALONG SAID NORTHWESTERLY RIGHT-OF-WAY LINE, SOUTH 46°47'18" WEST A DISTANCE OF 474.06 FEET TO A 5/8 INCH IRON ROD WITH A YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC" LOCATED AT A 50.00 FOOT NORTHWESTERLY PERPENDICULAR OFFSET FROM A POINT OF SPIRAL CURVATURE ON THE SOUTHBOUND CENTERLINE THEREOF; THENCE CONTINUING ALONG SAID NORTHWESTERLY RIGHT-OF-WAY LINE THROUGH A 50.00 FOOT SPIRAL CURVE OFFSET TO THE RIGHT, SAID OFFSET HAVING A CHORD BEARING OF SOUTH 46°47'12" WEST A DISTANCE OF 26.13 FEET TO A 5/8 INCH IRON ROD WITH A YELLOW PLASTIC CAP MARKED "NORTHWEST SURVEYING INC" LOCATED AT ITS INTERSECTION WITH THE SOUTHEASTERLY EXTENSION OF THE NORTHEASTERLY LINE OF THAT PROPERTY CONVEYED TO SILVER SKY DEVELOPMENT, LLC BY DEED RECORDED DECEMBER 8, 2015 AS DOCUMENT 2015-100787, WASHINGTON COUNTY DEED RECORDS; THENCE ALONG SAID SOUTHEASTERLY EXTENSION TOGETHER WITH THE NORTHEASTERLY LINE OF SAID SILVER SKY DEVELOPMENT, LLC PROPERTY AND THE NORTHWESTERLY EXTENSION THEREOF, NORTH 43°42'02" WEST A DISTANCE OF 481.45 FEET TO THE INITIAL POINT.

SAID DESCRIBED TRACT OF LAND CONTAINS 6.38 ACRES, MORE OR LESS.

AS PER O.R.S. 92.070(2), I, SCOTT F. FIELD, ALSO CERTIFY THAT THE POSTMONUMENTATION OF THE REMAINING MONUMENTS WITHIN THIS SUBDIVISION WILL BE ACCOMPLISHED WITHIN 90 CALENDAR DAYS FOLLOWING THE COMPLETION OF THE PAVING OF IMPROVEMENTS, OR WITHIN ON YEAR FOLLOWING THE ORIGINAL PLAT RECORDATION, WHICHEVER COMES FIRST, IN ACCORDANCE WITH O.R.S. 92.060.

REGISTERED PROFESSIONAL LAND SURVEYOR
Scott F Field
OREGON
JUNE 30, 1997
SCOTT F. FIELD
2844
RENEWS: 12-31-2019

NOTES

1. THIS SUBDIVISION IS SUBJECT TO THE CONDITIONS OF APPROVAL PER CITY OF SHERWOOD CASE FILE SUB 17-02.

2. THIS PLAT IS SUBJECT TO ACCESS RESTRICTIONS TO SW PACIFIC HIGHWAY PER DOC. NO. 91-028331 AS MODIFIED BY DOC. NO. 2017-078742; AND BOOK 362, PAGE 480 AS MODIFIED BY BOOK 548, PAGE 595 AND SUBSEQUENTLY MODIFIED BY DOC. NO. 2017-078742.

3. THIS PLAT IS SUBJECT TO ACCESS AND UTILITY EASEMENTS PER DOC. NO. 2017-059133, THE LOCATION OF WHICH ARE INDETERMINATE BASED ON THE DESCRIPTIONS CONTAINED THEREIN.

4. LOTS 2-4 ARE SUBJECT TO AN ACCESS EASEMENT FOR THE BENEFIT OF LOTS 1-7 AND THOSE PROPERTIES DESCRIBED IN DOC. NO. 2017-099521 AND 2017-059050 AS SHOWN AND NOTED ON SHEET 3.

5. LOTS 1-5 ARE SUBJECT TO A WATERLINE EASEMENT FOR THE BENEFIT OF THE CITY OF SHERWOOD AS SHOWN AND NOTED ON SHEET 2.

6. LOT 1 IS SUBJECT TO VARIABLE WIDTH PRIVATE WATERLINE EASEMENT FOR THE BENEFIT OF LOT 7 AS SHOWN AND NOTED ON SHEET 2.

7. LOTS 4-7 ARE SUBJECT TO A SANITARY SEWER EASEMENT FOR THE BENEFIT OF THE CITY OF SHERWOOD AS SHOWN AND NOTED ON SHEET 2.

8. LOT 2 IS SUBJECT TO A PRIVATE SANITARY SEWER EASEMENT FOR THE BENEFIT OF LOT 1, AS SHOWN AND NOTED ON SHEET 2.

9. LOTS 4-7 ARE SUBJECT TO A PUBLIC UTILITY EASEMENT ALONG THEIR FRONTAGE WITH SW PACIFIC HIGHWAY AS SHOWN AND NOTED ON SHEET 2.

10. LOT 7 IS SUBJECT TO A 10.00 FOOT WIDE PRIVATE STORM SEWER EASEMENT FOR THE BENEFIT OF LOT 1 AS SHOWN AND NOTED ON SHEET 3.

11. LOTS 5-7 ARE SUBJECT TO A 15.00 FOOT WIDE STORM SEWER EASEMENT FOR THE BENEFIT OF THE CITY OF SHERWOOD AS SHOWN AND NOTED ON SHEET 3.

12. LOTS 4 AND 5 ARE SUBJECT TO A VARIABLE WIDTH ACCESS EASEMENT FOR THE BENEFIT OF THE CITY OF SHERWOOD AS SHOWN AND NOTED ON SHEET 3.

13. LOT 1 IS SUBJECT TO A 10.00 FOOT WIDE PRIVATE WATERLINE EASEMENT AND A VARIABLE WIDTH PRIVATE WATERLINE EASEMENT FOR THE BENEFIT OF LOT 6 AS SHOWN AND NOTED ON SHEET 2.

14. LOT 4 IS SUBJECT TO A VARIABLE WIDTH PRIVATE SANITARY SEWER EASEMENT FOR THE BENEFIT OF LOT 3; AS SHOWN AND NOTED ON SHEET 2.

15. LOT 3 IS SUBJECT TO A VARIABLE WIDTH PRIVATE STORM SEWER EASEMENT FOR THE BENEFIT OF LOT 2 AS SHOWN AND NOTED ON SHEET 3.

16. LOT 4 IS SUBJECT TO A PRIVATE STORM SEWER EASEMENT FOR THE BENEFIT OF LOT 3 AS SHOWN AND NOTED ON SHEET 3.

17. LOT 6 IS SUBJECT TO A 1.80 FOOT WIDE PRIVATE STORM SEWER EASEMENT FOR THE BENEFIT OF LOT 7; AS SHOWN AND NOTED ON SHEET 3.

18. LOTS 4-7 ARE SUBJECT TO A VARIABLE WIDTH STORM SEWER EASEMENT FOR THE BENEFIT OF THE CITY OF SHERWOOD AS SHOWN AND NOTED ON SHEET 3.

19. LOTS 2-4 ARE SUBJECT TO A 30.00 FOOT WIDE STORM SEWER EASEMENT FOR THE BENEFIT OF THE CITY OF SHERWOOD AS SHOWN AND NOTED ON SHEET 3.

20. LOT 2 IS SUBJECT TO A VARIABLE WIDTH PRIVATE STORM SEWER EASEMENT FOR THE BENEFIT OF LOT 1 AS SHOWN AND NOTED ON SHEET 3.

21. LOT 2 IS SUBJECT TO A 18.00 FOOT WIDE PRIVATE ACCESS EASEMENT FOR THE BENEFIT OF LOT 1 AS SHOWN AND NOTED ON SHEET 3.

22. LOT 4 IS SUBJECT TO 15.00 FOOT WIDE PRIVATE WATERLINE EASEMENT FOR THE BENEFIT OF LOT 5 AS SHOWN AND NOTED ON SHEET 2.

23. LOTS 3 AND 4 ARE SUBJECT TO A 5.00 FOOT WIDE PRIVATE STORM SEWER EASEMENT FOR THE BENEFIT OF THE ADJOINING PROPERTY TO THE NORTHEAST DESCRIBED IN DOC. NO. 2017-059050.

DECLARATION

KNOW ALL PEOPLE BY THESE PRESENTS THAT DD SHERWOOD ONE, LLC, AN OREGON LIMITED LIABILITY COMPANY, IS THE OWNER OF THE LAND REPRESENTED ON THE ANNEXED MAP OF "CEDAR CREEK PLAZA", MORE PARTICULARLY DESCRIBED IN THE ACCOMPANYING SURVEYOR'S CERTIFICATE, AND HAS CAUSED THE SAME TO BE PLATTED INTO LOTS IN ACCORDANCE WITH O.R.S. CHAPTER 92 AND DOES HEREBY GRANT ALL EASEMENTS AS SHOWN OR NOTED FOR THE USES STATED AND INDICATED HEREON.

DD SHERWOOD ONE, LLC
AN OREGON LIMITED LIABILITY COMPANY

BY: DEACON DEVELOPMENT LLC
AN OREGON LIMITED LIABILITY COMPANY, ITS MANAGER

BY: STEVE DEACON, MANAGER

ACKNOWLEDGMENTS

STATE OF OREGON)
) S.S.
COUNTY OF Multnomah)

THIS INSTRUMENT WAS ACKNOWLEDGED BEFORE ME ON August 10th, 2018, BY STEVE DEACON, AS MANAGER OF DEACON DEVELOPMENT, LLC

Laurie Klenke Ramsey
NOTARY SIGNATURE

Laurie Klenke Ramsey
NOTARY PUBLIC-OREGON

COMMISSION NO. 968825

MY COMMISSION EXPIRES November 26, 2021

CONSENT AFFIDAVIT

A CONSENT AFFIDAVIT FROM M & T REAL ESTATE TRUST, A TRUST DEED BENEFICIARY, HAS BEEN RECORDED AS DOCUMENT NO. 2018- 059233, WASHINGTON COUNTY DEED RECORDS.

REMAINING CORNER MONUMENTATION

IN ACCORDANCE WITH O.R.S. 92.070, THE REMAINING CORNERS OF THIS SUBDIVISION HAVE BEEN CORRECTLY SET WITH PROPER MONUMENTS. AN AFFIDAVIT HAS BEEN PREPARED REGARDING THE SETTING OF SAID MONUMENTS AND IS RECORDED IN DOCUMENT NO. _____, WASHINGTON COUNTY DEED RECORDS.

APPROVED THIS ____ DAY OF _____, 20____

_____
WASHINGTON COUNTY SURVEYOR

PREPARED FOR

DEACON DEVELOPMENT GROUP
901 NE GLISAN STREET
PORTLAND, OR 97232

CITY OF SHERWOOD APPROVALS

APPROVED THIS 17th DAY OF August, 2018
CITY OF SHERWOOD COMMUNITY DEVELOPMENT DIRECTOR

BY _____

WASHINGTON COUNTY APPROVALS

APPROVED THIS 27th DAY OF August, 2018
WASHINGTON COUNTY SURVEYOR

BY _____

APPROVED THIS 27th DAY OF August, 2018
WASHINGTON COUNTY BOARD OF COMMISSIONERS

BY _____
County Surveyor

ATTEST THIS 27 DAY OF AUGUST, 2018

DIRECTOR OF ASSESSMENT AND TAXATION
EX-OFFICIO COUNTY CLERK

BY _____
DEPUTY

ALL TAXES, FEES, ASSESSMENTS OR OTHER CHARGES AS PROVIDED BY ORS 92.095 HAVE BEEN PAID AS OF THIS 27TH DAY OF AUGUST, 2018.

DIRECTOR OF ASSESSMENT AND TAXATION
(WASHINGTON COUNTY ASSESSOR)

BY _____
DEPUTY

STATE OF OREGON)
) S.S.
COUNTY OF WASHINGTON)

I, DO HEREBY CERTIFY THAT THIS SUBDIVISION PLAT, WAS RECEIVED FOR RECORD ON THIS 27 DAY OF AUGUST, 2018 AT 1:46 O'CLOCK P M, AND RECORDED IN THE COUNTY CLERK RECORDS

_____
DEPUTY COUNTY CLERK

JOB NAME:	CEDAR CREEK PLAZA
JOB NUMBER:	1697
DRAWN BY:	SFF
CHECKED BY:	CHS
DRAWING NO:	1697 PLAT2

BOUNDARY TOPOGRAPHIC CONSTRUCTION CADASTRAL
NORTHWEST SURVEYING, Inc.
1815 NW 169th PLACE, SUITE 2090
BEAVERTON, OR 97006
PHONE: 503-848-2127 FAX: 503-848-2179
www.nwsrvy.com

EXHIBIT I

Title Report

Transaction Identification Data, for which the Company assumes no liability as set forth in Commitment Condition 5.e.:

Issuing Agent: First American Title Insurance Company
National Commercial Services
Issuing Office: 200 SW Market Street, Suite 250, Portland, OR 97201
Issuing Office's ALTA® Registry ID: 1153372
Commitment Number: NCS-1149998-OR1
Issuing Office File Number: NCS-1149998-OR1
Property Address: 16864 Southwest Edy Road, Sherwood, OR 97140
Revision Number:

Escrow Officer Name: Rene Moody
Escrow Officer Number: (503)795-7600
Escrow Officer Email: rmoody@firstam.com
Escrow Assistant Name: Lisa Smith
Escrow Assistant Number: (503)795-7606
Escrow Assistant Email: lisasmith@firstam.com
Title Officer Name: Emily Collins
Title Officer Number: (503)795-7604
Title Officer Email: ECollins@firstam.com

SCHEDULE A

1. Commitment Date: September 26, 2022 at 8:00 a.m.

2. Policy to be issued:
   a. ALTA® Extended Loan Policy
      Proposed Insured: Lender TBD
      Proposed Amount of Insurance: $0.00
      The estate or interest to be insured: See Item 3 below
   b. 2021 ALTA Policy - form(s) To Be Determined
      Proposed Insured: To Be Determined
      Proposed Amount of Insurance: $0.00
      The estate or interest to be insured: See Item 3 below
   c. 2021 ALTA Policy - form(s) To Be Determined
      Proposed Insured: To Be Determined
      Proposed Amount of Insurance: $0.00
      The estate or interest to be insured: See Item 3 below

3. The estate or interest in the Land at the Commitment Date is:

   Fee as to Parcel I, an Easement as to Parcel II

4. The Title is, at the Commitment Date, vested in:

   DD Sherwood Two, LLC, an Oregon limited liability company

5. The Land is described as follows:

   See Exhibit A attached hereto and made a part hereof

First American Title Insurance Company National Commercial Services

By: _____

Authorized Signatory

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

Commitment No. NCS-1149998-OR1

SCHEDULE B, PART I—Requirements

All of the following Requirements must be met:

1. The Proposed Insured must notify the Company in writing of the name of any party not referred to in this Commitment who will obtain an interest in the Land or who will make a loan on the Land. The Company may then make additional Requirements or Exceptions.

2. Pay the agreed amount for the estate or interest to be insured.

3. Pay the premiums, fees, and charges for the Policy to the Company.

4. Documents satisfactory to the Company that convey the Title or create the Mortgage to be insured, or both, must be properly authorized, executed, delivered, and recorded in the Public Records.

5. The marital status of the vested owner described in Paragraph 4 of Schedule A is consistent with the marital status identified in the most current instrument vesting Title. First American Title Insurance Company does not represent that this is the current marital status of the vested owner. The current marital status of the vested owner should be provided to the Company prior to closing. Additional requirements may be imposed based upon any change in marital status since the recording of the current vesting deed.

6. If a proposed mortgage or deed of trust will secure, in whole or in part, construction advances, in order to consider providing coverage against statutory liens for services, labor, or materials arising from construction of improvements or work related to the Land, the Company will require:

    1. Project budget, including hard costs, soft costs, equity contributions, and sources and uses.
    2. An indemnity agreement on a form to be provided, and executed by indemnitor(s) approved, by the Company.
    3. Direct contract(s) with any general contractor(s), including projected schedule for completion of construction.
    4. Draft loan agreement detailing construction advance disbursement controls (or separate disbursement agreement, if applicable) and guaranty/ees.
    5. An appraisal, if lender has required one.

    Upon receipt and review of the foregoing, the Company reserves the right to require additional documentation. The cost for construction lien coverage will vary depending on if we issue up front coverage or incremental coverage:

    1. Full upfront coverage - the cost is $2.50 per thousand of the loan amount in addition to the title insurance policy fee.

2. Incremental coverage - the cost is $1 per thousand of the loan amount in addition to the title insurance policy fee.

Commitment No. NCS-1149998-OR1

SCHEDULE B, PART II—Exceptions

Some historical land records contain Discriminatory Covenants that are illegal and unenforceable by law. This Commitment and the Policy treat any Discriminatory Covenant in a document referenced in Schedule B as if each Discriminatory Covenant is redacted, repudiated, removed, and not republished or recirculated. Only the remaining provisions of the document will be excepted from coverage.

The Policy will not insure against loss or damage resulting from the terms and conditions of any lease or easement identified in Schedule A, and will include the following Exceptions unless cleared to the satisfaction of the Company:

1. Any defect, lien, encumbrance, adverse claim, or other matter that appears for the first time in the Public Records or is created, attaches, or is disclosed between the Commitment Date and the date on which all of the Schedule B, Part I—Requirements are met.

2. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.

3. Facts, rights, interests or claims which are not shown by the Public Records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.

4. Easements, or claims of easement, not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.

5. Any encroachment (of existing improvements located on the Land onto adjoining land or of existing improvements located on adjoining land onto the Land), encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land.

6. Any lien or right to a lien for services, labor, material or equipment, unless such lien is shown by the Public Records at Date of Policy and not otherwise excepted from coverage herein.

The exceptions to coverage 2-6 inclusive as set forth above will remain on any subsequently issued Standard Coverage Title Insurance Policy.

In order to remove these exceptions to coverage in the issuance of an Extended Coverage Policy the following items are required to be furnished to the Company; additional exceptions to coverage may be added upon review of such information:

A. Survey or alternative acceptable to the Company
B. Affidavit regarding possession
C. Proof that there is no new construction or remodeling of any improvement located on the Land. In the event of new construction or remodeling the following is required:
   i. Satisfactory evidence that no construction liens will be filed; or
   ii. Adequate security to protect against actual or potential construction liens;
   iii. Payment of additional premiums as required by the Industry Rate Filing approved by the Insurance Division of the State of Oregon

7. General and special taxes and assessments for the fiscal year 2022-2023, a lien not yet due or payable.

8. Limited access provisions contained in Deed to the State of Oregon, by and through its State Highway Commission recorded November 13, 1954 as Volume 362, Page 0480 Deed Records, which provides that no right of easement or right of access to, from or across the State Highway other than expressly therein provided for shall attach to the abutting property.

   Document(s) declaring modifications thereof recorded April 15, 1965 as Volume 548, Page 0595 of Official Records.

   Document(s) declaring modifications thereof recorded October 5, 2017 as Fee No. 2017 078742 of Official Records.

9. Easement, including terms and provisions contained therein:
   Recording Information: May 14, 1958 as Volume 404, Page 0599
   In Favor of:
   For: Underground water supply pipeline

   Document(s) declaring modifications thereof recorded October 29, 1958 as Volume 411, Page 0021 of Official Records.

10. Limited access provisions contained in Deed to the State of Oregon, by and through its State Highway Commission recorded May 31, 1991 as Fee No. 91028331 Deed Records, which provides that no right of easement or right of access to, from or across the State Highway other than expressly therein provided for shall attach to the abutting property.

Document(s) declaring modifications thereof recorded October 5, 2017 as Fee No. 2017 078742 of Official Records.

11. Restrictions shown on the recorded plat of Partition Plat No. 2003-055.

12. The terms, provisions and easement(s) contained in the document entitled "Declaration of Easement Agreement, Maintenance Agreement, and Prospective Easement Agreement" recorded July 25, 2003 as Fee No. 2003 121736 of Official Records.

13. The terms, provisions and easement(s) contained in the document entitled "Declaration of Easements and Restrictive Covenants" recorded July 26, 2017 as Fee No. 2017 059133 of Official Records.

14. Restrictions shown on the recorded plat of Cedar Creek Plaza.

15. Easements for Access purposes as shown on the recorded plat of Cedar Creek Plaza.

16. Easements for storm sewer purposes as shown on the recorded plat of Cedar Creek Plaza.

17. Easements for variable width private storm sewer purposes as shown on the recorded plat of Cedar Creek Plaza.

18. Easements for Private Sanitary Sewer purposes as shown on the recorded plat of Cedar Creek Plaza.

19. Easements for Waterline purposes as shown on the recorded plat of Cedar Creek Plaza.

20. Easements for Private Access purposes as shown on the recorded plat of Cedar Creek Plaza.

21. A **Line of Credit** Deed of Trust to secure an original indebtedness of $1,020,000.00 recorded September 7, 2018 as Fee No. 2018 061877 of Official Records.
    Dated: September 7, 2018
    Trustor: DD Sherwood Two, LLC, an Oregon limited liability company
    Trustee: First American Title Company of Oregon
    Beneficiary: M&T Real Estate Trust, a Maryland real estate investment trust, its successors and/or assigns

    The above deed of trust states that it is a construction deed of trust.

    Document re-recorded September 7, 2018 as Fee No. 2018 062096 of Official Records.

    A document recorded April 1, 2021 as Fee No. 2021 040683, of Official Records provides that the Deed of Trust/Mortgage or the obligation secured thereby has been modified.

A document recorded June 1, 2022 as Fee No. 2022 036559 of Official Records provides that Fidelity National Title Insurance Company was substituted as trustee under the deed of trust.

The effect of a document entitled "Deed of Reconveyance", recorded June 1, 2022 as Fee No. 2022 036560 of Official Records.

Note: The Company will require satisfactory proof of full payment of the debt secured by said mortgage or deed of trust prior to removing this exception or insuring the contemplated transaction.

22. The terms, provisions and easement(s) contained in the document entitled "Declaration and Establishment of Protective Covenants, Conditions and Restrictions and Grant of Easements" recorded May 1, 2019 as Fee No. 2019 026258 of Official Records.

    Document(s) declaring modifications thereof recorded September 18, 2019 as Fee No. 2019 064050 of Official Records.

    Document(s) declaring modifications thereof recorded August 9, 2022 as Fee No. 2022 050666 of Official Records.

23. The terms and provisions contained in the document entitled "Private Stormwater Facility Access & Maintenance Covenant" recorded May 14, 2019 as Fee No. 2019 029070 of Official Records.

24. Evidence of the authority of the individual(s) to execute the forthcoming document for DD Sherwood Two, LLC, an Oregon limited liability company, copies of the current operating agreement should be submitted prior to closing.

25. Unrecorded leases or periodic tenancies, if any.

-END OF EXCEPTIONS-

INFORMATIONAL NOTES

NOTE: This report does not include a search for Financing Statements filed in the office of the Secretary of State, or in a county other than the county wherein the premises are situated, and no liability is assumed if a Financing Statement is filed in the office of the County Clerk (Recorder) covering fixtures on the premises wherein the lands are described other than by metes and bounds or under the rectangular survey system or by recorded lot and book.

NOTE: Washington County Ordinance No. 267, filed August 5, 1982 in Washington County, Oregon, imposes a tax of $1.00 per thousand or fraction thereof on the transfer of real property located within Washington County.

NOTE: Taxes for the year 2021-2022, paid in full.

Tax Amount:	$14,554.36
Code No.:	088.52
Map & Tax Lot No.	2S130DA02200
Property ID/Key No.	R2207396

Commitment No. NCS-1149998-OR1

EXHIBIT A

The Land referred to herein below in situated in the County of Washington, State of Oregon, and is described as follows:

PARCEL I:

LOT 2 OF CEDAR CREEK PLAZA RECORDED AUGUST 27, 2018 AS PLAT FEE NO. 2018 059232, IN THE CITY OF SHERWOOD, COUNTY OF WASHINGTON AND STATE OF OREGON.

PARCEL II:

AN EASEMENT AS SET FORTH IN DECLARATION OF EASEMENT AND RESTRICTIVE COVENANTS RECORDED JULY 26, 2017 AS FEE NO. 2017 059133, IN THE CITY OF SHERWOOD, COUNTY OF WASHINGTON AND STATE OF OREGON.

ALTA COMMITMENT FOR TITLE INSURANCE
issued by
FIRST AMERICAN TITLE INSURANCE COMPANY

NOTICE

IMPORTANT—READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRACONTRACTUAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

THE COMPANY'S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and the Commitment Conditions, First American Title Insurance Company, a Nebraska Corporation (the "Company"), commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Amount of Insurance and the name of the Proposed Insured.

If all of the Schedule B, Part I—Requirements have not been met within after the Commitment Date, this Commitment terminates and the Company's liability and obligation end.

First American Title Insurance Company

Kenneth D. DeGiorgio, President

Greg L. Smith, Secretary

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

COMMITMENT CONDITIONS

1. DEFINITIONS

a. "Discriminatory Covenant": Any covenant, condition, restriction, or limitation that is unenforceable under applicable law because it illegally discriminates against a class of individuals based on personal characteristics such as race, color, religion, sex, sexual orientation, gender identity, familial status, disability, national origin, or other legally protected class.

b. "Knowledge" or "Known": Actual knowledge or actual notice, but not constructive notice imparted by the Public Records.

c. "Land": The land described in Item 5 of Schedule A and improvements located on that land that by State law constitute real property. The term "Land" does not include any property beyond that described in Schedule A, nor any right, title, interest, estate, or easement in any abutting street, road, avenue, alley, lane, right-of-way, body of water, or waterway, but does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.

d. "Mortgage": A mortgage, deed of trust, trust deed, security deed, or other real property security instrument, including one evidenced by electronic means authorized by law.

e. "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.

f. "Proposed Amount of Insurance": Each dollar amount specified in Schedule A as the Proposed Amount of Insurance of each Policy to be issued pursuant to this Commitment.

g. "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.

h. "Public Records": The recording or filing system established under State statutes in effect at the Commitment Date under which a document must be recorded or filed to impart constructive notice of matters relating to the Title to a purchaser for value without Knowledge. The term "Public Records" does not include any other recording or filing system, including any pertaining to environmental remediation or protection, planning, permitting, zoning, licensing, building, health, public safety, or national security matters.

i. "State": The state or commonwealth of the United States within whose exterior boundaries the Land is located. The term "State" also includes the District of Columbia, the Commonwealth of Puerto Rico, the U.S. Virgin Islands, and Guam.

j. "Title": The estate or interest in the Land identified in Item 3 of Schedule A.

2. If all of the Schedule B, Part I—Requirements have not been met within the time period specified in the Commitment to Issue Policy, this Commitment terminates and the Company's liability and obligation end.

3. The Company's liability and obligation is limited by and this Commitment is not valid without:
   a. the Notice;
   b. the Commitment to Issue Policy;
   c. the Commitment Conditions;
   d. Schedule A;
   e. Schedule B, Part I—Requirements; and
   f. Schedule B, Part II—Exceptions; and
   g. a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND
The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company is not liable for any other amendment to this Commitment.

5. LIMITATIONS OF LIABILITY
   a. The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:
      i. comply with the Schedule B, Part I—Requirements;
      ii. eliminate, with the Company's written consent, any Schedule B, Part II—Exceptions; or
      iii. acquire the Title or create the Mortgage covered by this Commitment.
   b. The Company is not liable under Commitment Condition 5.a. if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.
   c. The Company is only liable under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.
   d. The Company's liability does not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Condition 5.a. or the Proposed Amount of Insurance.
   e. The Company is not liable for the content of the Transaction Identification Data, if any.
   f. The Company is not obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I—Requirements have been met to the satisfaction of the Company.
   g. The Company's liability is further limited by the terms and provisions of the Policy to be issued to the Proposed Insured.

6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT; CHOICE OF LAW AND CHOICE OF FORUM

a. Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.

b. Any claim must be based in contract under the State law of the State where the Land is located and is restricted to the terms and provisions of this Commitment. Any litigation or other proceeding brought by the Proposed Insured against the Company must be filed only in a State or federal court having jurisdiction.

c. This Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or oral, express or implied, relating to the subject matter of this Commitment.

d. The deletion or modification of any Schedule B, Part II—Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.

e. Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company.

f. When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT IS ISSUED BY AN ISSUING AGENT

The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for closing, settlement, escrow, or any other purpose.

8. PRO-FORMA POLICY

The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.

9. CLAIMS PROCEDURES

This Commitment incorporates by reference all Conditions for making a claim in the Policy to be issued to the Proposed Insured. Commitment Condition 9 does not modify the limitations of liability in Commitment Conditions 5 and 6.

10. CLASS ACTION

ALL CLAIMS AND DISPUTES ARISING OUT OF OR RELATING TO THIS COMMITMENT, INCLUDING ANY SERVICE OR OTHER MATTER IN CONNECTION WITH ISSUING THIS COMMITMENT, ANY BREACH OF A COMMITMENT PROVISION, OR ANY OTHER CLAIM OR DISPUTE ARISING OUT OF OR RELATING TO THE TRANSACTION GIVING RISE TO THIS COMMITMENT, MUST BE BROUGHT IN AN INDIVIDUAL CAPACITY. NO PARTY MAY SERVE AS PLAINTIFF, CLASS MEMBER, OR PARTICIPANT IN ANY CLASS OR REPRESENTATIVE PROCEEDING. ANY POLICY ISSUED PURSUANT TO THIS COMMITMENT WILL CONTAIN A CLASS ACTION CONDITION.

EXHIBIT J

Neighborhood Meeting Packet & Mailing List

MEETING SUMMARY

PROJECT:	Cedar Creek Lot 2	DATE:	01/05/2023
PROJECT NUMBER:		TIME:	6:00 PM
ORGANIZER:	DOWL	SUBJECT:	Neighborhood Meeting

ATTENDEES:	ORGANIZATION:
Mike Towle	DOWL
Kenny Werth	DOWL
Annie Carlton	Deacon Development, LLC
Terry Novak	Novak Architecture, Inc.

*Please see sign-in sheet for list of meeting attendees

Introduction

DOWL shared a brief summary of the two buildings proposed: 13,000 square feet, approximately 90 parking spaces, last piece of infill at Cedar Creek. The goal is to maintain as much of landscape buffer behind the commercial development and the adjacent residential development.

Discussion

This discussion with the community was free-flowing and residents spoke up with any questions or comments. Questions below reflect the respective community member's questions and concerns. The questions and comments listed below are not in chronological order. The meeting was closed after approximately 30 minutes of discussion with the community members present.

Bill and Cheryl Mitchell

- Where is this development?
  - Mike T responded that it is at the corner of Edy and Highway 99
- How soon will this be built?
  - Mike T says potential construction start not until the end of summer, would be able to start construction before the rain starts
- Will there be another meeting like this?
  - Mike T says there will be a public hearing where the public can, again, come out and voice support or opposition

Mark Light

- Lives near Planet Fitness, is in support of commercial development versus the previous residential development
- Parking and traffic (there is only one in and out from Edy)
  - Mike T responded that there will be a traffic analysis
- Question on connection to Planet Fitness and neighborhood
  - Mike T responded that existing pedestrian connections will be kept intact
- Asked about architectural features
  - Terry Novak responded that the majority of the building will be stucco with brick base

- Asked about elevations
    - Terry Novak responded that the proposed buildings are about the same height as all the rest in Cedar Creek
- Requested plan sheets sent to him

Joyce Carter
- Approves of the height of the proposed development
- Will we be notified when tenants are confirmed?
    - Mike T said City will not notify on tenants, but there will be additional

Melissa Spacy
- Works for an adjacent landowner that has contributed to the development of Cedar Creek
- Are 95 parking stalls additional?
    - Mike T responded yes

Bruce Bebb
- Has concerns about the traffic
- Are 95 parking stalls required?
    - Mike T responded that it's just over the required minimum amount
- Any possible tenants?
    - Annie says that there are interested tenants, possibly medical but nothing yet
- Has there been any pushback from the City?
    - Annie responded that not at this point, should be usual permitting
- Is County involved?
    - Mike T responded no, but State will be involved to re-approve parking and drainage onsite
- Would tenant make request to have one building?
    - Mike T responded that this would require additional permitting to complete
- Concerns about stucco
    - Terry Novak said stucco has come a long way in PNW
- Will there be a requirement for a new traffic study going forward?
    - Mike T responded that there are code requirements in terms of what traffic the development will bring
        - Bruce replied that the right turn lane does not start until after the exit onto Edy Road
            - Mike replied that this development doesn't always affect the overall traffic flow

NEIGHBORHOOD MEETING SIGN IN SHEET

Proposed Project: Cedar Creek Plaza Lot 2 - Commercial Development

Proposed Project Location: 16864 SW Edy Road

Project Contact: DD Sherwood One, LLC; Attn: Annie Carlton

Meeting Location: Ridges Elementary School

Meeting Date: 01/05/2023

Name	Address	E-Mail	Please identify yourself (check all that apply)			
			Resident	Property owner	Business owner	Other
Melissa Spacy	16872 SW. Edy Rd	MSpacy@leisurecare.com			X	
Bill & Cheryl Mitchell	20764 SW Songwil Terr	cherylm@gmail.com	X			
Mark Light	17117 SW Robinwood Pl	mr-459@outlook.com	X			
Bruce Bebb	21233 SW Hawston Dr	brucebebb@gmail.com	X			
Joyce Carter	21196 SW Madeira	joyc1146@yahoo.com	✓	✓		

Continued sign-in sheet for proposed project:_____ **Date:**_____

Name	Address	E-Mail	Please identify yourself (check all that apply)			
			Resident	Property owner	Business owner	Other

Affidavit of Mailing

DATE: 12/21/22

STATE OF OREGON)
)
Washington County)

I, Kenneth Weath, representative for the Cedar Creek Plaza Lot 2 proposed development project do hereby certify that the attached notice to adjacent property owners and recognized neighborhood organizations that are within 1,000 feet of the subject project, was placed in a U.S. Postal receptacle on 12/21/22.

Representatives Name: Kenneth Weath
Name of the Organization: DOWL

UNITED STATES POSTAL SERVICE.

CENTRAL
204 SW 5TH AVE
PORTLAND, OR 97240-5000
(800)275-8777

12/21/2022 03:27 PM

Product	Qty	Unit Price	Price
U.S. Flags Coil	2	$60.00	$120.00
US Flags Bklt/20	3	$12.00	$36.00

Grand Total: $156.00

Credit Card Remit $156.00
Card Name: VISA
Account #: XXXXXXXXXXXX9860
Approval #: 014406
Transaction #: 245
AID: A0000000031010O1 Chip
AL: VISA CREDIT
PIN: Not Required

Preview your Mail
Track your Packages
Sign up for FREE @
https://informeddelivery.usps.com

All sales final on stamps and postage.
Refunds for guaranteed services only.
Thank you for your business.

Tell us about your experience.
Go to: https://postalexperience.com/Pos
or scan this code with your mobile device,

or call 1-800-410-7420.

UFN: 406762-0004
Receipt #: 840-59700110-1-4428506-1
Clerk: 9

SILVER SKY DEVELOPMENT LLC
4017 WASHINGTON RD
CANONSBURG, PA 15317

CHEVRON USA INC
PO BOX 285
HOUSTON, TX 77001

SHERWOOD CITY OF
22560 SW PINE ST
SHERWOOD, OR 97140

ABRAHAM WENDY
21372 SW ROELLICH AVE
SHERWOOD, OR 97140

GREEN TIN ROOF LLC
PO BOX 760
YAMHILL, OR 97148

CHEVRON USA INC
PO BOX 285
HOUSTON, TX 77001

SILVER SKY BILLBOARD
23425 NW MORELAND RD
NORTH PLAINS, OR 97133

KWAN OREGON LLC
PO BOX 3637
SALEM, OR 97302

BEYMER-DORN ENTERPRISES LLC
8156 SW WOODY END ST
PORTLAND, OR 97224

PATRICK & JOANN LARSON
34801 SW SOUTH RANCH RD
NEWBERG, OR 97132

LACHMAN DONALD & LACHMAN KAREN
35301 SW GEER RD
NEWBERG, OR 97132

ALBRECHT JOANN
PO BOX 643
SHERWOOD, OR 97140

WAIBEL CANDICE & WAIBEL JACOB
1057 SW VIEW CREST DR
DUNDEE, OR 97115

3 BY 3 LLC
PO BOX 2148
MILWAUKEE, WI 53201

GRANT BARBANAS & GRANT KATIE
16710 SW 12TH ST
SHERWOOD, OR 97140

BRUTON PROPERTIES LLC
12855 SW 22ND ST
BEAVERTON, OR 97008

MARILYN ROME
14645 SW WILLAMETTE ST
SHERWOOD, OR 97140

GREEN TIN ROOF LLC
PO BOX 760
YAMHILL, OR 97148

ALAN & CARLA
PO BOX 150
NEWBERG, OR 97132

RODA LLC
20407 SW BORCHERS DR
SHERWOOD, OR 97140

SHERWOOD CITY OF
22560 SW PINE ST
SHERWOOD, OR 97140

SHERWOOD CITY OF
22560 SW PINE ST
SHERWOOD, OR 97140

LEGACY HOMES INC
18025 SW BROOKMAN RD
SHERWOOD, OR 97140

MUNRO CHRISTINA & MUNRO TERRY
21604 SW CEDAR BROOK WAY
SHERWOOD, OR 97140

SHUFORD ALEXANDRA
20773 SW CHERRY ORCHARDS PL
SHERWOOD, OR 97140

GRATTERI ANTOINETTE
20778 SW CHERRY ORCHARDS PL
SHERWOOD, OR 97140

SALMON JASON & SALMON AIDA
20786 SW CHERRY ORCHARDS PL
SHERWOOD, OR 97140

MENDNDSKAS ARTURAS
20789 SW CHERRY ORCHARDS PL
SHERWOOD, OR 97140

VILLALOBOS ELVIRA
20794 SW CHERRY ORCHARDS PL
SHERWOOD, OR 97140

DEEN JOHN & DEEN SHIRLEY
20797 SW CHERRY ORCHARDS PL
SHERWOOD, OR 97140

FANTA ETOPI
16100 SW CENTURY DR #26
SHERWOOD, OR 97140

ANGELECHIO LUCINDA
20810 SW CHERRY ORCHARDS PL
SHERWOOD, OR 97140

M & J 2021 PROPERITES LLC
17416 SW INKSTER DR
SHERWOOD, OR 97140

CHAMBERS JEFF & CHAMBERS KELLY
20818 SW CHERRY ORCHARDS PL
SHERWOOD, OR 97140

SANTESSON HEATHER
20823 SW CHERRY ORCHARDS PL
SHERWOOD, OR 97140

CSURI BERNADETT
1087 SE TAMORA AVE
HILLSBORO, OR 97123

ZENKA MARY
20839 SW CHERRY ORCHARDS PL
SHERWOOD, OR 97140

PATRICK ABRUZZINI & LIV SHELLEY
12370 SW DUCHILLY CT
PORTLAND, OR 97224

M & M316 LLC
23443 SW RICHEN PARK TER
SHERWOOD, OR 97140

GLOECKNER DAWN
20852 SW CHERRY ORCHARDS PL
SHERWOOD, OR 97140

HOOPES NINA & HOOPES PAUL
20855 SW CHERRY ORCHARDS PL
SHERWOOD, OR 97140

WYMETALEK JOHN
20860 SW CHERRY ORCHARDS PL
SHERWOOD, OR 97140

HELEN BECKER & EXCHANGE BEUTLER
3510 NW GLENRIDGE DR
CORVALLIS, OR 97330

WOOTRESS GWENNA
20876 SW CHERRY ORCHARDS PL
SHERWOOD, OR 97140

BORICA GARDENS LLC
6701 OAKWOOD PL
ARLINGTON, WA 98223

MOJICA RAMIRO & VERGARA FABIOLA
16868 SW DAFFODIL ST
SHERWOOD, OR 97140

MARTINEZ JOSHUA
16890 SW DAFFODIL ST
SHERWOOD, OR 97140

LAKE BOWMAN MHP LLC
PO BOX 264
FOX ISLAND, WA 98333

NEW WORLD INVESTMENT
8705 SW NIMBUS AVE #260
BEAVERTON, OR 97008

JAFFE SHERWOOD LLC
4931 WINCHESTER PL
NEWARK, CA 94560

JAFFE SHERWOOD LLC
4931 WINCHESTER PL
NEWARK, CA 94560

CJRW LLC
PO BOX 2092
LAKE OSWEGO, OR 97035

DD SHERWOOD ONE LLC
901 NE GLISAN ST #100
PORTLAND, OR 97232

H & C HOLDINGS LLC
PO BOX 1068
WILSONVILLE, OR 97070

SHERWOOD SENIOR
10305 SW PARK WAY #204
PORTLAND, OR 97225

HARVEY & HARVEY LIV
16895 SW EDY RD
SHERWOOD, OR 97140

HARVEY & HARVEY LIV
16895 SW EDY RD
SHERWOOD, OR 97140

PUPPO AARON & PUPPO JAY
12900 SW WATKINS AVE
PORTLAND, OR 97223

KELEV LLC
9140 SW 57TH AVE
PORTLAND, OR 97219

SLEVEKE BRADLEY
17240 SW EDY RD
SHERWOOD, OR 97140

BUI TIFFANY & BUI TINH
17290 SW EDY RD
SHERWOOD, OR 97140

ROME LORI & ROME RICHARD
17295 SW EDY RD
SHERWOOD, OR 97140

JOAN BURRIS
2917 S FENTON ST
DENVER, CO 80227

JONES BRANDI
17370 SW EDY RD
SHERWOOD, OR 97140

JORDAN KATIE & JORDAN MARSHALL
17414 SW EDY RD
SHERWOOD, OR 97140

MUTCH BRENDA & MUTCH J
21511 SW GLENCO CT
SHERWOOD, OR 97140

WILDSCHUT BECKI & WILDSCHUT COLIN
21533 SW GLENCO CT
SHERWOOD, OR 97140

FLAGLER MICHAEL & FLAGLER KRYSTLE
21538 SW GLENCO CT
SHERWOOD, OR 97140

NEIL JAHARI
21569 SW GLENCO CT
SHERWOOD, OR 97140

BOBADILLA MARIA
16719 SW GLENEAGLE DR
SHERWOOD, OR 97140

SHOOK SYDNEY
16735 SW GLENEAGLE DR
SHERWOOD, OR 97140

BROMFIELD DAMION
167748 SW GLENEAGLE DR
SHERWOOD, OR 97140

HILL RHONDA & HILL RONALD
16751 SW GLENEAGLE DR
SHERWOOD, OR 97140

HAYS ROBERT & HAYS SABRINA
16763 SW GLENEAGLE DR
SHERWOOD, OR 97140

LAGOS DAVID
16810 SW GLENEAGLE DR #31
SHERWOOD, OR 97140

WHEELER DANIELLE
16810 SW GLENEAGLE DR #32E
SHERWOOD, OR 97140

DENSEM R & V TRUST
16810 SW GLENEAGLE DR #33
SHERWOOD, OR 97140

TANKERSLEY KRISTEN
16810 SW GLENEAGLE DR #34
SHERWOOD, OR 97140

KOFFEL CHRISTINA
16810 SW GLENEAGLE DR #35E
SHERWOOD, OR 97140

SORENSEN BRADFORD
16810 SW GLENEAGLE DR #36E
SHERWOOD, OR 97140

DEGROOT LARRY
425 ENA RD #504A
HONOLULU, HI 96815

DEGROOT LARRY
425 ENA RD #504A
HONOLULU, HI 96815

DEGROOT LARRY
425 ENA RD #504A
HONOLULU, HI 96815

DEGROOT LARRY & WELLS WENDY
24895 SW OBERST RD
SHERWOOD, OR 97140

ROS DANNY
16830 SW GLENEAGLE DR #21C
SHERWOOD, OR 97140

MARIN CARLOS & MARIN THUY
11981 SW SURREY ST
WILSONVILLE, OR 97070

DEGROOT LARRY
425 ENA RD #504A
HONOLULU, HI 96815

CHARLES ROBERT
16830 SW GLENEAGLE DR #24C
SHERWOOD, OR 97140

LAROCCA CLAIRE
16830 SW GLENEAGLE DR #26C
SHERWOOD, OR 97140

YUN SOO & YUN SU
16840 SW GLENEAGLE DR #A-1
SHERWOOD, OR 97140

LUCAS DIANNA & LUCAS LLOYD
178 WINEMA WAY
MEDFORD, OR 97501

CUNNINGHAM CHRISTINA & PELETT DANIEL
16840 SW GLENEAGLE DR #A3
SHERWOOD, OR 97140

DREW BRIAN & DREW NANCY
16840 SW GLENEAGLE DR #4
SHERWOOD, OR 97140

ARNOLD STACEY
16840 SW GLENEAGLE DR
SHERWOOD, OR 97140

SVENSON BETH & SVENSON MICHAEL
16840 SW GLENEAGLE DR #7A
SHERWOOD, OR 97140

JOHNSON TRACIE
16840 SW GLENEAGLE DR #8A
SHERWOOD, OR 97140

SNIEGOWSKI JUSTIN
16850 SW GLENEAGLE DR #B11
SHERWOOD, OR 97140

LEWIS BUNNY
16850 SW GLENEAGLE DR #12B
SHERWOOD, OR 97140

EVANS CHARLES & EVANS CHIE
16850 SW GLENEAGLE DR #B13
SHERWOOD, OR 97140

RODIN STEVEN & BEAN MARY
16850 SW GLENEAGLE DR #14B
SHERWOOD, OR 97140

GARCIA LUIS
26181 S BARLOW RD #15
CANBY, OR 97013

HARRINGTON ALEXANDRA & HARRINGTON ASHBY
16850 SW GLENEAGLE DR #16
SHERWOOD, OR 97140

MAEFAU DINO
16850 SW GLENEAGLE DR #17
SHERWOOD, OR 97140

TAVERA RAMON
16850 SW GLENEAGLE DR #B18
SHERWOOD, OR 97140

HUNTLEY REBEKAH & SEELEY GINA
16850 SW GLENEAGLE DR #19
SHERWOOD, OR 97140

CREDIT SHELTER TRUST
15480 NE CUNNINGHAM LN
GASTON, OR 97119

LAIRD LINDA & LAIRD ROBERT
17105 SW HOUSTON CT
SHERWOOD, OR 97140

BEED LINDA
17115 SW HOUSTON CT
SHERWOOD, OR 97140

PHAM CASSANDRA & PHAM TONY
17125 SW HOUSTON CT
SHERWOOD, OR 97140

ARMSTRONG LIGE & ARMSTRONG LISA
17135 SW HOUSTON CT
SHERWOOD, OR 97140

MATOUK SAMYA
17145 SW HOUSTON CT
SHERWOOD, OR 97140

DIERS DEBORAH
20720 SW HOUSTON DR
SHERWOOD, OR 97140

BAMFORTH BROOKS & BAMFORTH TAMI
20730 SW HOUSTON DR
SHERWOOD, OR 97140

MAGNUSON DEBRA & MAGNUSON NORMAN
2745 DELTA OAKS DR
EUGENE, OR 97408

SCHACHER ANDREA
9931 NE 134TH CT
KIRKLAND, WA 98034

ARMITAGE KARIE
20745 SW HOUSTON DR
SHERWOOD, OR 97140

HIMMEL BOBBI
20750 SW HOUSTON DR
SHERWOOD, OR 97140

NEWMAN MICHAEL
20760 SW HOUSTON DR
SHERWOOD, OR 97140

MASANQUE LAVERNE & MASANQUE RENEE
20775 SW HOUSTON DR
SHERWOOD, OR 97140

EDWARDS GEOFFREY & EDWARDS CYNTHIA
20780 SW HOUSTON DR
SHERWOOD, OR 97140

GARY RICHARD RIDDLE & GARY RIDDLE
20785 SW HOUSTON DR
SHERWOOD, OR 97140

GEORGE LAWRENCE
PO BOX 567
DONALD, OR 97020

PEACOCK TERRENCE
20795 SW HOUSTON DR
SHERWOOD, OR 97140

WYNKOOP NICHOLAS & WYNKOOP CRYSTAL
20800 SW HOUSTON DR
SHERWOOD, OR 97140

ROBERTS JEFFERY
20805 SW HOUSTON DR
SHERWOOD, OR 97140

PHAM DUNG & PHAM HEA
21010 SW HOUSTON DR
SHERWOOD, OR 97140

DUONG HUYEN & VANTRAN SANG
21032 SW HOUSTON DR
SHERWOOD, OR 97140

SMITH BRIAN & SMITH MELISSA
21037 SW HOUSTON DR
SHERWOOD, OR 97140

STEWART CHARITY & STEWART SCHEARON
21054 SW HOUSTON DR
SHERWOOD, OR 97140

ADAMS RACHELLE & ADAMS TRAVIS
21076 SW HOUSTON DR
SHERWOOD, OR 97140

BASSFORD THOMAS & LEEPER KENDALL
21122 SW HOUSTON DR
SHERWOOD, OR 97140

ANDERSON JOANNA & ANDERSON TONY
21131 SW HOUSTON DR
SHERWOOD, OR 97140

MITCHENKOV ALEXANDRE & MITCHENKOV NINA
14202 SE 120TH PL
CLACKAMAS, OR 97015

NEWMYER MARK & NEWMYER MELISSA
21145 SW HOUSTON DR
SHERWOOD, OR 97140

MCCLELLAN BOBBI & MCCLELLAN ERIN
21156 SW HOUSTON DR
SHERWOOD, OR 97140

TUREK NANCY
21163 SW HOUSTON DR
SHERWOOD, OR 97140

REISMAN DEBORAH & REISMAN FAMILY REVOCABLE TRUST
21174 SW HOUSTON DR
SHERWOOD, OR 97140

BOHN PATRICIA
21181 SW HOUSTON DR
SHERWOOD, OR 97140

MYERS BRET & MYERS MAURI
21192 SW HOUSTON DR
SHERWOOD, OR 97140

MONLUX & SHARON MONLUX FAMILY
21199 SW HOUSTON DR
SHERWOOD, OR 97140

HINKLEY MORGAN & HINKLEY SEAN
21217 SW HOUSTON DR
SHERWOOD, OR 97140

ZIGLER STEVEN & ZIGLER TAMARA
21228 SW HOUSTON DR
SHERWOOD, OR 97140

BEBB BRUCE & BEBB MARDA
21233 SW HOUSTON DR
SHERWOOD, OR 97140

OLESEN MEGANNE & OLESON ERIC
21236 SW HOUSTON DR
SHERWOOD, OR 97140

WALDO MATTHEW & WALDO RACQUEL
21241 SW HOUSTON DR
SHERWOOD, OR 97140

BELYAEV ALEXANDER & SHNITKO TATIANA
21249 SW HOUSTON DR
SHERWOOD, OR 97140

MITCHELL CHERYL & MITCHELL WILLIAM
20764 SW JONQUIL TER
SHERWOOD, OR 97140

WARNER MARGE
20781 SW JONQUIL TER
SHERWOOD, OR 97140

RUBA DENNIS
20786 SW JONQUIL TER
SHERWOOD, OR 97140

WK BELDEN INVESTMENTS LLC
16385 SW LANGER DR
SHERWOOD, OR 97140

CHEVRON USA INC
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HOUSTON, TX 77001

CHEVRON USA INC
PO BOX 285
HOUSTON, TX 77001

NGUYEN NGOC & VU NGOC
1345 SW 19TH DR
GRESHAM, OR 97080

HAVERKAMP CHRISTINA
20781 SW LAVENDER AVE
SHERWOOD, OR 97140

GORDILLO MIGUEL & GORDILLO SARA
21061 SW MADEIRA TER
SHERWOOD, OR 97140

MILLER DANIEL & FEARS JODY
21069 SW MADEIRA TER
SHERWOOD, OR 97140

CHACAJ-SOLIS KATHLEEN
21077 SW MADEIRA TER
SHERWOOD, OR 97140

LONG RYAN
21085 SW MADEIRA TER
SHERWOOD, OR 97140

LIU YANG & TANG QI
21097 SW MADEIRA TER
SHERWOOD, OR 97140

RYAN WILLIAM & RYAN DEBRA
PO BOX 190
SHERWOOD, OR 97140

PAYNE DEBORAH & PAYNE MATTHEW
21111 SW MADEIRA TER
SHERWOOD, OR 97140

PATAROQUE PAM
2304 OSWEGO GLEN CT
LAKE OSWEGO, OR 97034

SHARON & SHARON CAMPER
21135 SW MADEIRA TER
SHERWOOD, OR 97140

KLIEVER TERRI
21147 SW MADEIRA TER
SHERWOOD, OR 97140

DONALD MCCARTY
16798 SW STELLAR DR
SHERWOOD, OR 97140

DONALD MCCARTY
16798 SW STELLAR DR
SHERWOOD, OR 97140

MADIERA HOA
21174 SW MADEIRA TER
SHERWOOD, OR 97140

HOFMEISTER LINDA
21183 SW MADEIRA TER
SHERWOOD, OR 97140

BELLES DORCAS & BELLES RAYMOND
21195 SW MADEIRA TER
SHERWOOD, OR 97140

JOYCE CARTER
21196 SW MADEIRA TER
SHERWOOD, OR 97140

LUMBER BETHANY & MINDY
17154 SW WISTERIA PL
SHERWOOD, OR 97140

LUGO BONIFACIO & NAVA MILDRED
21219 SW MADEIRA TER
SHERWOOD, OR 97140

MADIERA HOA
21220 SW MADEIRA TER
SHERWOOD, OR 97140

MOTTA JENSEN MARIA & JENSEN CHRISTOPHER
21227 SW MADEIRA TER
SHERWOOD, OR 97140

MADIERA HOA
21230 SW MADEIRA TER
SHERWOOD, OR 97140

TABBAL NICOLE
21235 SW MADEIRA TER
SHERWOOD, OR 97140

BATES LINDA
21243 SW MADEIRA TER
SHERWOOD, OR 97140

MCCARTHY DEBRA
21251 SW MADEIRA TER
SHERWOOD, OR 97140

MARTINEZ RODOLFO & VILLALOBOS MIRNA
21259 SW MADEIRA TER
SHERWOOD, OR 97140

BURGESS HANNAH & WHITELY CONNOR
12070 SW FISCHER RD #E303
PORTLAND, OR 97224

DRUMMOND COLIN & DRUMMOND NANCY
21275 SW MADEIRA TER
SHERWOOD, OR 97140

AMSTAD ALOIS & JENSEN THERESA
14420 SW 114TH AVE
PORTLAND, OR 97224

CHERYL SCOTT
21291 SW MADEIRA TER
SHERWOOD, OR 97140

BECKER KATHLEEN
21301 SW MADEIRA TER
SHERWOOD, OR 97140

MEDEIROS-WHEELER KELLY & WHEELER JOHN
21311 SW MADEIRA TER
SHERWOOD, OR 97140

WOLFE JENNIFER
21321 SW MADEIRA TER
SHERWOOD, OR 97140

LEWALLEN ERIN
21331 SW MADEIRA TER
SHERWOOD, OR 97140

DERRY SEAN & JOHNSON RENEE
21341 SW MADEIRA TER
SHERWOOD, OR 97140

COMISKEY JEREMY
21351 SW MADEIRA TER
SHERWOOD, OR 97140

ZINDLE MELISSA
21361 SW MADEIRA TER
SHERWOOD, OR 97140

MCNABB LINDA
21381 SW MADEIRA TER
SHERWOOD, OR 97140

SHERWOOD CITY OF
22560 SW PINE ST
SHERWOOD, OR 97140

SHERWOOD CITY OF
22560 SW PINE ST
SHERWOOD, OR 97140

JAUREGUIZAR ALEJO
20763 SW NETTLE PL
SHERWOOD, OR 97140

DUVALL PAMELA
20768 SW NETTLE PL
SHERWOOD, OR 97140

CRAMER BREANNA & HANDLEY JEFFREY
20787 SW NETTLE PL
SHERWOOD, OR 97140

STELLAR SHERYL
17755 SW 131ST AVE
PORTLAND, OR 97224

OREGON STATE OF DEPT OF TRANSPORTATION
9200 SE LAWNFIELD RD #3
CLACKAMAS, OR 97015

CHERRY WOODS CONDO OWNERS OF ALL UNITS
NS #NS #NS
SHERWOOD, OR

CHERRY WOODS CONDO OWNERS OF ALL UNITS
NS #NS #NS
SHERWOOD, OR

CHERRY WOODS CONDO OWNERS OF ALL UNITS
NS #NS #NS
SHERWOOD, OR

ARLEEN HARVEY & ARLEEN HARVEY FAMILY LLC
16895 SW EDY RD
SHERWOOD, OR 97140

CEDAR CREEK PARK NO2 OWNERS OF LOTS 49-50
NS #NS #NS
SHERWOOD, OR

WK BELDEN INVESTMENTS LLC
16385 SW LANGER DR
SHERWOOD, OR 97140

CLAUS ROBERT & CLAUS SUSAN
22211 SW PACIFIC HWY
SHERWOOD, OR 97140

SHERWOOD CITY OF
22560 SW PINE ST
SHERWOOD, OR 97140

EDY VILLAGE OWNERS OF LOTS 14-17
NS #NS #NS
SHERWOOD, OR

SHERWOOD CITY OF
22560 SW PINE ST
SHERWOOD, OR 97140

MADIERA HOA
NS #NS #NS
SHERWOOD, OR

MADIERA HOA
NS #NS #NS
SHERWOOD, OR

MADIERA HOA
NS #NS #NS
SHERWOOD, OR

SHERWOOD CITY OF
22560 SW PINE ST
SHERWOOD, OR 97140

SHERWOOD CITY OF
22560 SW PINE ST
SHERWOOD, OR 97140

GLENEAGLE VILLAGE CONDO UNIT OWNERS
NS #NS #NS
SHERWOOD, OR

ABRAMS LLOYD
907 CAMINO SANTANDER
SANTA FE, NM 87505

DVA MEDICAL LLC
3130 NE ALAMEDA TER
PORTLAND, OR 97212

ABRAMS LLOYD
907 CAMINO SANTANDER
SANTA FE, NM 87505

BERKE PAW GROUP APC
22287 MULHOLLAND HWY #550
CALABASAS, CA 91302

CHEVRON USA INC
PO BOX 285
HOUSTON, TX 77001

SILVER SKY DEVELOPMENT LLC
484 S 9TH ST
SAINT HELENS, OR 97051

DOCKTER BRYAN & DOCKTER CHANTELLE
11081 SW PATWIN CT
TUALATIN, OR 97062

FREY-FRANKENFELD JAMIE
16987 SW RED LEAF PL
SHERWOOD, OR 97140

CHRISTY HEATHER & SELLERS DAVID
16999 SW RED LEAF PL
SHERWOOD, OR 97140

NIX CINDY & RIS AMY
17008 SW RED LEAF PL
SHERWOOD, OR 97140

PHILLIPS ROSA & PHILLIPS RYAN
17011 SW RED LEAF PL
SHERWOOD, OR 97140

MURPHY CHRISTOPHER
17020 SW RED LEAF PL
SHERWOOD, OR 97140

EAGLE CORBIN & EAGLE KELSEY
17042 SW RED LEAF PL
SHERWOOD, OR 97140

MADIERA HOA
17045 SW RED LEAF PL
SHERWOOD, OR 97140

MIDGLEY ANITA
17102 SW ROBINWOOD PL
SHERWOOD, OR 97140

LIGHT JULIA & LIGHT MARK
17117 SW ROBINWOOD PL
SHERWOOD, OR 97140

HELEN & DAVID BECKER
3510 NW GLENRIDGE DR
CORVALLIS, OR 97330

ORTUNO FELIZA & ORTUNO MARTIN
17129 SW ROBINWOOD PL
SHERWOOD, OR 97140

TRAINOR SANDRA
11850 SW MALLOY WAY
SHERWOOD, OR 97140

JOAN A HEROLD & JOAN HEROLD
17355 BOONES FERRY RD #A
LAKE OSWEGO, OR 97035

DICKERSON ANNABEL & DICKERSON PAUL
17142 SW ROBINWOOD PL
SHERWOOD, OR 97140

SHERWOOD CITY OF
22560 SW PINE ST
SHERWOOD, OR 97140

BLAKE & WADE BLAKE
21288 SW ROELLICH AVE
SHERWOOD, OR 97140

RUGER DAVID
21294 SW ROELLICH AVE
SHERWOOD, OR 97140

DUBE DENNIS & DUBE SUSANNA
21306 SW ROELLICH AVE
SHERWOOD, OR 97140

CHEN WAN-HSING & HO YUN
21312 SW ROELLICH AVE
SHERWOOD, OR 97140

SHERWOOD CITY OF
22560 SW PINE ST
SHERWOOD, OR 97140

HANLON TINA & HANLON TY
21330 SW ROELLICH AVE
SHERWOOD, OR 97140

CLEVELAND LEAH & CLEVELAND ROBERT
21342 SW ROELLICH AVE
SHERWOOD, OR 97140

FLOSI JOSHUA & FLOSI LAURA
17540 MESNARD ST #112
LAKE OSWEGO, OR 97034

JONES BRUCE & JONES NORA
21360 SW ROELLICH AVE
SHERWOOD, OR 97140

CARR JACQUELINE & LOWRY TODD
21366 SW ROELLICH AVE
SHERWOOD, OR 97140

ABRAHAM WENDY
21372 SW ROELLICH AVE
SHERWOOD, OR 97140

GLPJ LLC
59759 W KAPPLER RD
SAINT HELENS, OR 97051

DOUBLE K VENTURES INC
8255 SW HUNZIKER RD #101
PORTLAND, OR 97223

BOHANON BEN & WALKER EMILY
17168 SW SPRATLIN LN
SHERWOOD, OR 97140

RYCHLICK JENNIFER
17172 SW SPRATLIN LN
SHERWOOD, OR 97140

DROST KERRY
PO BOX 251
SHERWOOD, OR 97140

KELEV LLC
9140 SW 57TH AVE
PORTLAND, OR 97219

CLARK TERI
17203 SW TERRAPIN DR
SHERWOOD, OR 97140

SZLUKIER CAROLINE & SZLUKIER MARK
17206 SW TERRAPIN DR
SHERWOOD, OR 97140

SILVA FRANK & SILVA CINDY
17214 SW TERRAPIN DR
SHERWOOD, OR 97140

MORGAN JON & HINOVEANU MARIA
142 SW HAWTHORNE CT
DUNDEE, OR 97115

FLACH GRAIG & IRION FLACH LAURA
17227 SW TERRAPIN DR
SHERWOOD, OR 97140

TORRES GEORGE & TORRES JENNIFER
17235 SW TERRAPIN DR
SHERWOOD, OR 97140

TENNY & HELEN CHAN FAMILY
17243 SW TERRAPIN DR
SHERWOOD, OR 97140

GRIMM TRENTON & GRIMM LUNETTA
17251 SW TERRAPIN DR
SHERWOOD, OR 97140

SEWARD DAVID & SEWARD ERICA
17263 SW TERRAPIN DR
SHERWOOD, OR 97140

DUNLAP MARY
17465 SW WAPATO ST
SHERWOOD, OR 97140

TUCKER LISA
17142 SW WISTERIA PL
SHERWOOD, OR 97140

RACKLIFFE DAVID & RACKLIFFE JENNIFER
17153 SW WISTERIA PL
SHERWOOD, OR 97140

SABROE JENNIFER
17154 SW WISTERIA PL
SHERWOOD, OR 97140

CRUZ DONALDO & HERNANDEZ LUZ
17165 SW WISTERIA PL
SHERWOOD, OR 97140

FURNESS CHERRI
10216 SW KICKAPOO CT
TUALATIN, OR 97062

EXHIBIT K

Stormwater Report

Preliminary Drainage Report

Cedar Creek Lot 2

2322.14505.01

Prepared for

DD Sherwood One, LLC

901 NE Glisan Street, Suite 100

Portland, OR 97232

Prepared for	DD Sherwood One, LLC
Project Name	Cedar Creek Lot 2
Job Number	2322.14505.01
Date	January 13, 2023

DOWL
309 SW 6th Avenue, Suite 700
Portland, OR 97204
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Name	Title	Date	Revision	Reviewer
Greg Wadzinski	Civil Designer	01/13/23	1	Mike Towle

Executive Summary

The proposed commercial development is located near the corner of Edy Road and Pacific Highway 99W in the City of Sherwood, Oregon (See Figure 1-1, Vicinity Map) and is identified as Lot 2 of the Cedar Creek Plaza development. The development will include construction of two retail buildings, associated parking, utilities, sidewalk connections and landscaping. The project is approximately 1.7 acres and will be completed in one phase.

The proposed storm design will meet the requirements of both the City of Sherwood as listed in the *Engineering Design and Standard Detail Manual* dated August 2022 Clean Water Services as listed in the *Design and Construction Standards for Sanitary Sewer and Surface Water Management* issued in December 2019. The proposed private and public conveyance system will be designed using the 25-year storm event in the final Drainage Report.

Onsite water quality treatment will occur through a proposed BayFilter manhole. Detention will be provided onsite within an underground StormTech Chamber system. The detention system was designed to limit the 2, 10 and 25-year storms to existing conditions per the CWS hydromodification standards. This is less than the flow rate in existing conditions and results in a decrease in flow for all storm events.

Downstream analysis and improvements were addressed in the previous phases of the Cedar Creek Plaza development; therefore, no downstream analysis is required.

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Tables

Figures

1 Project Overview

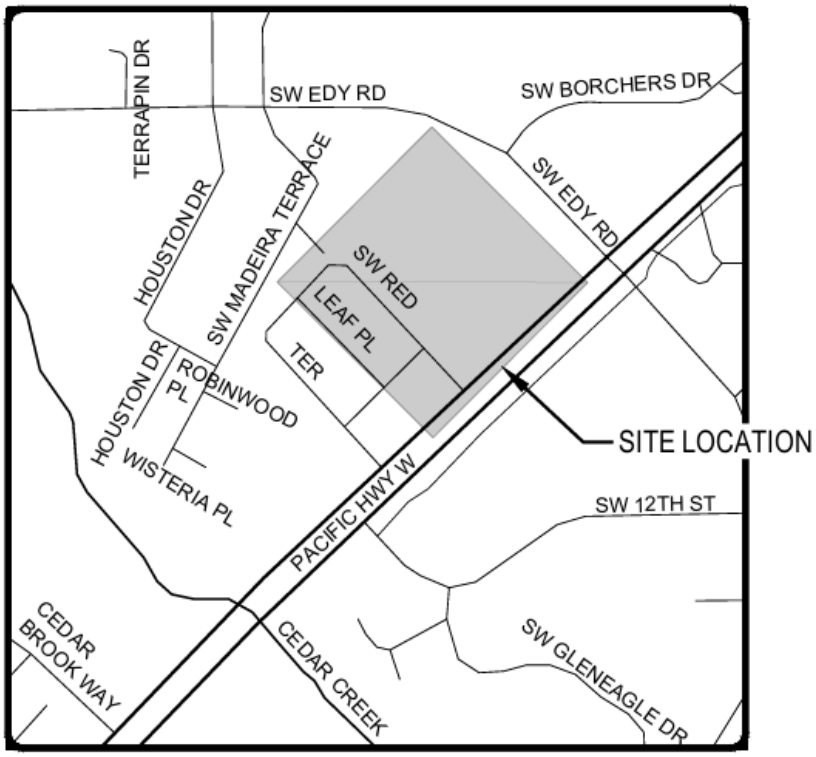
1.1 Project Overview

The proposed development will include construction of two retail buildings, associated parking, utilities, sidewalk connections and landscaping on "Lot 2" of the Cedar Creek Plaza development. All frontage improvements were installed in previous Cedar Creek Plaza development phases.

1.2 Location

The project is located at 16814 SW Edy Road, Sherwood, Oregon (See Figure 1-1, Vicinity Map).

Figure 1-1 Vicinity Map



1.3 Methodology

The proposed storm design will meet the requirements of both the City of Sherwood as listed in the *Engineering Design and Standard Detail Manual* dated August 2022 and Clean Water Services as listed in the *Design and Construction Standards for Sanitary Sewer and Surface Water Management* issued in December 2019.

1.4 Hydromodification

The proposed project must meet the hydromodification requirements set forth by Clean Water Services Design and Construction Standards Section 4.03. A hydromodification assessment shows the site is in Category 2 based on the following characteristics:

Development Class: Developed
Risk Level: Moderate
Project Size: Medium

Projects in Category 2 represent those with a moderate anticipated risk. The proposed storm system will be designed to follow Section 4.03.5(b)3, which requires Peak-Flow Matching Detention to address the hydromodification requirement.

2 Existing Conditions

2.1 Topography

The existing Cedar Creek Plaza Lot 2 site is undeveloped and contains several gravel stock piles. The lot is mostly flat at the north corner and general slopes southwest at the south corner, with gradual slopes between 1 and 3%. The highest elevation of 201 is located in the north property corner, and the lowest elevation of 195 is located in the southwestern property corner.

2.2 Climate

The site is in Sherwood, Oregon and is located approximately 50 miles inland from the Pacific Ocean. There is a gradual change in seasons with defined seasonal characteristics. Average daily temperatures range from 34°F to 80°F. Record temperatures recorded for this region of the state are 0°F and 106°F. Average annual rainfall recorded in this area is 41-inches. Average annual snowfall is approximately 1-inches.

2.3 Site Geology

The underlying soil types on the site, as classified by the United States Department of Agriculture Soil Survey of Washington County, Oregon are identified in Table 2-1 (See Technical Appendix: Hydrologic Soils Map - Washington County).

Table 2-1 Soil Characteristics

Soil Type	Hydrologic Group
Hillsboro loam	B

2.4 Curve Number

The curve number represents runoff potential from the soil. The major factors for determining the curve number values are hydrologic soil group, cover type, treatment, hydrologic condition and antecedent runoff condition. The pervious curve number of 79 representing Open Space in Poor Condition and an impervious curve number of 98 representing pavement and roofs was used for the existing site (See Technical Appendix: Table 2-2a – Technical Release 55-Urban Hydrology for Small Watersheds).

2.5 Time of Concentration

The time of concentration (T_C) as described in NEH-4 Chapter 15 is defined in two ways; the time for runoff to travel from the furthermost point of the watershed to the point in question, and the time from the end of excess rainfall to the point of inflection on the trailing limb of the unit hydrograph. Time of concentration can be estimated from several formulas. Clean Water Services guidelines which are based on the NRCS method were used in this analysis. The site is currently undeveloped and was assumed to have a T_C of 15 minutes.

2.6 Hydrology

The existing site is delineated into two watersheds: DA-1 and DA-2.

DA-1 is comprised of 1.49 acres on the east of the site. Stormwater runoff is collected within a series of "Lynch-style" trapped stormwater catch basins and is then conveyed east to the storm conveyance system designed with the previous phase of the Cedar Creek development. This runoff is treated via a treatment manhole with an 18" Perk Filter cartridge, and is detained in an underground detention chamber system designed in the previous phase.

DA-2 is comprised of 0.23 acres on the northwest portion of the site. Stormwater runoff sheet flows west where it is collected in catch basins installed in the previous phase of the Cedar Creek development. This runoff is treated in a treatment manhole with (3) 18" Perk Filter cartirdges, and is detained in the same underground detention chamber system as DA-1.

(See Technical Appendix: Retail Storm Report by Mackenzie for more information on existing hydrology.)

2.7 Basin Area

Existing impervious and pervious surface areas for DA-1 and DA-2 are shown below in Table 2-2. (See Technical Appendix: Figure 1 – Existing Basin Delineation).

Table 2-2 Existing Basin Areas

Watershed	Pervious Area (AC)	Impervious Area (AC)	Total Area (AC)
DA-1	1.32 (88.6%)	0.17 (11.4%)	1.49 (100%)
DA-2	0.21 (91.3%)	0.02 (8.7%)	0.23 (100%)

3 Proposed Conditions

3.1 Curve Number

The pervious curve number of 61 representing Open Space in Good Condition and an impervious curve number of 98 representing pavement and roofs was used for the proposed site (See Technical Appendix: Table 2-2a – Technical Release 55-Urban Hydrology for Small Watersheds).

3.2 Time of Concentration

A time of concentration of 5 minutes was used for the proposed basin.

3.3 Hydrology

The proposed site is delineated into two watersheds that exactly correspond to the existing conditions watersheds (DA-1 and DA-2).

DA-1 is comprised of 1.49 acres, which includes the majority of the proposed site including the proposed building and parking area. Runoff from this area is routed to on-site catch basins, which is then routed to a BayFilter manhole for treatment, and an underground chamber detention system for detention. The treated and detained runoff will exit the site the same as the existing conditions, where it is routed to the storm conveyance system installed with the previous phase of the Cedar Creek development.

DA-2 is comprised of 0.23 acres, which includes a small portion of the proposed parking lot that sheet flows west and is collected in catch basins installed with the previous phase of the Cedar Creek

development, the same as the existing conditions. Since this area is already treated and detained with the previous phase, it is not analyzed in this analysis. See Section 3.5 below for more information.

3.4 Basin Area

Proposed impervious and pervious surface areas for DA-1 and DA-2 are shown below in Table 3-1.

(See Technical Appendix: Figure 2 – Proposed Basin Delineation).

Table 3-1 Proposed Basin Areas

Watershed	Pervious Area (AC)	Impervious Area (AC)	Total Area (AC)
DA-1	0.23 (15.4%)	1.26 (84.6%)	1.49 (100%)
DA-2	0.04 (17.4%)	0.19 (82.6%)	0.23 (100%)

3.5 Cedar Creek Plaza Stormwater Design

The existing site was included in the original stormwater design for the Cedar Creek Plaza previously permitted. The design included treatment and detention for the entirety of the undeveloped site. The treatment for Lot 2 included filter treatment manholes which accounted for 75,354 sf of area including 14,134 sf of impervious area. This area was also accounted for in the detention analysis for Lot 2.

Most of the proposed Lot 2 site is being treated and detained on-site (DA-1). The proposed runoff rates from DA-1 are less than the existing rates from this same area. Additionally, the portion of the site that is not treated and detained (DA-2) is less than the total area and impervious area that was accounted for in the previous phase. DA-2 is proposed to be comprised of 8,250 sf of impervious area and 10,085 sf of total area, which is less than the 14,134 sf of impervious area and 75,354 sf of total area analyzed in the previous phase. Therefore, no analysis of DA-2 was performed since that area is accounted for previously.

4 Hydrologic and Hydraulic Analysis

4.1 Design Guidelines

The analysis and design criteria used for stormwater management described in this section will follow the Clean Water Services *Design and Construction Standards for Sanitary Sewer and Surface Water Management* issued December 2019. Section 5.04.2 describes the allowable flow determination methods including the selected TR-55 NRCS method.

4.2 Hydrologic Method

The Santa Barbara Urban Hydrograph (SBUH) method was used for this analysis. The SBUH method is based on the curve number (CN) approach and uses the Natural Resource Conservation Service's (NRCS) equations for computing soil absorption and precipitation excess. The SBUH method converts the incremental runoff depths into instantaneous hydrographs, which are then routed through an imaginary reservoir with a time delay equal to the basin time of concentration.

The XPSWMM software version 18.1 was used for the hydrology and hydraulics analysis. The runoff function of XPSWMM generates surface and subsurface runoff based on design or measured rainfall conditions, land use and topography.

The XPSWMM software is based on the public EPA SWMM program and is an approved method of analysis by Clean Water Services per Section 5.04.2(b)4.

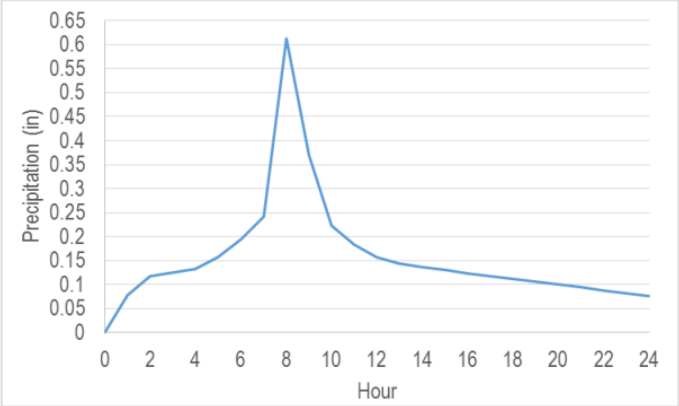
4.3 Design Storm

The rainfall distribution to be used within the Clean Water Services jurisdiction is the design storm of 24-hour duration based on the standard Type 1A rainfall distribution. Table 4-1 shows total precipitation depths for different storm events. The CWS Design Storm Distribution for a type 1A 24-hour rainfall distribution for a 25-year storm event is shown in Figure 4-1.

Table 4-1 Precipitation Depth

Recurrence Interval (years)	Total Precipitation Depth (in)
2	2.500
10	3.450
25	3.900
100	4.500

Figure 4-1 25-Year Clean Water Services Type 1A Rainfall Ditribution



4.4 Basin Runoff

Table 4-2 lists the runoff rates for existing and proposed conditions for the site during the 2, 10, and 25-year storm events. See Technical Appendix: XPSWMM Results).

Table 4-2 Runoff Rates

Storm Event	Existing (cfs)	Proposed (cfs)
2-year	0.221	0.110 (50%)
10-year	0.421	0.330
25-year	0.523	0.522

5 Conveyance Analysis

5.1 Design Guidelines

The analysis and design criteria described in this section will follow the Clean Water Services as listed in the Design and Construction Standards for Sanitary Sewer and Surface Water Management, December 2019. The manual requires storm drainage system and facilities be designed to convey the 25-year storm event with at least one foot of freeboard within the system.

5.2 System Capacity

The proposed conveyance system is designed to convey and contain the peak runoff from a 25-year design storm. The proposed conveyance system will have sufficient capacity to handle all storm events up to and including the 100-year storm event.

5.3 System Performance

The conveyance capacity analysis found that the proposed conveyance system can adequately convey the 10- and 25-year storm events. A minimum of one foot of freeboard is maintained within the system. Full conveyance analysis calculations will be provided in the final drainage report.

6 Water Quality

6.1 Design Guidelines

The proposed water quality facility was designed per Clean Water Services standards. The proposed facilities were designed using a rainfall depth of 0.36" over a 4-hour period with a return period of 96-hours as outlined in section 4.05.06 of *the Design and Construction Standards for Sanitary Sewer and Surface Water Management*.

6.2 Water Quality Facility

Per Section 4.05.5 of the Clean Water Services design manual, all created impervious area will be treated. Per Section 4.05.6 of the Clean Water Services design manual, the water quality volume and flow rate are calculated according to the equations below:

$$\text{Water Quality Volume (cf)} = \frac{0.36\text{ (in)} \times \text{Area (sf)}}{12\text{ (in/ft)}} \qquad \text{Water Quality Flow} = \frac{\text{WQV (cf)}}{14{,}400}$$

Onsite

Proposed watershed DA-1 is proposed to be treated for water quality. The entirety of the watershed will be collected and treated; therefore, treatment will be provided for all impervious area of the watershed. Proposed watershed DA-2 is already treated within the previous phase of the Cedar Creek development (See Section 3.5 above for more information.).

ADS BayFilter is the selected water quality facility. Each BayFilter system will have the standard cartridge size (BayFilter 530) with a 30-inch drop and have a treatment capacity of 0.067 cfs.

- Site Impervious Area = 55,010 sq.-ft
- Water Quality Flow = 0.11 cfs
- # of Cartridges = 2 Cartridge(s) (0.13 cfs treatment capacity)

Offsite Improvements

No offsite improvements are required for this development.

7 Water Quantity

7.1 Design Guidelines

The water quantity facility was designed in accordance with Section 4.03.4 of the Clean Water Services as listed in the *Design and Construction Standards for Sanitary Sewer and Surface Water Management* issued in December 2019. The detention and hydromodification requirements per CWS require the post-developed runoff rates from the site do not exceed the existing runoff rates as listed in Section 4.08.6(c) and as shown in Table 7-1 below.

Table 7-1 Required Release Rates

Post-Development Peak Runoff Rate	Pre-Development Peak Runoff Rate Target
2-year, 24-hour	50% of 2-year, 24-hour
5-year, 24-hour	5-year, 24 hour
10-year, 24-hour	10-year, 24-hour

7.2 Water Quantity Facility

Table 7-2 lists the existing and proposed design release flow rates generated for the site. In all cases, the design release rates are less than the allowable release rates calculated for this site.

Table 7-2 Existing and Proposed Release Rates

Storm Event	Existing (cfs)	Proposed (cfs)
2-year	0.221	0.110 (50%)
10-year	0.421	0.330
25-year	0.523	0.522

The proposed control structure is a 60-inch manhole with a standpipe. The bottom orifice was designed to control the 2-year storm, side orifice for the 10-year storm and the top weir (top of standpipe) is used as an overflow weir for large storm events (the 25-year storm does not reach the top of standpipe). See Table 7-3 below for control structure information.

Table 7-3 Control Structure

Orifice	Size	Elevation
Bottom Orifice	1 inch	188.50
Side Orifice	3 inches	193.42
Overflow Weir (Top of Standpipe)	12 inches	194.58

StormTech chambers will be used as the onsite underground detention system. The MC-4500 chamber system was designed as a 60-inch arched pipe with 12 inches of stone above and below the chambers. The system contains two rows and 26 chambers. This provides approximately 5,212 cu-ft of storage. (See Technical Appendix: StormTech Chamber System for more information.)

8 Downstream Analysis

8.1 Design Guidelines

The previous phases of the Cedar Creek development assumed 85% impervious surface on Lot 2 for their downstream analysis design. (See the Technical Appendix: Retail Storm Report by Mackenzie for more information.) The proposed Lot 2 development does not increase the amount of impervious area at the site (84.6%), therefore a downstream analysis is not required.

9 Summary

The proposed storm design will meet the requirements of both the City of Sherwood as listed in the *Engineering Design and Standard Detail Manual* dated August 2022 and Clean Water Services as listed in the *Design and Construction Standards for Sanitary Sewer and Surface Water Management* issued in December 2019.

The proposed treatment system includes a BayFilter Manhole and detention will be provided within a StormTech Chamber system. The proposed storm conveyance system will be designed using the 25-year storm event.

Technical Appendix

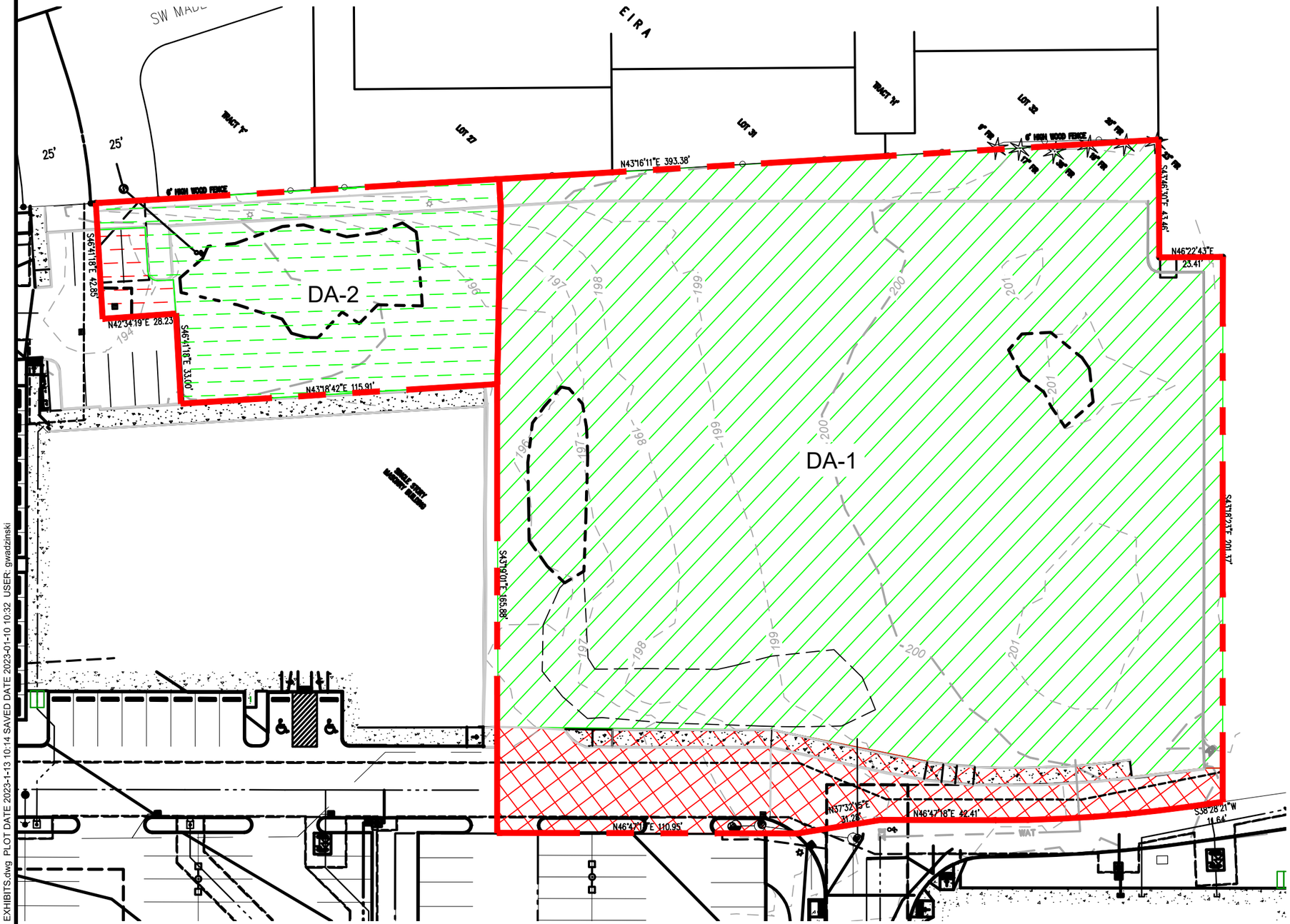
Technical Appendix

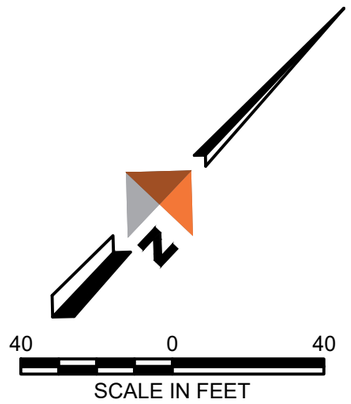
- Figure 1 – Existing Basin Delineation
- Figure 2 – Proposed Basin Delineation

- Hydrologic Soil Map – Washington County
- Table 2-2a – Runoff Curve Numbers for Urban Areas
- XPSWMM Results
- Stormtech Chamber System
- Retail Storm Report by Mackenzie dated 11/02/2017

EXISTING CONDITIONS

- DA-1: EXISTING PERVIOUS AREA (1.32 AC)
- DA-1: EXISTING IMPERVIOUS AREA (0.17 AC)
- DA-2: EXISTING PERVIOUS AREA (0.21 AC)
- DA-2: EXISTING IMPERVIOUS AREA (0.02 AC)



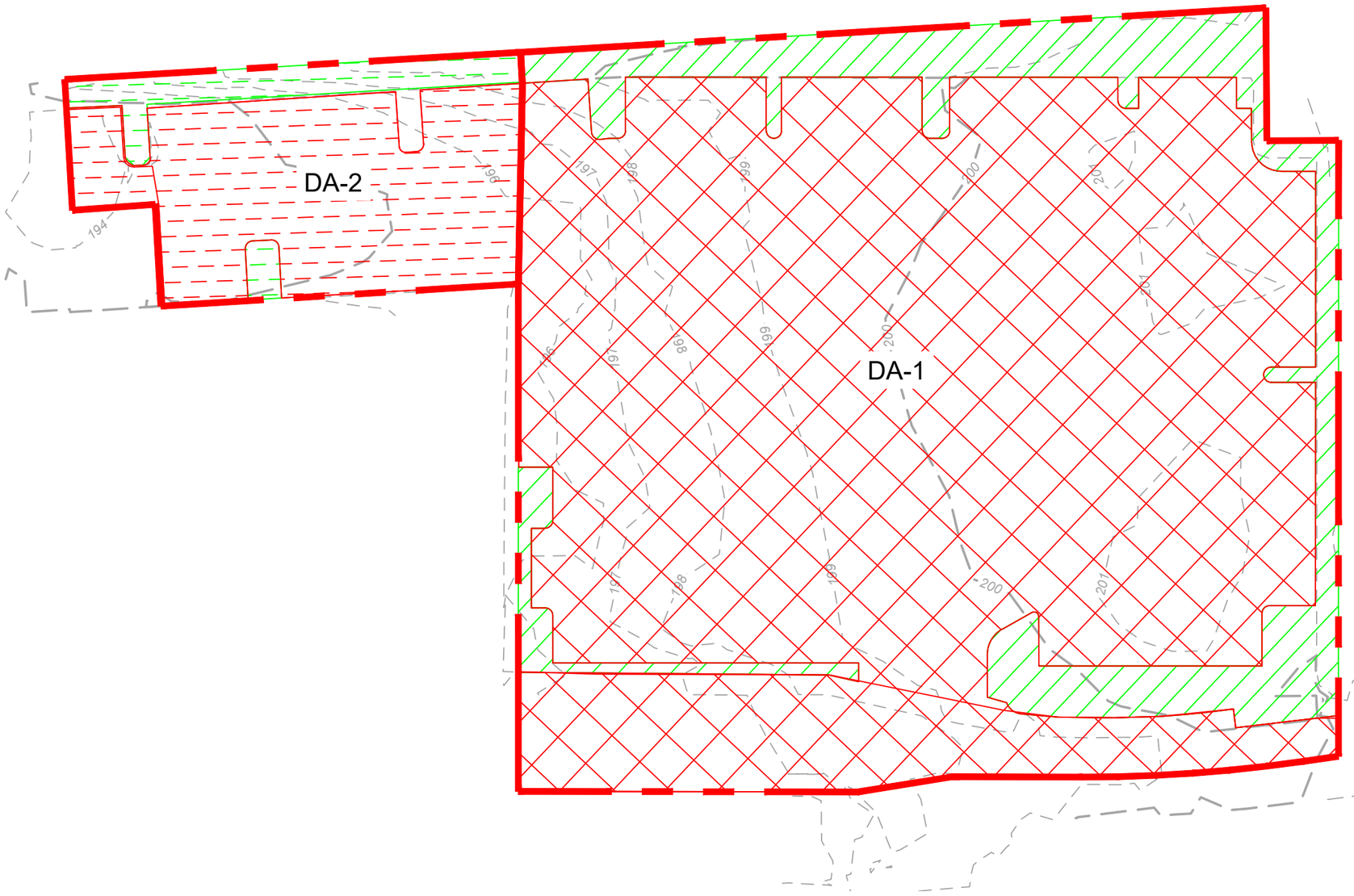


DOWL
WWW.DOWL.COM

CEDAR CREEK LOT 2
EXISTING BASIN DELINEATION
SHERWOOD, OREGON

PROJECT	14505.01
DATE	01/13/2023

FIGURE #1



PROPOSED CONDITIONS

- DA-1: EXISTING PERVIOUS AREA (0.23 AC)
- DA-1: EXISTING IMPERVIOUS AREA (1.26 AC)
- DA-2: EXISTING PERVIOUS AREA (0.04 AC)
- DA-2: EXISTING IMPERVIOUS AREA (0.19 AC)

N

40 0 40

SCALE IN FEET

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CEDAR CREEK LOT 2
PROPOSED BASIN DELINEATION
SHERWOOD, OREGON

PROJECT	14505.01
DATE	01/13/2023

FIGURE #2

Custom Soil Resource Report
Soil Map

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: Washington County, Oregon
Survey Area Data: Version 16, Sep 18, 2018

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

Date(s) aerial images were photographed: Aug 19, 2015—Sep 13, 2016

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
21A	Hillsboro loam, 0 to 3 percent slopes	48.8	67.4%
21B	Hillsboro loam, 3 to 7 percent slopes	6.5	8.9%
21C	Hillsboro loam, 7 to 12 percent slopes	3.6	4.9%
21D	Hillsboro loam, 12 to 20 percent slopes	1.7	2.4%
30	McBee silty clay loam	1.1	1.5%
37B	Quatama loam, 3 to 7 percent slopes	1.5	2.0%
37D	Quatama loam, 12 to 20 percent slopes	0.8	1.1%
43	Wapato silty clay loam	5.7	7.9%
46F	Xerochrepts and Haploxerolls, very steep	2.0	2.7%
2225A	Huberly silt loam, 0 to 3 percent slopes	0.8	1.1%
Totals for Area of Interest		**72.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They

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

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

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

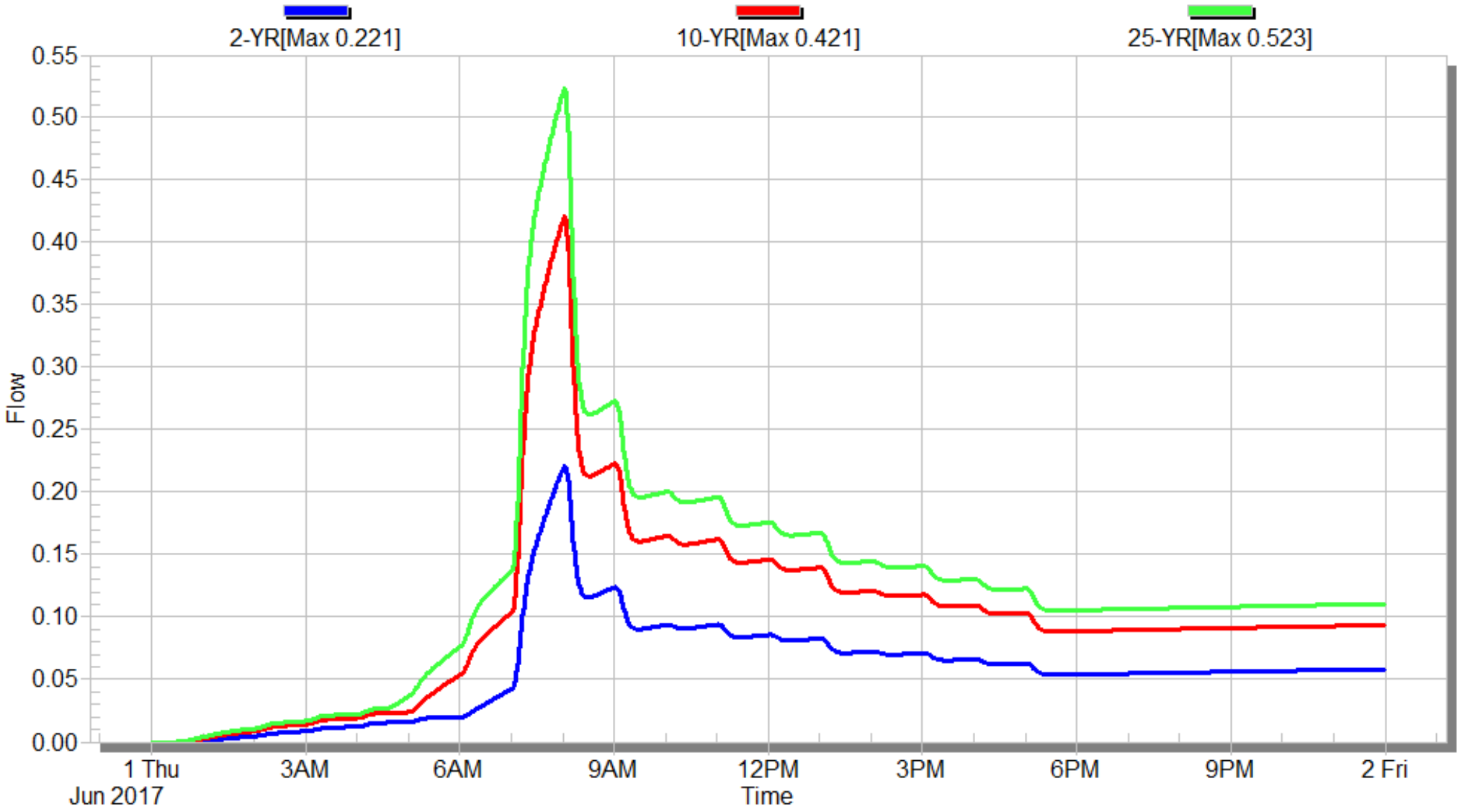
[2] The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition.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

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

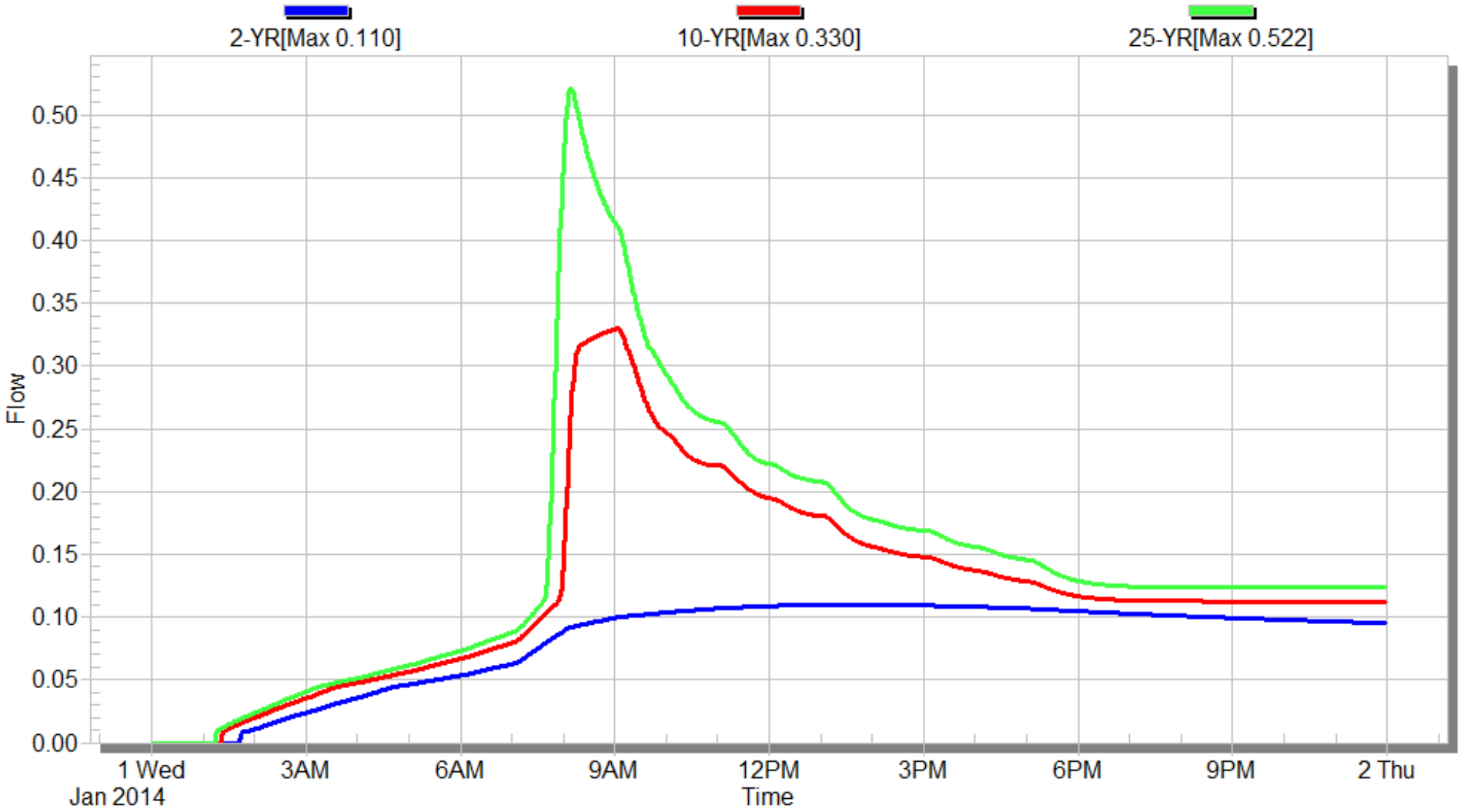
[4] Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

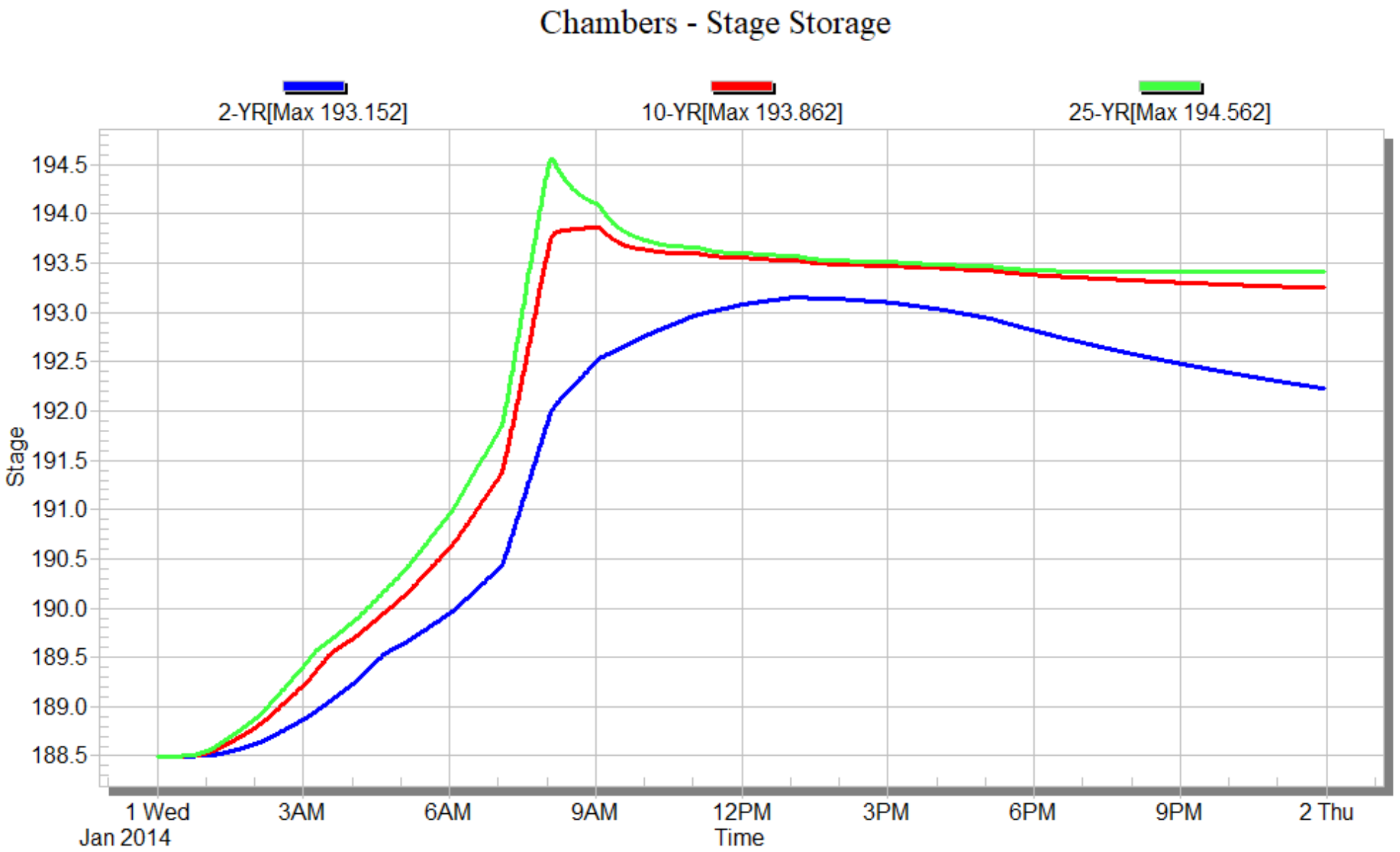
[5] Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Pre Development Flow Rates



Post Development Flow Rates

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10-YR[Max 193.862]
25-YR[Max 194.562]
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Time

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

Advanced Drainage Systems, Inc.

SiteAssist™
FOR STORMTECH
INSTALLATION INSTRUCTIONS
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CEDAR CREEK LOT 2

SHERWOOD, OR, USA

MC-4500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-4500.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-4500 CHAMBER SYSTEM

1. STORMTECH MC-4500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
10. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
11. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
12. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-4500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

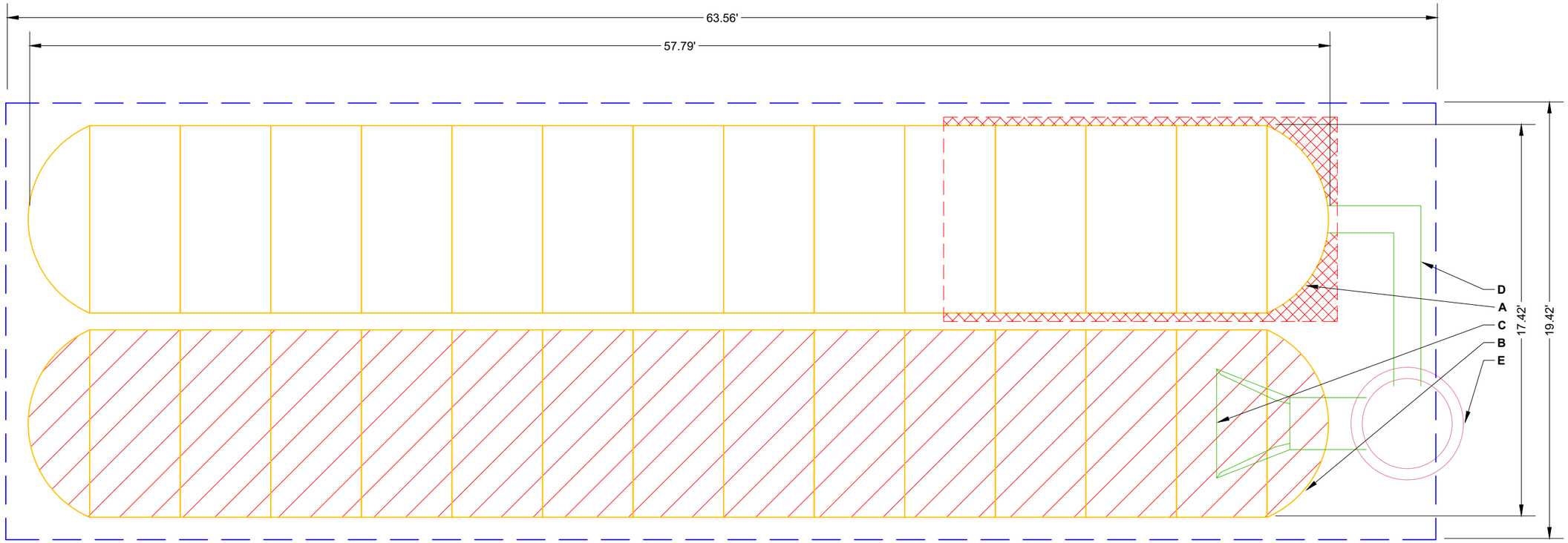
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT		CONCEPTUAL ELEVATIONS	
26	STORMTECH MC-4500 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	13.00
4	STORMTECH MC-4500 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	8.50
12	STONE ABOVE (in)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	8.00
12	STONE BELOW (in)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	8.00
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	8.00
5212	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	7.00
		TOP OF MC-4500 CHAMBER:	6.00
		12" x 12" TOP MANIFOLD INVERT:	3.97
		24" ISOLATOR ROW PLUS INVERT:	1.19
1234	SYSTEM AREA (SF)	BOTTOM OF MC-4500 CHAMBER:	1.00
166.0	SYSTEM PERIMETER (ft)	BOTTOM OF STONE:	0.00

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	12" TOP PARTIAL CUT END CAP, PART#: MC4500IEPP12T / TYP OF ALL 12" TOP CONNECTIONS	35.69"	
PREFABRICATED END CAP	B	24" BOTTOM PARTIAL CUT END CAP, PART#: MC4500IEPP24B / TYP OF ALL 24" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	2.26"	
FLAMP	C	INSTALL FLAMP ON 24" ACCESS PIPE / PART#: MC450024RAMP		
MANIFOLD	D	12" x 12" TOP MANIFOLD, ADS N-12	35.69"	
CONCRETE STRUCTURE	E	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		2.5 CFS IN



ISOLATOR ROW PLUS
(SEE DETAIL)

PLACE MINIMUM 17.50' OF ADSPLUS175 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- **NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

CEDAR CREEK LOT 2
SHERWOOD, OR, USA
DATE:
DRAWN: GW
CHECKED: N/A
PROJECT #:

DATE	DRW	CHK	DESCRIPTION

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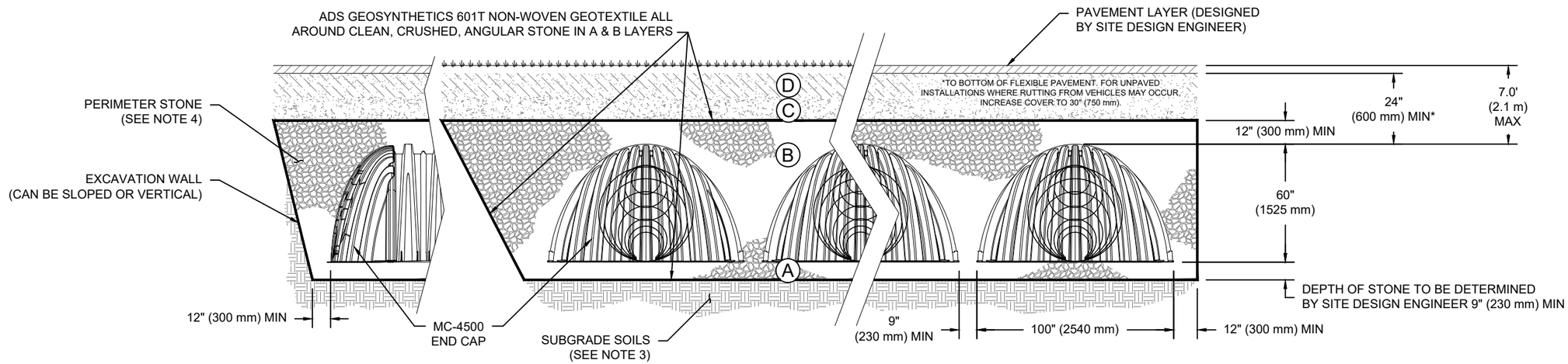
ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101
2. MC-4500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

CEDAR CREEK LOT 2
SHERWOOD, OR, USA
DATE:
DRAWN: GW
PROJECT #:
CHECKED: N/A

DATE	DRW	CHK	DESCRIPTION

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

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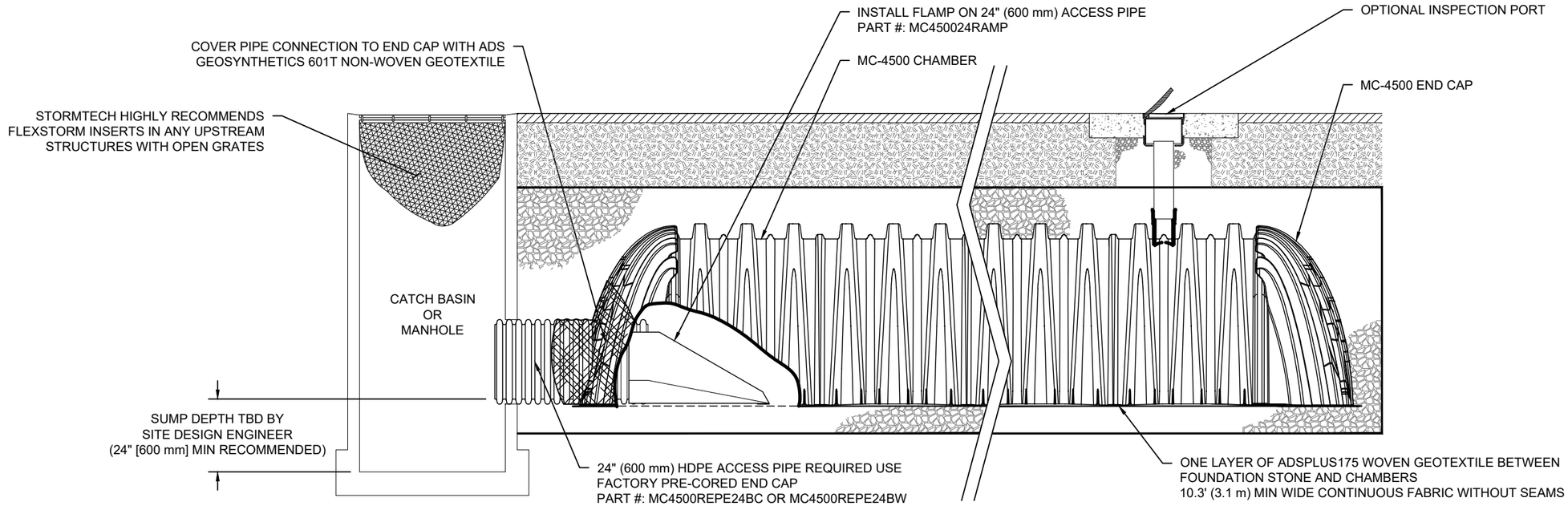
3 OF 5



MC-4500 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

CEDAR CREEK LOT 2
SHERWOOD, OR, USA
DATE:
DRAWN: GW
PROJECT #:
CHECKED: N/A

DESCRIPTION	CHK	DRW	DATE

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MC-4500 TECHNICAL SPECIFICATION

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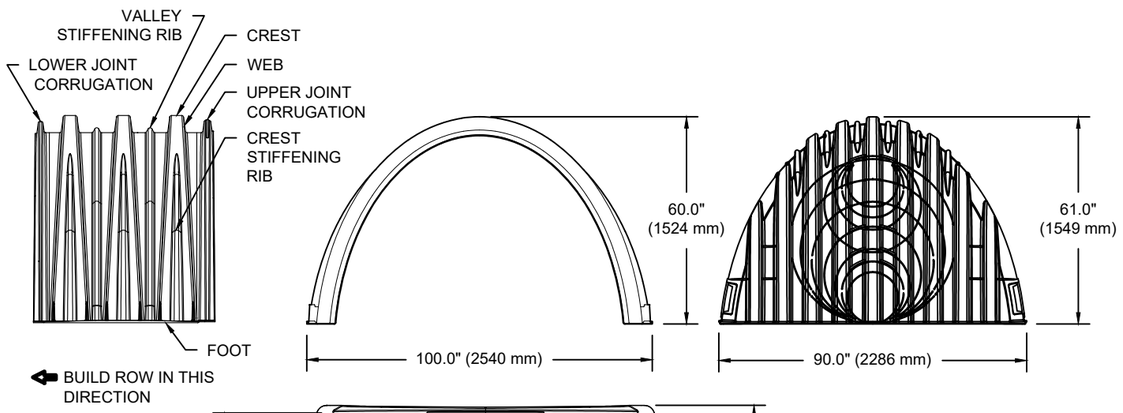


NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 48.3"	(2540 mm X 1524 mm X 1227 mm)
CHAMBER STORAGE	106.5 CUBIC FEET	(3.01 m³)
MINIMUM INSTALLED STORAGE*	162.6 CUBIC FEET	(4.60 m³)
WEIGHT (NOMINAL)	125.0 lbs.	(56.7 kg)

NOMINAL END CAP SPECIFICATIONS

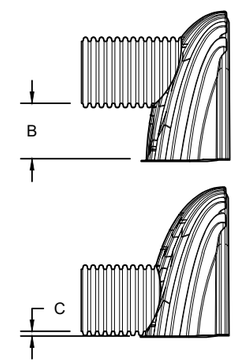
SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	39.5 CUBIC FEET	(1.12 m³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC4500IEPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC4500IEPP06B		---	0.86" (22 mm)
MC4500IEPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC4500IEPP08B		---	1.01" (26 mm)
MC4500IEPP10T	10" (250 mm)	38.37" (975 mm)	---
MC4500IEPP10B		---	1.33" (34 mm)
MC4500IEPP12T	12" (300 mm)	35.69" (907 mm)	---
MC4500IEPP12B		---	1.55" (39 mm)
MC4500IEPP15T	15" (375 mm)	32.72" (831 mm)	---
MC4500IEPP15B		---	1.70" (43 mm)
MC4500IEPP18T	18" (450 mm)	29.36" (746 mm)	---
MC4500IEPP18TW			
MC4500IEPP18B		---	1.97" (50 mm)
MC4500IEPP18BW			
MC4500IEPP24T	24" (600 mm)	23.05" (585 mm)	---
MC4500IEPP24TW			
MC4500IEPP24B		---	2.26" (57 mm)
MC4500IEPP24BW			
MC4500IEPP30BW	30" (750 mm)	---	2.95" (75 mm)
MC4500IEPP36BW	36" (900 mm)	---	3.25" (83 mm)
MC4500IEPP42BW	42" (1050 mm)	---	3.55" (90 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PARTIAL CUT INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-4500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

MC-SERIES END CAP INSERTION DETAIL

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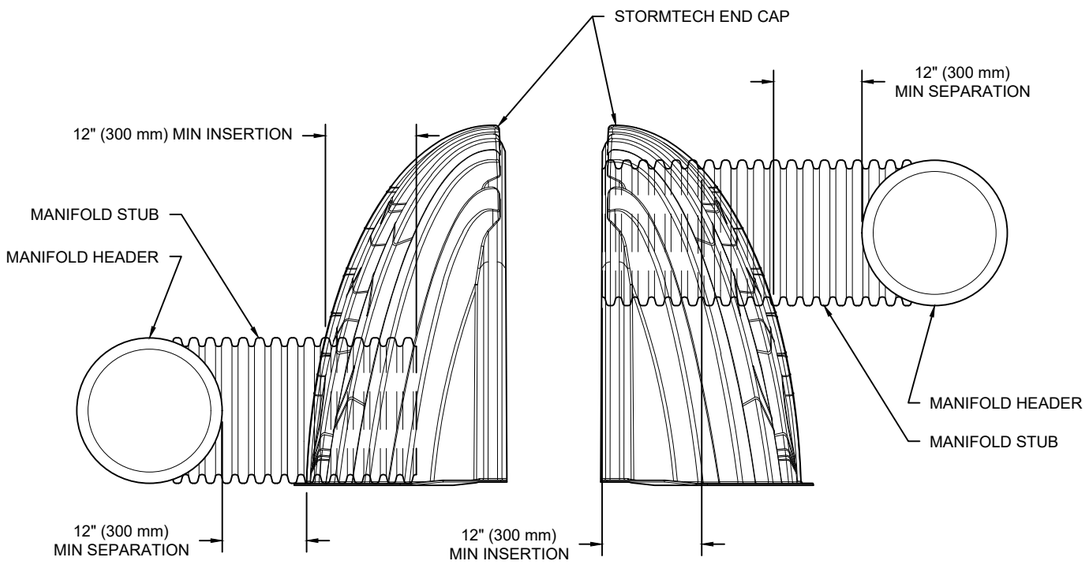

NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

CEDAR CREEK LOT 2
SHERWOOD, OR, USA
DATE: DRAWN: GW CHECKED: N/A
PROJECT #:

DESCRIPTION	CHK	DRW	DATE

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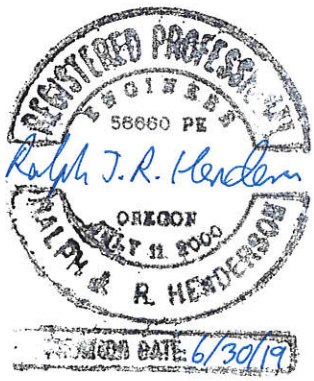
RETAIL STORM REPORT

To
City of Sherwood

For
Cedar Creek Plaza,
SW Edy Rd and Hwy 99

Submitted
July 12, 2017
Revised
September 29, 2017
November 2, 2017

Project Number
2160618



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ATTACHMENTS

I. PROJECT OVERVIEW AND DESCRIPTION

The site is located in Sherwood, Oregon on the south side of SW Edy Road, and the west side of Hwy 99.

The subject site consists of Tax Lot 900, which is currently underdeveloped and contains remnant site improvements from a former mobile home park. The tax lot is a part of larger site that is the subject of a recently approved Site Plan Review and Conditional Use application (SP16-10 and CUP 16-06). A Property Line Adjustment application LLA 17-02 was also recently approved, and reconfigures the existing boundaries of Tax Lot 900 to increase its area from 5.69 to 6.38 acres. Once approved, this subdivision will be recorded with Washington County following recording of the Property Line Adjustment.

The total proposed site consists of 13.1 acres. The proposed project includes an assisted living facility, an existing Providence medical office, a hotel, a fitness center, and 5 other smaller retail buildings with associated parking, landscaping, and utilities.

The site currently has a parking lot for the adjacent Providence Medical Office, an existing house, and an abandoned mobile home park. The majority of the remainder of the site is landscaped. Under the existing conditions, the site has a ridge running through it.

The north portion of the overall site (adjacent to SW Edy Road) slopes from the southeast to the northwest (approximately 10' of elevation change). This will include an assisted living building that will be constructed adjacent to SW Edy Road, and the existing Providence Medical Office and parking. The south portion of the site slopes from the northeast to the southwest (approximately 10' of elevation change).

No development is proposed through this application; buildings, access, and associated site improvements were approved through SP 16-10.

This proposed subdivision will create seven lots from reconfigured Tax Lot 900. Each new building will be on its own lot following the subdivision, and stormwater services and mitigation will be provided to and on each individual lot. New public access and maintenance easements are also proposed as part of the subject subdivision to facilitate extension of public utility lines into and through the site, consistent with the associated Site Plan Review application recently approved by the City of Sherwood.

One of the seven lots (Lot 2) is proposed to be left undeveloped in this phase of work. Given future plans will provide the data required for stormwater sizing and approach, we have made a general assumption of 85% impervious development on this lot and provided a stormwater connection to the public system sufficient for conveyance of the mitigated flowrate.

An overall site storm report was submitted to the City of Sherwood on December 23, 2016.

A separate storm report was submitted to the City of Sherwood for the Providence Parking project on May 11, 2017. An additional storm report for the Assisted Living Facility will be made when that site is submitted for building permit.

II. METHODOLOGY

The project water quality stormwater calculations are performed using the Clean Water Services (CWS) and Oregon Department of Transportation (ODOT) design standards. The goals of the site storm design are to reduce the volume of stormwater runoff and to treat pollutant loads where they are generated using appropriate site planning and directing stormwater to systems throughout the site.

The primary approach to water quality treatment is proposed through the use of a proprietary filter system approved for use by CWS. The design utilizes the Perk Filter by Oldcastle Stormwater Solutions

All roof water and parking lot water will be treated and detained on site. The detention will match ODOT standards matching existing 2-year, 10-year and 25-year storm events.

To provide the required detention, the design utilizes an underground system of ADS StormTech chambers within a drain rock gallery will provide the detention component of the design. A storm control manhole with orifices at the downstream end of the detention facility will control the flow off the site. Storm water will also infiltrate from the bottom of the rock layer, thereby reducing the total volume of water leaving the site.

Additional water beyond a 25-year storm event will be routed through an overflow pipe in the storm control manhole.

III. DESIGN ASSUMPTIONS – WATER QUALITY

The Water Quality system follows Clean Water Services standards. Clean Water Services Design and Construction Standards, chapter 4.05.7 and 4.05.8, describes required water quality Pretreatment and Proprietary Treatment systems. The sizing of the Water Quality for the remainder of the site is described as follows.

A sedimentation manhole will be provided in advance of the planter for pre-treatment of the storm runoff and "Lynch-style" trapped catch basin are used exclusively in the design.

Water Quality – Lot 1

The water quality flow rate for Lot 1 is

Required Water Quality Flow (cfs) = Water Quality Volume / 14,400

= 0.36 (in) x Area(sq. ft.)/ (12 (in/ft)(4hr)(60 min/hr)(60 s/min))

= 0.36 x 57,906 / (12 x 4 x 60 x 60)

= 0.120 cfs

The required Water Quality for Lot 1 will be treated by means of Perk Filter cartridges.

An 18" Perk Filter cartridge can treat 0.04 cfs/min. to achieve CWS treatment goals. To calculate the number of cartridges required, we need to divide the site flow rate by the flow capability of a cartridge.

0.120/0.04 = 3.0.

Therefore, three Perk Filter cartridges will be provided to treat Lot 1. These can be accommodated in a 5' x 8' Perk Filter vault.

A sedimentation manhole will be provided in advance of the Perk Filter manhole for pre-treatment of the storm runoff. This sedimentation manhole will also bypass higher flows around the Perk Filter manhole.

Water Quality – Lot 2

A portion of Lot 2 (the drive aisle adjacent to the proposed pad) is downhill from the remainder of the lot and will need to be treated with this phase. The remainder of Lot 2 is proposed to be left undeveloped in this phase of work.

The water quality flow rate for this portion of Lot 2 is

Required Water Quality Flow (cfs) = Water Quality Volume / 14,400

= 0.36 (in) x Area(sq. ft.)/ (12 (in/ft)(4hr)(60 min/hr)(60 s/min))

= 0.36 x 5,940 / (12 x 4 x 60 x 60)

= 0.008 cfs

The required Water Quality for Lot 2 will be treated by means of Perk Filter cartridges.

An 18" Perk Filter cartridge can treat 0.04 cfs/min. to achieve CWS treatment goals. To calculate the number of cartridges required, we need to divide the site flow rate by the flow capability of a cartridge.

0.008/0.04 = 0.2. Round 0.2 up to 1.

Therefore, one Perk Filter cartridge will be provided to treat Lot 2. These can be accommodated in a 48" Perk Filter manhole.

A sedimentation manhole will be provided in advance of the Perk Filter manhole for pre-treatment of the storm runoff. This sedimentation manhole will also bypass higher flows around the Perk Filter manhole.

Water Quality – Lot 3

The water quality flow rate for Lot 3 is

Required Water Quality Flow (cfs) = Water Quality Volume / 14,400

= 0.36 (in) x Area(sq. ft.)/ (12 (in/ft)(4hr)(60 min/hr)(60 s/min))

= 0.36 x 39,577 / (12 x 4 x 60 x 60)

= 0.08 cfs

The required Water Quality for Lot 3 will be treated by means of Perk Filter cartridges.

An 18" Perk Filter cartridge can treat 0.04 cfs/min. to achieve CWS treatment goals. To calculate the number of cartridges required, we need to divide the site flow rate by the flow capability of a cartridge.

0.08/0.04 = 2.

Therefore, two Perk Filter cartridges will be provided to treat Lot 3. These can be accommodated in a 48" Perk Filter manhole.

A sedimentation manhole will be provided in advance of the Perk Filter manhole for pre-treatment of the storm runoff. This sedimentation manhole will also bypass higher flows around the Perk Filter manhole.

Water Quality – Lot 4

The water quality flow rate for Lot 4 is

Required Water Quality Flow (cfs) = Water Quality Volume / 14,400

= 0.36 (in) x Area(sq. ft.)/ (12 (in/ft)(4hr)(60 min/hr)(60 s/min))

= 0.36 x 31,090 / (12 x 4 x 60 x 60)

= 0.064 cfs

The required Water Quality for Lot 4 will be treated by means of Perk Filter cartridges.

An 18" Perk Filter cartridge can treat 0.04 cfs/min. to achieve CWS treatment goals. To calculate the number of cartridges required, we need to divide the site flow rate by the flow capability of a cartridge.

0.064/0.04 = 1.6. Round 1.6 up to 2.

Therefore, two Perk Filter cartridges will be provided to treat Lot 4. These can be accommodated in a 48" Perk Filter manhole.

A sedimentation manhole will be provided in advance of the Perk Filter manhole for pre-treatment of the storm runoff. This sedimentation manhole will also bypass higher flows around the Perk Filter manhole.

Water Quality – Lot 5

The water quality flow rate for Lot 5 is

Required Water Quality Flow (cfs) = Water Quality Volume / 14,400

= 0.36 (in) x Area(sq. ft.)/ (12 (in/ft)(4hr)(60 min/hr)(60 s/min))

= 0.36 x 23,995 / (12 x 4 x 60 x 60)

= 0.049 cfs

The required Water Quality for Lot 5 will be treated by means of Perk Filter cartridges.

An 18" Perk Filter cartridge can treat 0.04 cfs/min. to achieve CWS treatment goals. To calculate the number of cartridges required, we need to divide the site flow rate by the flow capability of a cartridge.

0.049/0.04 = 1.25. Round 1.25 up to 2.

Therefore, one Perk Filter cartridge will be provided to treat Lot 5. This can be accommodated in a 48" Perk Filter manhole.

A sedimentation manhole will be provided in advance of the Perk Filter manhole for pre-treatment of the storm runoff. This sedimentation manhole will also bypass higher flows around the Perk Filter manhole.

Water Quality – Lot 6

The water quality flow rate for Lot 6 is

Required Water Quality Flow (cfs) = Water Quality Volume / 14,400

= 0.36 (in) x Area(sq. ft.)/ (12 (in/ft)(4hr)(60 min/hr)(60 s/min))

= 0.36 x 19,589 / (12 x 4 x 60 x 60)

= 0.040 cfs

The required Water Quality for Lot 6 will be treated by means of Perk Filter cartridges.

An 18" Perk Filter cartridge can treat 0.04 cfs/min. to achieve CWS treatment goals. To calculate the number of cartridges required, we need to divide the site flow rate by the flow capability of a cartridge.

0.040/0.04 = 1.

Therefore, one Perk Filter cartridge will be provided to treat Lot 6. This can be accommodated in a 48" Perk Filter manhole.

A sedimentation manhole will be provided in advance of the Perk Filter manhole for pre-treatment of the storm runoff. This sedimentation manhole will also bypass higher flows around the Perk Filter manhole.

Water Quality – Lot 7

The water quality flow rate for Lot 7 is

Required Water Quality Flow (cfs) = Water Quality Volume / 14,400

= 0.36 (in) x Area(sq. ft.)/ (12 (in/ft)(4hr)(60 min/hr)(60 s/min))

= 0.36 x 30,451 / (12 x 4 x 60 x 60)

= 0.063 cfs

The required Water Quality for Lot 7 will be treated by means of Perk Filter cartridges.

An 18" Perk Filter cartridge can treat 0.04 cfs/min. to achieve CWS treatment goals. To calculate the number of cartridges required, we need to divide the site flow rate by the flow capability of a cartridge.

0.063/0.04 = 1.6. Round 1.6 up to 2.

Therefore, two Perk Filter cartridges will be provided to treat Lot 7. These can be accommodated in a 48" Perk Filter manhole.

A sedimentation manhole will be provided in advance of the Perk Filter manhole for pre-treatment of the storm runoff. This sedimentation manhole will also bypass higher flows around the Perk Filter manhole.

IV. DESIGN ASSUMPTIONS – DETENTION

The site detention system follows ODOT detention standards to not impact flow rates to the downstream drainage ditch. All roof water and parking lot water will be treated and detained on site.

The detention facilities shall be designed to capture runoff so the post-development runoff rates from the site do not exceed the pre-development runoff rates from the site based on 24-hour storm events for the 2-year, 10-year, and 25-year storms. Specifically, the 2-, 10-, and 25-year post-development runoff rates will not exceed their respective 2-, 10-, and 25-year pre-development runoff rates.

The detention analysis was performed using Hydraflow software.

Detention Approach

The Retail and new Providence parking area currently drain to Hwy 99. The existing drainage pattern will be maintained. ODOT requires that proposed flows from the site do not exceed existing flows. The geotechnical report determined an infiltration layer at about 7' depth. *The storm system will set the bottom of the rock storage to use this infiltration layer to drain the bottom of the rock area after a storm event has passed. I reality, any infiltration will slightly reduce the the total flow off the site.*

The detention system has been provided as an underground detention system using "Stormtech" chambers. The system will receive water via released from the detention system by means of a control manhole with orifices. The orifices control the release of stormwater to match the existing storm events at the 2-year, 10-year, and 25-year storm events.

The detention system for the new Providence parking is designed with water quality provided by means of a filter vault and underground detention under the drive aisle at the south of the new Providence parking. In the hydrograph report, the pond tied to this basin is named "Pond 2". The detention system has been provided as an underground detention system using "Stormtech" chambers. The system will receive water from the water quality vault, and stormwater will be released from the detention system by means of a control manhole with orifices. The orifices control the release of stormwater to match the existing storm events at the 2-year, 10-year, and 25-year storm events.

Infiltration Results

There were several infiltration tests performed across the site. Based on these, the geotechnical engineer determined an unfactored infiltration rate of 0.5 inches per hour on the site at a depth of 7.5 feet. The Geotechnical Engineer recommends infiltrating close to this depth, so the bottom of the facilities should be set at between 7 and 8 feet below existing ground elevations to set them within the infiltrating layer. A factor of safety of two was applied to the measured infiltration rate to arrive at a design infiltration rate of 0.25 inches per hour.

The design of the detention chambers infiltration will also assume that water only infiltrates from the bottom of the rock layer, and not from the sides as well. The rate is so low that the calculations do not account for infiltration. It will be assumed that infiltration will drain any water from the bottom of the detention facility after a storm event is over, hence providing a slight reduction to the total flow off the site.

Detention Summary

Summarizing the Hydraflow results for the orifice sizes, each basin matches flows for the 2-yr, and 10-yr storm events. The additional orifices for 25-yr events were omitted as they made very little difference to the volumes. The orifice sizes, required detention volumes, and provided volumes (in Stormtech chambers) are summarized below.

The Stormtech spreadsheets showing dimensions are included as an attachment to the report.

Detention – Lot 1

Lot 1 detention Control manhole:

2yr orifice = 2.87-inch diameter at elev. = 184.3.

10yr orifice = 3.15-inch diameter at elev. = 186.01.

Required Detention volume = 2,477 cu.ft.

Provided Detention volume = 2,520 cu. ft.

Detention – Lot 2

Lot 2 will be developed as a different phase. However, there is a small portion of Lot 2 that is drive aisle getting built with this phase. The catch basin in the drive aisle adjacent to building A will be connected with this phase to the Lot 1 storm system. The catch basin in the drive aisle adjacent to lot 3 will receive treatment by means of a filter cartridge, then connect to the storm connection provided for Lot 2. When Lot 2 develops, these catch basins can either be reconnected to a central detention system on lot 2, or the detention in lot 2 can be over-detained to accommodate the difference.

Detention – Lot 3

Lot 3 detention Control manhole:

2yr orifice = 2.39-inch diameter at elev. = 186.45.

10yr orifice = 2.61-inch diameter at elev. = 188.17.

Required Detention volume = 1,628 cu.ft.

Provided Detention volume = 1,650 cu.ft.

Detention – Lot 4

Lot 4 detention Control manhole:

2yr orifice = 2.00-inch diameter at elev. = 184.70.

10yr orifice = 2.31-inch diameter at elev. = 186.44.

Required Detention volume = 1,398 cu.ft.

Provided Detention volume = 1,410 cu.ft.

Detention – Lot 5

Lot 5 detention Control manhole:

2yr orifice = 1.88-inch diameter at elev. = 184.22.

10yr orifice = 1.98-inch diameter at elev. = 185.81.

Required Detention volume = 805 cu.ft.

Provided Detention volume = 840 cu.ft.

Detention – Lot 6

Lot 6 detention Control manhole:

2yr orifice = 1.67-inch diameter at elev. = 182.00.

10yr orifice = 1.78-inch diameter at elev. = 183.52.

Required Detention volume = 621 cu.ft.

Provided Detention volume = 660 cu.ft.

Detention – Lot 7

Lot 7 detention Control manhole:

2yr orifice = 2.11-inch diameter at elev. = 181.40.

10yr orifice = 2.27-inch diameter at elev. = 183.07.

Required Detention volume = 1,246 cu.ft.

Provided Detention volume = 1,290 cu.ft.

The Hydraflow output was set to release the infiltration from the bottom of the facilities plus the allowed release rates matching existing 2-year, 10-year and 25-year conditions. The Hydraflow results are shown in the appendix to this report.

Detention Outfall to Hwy 99

The detention system for the Retail and Providence sites will release the storm water to a new storm system in Highway 99W. This new system replaces the existing ditches at the side of the road. The required frontage improvements on Highway 99W necessitate the replacement of the ditches with a piped storm system. At the downstream end of the improvements, the new storm pipe in the right-of-way will discharge into the existing ditch.

The storm water will be detained on site in multiple locations, resulting in maximum runoff to the ODOT right-of-way matching existing rates, but less overall volume leaving the site due to the use of some on-site infiltration.

V. CONSIDERATION OF 100-YEAR STORM EVENT

The portion of the 100-year storm event that is greater than the 25-year storm event will utilize the overflow outlet from the control manholes into the public storm system *in SW Pacific Hwy.* The building is designed at the high side of the site. *All the detention system elevations are in excess of one foot below the finished floor elevations, so there is no chance of water backing up from any storm facilities into the buildings.*

The overall site grading is from the northwest corner of the site to the southeast corner of the site.

In case of a failure in the Retail site, the following describes where water will flow on a lot by lot basis.

Lot 1: Overflow storm water will flow to lot 7.

Lot 2: Overflow storm water will flow to lot 3.

Lot 3: Overflow storm water will flow to lot 4.

Lot 4: Overflow storm water will flow to the drive-thru and spill over the landscaping to SW Pacific Hwy.

Lot 5: Overflow storm water will flow to the drive-thru and spill over the landscaping to SW Pacific Hwy.

Lot 6: Overflow storm water will flow to the low area in the drive aisle, and then to lot 7.

Lot 6: Overflow storm water will flow to the low area in the drive aisle in front of Building F. An emergency overflow catch-basin has been added in the pavement to convey any potential flooding past the west side of the Retail building to SW Pacific Hwy.

VI. CONVEYANCE CALCULATIONS

Site storm lines are designed to convey flow up to and including the 25-year storm event. The portion of the 100-year storm event that is greater than the 25-year storm event will utilize overflow outlets from each individual control manhole into the public storm system.

Conveyance calculations will be included with the site development and building permit applications.

For the undeveloped Lot 2, a 12" storm line within a public easement is provided for future connection.

VII. DOWNSTREAM ANALYSIS

All lots of the proposed subdivision and the new Providence parking area drain to Highway 99. Since this is an ODOT facility, the analysis also addresses their downstream conditions. The storm water will be detained on site in multiple locations, resulting in maximum runoff to the ODOT right-of-way matching existing rates, but less overall volume leaving the site due to the use of some minor on-site infiltration.

As noted above, the detention system will release the storm water to a new piped storm system in Highway 99W, replacing the existing ditches at the side of the road. At the downstream end of the improvements, the new storm pipe in the right-of-way will discharge into the existing ditch. Field observations of this location indicate the improvements will not adversely affect the receiving channel or the adjacent properties or public structures. These improvements will be further reviewed and approved via ODOT permitting.

VIII. ENGINEERING CONCLUSIONS

By individual lots, the storm drainage system for the site has been designed to Clean Water Services, ODOT and City of Sherwood standards using a combination of pretreatment means and filter systems for water quality and an underground chamber detention system, in conjunction with infiltration to meet the detention requirements.

All treated and detained stormwater is collected and conveyed to Highway 99W in quantities matching existing conditions at the 2-year, 10-year, and 25-year events.

Thus, the engineering design of the facilities meets the City's, ODOT's, and Clean Water Services' requirements for water quality and detention.

SITE DATA TABLE

LOT 1:
LOT AREA: 57,906 SF
IMPERVIOUS AREA: 50,778 SF

LOT 2:
LOT AREA: 75,354 SF
IMPERVIOUS AREA: 14,134 SF

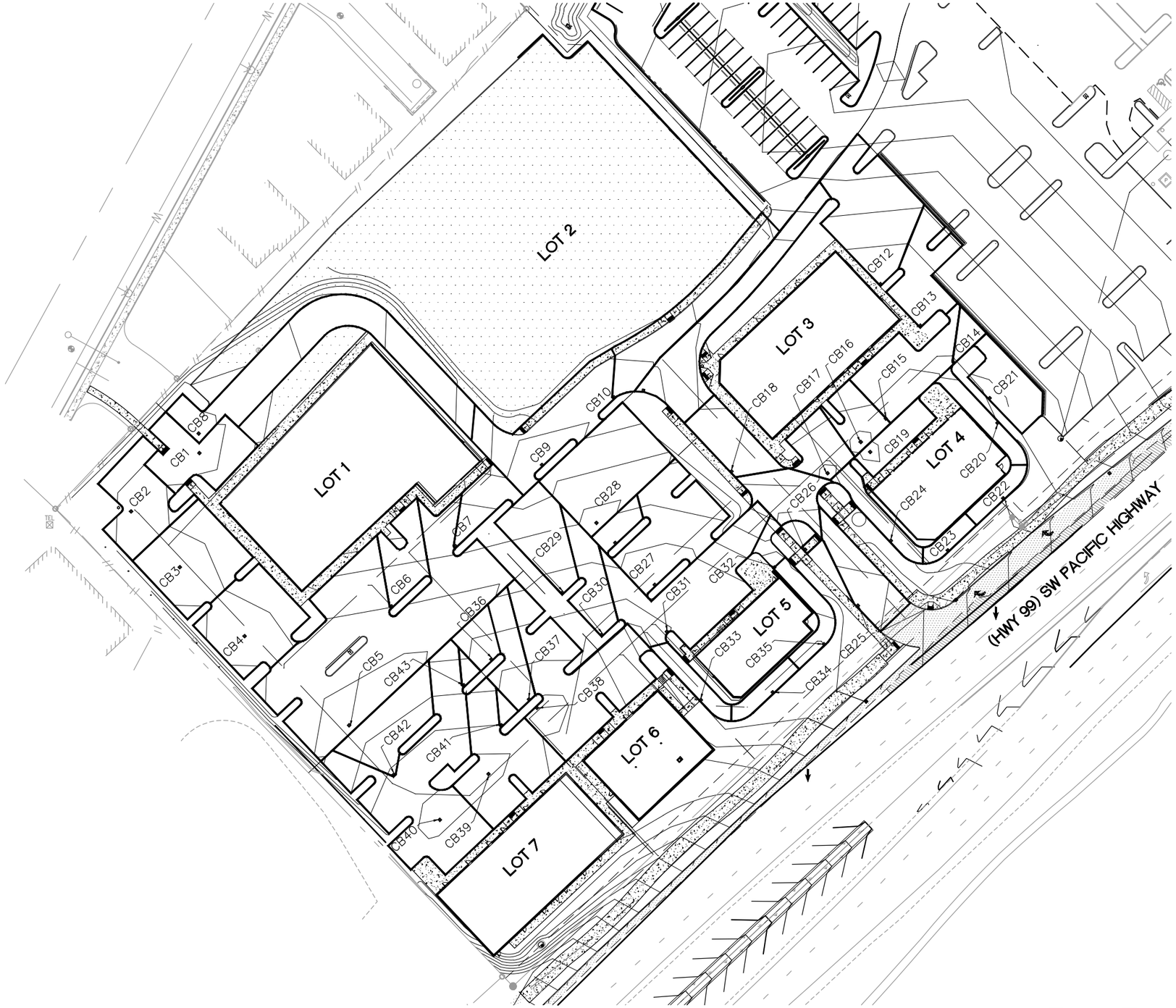
LOT 3:
LOT AREA: 39,577 SF
IMPERVIOUS AREA: 34,254 SF

LOT 4:
LOT AREA: 31,090 SF
IMPERVIOUS AREA: 26670 SF

LOT 5:
LOT AREA: 23,995 SF
IMPERVIOUS AREA: 18.754 SF

LOT 6:
LOT AREA: 19,589 SF
IMPERVIOUS AREA: 14,213 SF

LOT 7:
LOT AREA: 30,451 SF
IMPERVIOUS AREA: 26664 SF



BASIN MAP
CEDAR CREEK PLAZA

JULY 12, 2017
Job # 2160618.00

SCALE: 1"=80
0 80 160

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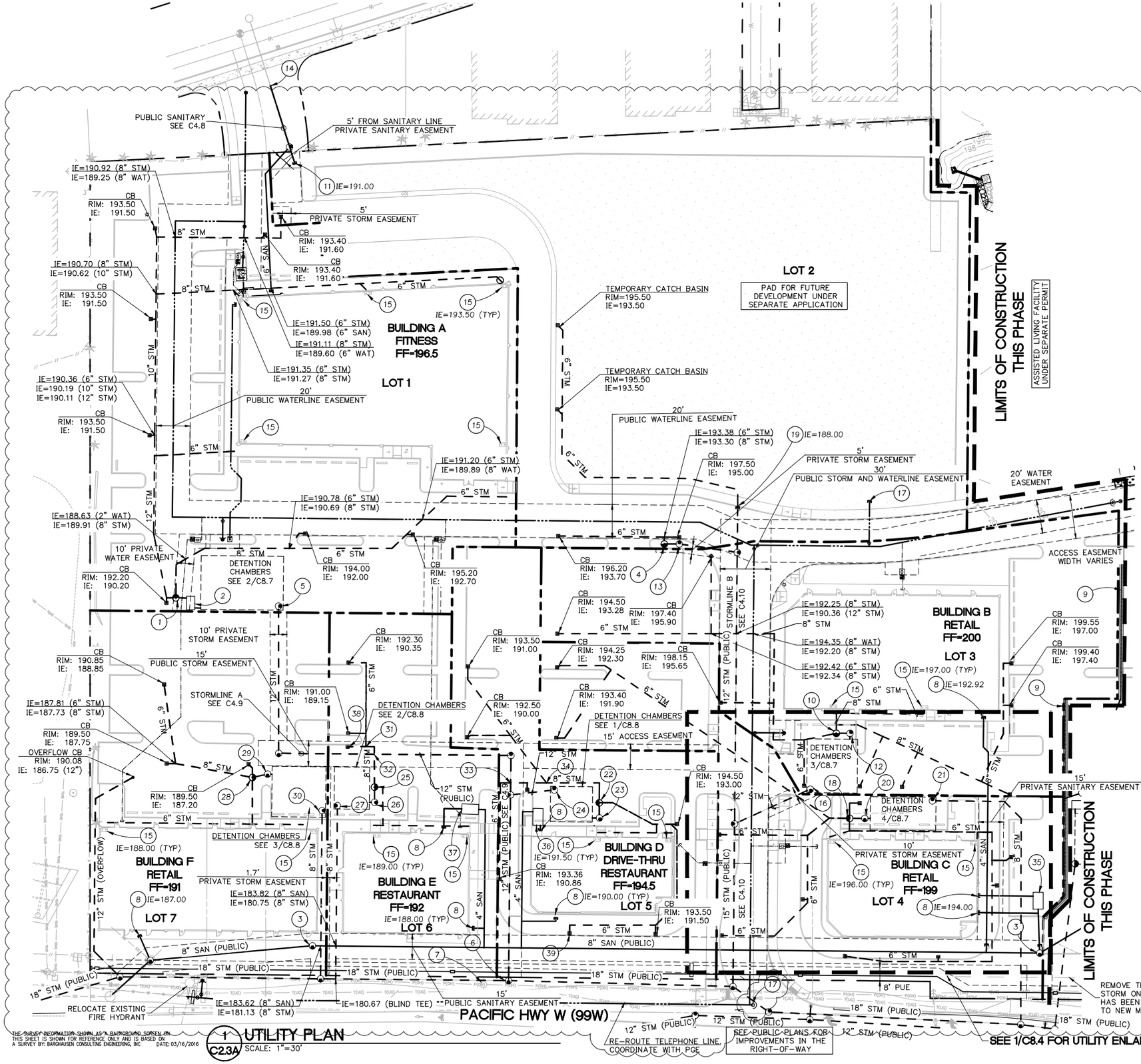

1 UTILITY PLAN
C2.3A SCALE: 1"=30'

THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS SHOWN FOR REFERENCE ONLY AND IS BASED ON A SURVEY BY: BARGHAUSEN CONSULTING ENGINEERING, INC DATE: 03/16/2016

LEGEND

SEE SHEET C2.1A FOR LEGEND

UTILITY NOTES

SEE SHEET C1.1A FOR UTILITY NOTES

SEE SHEET C4.0–C4.6 FOR WATERLINE PLANS

ALL UTILITIES ON THIS SHEET ARE PRIVATE UNLESS LABELED AS PUBLIC

KEY NOTES

1. PRE–TREATMENT MANHOLE
SEE DETAIL SS–25/C8.12
RIM=192.65
IE IN=189.57 (12" SW)
IE IN=189.57 (8" NW)
IE OUT=189.57 (12" NE)
SUMP=185.07
2. WATER QUALITY VAULT
WITH (3) 18" FILTER CARTRIDGES
SEE DETAIL 4/C8.5
RIM=192.65
IE IN=189.60 (12" SW)
IE OUT=187.30 (12" NE)
3. SANITARY MH, SEE SHEET C4.7 FOR INFORMATION
4. PRE–TREATMENT MANHOLE
SEE DETAIL SS–25/C8.12
RIM=197.80
IE IN=193.30 (8" NW)
IE OUT=193.10 (8" NE)
SUMP=188.60
5. CONTROL MANHOLE
SEE DETAIL 2/C8.2
6. CONTRACTOR TO INSTALL IE OUT (18" SE) 1' ECCENTRICALLY NE
7. CONTRACTOR TO COORDINATE WITH PGE 48 HOURS PRIOR TO WORK WITHIN 15' OF POWER POLE. 2.25' EDGE OF POLE TO EDGE OF PIPE
8. CONNECT 4" SS LINE TO BUILDING. COORDINATE WITH PLUMBING PLANS.
9. TRENCH DRAIN SEE PHASE I PLANS
10. PRE–TREATMENT MANHOLE
SEE DETAIL SS–25/C8.12
RIM=199.10
IE IN=194.26 (10" NW)
IE IN=191.66 (8" SW)
IE OUT=191.46 (10" NE)
SUMP=186.96
11. PROVIDE 8" SANITARY FOR FUTURE DEVELOPMENT. PLUG AND MARK
12. WATER QUALITY MANHOLE
WITH (2) 18" FILTER CARTRIDGES
SEE DETAIL 6/C8.5
RIM=199.10
IE IN=191.75 (10" SW)
IE OUT=189.45 (10" SE)
13. WATER QUALITY MANHOLE
WITH (1) 18" FILTER CARTRIDGE
SEE DETAIL 6/C8.5
RIM=197.90
IE IN=193.00 (8" SW)
IE OUT=190.70 (8" NE)
14. CONNECT TO EXISTING SANITARY CLEAN OUT SEE SHEET C4.8
15. 6" ROOF DRAIN
16. CONTROL MANHOLE
SEE DETAIL 3/C8.2
17. INSTALL 8" FIRE WATER SERVICE WITH 2" BLOW OFF PER W–33/C8.11 FOR FUTURE FIRE EXTENSION
18. PRE–TREATMENT MANHOLE
SEE DETAIL SS–25/C8.12
RIM=198.10
IE IN=191.99 (8" SE)
IE IN=190.22 (8" SW)
IE IN=196.43 (6" NW)
IE OUT=190.02 (12" NE)
SUMP=185.52
19. PROVIDE 12" STORM FOR FUTURE DEVELOPMENT.
20. WATER QUALITY MANHOLE
WITH (2) 18" FILTER CARTRIDGES
SEE DETAIL 6/C8.5
RIM=198.05
IE IN=190.00 (8" SW)
IE OUT=187.70 (8" NE)
21. CONTROL MANHOLE
SEE DETAIL 4/C8.2
22. PRE–TREATMENT MANHOLE
SEE DETAIL SS–25/C8.12
RIM=193.70
IE IN=190.25 (6" NE)
IE IN=189.81 (8" NW)
IE OUT=189.61 (8" SE)
SUMP=185.11
23. WATER QUALITY MANHOLE
WITH (2) 18" FILTER CARTRIDGE
SEE DETAIL 6/C8.5
RIM=193.70
IE IN=189.52 (8" NW)
IE OUT=187.22 (8" SW)
24. CONTROL MANHOLE
SEE DETAIL 5/C8.2
25. PRE–TREATMENT MANHOLE
SEE DETAIL SS–25/C8.12
RIM=191.20
IE IN=187.70 (8" NW)
IE IN=188.70 (6" NE)
IE OUT=187.40 (8" SE)
SUMP=182.90
26. WATER QUALITY MANHOLE
WITH (1) 18" FILTER CARTRIDGE
SEE DETAIL 6/C8.5
RIM=191.30
IE IN=187.30 (8" NW)
IE OUT=185.00 (8" SW)
27. CONTROL MANHOLE
SEE DETAIL 6/C8.2
28. PRE–TREATMENT MANHOLE
SEE DETAIL SS–25/C8.12
RIM=190.00
IE IN=187.08 (6" NW)
IE IN=187.00 (8" SW)
IE IN=187.08 (6" SE)
IE OUT=186.80 (8" NE)
SUMP=182.30
29. WATER QUALITY MANHOLE
WITH (2) 18" FILTER CARTRIDGES
SEE DETAIL 6/C8.5
RIM=190.00
IE IN=186.70 (8" SW)
IE OUT=184.40 (8" NE)
30. CONTROL MANHOLE
SEE DETAIL 7/C8.2
31. PIPE UPSIZE
IE=188.80 (6" STM)
IE=188.72 (8" STM)
32. PIPE CROSSING
IE=188.66 (8" STM)
IE=185.88 (12" STM)
33. PIPE CROSSING
IE=190.26 (6" STM)
IE=184.89 (12" STM)
34. PIPE UPSIZE
IE=190.10 (6" STM)
IE=190.02 (8" STM)
35. 1500 GAL GREASE INTERCEPTOR
IE IN=193.40 (4" SW)
IE OUT=193.40 (4" SE)
36. 1500 GAL GREASE INTERCEPTOR
IE IN=189.40 (4" SE)
IE OUT=189.40 (4" SW)
37. 2000 GAL GREASE INTERCEPTOR
IE IN=186.60 (4" SE)
IE OUT=186.60 (4" NE)
38. CATCH BASIN
RIM=190.30
IE=188.85
39. CATCH BASIN
RIM=193.50
IE=191.50

30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

PERMIT RESUBMITTAL - OCTOBER 30, 2017

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REGISTERED PROFESSIONAL ENGINEER #56660
OREGON JULY 11, 2006 RALPH J.R. HENDERSON
EXPIRES: 6/30/19

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE
1	X	IN PROGRESS

SHEET TITLE:
UTILITY PLAN - RETAIL

DRAWN BY: KRC

CHECKED BY: RJH

SHEET:
C2.3A

JOB NO. 2160618.00

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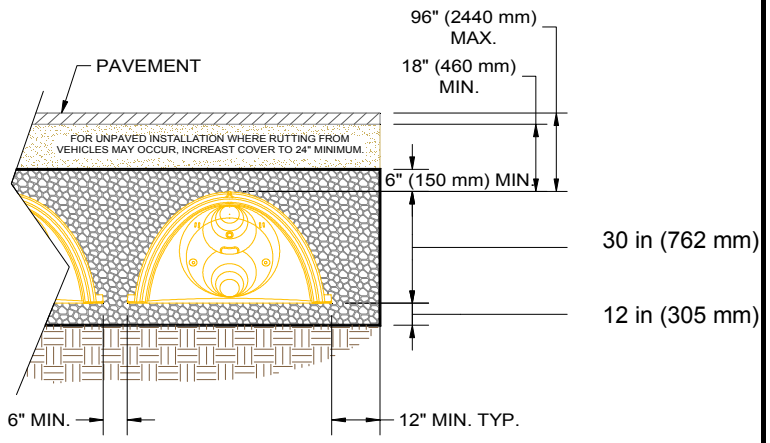
StormTech
Detention • Retention • Recharge
Subsurface Stormwater Management℠

Units: **Imperial**

Project: Sherwood Retail - Lot 1
By: Mackenzie
Point of Contact Ralph Henderson
Date: 7/18/2017

System Requirements

Required Storage Volume	**2,520**	CF
Select Stormtech Chamber System	SC-740	
Stone Porosity (Industry Standard = 40%)	**33%**	
Stone Foundation Depth	12	Inches
Storage Volume Per Chamber	75.40	CF
Avg Cover over Chambers (18 in min. & 96 in max.)	18	Inches



Number of Chambers Required - 34

Approximate Bed Size Required	1,369	SF
Tons of Stone Required	203	Tons
Volume of Excavation	254	CY
Area of Filter Fabric	433	SY
# of End Caps Required	**20**	Each
Length of ISOLATOR ROW	**28.48**	FT
ISOLATOR FABRIC	**16**	SY

Is the limiting dimension for the bed the width or length? **width**

Controlled by Width (Rows)

Width	**50**	FT
# of Chambers Long	4	EA
# of Rows	10	EA
Actual Length	32.08	FT
Actual Width	49.00	FT

6 of the chambers rows will contain only 3 chambers

Controlled by Length

Length	**61**	FT
# of Chambers long	-	EA
# of Rows	-	EA
Actual Length	-	FT
Actual Width	-	FT

Material Estimate

To use this sheet: Please enter data into the blue and green cells. If switching between Imperial and Metric units please check the correct units and data is input in the green cells.

Please call StormTech @ 888-892-2694 for conceptual cost estimates.

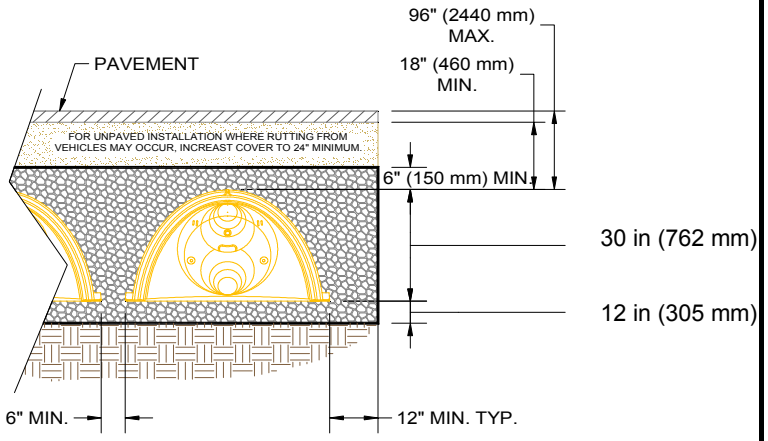
StormTech
Detention • Retention • Recharge
Subsurface Stormwater Management℠

Units: **Imperial**

Project: Sherwood Retail - Lot 3
By: Mackenzie
Point of Contact: Ralph Henderson
Date: 7/18/2017

System Requirements

Required Storage Volume	**1,650**	CF
Select Stormtech Chamber System	SC-740	
Stone Porosity (Industry Standard = 40%)	**33%**	
Stone Foundation Depth	12	Inches
Storage Volume Per Chamber	75.40	CF
Avg Cover over Chambers (18 in min. & 96 in max.)	18	Inches



Number of Chambers Required - 22

Approximate Bed Size Required	895	SF
Tons of Stone Required	133	Tons
Volume of Excavation	166	CY
Area of Filter Fabric	292	SY
# of End Caps Required	**12**	Each
Length of ISOLATOR ROW	**28.48**	FT
ISOLATOR FABRIC	**16**	SY

Is the limiting dimension for the bed the width or length? **width**

Controlled by Width (Rows)

Width	**30**	FT
# of Chambers Long	4	EA
# of Rows	6	EA
Actual Length	32.08	FT
Actual Width	30.00	FT

2 of the chambers rows will contain only 3 chambers

Controlled by Length

Length	**61**	FT
# of Chambers long	-	EA
# of Rows	-	EA
Actual Length	-	FT
Actual Width	-	FT

Material Estimate

To use this sheet: Please enter data into the blue and green cells. If switching between Imperial and Metric units please check the correct units and data is input in the green cells.

Please call StormTech @ 888-892-2694 for conceptual cost estimates.

StormTech
Detention • Retention • Recharge
Subsurface Stormwater Management℠

Units: **Imperial**

Project: Sherwood Retail - Lot 4
By: Mackenzie
Point of Contact Ralph Henderson
Date: 7/18/2017

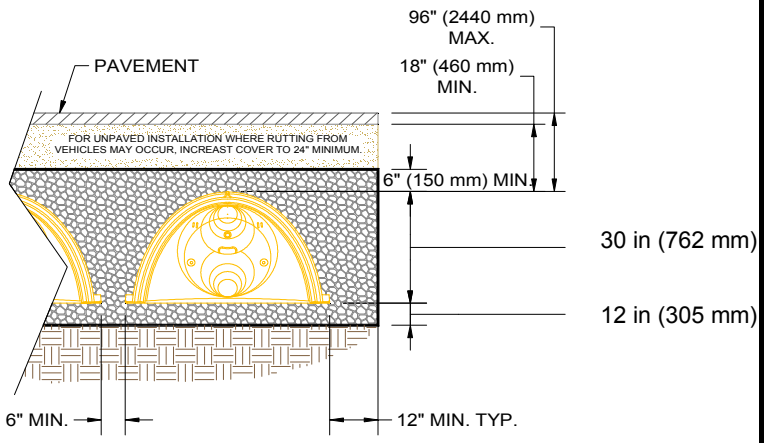
System Requirements

Required Storage Volume	**1,410**	CF
Select Stormtech Chamber System	SC-740	
Stone Porosity (Industry Standard = 40%)	**33%**	
Stone Foundation Depth	12	Inches
Storage Volume Per Chamber	75.40	CF
Avg Cover over Chambers (18 in min. & 96 in max.)	18	Inches

Number of Chambers Required - 19

Approximate Bed Size Required	770	SF
Tons of Stone Required	114	Tons
Volume of Excavation	143	CY
Area of Filter Fabric	258	SY
# of End Caps Required	**8**	Each
Length of ISOLATOR ROW	**35.6**	FT
ISOLATOR FABRIC	**20**	SY

Is the limiting dimension for the bed the width or length? **width**



Controlled by Width (Rows)

Width	**20.5**	FT
# of Chambers Long	5	EA
# of Rows	4	EA
Actual Length	39.20	FT
Actual Width	20.50	FT

1 of the chambers rows will contain only 4 chambers

Controlled by Length

Length	**61**	FT
# of Chambers long	-	EA
# of Rows	-	EA
Actual Length	-	FT
Actual Width	-	FT

Material Estimate

To use this sheet: Please enter data into the blue and green cells. If switching between Imperial and Metric units please check the correct units and data is input in the green cells.

Please call StormTech @ 888-892-2694 for conceptual cost estimates.

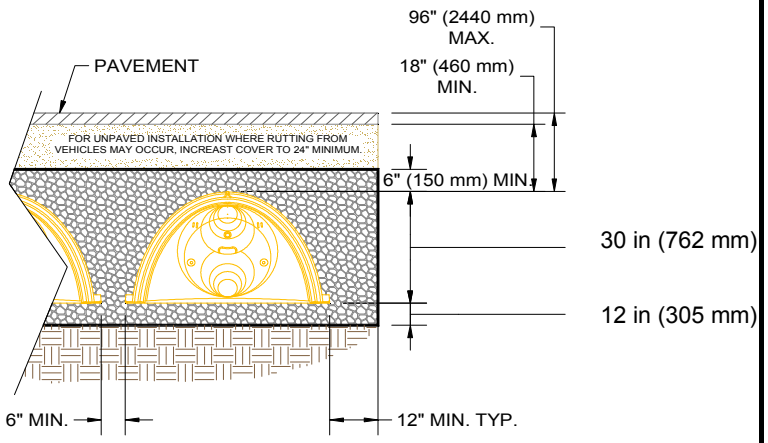
StormTech
Detention • Retention • Recharge
Subsurface Stormwater Management℠

Units: **Imperial**

Project: Sherwood Retail - Lot 5
By: Mackenzie
Point of Contact: Ralph Henderson
Date: 7/18/2017

System Requirements

Required Storage Volume	**840**	CF
Select Stormtech Chamber System	SC-740	
Stone Porosity (Industry Standard = 40%)	**33%**	
Stone Foundation Depth	12	Inches
Storage Volume Per Chamber	75.40	CF
Avg Cover over Chambers (18 in min. & 96 in max.)	18	Inches



Number of Chambers Required - 12

Approximate Bed Size Required	512	SF
Tons of Stone Required	78	Tons
Volume of Excavation	95	CY
Area of Filter Fabric	177	SY
# of End Caps Required	**8**	Each
Length of ISOLATOR ROW	**21.36**	FT
ISOLATOR FABRIC	**12**	SY

Is the limiting dimension for the bed the width or length? **width**

Controlled by Width (Rows)

Width	**20.5**	FT
# of Chambers Long	3	EA
# of Rows	4	EA
Actual Length	24.96	FT
Actual Width	20.50	FT

Controlled by Length

Length	**25**	FT
# of Chambers long	-	EA
# of Rows	-	EA
Actual Length	-	FT
Actual Width	-	FT

Material Estimate

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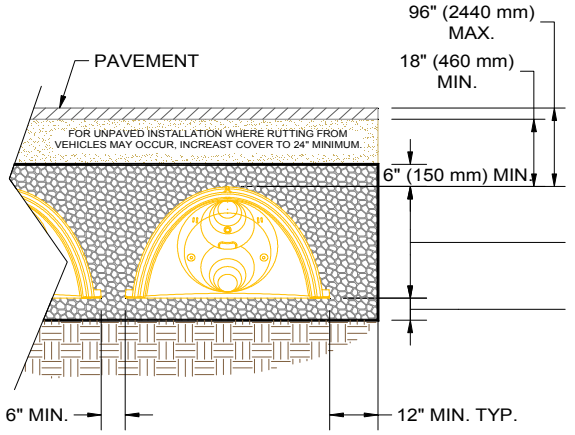
Subsurface Stormwater Management℠

Units: **Imperial**

Project: Sherwood Retail - Lot 6
By: Mackenzie
Point of Contact: Ralph Henderson
Date: 7/18/2017

System Requirements

Required Storage Volume	**660**	CF
Select Stormtech Chamber System	SC-740	
Stone Porosity (Industry Standard = 40%)	**33%**	
Stone Foundation Depth	12	Inches
Storage Volume Per Chamber	75.40	CF
Avg Cover over Chambers (18 in min. & 96 in max.)	18	Inches



Number of Chambers Required - 9

Approximate Bed Size Required	410	SF
Tons of Stone Required	64	Tons
Volume of Excavation	76	CY
Area of Filter Fabric	151	SY
# of End Caps Required	**8**	Each
Length of ISOLATOR ROW	**21.36**	FT
ISOLATOR FABRIC	**12**	SY

Is the limiting dimension for the bed the width or length? **width**

Controlled by Width (Rows)

Width	**22**	FT
# of Chambers Long	3	EA
# of Rows	4	EA
Actual Length	24.96	FT
Actual Width	20.50	FT

3 of the chambers rows will contain only 2 chambers

Controlled by Length

Length	**25**	FT
# of Chambers long	-	EA
# of Rows	-	EA
Actual Length	-	FT
Actual Width	-	FT

Material Estimate

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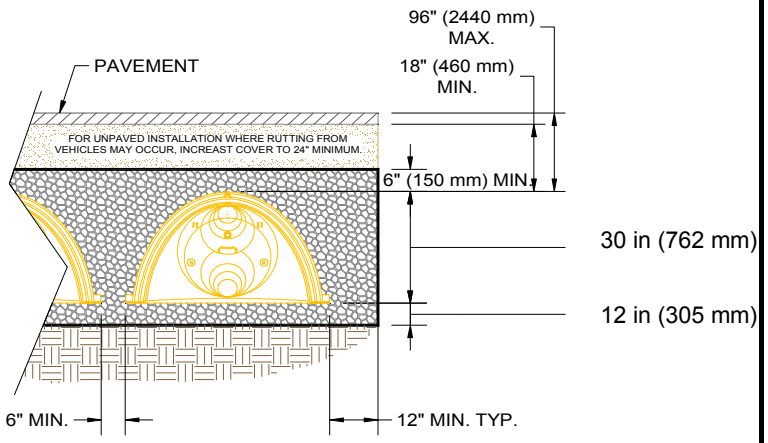
StormTech
Detention • Retention • Recharge
Subsurface Stormwater Management℠

Units: **Imperial**

Project: Sherwood Retail - Lot 7
By: Mackenzie
Point of Contact: Ralph Henderson
Date: 7/18/2017

System Requirements

Required Storage Volume	**1,290**	CF
Select Stormtech Chamber System	SC-740	
Stone Porosity (Industry Standard = 40%)	**33%**	
Stone Foundation Depth	12	Inches
Storage Volume Per Chamber	75.40	CF
Avg Cover over Chambers (18 in min. & 96 in max.)	18	Inches



Number of Chambers Required - 18

Approximate Bed Size Required	749	SF
Tons of Stone Required	112	Tons
Volume of Excavation	139	CY
Area of Filter Fabric	248	SY
# of End Caps Required	**12**	Each
Length of ISOLATOR ROW	**21.36**	FT
ISOLATOR FABRIC	**12**	SY

Is the limiting dimension for the bed the width or length? **width**

Controlled by Width (Rows)

Width	**32**	FT
# of Chambers Long	3	EA
# of Rows	6	EA
Actual Length	24.96	FT
Actual Width	30.00	FT

Controlled by Length

Length	**25**	FT
# of Chambers long	-	EA
# of Rows	-	EA
Actual Length	-	FT
Actual Width	-	FT

Material Estimate

To use this sheet: Please enter data into the blue and green cells. If switching between Imperial and Metric units please check the correct units and data is input in the green cells.

Please call StormTech @ 888-892-2694 for conceptual cost estimates.

Hydraflow Table of Contents

Retail Detention.gpw

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.514 Monday, 11 / 13 / 2017

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.514

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)							Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SBUH Runoff	------	-------	0.276	-------	-------	0.548	0.696	-------	-------	Lot 1 Pre-Developed
2	SBUH Runoff	------	-------	0.462	-------	-------	0.691	0.804	-------	-------	Lot 3 Post-Developed
3	SBUH Runoff	------	-------	0.193	-------	-------	0.381	0.483	-------	-------	Lot 3 Pre-Developed
4	SBUH Runoff	------	-------	0.681	-------	-------	1.016	1.184	-------	-------	Lot 1 Post-Developed
5	SBUH Runoff	------	-------	0.138	-------	-------	0.281	0.359	-------	-------	Lot 4 Pre-Developed
6	SBUH Runoff	------	-------	0.361	-------	-------	0.539	0.627	-------	-------	Lot 4 Post-Developed
7	SBUH Runoff	------	-------	0.117	-------	-------	0.230	0.292	-------	-------	Lot 5 Pre-Developed
8	SBUH Runoff	------	-------	0.251	-------	-------	0.389	0.458	-------	-------	Lot 5 Post-Developed
9	SBUH Runoff	------	-------	0.089	-------	-------	0.182	0.232	-------	-------	Lot 6 Pre-Developed
10	SBUH Runoff	------	-------	0.194	-------	-------	0.306	0.363	-------	-------	Lot 6 Post-Developed
11	SBUH Runoff	------	-------	0.148	-------	-------	0.292	0.371	-------	-------	Lot 7 Pre-Developed
12	SBUH Runoff	------	-------	0.356	-------	-------	0.531	0.619	-------	-------	Lot 7 Post-Developed
13	Reservoir	4	-------	0.275	-------	-------	0.547	0.638	-------	-------	Lot 1 routing
14	Reservoir	2	-------	0.193	-------	-------	0.381	0.444	-------	-------	Lot 3 routing
15	Reservoir	6	-------	0.138	-------	-------	0.281	0.328	-------	-------	Lot 4 routing
16	Reservoir	8	-------	0.114	-------	-------	0.229	0.268	-------	-------	Lot 5 routing
17	Reservoir	12	-------	0.148	-------	-------	0.292	0.340	-------	-------	Lot 7 routing
18	Reservoir	10	-------	0.089	-------	-------	0.182	0.214	-------	-------	Lot 6 routing

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.514

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SBUH Runoff	0.276	2	480	4,818	------	------	------	Lot 1 Pre-Developed
2	SBUH Runoff	0.462	2	474	6,485	------	------	------	Lot 3 Post-Developed
3	SBUH Runoff	0.193	2	480	3,297	------	------	------	Lot 3 Pre-Developed
4	SBUH Runoff	0.681	2	474	9,478	------	------	------	Lot 1 Post-Developed
5	SBUH Runoff	0.138	2	480	2,429	------	------	------	Lot 4 Pre-Developed
6	SBUH Runoff	0.361	2	474	5,060	------	------	------	Lot 4 Post-Developed
7	SBUH Runoff	0.117	2	480	1,993	------	------	------	Lot 5 Pre-Developed
8	SBUH Runoff	0.251	2	476	3,553	------	------	------	Lot 5 Post-Developed
9	SBUH Runoff	0.089	2	480	1,574	------	------	------	Lot 6 Pre-Developed
10	SBUH Runoff	0.194	2	476	2,766	------	------	------	Lot 6 Post-Developed
11	SBUH Runoff	0.148	2	480	2,536	------	------	------	Lot 7 Pre-Developed
12	SBUH Runoff	0.356	2	474	4,989	------	------	------	Lot 7 Post-Developed
13	Reservoir	0.275	2	508	9,474	4	186.01	1,437	Lot 1 routing
14	Reservoir	0.193	2	508	6,482	2	188.17	944	Lot 3 routing
15	Reservoir	0.138	2	524	5,057	6	186.44	818	Lot 4 routing
16	Reservoir	0.114	2	504	3,551	8	185.80	442	Lot 5 routing
17	Reservoir	0.148	2	508	4,986	12	183.07	719	Lot 7 routing
18	Reservoir	0.089	2	504	2,764	10	183.51	333	Lot 6 routing

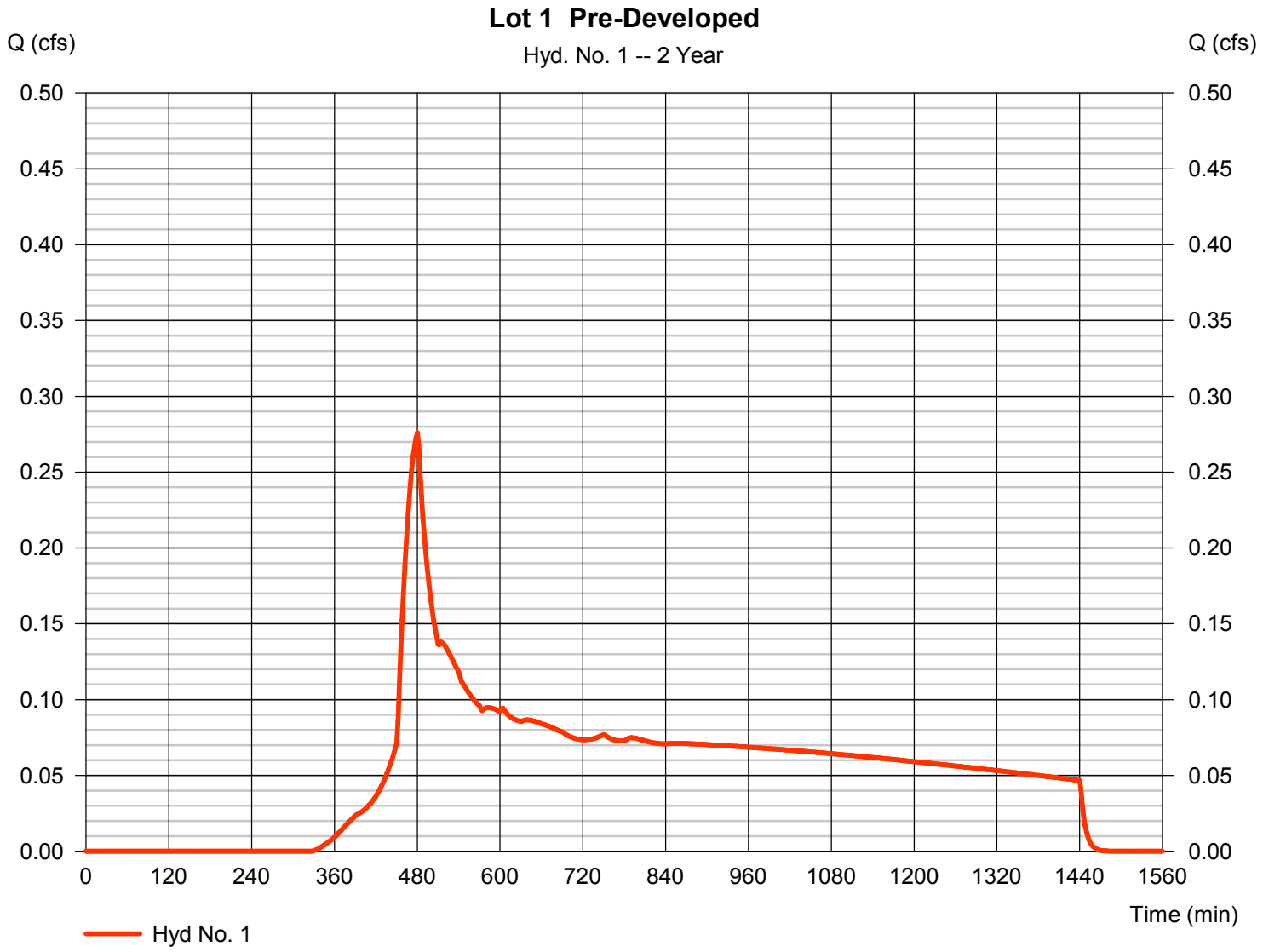
Hydrograph Report

Hyd. No. 1

Lot 1 Pre-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.276 cfs
Storm frequency	= 2 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 4,818 cuft
Drainage area	= 1.330 ac	Curve number	= 82*
Basin Slope	= 2.8 %	Hydraulic length	= 300 ft
Tc method	= LAG	Time of conc. (Tc)	= 6.80 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.380 x 98) + (0.950 x 75)] / 1.330



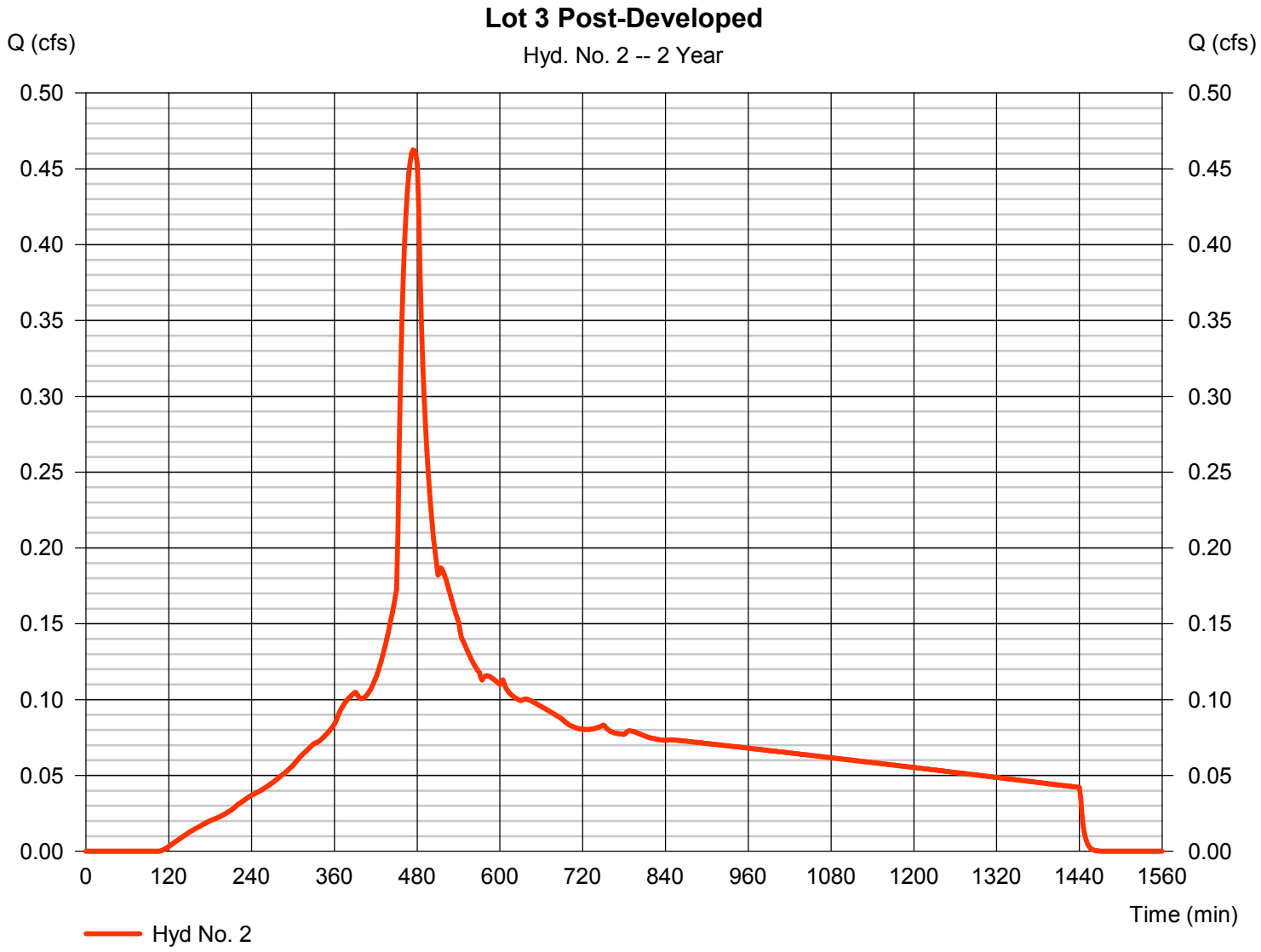
Hydrograph Report

Hyd. No. 2

Lot 3 Post-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.462 cfs
Storm frequency	= 2 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 6,485 cuft
Drainage area	= 0.910 ac	Curve number	= 95*
Basin Slope	= 2.7 %	Hydraulic length	= 260 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.790 x 98) + (0.120 x 75)] / 0.910



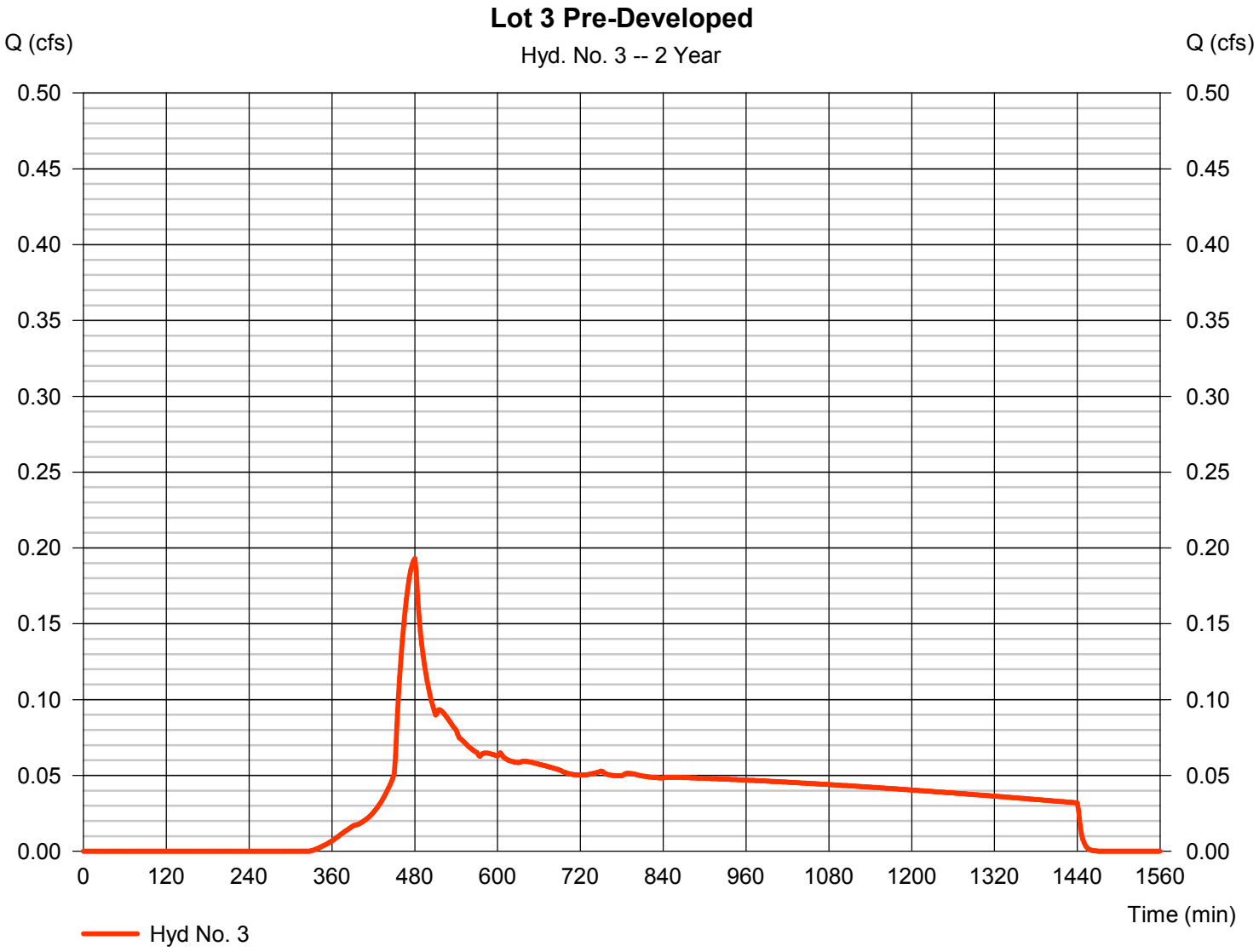
Hydrograph Report

Hyd. No. 3

Lot 3 Pre-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.193 cfs
Storm frequency	= 2 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 3,297 cuft
Drainage area	= 0.910 ac	Curve number	= 82*
Basin Slope	= 2.7 %	Hydraulic length	= 260 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.260 x 98) + (0.650 x 75)] / 0.910



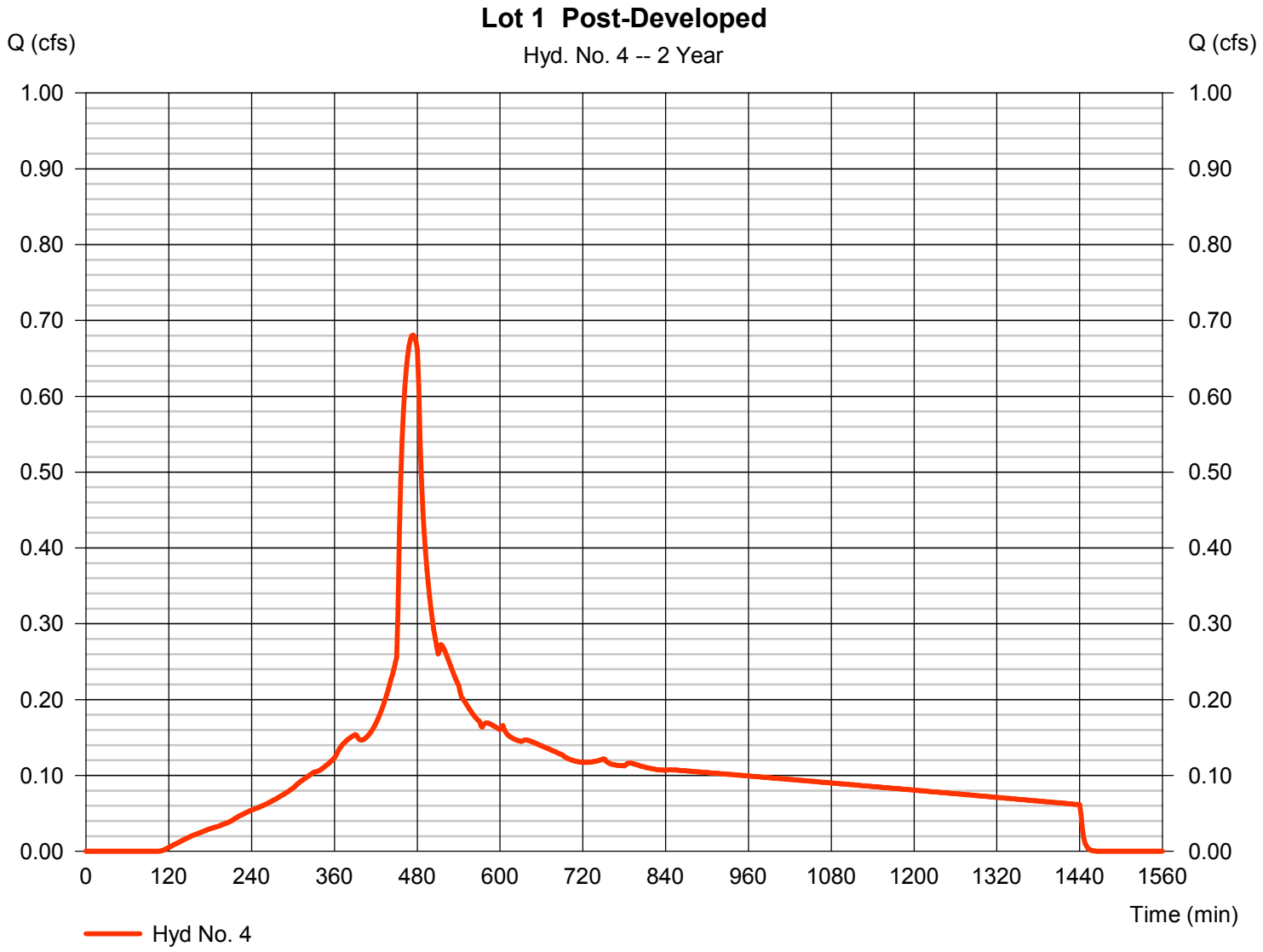
Hydrograph Report

Hyd. No. 4

Lot 1 Post-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.681 cfs
Storm frequency	= 2 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 9,478 cuft
Drainage area	= 1.330 ac	Curve number	= 95*
Basin Slope	= 2.8 %	Hydraulic length	= 300 ft
Tc method	= LAG	Time of conc. (Tc)	= 4.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(1.170 x 98) + (0.160 x 75)] / 1.330



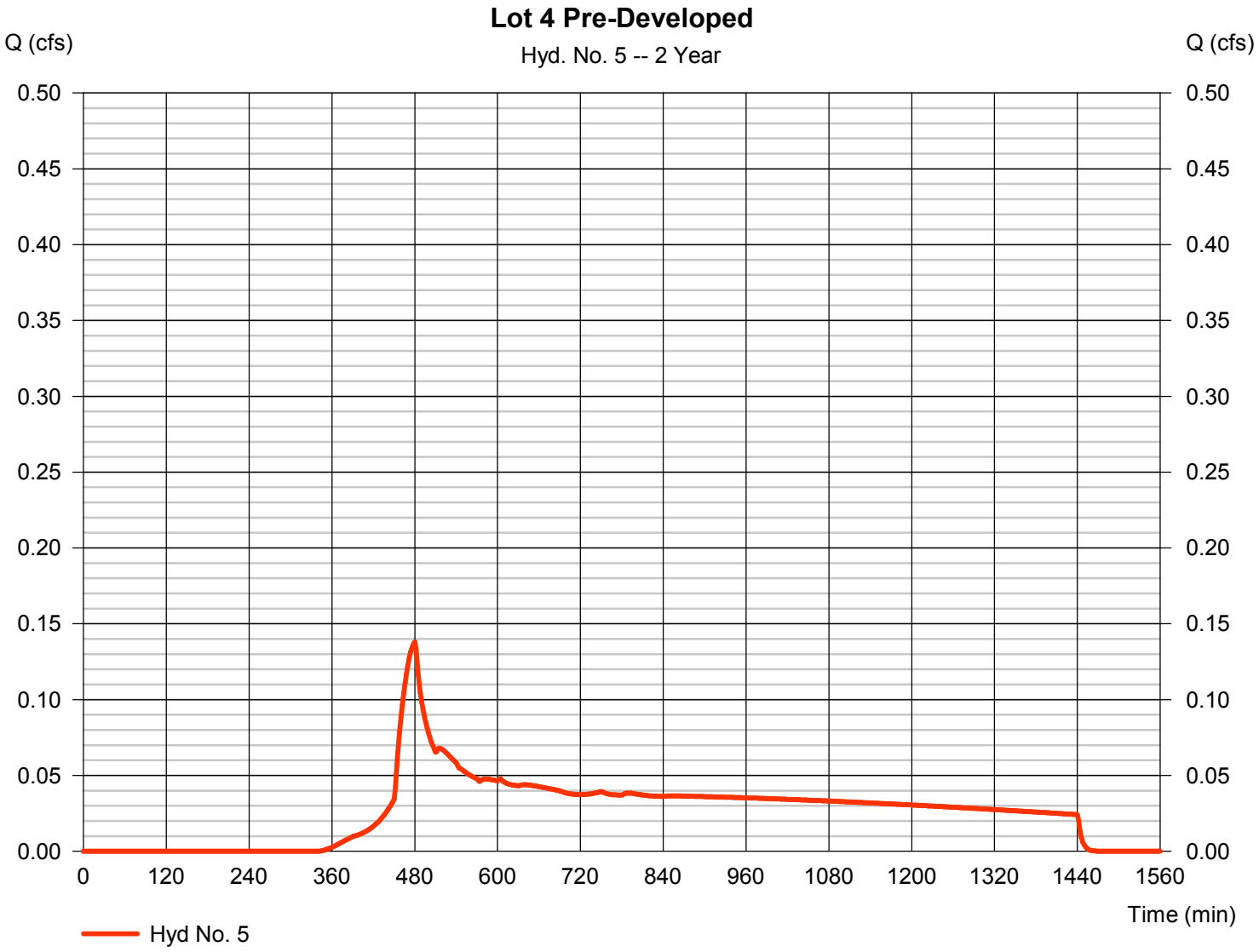
Hydrograph Report

Hyd. No. 5

Lot 4 Pre-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.138 cfs
Storm frequency	= 2 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 2,429 cuft
Drainage area	= 0.710 ac	Curve number	= 81*
Basin Slope	= 2.7 %	Hydraulic length	= 260 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.200 x 98) + (0.510 x 75)] / 0.710



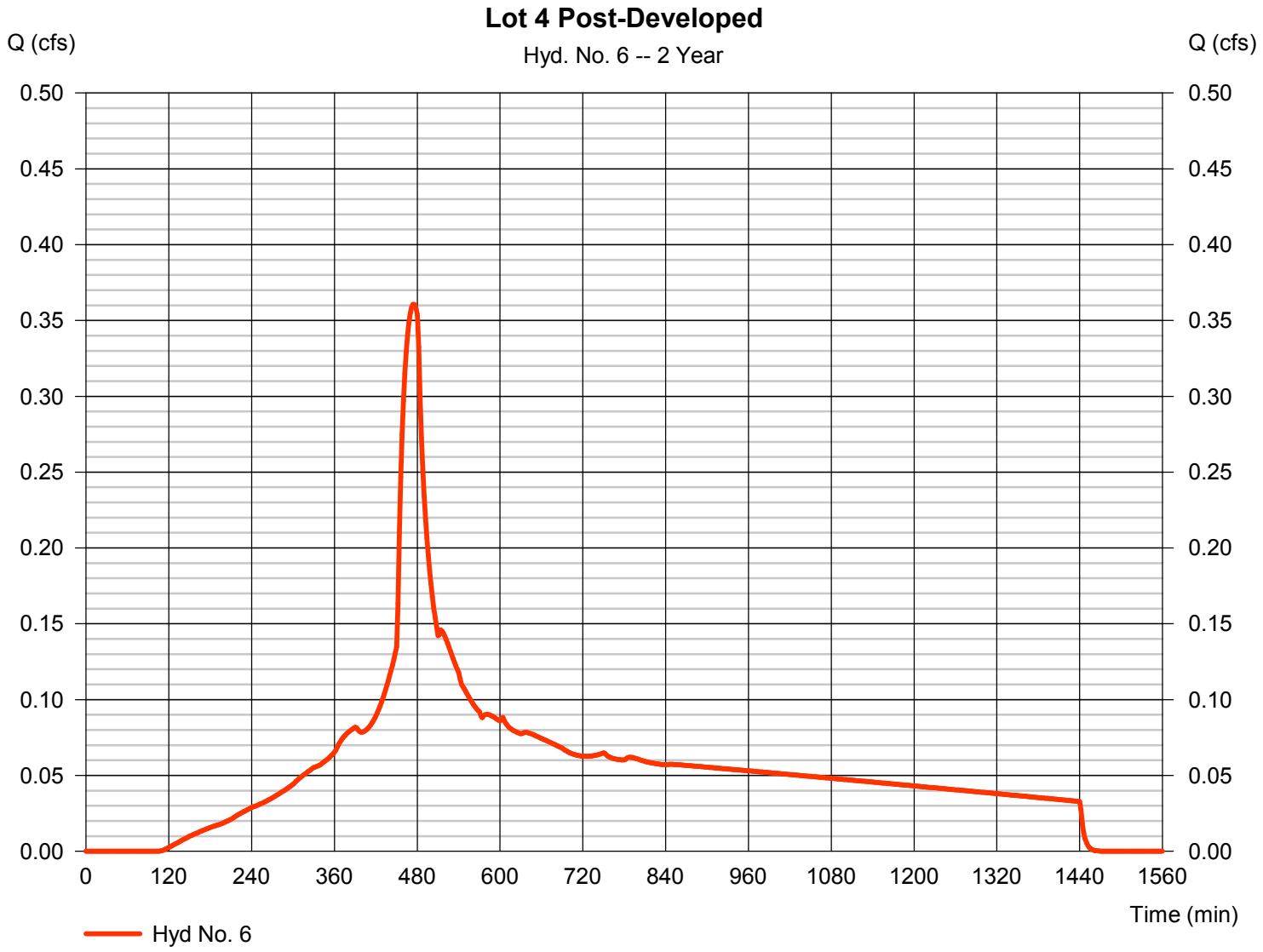
Hydrograph Report

Hyd. No. 6

Lot 4 Post-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.361 cfs
Storm frequency	= 2 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 5,060 cuft
Drainage area	= 0.710 ac	Curve number	= 95*
Basin Slope	= 2.7 %	Hydraulic length	= 260 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.610 x 98) + (0.100 x 75)] / 0.710



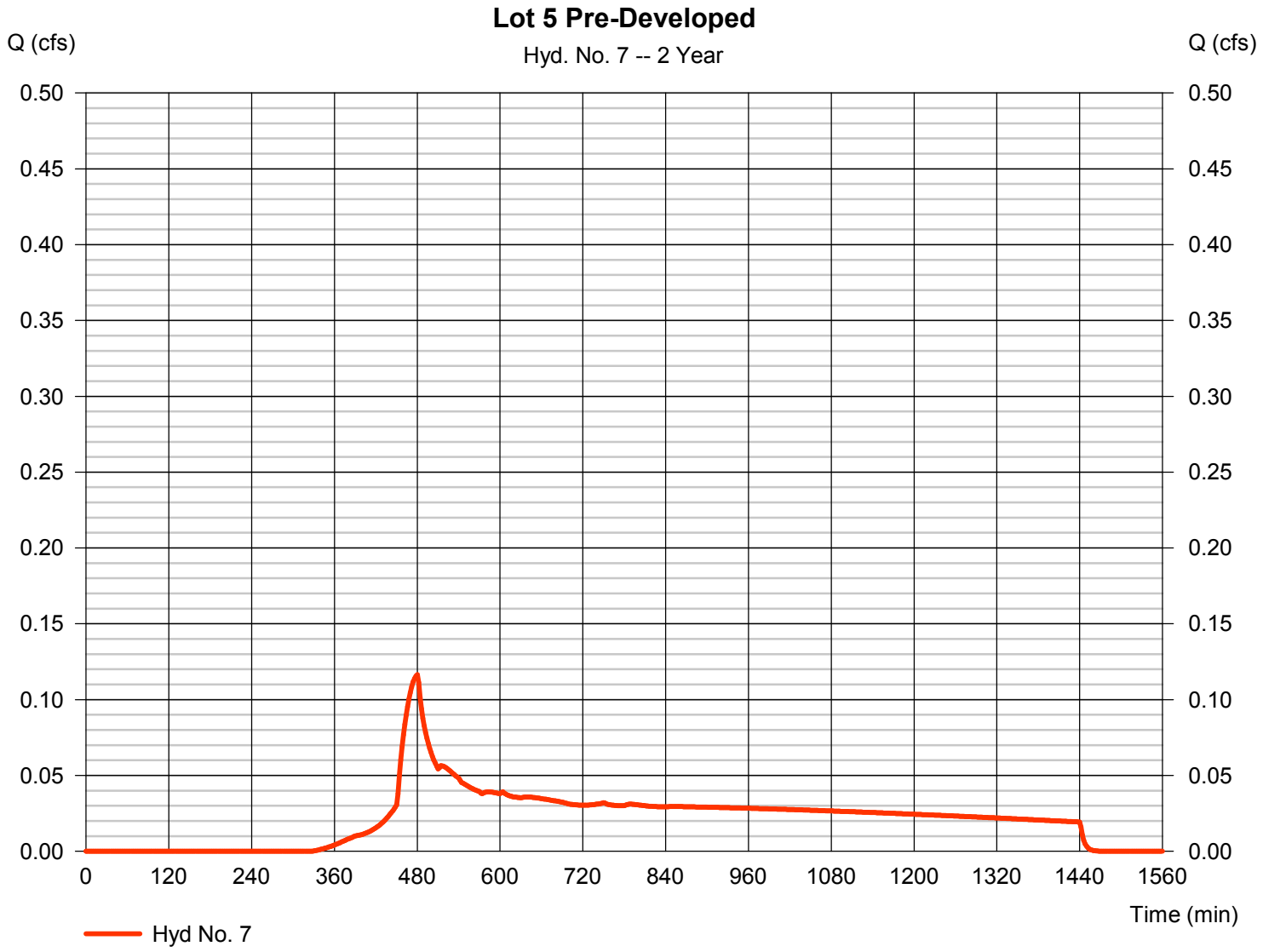
Hydrograph Report

Hyd. No. 7

Lot 5 Pre-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.117 cfs
Storm frequency	= 2 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 1,993 cuft
Drainage area	= 0.550 ac	Curve number	= 82*
Basin Slope	= 2.2 %	Hydraulic length	= 180 ft
Tc method	= LAG	Time of conc. (Tc)	= 5.10 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.160 x 98) + (0.390 x 75)] / 0.550



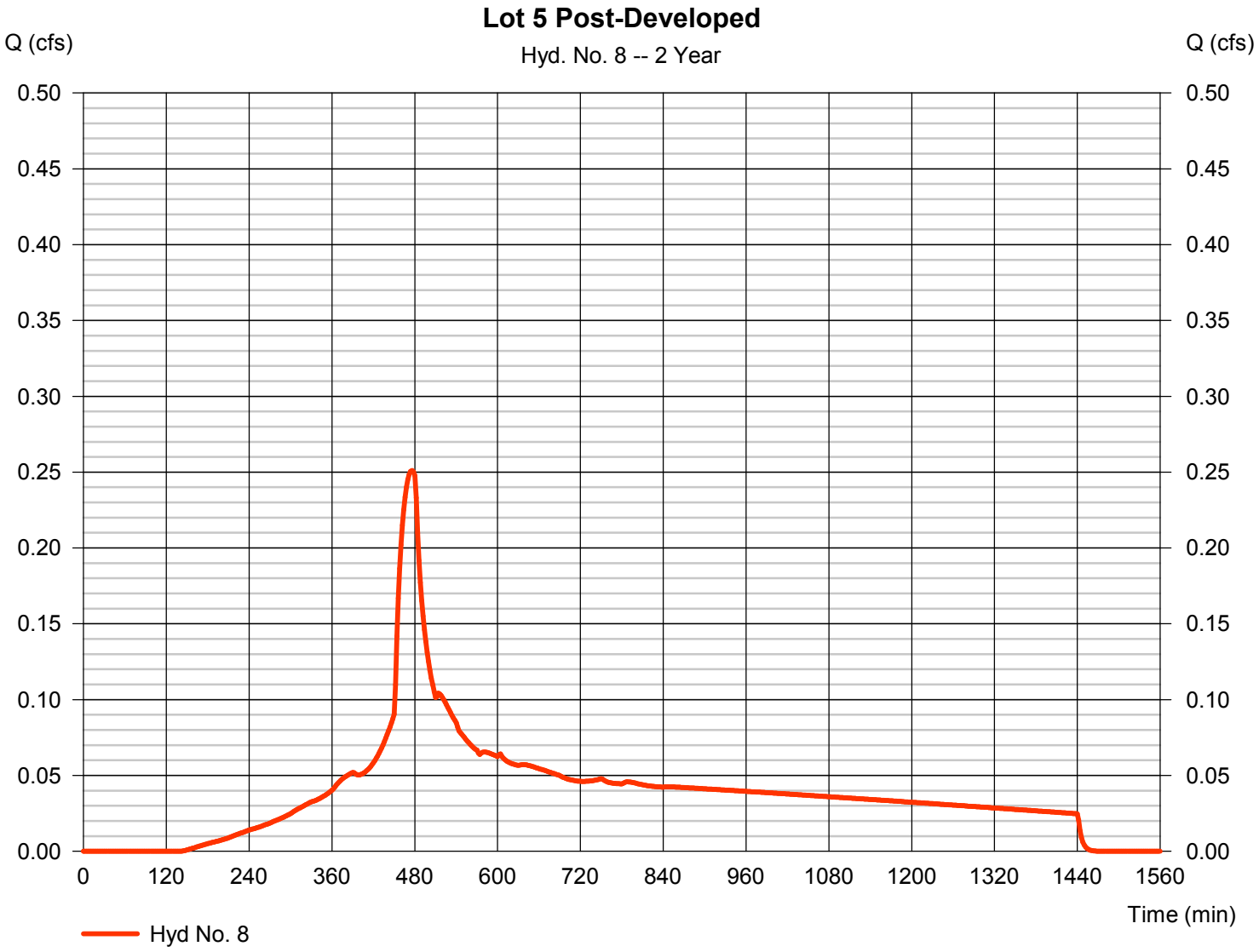
Hydrograph Report

Hyd. No. 8

Lot 5 Post-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.251 cfs
Storm frequency	= 2 yrs	Time to peak	= 476 min
Time interval	= 2 min	Hyd. volume	= 3,553 cuft
Drainage area	= 0.550 ac	Curve number	= 93*
Basin Slope	= 2.0 %	Hydraulic length	= 90 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.430 x 98) + (0.120 x 75)] / 0.550



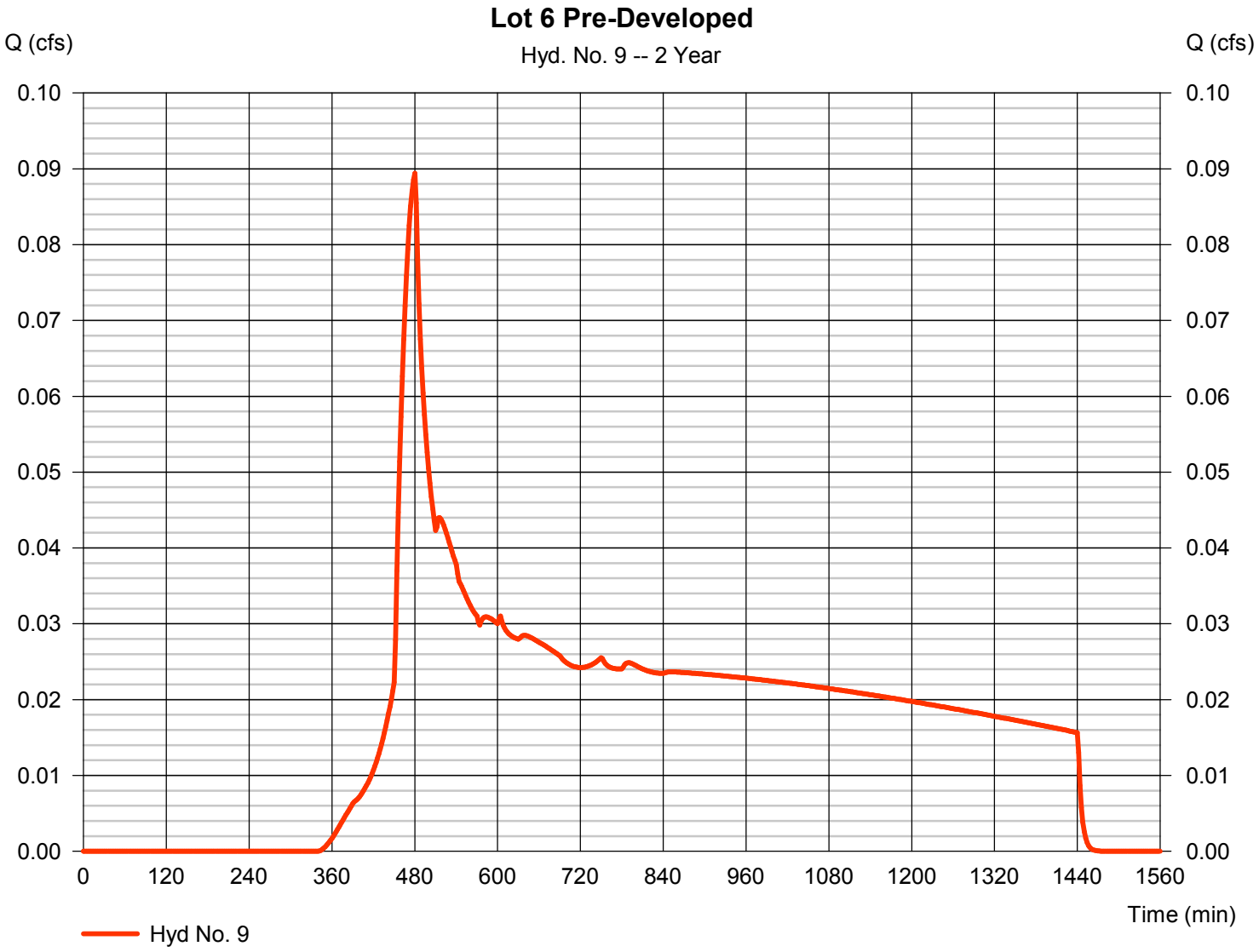
Hydrograph Report

Hyd. No. 9

Lot 6 Pre-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.089 cfs
Storm frequency	= 2 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 1,574 cuft
Drainage area	= 0.460 ac	Curve number	= 81*
Basin Slope	= 2.3 %	Hydraulic length	= 110 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.130 x 95) + (0.330 x 75)] / 0.460



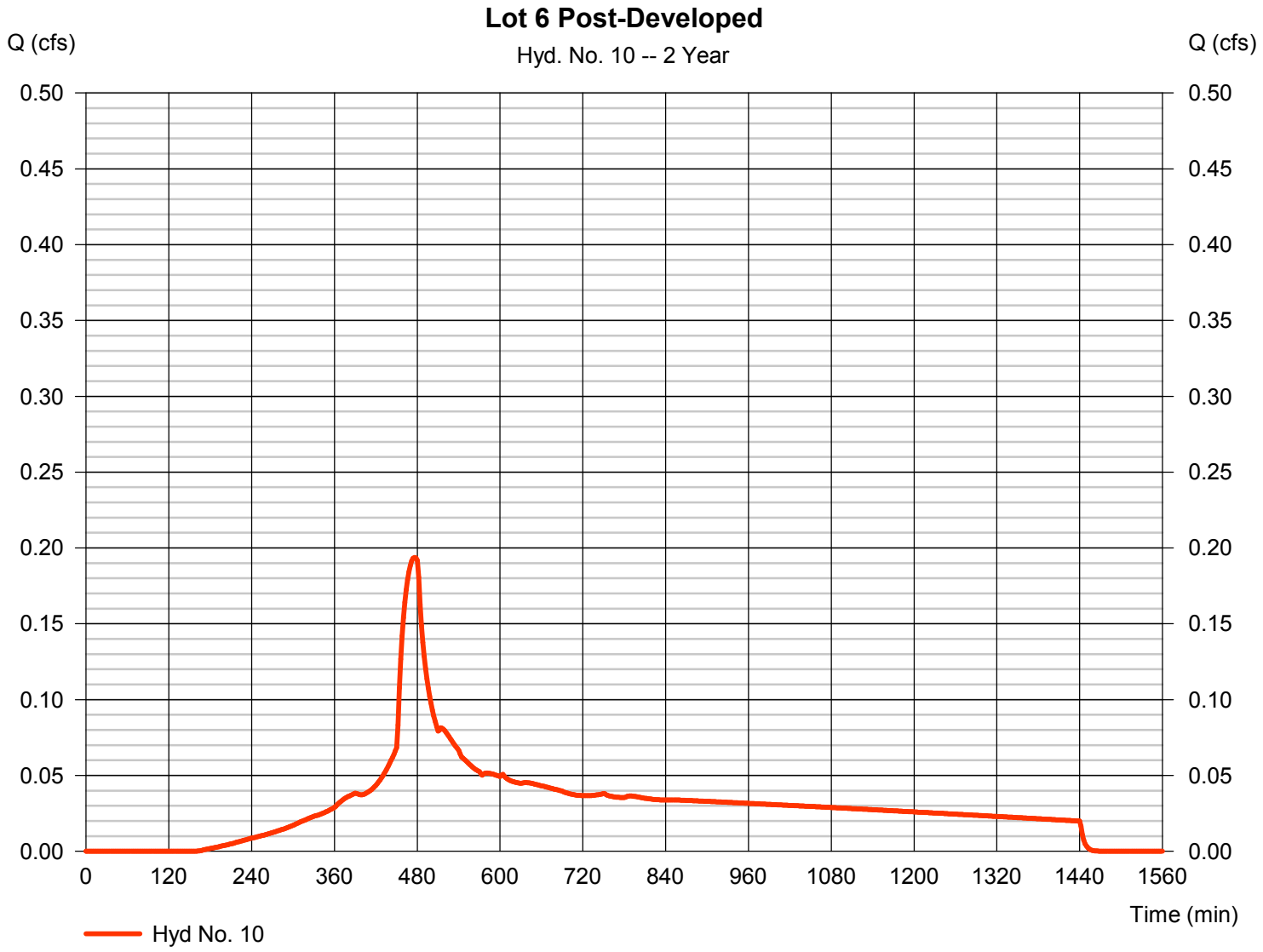
Hydrograph Report

Hyd. No. 10

Lot 6 Post-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.194 cfs
Storm frequency	= 2 yrs	Time to peak	= 476 min
Time interval	= 2 min	Hyd. volume	= 2,766 cuft
Drainage area	= 0.450 ac	Curve number	= 92*
Basin Slope	= 2.0 %	Hydraulic length	= 90 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.330 x 98) + (0.120 x 75)] / 0.450



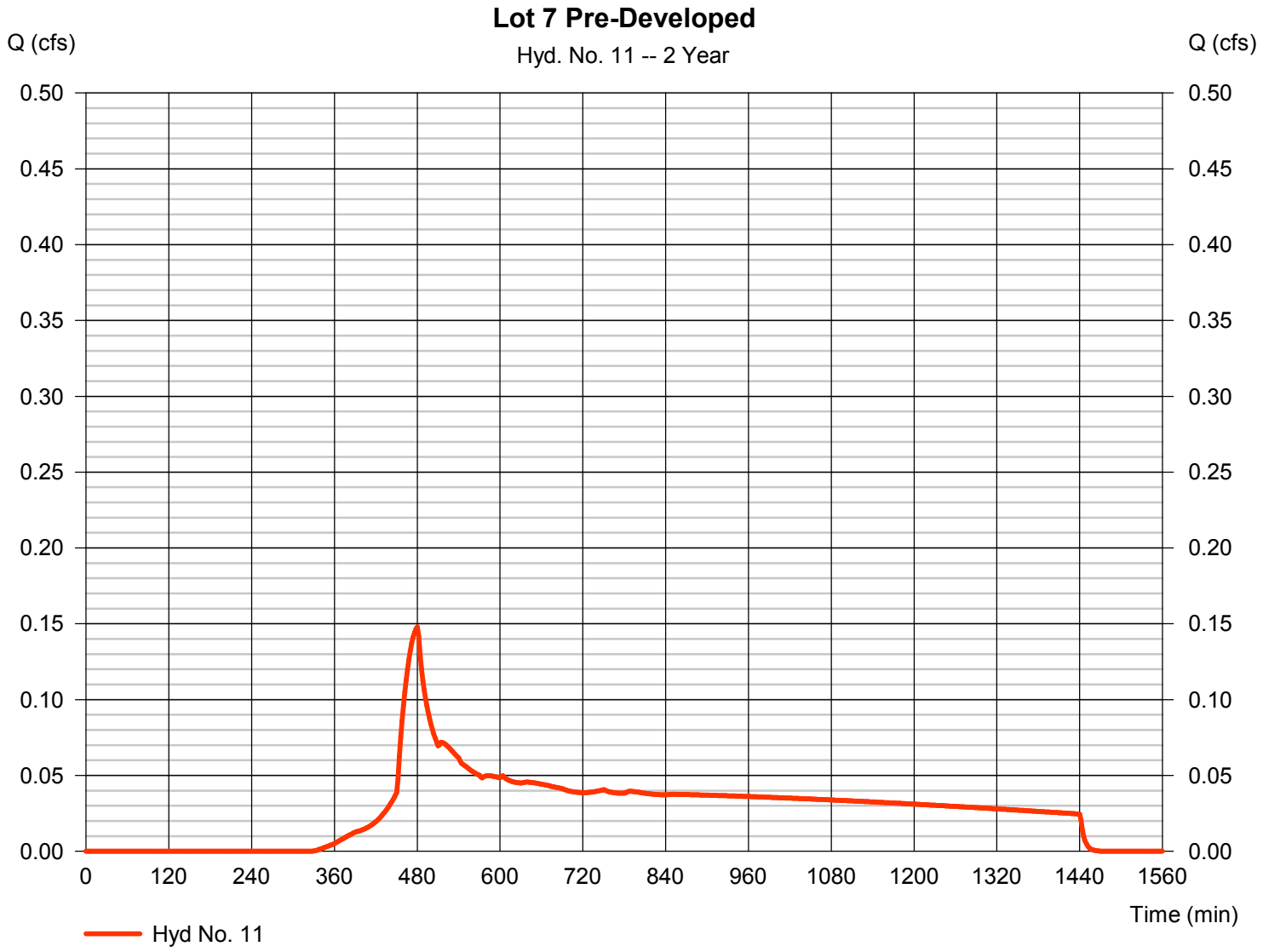
Hydrograph Report

Hyd. No. 11

Lot 7 Pre-Developed

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.148 cfs
Storm frequency	=	2 yrs	Time to peak	=	480 min
Time interval	=	2 min	Hyd. volume	=	2,536 cuft
Drainage area	=	0.700 ac	Curve number	=	82*
Basin Slope	=	2.7 %	Hydraulic length	=	220 ft
Tc method	=	LAG	Time of conc. (Tc)	=	5.40 min
Total precip.	=	2.50 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(0.200 x 98) + (0.500 x 75)] / 0.700



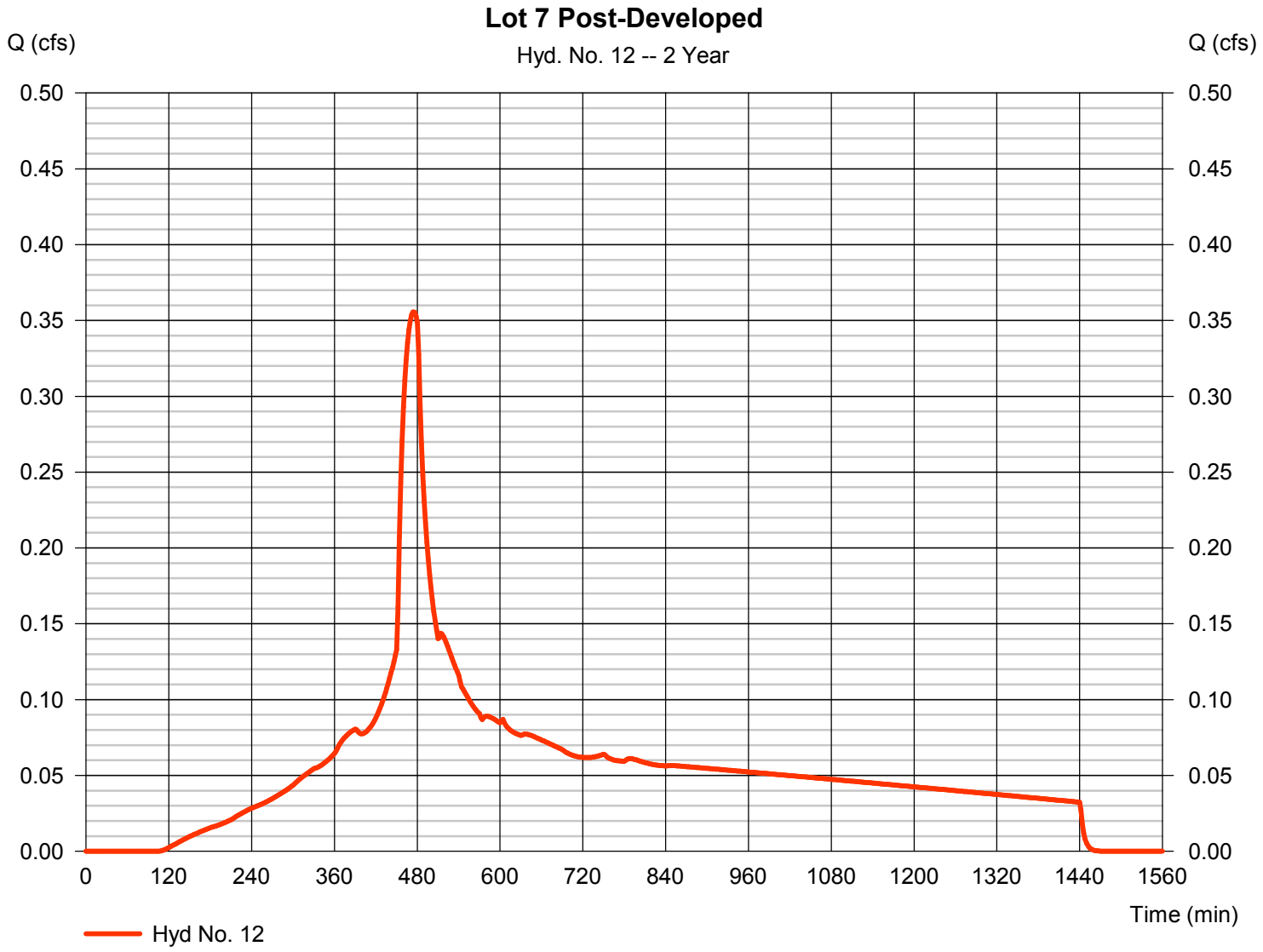
Hydrograph Report

Hyd. No. 12

Lot 7 Post-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.356 cfs
Storm frequency	= 2 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 4,989 cuft
Drainage area	= 0.700 ac	Curve number	= 95*
Basin Slope	= 3.5 %	Hydraulic length	= 100 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.610 x 98) + (0.090 x 75)] / 0.700



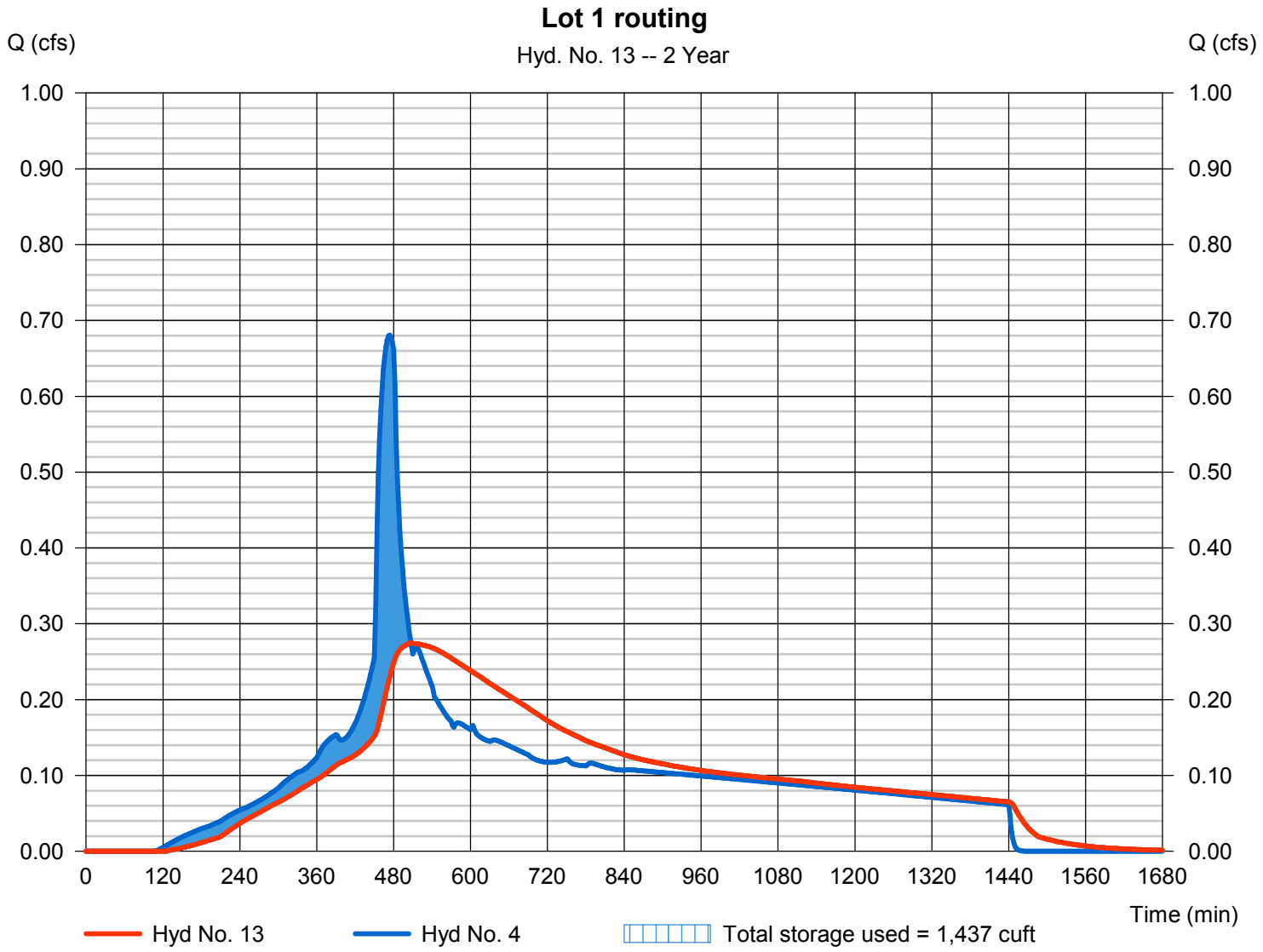
Hydrograph Report

Hyd. No. 13

Lot 1 routing

Hydrograph type	= Reservoir	Peak discharge	= 0.275 cfs
Storm frequency	= 2 yrs	Time to peak	= 508 min
Time interval	= 2 min	Hyd. volume	= 9,474 cuft
Inflow hyd. No.	= 4 - Lot 1 Post-Developed	Max. Elevation	= 186.01 ft
Reservoir name	= Lot 1 Storage	Max. Storage	= 1,437 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 2 - Lot 1 Storage

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	184.30	n/a	0	0
1.00	185.30	n/a	840	840
2.00	186.30	n/a	840	1,680
3.00	187.30	n/a	840	2,520

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.87	3.15	Inactive	Inactive
Span (in)	= 2.87	3.15	2.39	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 184.30	186.01	186.44	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.250 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	184.30	0.00	0.00	0.00	---	---	---	---	---	0.000	---	0.000
1.00	840	185.30	0.20 ic	0.00	0.00	---	---	---	---	---	0.000	---	0.203
2.00	1,680	186.30	0.30 ic	0.10 ic	0.00	---	---	---	---	---	0.000	---	0.400
3.00	2,520	187.30	0.37 ic	0.28 ic	0.00	---	---	---	---	---	0.000	---	0.648

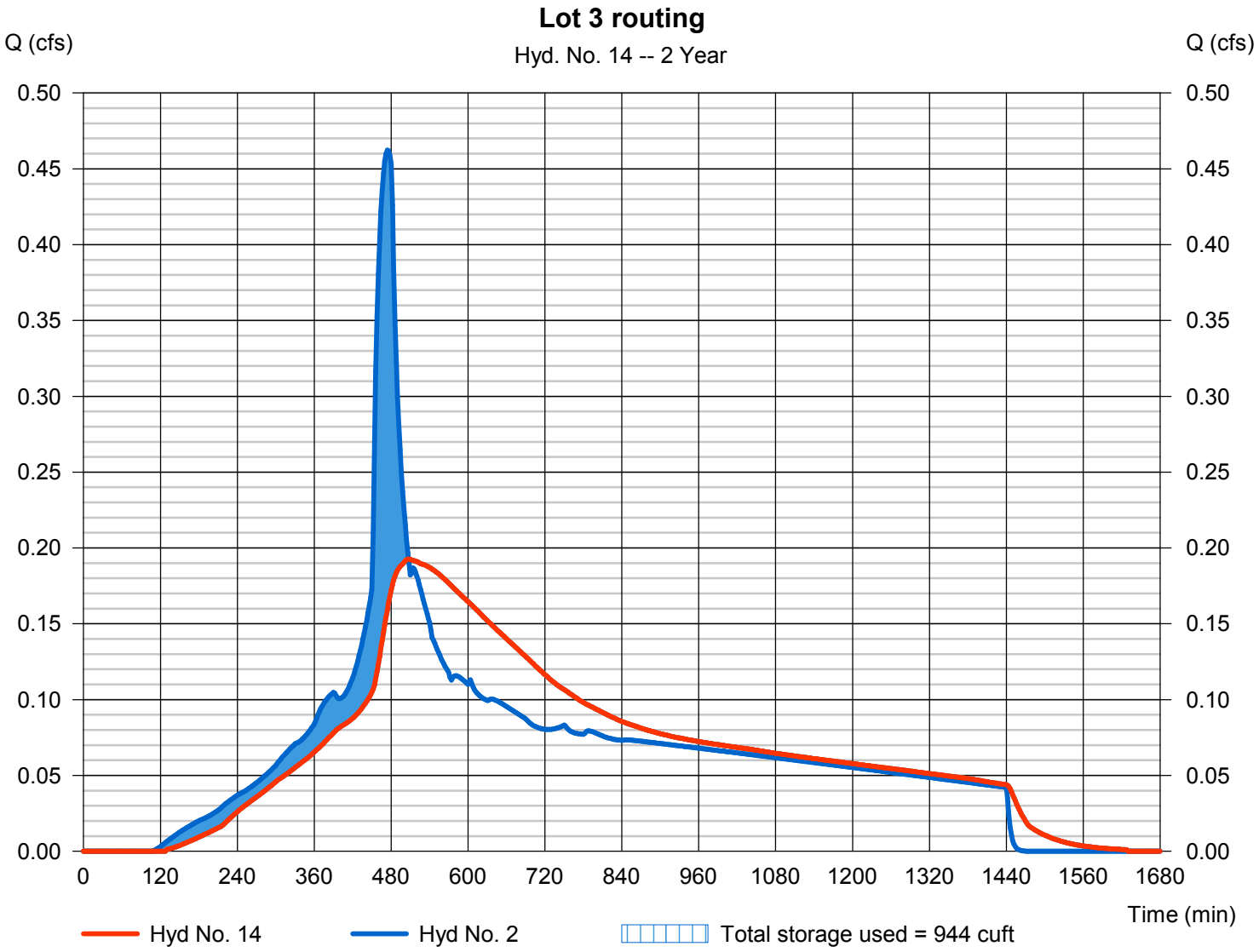
Hydrograph Report

Hyd. No. 14

Lot 3 routing

Hydrograph type	=	Reservoir	Peak discharge	=	0.193 cfs
Storm frequency	=	2 yrs	Time to peak	=	508 min
Time interval	=	2 min	Hyd. volume	=	6,482 cuft
Inflow hyd. No.	=	2 - Lot 3 Post-Developed	Max. Elevation	=	188.17 ft
Reservoir name	=	Lot 3 Storage	Max. Storage	=	944 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 1 - Lot 3 Storage

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	186.45	n/a	0	0
1.00	187.45	n/a	550	550
2.00	188.45	n/a	550	1,100
3.00	189.45	n/a	550	1,650

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.39	2.61	Inactive	0.00
Span (in)	= 2.39	2.61	2.38	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 186.45	188.17	188.68	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.250 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	186.45	0.00	0.00	0.00	---	---	---	---	---	0.000	---	0.000
1.00	550	187.45	0.14 ic	0.00	0.00	---	---	---	---	---	0.000	---	0.142
2.00	1,100	188.45	0.21 ic	0.07 ic	0.00	---	---	---	---	---	0.000	---	0.281
3.00	1,650	189.45	0.26 ic	0.19 ic	0.00	---	---	---	---	---	0.000	---	0.449

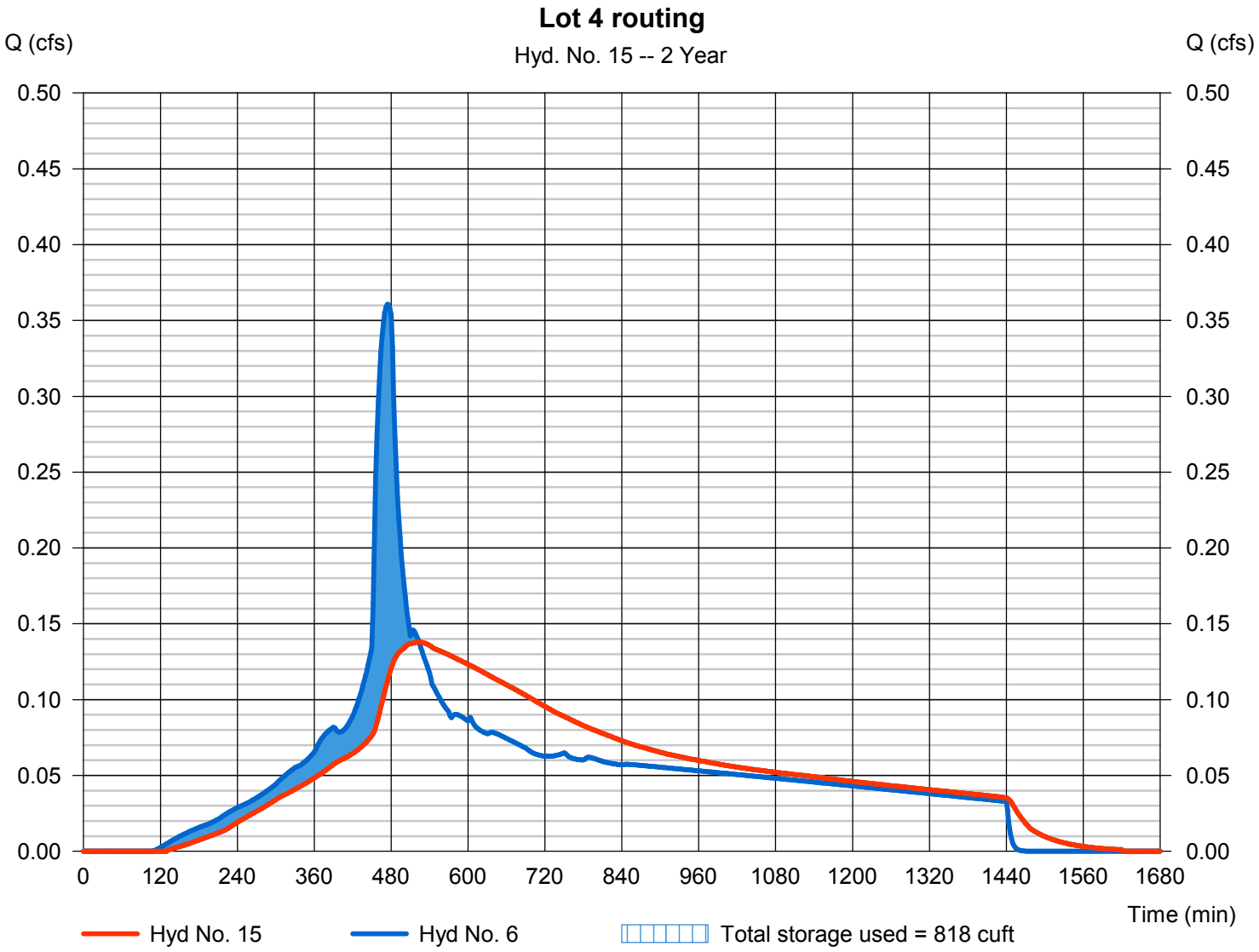
Hydrograph Report

Hyd. No. 15

Lot 4 routing

Hydrograph type	=	Reservoir	Peak discharge	=	0.138 cfs
Storm frequency	=	2 yrs	Time to peak	=	524 min
Time interval	=	2 min	Hyd. volume	=	5,057 cuft
Inflow hyd. No.	=	6 - Lot 4 Post-Developed	Max. Elevation	=	186.44 ft
Reservoir name	=	Lot 4 Storage	Max. Storage	=	818 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 3 - Lot 4 Storage

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	184.70	n/a	0	0
1.00	185.70	n/a	470	470
2.00	186.70	n/a	470	940
3.00	187.70	n/a	470	1,410

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	2.31	Inactive	Inactive
Span (in)	= 2.00	2.31	1.65	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 184.70	186.44	191.88	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.250 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	184.70	0.00	0.00	0.00	---	---	---	---	---	0.000	---	0.000
1.00	470	185.70	0.10 ic	0.00	0.00	---	---	---	---	---	0.000	---	0.101
2.00	940	186.70	0.15 ic	0.06 ic	0.00	---	---	---	---	---	0.000	---	0.202
3.00	1,410	187.70	0.18 ic	0.15 ic	0.00	---	---	---	---	---	0.000	---	0.331

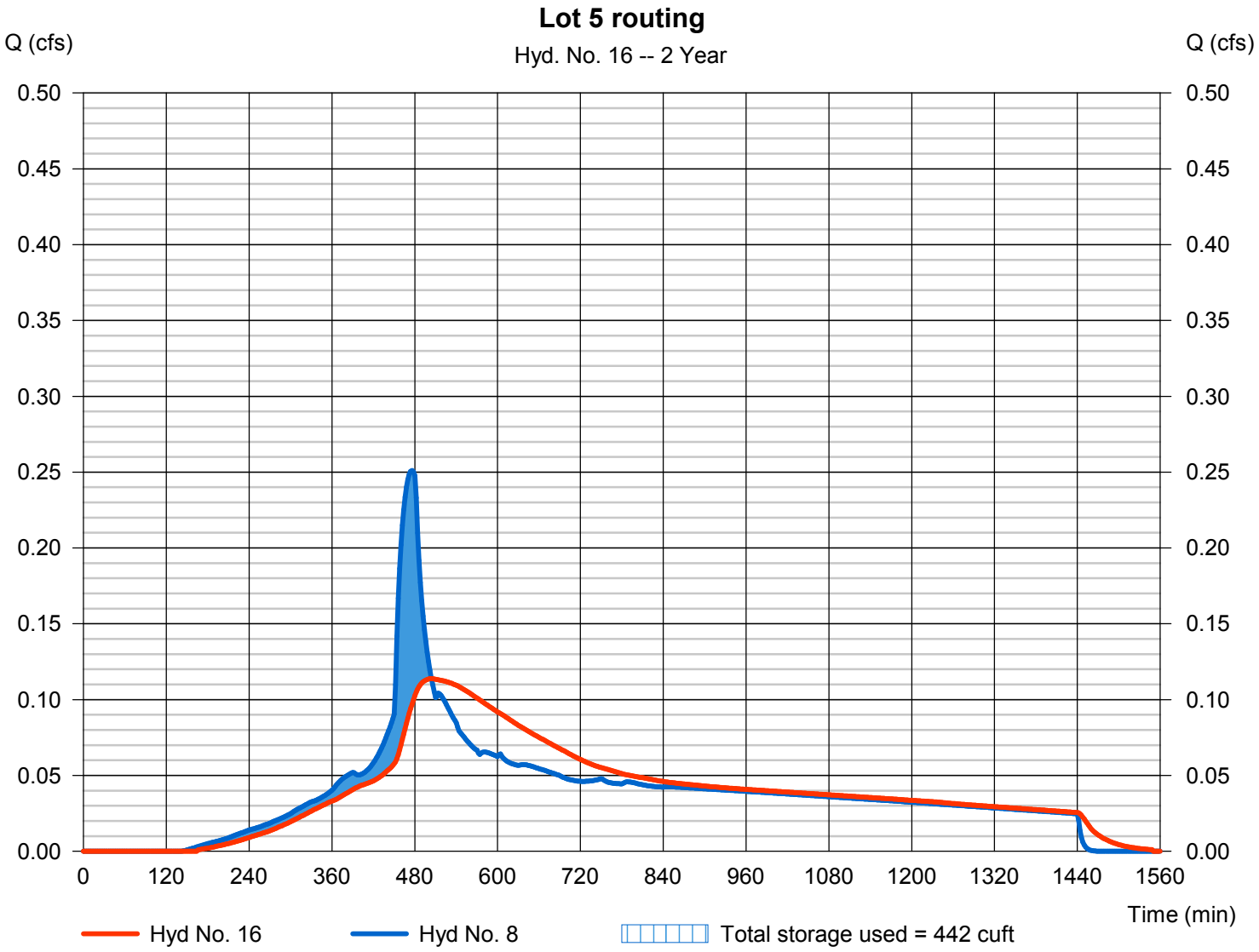
Hydrograph Report

Hyd. No. 16

Lot 5 routing

Hydrograph type	=	Reservoir	Peak discharge	=	0.114 cfs
Storm frequency	=	2 yrs	Time to peak	=	504 min
Time interval	=	2 min	Hyd. volume	=	3,551 cuft
Inflow hyd. No.	=	8 - Lot 5 Post-Developed	Max. Elevation	=	185.80 ft
Reservoir name	=	Lot 5 Storage	Max. Storage	=	442 cuft

Storage Indication method used. Outflow includes exfiltration.



Pond No. 4 - Lot 5 Storage

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	184.22	n/a	0	0
1.00	185.22	n/a	280	280
2.00	186.22	n/a	280	560
3.00	187.22	n/a	280	840

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 1.88	1.98	Inactive	Inactive
Span (in)	= 1.88	1.98	1.60	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 184.22	185.81	185.42	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.250 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	184.22	0.00	0.00	0.00	---	---	---	---	---	0.000	---	0.000
1.00	280	185.22	0.09 ic	0.00	0.00	---	---	---	---	---	0.000	---	0.089
2.00	560	186.22	0.13 ic	0.06 ic	0.00	---	---	---	---	---	0.000	---	0.188
3.00	840	187.22	0.16 ic	0.12 ic	0.00	---	---	---	---	---	0.000	---	0.277

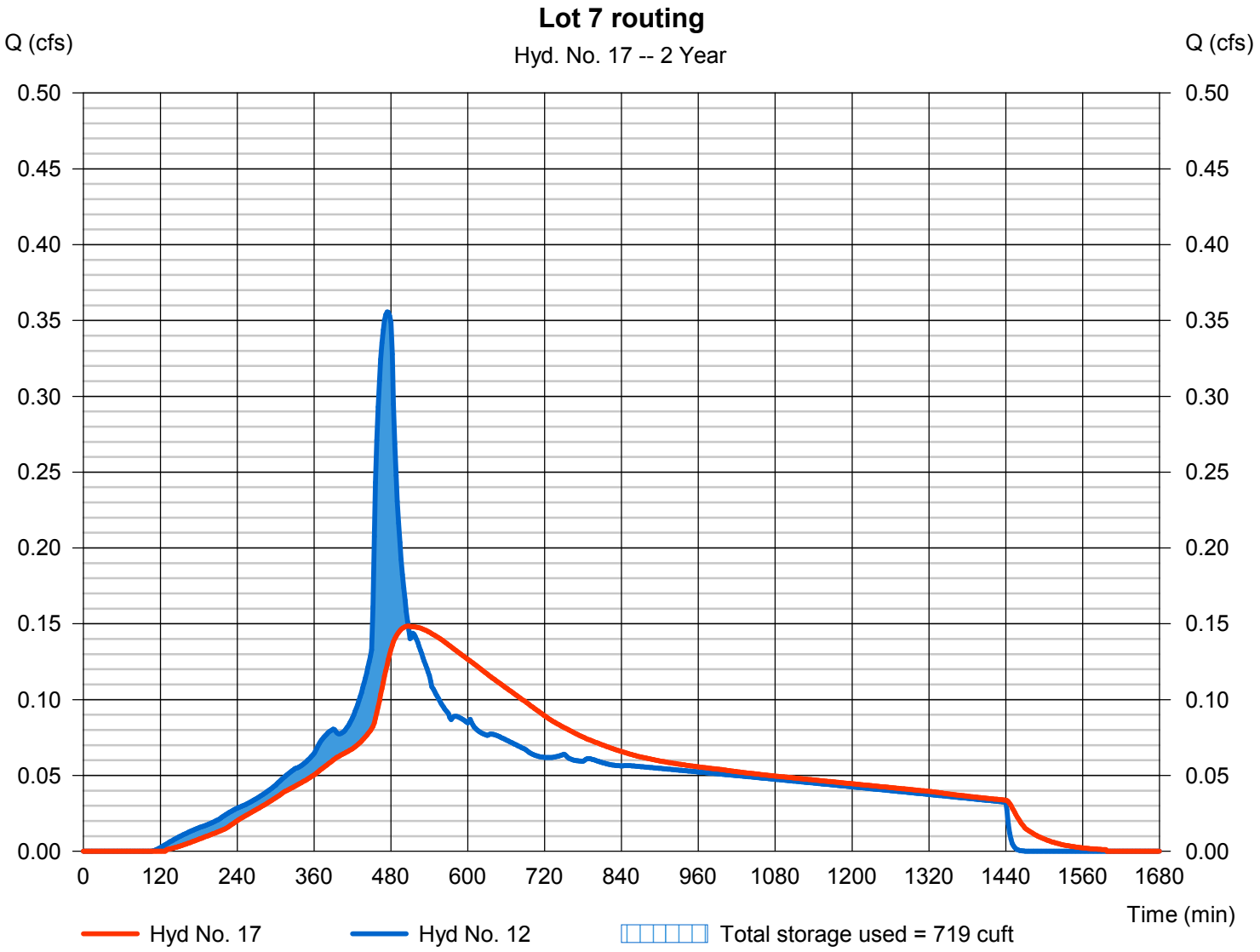
Hydrograph Report

Hyd. No. 17

Lot 7 routing

Hydrograph type	=	Reservoir	Peak discharge	=	0.148 cfs
Storm frequency	=	2 yrs	Time to peak	=	508 min
Time interval	=	2 min	Hyd. volume	=	4,986 cuft
Inflow hyd. No.	=	12 - Lot 7 Post-Developed	Max. Elevation	=	183.07 ft
Reservoir name	=	Lot 7 Storage	Max. Storage	=	719 cuft

Storage Indication method used.



Pond No. 6 - Lot 7 Storage

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	181.40	n/a	0	0
1.00	182.40	n/a	430	430
2.00	183.40	n/a	430	860
3.00	184.40	n/a	430	1,290

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.11	2.27	Inactive	Inactive
Span (in)	= 2.11	2.27	2.20	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 181.40	183.07	182.54	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	181.40	0.00	0.00	0.00	---	---	---	---	---	---	---	0.000
1.00	430	182.40	0.11 ic	0.00	0.00	---	---	---	---	---	---	---	0.112
2.00	860	183.40	0.16 ic	0.07 ic	0.00	---	---	---	---	---	---	---	0.227
3.00	1,290	184.40	0.20 ic	0.15 ic	0.00	---	---	---	---	---	---	---	0.350

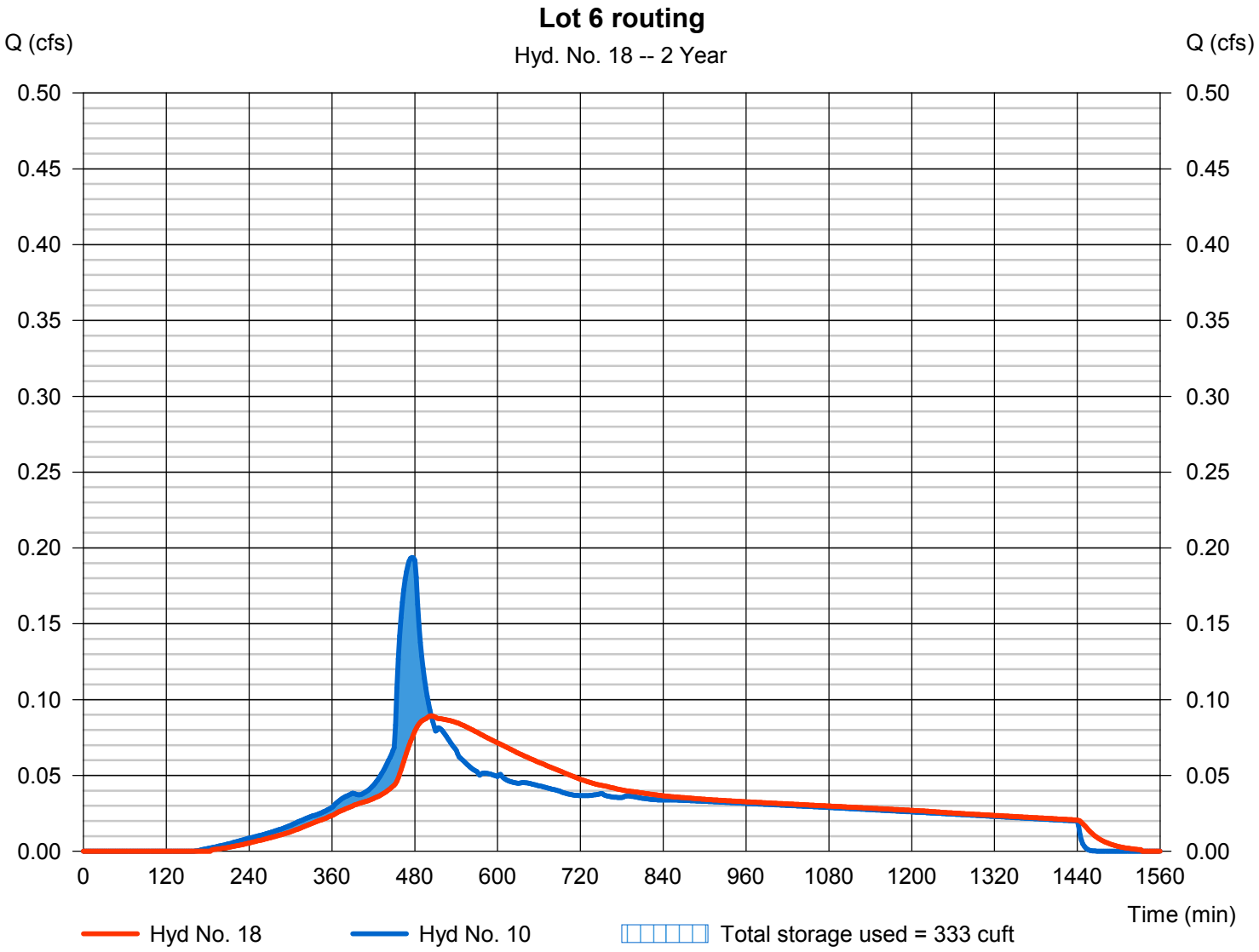
Hydrograph Report

Hyd. No. 18

Lot 6 routing

Hydrograph type	=	Reservoir	Peak discharge	=	0.089 cfs
Storm frequency	=	2 yrs	Time to peak	=	504 min
Time interval	=	2 min	Hyd. volume	=	2,764 cuft
Inflow hyd. No.	=	10 - Lot 6 Post-Developed	Max. Elevation	=	183.51 ft
Reservoir name	=	Lot 6 Storage	Max. Storage	=	333 cuft

Storage Indication method used.



Pond No. 5 - Lot 6 Storage

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	182.00	n/a	0	0
1.00	183.00	n/a	220	220
2.00	184.00	n/a	220	440
3.00	185.00	n/a	220	660

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 1.67	1.78	Inactive	Inactive
Span (in)	= 1.67	1.78	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 182.00	183.52	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	182.00	0.00	0.00	---	---	---	---	---	---	---	---	0.000
1.00	220	183.00	0.07 ic	0.00	---	---	---	---	---	---	---	---	0.071
2.00	440	184.00	0.10 ic	0.05 ic	---	---	---	---	---	---	---	---	0.155
3.00	660	185.00	0.13 ic	0.10 ic	---	---	---	---	---	---	---	---	0.224

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.514

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SBUH Runoff	0.548	2	480	8,606	------	------	------	Lot 1 Pre-Developed
2	SBUH Runoff	0.691	2	474	9,709	------	------	------	Lot 3 Post-Developed
3	SBUH Runoff	0.381	2	478	5,888	------	------	------	Lot 3 Pre-Developed
4	SBUH Runoff	1.016	2	472	14,190	------	------	------	Lot 1 Post-Developed
5	SBUH Runoff	0.281	2	480	4,403	------	------	------	Lot 4 Pre-Developed
6	SBUH Runoff	0.539	2	474	7,575	------	------	------	Lot 4 Post-Developed
7	SBUH Runoff	0.230	2	478	3,559	------	------	------	Lot 5 Pre-Developed
8	SBUH Runoff	0.389	2	474	5,460	------	------	------	Lot 5 Post-Developed
9	SBUH Runoff	0.182	2	480	2,853	------	------	------	Lot 6 Pre-Developed
10	SBUH Runoff	0.306	2	476	4,307	------	------	------	Lot 6 Post-Developed
11	SBUH Runoff	0.292	2	480	4,530	------	------	------	Lot 7 Pre-Developed
12	SBUH Runoff	0.531	2	474	7,468	------	------	------	Lot 7 Post-Developed
13	Reservoir	0.547	2	494	14,185	4	186.81	2,106	Lot 1 routing
14	Reservoir	0.381	2	494	9,705	2	188.97	1,383	Lot 3 routing
15	Reservoir	0.281	2	496	7,572	6	187.23	1,188	Lot 4 routing
16	Reservoir	0.229	2	494	5,458	8	186.62	673	Lot 5 routing
17	Reservoir	0.292	2	494	7,465	12	183.86	1,057	Lot 7 routing
18	Reservoir	0.182	2	492	4,305	10	184.34	515	Lot 6 routing

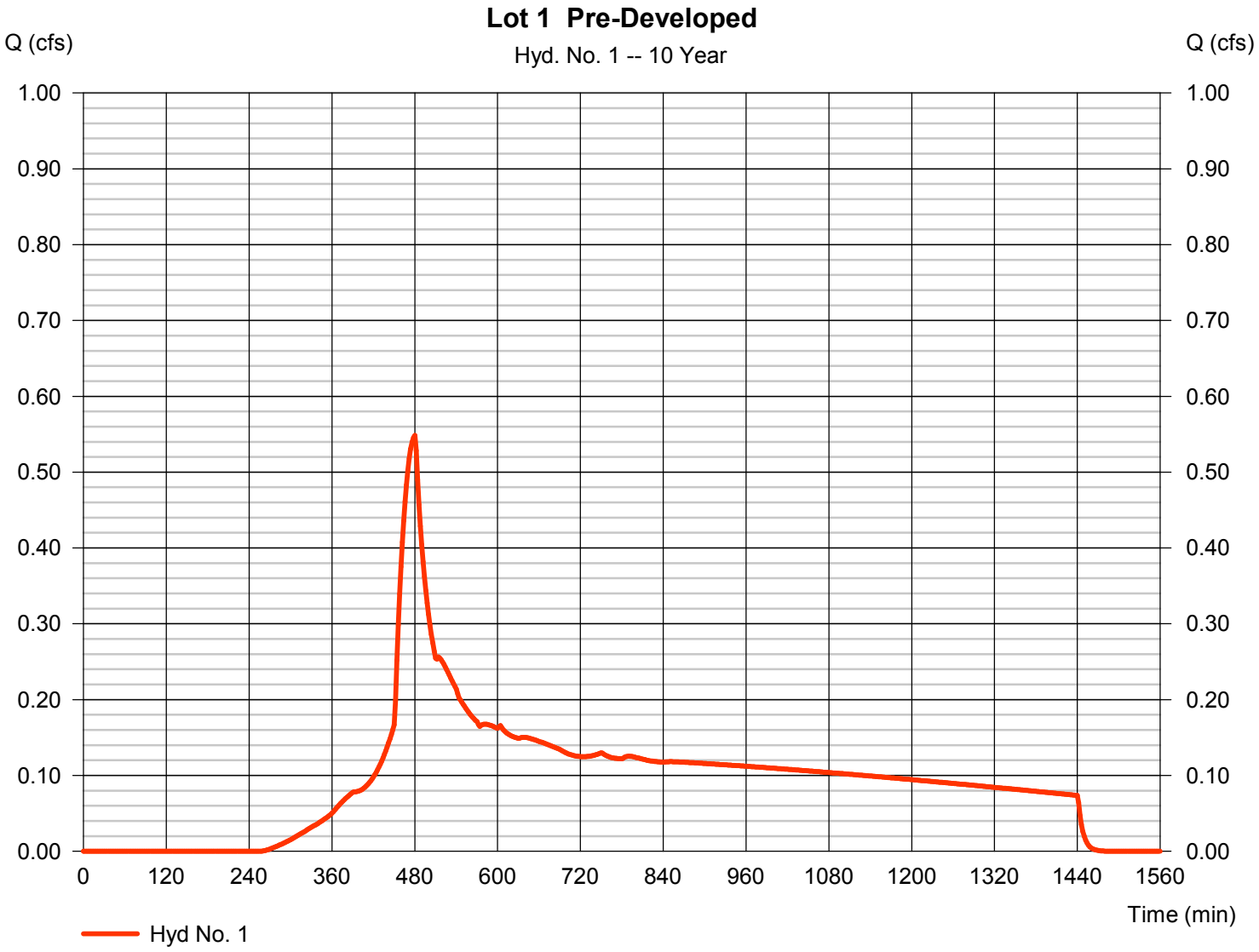
Hydrograph Report

Hyd. No. 1

Lot 1 Pre-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.548 cfs
Storm frequency	= 10 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 8,606 cuft
Drainage area	= 1.330 ac	Curve number	= 82*
Basin Slope	= 2.8 %	Hydraulic length	= 300 ft
Tc method	= LAG	Time of conc. (Tc)	= 6.80 min
Total precip.	= 3.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.380 x 98) + (0.950 x 75)] / 1.330



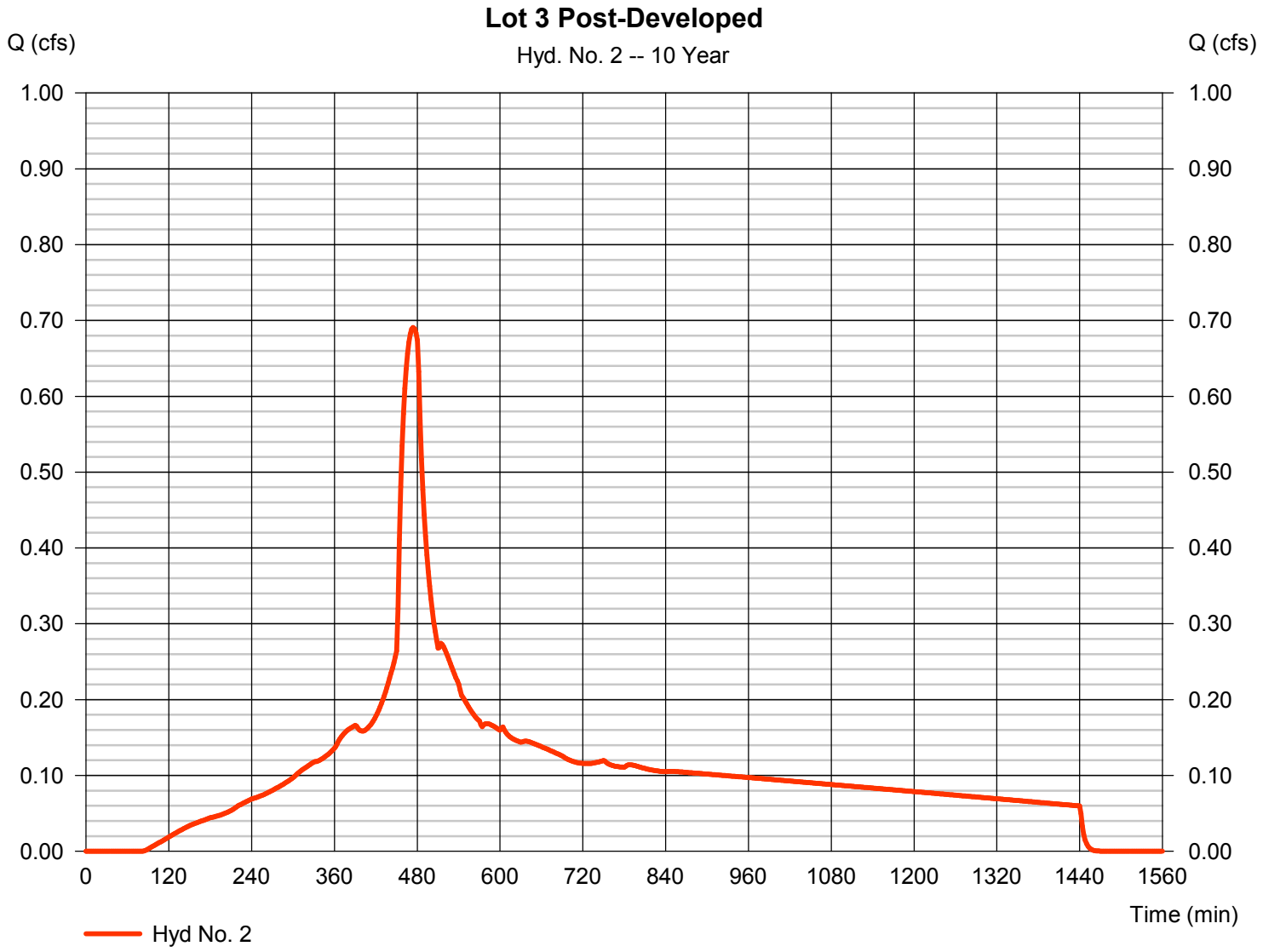
Hydrograph Report

Hyd. No. 2

Lot 3 Post-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.691 cfs
Storm frequency	= 10 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 9,709 cuft
Drainage area	= 0.910 ac	Curve number	= 95*
Basin Slope	= 2.7 %	Hydraulic length	= 260 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.790 x 98) + (0.120 x 75)] / 0.910



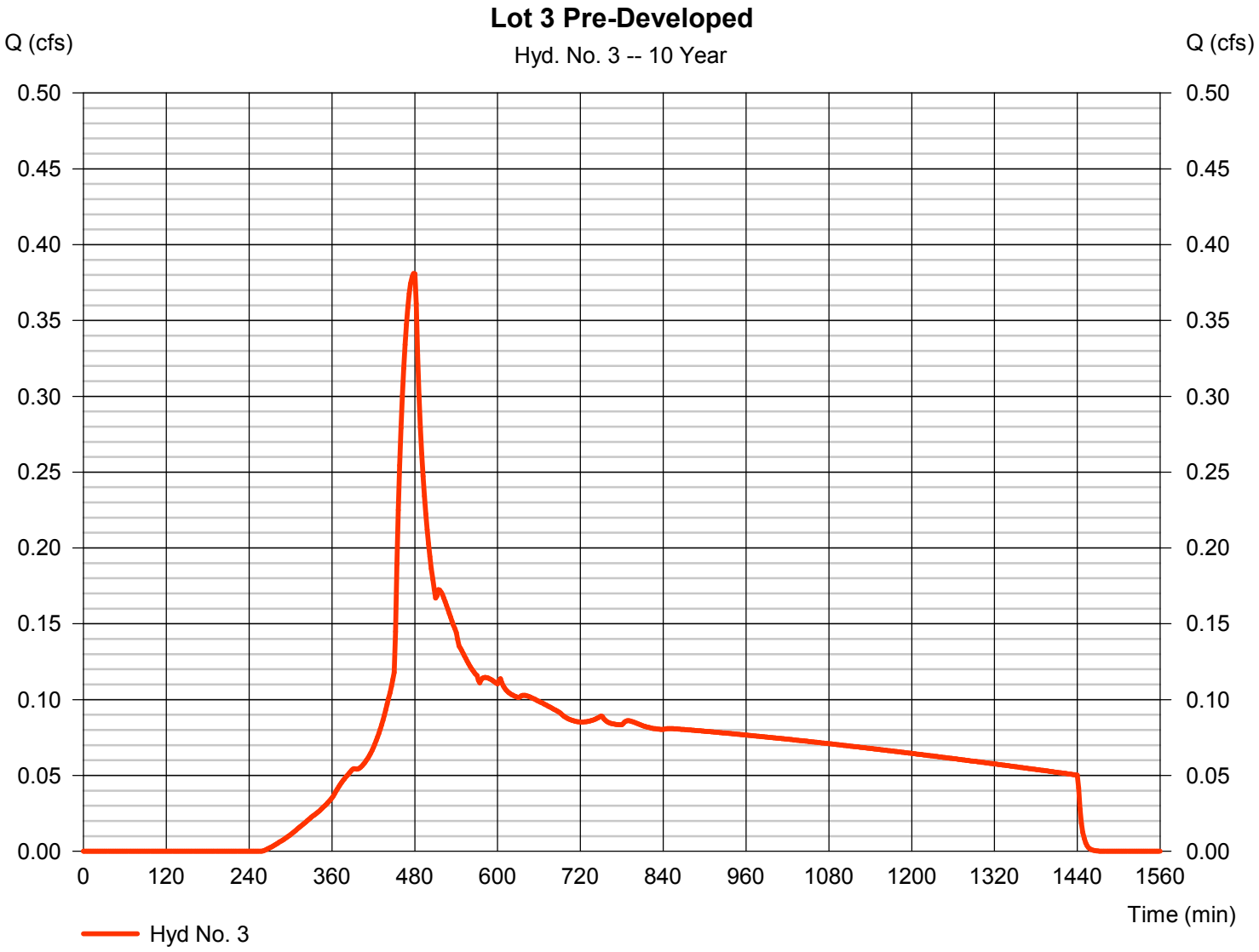
Hydrograph Report

Hyd. No. 3

Lot 3 Pre-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.381 cfs
Storm frequency	= 10 yrs	Time to peak	= 478 min
Time interval	= 2 min	Hyd. volume	= 5,888 cuft
Drainage area	= 0.910 ac	Curve number	= 82*
Basin Slope	= 2.7 %	Hydraulic length	= 260 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.260 x 98) + (0.650 x 75)] / 0.910



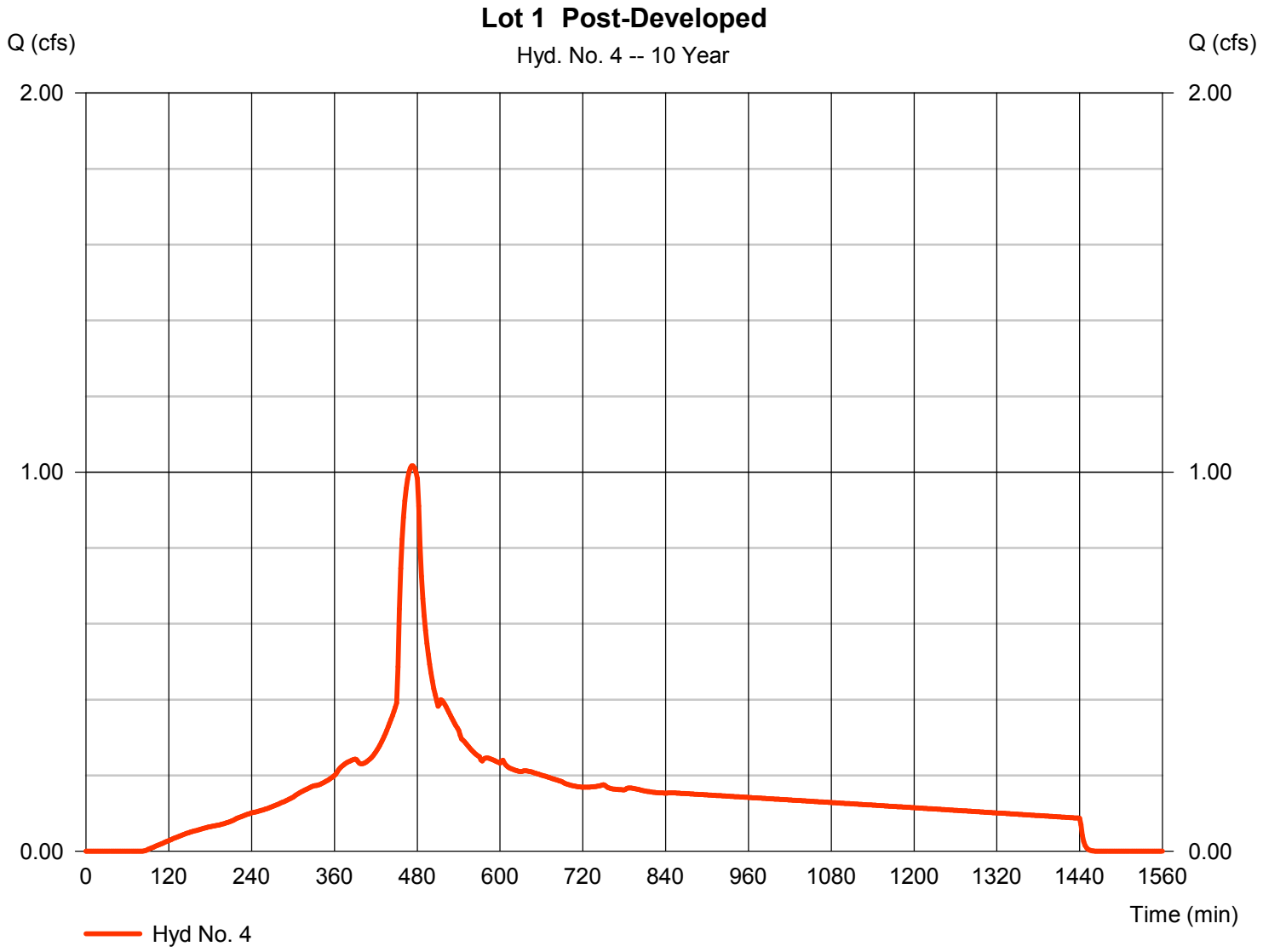
Hydrograph Report

Hyd. No. 4

Lot 1 Post-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 1.016 cfs
Storm frequency	= 10 yrs	Time to peak	= 472 min
Time interval	= 2 min	Hyd. volume	= 14,190 cuft
Drainage area	= 1.330 ac	Curve number	= 95*
Basin Slope	= 2.8 %	Hydraulic length	= 300 ft
Tc method	= LAG	Time of conc. (Tc)	= 4.00 min
Total precip.	= 3.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(1.170 x 98) + (0.160 x 75)] / 1.330



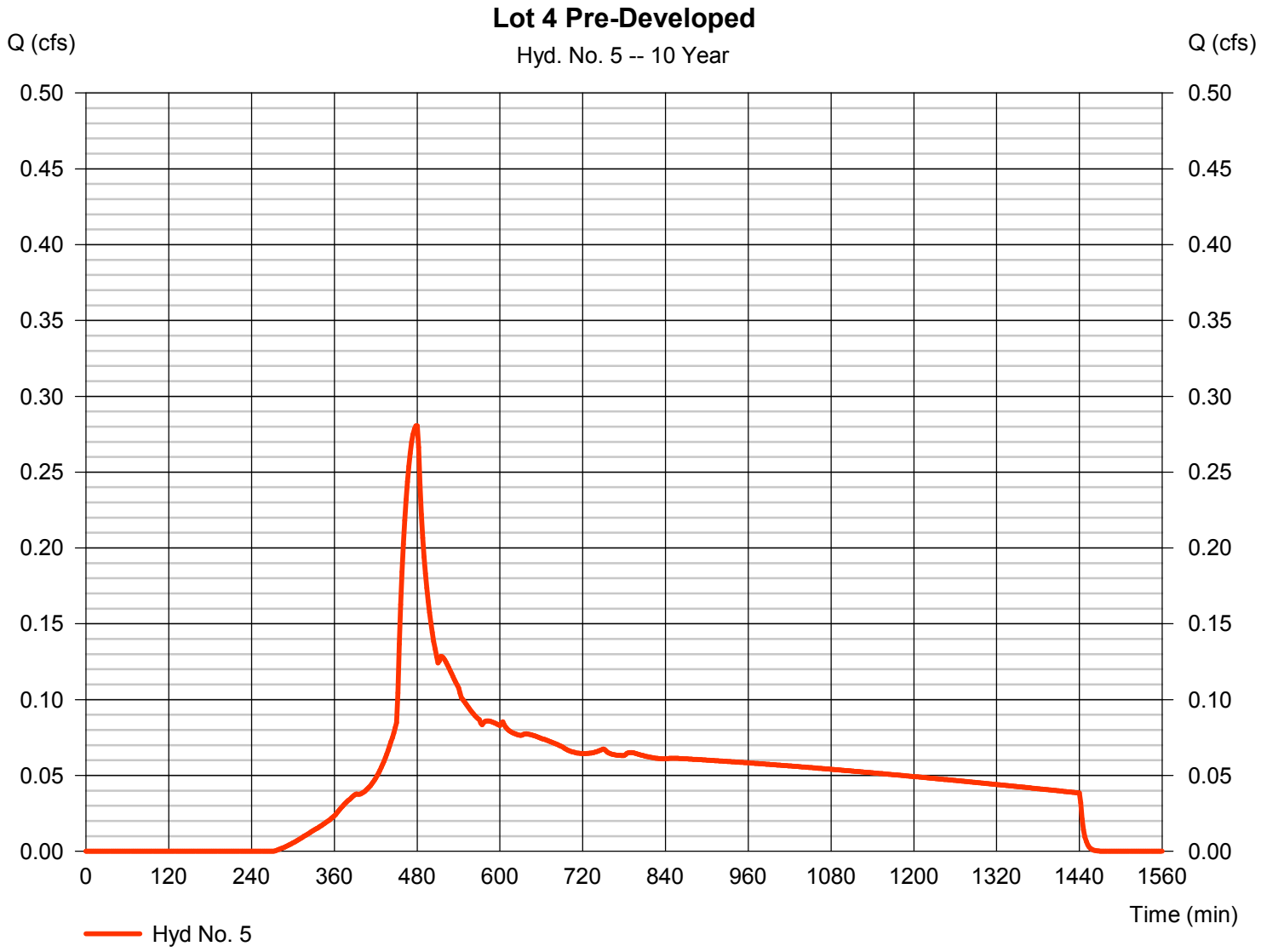
Hydrograph Report

Hyd. No. 5

Lot 4 Pre-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.281 cfs
Storm frequency	= 10 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 4,403 cuft
Drainage area	= 0.710 ac	Curve number	= 81*
Basin Slope	= 2.7 %	Hydraulic length	= 260 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.200 x 98) + (0.510 x 75)] / 0.710



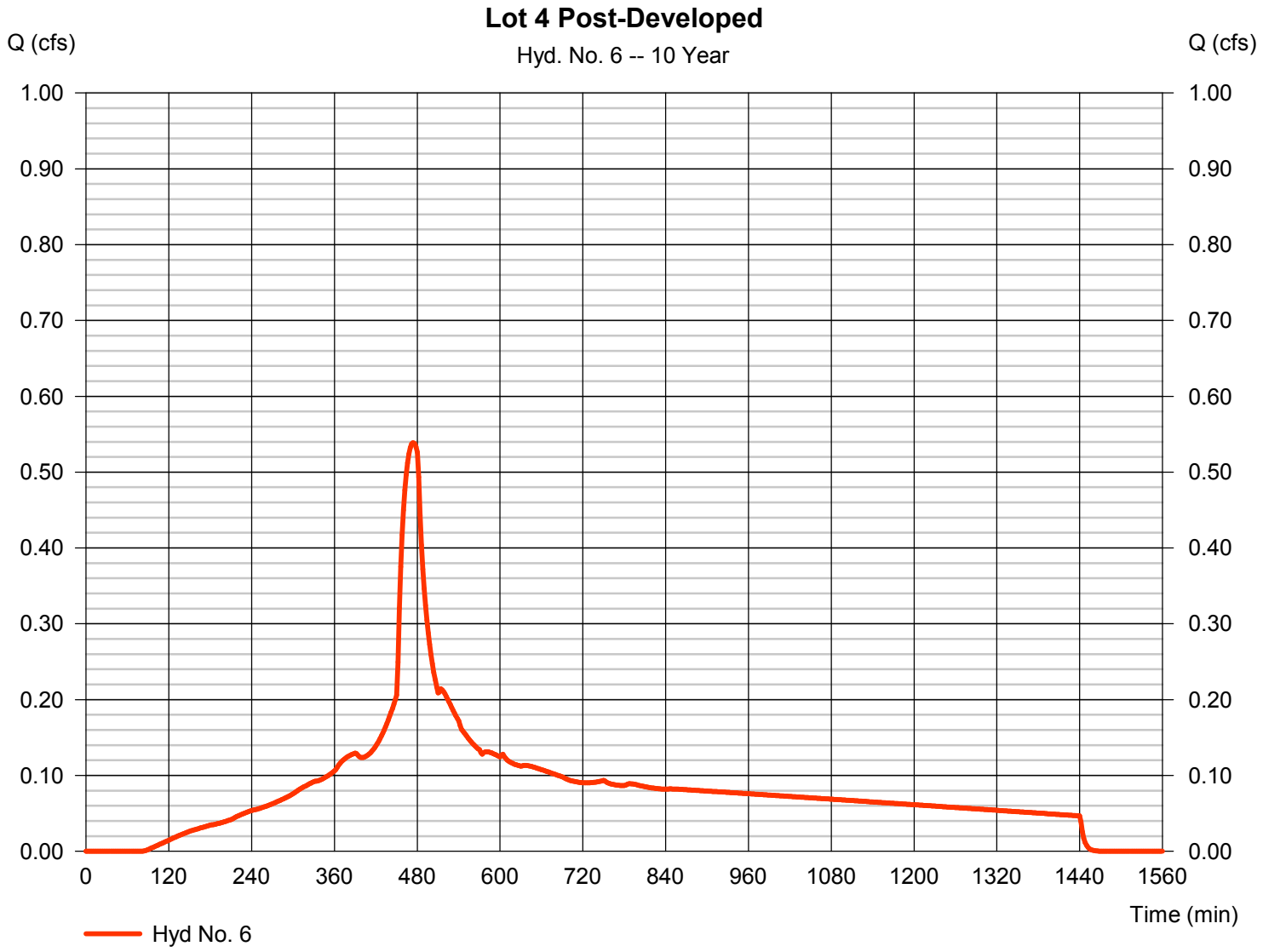
Hydrograph Report

Hyd. No. 6

Lot 4 Post-Developed

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.539 cfs
Storm frequency	=	10 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	7,575 cuft
Drainage area	=	0.710 ac	Curve number	=	95*
Basin Slope	=	2.7 %	Hydraulic length	=	260 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.50 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(0.610 x 98) + (0.100 x 75)] / 0.710



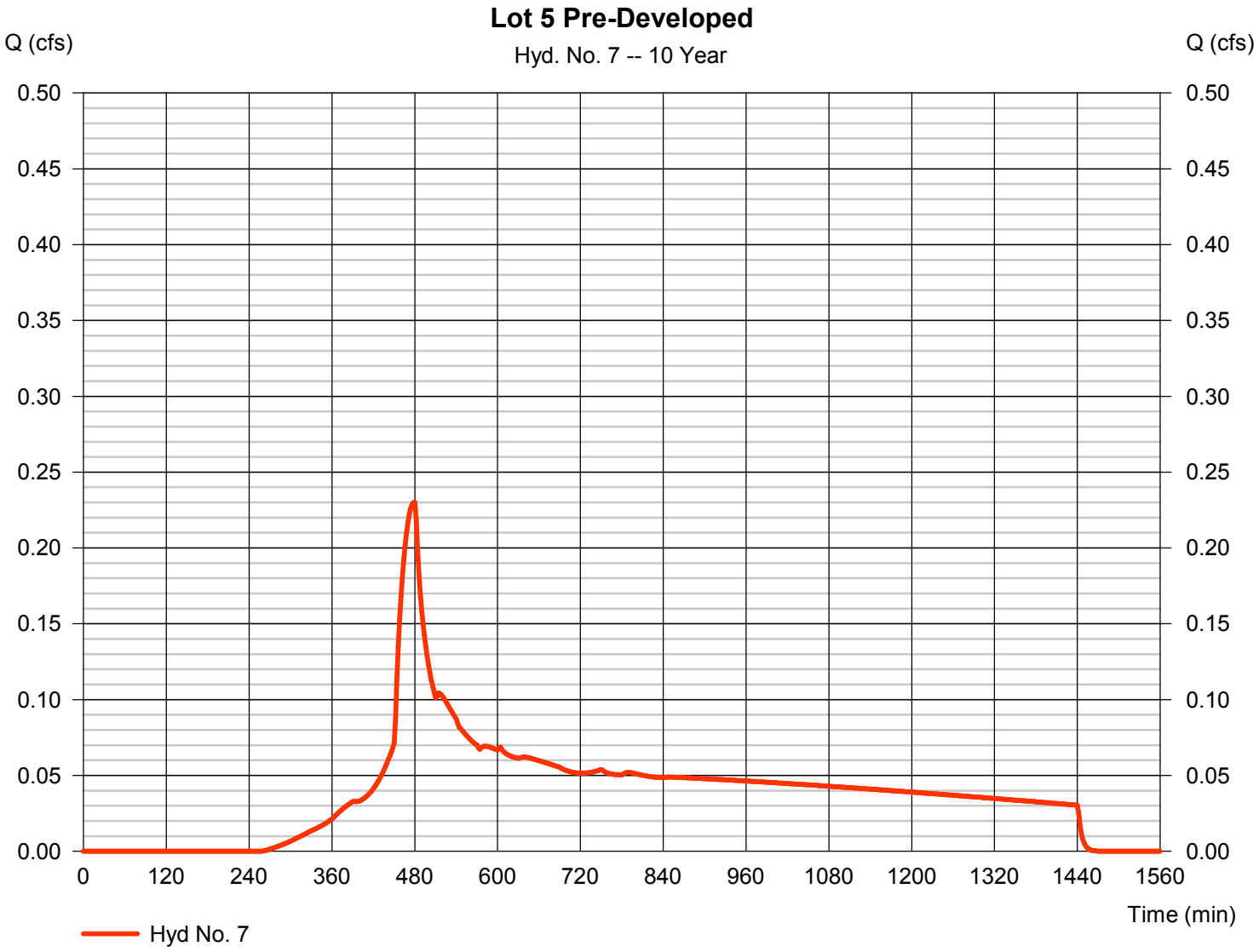
Hydrograph Report

Hyd. No. 7

Lot 5 Pre-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.230 cfs
Storm frequency	= 10 yrs	Time to peak	= 478 min
Time interval	= 2 min	Hyd. volume	= 3,559 cuft
Drainage area	= 0.550 ac	Curve number	= 82*
Basin Slope	= 2.2 %	Hydraulic length	= 180 ft
Tc method	= LAG	Time of conc. (Tc)	= 5.10 min
Total precip.	= 3.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.160 x 98) + (0.390 x 75)] / 0.550



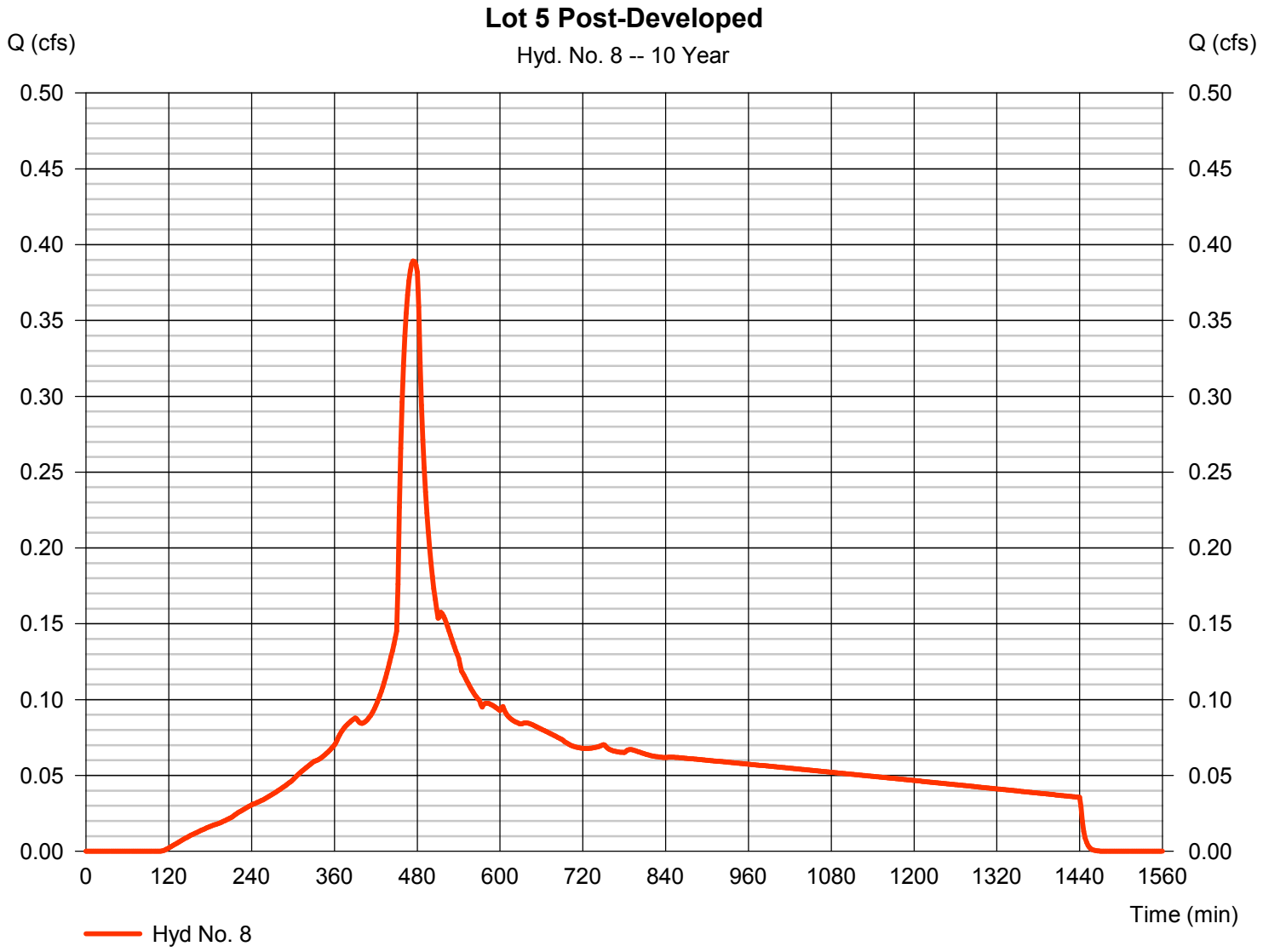
Hydrograph Report

Hyd. No. 8

Lot 5 Post-Developed

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.389 cfs
Storm frequency	=	10 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	5,460 cuft
Drainage area	=	0.550 ac	Curve number	=	93*
Basin Slope	=	2.0 %	Hydraulic length	=	90 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.50 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(0.430 x 98) + (0.120 x 75)] / 0.550



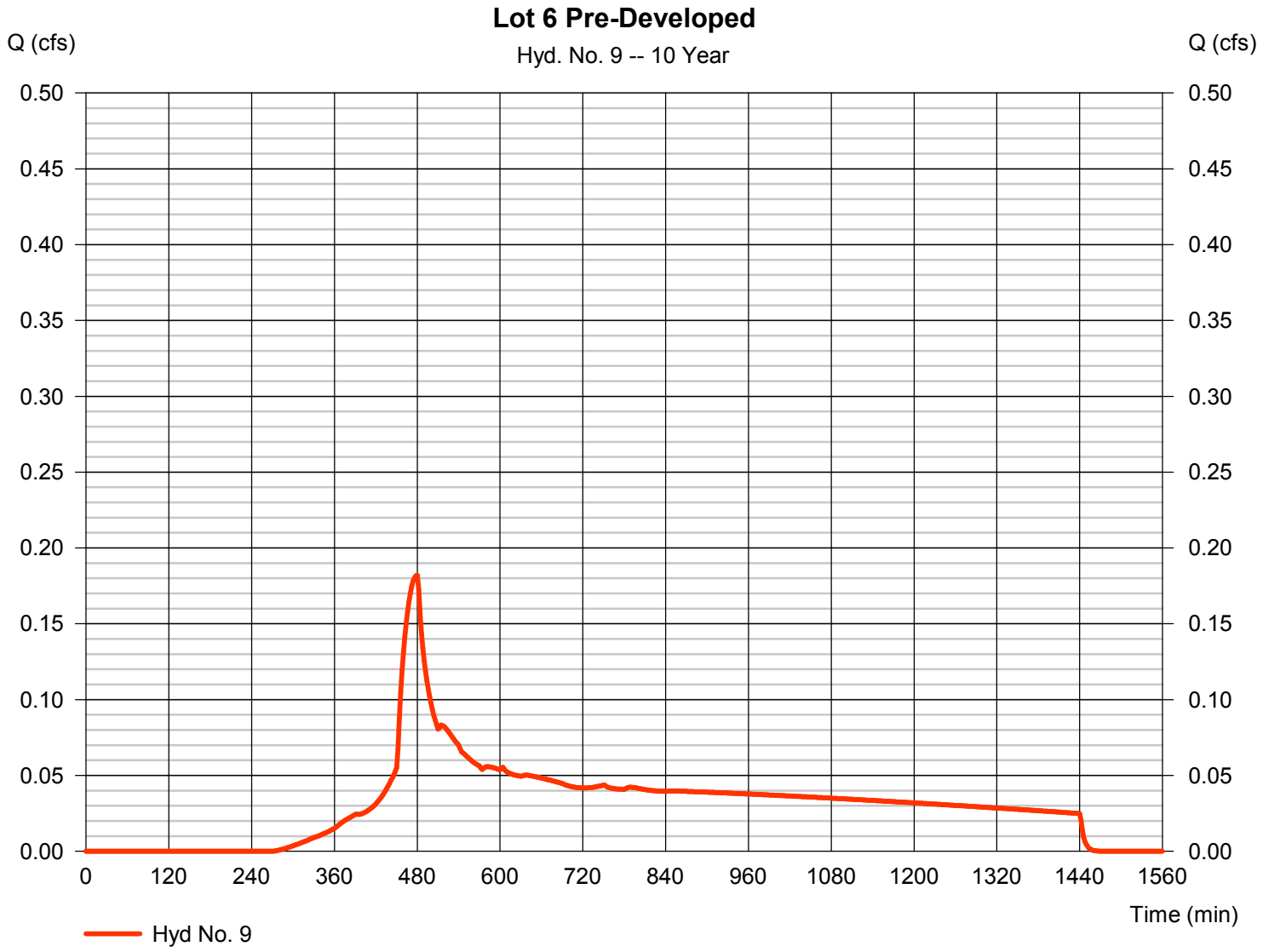
Hydrograph Report

Hyd. No. 9

Lot 6 Pre-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.182 cfs
Storm frequency	= 10 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 2,853 cuft
Drainage area	= 0.460 ac	Curve number	= 81*
Basin Slope	= 2.3 %	Hydraulic length	= 110 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.130 x 95) + (0.330 x 75)] / 0.460



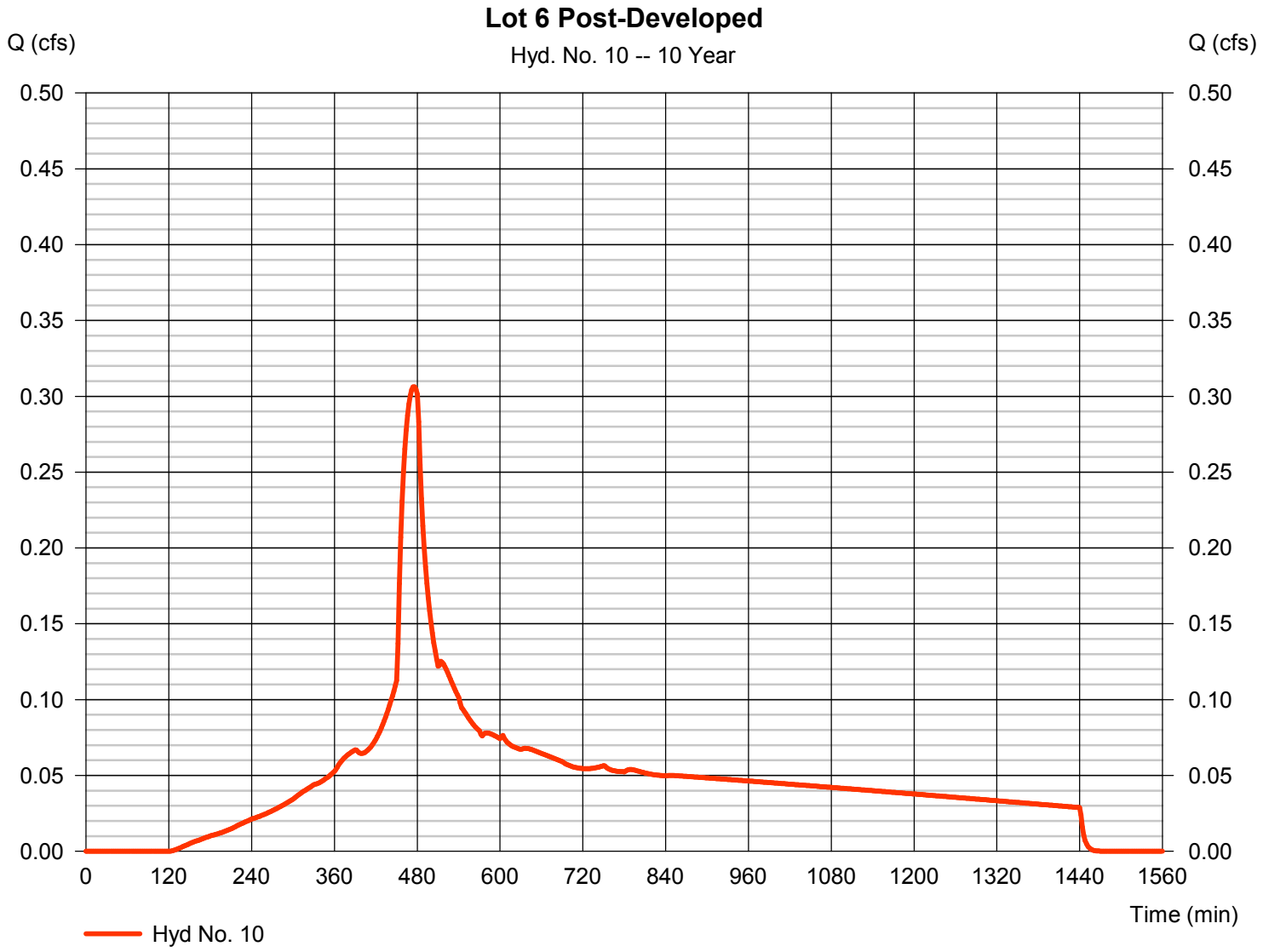
Hydrograph Report

Hyd. No. 10

Lot 6 Post-Developed

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.306 cfs
Storm frequency	=	10 yrs	Time to peak	=	476 min
Time interval	=	2 min	Hyd. volume	=	4,307 cuft
Drainage area	=	0.450 ac	Curve number	=	92*
Basin Slope	=	2.0 %	Hydraulic length	=	90 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.50 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(0.330 x 98) + (0.120 x 75)] / 0.450



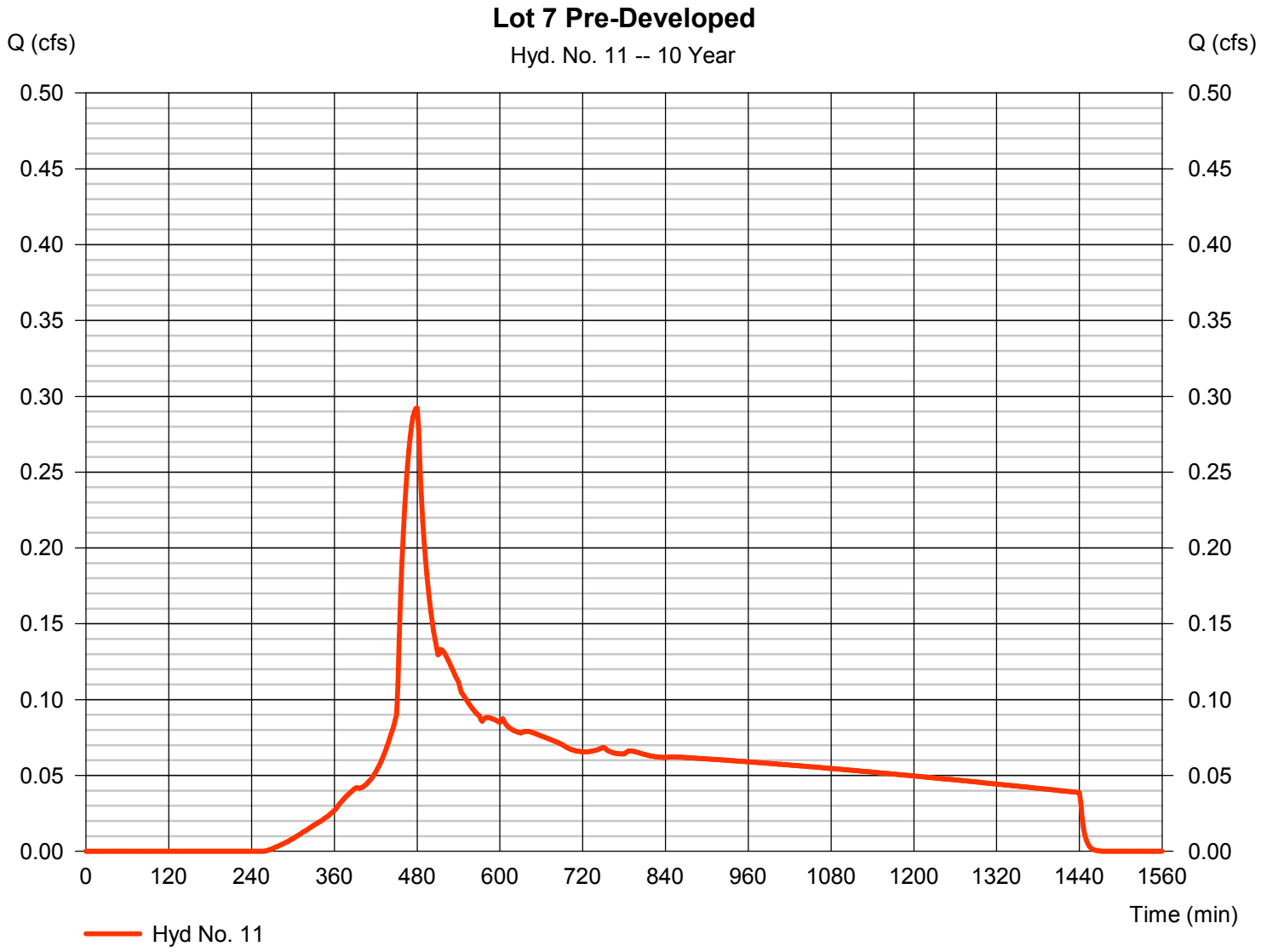
Hydrograph Report

Hyd. No. 11

Lot 7 Pre-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.292 cfs
Storm frequency	= 10 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 4,530 cuft
Drainage area	= 0.700 ac	Curve number	= 82*
Basin Slope	= 2.7 %	Hydraulic length	= 220 ft
Tc method	= LAG	Time of conc. (Tc)	= 5.40 min
Total precip.	= 3.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.200 x 98) + (0.500 x 75)] / 0.700



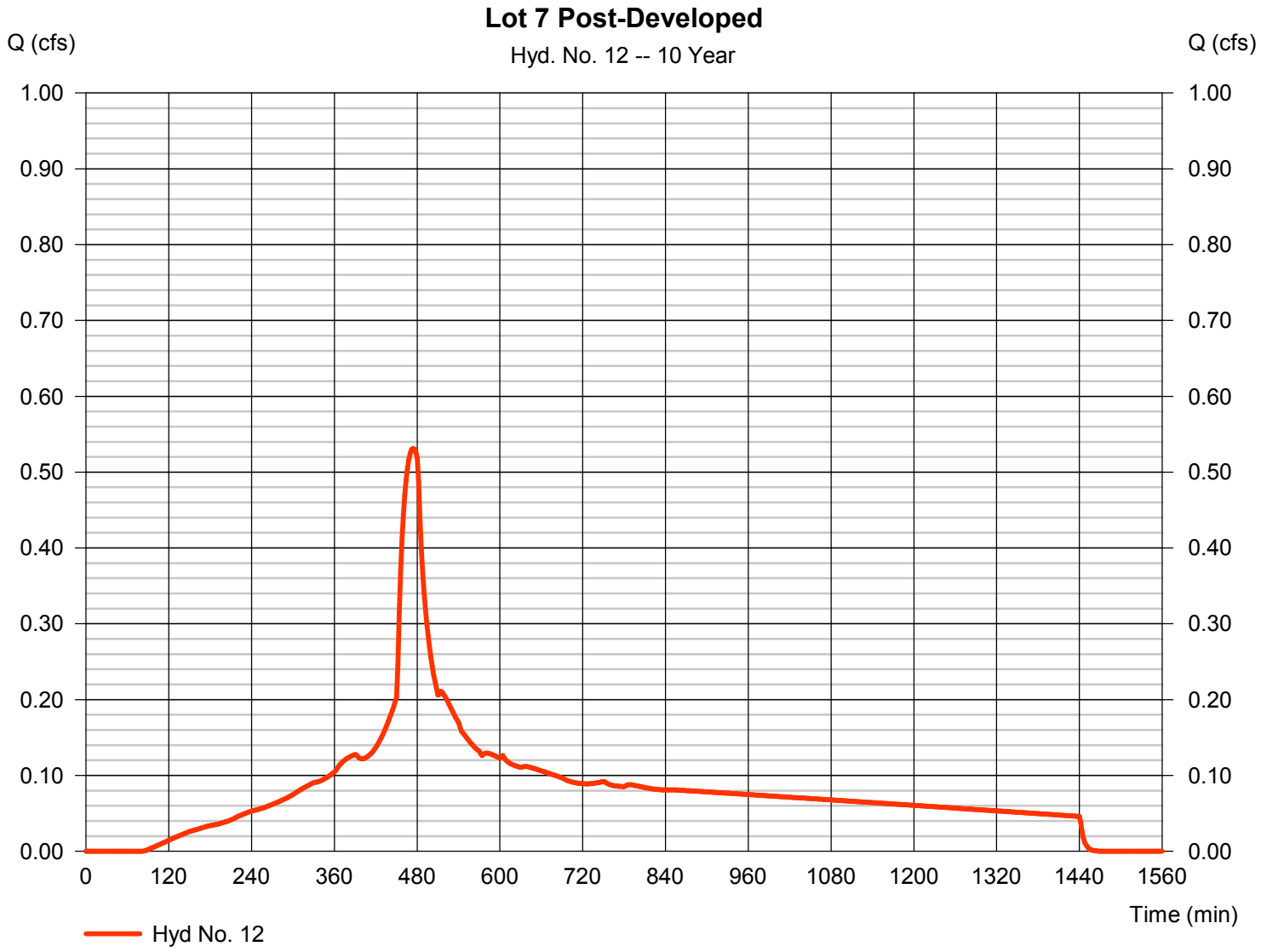
Hydrograph Report

Hyd. No. 12

Lot 7 Post-Developed

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.531 cfs
Storm frequency	=	10 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	7,468 cuft
Drainage area	=	0.700 ac	Curve number	=	95*
Basin Slope	=	3.5 %	Hydraulic length	=	100 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.50 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(0.610 x 98) + (0.090 x 75)] / 0.700



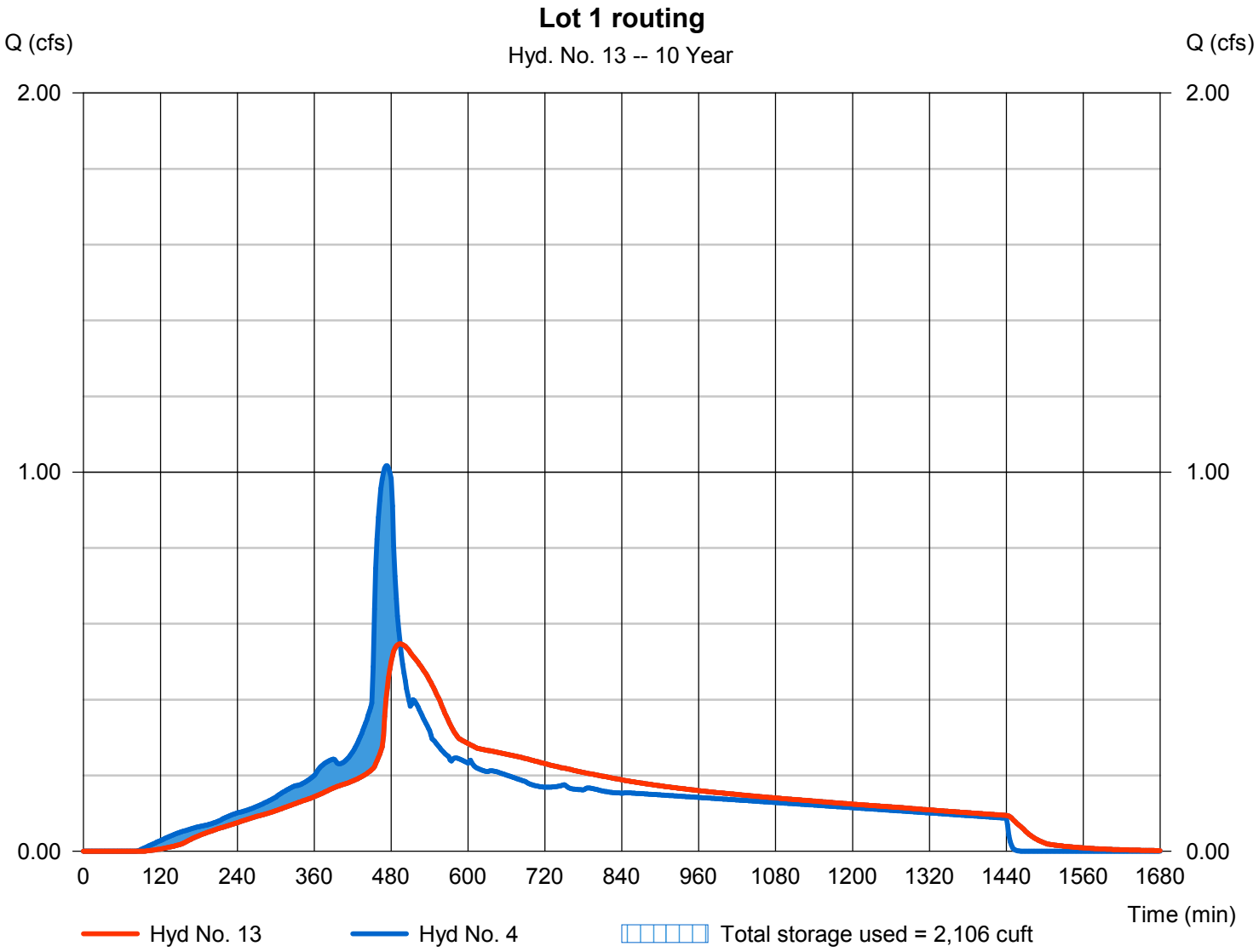
Hydrograph Report

Hyd. No. 13

Lot 1 routing

Hydrograph type	= Reservoir	Peak discharge	= 0.547 cfs
Storm frequency	= 10 yrs	Time to peak	= 494 min
Time interval	= 2 min	Hyd. volume	= 14,185 cuft
Inflow hyd. No.	= 4 - Lot 1 Post-Developed	Max. Elevation	= 186.81 ft
Reservoir name	= Lot 1 Storage	Max. Storage	= 2,106 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



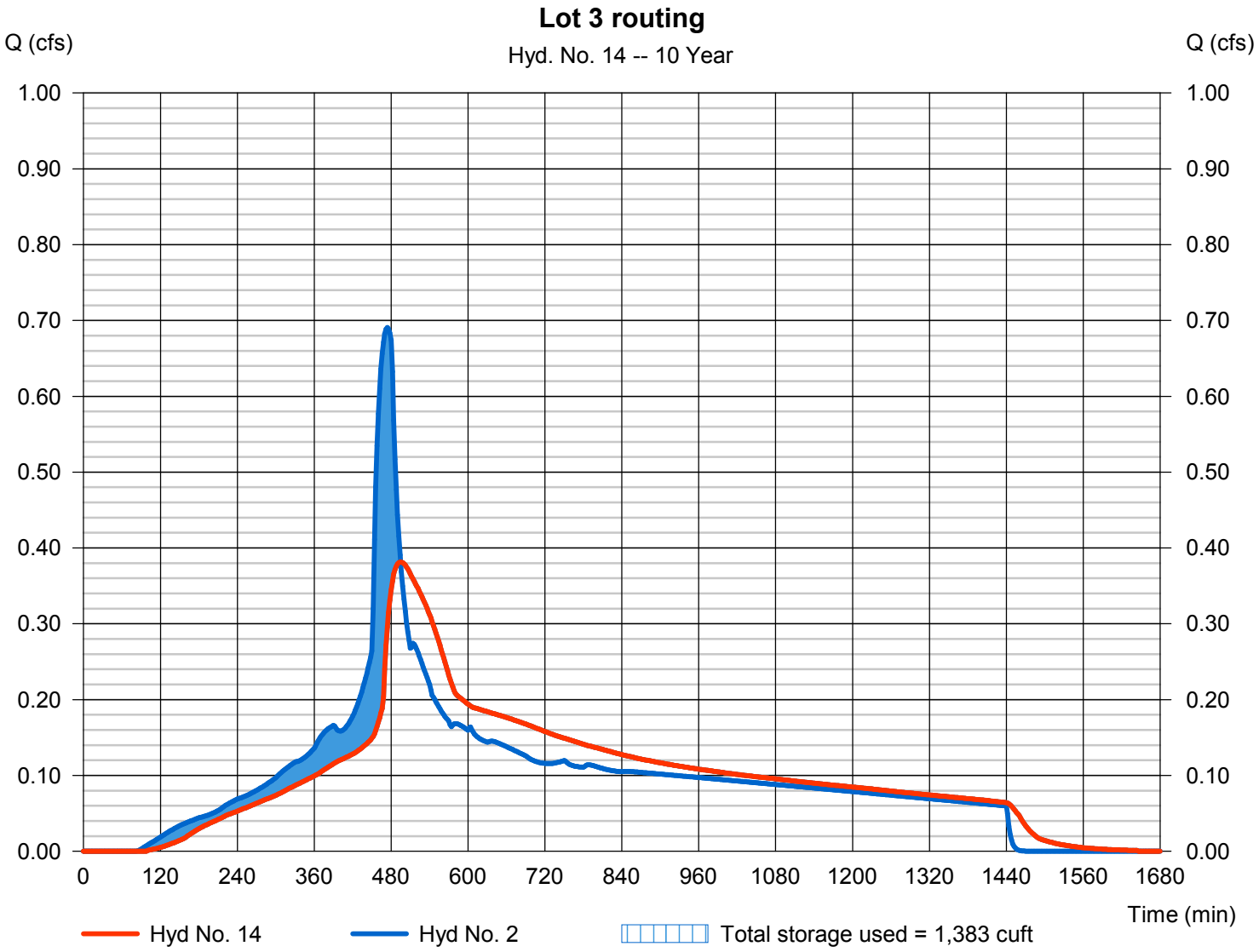
Hydrograph Report

Hyd. No. 14

Lot 3 routing

Hydrograph type	=	Reservoir	Peak discharge	=	0.381 cfs
Storm frequency	=	10 yrs	Time to peak	=	494 min
Time interval	=	2 min	Hyd. volume	=	9,705 cuft
Inflow hyd. No.	=	2 - Lot 3 Post-Developed	Max. Elevation	=	188.97 ft
Reservoir name	=	Lot 3 Storage	Max. Storage	=	1,383 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



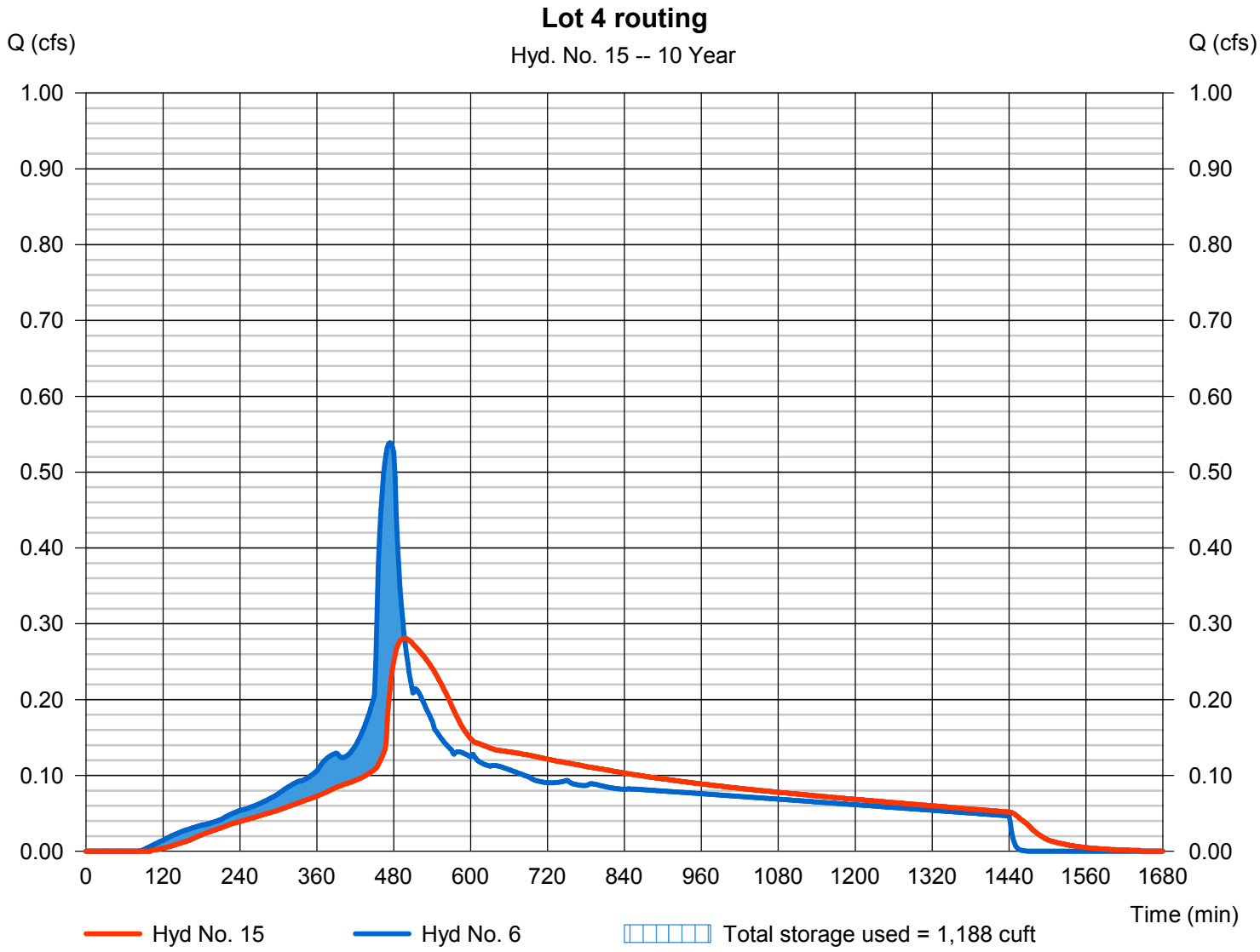
Hydrograph Report

Hyd. No. 15

Lot 4 routing

Hydrograph type	=	Reservoir	Peak discharge	=	0.281 cfs
Storm frequency	=	10 yrs	Time to peak	=	496 min
Time interval	=	2 min	Hyd. volume	=	7,572 cuft
Inflow hyd. No.	=	6 - Lot 4 Post-Developed	Max. Elevation	=	187.23 ft
Reservoir name	=	Lot 4 Storage	Max. Storage	=	1,188 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



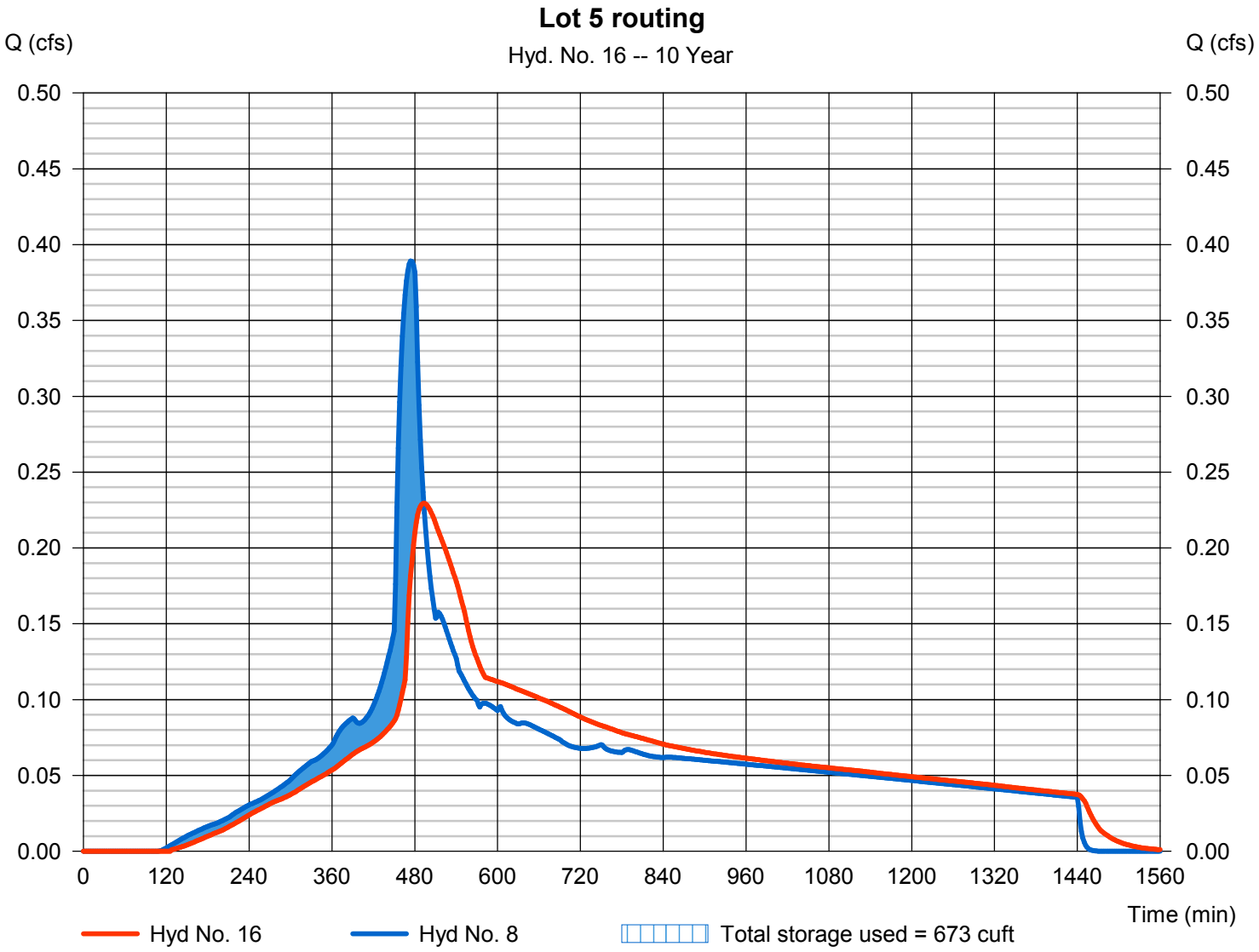
Hydrograph Report

Hyd. No. 16

Lot 5 routing

Hydrograph type	=	Reservoir	Peak discharge	=	0.229 cfs
Storm frequency	=	10 yrs	Time to peak	=	494 min
Time interval	=	2 min	Hyd. volume	=	5,458 cuft
Inflow hyd. No.	=	8 - Lot 5 Post-Developed	Max. Elevation	=	186.62 ft
Reservoir name	=	Lot 5 Storage	Max. Storage	=	673 cuft

Storage Indication method used. Outflow includes exfiltration.



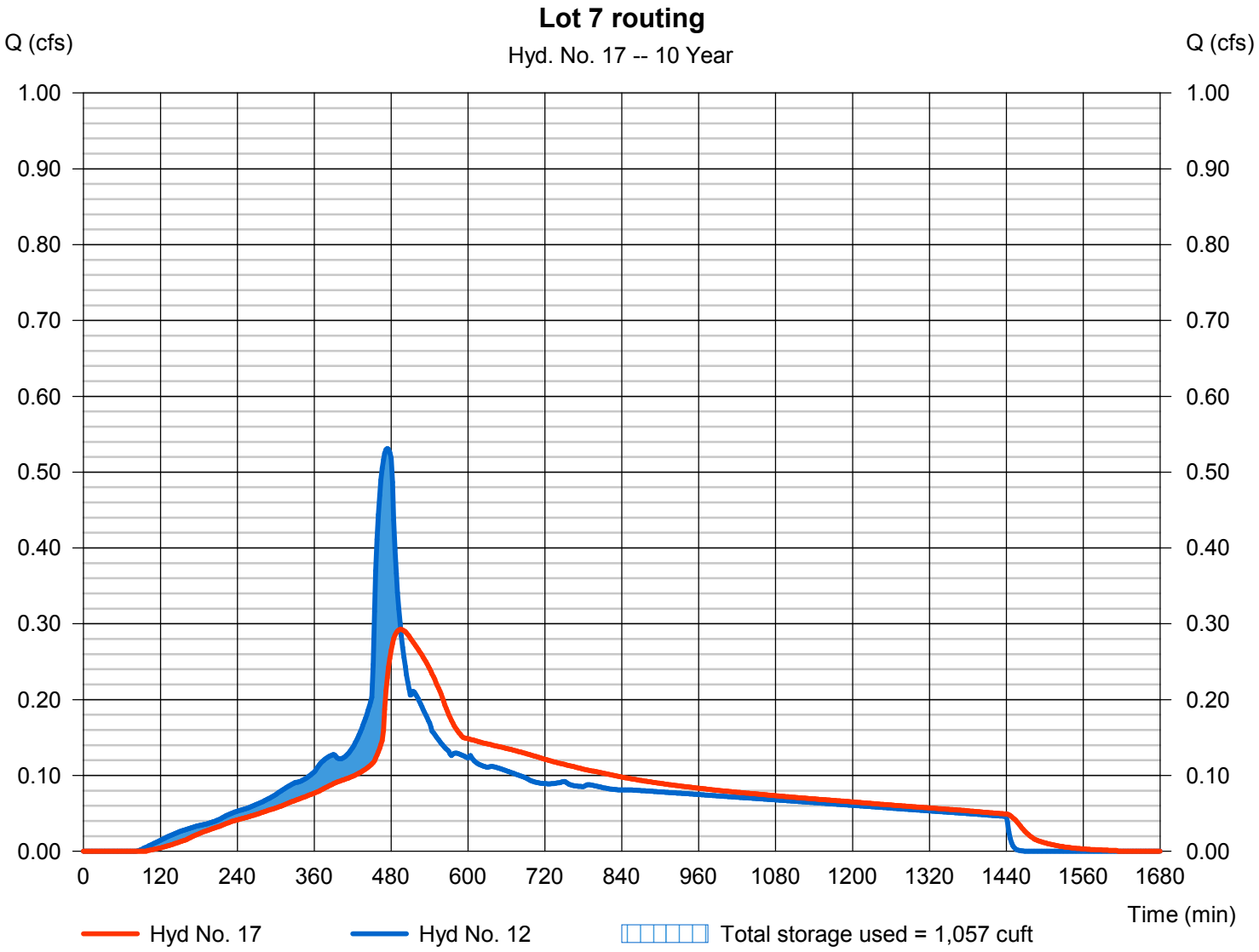
Hydrograph Report

Hyd. No. 17

Lot 7 routing

Hydrograph type	=	Reservoir	Peak discharge	=	0.292 cfs
Storm frequency	=	10 yrs	Time to peak	=	494 min
Time interval	=	2 min	Hyd. volume	=	7,465 cuft
Inflow hyd. No.	=	12 - Lot 7 Post-Developed	Max. Elevation	=	183.86 ft
Reservoir name	=	Lot 7 Storage	Max. Storage	=	1,057 cuft

Storage Indication method used.



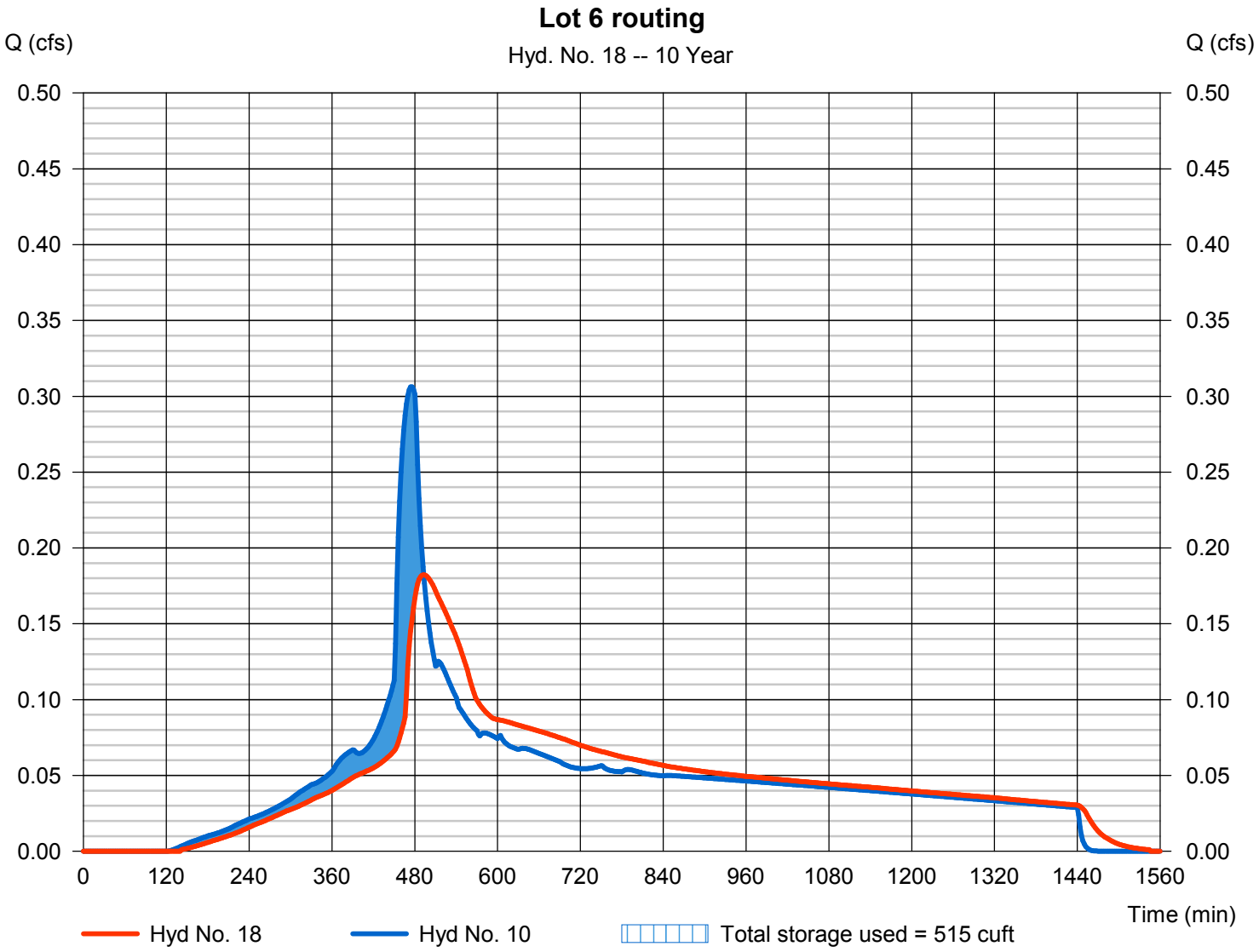
Hydrograph Report

Hyd. No. 18

Lot 6 routing

Hydrograph type	= Reservoir	Peak discharge	= 0.182 cfs
Storm frequency	= 10 yrs	Time to peak	= 492 min
Time interval	= 2 min	Hyd. volume	= 4,305 cuft
Inflow hyd. No.	= 10 - Lot 6 Post-Developed	Max. Elevation	= 184.34 ft
Reservoir name	= Lot 6 Storage	Max. Storage	= 515 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.514

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SBUH Runoff	0.696	2	480	10,636	------	------	------	Lot 1 Pre-Developed
2	SBUH Runoff	0.804	2	474	11,334	------	------	------	Lot 3 Post-Developed
3	SBUH Runoff	0.483	2	478	7,277	------	------	------	Lot 3 Pre-Developed
4	SBUH Runoff	1.184	2	472	16,565	------	------	------	Lot 1 Post-Developed
5	SBUH Runoff	0.359	2	478	5,468	------	------	------	Lot 4 Pre-Developed
6	SBUH Runoff	0.627	2	474	8,843	------	------	------	Lot 4 Post-Developed
7	SBUH Runoff	0.292	2	478	4,398	------	------	------	Lot 5 Pre-Developed
8	SBUH Runoff	0.458	2	474	6,428	------	------	------	Lot 5 Post-Developed
9	SBUH Runoff	0.232	2	478	3,542	------	------	------	Lot 6 Pre-Developed
10	SBUH Runoff	0.363	2	474	5,093	------	------	------	Lot 6 Post-Developed
11	SBUH Runoff	0.371	2	478	5,598	------	------	------	Lot 7 Pre-Developed
12	SBUH Runoff	0.619	2	474	8,718	------	------	------	Lot 7 Post-Developed
13	Reservoir	0.638	2	494	16,561	4	187.25	2,477	Lot 1 routing
14	Reservoir	0.444	2	494	11,331	2	189.41	1,628	Lot 3 routing
15	Reservoir	0.328	2	496	8,840	6	187.68	1,398	Lot 4 routing
16	Reservoir	0.268	2	494	6,426	8	187.10	805	Lot 5 routing
17	Reservoir	0.340	2	494	8,716	12	184.30	1,246	Lot 7 routing
18	Reservoir	0.214	2	494	5,091	10	184.83	621	Lot 6 routing

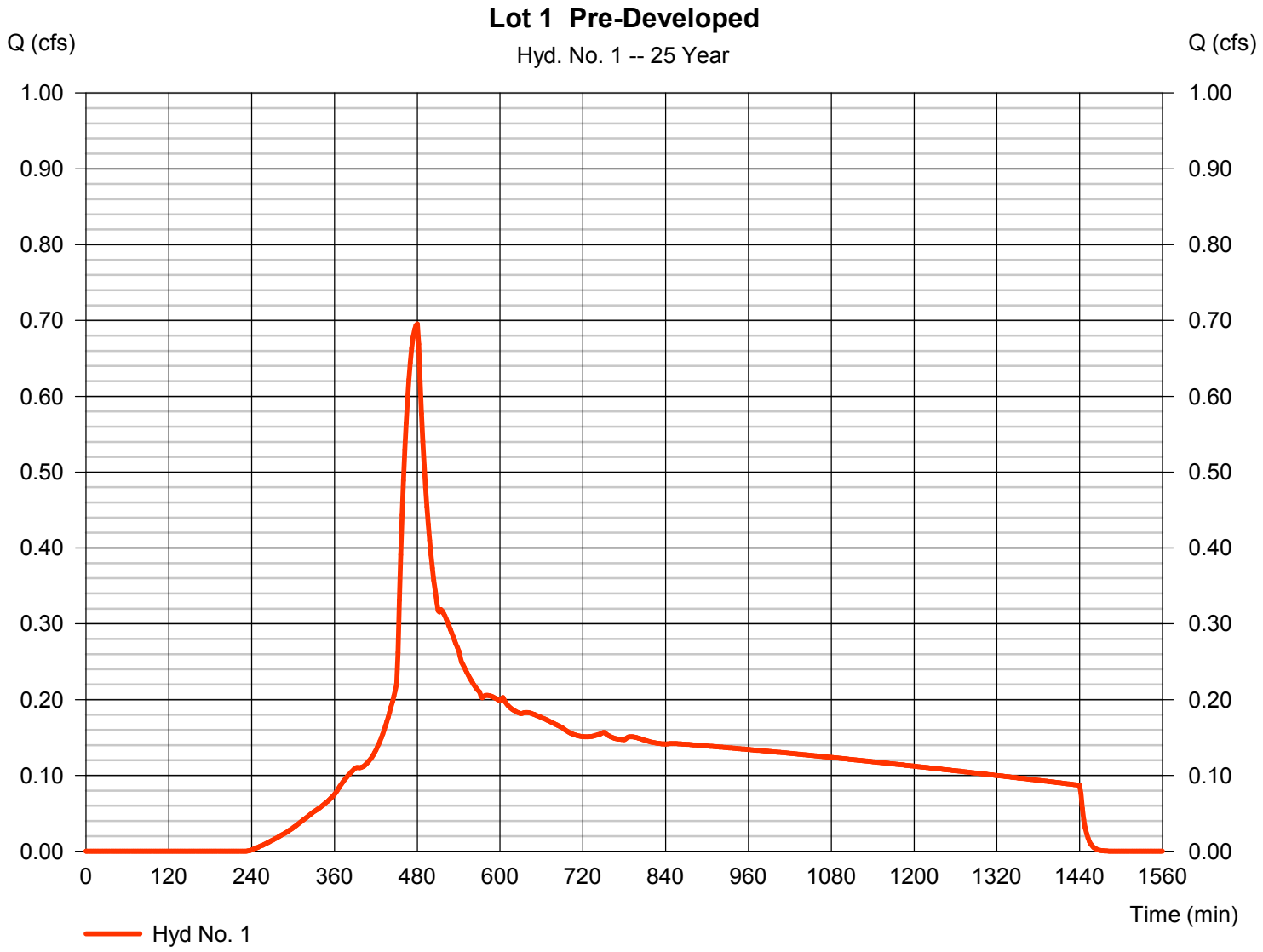
Hydrograph Report

Hyd. No. 1

Lot 1 Pre-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.696 cfs
Storm frequency	= 25 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 10,636 cuft
Drainage area	= 1.330 ac	Curve number	= 82*
Basin Slope	= 2.8 %	Hydraulic length	= 300 ft
Tc method	= LAG	Time of conc. (Tc)	= 6.80 min
Total precip.	= 4.00 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.380 x 98) + (0.950 x 75)] / 1.330



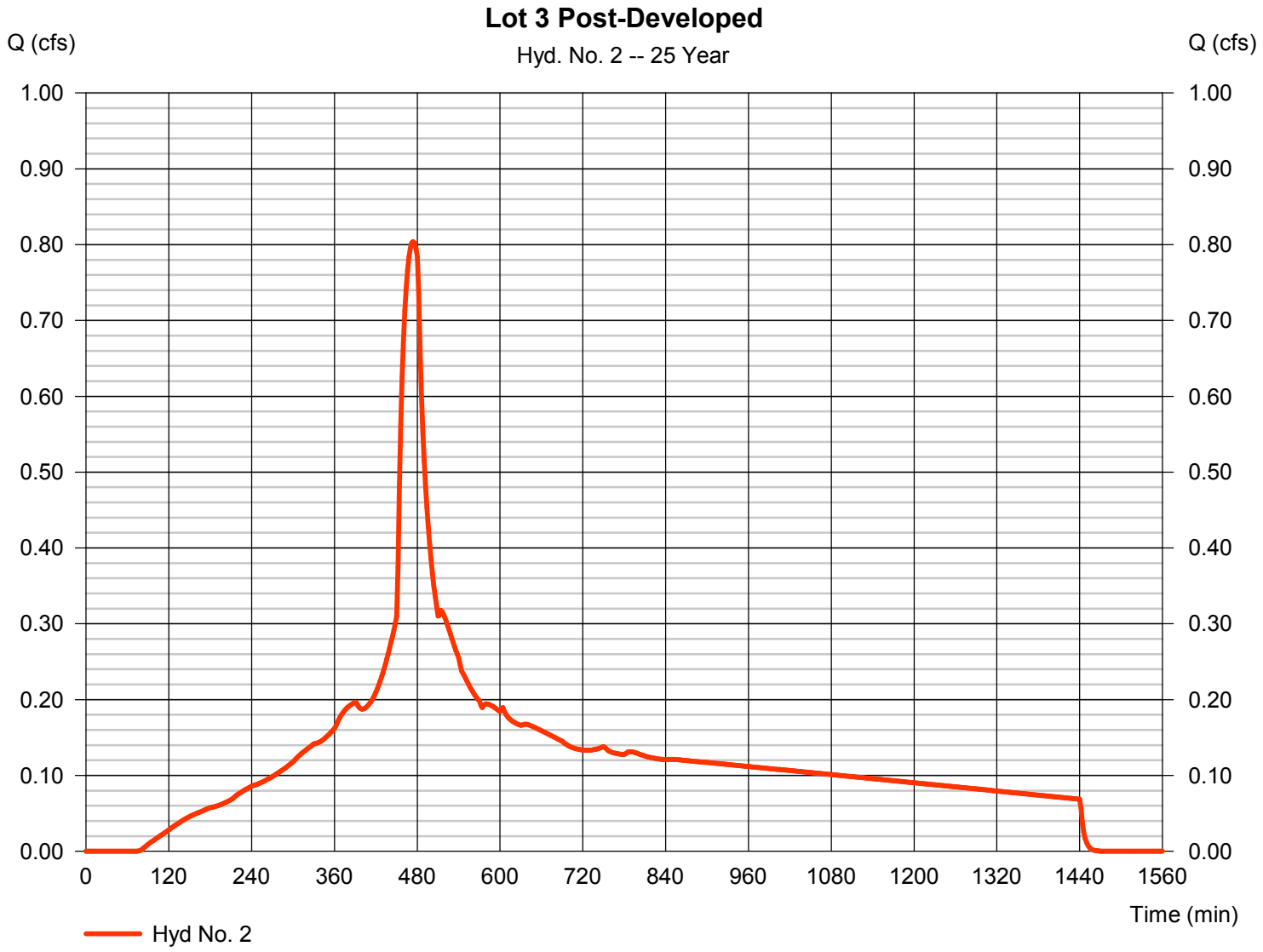
Hydrograph Report

Hyd. No. 2

Lot 3 Post-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.804 cfs
Storm frequency	= 25 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 11,334 cuft
Drainage area	= 0.910 ac	Curve number	= 95*
Basin Slope	= 2.7 %	Hydraulic length	= 260 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.00 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.790 x 98) + (0.120 x 75)] / 0.910



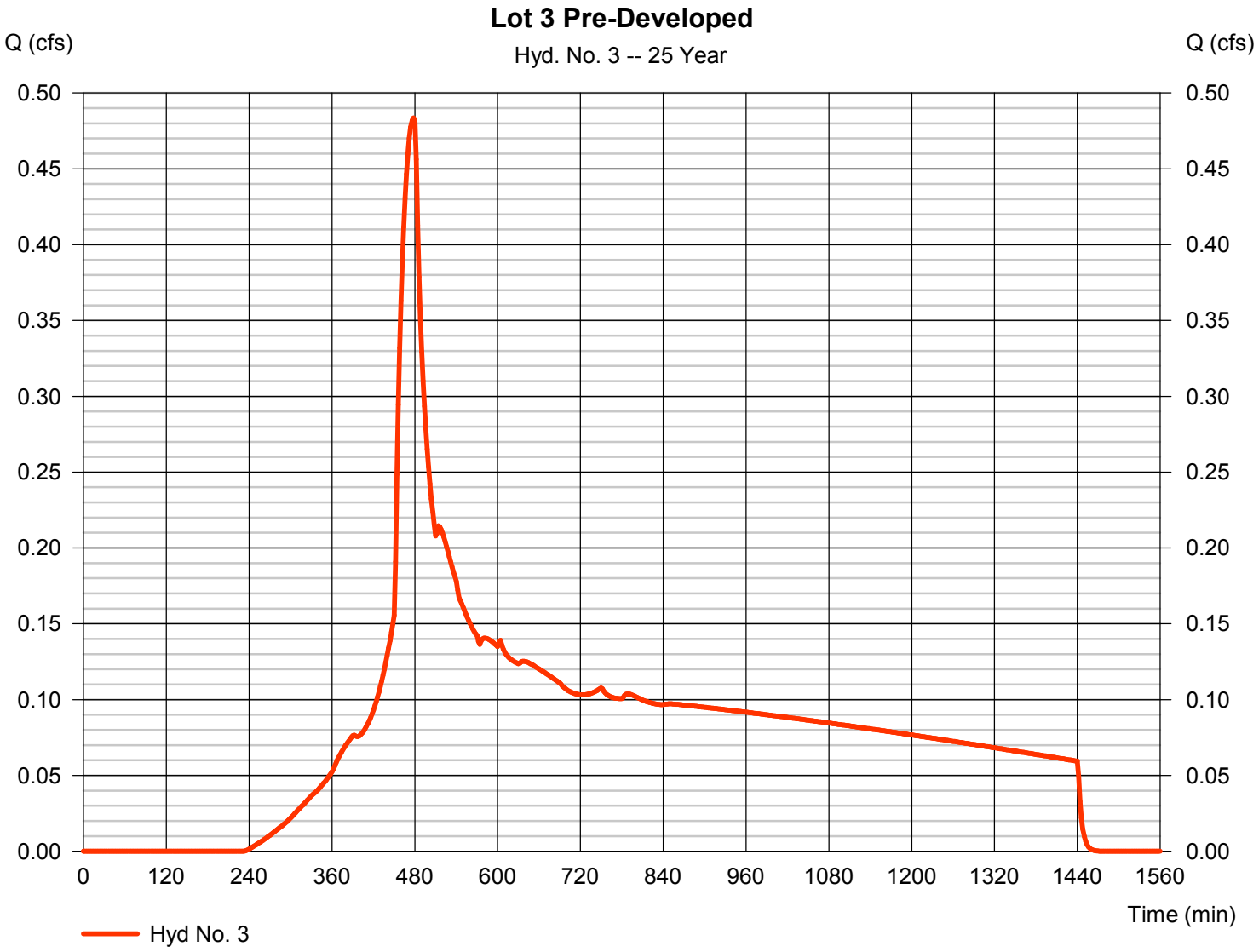
Hydrograph Report

Hyd. No. 3

Lot 3 Pre-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.483 cfs
Storm frequency	= 25 yrs	Time to peak	= 478 min
Time interval	= 2 min	Hyd. volume	= 7,277 cuft
Drainage area	= 0.910 ac	Curve number	= 82*
Basin Slope	= 2.7 %	Hydraulic length	= 260 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.00 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.260 x 98) + (0.650 x 75)] / 0.910



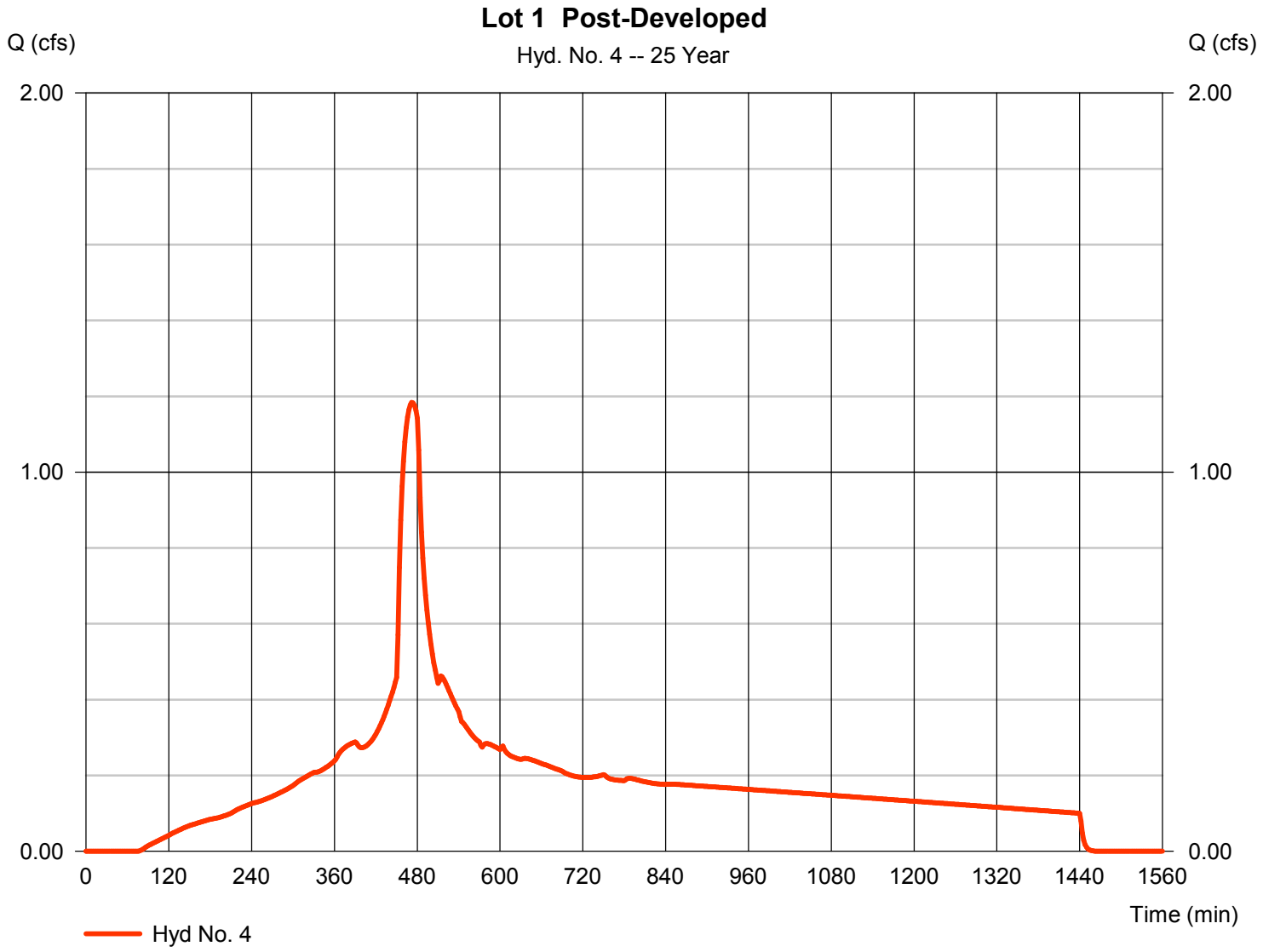
Hydrograph Report

Hyd. No. 4

Lot 1 Post-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 1.184 cfs
Storm frequency	= 25 yrs	Time to peak	= 472 min
Time interval	= 2 min	Hyd. volume	= 16,565 cuft
Drainage area	= 1.330 ac	Curve number	= 95*
Basin Slope	= 2.8 %	Hydraulic length	= 300 ft
Tc method	= LAG	Time of conc. (Tc)	= 4.00 min
Total precip.	= 4.00 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(1.170 x 98) + (0.160 x 75)] / 1.330



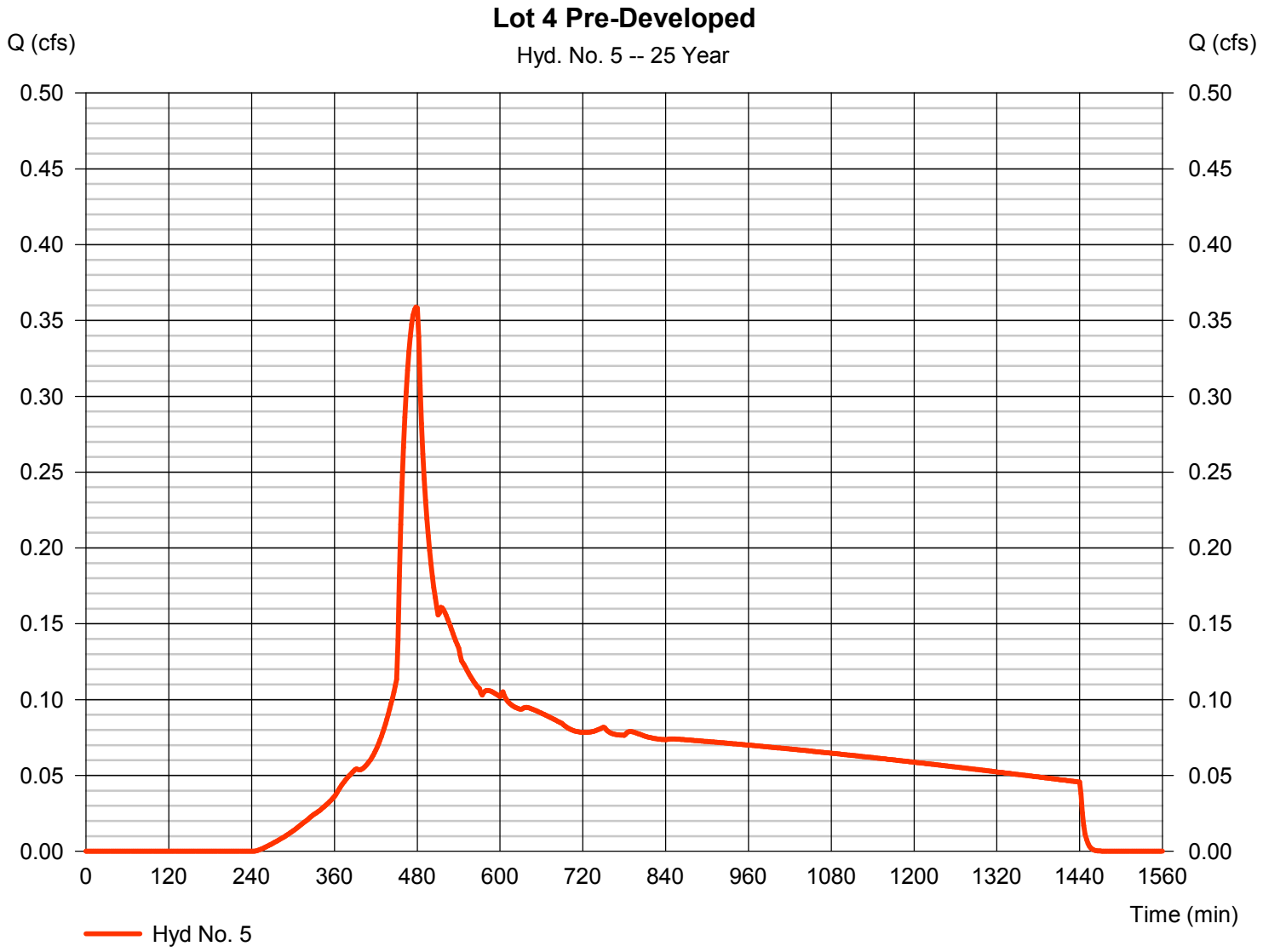
Hydrograph Report

Hyd. No. 5

Lot 4 Pre-Developed

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.359 cfs
Storm frequency	=	25 yrs	Time to peak	=	478 min
Time interval	=	2 min	Hyd. volume	=	5,468 cuft
Drainage area	=	0.710 ac	Curve number	=	81*
Basin Slope	=	2.7 %	Hydraulic length	=	260 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.00 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(0.200 x 98) + (0.510 x 75)] / 0.710



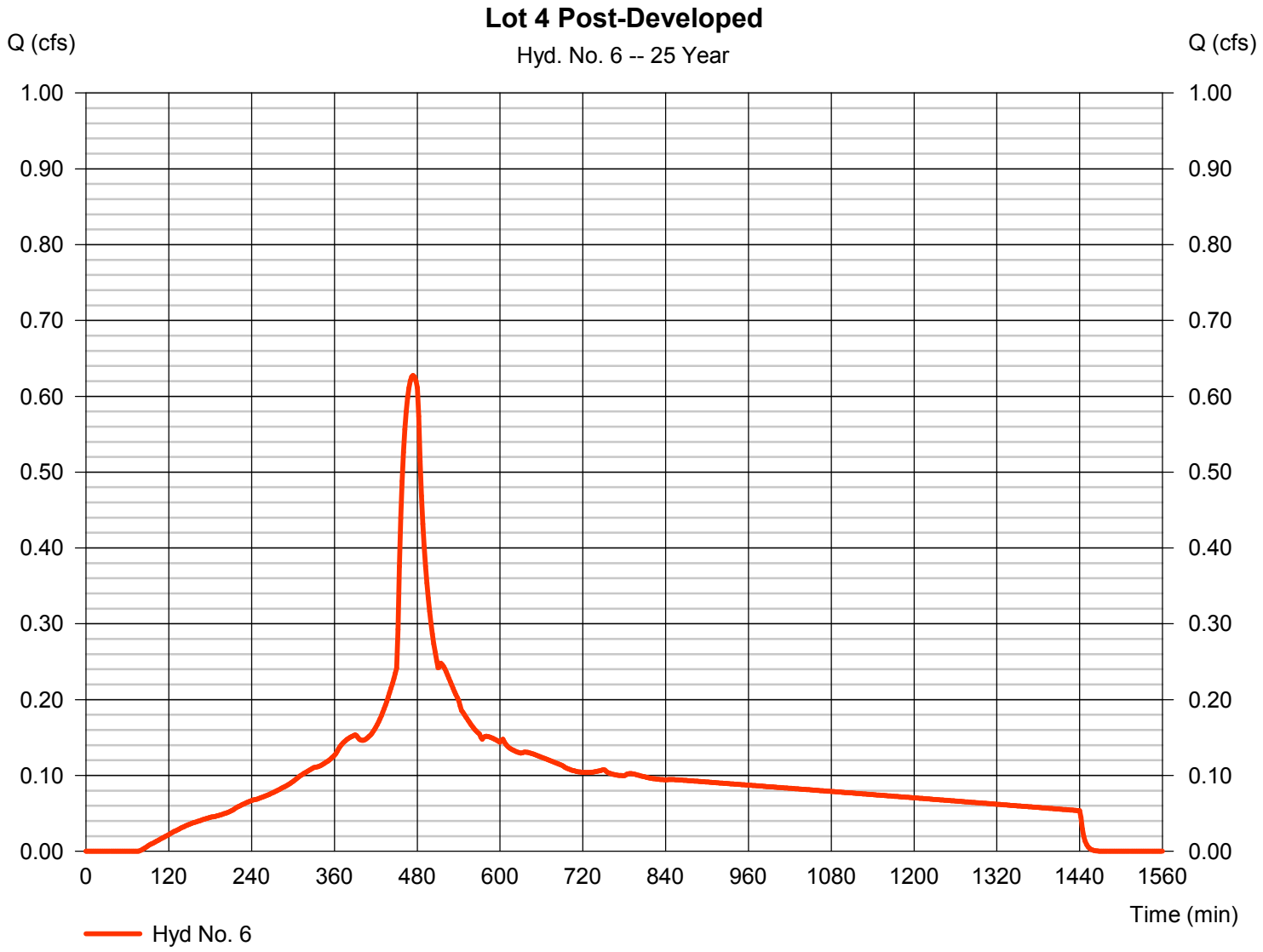
Hydrograph Report

Hyd. No. 6

Lot 4 Post-Developed

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.627 cfs
Storm frequency	=	25 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	8,843 cuft
Drainage area	=	0.710 ac	Curve number	=	95*
Basin Slope	=	2.7 %	Hydraulic length	=	260 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.00 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(0.610 x 98) + (0.100 x 75)] / 0.710



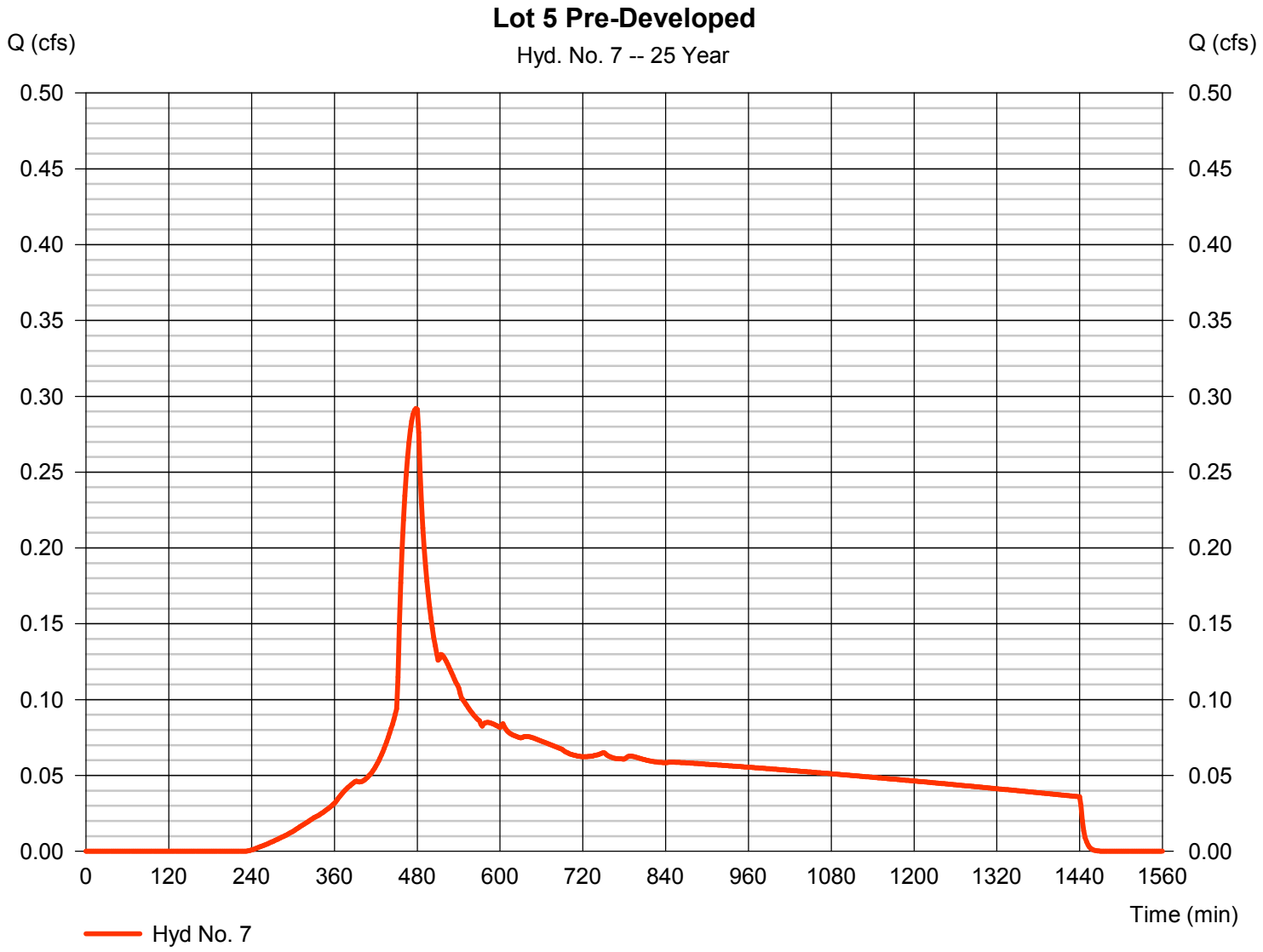
Hydrograph Report

Hyd. No. 7

Lot 5 Pre-Developed

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.292 cfs
Storm frequency	=	25 yrs	Time to peak	=	478 min
Time interval	=	2 min	Hyd. volume	=	4,398 cuft
Drainage area	=	0.550 ac	Curve number	=	82*
Basin Slope	=	2.2 %	Hydraulic length	=	180 ft
Tc method	=	LAG	Time of conc. (Tc)	=	5.10 min
Total precip.	=	4.00 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(0.160 x 98) + (0.390 x 75)] / 0.550



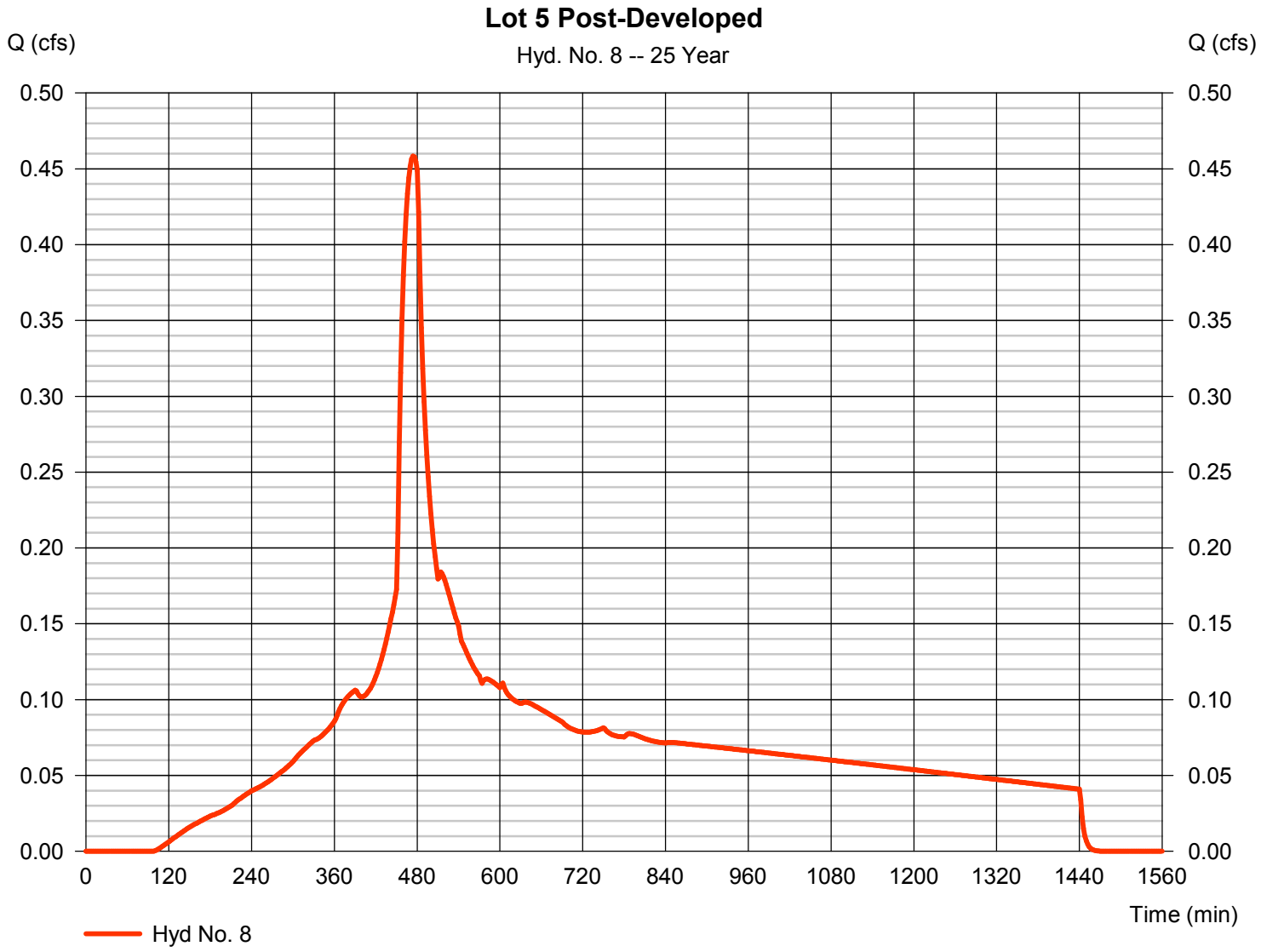
Hydrograph Report

Hyd. No. 8

Lot 5 Post-Developed

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.458 cfs
Storm frequency	=	25 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	6,428 cuft
Drainage area	=	0.550 ac	Curve number	=	93*
Basin Slope	=	2.0 %	Hydraulic length	=	90 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.00 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(0.430 x 98) + (0.120 x 75)] / 0.550



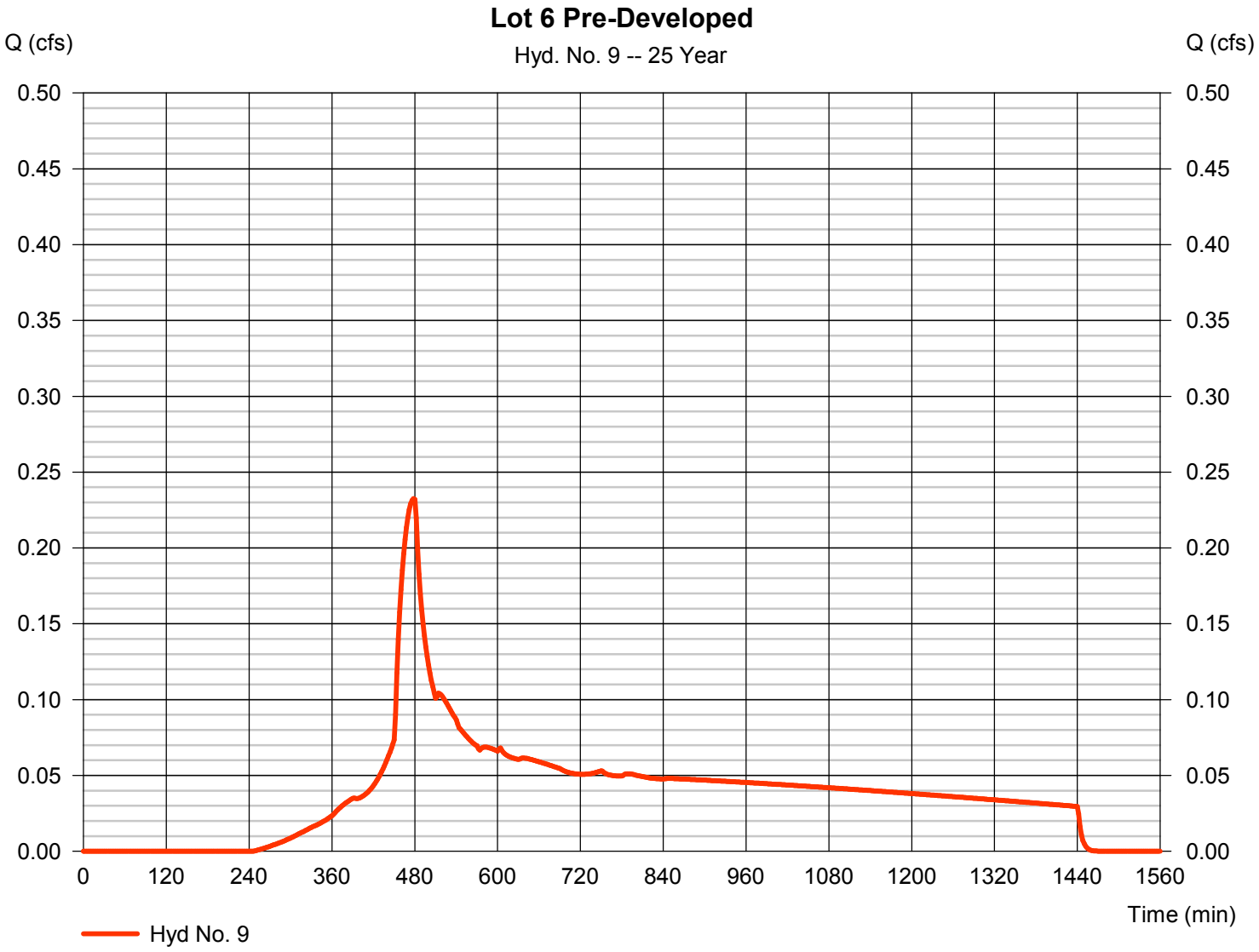
Hydrograph Report

Hyd. No. 9

Lot 6 Pre-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.232 cfs
Storm frequency	= 25 yrs	Time to peak	= 478 min
Time interval	= 2 min	Hyd. volume	= 3,542 cuft
Drainage area	= 0.460 ac	Curve number	= 81*
Basin Slope	= 2.3 %	Hydraulic length	= 110 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.00 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.130 x 95) + (0.330 x 75)] / 0.460



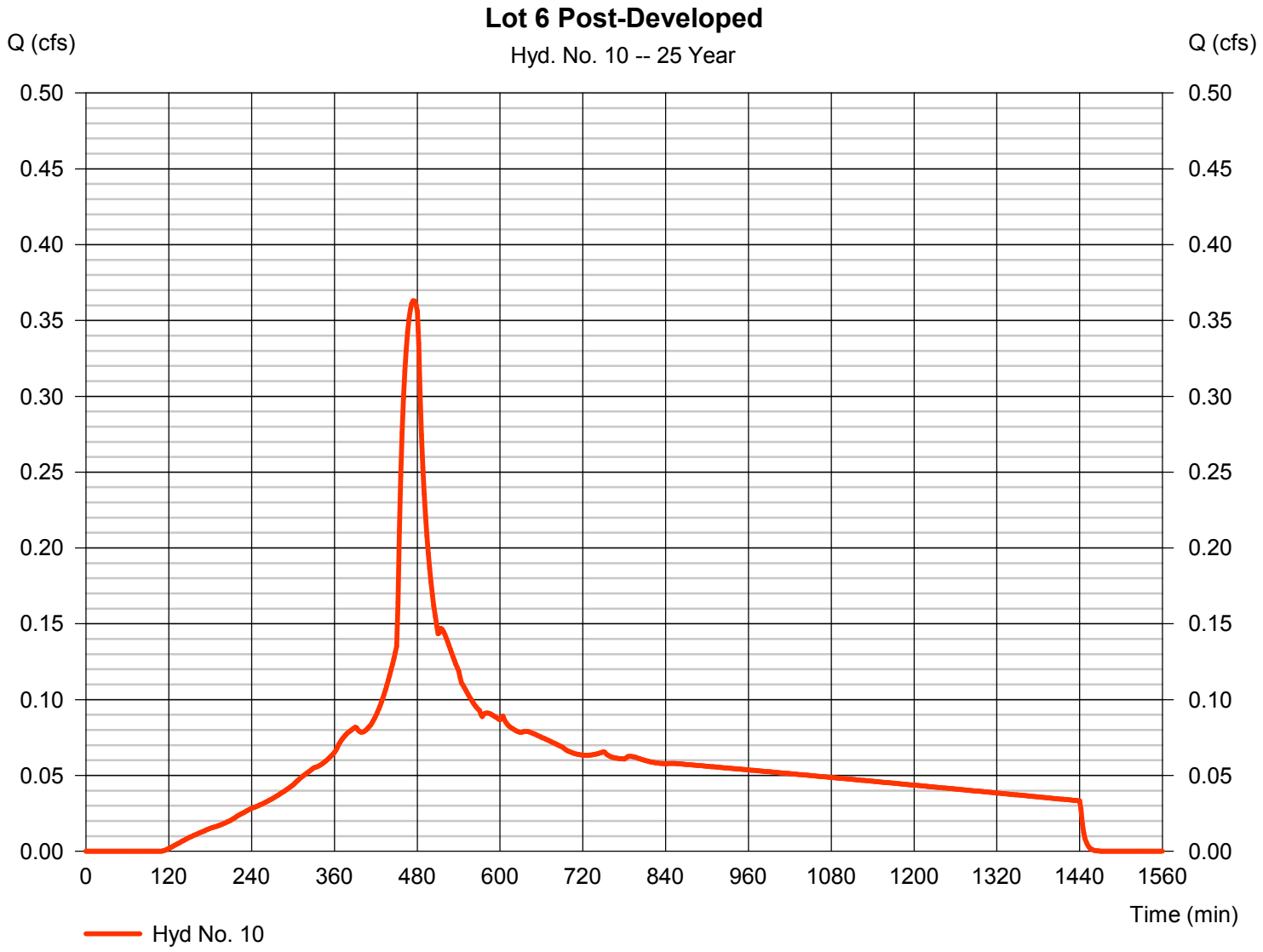
Hydrograph Report

Hyd. No. 10

Lot 6 Post-Developed

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.363 cfs
Storm frequency	=	25 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	5,093 cuft
Drainage area	=	0.450 ac	Curve number	=	92*
Basin Slope	=	2.0 %	Hydraulic length	=	90 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.00 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(0.330 x 98) + (0.120 x 75)] / 0.450



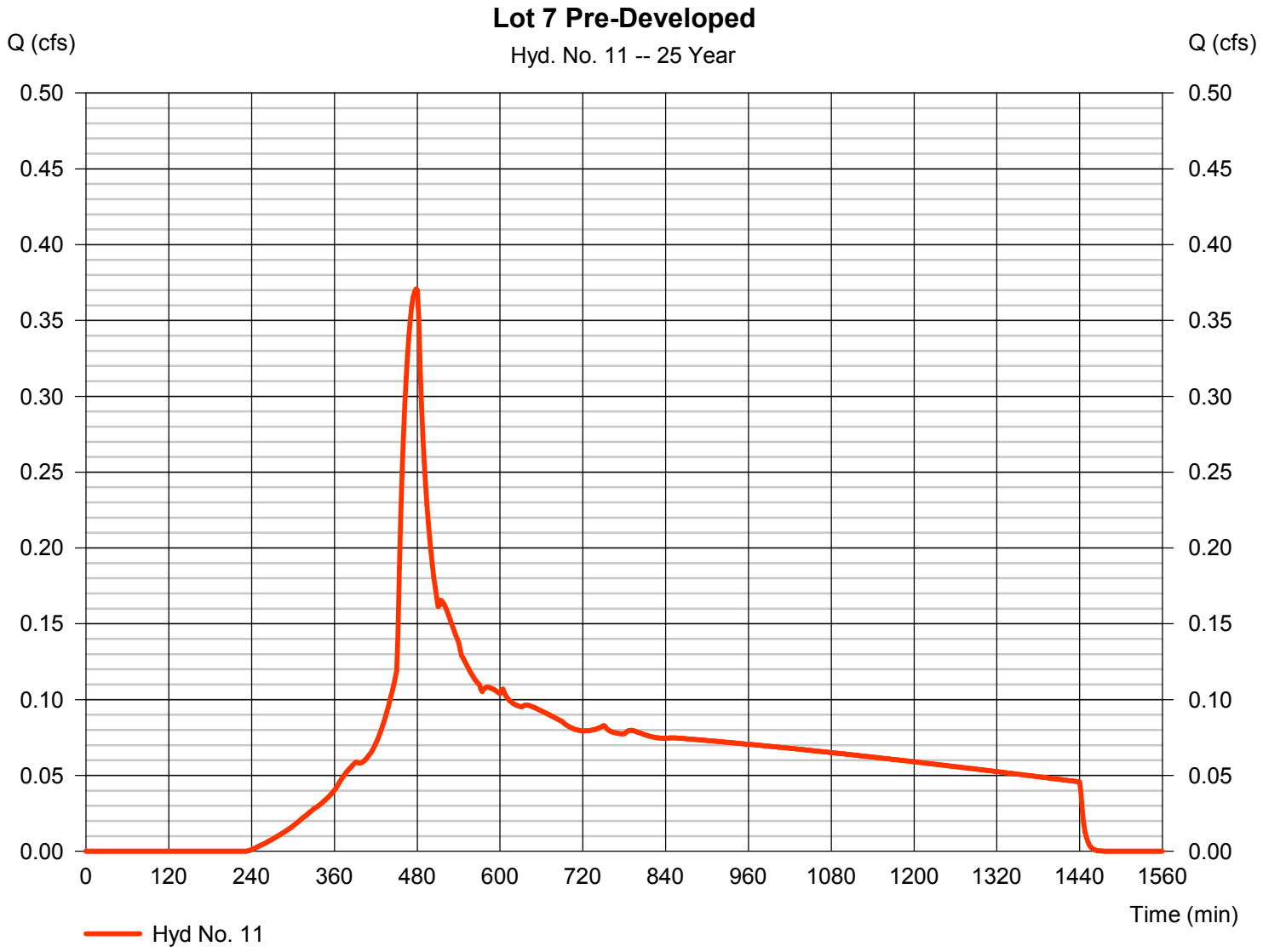
Hydrograph Report

Hyd. No. 11

Lot 7 Pre-Developed

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.371 cfs
Storm frequency	= 25 yrs	Time to peak	= 478 min
Time interval	= 2 min	Hyd. volume	= 5,598 cuft
Drainage area	= 0.700 ac	Curve number	= 82*
Basin Slope	= 2.7 %	Hydraulic length	= 220 ft
Tc method	= LAG	Time of conc. (Tc)	= 5.40 min
Total precip.	= 4.00 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(0.200 x 98) + (0.500 x 75)] / 0.700



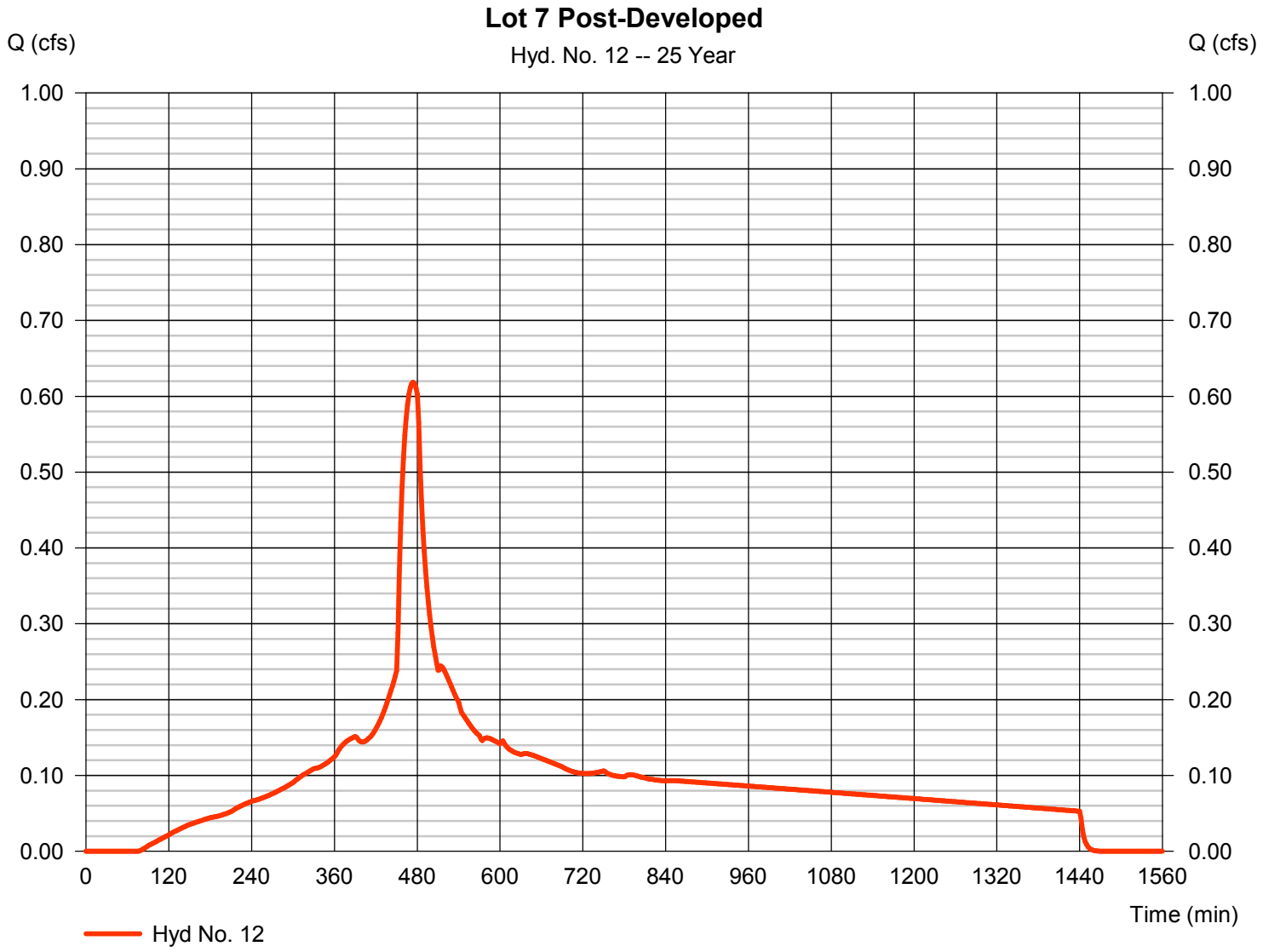
Hydrograph Report

Hyd. No. 12

Lot 7 Post-Developed

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.619 cfs
Storm frequency	=	25 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	8,718 cuft
Drainage area	=	0.700 ac	Curve number	=	95*
Basin Slope	=	3.5 %	Hydraulic length	=	100 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.00 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(0.610 x 98) + (0.090 x 75)] / 0.700



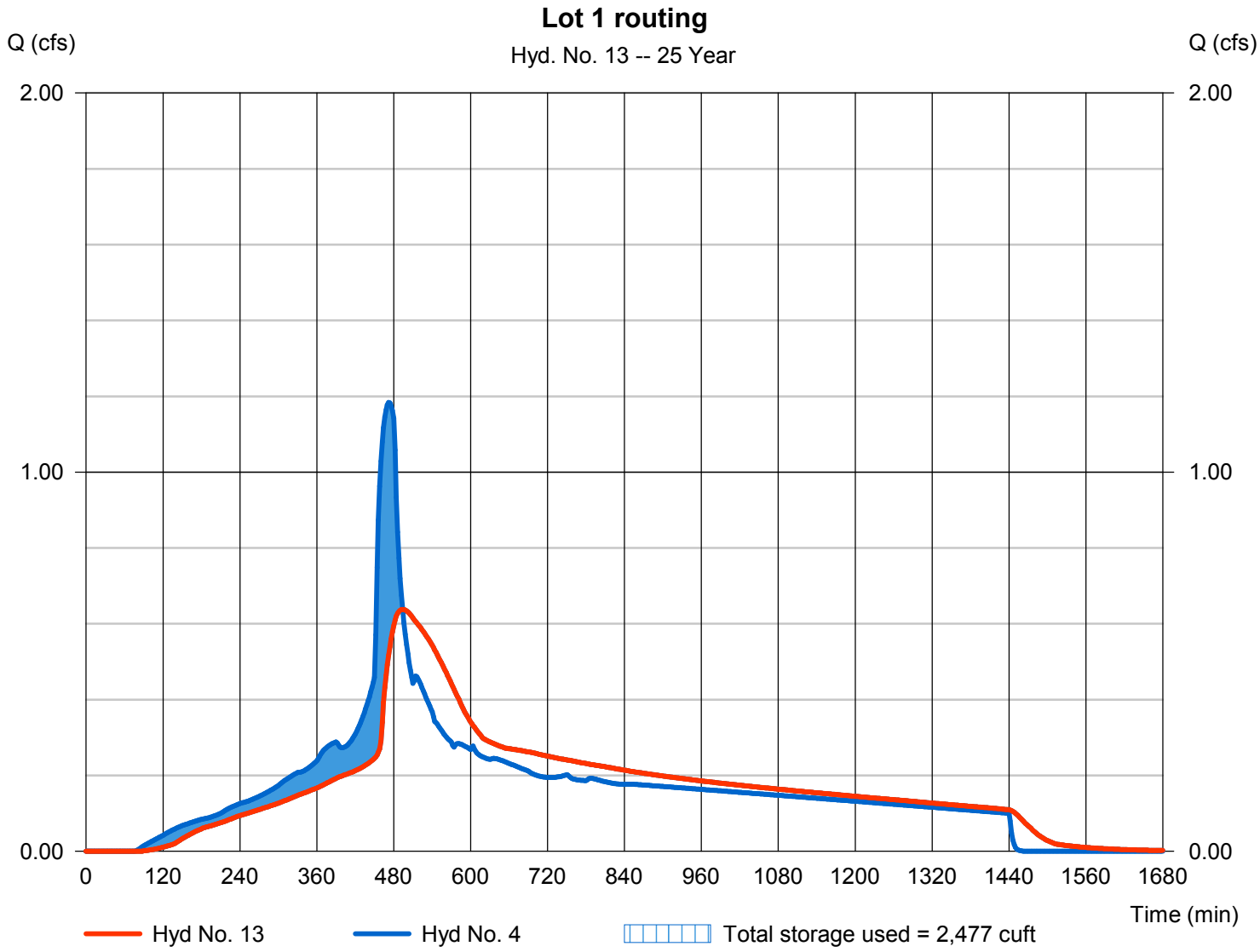
Hydrograph Report

Hyd. No. 13

Lot 1 routing

Hydrograph type	=	Reservoir	Peak discharge	=	0.638 cfs
Storm frequency	=	25 yrs	Time to peak	=	494 min
Time interval	=	2 min	Hyd. volume	=	16,561 cuft
Inflow hyd. No.	=	4 - Lot 1 Post-Developed	Max. Elevation	=	187.25 ft
Reservoir name	=	Lot 1 Storage	Max. Storage	=	2,477 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



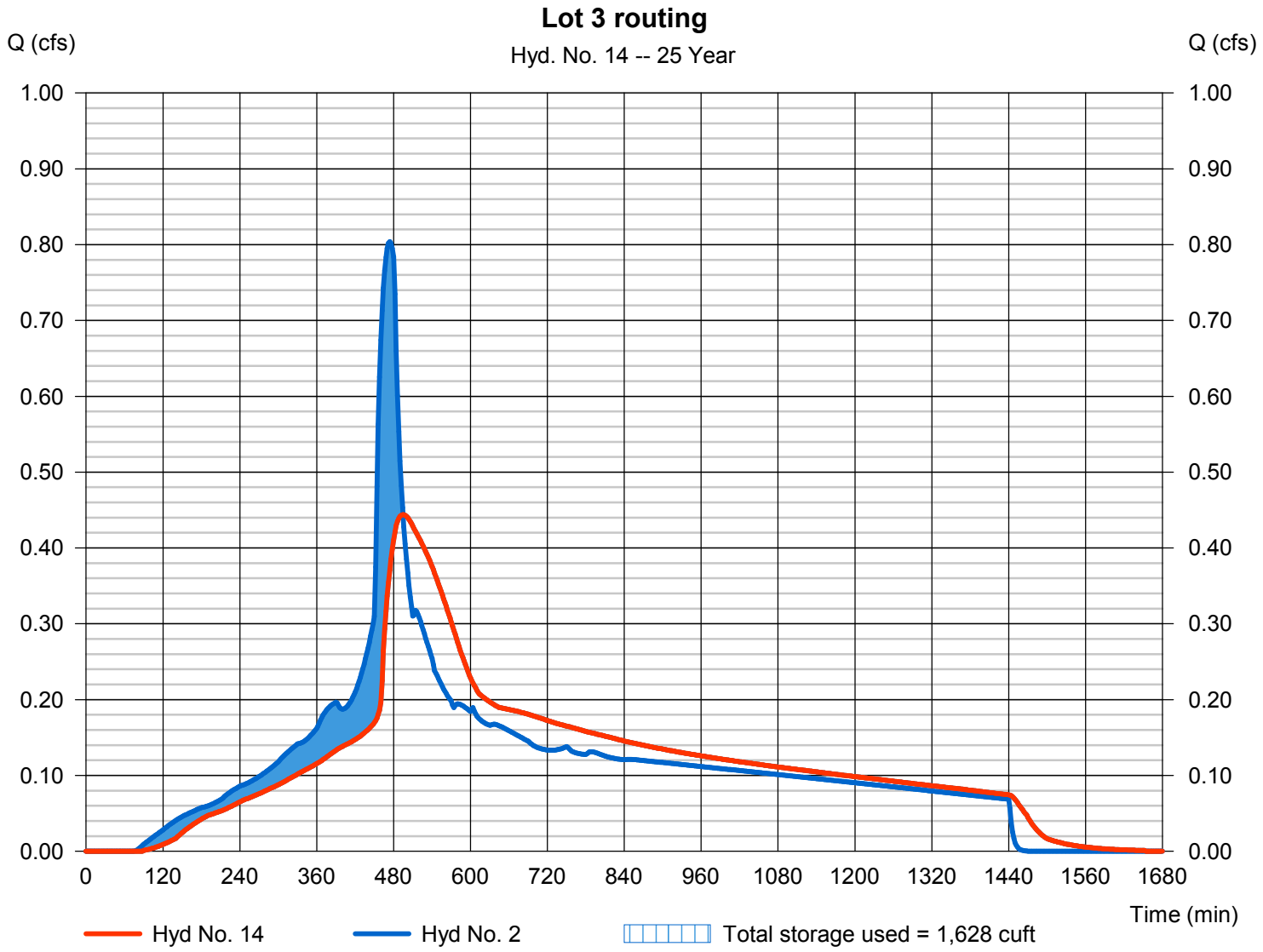
Hydrograph Report

Hyd. No. 14

Lot 3 routing

Hydrograph type	=	Reservoir	Peak discharge	=	0.444 cfs
Storm frequency	=	25 yrs	Time to peak	=	494 min
Time interval	=	2 min	Hyd. volume	=	11,331 cuft
Inflow hyd. No.	=	2 - Lot 3 Post-Developed	Max. Elevation	=	189.41 ft
Reservoir name	=	Lot 3 Storage	Max. Storage	=	1,628 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



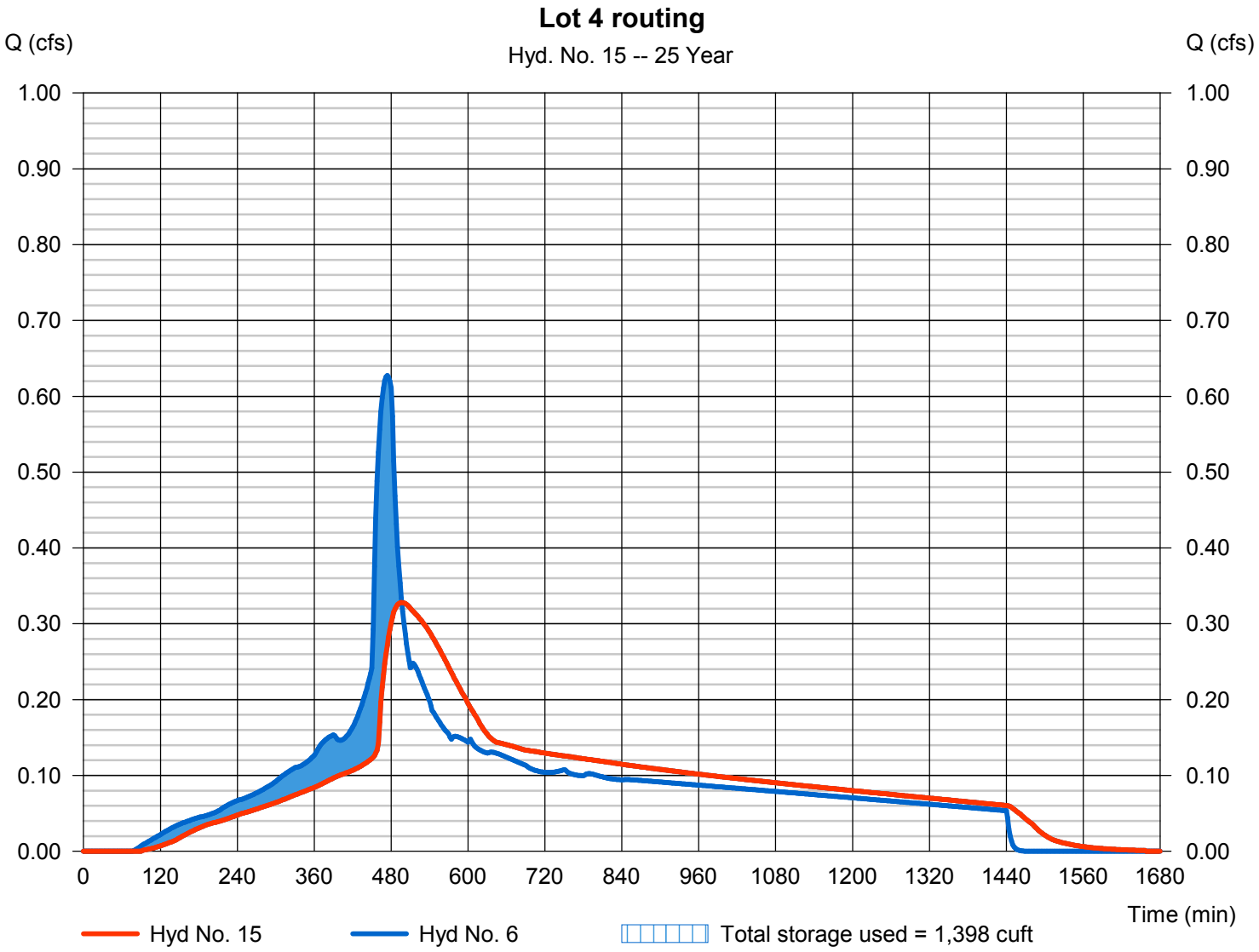
Hydrograph Report

Hyd. No. 15

Lot 4 routing

Hydrograph type	=	Reservoir	Peak discharge	=	0.328 cfs
Storm frequency	=	25 yrs	Time to peak	=	496 min
Time interval	=	2 min	Hyd. volume	=	8,840 cuft
Inflow hyd. No.	=	6 - Lot 4 Post-Developed	Max. Elevation	=	187.68 ft
Reservoir name	=	Lot 4 Storage	Max. Storage	=	1,398 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



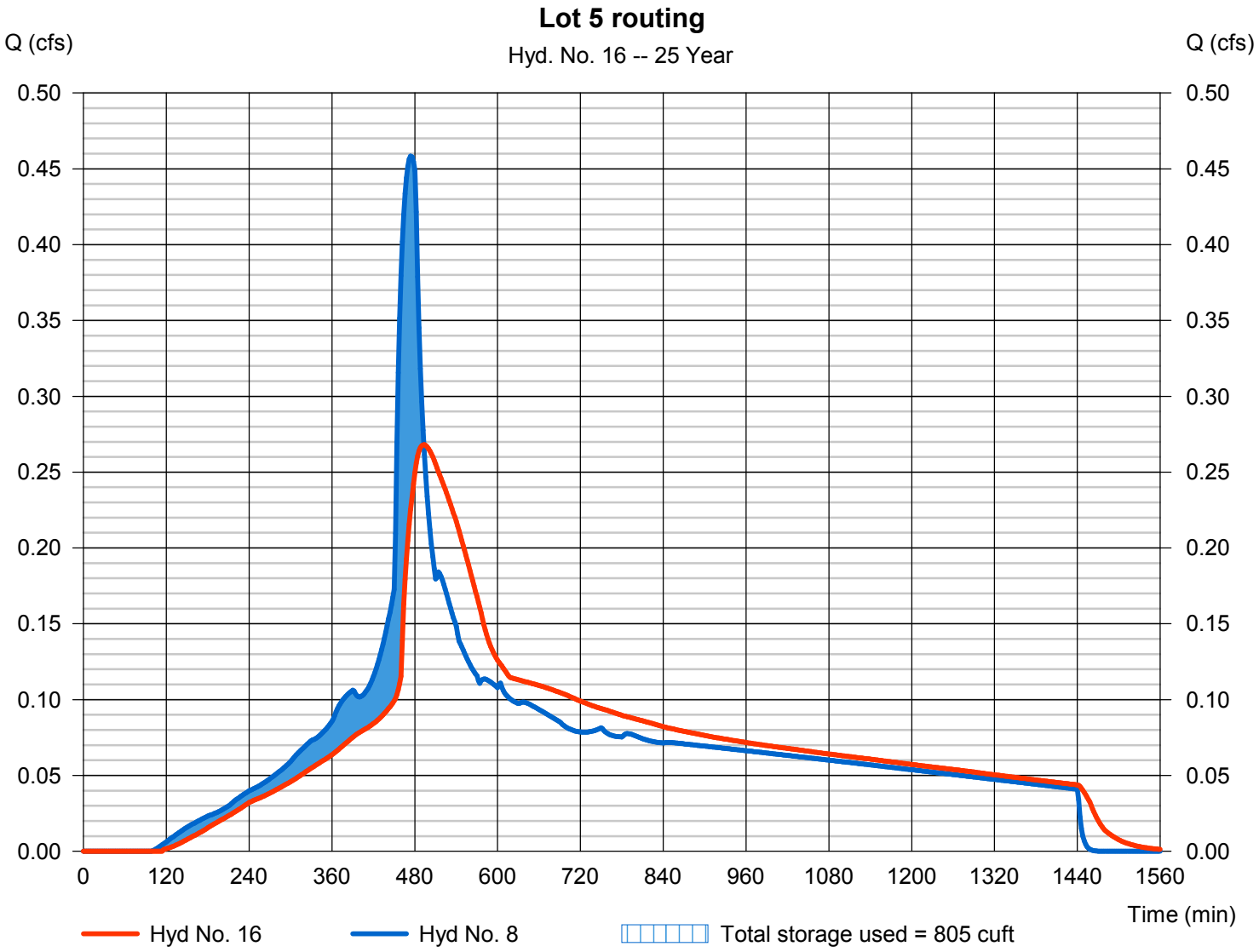
Hydrograph Report

Hyd. No. 16

Lot 5 routing

Hydrograph type	=	Reservoir	Peak discharge	=	0.268 cfs
Storm frequency	=	25 yrs	Time to peak	=	494 min
Time interval	=	2 min	Hyd. volume	=	6,426 cuft
Inflow hyd. No.	=	8 - Lot 5 Post-Developed	Max. Elevation	=	187.10 ft
Reservoir name	=	Lot 5 Storage	Max. Storage	=	805 cuft

Storage Indication method used. Outflow includes exfiltration.



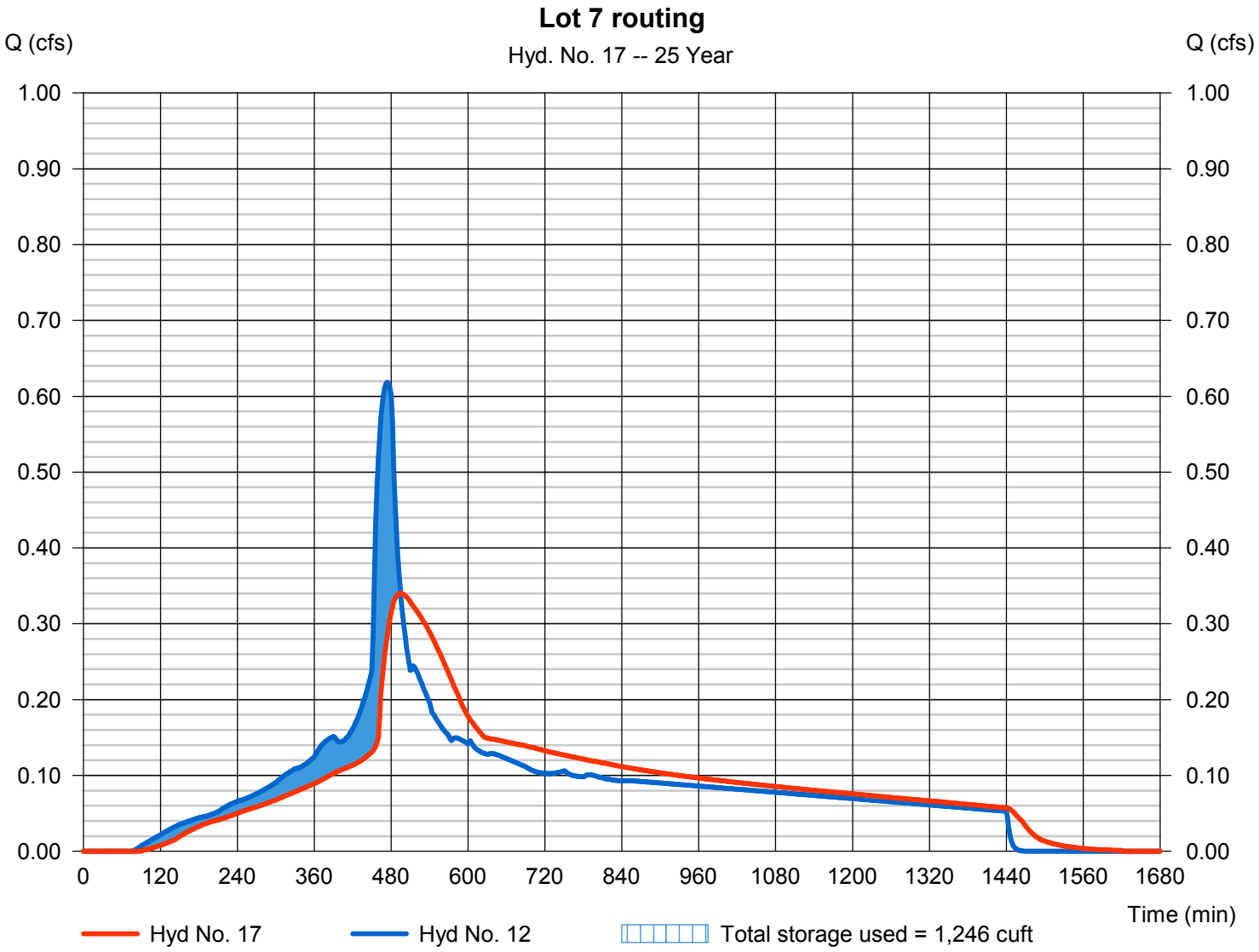
Hydrograph Report

Hyd. No. 17

Lot 7 routing

Hydrograph type	=	Reservoir	Peak discharge	=	0.340 cfs
Storm frequency	=	25 yrs	Time to peak	=	494 min
Time interval	=	2 min	Hyd. volume	=	8,716 cuft
Inflow hyd. No.	=	12 - Lot 7 Post-Developed	Max. Elevation	=	184.30 ft
Reservoir name	=	Lot 7 Storage	Max. Storage	=	1,246 cuft

Storage Indication method used.



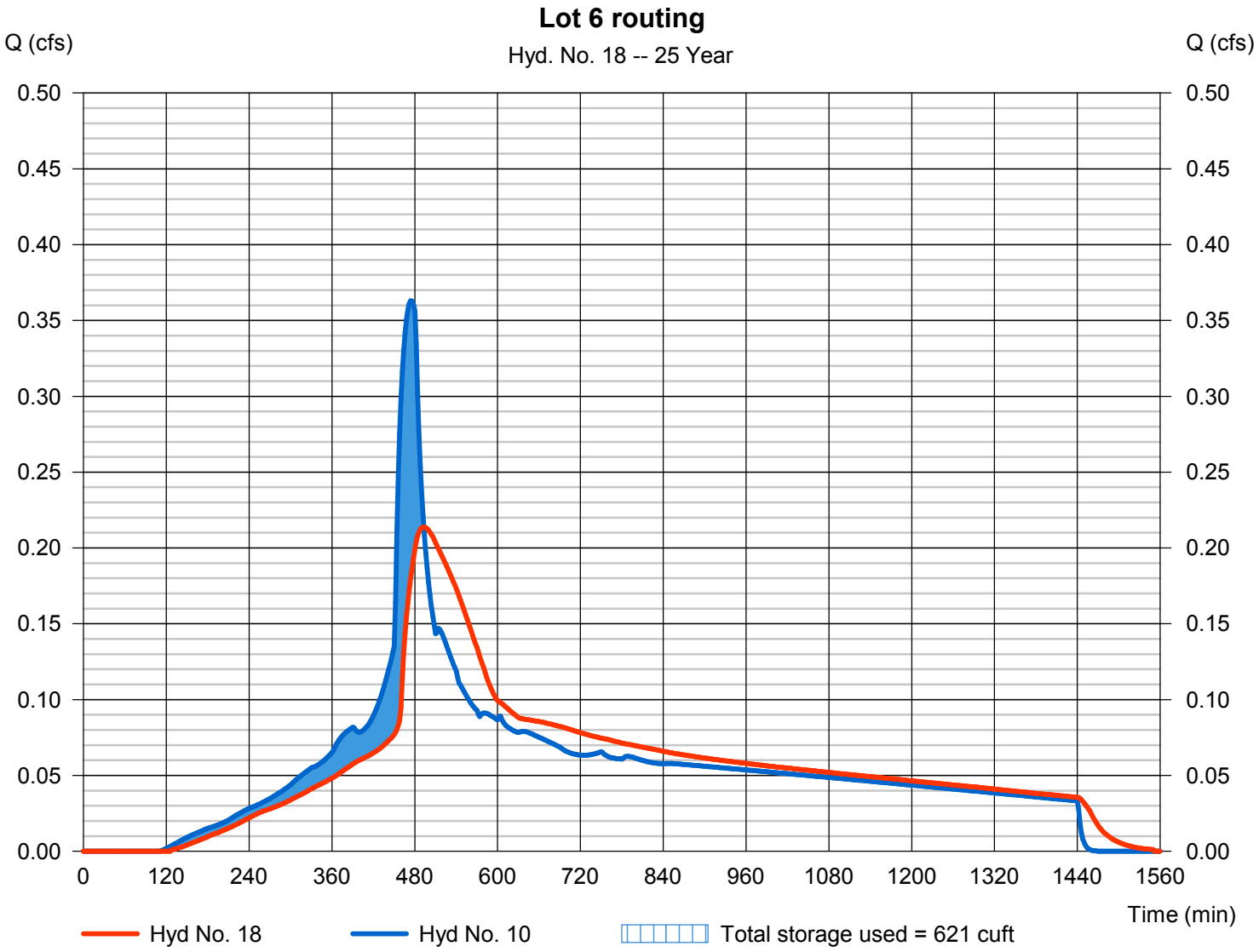
Hydrograph Report

Hyd. No. 18

Lot 6 routing

Hydrograph type	=	Reservoir	Peak discharge	=	0.214 cfs
Storm frequency	=	25 yrs	Time to peak	=	494 min
Time interval	=	2 min	Hyd. volume	=	5,091 cuft
Inflow hyd. No.	=	10 - Lot 6 Post-Developed	Max. Elevation	=	184.83 ft
Reservoir name	=	Lot 6 Storage	Max. Storage	=	621 cuft

Storage Indication method used.



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	69.8703	13.1000	0.8658	--------
3	0.0000	0.0000	0.0000	--------
5	79.2597	14.6000	0.8369	--------
10	88.2351	15.5000	0.8279	--------
25	102.6072	16.5000	0.8217	--------
50	114.8193	17.2000	0.8199	--------
100	127.1596	17.8000	0.8186	--------

File name: SampleFHA.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

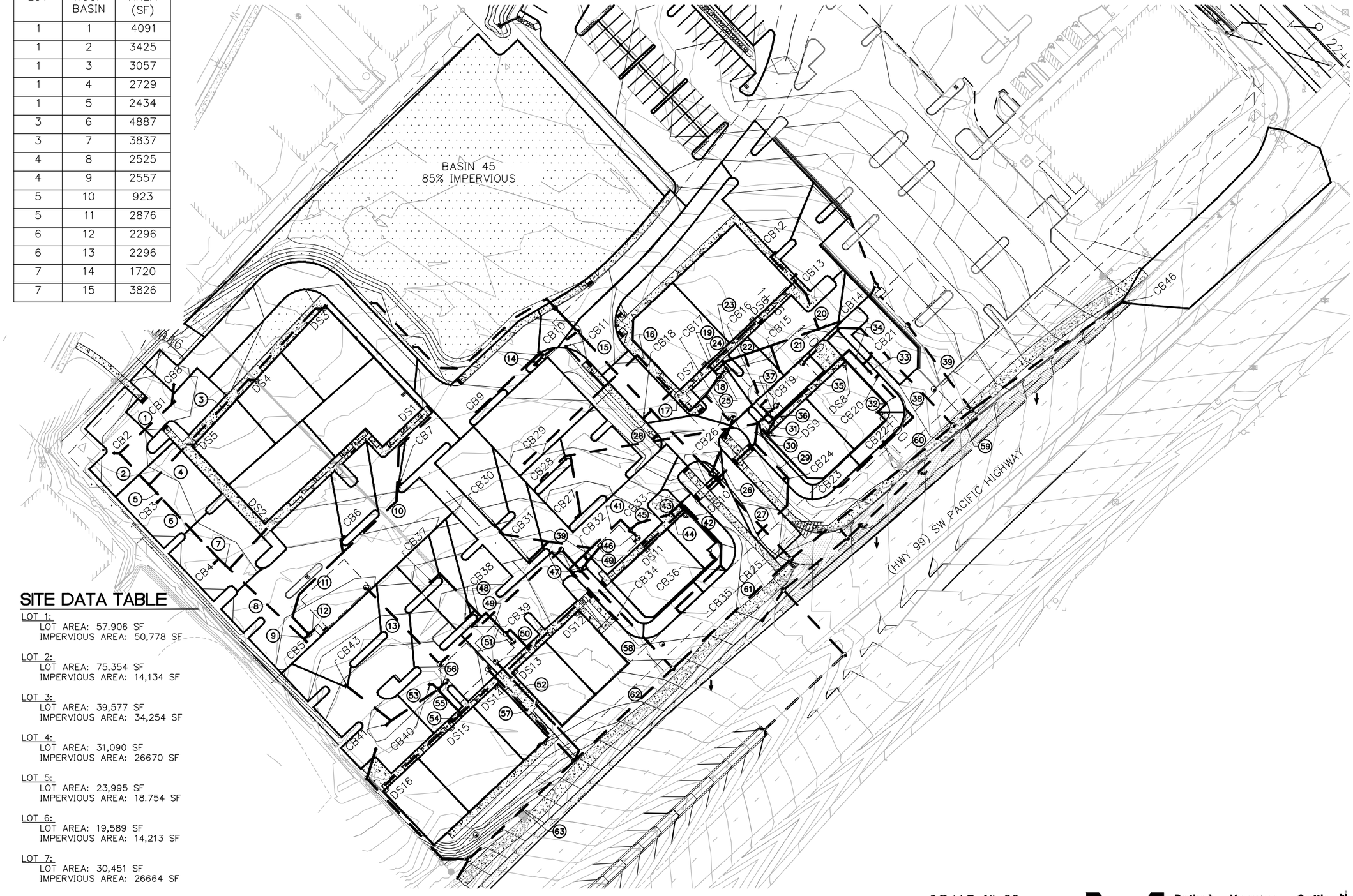
Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	2.50	0.00	3.30	3.50	4.00	6.80	4.50
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

LOT	CATCH BASIN	AREA (SF)
1	1	2706
1	2	2866
1	3	3943
1	4	3850
1	5	13895
1	6	1651
1	7	1307
2	8	6361
2	9	4291
2	10	3447
3	11	3485
3	12	4585
3	13	2305
3	14	473
3	15	2907
3	16	1324
3	17	1471
3	18	1932
4	19	1267
4	20	1099
4	21	1929
4	22	687
4	23	537
4	24	1124
4	25	2102
4	26	1922
4	27	4012
4	28	664
3	29	4702
5	30	2488
5	31	1724
5	32	5223
5	33	403
5	34	886
5	35	710
5	36	1249
6	37	879
6	38	1666
6	39	6130
7	40	4410
7	41	7664
7	42	NA
7	43	2622
7	44	NA
2	45	42819.6
hwy 99	46	9934

LOT	ROOF BASIN	AREA (SF)
1	1	4091
1	2	3425
1	3	3057
1	4	2729
1	5	2434
3	6	4887
3	7	3837
4	8	2525
4	9	2557
5	10	923
5	11	2876
6	12	2296
6	13	2296
7	14	1720
7	15	3826



SITE DATA TABLE

LOT 1:
LOT AREA: 57.906 SF
IMPERVIOUS AREA: 50,778 SF

LOT 2:
LOT AREA: 75,354 SF
IMPERVIOUS AREA: 14,134 SF

LOT 3:
LOT AREA: 39,577 SF
IMPERVIOUS AREA: 34,254 SF

LOT 4:
LOT AREA: 31,090 SF
IMPERVIOUS AREA: 26670 SF

LOT 5:
LOT AREA: 23,995 SF
IMPERVIOUS AREA: 18.754 SF

LOT 6:
LOT AREA: 19,589 SF
IMPERVIOUS AREA: 14,213 SF

LOT 7:
LOT AREA: 30,451 SF
IMPERVIOUS AREA: 26664 SF

BASIN MAP

CEDAR CREEK PLAZA

SEPTEMBER 20, 2017
Job # 2160618.00

SCALE: 1"=80

0 80 160

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216061800\4_DRAWINGS\CIVIL\618-BASIN MAP-RET.DWG KRC 09/20/17 08:28 1:80

Project name: **Cedar Plaza - Retail** **Project number:** **2160618.00**

CWS 25 year/24-hour storm event

By: NKL Checked: RJH DS = Downspout MH = Manhole

Date: 4/11/2017 Date: 4/11/2017 CI = Curb Inlet WQ = Water Quality

n = 0.013 AD= Area Drain O/W = Oil Water Separator

Pipe Link	Drainage Basin	Time of Concentration (min)	Total Time(min)	25-yr Storm Intensity(in/hr)	Incr. Area(Ac)	Coef. Of Runoff	Incr. Equiv.(CxA)	Total Equiv. Area	**Runoff (cfs)**	Slope(%)	Diameter (in)	Pipe Area (sf)	Hydraulic Radius^2/3	Capacity (cfs)	Velocity at Design Flow (fps)	Runoff/Capacity (ratio)	Length(ft)	Incr. Time(min)
	CB8	5.00	5.00	3.40	0.146	0.9	0.13	0.13	**0.45**	0.50	8	0.349	0.303	**0.85**	2.44	0.53	16	0.11
	CB1	5.00	5.00	3.40	0.062	0.9	0.06	0.06	**0.19**	0.50	6	0.196	0.250	**0.40**	1.97	0.48	2	0.02
1	CB8+CB1	0.11	5.11	3.38				0.19	**0.63**	0.50	8	0.349	0.303	**0.85**	2.64	0.74	60	0.38
	CB2	5.00	5.00	3.40	0.066	0.9	0.06	0.06	**0.20**	0.50	6	0.196	0.250	**0.40**	2.00	0.51	3	0.02
2	1+CB2	0.38	5.49	3.31				0.25	**0.82**	0.50	8	0.349	0.303	**0.85**	2.74	0.96	40	0.24
	DS3	5.00	5.00	3.40	0.070	0.9	0.06	0.06	**0.21**	0.50	6	0.196	0.250	**0.40**	2.03	0.54	81	0.66
	DS4	5.00	5.00	3.40	0.063	0.9	0.06	0.06	**0.19**	0.50	6	0.196	0.250	**0.40**	1.98	0.49	1	0.01
3	DS3+DS4	0.66	5.66	3.28				0.12	**0.39**	0.50	6	0.196	0.250	**0.40**	2.26	0.99	89	0.66
	DS5	5.00	5.00	3.40	0.056	0.9	0.05	0.05	**0.17**	0.50	6	0.196	0.250	**0.40**	1.92	0.43	1	0.01
4	3+DS5	0.66	6.32	3.17				0.17	**0.54**	0.50	8	0.349	0.303	**0.85**	2.55	0.63	46	0.30
5	2+4	0.30	6.62	3.11				0.42	**1.29**	0.50	10	0.545	0.351	**1.54**	3.13	0.84	12	0.06
	CB3	5.00	5.00	3.40	0.091	0.9	0.08	0.08	**0.28**	0.50	6	0.196	0.250	**0.40**	2.15	0.70	4	0.03
6	5+CB3	0.06	6.68	3.28				0.50	**1.63**	1.00	10	0.545	0.351	**2.18**	4.34	0.75	69	0.26
	CB4	5.00	5.00	3.40	0.088	0.9	0.08	0.08	**0.27**	0.50	6	0.196	0.250	**0.40**	2.14	0.68	4	0.03

Project name: **Cedar Plaza - Retail** **Project number:** **2160618.00**

CWS 25 year/24-hour storm event

By: NKL Checked: RJH DS = Downspout MH = Manhole

Date: 4/11/2017 Date: 4/11/2017 CI = Curb Inlet WQ = Water Quality

n = 0.013 AD= Area Drain O/W = Oil Water Separator

Pipe Link	Drainage Basin	Time of Concentration (min)	Total Time(min)	25-yr Storm Intensity(in/hr)	Incr. Area(Ac)	Coef. Of Runoff	Incr. Equiv.(CxA)	Total Equiv. Area	**Runoff (cfs)**	Slope(%)	Diameter (in)	Pipe Area (sf)	Hydraulic Radius^2/3	Capacity (cfs)	Velocity at Design Flow (fps)	Runoff/Capacity (ratio)	Length(ft)	Incr. Time(min)
7	6+CB4	0.26	6.95	3.05				0.58	**1.76**	0.50	12	0.785	0.397	**2.51**	3.42	0.70	51	0.25
	DS2	5.00	5.00	3.40	0.079	0.9	0.07	0.07	**0.24**	0.50	6	0.196	0.250	**0.40**	2.09	0.61	45	0.36
8	7+DS2	0.36	7.31	2.99				0.65	**1.94**	0.50	12	0.785	0.397	**2.51**	3.49	0.77	85	0.41
	CB5	5.00	5.00	3.40	0.319	0.9	0.29	0.29	**0.98**	1.00	8	0.349	0.303	**1.20**	3.80	0.81	2	0.01
9	8+CB5	0.41	7.71	2.91				0.94	**2.72**	0.75	12	0.785	0.397	**3.07**	4.37	0.89	4	0.02
	DS1	5.00	5.00	3.40	0.094	0.9	0.08	0.08	**0.29**	0.50	6	0.196	0.250	**0.40**	2.17	0.73	77	0.59
	CB7	5.00	5.00	3.40	0.030	0.9	0.03	0.03	**0.09**	0.50	6	0.196	0.250	**0.40**	1.62	0.23	3	0.03
10	DS1+CB7	0.59	5.59	3.29				0.11	**0.37**	0.50	6	0.196	0.250	**0.40**	2.26	0.93	74	0.55
	CB6	5.00	5.00	3.40	0.038	0.9	0.03	0.03	**0.12**	0.50	6	0.196	0.250	**0.40**	1.73	0.29	14	0.13
11	10+CB6	0.55	6.14	3.19				0.15	**0.46**	0.50	8	0.349	0.303	**0.85**	2.47	0.55	88	0.59
12	9+11	0.59	8.31	2.81				1.08	**3.04**	0.75	12	0.785	0.397	**3.07**	4.40	0.99	5	0.02
13	12 Thru Detention Chamber								**0.28**	0.50	6	0.196	0.250	**0.40**	2.15	0.70	245	1.90
	CB9	5.00	5.00	3.40	0.099	0.9	0.09	0.09	**0.30**	0.50	6	0.196	0.250	**0.40**	2.19	0.76	62	0.47

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Project name: **Cedar Plaza - Retail** **Project number:** **2160618.00**

CWS 25 year/24-hour storm event

By: NKL Checked: RJH DS = Downspout MH = Manhole

Date: 4/11/2017 Date: 4/11/2017 CI = Curb Inlet WQ = Water Quality

n = 0.013 AD= Area Drain O/W = Oil Water Separator

Pipe Link	Drainage Basin	Time of Concentration (min)	Total Time(min)	25-yr Storm Intensity(in/hr)	Incr. Area(Ac)	Coef. Of Runoff	Incr. Equiv.(CxA)	Total Equiv. Area	**Runoff (cfs)**	Slope(%)	Diameter (in)	Pipe Area (sf)	Hydraulic Radius^2/3	Capacity (cfs)	Velocity at Design Flow (fps)	Runoff/Capacity (ratio)	Length(ft)	Incr. Time(min)
	CB10	5.00	5.00	3.40	0.079	0.9	0.07	0.07	**0.24**	0.50	6	0.196	0.250	**0.40**	2.09	0.61	8	0.06
14	CB9+CB10	0.47	5.47	3.32				0.16	**0.53**	0.50	8	0.349	0.303	**0.85**	2.54	0.62	46	0.30
	CB45	5.00	5.00	3.40	0.983	0.9	0.88	0.88	**3.01**	0.75	12	0.785	0.397	**3.07**	4.40	0.98	26	0.10
15	14+CB45	0.30	5.77	3.27				1.04	**3.42**	1.00	12	0.785	0.397	**3.55**	5.08	0.96	47	0.15
	CB11	5.00	5.00	3.40	0.080	0.9	0.07	0.07	**0.24**	0.50	6	0.196	0.250	**0.40**	2.10	0.62	45	0.36
	CB29	5.00	5.00	3.40	0.108	0.9	0.10	0.10	**0.33**	0.50	6	0.196	0.250	**0.40**	2.23	0.84	91	0.68
16	CB11+CB29	0.68	5.68	3.29				0.17	**0.56**	0.50	8	0.349	0.303	**0.85**	2.57	0.65	79	0.51
	CB18	5.00	5.00	3.40	0.044	0.9	0.04	0.04	**0.14**	0.50	6	0.196	0.250	**0.40**	1.81	0.34	31	0.29
17	16+CB18	0.51	6.19	3.20				0.21	**0.67**	0.50	8	0.349	0.303	**0.85**	2.67	0.79	40	0.25
	CB17	5.00	5.00	3.40	0.034	0.9	0.03	0.03	**0.10**	0.50	6	0.196	0.250	**0.40**	1.68	0.26	27	0.27
18	17+CB17	0.27	6.46	3.15				0.24	**0.75**	0.50	8	0.349	0.303	**0.85**	2.72	0.89	18	0.11
	DS6	5.00	5.00	3.40	0.112	0.9	0.10	0.10	**0.34**	0.50	6	0.196	0.250	**0.40**	2.24	0.87	52	0.39
	DS7	5.00	5.00	3.40	0.088	0.9	0.08	0.08	**0.27**	0.50	6	0.196	0.250	**0.40**	2.14	0.68	2	0.02
19	DS6 + DS7	0.39	5.39	3.35				0.18	**0.60**	0.50	8	0.349	0.303	**0.85**	2.62	0.71	7	0.04

Project name: **Cedar Plaza - Retail** **Project number:** **2160618.00**

CWS 25 year/24-hour storm event

By: NKL Checked: RJH DS = Downspout MH = Manhole

Date: 4/11/2017 Date: 4/11/2017 CI = Curb Inlet WQ = Water Quality

n = 0.013 AD= Area Drain O/W = Oil Water Separator

Pipe Link	Drainage Basin	Time of Concentration (min)	Total Time(min)	25-yr Storm Intensity(in/hr)	Incr. Area(Ac)	Coef. Of Runoff	Incr. Equiv.(CxA)	Total Equiv. Area	**Runoff (cfs)**	Slope(%)	Diameter (in)	Pipe Area (sf)	Hydraulic Radius^2/3	Capacity (cfs)	Velocity at Design Flow (fps)	Runoff/Capacity (ratio)	Length(ft)	Incr. Time(min)
	CB12	5.00	5.00	3.40	0.105	0.9	0.09	0.09	**0.32**	0.50	6	0.196	0.250	**0.40**	2.22	0.82	45	0.34
	CB13	5.00	5.00	3.40	0.053	0.9	0.05	0.05	**0.16**	0.50	6	0.196	0.250	**0.40**	1.89	0.41	4	0.04
20	CB12 + CB13	0.34	5.34	3.35				0.14	**0.48**	0.50	8	0.349	0.303	**0.85**	2.48	0.56	31	0.21
	CB14	5.00	5.00	3.40	0.011	0.9	0.01	0.01	**0.03**	0.50	6	0.196	0.250	**0.40**	1.21	0.08	18	0.25
21	20 + CB14	0.25	5.59	3.35				0.15	**0.51**	0.50	8	0.349	0.303	**0.85**	2.52	0.60	42	0.28
	CB15	5.00	5.00	3.40	0.067	0.9	0.06	0.06	**0.20**	0.50	6	0.196	0.250	**0.40**	2.01	0.52	21	0.17
22	21 + CB15	0.28	5.86	3.26				0.21	**0.69**	0.50	8	0.349	0.303	**0.85**	2.69	0.81	23	0.14
	CB16	5.00	5.00	3.40	0.030	0.9	0.03	0.03	**0.09**	0.50	6	0.196	0.250	**0.40**	1.63	0.24	32	0.33
23	22 + CB16	0.33	6.19	3.20				0.24	**0.77**	0.50	8	0.349	0.303	**0.85**	2.73	0.90	29	0.18
24	19 + 23	0.18	6.37	3.17				0.42	**1.33**	0.50	10	0.545	0.351	**1.54**	3.15	0.86	5	0.03
25	18 + 24	0.11	6.57	3.17				0.66	**2.09**	1.00	10	0.545	0.351	**2.18**	4.50	0.96	6	0.02
26	25 Thru Detention Chamber								**0.19**	0.50	6	0.196	0.250	**0.40**	1.98	0.49	46	0.39
27	15 + 26	0.39	7.35	2.99				1.70	**5.09**	0.75	15	1.227	0.461	**5.57**	5.09	0.91	93	0.30

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Project name: **Cedar Plaza - Retail** **Project number:** **2160618.00**

CWS 25 year/24-hour storm event

By: NKL Checked: RJH DS = Downspout MH = Manhole

Date: 4/11/2017 Date: 4/11/2017 CI = Curb Inlet WQ = Water Quality

n = 0.013 AD= Area Drain O/W = Oil Water Separator

Pipe Link	Drainage Basin	Time of Concentration (min)	Total Time(min)	25-yr Storm Intensity(in/hr)	Incr. Area(Ac)	Coef. Of Runoff	Incr. Equiv.(CxA)	Total Equiv. Area	**Runoff (cfs)**	Slope(%)	Diameter (in)	Pipe Area (sf)	Hydraulic Radius^2/3	Capacity (cfs)	Velocity at Design Flow (fps)	Runoff/Capacity (ratio)	Length(ft)	Incr. Time(min)
	CB28	5.00	5.00	3.40	0.015	0.9	0.01	0.01	**0.05**	0.50	6	0.196	0.250	**0.40**	1.34	0.12	32	0.40
	CB27	5.00	5.00	3.40	0.092	0.9	0.08	0.08	**0.28**	0.50	6	0.196	0.250	**0.40**	2.16	0.71	53	0.41
28	CB28 + CB27	0.41	5.41	3.33				0.10	**0.32**	0.50	6	0.196	0.250	**0.40**	2.22	0.81	157	1.18
	CB25	5.00	5.00	3.40	0.048	0.9	0.04	0.04	**0.15**	0.50	6	0.196	0.250	**0.40**	1.85	0.37	61	0.55
	CB24	5.00	5.00	3.40	0.026	0.9	0.02	0.02	**0.08**	0.50	6	0.196	0.250	**0.40**	1.56	0.20	2	0.02
29	CB25 + CB24	0.55	5.55	3.31				0.07	**0.22**	0.50	6	0.196	0.250	**0.40**	2.05	0.56	38	0.31
	CB26	5.00	5.00	3.40	0.044	0.9	0.04	0.04	**0.14**	0.50	6	0.196	0.250	**0.40**	1.80	0.34	52	0.48
30	29 + CB26	0.48	6.03	3.22				0.11	**0.34**	0.50	6	0.196	0.250	**0.40**	2.24	0.87	17	0.13
31	28 + 30	1.18	7.21	3.00				0.20	**0.61**	0.50	8	0.349	0.303	**0.85**	2.62	0.72	17	0.11
	CB23	5.00	5.00	3.40	0.012	0.9	0.01	0.01	**0.04**	0.50	6	0.196	0.250	**0.40**	1.26	0.10	56	0.74
	CB22	5.00	5.00	3.40	0.016	0.9	0.01	0.01	**0.05**	0.50	6	0.196	0.250	**0.40**	1.35	0.12	56	0.69
32	CB 23 + CB22	0.74	5.74	3.27				0.03	**0.08**	0.50	6	0.196	0.250	**0.40**	1.58	0.21	77	0.81
	CB20	5.00	5.00	3.40	0.025	0.9	0.02	0.02	**0.08**	0.50	6	0.196	0.250	**0.40**	1.55	0.20	2	0.02
33	32 + CB20	0.81	6.56	3.27				0.05	**0.16**	0.50	6	0.196	0.250	**0.40**	1.88	0.40	15	0.13

Project name: **Cedar Plaza - Retail** **Project number:** **2160618.00**

CWS 25 year/24-hour storm event

By: NKL Checked: RJH DS = Downspout MH = Manhole

Date: 4/11/2017 Date: 4/11/2017 CI = Curb Inlet WQ = Water Quality

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Pipe Link	Drainage Basin	Time of Concentration (min)	Total Time(min)	25-yr Storm Intensity(in/hr)	Incr. Area(Ac)	Coef. Of Runoff	Incr. Equiv.(CxA)	Total Equiv. Area	**Runoff (cfs)**	Slope(%)	Diameter (in)	Pipe Area (sf)	Hydraulic Radius^2/3	Capacity (cfs)	Velocity at Design Flow (fps)	Runoff/Capacity (ratio)	Length(ft)	Incr. Time(min)
	CB21	5.00	5.00	3.40	0.044	0.9	0.04	0.04	**0.14**	0.50	6	0.196	0.250	**0.40**	1.81	0.34	11	0.10
34	33 + CB21	0.13	6.69	3.11				0.09	**0.27**	0.50	6	0.196	0.250	**0.40**	2.15	0.69	36	0.28
	DS8	5.00	5.00	3.40	0.058	0.9	0.05	0.05	**0.18**	0.50	6	0.196	0.250	**0.40**	1.94	0.45	5	0.04
35	34 + DS8	0.28	6.97	3.06				0.14	**0.43**	0.60	6	0.196	0.250	**0.43**	2.48	0.99	36	0.24
	DS9	5.00	5.00	3.40	0.059	0.9	0.05	0.05	**0.18**	0.50	6	0.196	0.250	**0.40**	1.94	0.45	12	0.10
36	35 + DS9	0.24	7.21	3.00				0.19	**0.58**	0.50	8	0.349	0.303	**0.85**	2.59	0.68	6	0.04
	CB19	5.00	5.00	3.40	0.029	0.9	0.03	0.03	**0.09**	0.50	6	0.196	0.250	**0.40**	1.61	0.23	12	0.12
37	31 + 36 + CB19	0.12	7.34	2.97				0.42	**1.25**	1.20	8	0.349	0.303	**1.32**	4.24	0.95	5	0.02
38	37 Thru Detention Chamber								**0.14**	0.50	6	0.196	0.250	**0.40**	1.81	0.35	167	1.53
	CB30	5.00	5.00	3.40	0.057	0.9	0.05	0.05	**0.17**	0.50	6	0.196	0.250	**0.40**	1.93	0.44	48	0.41
	CB31	5.00	5.00	3.40	0.040	0.9	0.04	0.04	**0.12**	0.50	6	0.196	0.250	**0.40**	1.75	0.31	23	0.22
39	CB30 + CB31	0.41	5.41	3.33				0.09	**0.29**	0.50	6	0.196	0.250	**0.40**	2.18	0.73	35	0.27
	CB34	5.00	5.00	3.40	0.020	0.9	0.02	0.02	**0.06**	0.50	6	0.196	0.250	**0.40**	1.45	0.16	72	0.83

Project name: **Cedar Plaza - Retail** **Project number:** **2160618.00**

CWS 25 year/24-hour storm event

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Pipe Link	Drainage Basin	Time of Concentration (min)	Total Time(min)	25-yr Storm Intensity(in/hr)	Incr. Area(Ac)	Coef. Of Runoff	Incr. Equiv.(CxA)	Total Equiv. Area	**Runoff (cfs)**	Slope(%)	Diameter (in)	Pipe Area (sf)	Hydraulic Radius^2/3	Capacity (cfs)	Velocity at Design Flow (fps)	Runoff/Capacity (ratio)	Length(ft)	Incr. Time(min)
	CB32	5.00	5.00	3.40	0.120	0.9	0.11	0.11	**0.37**	17.90	6	0.196	0.250	**2.36**	8.66	0.16	3	0.01
40	CB34 + CB32	0.83	5.83	3.26				0.13	**0.41**	0.85	6	0.196	0.250	**0.52**	2.88	0.80	35	0.20
41	39 + 40	0.27	6.09	3.22				0.21	**0.69**	0.50	8	0.349	0.303	**0.85**	2.68	0.81	35	0.22
	CB35	5.00	5.00	3.40	0.016	0.9	0.01	0.01	**0.05**	0.50	6	0.196	0.250	**0.40**	1.36	0.13	55	0.67
	CB36	5.00	5.00	3.40	0.029	0.9	0.03	0.03	**0.09**	0.50	6	0.196	0.250	**0.40**	1.60	0.22	5	0.05
42	CB35 + CB36	0.67	5.67	3.29				0.04	**0.13**	0.50	6	0.196	0.250	**0.40**	1.80	0.34	67	0.62
	CB33	5.00	5.00	3.40	0.009	0.9	0.01	0.01	**0.03**	0.50	6	0.196	0.250	**0.40**	1.16	0.07	3	0.04
43	42 + CB33	0.62	6.29	3.17				0.05	**0.15**	0.50	6	0.196	0.250	**0.40**	1.87	0.39	9	0.08
	DS10	5.00	5.00	3.40	0.021	0.9	0.02	0.02	**0.06**	0.50	6	0.196	0.250	**0.40**	1.47	0.16	9	0.10
	DS11	5.00	5.00	3.40	0.066	0.9	0.06	0.06	**0.20**	0.50	6	0.196	0.250	**0.40**	2.00	0.51	35	0.29
44	DS10 + DS11	0.29	5.29	3.36				0.08	**0.26**	0.50	6	0.196	0.250	**0.40**	2.13	0.67	5	0.04
45	43 + 44	0.08	6.37	3.17				0.13	**0.40**	0.70	6	0.196	0.250	**0.47**	2.65	0.86	35	0.22
46	41 + 45	0.22	6.59	3.13				0.34	**1.07**	1.00	8	0.349	0.303	**1.20**	3.85	0.89	11	0.05
47	46 Thru Detention Chamber								**0.12**	0.50	6	0.196	0.250	**0.40**	1.74	0.30	167	1.60

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Pipe Link	Drainage Basin	Time of Concentration (min)	Total Time(min)	25-yr Storm Intensity(in/hr)	Incr. Area(Ac)	Coef. Of Runoff	Incr. Equiv.(CxA)	Total Equiv. Area	**Runoff (cfs)**	Slope(%)	Diameter (in)	Pipe Area (sf)	Hydraulic Radius^2/3	Capacity (cfs)	Velocity at Design Flow (fps)	Runoff/Capacity (ratio)	Length(ft)	Incr. Time(min)
	CB37	5.00	5.00	3.40	0.020	0.9	0.02	0.02	**0.06**	0.50	6	0.196	0.250	**0.40**	1.45	0.16	52	0.60
	CB38	5.00	5.00	3.40	0.038	0.9	0.03	0.03	**0.12**	0.50	6	0.196	0.250	**0.40**	1.74	0.30	10	0.10
48	CB37 + CB38	0.60	5.60	3.29				0.05	**0.17**	0.50	6	0.196	0.250	**0.40**	1.93	0.44	8	0.07
	CB39	5.00	5.00	3.40	0.141	0.9	0.13	0.13	**0.43**	0.60	6	0.196	0.250	**0.43**	2.48	0.99	10	0.07
49	48 + CB39	0.07	5.67	3.29				0.18	**0.59**	0.50	8	0.349	0.303	**0.85**	2.60	0.69	27	0.17
	DS12	5.00	5.00	3.40	0.053	0.9	0.05	0.05	**0.16**	0.50	6	0.196	0.250	**0.40**	1.89	0.41	51	0.45
	DS13	5.00	5.00	3.40	0.053	0.9	0.05	0.05	**0.16**	0.50	6	0.196	0.250	**0.40**	1.89	0.41	23	0.20
50	DS12 + DS13	0.45	5.45	3.33				0.09	**0.32**	0.50	6	0.196	0.250	**0.40**	2.21	0.80	26	0.20
51	49 + 50	0.20	5.86	3.26				0.27	**0.89**	0.75	8	0.349	0.303	**1.04**	3.32	0.86	10	0.05
52	51 Thru Detention Chamber								**0.09**	0.50	6	0.196	0.250	**0.40**	1.61	0.23	107	1.11
	CB43	5.00	5.00	3.40	0.060	0.9	0.05	0.05	**0.18**	0.50	6	0.196	0.250	**0.40**	1.96	0.47	47	0.40
	CB41	5.00	5.00	3.40	0.176	0.9	0.16	0.16	**0.54**	0.50	8	0.349	0.303	**0.85**	2.55	0.63	5	0.03
53	CB37 + CB38	0.40	5.40	3.33				0.21	**0.71**	0.50	8	0.349	0.303	**0.85**	2.70	0.83	45	0.28

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Pipe Link	Drainage Basin	Time of Concentration (min)	Total Time(min)	25-yr Storm Intensity(in/hr)	Incr. Area(Ac)	Coef. Of Runoff	Incr. Equiv.(CxA)	Total Equiv. Area	**Runoff (cfs)**	Slope(%)	Diameter (in)	Pipe Area (sf)	Hydraulic Radius^2/3	Capacity (cfs)	Velocity at Design Flow (fps)	Runoff/Capacity (ratio)	Length(ft)	Incr. Time(min)
	CB40	5.00	5.00	3.40	0.101	0.9	0.09	0.09	**0.31**	0.50	6	0.196	0.250	**0.40**	2.20	0.78	6	0.05
	DS16	5.00	5.00	3.40	0.056	0.9	0.05	0.05	**0.17**	0.50	6	0.196	0.250	**0.40**	1.92	0.43	74	0.64
	DS15	5.00	5.00	3.40	0.088	0.9	0.08	0.08	**0.27**	0.50	6	0.196	0.250	**0.40**	2.14	0.68	5	0.04
54	DS16 + DS15	0.64	5.64	3.29				0.13	**0.43**	0.60	6	0.196	0.250	**0.43**	2.48	0.98	45	0.30
	DS14	5.00	5.00	3.40	0.039	0.9	0.04	0.04	**0.12**	0.50	6	0.196	0.250	**0.40**	1.75	0.31	31	0.30
55	DS14 + 54	0.30	5.94	3.24				0.17	**0.53**	1.00	6	0.196	0.250	**0.56**	3.20	0.96	26	0.14
56	CB40 + 53 + 55	0.28	6.22	3.18				0.47	**1.49**	0.50	10	0.545	0.351	**1.54**	3.18	0.97	10	0.05
57	56 Thru Detention Chamber								**0.15**	0.50	6	0.196	0.250	**0.40**	1.85	0.37	101	0.91
58	13 + 47	1.90	12.10	2.33				1.42	**3.31**	1.00	12	0.785	0.397	**3.55**	5.07	0.93	10	0.03
	CB46	5.00	5.00	3.40	0.230	0.9	0.21	0.21	**0.70**	10.00	12	0.785	0.397	**11.22**	7.88	0.06	153	0.32
39	(from Providence)								**0.47**	0.50	10	0.545	0.351	**1.54**	2.45	0.30	85	0.58
59	CB46 + 39	0.58	5.58	3.29				0.21	**0.68**	0.50	18	1.767	0.520	**7.40**	2.59	0.09	20	0.13
60	59 + 38	1.53	7.11	3.02				0.63	**1.90**	0.50	18	1.767	0.520	**7.40**	3.47	0.26	256	1.23
61	27 + 60	1.23	8.58	2.82				2.33	**6.58**	0.50	18	1.767	0.520	**7.40**	4.67	0.89	133	0.47

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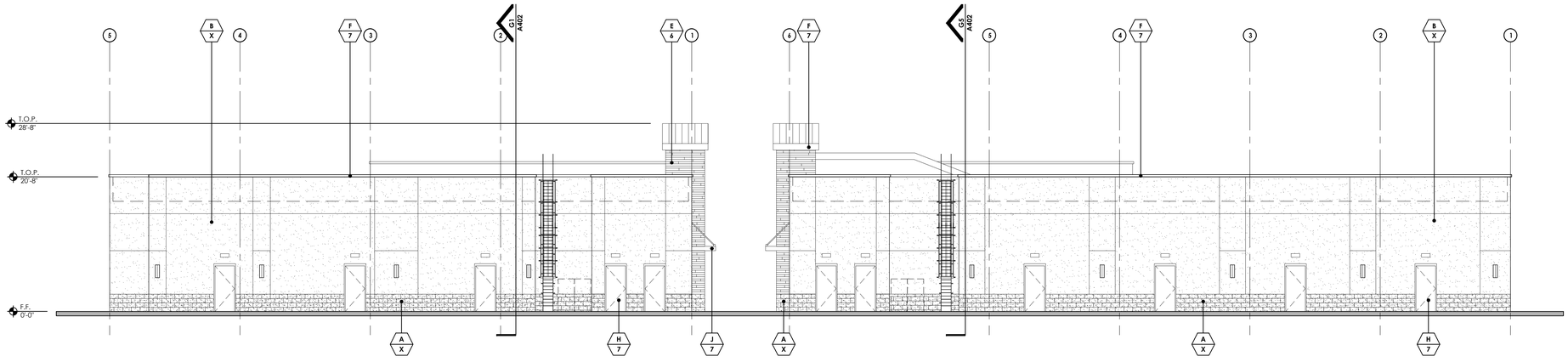
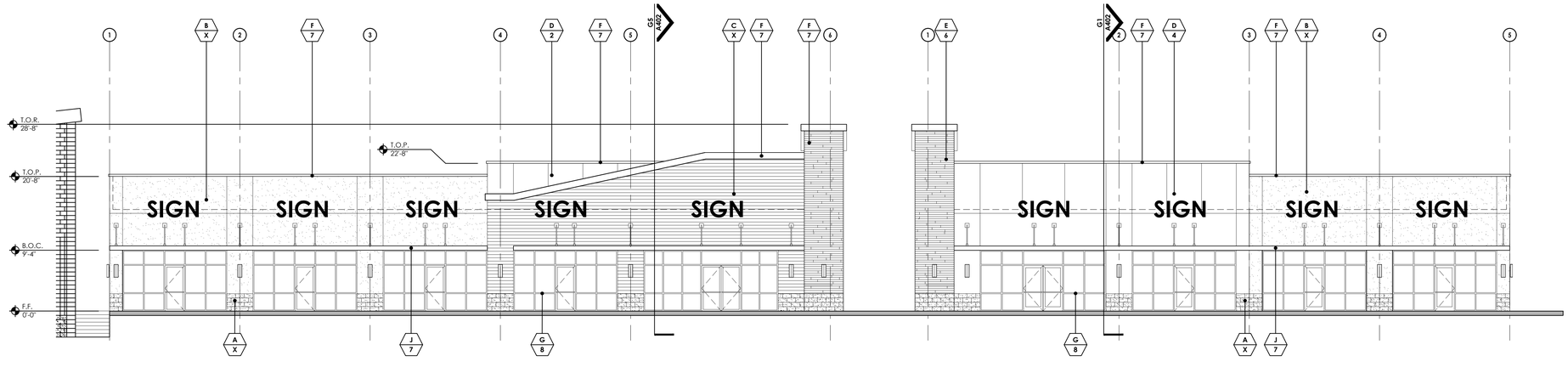
CWS 25 year/24-hour storm event																		
By:	NKL		Checked:	RJH					DS = Downspout				MH = Manhole					
Date:	4/11/2017		Date:	4/11/2017					CI = Curb Inlet				WQ = Water Quality					
n =	0.013								AD= Area Drain				O/W = Oil Water Separator					
Pipe Link	Drainage Basin	Time of Concentration (min)	Total Time(min)	25-yr Storm Intensity(in/hr)	Incr. Area(Ac)	Coef. Of Runoff	Incr. Equiv.(CxA)	Total Equiv. Area	**Runoff (cfs)**	Slope(%)	Diameter (in)	Pipe Area (sf)	Hydraulic Radius^2/3	Capacity (cfs)	Velocity at Design Flow (fps)	Runoff/Capacity (ratio)	Length(ft)	Incr. Time(min)
62	58 + 61	0.47	12.58	2.28				3.75	**8.56**	0.81	18	1.767	0.520	**9.42**	5.96	0.91	112	0.31
63	52 + 57 + 62	1.11	13.69	2.20				4.50	**9.89**	1.50	18	1.767	0.520	**12.81**	7.91	0.77	120	0.25

EXHIBIT L

Architectural Elevations



G1 NORTH ELEVATION
SCALE:1/8" = 1'-0"



K1 SOUTH ELEVATION
SCALE:1/8" = 1'-0"

FINISH SCHEDULE

MATERIAL

A -	4X8 CMU VENEER
B -	STUCCO (EIFS)
C -	FIBER CEMENT LAP SIDING (SMOOTH)
D -	SMOOTH FIBER CEMENT PANELS WITH PAINTED ALUM REVEALS
E -	FIBER CEMENT LAP SIDING (CEDAR MILL TEXTURE)
F -	SHEET METAL FLASHING
G -	ALUMINUM STOREFRONT SYSTEM
H -	HOLLOW METAL DOOR + FRAME
J -	STEEL CANOPY STRUCTURE
K -	ALUMINUM BREAK METAL FLASHING
L -	STANDING SEAM METAL ROOFING

COLOR

- 1	GREY SQUIRREL #581
- 2	AMERICAN EAGLE #515
- 3	SCROLL BEIGE #529
- 4	LEGEND TAN #539
- 5	SARATOGA SPRINGS #1298
- 6	WOODTONE © - OLD CHERRY
- 7	MATCH BRONZE ANODIZED STOREFRONT
- 8	BRONZE ANODIZED
- 9	MONTANA TAN #693

ELEVATION NOTES

1. ALL CONCEALED MASONRY WALL AREAS SHALL BE SMOOTH TYPE CMU
2. PROVIDE LOCKABLE HINGED PANEL AT BOTTOM OF ROOF ACCESS LADDER FROM 6" ABOVE GRADE TO BOTTOM OF CAGE

NOVAK ARCHITECTURE INC
8380 SW NYBERG ST.
SUITE B
TUALATIN, OR 97062
P 503.352.4987

CEDAR CREEK PLAZA - BUILDING G
16864 SW EDY ROAD
SHERWOOD, OREGON, 97140

DEACON DEVELOPMENT
901 NE GLISAN STREET, STE 100
PORTLAND, OREGON, 97232

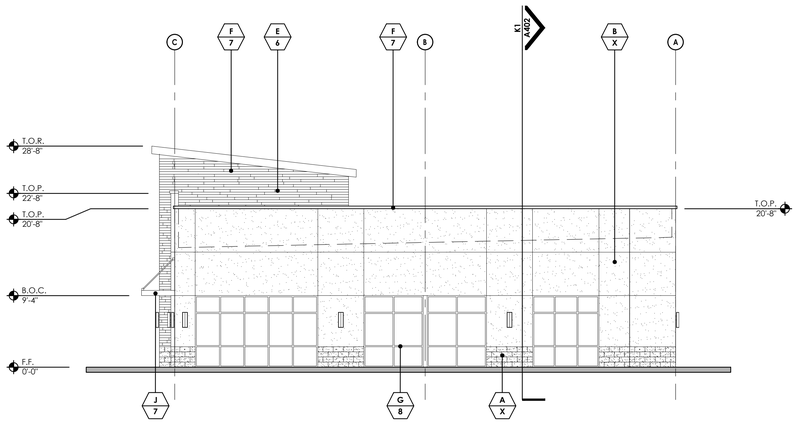
PROJECT NUMBER 17-03
DATE 09/22/22

REVISIONS

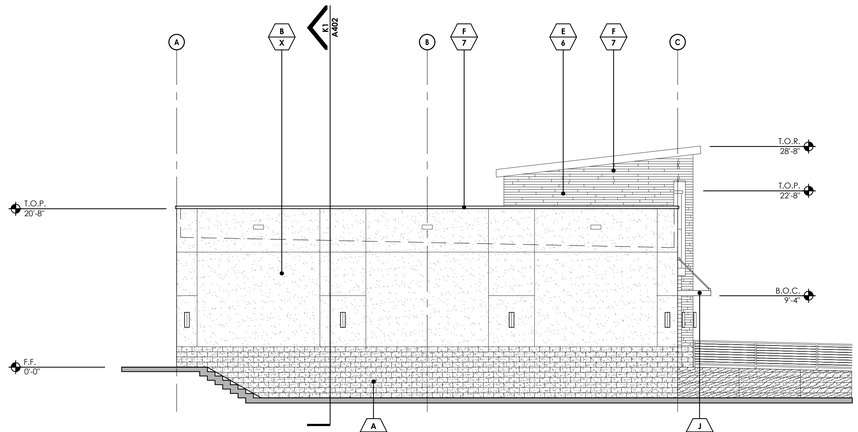
REGISTERED ARCHITECT
4140
TERRY J NOVAK
PORTLAND, OREGON
STATE OF OREGON

BUILDING ELEVATIONS

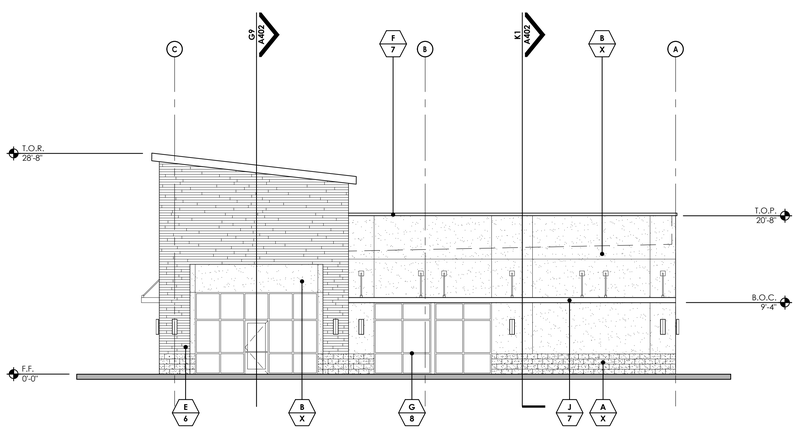
SHEET NUMBER
A301



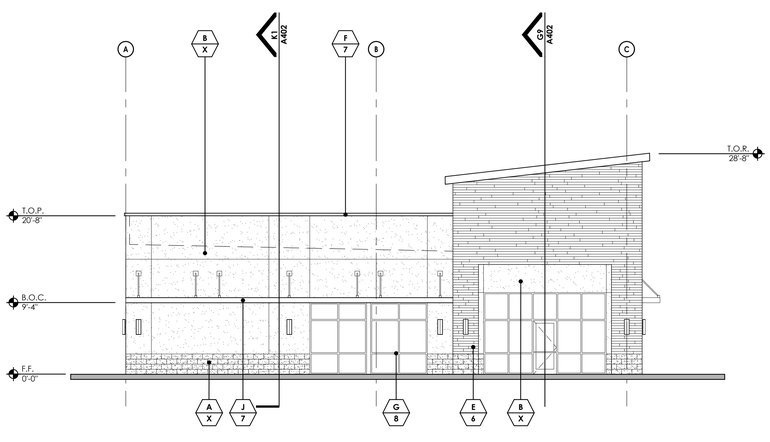
G1 WEST ELEVATION
SCALE: 1/8" = 1'-0"



G5 EAST ELEVATION
SCALE: 1/8" = 1'-0"



K1 WEST COURTYARD
SCALE: 1/8" = 1'-0"



K5 EAST COURTYARD
SCALE: 1/8" = 1'-0"

FINISH SCHEDULE

MATERIAL

A	4X8 CMU VENEER
B	STUCCO (EIFS)
C	FIBER CEMENT LAP SIDING (SMOOTH)
D	SMOOTH FIBER CEMENT PANELS WITH PAINTED ALUM REVEALS
E	FIBER CEMENT LAP SIDING (CEDAR MILL TEXTURE)
F	SHEET METAL FLASHING
G	ALUMINUM STOREFRONT SYSTEM
H	HOLLOW METAL DOOR + FRAME
J	STEEL CANOPY STRUCTURE
K	ALUMINUM BREAK METAL FLASHING
L	STANDING SEAM METAL ROOFING

COLOR

1	GREY SQUIRREL #581
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PROJECT NUMBER 17-03
DATE 09/22/22

REVISIONS

REGISTERED ARCHITECT
4140
TERRY J NOVAK
PORTLAND, OREGON
STATE OF OREGON

BUILDING ELEVATIONS

SHEET NUMBER
A302

EXHIBIT M

Commercial Design Review Matrix

EXHIBIT M

Design Criteria	Possible Points 0	1	2	3	4	Finding:
Building Design (21 Total Points Possible; Minimum 12 Points Required) These standards may be applied to individual buildings or developments with multiple buildings.						
Materials 1 []	Concrete, artificial materials (artificial or "spray" stucco, etc.)	Cultured stone, brick, stone, decorative patterned masonry, wood	A mixture of at least two (2) materials (i.e. to break up vertical facade)	A mixture of at least three (3) materials (i.e. to break up vertical facade)	A mixture of at least three (3) of the following materials: brick, stone, cultured stone, decorative patterned masonry, wood	**Estimated Point Total: 3 points** The development includes a mixture of at least three materials to break up the vertical façade (concrete, metal flashing, fiber cement siding, and steel canopies) Note: It is assumed that the split-faced masonry would not meet the City's definition of decorative masonry. If it does, 4 points may be achievable.
Design Criteria	Possible Points 0	1	2	3	4	Finding:

Roof Form 2 []	Flat (no cornice) or single-pitch (no variation)	Distinctive from existing adjacent structures (not applicable to expansion of same building) or either variation in pitch or flat roof with cornice treatment	Distinctive from existing adjacent structures (not applicable to expansion of same building) and either variation in pitch or flat roof with cornice treatment	—	—	**Estimated Point Total: 2 points** The development on Lot 2 has a roof form that is distinctive from existing adjacent structures and includes a pitch element. Response: Each building in the development has unique forms to make them distinct from each other and provide variety and character to each building, while maintaining continuity in colors and materials. Building G continues the same building features, colors and materials as the rest of the center.
Glazing 3 []	0—20% glazing on street-facing side(s)	>20% glazing on at least one street-facing side (inactive, display or façade windows)	>20% glazing on all street-facing sides (inactive, display or façade windows)	>20% glazing on at least one street-facing side (active glazing—actual windows)	>20% glazing on all street-facing sides (active glazing—actual windows)	**Estimated Point Total: 4 points** The east and south elevations are street-facing facades. The development includes generous glazing on all facades including those that are street facing and those directed toward the interior courtyard. Total street facing building façade area - 4,586 sf Total street facing glazing area - 1,422 sf Percentage - 30%
Fenestration on street-facing elevation(s)	One distinct "bay" with no vertical building elements	Multiple "bays" with one or more "bay" exceeding 30 feet in width	Vertical building elements with no "bay" exceeding 30 feet in width	Vertical building elements with no "bay" exceeding 20 feet in width	—	**Estimated Point Total: 3 points** Two vertical tower elements at the north and south entrances of the courtyard are 24-feet wide. Response: The majority of windows openings are 16 feet wide. The main entries at the tower features facing the parking lot are 20 feet wide.
Design Criteria	Possible Points 0	1	2	3	4	Finding:

Entrance	No weather protection provided	Weather protection provided via awning, porch, etc.	—	Weather protection provided via awning, porch, etc. and pedestrian amenities such as benches, tables and chairs, etc. provided near the entrance but not covered	Weather protection provided via awning, porch, etc. and pedestrian amenities such as benches, tables and chairs, etc. provided near the entrance and covered	**Estimated Point Total: 1** Steel canopies are provided. Note: Novak to help clarify if pedestrian amenities will be provided near the entrance and/or under the canopy.
Articulation						
Structure Size 4 [] to discourage "big box" style development	Greater than 80,000 square feet	60,000—79,999 square feet	40,000—59,999 square feet	20,000—39,999 square feet	Less than 20,000 square feet	**Estimated Point Total: 4** 13,000 SF is proposed. Note: City to confirm that this is a stand-alone development and that we don't need to average the structure size with the other buildings in the development.
Total:						**17 / 21 points (12 points required)**
Building Location and Orientation (6 Total Points Possible; Minimum 3 Points Required)						
Location 5 []	Building(s) not flush to any right-of-way (including required PUE adjacent to ROW, setbacks or visual corridor) (i.e. parking or drive aisle intervening)	Building(s) located flush to right-of-way on at least one side (with the exception of required setbacks, easements or visual corridors)	Buildings flush to all possible right-of-way (with the exception of required setbacks, easements or visual corridors) (i.e. "built to the corner")	—	—	**Estimated Point Total: 0** Lot 2 is not adjacent to any possible public frontages.
Design Criteria	Possible Points 0	1	2	3	4	Finding:

Orientation	Single-building site primary entrance oriented to parking lot	—	Single-building site primary entrance oriented to the pedestrian (i.e. entrance is adjacent to public sidewalk or adjacent to plaza area connected to public sidewalk and does not cross a parking area)	—	—	
	Multiple building site primary entrance to anchor tenant or primary entrance to development oriented to parking lot	—	Multiple building site primary entrance to anchor tenant or primary entrance to development oriented to the pedestrian	—	—	**Estimated Point Total: 2 points** The development proposes orienting the primary entrance towards the sidewalk that includes pedestrian elements and the pedestrian plaza that connects to the rest of Cedar Creek Plaza shopping center. The primary entrances also include pedestrian amenities including potted planters and benches.
Design Criteria	Possible Points 0	1	2	3	4	Finding:

Secondary Public Entrance [6] []			Secondary public pedestrian entrance provided adjacent to public sidewalk or adjacent to plaza area connected to public sidewalk			**Estimated Point Total: 2 points** The secondary pedestrian entrance is adjacent to a courtyard/plaza which is connected to the public sidewalk via Cedar Creek Plaza circulation. Note: Final site design to emphasize pedestrian connection to public sidewalk to show compliance.
Total:						**4 / 6 points (3 points required)**
Parking and Loading Areas (13 Total Points Possible; Minimum 7 Points Required)						
Location of Parking	Greater than 50 percent of required parking is located between any building and a public street	25—50 percent of required parking is located between any building and a public street	Less than 25 percent of required parking is located between any building and a public street	No parking is located between any building and a public street	—	**Estimated Point Total: 3 points** The proposed development is located within a commercial development that does not front a public street.
Loading Areas	Visible from public street and not screened	Visible from public street and screened	Not visible from public street	—	—	**Estimated Point Total: 2 points** The applicant proposes no loading area**s.**
Vegetation	At least one "landscaped" island every 13—15 parking spaces in a row	At least one "landscaped" island every 10—12 parking spaces in a row	At least one "landscaped" island every 8—9 parking spaces in a row	At least one "landscaped" island every 6—7 parking spaces in a row	—	**Estimated Point Total: 1 points** The applicant proposes at least one "landscaped" island every 10-12 parking spaces in a row.
Number of Parking Spaces 7 []	>120%	101—120%	100%	<100% (i.e. joint use or multiple reduction) (1 bonus)	—	**Estimated Point Total: 4 points** The applicant proposes shared parking throughout Cedar Creek Plaza through a reciprocal acess and parking agreement.
Parking Surface	Impervious	Some pervious paving (10—25%)	Partially pervious paving (26—50%)	Mostly pervious paving (>50%)	—	**Estimated Point Total: 0 points**
Total:						**10 / 13 points (7 points required)**

Landscaping (24 Total Point Possible, Minimum 14 Points Required)						
Tree Retention 8 []	Less than 50% of existing trees on-site retained	51—60% of existing trees on-site retained	61—70% of existing trees on-site retained	71—80% of existing trees on-site retained	81—100% of existing trees on-site retained	**Estimated Point Total: 4 points** The applicant is retaining all existing trees on-site.
Mitigation Trees 9 []	Trees mitigated off-site or fee-in-lieu	25—50% of trees mitigated on-site	51—75% of trees mitigated on-site	76—100% of trees mitigated on-site	—	**Estimated Point Total: 0 points** No mitigation required.
Landscaping Trees 10 []	Less than one tree for every 500 square feet of landscaping	1 tree for every 500 square feet of landscaping	2 trees for every 500 square feet of landscaping	3 trees for every 500 square feet of landscaping	4 trees for every 500 square feet of landscaping	**Estimated Point Total: 2 points** The applicant proposes 12,045 square feet of landscaping with 53 total qualifying trees.
Landscaped Areas	Greater than 35% of landscaped areas are less than 100 square feet in size	Less than 25% of landscaped areas are less than 100 square feet in size	No landscaped areas are less than 100 square feet in size	—	—	**Estimated Point Total: 2 points** The applicant proposes 12,045 square feet of landscaping with no landscaped areas less than 100 square feet.
Landscaping Trees greater than 3-inch Caliper	<25%	25—50%	>50%	—	—	**Estimated Point Total: 0 points**
Amount of Grass 11,12 []	>75% of landscaped areas	50—75% of landscaped areas	25—49% of landscaped areas	<25% of 1andscaped areas	—	**Estimated Point Total: 3 points** The applicant proposes shrubs and drought resistant ground cover in place of grass.
Total Amount of Site Landscaping 13 []	<10% of gross site	10—15% of gross site	16—20% of gross site	21—25% of gross site	>25% of gross site	**Estimated Point Total: 2 points** The applicant proposes 12,045 square feet of landscaping and the total site area measure 75,166 square feet which amounts to approximately 16% total landscaped area.
Automatic Irrigation	No	Partial	Yes	—	—	**Estimated Point Total: 2 points** The applicant proposes automatic irrigation.
Total:						**15 / 24 points (14 points required)**
Miscellaneous (10 Total Points Possible; Minimum 5 Points Required)						

Equipment Screening (roof)	Equipment not screened	Equipment partially screened	Equipment fully screened	Equipment fully screened by materials matching building architecture/finish	—	**Estimated Point Total: 3 points** The applicant is proposing roof mounted mechanical equipment that will be screen with either the parapets or a roof mounted screen, depending on the height of the mechanical equipment.
Fences and Walls 14 []	Standard fencing and wall materials (i.e. wood fences, CMU walls etc.)	—	Fencing and wall materials match building materials	—	—	**Estimated Point Total: 0 points** There is an existing fence along the north property line that is constructed with standard fencing materials.
On-Site Pedestrian Amenities Not Adjacent to Building Entrances	No	Yes; 1 per building	Yes; more than 1 per building	—	—	**Estimated Point Total: 0 points**
Open Space Provided for Public Use	No	Yes; <500 square feet	Yes; 500—1,000 square feet	Yes; >1,000 square feet	—	**Estimated Point Total: 2 points** Approximately 600 square-foot public plaza provided between the two proposed buildings.
Green Building Certification				LEED, Earth Advantage, etc. (Bonus)		**Estimated Point Total: 0 points** No Green Building certifications
Total:						**5 / 10 points (5 points required)**

EXHIBIT N

Covenants, Conditions and Restrictions

Washington County, Oregon **2019-026258**
D-IRUL
Stn=6 M FERNANDES **05/01/2019 12:03:11 PM**
$140.00 $11.00 $5.00 $60.00 **$216.00**

I, Richard Hobernicht, Director of Assessment and Taxation and Ex-Officio County Clerk for Washington County, Oregon, do hereby certify that the within instrument of writing was received and recorded in the book of records of said county.

Richard Hobernicht, Director of Assessment and Taxation, Ex-Officio

RECORDING REQUESTED BY:
AND WHEN RECORDED MAIL TO:
Brad Miller
Brix Law LLP
75 SE Yamhill, Suite 202
Portland, Oregon 97214

Space Above This Line Is For Recorder's Use Only

DECLARATION AND ESTABLISHMENT OF PROTECTIVE COVENANTS, CONDITIONS AND RESTRICTIONS AND GRANT OF EASEMENTS

This DECLARATION AND ESTABLISHMENT OF PROTECTIVE COVENANTS, CONDITIONS AND RESTRICTIONS AND GRANT OF EASEMENTS ("Declaration") is made as of the 30th day of April, 2019 by DD Sherwood One, LLC, an Oregon limited liability company ("Declarant").

RECITALS

A. Declarant is the owner of certain real property located in the City of Sherwood, Washington County, Oregon, more particularly described on Exhibit "A" attached hereto, upon which Declarant has developed an integrated commercial project (the "Project").

B. Declarant has developed the Project for commercial use as part of an integrated project for the mutual benefit of all real property in the Project. In connection therewith, Declarant does hereby fix and establish the Restrictions (as hereinafter defined), upon and subject to which all of the Project, or any part thereof, shall be improved, held, leased, sold and/or conveyed. It is the intent of this Declaration that each and all of the easements, covenants, conditions and restrictions set forth in this Declaration are for the mutual benefit of the Parcels (as hereinafter defined) and every portion of each thereof (except to the extent otherwise stated herein). Each and all of the easements, covenants, conditions, restrictions, liens and charges set forth in this Declaration shall run with the land of each of the Parcels and every portion of each thereof, and shall apply to and bind the respective successors in interest to each of the Parcels and every portion of each thereof, for the benefit of each of the other Parcels and every portion of each thereof (except to the extent otherwise stated herein). Each and all of the easements, covenants, conditions, restrictions, liens and charges set forth in this Declaration are imposed on each portion of and interest in each of the Parcels as mutual equitable servitudes in favor of each and all other portions of and interests in the Parcels and constitute covenants running with the land pursuant to applicable law.

ARTICLE 1

DEFINITIONS

1.1 "Assessment Lien" shall mean that lien created by reason of the delinquency described in and upon recordation of the Notice of Assessment Lien (as hereinafter defined).

1.2 "Building" shall mean any enclosed structure designated for the exclusive use of an occupant or limited occupant(s), as the case may be, placed, constructed or located on a Parcel, which for the purpose of this Declaration shall include any appurtenant supports, service areas and other outward extensions.

1.3 "Building Area" shall mean the limited areas of the Project within which Buildings may be constructed, placed or located, to the extent Declarant elects to develop the Project. Building Areas shall be designated by the Declarant.

1.4 "Common Area" shall mean all the areas within the exterior boundaries of the Project (to the extent developed) which are made available for the general use, convenience and benefit of all Permittees (as hereinafter defined) and any areas owned by governmental entities located adjacent to the exterior boundaries of the Project (such as sidewalks or landscape areas) that are from time to time designated by Declarant as Common Areas and are maintained by Declarant for the benefit of the Project. Without limitation, Common Areas may include the following areas within the exterior boundaries of the Parcels: (i) parking areas and parking decks, if any, which are intended to be shared by more than one Parcel; (ii) roadways and driveways; (iii) sidewalks and walkways; and (iv) landscaped and planted areas; and (v) storm water ponds, swales, filtration, underground detention systems and piping.

1.5 "Common Area Maintenance Expenses" shall mean and include all costs and expenses of every nature and kind as may be actually paid or incurred by Declarant (including appropriate reasonable reserves as approved by Declarant) in operating, managing, equipping, lighting, repairing, decorating, replacing, repairing and maintaining the Common Area (including, without limitation, the stormwater treatment facilities described in the Private Stormwater Covenant, and all other all easement areas granted to third parties or received from third parties if required by the terms of the grant of easement granting the same), and in providing such security and other protection for the Project as Declarant deems necessary. The Common Area Maintenance Expenses shall include, but shall not be limited to, general maintenance and repairs, resurfacing, repaving, striping and cleaning the Common Area; snow removal; maintenance and repair of landscaping and irrigation systems, including, without limitation weeding, pruning, fertilizing and replacing shrubs and other landscaping as necessary; maintenance, replacement and repair of Project signs, directional signs, lighting systems and vertical transportation systems (if any); maintenance and repair of fire protection systems located in the Common Area; storm drainage and sanitary sewer systems, trash disposal or other utility systems; the cost of water service, electricity and other utility costs incurred in connection with the Common Area; exterior holiday decorations; the wages and related payroll costs of Manager (hereinafter defined) and any other personnel employed by Declarant to implement services furnished by Declarant; premiums for commercial general liability insurance and property damage insurance, if any, maintained by Declarant in connection with the Common Area; fees

for required licenses and permits; such management fee as Declarant determines appropriate; supplies; reasonable depreciation on maintenance and operating machinery and equipment (if owned by Declarant) and rental paid for such machinery and equipment (if rented), provided that no Owner (as hereinafter defined) has previously been assessed for the costs and expenses of acquiring such machinery and equipment and only to the extent such machinery and equipment is actually used on the Common Area, such depreciation and rentals to be allocated based upon the actual use of such equipment and machinery in the Project; all costs incurred by Declarant in connection with the Declaration 2017; and the costs and expenses incurred by Declarant in enforcing this Declaration and in preparing, recording and foreclosing assessment liens to the extent not recovered by an Owner as provided in Article 7 below.

1.6 "Default Rate" shall mean that annual rate of interest equal to the interest rate per annum published by the Wall Street Journal as the prime rate (or in the event the Wall Street Journal no longer publishes a prime rate, then the prime rate or reference rate announced by the then largest chartered bank in Oregon in terms of deposits) from time to time plus five percentage (5%) points per annum, but in no event more than any maximum rate of interest permitted by law.

1.7 "Exclusive Use"

shall mean any exclusive right to operate a business in the Project for a specific use where such exclusive right to operate such business in the Project for such specific use is set forth in a memorandum of lease that is recorded in the Official Records of Washington County, Oregon, it being understood that any grant by a Parcel Owner (as hereinafter defined) of any such exclusive right shall only apply to the portions of the Project owned by such Parcel Owner at the time such exclusive right is granted, excepting those rights granted prior to the recordation of this Declaration (the "Existing Exclusives"), which shall apply to all Parcels. The Existing Exclusives are set forth in attached Exhibit "B", each of which shall survive only until such time as such Existing Exclusive expires or is otherwise terminated in accordance with the terms of the applicable lease.

1.8 "First Year" shall mean the first full calendar year following the Partial Year.

1.9 "Floor Area" shall mean the actual number of square feet of space contained on each floor within each separately demised space within a Building, including any mezzanine or basement space (provided that such mezzanine or basement space is taken into account in determining the number of parking spaces required with respect to such Building under applicable governmental laws, codes, ordinances and requirements), as measured from the exterior faces of the exterior walls or store front and/or the center line of any common walls; provided, however, that the following areas shall not be included in such calculations (except to the extent the following areas are taken into account in determining the number of parking spaces required with respect to such Building under applicable governmental laws, codes, ordinances and requirements without benefit of variance or special exception): space attributable to any multi-deck, platform or structural levels used for the storage of merchandise which is located vertically above ground floor; and any space used for Building utilities or mechanical equipment. Within thirty (30) days of a request, a Parcel Owner shall certify to another requesting Parcel Owner the amount of Floor Area applicable to each Building on its Parcel (as

hereinafter defined). If any Parcel Owner causes an as-built survey to be prepared with respect to any portion of the Project, upon request, such Parcel Owner shall furnish a copy of the survey to the other Parcel Owners for informational purposes only.

1.10 "Governmental Restrictions" shall mean any or all laws, statutes, ordinances, codes, decrees, rulings, regulations, writs, injunctions, orders, rules, conditions of approval or authorization of any governmental entity, agency or political subdivision, whether now in force or which may hereafter be in force.

1.11 "Hazardous Materials" shall include, without limitation, any (a) oil, petroleum products, flammable substances, explosives, radioactive materials, hazardous wastes or substances, toxic wastes or substances or any other wastes, materials or pollutants which (i) pose a hazard to the Project or to persons on or about the Project, or (ii) cause the Project or any portion thereof to be in violation of any applicable Governmental Restrictions; (b) asbestos in any form, urea formaldehyde foam insulation, transformers or other equipment which contain dielectric fluid or radon gas; (c) chemical, material or substance defined as or included in the definition of "hazardous materials," "extremely hazardous waste," "restricted hazardous waste," or "toxic substances" or words of similar import under any Governmental Restrictions, including, but not limited to, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 USC § 9601, et seq.; the Federal Water Pollution Control Act, as amended, 33 USC § 1251, et seq; and (d) other chemical, material or substance, exposure to which is prohibited, limited or regulated by any governmental authority.

1.12 "Manager" shall mean the person or entity to whom Declarant may delegate any duties, powers or functions of the Declarant as Declarant, in its sole discretion, determines necessary or appropriate, which shall initially be Declarant. In the event Declarant ceases to be Manager, the Declarant (subject to the provisions of Section 10.19 below) shall appoint a new Manager within sixty (60) days of the date Declarant ceases to be Manager. Should the Declarant not appoint a new Manager within the sixty (60) day period, the majority of the Owners shall appoint the Manager.

1.13 "Mortgage" shall mean an indenture of mortgage or deed of trust on a Parcel, including a fee or leasehold indenture of mortgage or deed of trust, or a "sale and leaseback" (meaning a transaction whereby an Owner conveys its fee or a leasehold estate in such Parcel and such conveyance is followed immediately by a leaseback or sub-leaseback of the entire interest so conveyed or the improvements thereupon to such Owner, or to a party wholly controlled by such Owner).

1.14 "Mortgagee" shall mean any mortgagee under a Mortgage, or any trustee or beneficiary under a deed of trust constituting a lien on all or any portion of any of the Parcels or any leasehold interest in the Parcels, or on any ground lessor under any ground lease or master lessor under any master lease with respect to all or any portion of any of the Parcels. The interest held by any Mortgagee in any Parcel shall be subordinate to this Agreement.

1.15 "Notice of Assessment Lien" shall mean a notice recorded in the Official Records of Washington County, Oregon (the "Official Records"), and such other place as may be required by law, by any person to whom any assessment or other sum of money payable by any

Owner pursuant to any provision of this Declaration stating that said assessment or sum has not been paid and that the applicable grace period for such payment (if any) has expired.

1.16 "Owner" shall mean each person who, at any given time, holds fee title to any Parcel or any portion thereof, or a ground lessee of any Parcel or any portion thereof (provided the Owner of such Parcel so designates such party, which designation must be set forth in a written statement recorded in the Official Records).

1.17 "Parcel" or "Parcels" shall mean one or more legal parcels that comprise the Project and such further ground lease or subdivision of any such Parcel as approved by Declarant. Attached Exhibit A describes each Parcel with a Lot number (e.g. Parcel 1 is Lot 1, Parcel 2 is Lot 2, etc.). Therefore, the Owner of Parcel 1 is the Owner of Lot 1, the Owner of Parcel 2 is the Owner of Lot 2, etc.

1.18 "Parcel Area" shall mean the total gross square footage of the land of such Parcel. Such area shall be conclusively presumed to be the areas shown on any parcel map or survey that may be recorded in the Official Records, as such parcel map or survey may be amended by any lot line adjustment, or such later parcel map or subdivision map showing the Parcel.

1.19 "Parcel Owner" shall mean the Owner, and its successors and assigns, of any Parcel. No ground lessee of a Parcel shall be considered a Parcel Owner.

1.20 "Partial Year" shall mean the initial fractional calendar year following the date Declarant determines that such portion of the Common Area of the Project has been completed for purposes of commencing payment of Common Area Maintenance Expenses.

1.21 "Parties" shall mean the Parcel Owners.

1.22 "Permittees" shall mean the Owners of any and all portions of the Project and their respective heirs, successors, assigns, grantees, tenants and subtenants and all persons who now hold, or hereafter hold, portions of real property within the Project, or any leasehold estate, or building space thereon; and respective tenants or subtenants thereof; and the officers, directors, concessionaires, agents, employees, contractors, customers, visitors and licensees and invitees of any of them.

1.23 "Person" shall mean any natural person, partnership, trust, corporation, limited liability company or other legal entity.

1.24 "Prohibited Uses" shall mean any unlawful use and any use or operation which is clearly objectionable to the development or operation of the Project as a high quality retail and/or commercial project, as so operated, as determined by Declarant in Declarant's sole discretion. Except as consented to in writing by Declarant, which consent may be withheld by Declarant in Declarant's sole discretion, the following shall be Prohibited Uses:

(i) Any use which emits an obnoxious odor, noise, or sound which can be heard or smelled at an unreasonable level outside of any building in the Project; provided that the

foregoing shall not apply to: (a) the preparation of food, (b) a Permittee serving food at outdoor tables, or (c) a paging system within a building;

(ii) Any operation primarily used for any refining, smelting, agricultural, or mining operation;

(iii) Any mobile home park, trailer court, labor camp, junkyard, or stockyard (except that this provision shall not prohibit the temporary use of construction trailers during periods of construction, reconstruction, or maintenance);

(iv) Any dumping, disposing, incineration, or reduction of garbage (exclusive of garbage compactors located at the rear or side of any building or inside any building); provided, however, this prohibition shall not preclude the recycling of bottles or other containers as an incidental part of the operations of any Permittee;

(v) Any central laundry dry cleaning plant or laundromat; provided, however, this prohibition shall not be applicable to on-site laundry or dry-cleaning service oriented to pickup and delivery by the ultimate consumer. Allowable operations may include on-site dry-cleaning provided the operator complies with the following requirements:

(a) There shall be no dry-cleaning performed on-site except dry-cleaning for pickup on-site by the ultimate consumer.

(b) The operator shall at all times comply with all federal, state, and local laws related to hazardous materials;

(c) The operator shall at all times provide Declarant with an updated list of all dry-cleaning equipment, together with copies of manufacturers' warranties; and

(d) Declarant shall at all times have the right to require the operator to upgrade its equipment or the installation thereof at Declarant's discretion.

(vi) Any automobile, truck, trailer or recreational vehicle sales, leasing, display or repair operation. This prohibition shall not preclude an auto parts retail store, oil change business or a service station that includes automobile repair, provided that any servicing of vehicles shall be primarily performed indoors and there shall be no outdoor storage of any kind, including without limitation, parts, equipment, supplies, or vehicles;

(vii) Any funeral parlor, cemetery or crematorium;

(viii) Any establishment selling or exhibiting materials or paraphernalia for use with cannabis or illicit drugs;

(ix) Any business such as a bar or tavern which requires all patrons to be 21 years of age or older to enter (it being understood that this provision shall not restrict a restaurant or brew pub that brews and/or serves alcoholic beverages as part of such business);

(x) Any establishment selling or exhibiting pornographic materials;

(xi) A theatre; skating rink; bowling alley; billiard parlor; carnival; amusement park; arcade; video game parlor; discotheque; or dance hall;

(xii) A flea market;

(xiii) A tattoo parlor;

(xiv) A house of worship;

(xv) A school (except instructional classes incidental to another primary retail use);

(xvi) A library;

(xvii) A day care facility, child care facility, preschool or children's nursery; or

(xviii) Any business that cashes checks or makes short-term or "payday advance" type loans; this is not to exclude the regular business of any bank, credit union, or financial institution insured by the F.D.I.C. or mortgage brokerage firm or other similar business providing long-term, mortgage type loans.

1.25 "Restrictions" shall mean those easements, covenants, restrictions, liens and charges fixed and established upon the Project pursuant to this Declaration.

1.26 "Taxes" shall mean all taxes and assessments on the property within the Project.

1.27 "Common Signs" shall mean monument, pylon and or wall signs placed in the Common Area which are intended to advertise all Parcels equally. Declarant shall install three (3) such signs and assign certain areas on each for the use of the Parcel Owners. The initial assignment of advertising space is as shown in the attached Exhibit "C". The initial assignments may only be changed after the business being advertised has abandoned or terminated its tenancy within the Parcels. The cost of the operation, maintenance and replacement of Common Signs shall be a Common Area Expense.

1.28 "Declaration 2017" shall mean the Declaration of Easements and Restrictive Covenants dated July 25, 2017 entered into between Providence Health & Services-Oregon, Quarto, LLC and the Declarant (as "Deacon" thereunder), recorded in the Official Records of Washington County, Oregon on July 26, 2017 under recording number 2017-059133. Declarant shall be responsible for all of Deacon's obligations and covenants contained in the Declaration 2017. Any cost incurred by Declarant in connection with the Declaration 2017 shall be a Common Area Maintenance Expense.

1.29 "Private Stormwater Covenant" shall mean the Private Stormwater Facility Access & Maintenance Covenant entered into between the City of Sherwood, Oregon and the Declarant (as "Owner" thereunder), to be recorded in the Official Records of Washington County, Oregon. Declarant shall be responsible for all of the Owner's obligations and covenants contained in the Private Stormwater Covenant. Any cost incurred by Declarant in connection with the Private Stormwater Covenant shall be a Common Area Maintenance Expense.

ARTICLE 2

USE IN GENERAL

2.1 Lawful Use. If and when developed (meaning, for purposes of this Declaration, an integrated commercial project for the mutual benefit of all real property in the Project), the Project may be used for any lawful commercial purpose not specifically prohibited herein. No portion of the Project shall be used for a Prohibited Use. Declarant shall have the authority to adopt such rules and regulations pertaining to the Common Area as Declarant determines appropriate from time to time in Declarant's business judgment subject to the following limitations: (i) similarly situated Owners and Permittees shall be generally treated similarly; and (ii) no rule shall interfere with the activities carried on within the confines of the structures on any Parcel, except that the Declarant may restrict or prohibit activities that create the possibility of monetary costs for other Owners or Permittees, that endanger the health or safety of Permittees of other Parcels, that generate excessive noise or traffic, that create unsightly conditions visible outside the confines of such structures, or that create a source of unreasonable annoyance to Permittees of other Parcels.

2.2 Zoning. This Declaration shall be subject to applicable zoning.

ARTICLE 3

CONSTRUCTION

3.1 Buildings Only in Building Area. If and when the Project is developed, no Building or structure of any kind shall be erected, placed or maintained on any portion of the Project except upon those portions designated by Declarant; provided, however, that any cover for a service area or outdoor seating area shall be excluded from this provision when approved by the other Owners (such approval not to be unreasonably withheld, conditioned or delayed), and permitted under the Governmental Restrictions.

3.2 Alteration Approval. In order to maintain the architectural and functional harmony of the Project (to the extent developed), no Building or structure within the Project shall be reconstructed, altered, added to or maintained in such a fashion as to alter, in any material respect, the architectural appearance, character or motif or functional purpose of such item, unless such alteration is first approved in writing by Declarant in its sole and absolute discretion. Such approval shall be given or withheld in writing within thirty (30) days after receipt of written request and receipt by Declarant of detailed plans and specifications therefor. Failure to respond in writing to a written request for such approval within thirty (30) days of its receipt shall constitute disapproval of such proposed construction, reconstruction or alteration. All alterations or improvements shall be constructed in strict accordance with the plans and specifications approved by Declarant. No material deviation shall be made from such plans and specifications without Declarant's prior written approval. Compliance with the design review process set forth in this Declaration is not a substitute for compliance with County building, zoning, and subdivision regulations, and each Owner shall be responsible for obtaining all approvals, licenses, and permits required by applicable law prior to commencing construction. Neither

Declarant, nor any manager, employee, agent, or consultant of Declarant shall be: (i) liable to any Person, including any Owner, Permittee, or contractor for any loss, liability, claim, or expense which may arise by reason of the approval or disapproval of any improvement; or (ii) responsible in any way for any defects in any plans or specifications submitted, revised, or approved pursuant to this Article or for any structural or other defect in any work done. Approval by the Declarant of any application shall not be deemed to constitute a precedent or waiver impairing its right to withhold approval as to any similar application thereafter submitted. The Declarant's approval of any proposed alteration or improvement shall automatically be revoked one year after issuance unless construction of the alteration or improvement has been commenced.

3.3 Construction Procedures. To the extent the Project is developed:

a. All construction activities within the Project shall be performed in a good and workmanlike manner, using first class materials, and in compliance with all laws, rules, regulations, orders, and ordinances of the city, county, state and federal governments, or any department or agency thereof, having jurisdiction over the Project.

b. All construction activities within the Parcels shall be performed in accordance with the following provisions:

(i) so as not to unreasonably interfere with any construction work being performed on the remainder of the Parcels, or any part thereof; and

(ii) so as not to unreasonably interfere with the use, occupancy or enjoyment of the remainder of the Project or any part thereof or the business conducted by any other Owner or Permittees.

c. When an Owner is constructing, reconstructing, repairing, maintaining, remodeling, or enlarging any improvements on its Parcel, such Owner shall establish a staging and storage area on its Parcel prior to commencing such work. Notwithstanding anything to the contrary contained herein, such staging and storage areas (i) shall not unreasonably interfere with access between the other areas of the Project, with the use of any other Parcel, or with the operation of any business on any other Parcel by the Permittees thereof (such Permittees to have free and unobstructed access to the loading areas , trash areas, sidewalks, entrances and exits), (ii) shall be subject to the approval of Declarant, in its sole and absolute discretion. If substantial work is to be performed, such Owner, at the request of Declarant or any other Owner of a Parcel which would be materially and adversely affected by such staging or storage area, shall fence off such staging and storage area. Upon completion of such work, such staging and storage area shall be restored to a condition at least equal to that existing prior to commencement of such work.

d. Prior to constructing, reconstructing, remodeling or enlarging a building or changing the Common Areas on a Parcel, and subject to obtaining all required approvals under Section 3.2, the Permittee of such Parcel shall give Declarant at least thirty (30) days prior written notice of the proposed activities and the proposed location of any staging and storage area and proposed access points. Upon completion of such work, the constructing Person

shall restore the affected Common Areas to a condition at least equal to that existing prior to commencement of such work. The construction of any building, including painting and all exterior finish, shall be pursued diligently and shall be completed within nine (9) months after the beginning of construction so as to present a finished appearance when viewed from any angle. All landscaping on a Parcel shall be completed within one (1) month after the date of completion of the structures thereon.

e. Each Owner shall complete all construction activities within its Parcel as diligently as possible, shall regularly clean the roadways and driveways used by its construction vehicles of mud, dirt and construction debris, and upon completion of all construction activities shall promptly restore such affected roadways and driveways to a condition which is equal to or better than the condition which existed prior to the commencement of such work.

f. Each Owner shall indemnify, defend and hold harmless each other Owner from and against any and all claims, losses, damages, liabilities, injuries, costs and expenses, including, without limitation, reasonable attorneys' fees, because of personal injury or death of persons or destruction of property arising from or as a result of construction by such Owner on its Parcel, except for claims caused by the negligence or willful act or omission of the indemnified Owner, its licensees, concessionaires, agents, servants, or employees.

ARTICLE 4

PROJECT EASEMENTS

4.1 Grant of Easements. Declarant hereby establishes and grants to, and each other person who becomes an Owner shall, immediately upon becoming an Owner and without further act, be deemed to have established and granted to all other Owners and all Permittees of the Project, and their guests, employees, invitees, permittees, licensees, patrons and customers, irrevocable, non-exclusive easements over, across, upon and beneath the Common Area held by such Owner for the purposes set forth in Section 4.2. Nothing in this Section or elsewhere in this Declaration shall be deemed to be or constitute a gift or dedication of any portion of the Project to the general public or for any public use or purpose whatsoever.

4.2 Permitted Common Area Uses. To the extent the Project is developed, the Common Area shall be used for the following purposes:

a. The parking of passenger vehicles and the pedestrian and vehicular traffic of all Permittees; provided, however, a Parcel Owner shall have the right to designate not more than four (4) parking spaces directly in front of a Building on such Parcel Owner's Parcel for the exclusive parking for an occupant of such Building.

The Owner of Lot 1 shall have the right to use the fifteen (15) parking spaces identified in that certain Lease Agreement dated July 31, 2017, entered into by and between Declarant, as "Landlord", and Creek Plaza fit LLC dba Planet Fitness, as "Tenant" (the "Planet Fitness Lease"), only for as long as the Planet Fitness Lease remains in full force and effect. Upon

expiration or earlier termination of the Planet Fitness Lease, the Owner of Lot 1 shall have the right to designate no more than four (4) parking spaces, as provided above.

The Owner of Lot 5 shall have the right to restrict the location of compact parking spaces as provided in that certain Lease Agreement dated April 10, 2018, entered into by and between Declarant, as "Landlord", and MESK Investment 3653 LLC, an Oregon limited liability company dba IHOP, as "Tenant" (the "IHOP Lease"), only for as long as the IHOP Lease remains in full force and effect. Upon expiration or earlier termination of the IHOP Lease, the Owner of Lot 5 shall have no right to control the location of compact parking spaces.

The Owner of Lot 6 shall have the right to restrict the location of compact parking spaces as provided in that certain Lease Agreement dated August 17, 2017, entered into by and between Declarant, as "Landlord", and Rock Solid Restaurants, L.L.C. dba Hop Jack's Restaurant (now known as Hops N Drops), as "Tenant" (the "Hops N Drops Lease"), only for as long as the Hops N Drops Lease remains in full force and effect. Upon expiration or earlier termination of the Hops N Drops Lease, the Owner of Lot 6 shall have no right to control the location of compact parking spaces.

b. The ingress and egress of any Permittees and the vehicles thereof to and from any portion of the Common Area and the public streets adjacent to the Common Area.

c. The installation, operation, maintenance, repair, replacement, relocation and removal of sanitary sewers, storm drains, storm detention and filtration facilities, water and gas mains, electric power lines and conduits, telephone lines and conduits, television cables, vaults, manholes, meters, pipelines, valves, hydrants, sprinkler controls and related utility and service facilities serving any part of the Project, all of which (except hydrants and transformers and other installations as may be requested by the utility company) shall be even with or below the surface of the Common Area or within Common Area walls or as otherwise directed by Declarant and in compliance with the Governmental Restrictions. All Owners shall cooperate in the granting of appropriate and proper easements to each other or to utility companies and governmental authorities for the installation, operation, maintenance, repair, replacement, relocation and removal of the facilities set forth above. Each Owner shall have the right to enter upon any portion of the Common Area as may be necessary or appropriate in order to accomplish the installation, operation, maintenance, repair, replacement, relocation and removal of the facilities referred to above; provided, however, such Owner does not unreasonably interfere with the use of the Common Area by Permittees and that no relocation or removal of any such facilities shall be made without the prior written consent of Declarant, which consent may be withheld by Declarant in its sole discretion.

d. The maintenance and repair of any of the items referred to in Section 4.2(c) above.

e. The ingress and egress of delivery and service trucks and vehicles to and from the Building Areas or any portion thereof and the public streets adjacent to the Project, the delivery of goods, wares and merchandise, and the rendering of services to all persons or other entities who may lease portions of the Building Areas. Each tenant or other occupant of the Project shall use commercially reasonable efforts to have deliveries made within the areas

designated for such purposes by Declarant. In the event it is necessary that deliveries be made other than in the areas designated by Declarant, such deliveries shall be made so as to cause the least amount of interference with the use of adjacent portions of the Common Area.

f. Subject to the prior written approval of Declarant, which will not be unreasonably withheld, the temporary use (including erection of ladders, scaffolding and store front barricades) during periods of construction, remodeling or repair, and ingress and egress for vehicles transporting construction materials and equipment and use thereof by construction equipment, upon the condition, however, that all construction, remodeling or repair of buildings and building appurtenances is diligently performed and such ladders, scaffolding and barricades are promptly removed upon completion of such work.

g. Reciprocal appurtenant easements for any encroachment, and for maintenance and use of any encroachment permitted under this Section which now or hereafter exists between any Parcel and any adjacent Common Areas or between any adjacent Parcels, to the extent that any such encroachment: (i) is not the result of any willful, knowing, or negligent conduct on the part of an Owner or Permittee, as the case may be; and (ii) extends for a distance of not more than three (3) feet, measured from any point on the common boundary along a line perpendicular to such boundary.

h. Easements over the Common Areas for natural drainage of storm water runoff from other portions of the Project. In addition, an easement is hereby reserved for Declarant to enter on, across, over, in, and under any portion of the Project (except for any Building Area) for the purpose of changing, correcting, or otherwise modifying the grade or drainage channels of the Project for the purpose of improving drainage from and across the Project; provided that the holders of such easement shall use all reasonable efforts to conduct any such work in a manner which minimizes any disturbance to the uses of the Project by Declarant, the Owners, and Permittees; shall undertake any such work expeditiously; and shall restore any areas affected by such work to a sightly and usable condition as soon as reasonably possible following the completion such work. No Person shall alter the natural drainage on or over any Parcel so as to increase materially the drainage of storm water onto adjacent portions of the Project without the consent of the Owner of the affected Parcel, which shall not be unreasonably withheld, conditioned or delayed.

i. Declarant or Declarant's agents and designees shall have the right, but not the obligation, to enter upon any Parcel, including any Building thereon, for emergency, security, or safety reasons (including the correction of any condition which may increase the possibility of a fire or other hazard in the event an Owner fails or refuses to cure the condition within a reasonable time after request by Declarant), to perform maintenance pursuant to this Declaration, and to determine whether such Parcel and improvements and the activities thereon comply with this Declaration. Except in an emergency situation, entry to any structure shall occur only during reasonable hours and after reasonable advance notice to the Owner thereof.

4.3 Common Area Alteration. To the extent the Project is developed, no Owner or other person shall alter any parking areas or other improvements located upon the Common Area without the prior written consent of Declarant. Notwithstanding the foregoing: (i) an Owner (or Declarant) shall have the right to excavate or conduct construction activities upon the

Common Area, if necessary, in connection with the installation, operation, maintenance, repair, replacement, relocation and removal of any utility or service facilities, subject, however, to the provisions of Section 4.2(c), so long as such excavation or construction activities shall be prosecuted diligently to completion; provided, that the consent of the Parcel Owner on whose Parcel such activity is to take place shall also be obtained, which consent shall not be unreasonably withheld, and the person causing such excavation or construction activities to be made shall forthwith, upon completion thereof, restore any portion of the Common Area affected thereby to the same condition as existed prior to the commencement of such installation or construction activities using the same type and quality of materials as previously used; and (ii) Declarant may make alterations in the Common Area as it shall deem appropriate or necessary. Any work performed in the Project pursuant to this subparagraph shall be performed so as to minimize the disruption of business operations conducted anywhere within the Project.

ARTICLE 5

OPERATION AND MAINTENANCE OF BUILDING AREA AND COMMON AREA

5.1 Taxes and Assessments. All Owners shall pay, prior to delinquency, all Taxes on the property within the Project owned or leased by them. If any such Owner shall fail to pay such Taxes prior to delinquency, any other Owner or the tenant of any other Owner may pay such Taxes and the curing Owner or tenant may then bill the defaulting Owner for the expense incurred. If the defaulting Owner shall not pay such bill within thirty (30) days, the curing Owner or tenant shall have a lien on the property within the Project of the defaulting Owner for the amount of such bill, which amount shall bear interest at a rate equal to the Default Rate until paid. Such lien may be foreclosed by such Owner or tenant as provided in Article 7 below. An Owner (or the tenant or occupant of an Owner if such tenant or occupant has the right under its lease or occupancy agreement to contest Taxes) shall have the right, in good faith, to contest the amount of Taxes owing with respect to its property; provided, that such Owner (or tenant or occupant) shall take all such action as may be necessary to prevent any assessment or tax lien from being foreclosed or enforced with respect to any property within the Project, including, immediately following the request of Declarant, recording an adequate bond to remove such lien as a matter of record or to otherwise secure the payment of such lien.

5.2 Undivided Assessments. Any assessment for public improvements levied against the entire Project, rather than against individual Parcels, shall be paid by all Owners in accordance with the percentages determined pursuant to Section 5.9 below.

5.3 Building Maintenance. Each Owner shall maintain, or cause to be maintained, in a safe, clean, attractive and tenantable condition, all Buildings located upon its Parcel or Parcels. Each Owner of a Parcel shall keep the Buildings located on its Parcel in a high quality condition and state of repair, in compliance with all governmental laws, rules, regulations, orders and ordinances exercising jurisdiction therefor, and in compliance with the provisions of this Declaration. Each Permittee shall store all trash and garbage in adequate containers, locate such containers in the portions of the Project as are approved by Declarant, and arrange for regular removal of such trash or garbage. Each Owner shall maintain in good condition and repair all

utility facilities, lines and systems located on such Parcel. To the extent any such facilities, lines or systems serve more than one Parcel, such maintenance obligations shall be equitably shared between each such Owner so long as the cause for the need of any maintenance was not due to a negligent act or omission by one Owner or its Permittee or their respective agents or employees (in which event such Owner shall be solely responsible for all costs of such maintenance). Any Person performing or causing to be performed maintenance or repair work agrees to promptly pay all costs and expenses associated with such maintenance or repairs to be diligently and promptly completed and to promptly clean the area and restore any affected portion of the Common Areas to a condition equal to or better than the condition which existed prior to the commencement of such work.

5.4 Common Area Maintenance. Declarant shall operate and maintain, or cause to be operated and maintained, the Common Area, including the repairs or services with respect to the Common Areas, all of the costs and expenses for which shall be included in Common Area Maintenance Expenses; provided, however, Declarant shall have the right to allow any Parcel Owner or any occupant of any Parcel to self-maintain a Parcel so long as such Parcel is being maintained in a first class condition and consistent with the level of maintenance for the remainder of the Project. Declarant shall have the right to revoke any such grant of self-maintenance rights to a Person at any time upon thirty (30) days prior written notice if Declarant believes in its business judgment that such Person performing such self-maintenance is not performing such self-maintenance obligations consistent with the requirements of this Section.

5.5 Common Area Liability Insurance. As part of the operation of the Common Area (to the extent developed), Declarant shall obtain and maintain commercial general liability insurance insuring all Owners and such other persons who now or hereafter own portions of the Project, as their respective interests may appear, against claims for personal injury, death or property damage occurring in, upon or about the Common Area. Such insurance shall be written with an insurer licensed to do business in the State of Oregon. The limits of liability of all such insurance shall be at least Three Million Dollars ($3,000,000.00) combined single limit, and may be increased by Declarant in its discretion from time to time. Declarant shall cause to be issued certificates of insurance to each of the Owners and have such certificates provide that such insurance shall not be canceled or amended without ten (10) days prior written notice to each of the Owners.

5.6 Proportionate Share of Common Area Maintenance Expenses. To the extent the Project is developed, Declarant shall expend only the monies reasonably necessary for the operation of the Common Area and for the maintenance thereof in order to keep the Common Area in good repair and clean condition. Each Owner shall pay to Declarant its proportionate share (determined pursuant to Section 5.9 below) of Common Area Maintenance Expenses. For the Partial Year and during the First Year, until the month following the delivery of the Statement referred to in Section 5.7 below, each Owner shall pay to Declarant, on or before the first day of each calendar month, its proportionate share of an estimate of the Common Area Maintenance Expenses for the Partial Year, which estimate shall be reasonably established by Declarant. Declarant may elect to have an independent third party property management company provide certain, or all, of the management for the expenditure and collection of amounts due under this Declaration, and for the related bookkeeping. The cost of such property manager shall be a Common Area Maintenance Expense.

5.7 Partial Year Expenses. On or before April 15 of the First Year, Declarant shall furnish each Owner with a statement (the "Statement") showing in reasonable detail the total Common Area Maintenance Expenses for the Partial Year. Commencing with the first day of the calendar month in the First Year immediately following the calendar month in which the Statement is furnished, as provided above, each Owner shall pay to Declarant on or before the first day of each calendar month an amount equal to such Owner's proportionate share of the quotient obtained by dividing the total Common Area Maintenance Expenses paid by Declarant for the Partial Year by the number of calendar months (including as a fraction any initial fractional calendar month) in such Partial Year. On or before April 15 of each calendar year thereafter, Declarant shall furnish each Owner with the Statement showing in reasonable detail the total actual Common Area Maintenance Expenses for the preceding calendar year. Commencing with the first day of the calendar month immediately following the calendar month in which the Statement is furnished, each Owner shall pay to Declarant on or before the first day of each calendar month an amount equal to such Owner's proportionate share of the quotient obtained by dividing the actual Common Area Maintenance Expenses paid by Declarant for the preceding calendar year by twelve (12). The failure of Declarant to furnish a Statement setting forth Common Area Maintenance Expenses within the time periods set forth above shall not constitute a default hereunder by Declarant or a waiver of Declarant's right to receive payment of an Owner's proportionate share thereof, except that Declarant shall be deemed to have waived its right to receive payment as to any Common Area Maintenance Expenses that are not set forth in a Statement delivered to the Owners within two (2) years after the date upon which they were incurred.

5.8 Full Year Expenses. Following the end of the Partial Year and each subsequent full calendar year of the term hereof and each Owner's receipt of a Statement of the total Common Area Maintenance Expenses for such year, the amounts due from each Owner as its proportionate share of the Common Area Maintenance Expenses for the Partial Year or full calendar year shall be adjusted between Declarant and each Owner. If any Owner's proportionate share of the total Common Area Maintenance Expenses for the Partial Year or full calendar year exceeds the amount prepaid by such Owner, such Owner shall pay to Declarant such excess within thirty (30) days following the Owner's receipt of Declarant's statement. If any Owner's proportionate share of the total Common Area Maintenance Expenses for the Partial Year or full calendar year is less than the amount prepaid by such Owner, the amount of excess prepayment by such Owner shall be credited against such Owner's future prepayment obligations regarding Common Area Maintenance Expenses, cumulative from month to month until such excess is exhausted.

5.9 Determination of Proportionate Share. Each Owner of a Parcel shall pay, as its proportionate share of Common Area Maintenance Expenses, that amount determined by multiplying the amount of such Common Area Maintenance Expenses by a percentage based on the ratio that the Floor Area of Owner's Parcel bears to the total Floor Area of all Parcels within the Project, as determined from time to time; provided, however: (i) to the extent any Common Area Maintenance Expenses relate to the operation or maintenance of Common Areas that serve fewer than all the Parcels (such as shared parking facilities that serve more than one but fewer than all the Parcels), such Common Area Maintenance Expenses shall be equitably shared between only the Parcels served by such Common Areas, (ii) to the extent any Owner of a Parcel is self-maintaining the Common Areas on such Parcel, the Floor Area of such Parcel shall be

excluded from the Floor Area of all Parcels within the Project in determining the Proportionate Share, and (iii) to the extent any Common Area Maintenance Expenses (including, but not limited to, expenses incurred pursuant to the Private Stormwater Covenant) are, as determined by Declarant in its business judgment, incurred primarily for the benefit of a particular occupant of the Project, such Common Area Maintenance Expenses shall be allocated to such occupant or the Owner of the Parcel in which such occupant operates its business, as reasonably determined by Declarant.

5.10 Owners' Duty to Maintain Common Area. If, following the development of the Project by Declarant, any period of time exists when no person is performing the duties of Declarant, each Owner shall have the obligation to maintain its Parcel(s) in a manner consistent with the provisions of this Declaration. If any such Owner shall fail to so maintain its own Parcel(s), then subject to Article 9, any other Owner or Permittee shall have the right to give the defaulting Owner written notice of such default specifying the particulars thereof. The Owner receiving such a notice shall have a period of thirty (30) days in which to cure such default, or, if the nature of the default is such that it cannot be reasonably cured within such 30 day period, the Owner shall commence to cure said default within such 30 day period and diligently pursue the curing of such default to completion. If the defaulting Owner does not cure such default within said 30 day period, or, if applicable, commence to cure such default within said 30 day period and diligently pursue the curing of such default to completion, then subject to Article 9, the Owner(s) and/or Permittee(s) giving the notice of default may do so and the curing Owner or Permittee may then bill the defaulting Owner for the expense incurred. If the defaulting Owner shall not pay such bill within fifteen (15) days, then the curing Owner or Permittee shall have a lien on the Parcel of the defaulting Owner for the amount of such bill, which amount shall bear interest at the Default Rate and which lien may be foreclosed as provided in Article 7.

5.11 Agents. In performing the duties of Declarant hereunder, Declarant may utilize such agents and independent contractors (including the Manager) as Declarant may designate.

5.12 Signs. Excepting Common Signs, no exterior identification signs shall be allowed within the Project except as set forth hereinafter.

a. No freestanding sign shall be permitted within the Project unless constructed in areas approved by Declarant. The designation of a freestanding sign location on a Parcel shall in no way obligate the Owner of such Parcel to construct such freestanding sign. Notwithstanding anything above to the contrary, an Owner shall be permitted to place within the Common Areas located on its Parcel directional signs or informational signs such as "Handicapped Parking", the temporary display of leasing information and the temporary erection of one sign identifying each contractor working on a construction job. Without the prior written consent of Declarant, no exterior identification sign attached to a building or interior sign displayed in a window of a building for viewing from the exterior of such building shall be of the type set forth below:

(i) placed on canopy roofs extending above the building roof, placed on penthouse walls, or placed so as to project above the parapet, canopy, or top of the wall upon which it is mounted;

(ii) placed at any angle to the building; provided, however, the foregoing shall not apply to any sign located under a sidewalk canopy if such sign is at least eight feet above the sidewalk; or

(iii) painted on the surface of any building.

b. Without the prior written consent of Declarant, all signs shall comply with the following requirements:

(i) No animated, flashing, moving or audible signs.

(ii) All signs and their installation shall comply with all local building and electrical codes.

(iii) No exposed conduit. All conductors, transformers and other equipment shall be concealed.

(iv) All signs shall be professionally made. No painted lettering, paper or cardboard signs, temporary signs (exclusive of contractor or real estate leasing or sale signs), stickers or decals without Declarant's prior written consent.

(v) No advertising placards, banners, pennants, names, insignia, trademarks or other descriptive material shall be affixed or maintained upon the exterior of glass panes and supports of the show windows and doors, or upon the exterior wall of the building or storefront unless specifically approved in writing by Declarant. The name and logo of a tenant in occupancy together with the days and hours of operation in a typestyle less than six inches (6") in height are excepted.

(vi) Subject to compliance with all applicable governmental regulations, the total length of sign shall in no event be more than 66% of the wall length measured along any frontage of each tenancy space within a Building. Each Permittee's total sign area shall be in accordance with the Governmental Restrictions.

(vii) No signs perpendicular to the wall face of the building or storefront.

ARTICLE 6

INSURANCE

6.1 Liability Insurance. Each Owner shall, during the term of this Declaration, except as otherwise expressly set forth herein, maintain, or cause to be maintained, at its sole expense, in full force and effect, with good and solvent insurance companies authorized and registered to do business in the State of Oregon and having a rating by Best's Insurance Reports of not less than A-/X, on all property within the Project owned or leased by such Owner and all Buildings and other improvements owned or leased by such Owner, a policy or policies of bodily injury and property damage liability insurance with combined single limits of at least Three

Million Dollars ($3,000,000.00), in which all other Owners, Declarant, any Mortgagee of Declarant and any property manager of Declarant shall be named as additional insureds, insuring against any and all liability arising out of the maintenance, use and occupancy of the Building(s) and other improvements located on the property within the Project owned or leased by such Owner. Each Owner shall also maintain all-risk insurance coverage on all Buildings and improvements (including Common Areas) located upon that portion of the Project leased or owned by such Owner including loss or damage by fire and such other risks as are from time to time included in the all-risk coverage insurance policies customarily issued in Oregon in an amount not less than one hundred percent (100%) of the full replacement cost of such buildings and improvements. Such all-risk insurance policies shall be maintained with good and solvent insurance companies authorized to do business in and registered with the State of Oregon and having a rating by Best's Insurance Reports of not less than A-/X. Declarant shall be named as a loss payee on all such all-risk insurance policies.

6.2 Certificates. Each Owner shall, upon request thereof from Declarant or any other Owner, furnish to the party making such request certificates of insurance evidencing the existence of the insurance required to be carried pursuant to this Article. To the extent that the same shall not invalidate any insurance coverage obtained by an Owner, each Owner hereby waives any claim that it might have against any other Owner for damages which would be covered by any of the insurance required to be carried under this Article. Said mutual waivers shall be in addition to, and not in limitation or derogation of, any other waiver or release regarding any loss of, or any damage to, the said property of any Owner. Inasmuch as the said mutual waivers will preclude the assignment of any such claim by way of subrogation (or otherwise) to an insurance company (or any other person, firm or corporation), each Owner shall give to each insurance company which has issued to it policies of all-risk insurance, written notice of the terms of said mutual waivers, and shall have said insurance policies properly endorsed, if necessary, to prevent invalidation of said insurance coverages by reason of said waiver. All such insurance maintained pursuant to this Article shall provide that such insurance shall not be canceled or amended without ten (10) days prior written notice to Declarant.

If any Owner shall fail to maintain any of the insurance required to be maintained by such Owner pursuant to this Declaration, then subject to Article 9, any other Owner or Permittee shall have the right to give the defaulting Owner written notice of such default specifying the particulars thereof. The Owner receiving such a notice shall have a period of ten (10) days in which to cure such default. If the defaulting Owner does not cure such default within said 10 day period, then subject to Article 9, the Owner(s) and/or Permittee(s) giving the notice of default may do so and the curing Owner or Permittee may then bill the defaulting Owner for the expense incurred. If the defaulting Owner shall not pay such bill within ten (10) days, then the curing Owner or Permittee shall have a lien on the Parcel of the defaulting Owner for the amount of such bill, which amount shall bear interest at the Default Rate and which lien may be foreclosed as provided in Article 7.

6.3 Indemnification. Each Owner ("Indemnitor") covenants and agrees to defend, protect, indemnify and hold harmless each other Owner ("Indemnitee") from and against all claims, including any actions or proceedings brought thereon, and all costs, losses, expenses and liability (including reasonable attorneys' fees actually incurred and costs of suit) arising from or as a result of the injury to or death of any Person, or damage to the property of any Person

located on the Parcel owned or leased by Indemnitor, except for claims caused by the negligence or willful act or omission of Indemnitee or its agents, servants, partners or employees.

ARTICLE 7

ASSESSMENT LIEN

7.1 Assessment Lien Procedure. In the event any assessment or other sum of money payable by any Owner pursuant to any provision of this Declaration to any person is not paid when due and after expiration of any applicable grace period set forth herein, then the person to whom such sums are owing shall have the right to record, in the Official Records, a Notice of Assessment Lien which shall set forth the then delinquent amount owed by such Owner (including default interest, if applicable) and a legal description of the property within the Project owned or leased by such defaulting Owner. Upon recordation of such Notice of Assessment Lien, the then delinquent amount owing by such Owner, together with interest thereon, shall constitute an Assessment Lien upon the property within the Project described in the Notice of Assessment Lien and the person recording such Notice of Assessment Lien shall provide written notice of such recordation to the defaulting Owner. In the event the amount secured by such Assessment Lien is not paid in full within thirty (30) days after the defaulting Owner's receipt of notice that a Notice of Assessment Lien has been recorded, the person to whom such amounts are owing may enforce payment of the assessment or other amount due, or enforce the Assessment Lien against the property and interest of the delinquent Owner, by taking either or both of the following actions, concurrently or separately (by exercising either of the remedies set forth below, such person shall not prejudice or waive its right to exercise the other remedy, or such additional remedies as may be available under its lease or under applicable law):

a. Bringing an action at law against the Owner personally obligated to pay the assessment or other sum of money;

b. Foreclosing the Assessment Lien against the property of the Owner in accordance with the then prevailing Oregon law relating to the foreclosure of Mortgages (including the right to recover any deficiency); or

c. Pursuing any other remedy at law or in equity.

7.2 Personal Obligation. Each assessment or amount due pursuant to any provision of this Declaration by an Owner, together with interest at the Default Rate, costs and attorneys' fees, shall be the personal obligation of such defaulting Owner, but such personal obligation of such Owner shall not be deemed to discharge or limit the charge on the land of any Assessment Lien encumbering the property of such Owner within the Project, regardless of a subsequent conveyance of that property. No Owner shall escape liability for payment of any amount due hereunder during any period that the Owner is not using the Common Area or by transfer or abandonment of such Owner's property. In the event any property within the Project as to which a Notice of Assessment Lien has been recorded pursuant to Section 7.1 above is sold, conveyed or otherwise transferred, in whole or in part, by the Owner thereof, such property shall

remain subject and subordinate to the Assessment Lien created by reason of the delinquency described in the Notice of Assessment Lien.

7.3 Priority. The Assessment Lien provided for above shall be superior to any and all other charges, liens or encumbrances which hereafter in any manner may arise or be imposed upon any portion of the Project; provided, however, that such Assessment Lien shall be subject and subordinate to:

a. Liens for taxes and other public charges which by applicable law are expressly made superior;

b. Any Mortgages recorded in the Official Records (and such other place as may be required or permitted by law) prior to the date of recordation of a Notice of Assessment Lien. All liens recorded subsequent to the recordation of a Notice of Assessment Lien shall be junior and subordinate to the Assessment Lien created by reason of the delinquency described in the recorded Notice of Assessment Lien; and

c. The rights of any and all tenants occupying any portion of the Project under written leases.

7.4 Cure. Upon the curing of any default for which a Notice of Assessment Lien was recorded, the person recording such Notice of Assessment Lien shall record an appropriate release of any Notice of Assessment Lien upon payment by the defaulting Owner of a reasonable fee, to be determined by such person, to cover the costs of preparing and recording such release, together with the payment of such other costs, including, without limitation, legal fees and court costs, interest or fees, as such person shall have incurred.

7.5 Late Charge/Default Interest. If any assessment or other sum of money payable by any Owner pursuant to any provision of this Declaration to any person is not paid when due and after expiration of any applicable grace period set forth herein, in addition to any other rights and remedies of Declarant for such Owner's default, such Owner shall pay to Declarant: (A) a late charge equal to ten percent (10%) of the overdue amount or five hundred dollars ($500.00), whichever is greater, to cover additional administrative costs; and (B) interest on the delinquent amounts at a default rate of interest equal to the lesser of the maximum rate permitted by law, if any, or the Default Rate plus eight percent (8%) per annum, from the date due to the date paid.

ARTICLE 8

CASUALTY

8.1 Damage to Buildings. In the event any Building or appurtenant improvement on a Parcel is damaged or destroyed by any casualty, the Owner upon whose Parcel such Building and/or improvement is/was located shall promptly (i) repair and/or reconstruct such Building or improvement in accordance with the applicable provisions of this Declaration, or (ii) level such Building or improvement, remove the debris from the Parcel and keep the affected portions of the Parcel neat, orderly, and well maintained, and covered with planted grass, one

inch (1") of asphaltic concrete, a dust cap, decomposed granite or other appropriate ground cover approved by Declarant (in Declarant's sole discretion), until subsequently improved or constructed upon, provided that no such protective covering shall increase the drainage burden on any other Parcel.

8.2 Damage to Common Areas. Upon any damage or destruction to the Common Area on a Parcel during the term of this Declaration (i) from any cause insurable under an all-risk insurance policy of the type then customarily issued in the State of Oregon for similar property or (ii) if not so insurable, the cost of repair of which (including applicable governmental fees and exactions) does not exceed fifty percent (50%) of the then full replacement cost of all of the Common Area on such Parcel, the Owner upon whose Parcel such damage or destruction occurred shall, at its sole cost and expense, promptly after the occurrence of the event of damage or destruction, restore, repair or rebuild such damaged or destroyed Common Area. If the cost of repair under clause (ii) above exceeds fifty percent (50%) of the then full replacement cost of all of the Common Area on the subject Parcel and the Owner of the affected Parcel elects (which such election shall be made, if at all, within thirty (30) days following such damage or destruction) not to restore, repair or rebuild the damaged or destroyed Common Area, and if the damaged or destroyed Common Area includes or affects any entrances to the Project, access drives or drive aisles within the Project, or common utilities or signs, then any other Owner shall have the right, by written notice to the Owner upon whose Parcel such damage or destruction occurred, to elect to effect restoration, repair or rebuilding of all or any part of such damaged or destroyed Common Area, in which event the electing Owner or Owners shall effect such restoration, repair or rebuilding in accordance with the applicable provisions of this Declaration, and the Owner of the Parcel upon which such damage and destruction occurred shall bear the first of the costs incurred to restore, repair and rebuild the affected Common Area to the extent not in excess of fifty percent (50%) of the then full replacement cost of all of the Common Area on the subject Parcel, and the electing Owner or Owners shall bear all such costs exceeding fifty percent (50%) of the then full replacement cost of such Common Area. If an affected Owner is not obligated to repair damaged or destroyed Common Area pursuant to clause (ii) above, and no other Owner elects to effect such repair within thirty (30) days after the date the affected Owner determines not to proceed with such repairs, then the affected Owner shall promptly remove any debris from its Parcel and keep the affected portions of the Parcel neat, orderly, and well maintained, and covered with planted grass, one inch (1") of asphaltic concrete, a dust cap, decomposed granite or other appropriate ground cover approved by Declarant (in Declarant's sole discretion), until subsequently improved or constructed upon, provided that no such protective covering shall increase the drainage burden on any other Parcel. Unless the work of restoration, repair, rebuilding or improvement is carried out pursuant to the original plans and specifications for the construction of the Common Area, the plans or specifications for such work shall be subject to the prior written approval of Declarant as otherwise required pursuant to this Declaration. Each affected Owner shall use all due diligence to complete such restoration and repair of the Common Area as expeditiously as possible so that the same may be available for use as part of the Project with as little delay and as little disruption as circumstances permit.

ARTICLE 9
ENFORCEMENT OF COVENANTS.

9.1 Remedies. In the event of any breach of or other non-compliance with any provision of the Declaration (other than the provisions of Article 7, as to which the rights and remedies set forth therein shall apply), Declarant may: (i) bring an action to recover monetary damages; (ii) institute a proceeding in equity to obtain injunctive or other equitable relief; (iii) impose reasonable fines against such Owner in such amount as Declarant deems appropriate in response to the violation; (iv) enter the Parcel in question, remove, abate, modify, or replace the item which is the cause of such violation in a manner that results in conformance with the Declaration, and assess the cost thereof against the Owner of such Parcel; and/or (v) exercise any other right or remedy available to it at law, in equity, or under the Declaration.

9.2 Rights of Owners. Any action to enforce the Declaration may be instituted by Declarant. If, after written request from an aggrieved Owner or Permittee, Declarant fails to commence an action to enforce the Declaration within a reasonable period, then the aggrieved Owner or Permittee may bring such an action independently.

9.3 Limitation of Liability. Reasonable and good faith exercise of any rights of entry set forth in the Declaration shall not subject Declarant or its members, managers, agents, employees, or contractors to any liability for trespass, conversion, or other claim for damages. Neither Declarant, nor its members, managers, agents, employees, or contractors shall be liable to any Owner or other Person for failure at any time to enforce any of the Declaration.

9.4 Recovery of Costs and Fees. In the event any suit, action, or other proceeding is instituted to enforce any of the Declaration or in connection with any dispute arising thereunder, the prevailing party shall be entitled to recover its costs and expenses incurred in connection therewith, including such amount as the court may determine to be reasonable as attorneys' fees at trial and on any appeal or review.

9.5 Remedies Not Exclusive. An election to pursue any remedy provided for violation of the Declaration shall not prevent concurrent or subsequent exercise of other rights or remedies permitted thereunder. The remedies provided in this Declaration are not exclusive, but shall be in addition to all other remedies, including actions for damages and suits for injunctions and specific performance, available at law or in equity.

ARTICLE 10
GENERAL PROVISIONS

10.1 Successors and Assigns. Each easement, restriction and covenant contained herein shall be appurtenant to and for the benefit of all portions of the Project and shall be a burden thereon, for the benefit of all portions of the Project, and shall run with the land. This Declaration and the restrictions, easements, covenants, benefits and obligations created hereby shall inure to the benefit of and be binding upon Declarant and the Owners and their successors, transferees and assigns; provided, however, that, if any Owner transfers all of its interest in the Project, the transferee thereof shall automatically be deemed to have assumed and agreed to be bound by the covenants and agreements herein contained, and the transferor shall

thereupon be released and discharged from any and all obligations under this Declaration accruing after the date of sale. No Owner shall bring any action for partition or division of the Common Areas. By accepting a deed to or entering into a recorded contract of sale for a Parcel, each Owner shall be deemed to have specifically waived such Owner's rights to institute or maintain any partition or other action designed to cause a division of the Common Areas.

10.2 Run With the Land. The covenants, conditions and restrictions contained in this Declaration shall run with the land and be binding upon each and all of the parties (and upon all persons claiming under them) for a period of ninety-nine (99) years, and shall thereafter renew automatically for successive ten (10) year periods, unless Owners owning at least fifty-one percent (51%) of the land area within the Project otherwise elect in a writing recorded in the Official Records.

10.3 Modification. This Declaration may be modified in any respect whatsoever with the consent of Declarant without the necessity of obtaining the consent of any other Owner; provided, however if such a modification:

a. directly and materially affects the access to, visibility of Common Signs or parking on a Parcel; or

b. would result in an increase in Common Area Maintenance Expenses for a Parcel Owner by more than 15% from the immediately preceding calendar year;

then the Owner of any such affected Parcel must also consent to such modification. Such modification may only be accomplished by a written instrument duly executed and acknowledged by the requisite parties, and duly recorded in the Official Records and at such other place as may be necessary.

10.4 No Dedication to Public. Nothing herein contained shall be deemed to be a gift or dedication of any portion of the Project to the general public or for the general public or for any public purposes whatsoever, it being the intention of Declarant that this Declaration shall be strictly limited to and for the purposes herein expressed.

10.5 No Cancellation. No breach of this Declaration shall entitle any Owner to cancel, rescind or otherwise terminate this Declaration, but such limitation shall not affect in any manner any other rights or remedies which such Owner may have hereunder by reason of any breach of this Declaration.

10.6 Survival. If any clause, sentence or other portion of this Declaration shall become illegal, null or void for any reason, or shall be held by any court of competent jurisdiction to be so, the remaining portions hereof shall remain in full force and effect.

10.7 No Merger. The ownership of the entire Project by the same party shall not effect the termination of this Declaration.

10.8 Mortgagee Protection. Breach of any of the covenants or restrictions contained in this Declaration shall not defeat or render invalid the lien of any Mortgage made in good faith and for value as to the Project or any part thereof, but all of the foregoing provisions,

restrictions and covenants shall be binding upon and effective against any Owner whose title thereto is acquired by foreclosure, trustee's sale, deed in lieu of foreclosure or otherwise.

10.9 Minimization of Damages. In all situations arising out of this Declaration, all Persons shall attempt to avoid and minimize the damages resulting from the conduct of any other Person. It is expressly agreed that no breach of this Declaration shall entitle any Person to cancel, rescind, or otherwise terminate this Declaration, or defeat or render invalid the lien of any mortgage or deed of trust made in good faith and for value as to any part of the Project. However, such limitation shall not affect in any manner any other rights or remedies which a party may have hereunder by reason of any such breach.

10.10 No Third Party Beneficiary. Except as herein specifically provided, no rights, privileges or immunities set forth herein shall inure to the benefit of any customer, employee, guest, licensee or invitee of any Owner, tenant or occupant of any portion of the Project, nor shall any customer, employee, guest, licensee or invitee of such Owner, tenant or occupant be deemed to be a third party beneficiary of any of the provisions contained herein. Notwithstanding the foregoing, tenants and other occupants of the Project, and their customers, guests and invitees, shall be permitted to use the Common Area of the Project as set forth herein.

10.11 Condemnation. In the event of condemnation (or sale under threat of condemnation) by any duly constituted authority for a public or quasi-public use of all or any part of the Project, that portion of the award attributable to the value of the interest in the Parcel so taken shall be payable to the Owner of such Parcel and no claim thereon shall be made by any other Owner of any part of the Project; provided, however, that the other Owners may file collateral claims with the condemning authority over and above the value of the interest to be taken, provided no such collateral claim shall reduce the award to the Owner of the condemned Parcel. The Owner of any portion of the Common Areas on a Parcel so condemned shall promptly repair and restore the remaining portion of the Common Areas located on such Owner's Parcel (including reestablishing any common utility facilities) as nearly as practicable to the condition of the same immediately prior to such condemnation or transfer, to the extent that the proceeds of such award are sufficient to pay the cost of such restoration and repair and without contribution from any other Owner.

10.12 Captions. The captions heading the various Articles and Sections of this Declaration are for convenience and identification only, and shall not be deemed to limit or define the contents of their respective sections.

10.13 Consent. Unless otherwise set forth herein, any approval or consent required or requested of Declarant may be withheld in its sole and absolute discretion. Unless otherwise specified herein, any approval or consent required to be obtained hereunder by any Owner, other than Declarant, shall not be unreasonably withheld and shall be given or withheld within thirty (30) days after delivery of the request therefor. In the event an Owner whose approval or consent is sought pursuant to the immediately preceding sentence fails to respond within the applicable time period, such Owner shall be deemed to have approved of, or consented to, the matter in question.

10.14 Assignment. Except as otherwise expressly set forth herein, no Owner shall have the right to assign all or any portion of its rights, benefits, duties or obligations under this Declaration except in connection with a transfer or conveyance by such Owner of its interest in property within the Project (and any conveyance made by deed of trust, Mortgage or other security instrument as security for any obligation or indebtedness shall not be deemed to be a transfer or conveyance within the meaning of the foregoing). In the event, at any time, that an interest in the same portion of property within the Project shall be vested in more than one person, such persons shall designate one of them to act on behalf of all such persons in the performance of the provisions of this Declaration. Any such designation shall be in writing and duly executed and acknowledged by each such person, and a copy of such designation shall be given to all other Owners in accordance with the notice provisions of this Declaration. An original of such designation shall be recorded in the Official Records. A majority of such persons shall have the right, from time to time, to change the designation made by executing, acknowledging, delivering and recording a new notice of designation in the same manner set forth above.

10.15 Notices. Any notice, demand, request or other communication required or permitted to be given by an Owner, occupant or tenant of the Project to another Owner, occupant or tenant hereunder shall be in writing, signed by the party giving the notice, and shall be given by delivering the same in person, by a recognized overnight courier service which maintains delivery records (such as Federal Express), or by depositing the same in the United States mail, registered or certified, return receipt requested, first class postage, and postage prepaid. All notices shall be sent to the respective mailing addresses of the parties hereto at the following addresses, until such addresses are changed as hereinafter provided:

Declarant:	DD Sherwood One, LLC 901 NE Glisan Street, Suite 100 Portland, OR 97232 Phone: (503) 297-8791
To any other Owner:	At such address as such Owner shall designate in writing to Declarant, or at such Owner's address in the Project if such Owner shall fail to designate in writing another address to Declarant.

Declarant shall make all addresses furnished by any Owner pursuant to this Section 10.15 available to any Owner, occupant or tenant of the Project who shall so request such addresses. Any Owner may change its mailing address at any time by giving written notice of such change to Declarant in the manner provided herein at least ten (10) days prior to the date such change is effective. Personal service and service by recognized overnight courier service will be deemed to be complete upon receipt and service by mail will be deemed complete on deposit of said notice in the United States mail.

10.16 Estoppel Certificates. Each Owner shall deliver to any other Owner, without charge, within fifteen (15) days after request therefor, a written statement setting forth that, to the best of such Owner's knowledge, the requesting Owner is not in default in the performance of any of its obligations under this Declaration (or, if in default, setting forth the nature of such default), and that, to such Owner's actual knowledge and belief, there are no

outstanding Assessment Liens against the requesting Owner's Parcel (or stating the amount of any such Assessment Lien(s)).

10.17 Subdivision. Declarant has subdivided the Project into multiple Parcels. Each portion of the subdivided Project is a separate Parcel. No other Owner shall have the right to subdivide any Parcel.

10.18 Governing Law. Any matter arising between the Owners shall be governed by and determined in accordance with the laws of the State of Oregon, without regard to any conflicts of laws or choice of law provisions thereof.

10.19 Declarant. So long as DD Sherwood One, LLC ("Deacon") owns any Parcel within the Project, Deacon shall be the "Declarant" for purposes of this Declaration, unless it otherwise elects. At such time that Deacon no longer owns a Parcel within the Project or otherwise elects to no longer be Declarant hereunder, Owners owning a majority of the Parcels within the Project shall then elect another Owner to be Declarant hereunder. For all purposes under this Declaration, Deacon shall include its successors and assigns, by merger, consolidation or by purchase of all or substantially all of its assets and any person or entity, his or its successors or assigns, to which Declarant has assigned any or all of its rights and obligations by an express assignment which may be incorporated into a recorded instrument including but not limited to a deed, lease, option agreement, land sale contract or assignment as the case may be, transferring such interest if such assignee agrees in writing with the Declarant.

10.20 No Representations or Warranties. No representations or warranties of any kind, express or implied, have been given or made by Declarant or its agents or employees in connection with the Project, any parcel, or any improvement, including, without limitation, physical condition, zoning, compliance with applicable laws, fitness for intended use, operations, maintenance, cost of maintenance, level of assessments or taxes.

10.21 Other Agreements. Nothing contained in this Declaration shall be construed as a limitation on Declarant's right to enter into any supplemental agreement with the grantee or lessee of any Parcel (or portion thereof) on terms and conditions more favorable to Declarant or otherwise different than those contained herein; provided, however, in all events, any such agreement shall be subordinate to this Declaration.

IN WITNESS WHEREOF, Declarant has executed this Declaration the day and year first above written.

DECLARANT:

DD Sherwood One, LLC,
an Oregon limited liability company

By: _____
Steve Deacon

Title: Manager

STATE OF OREGON)
)ss.
County of Multnomah)

On this day personally appeared before me Steve Deacon to me known to be the individual, or individuals described in and who executed the within and foregoing instrument, as the Manager of DD Sherwood One, LLC, an Oregon limited liability company, and acknowledged that he/she signed the same as his/her free and voluntary act and deed, for the uses and purposes therein mentioned on behalf of such limited liability company. Given under my hand and official seal this 30th day of April, 2019.

Leslie K. Munson
Notary Public in and for the State of Oregon
Residing at 901 NE Glisan Street
My Commission Expires: 06/18/2021

EXHIBIT A

LEGAL DESCRIPTION OF PROJECT AND PARCELS

Project Description

Lots 1, 2, 3, 4, 5, 6 and 7 of the Plat of Cedar Creek Plaza, as recorded in document number 2018 059232 in Washington County, Oregon.

Parcel Descriptions

Lot 1 of the Plat of Cedar Creek Plaza, as recorded in document number 2018 059232 in Washington County, Oregon.

Lot 2 of the Plat of Cedar Creek Plaza, as recorded in document number 2018 059232 in Washington County, Oregon.

Lot 3 of the Plat of Cedar Creek Plaza, as recorded in document number 2018 059232 in Washington County, Oregon.

Lot 4 of the Plat of Cedar Creek Plaza, as recorded in document number 2018 059232 in Washington County, Oregon.

Lot 5 of the Plat of Cedar Creek Plaza, as recorded in document number 2018 059232 in Washington County, Oregon.

Lot 6 of the Plat of Cedar Creek Plaza, as recorded in document number 2018 059232 in Washington County, Oregon.

Lot 7 of the Plat of Cedar Creek Plaza, as recorded in document number 2018 059232 in Washington County, Oregon.

EXHIBIT O

Parking Map

Existing Parking Stall Count

Rembold Tract
= 98 Stalls

Deacon
Tract =
~~238~~ Stalls

236 Stalls after deduction of 2 stalls proposed with Lot 2

Providence
Tract = 170
Stalls

EDY
BORCHERS
HOUSTON
RED LEAF
MADEIRA
SPRATLIN
ROBINWOOD
PACIFIC

Legend

- Deacon Tract
- Deacon Stalls (count = ~~238~~ 236)
- Providence Tract
- Providence Stalls (count = 170)
- Rembold Tract (The Ackerly)
- Rembold Stalls (count = 98)
- Tax Lots (July 2021)

N

0 37.5 75 150
Feet

Aerial Imagery Source: RLIS Partners Regional Aerial Photo Consortium

Date: 12-6-2021

Created by: Eric Rutledge

FIRE CODE / LAND USE / BUILDING REVIEW APPLICATION

Tualatin Valley Fire & Rescue

North Operating Center
11945 SW 70th Avenue
Tigard, OR 97223
Phone: 503-649-8577

South Operating Center
8445 SW Elligsen Rd
Wilsonville, OR 97070
Phone: 503-649-8577

REV 6-30-20

Project Information

Applicant Name: DOWL; Attn: Mike Towle
Address: 309 SW 6th Avenue, Suite 700
Phone: 971-280-8461
Email: mtowle@dowl.com
Site Address: 16864 SW Edy Road
City: Sherwood
Map & Tax Lot #: 2S130DA02200
Business Name: DD Sherwood One, LLC
Land Use/Building Jurisdiction: Sherwood
Land Use/ Building Permit # PAC 2022-009

Choose from: Beaverton, Tigard, Newberg, Tualatin, North Plains, West Linn, Wilsonville, Sherwood, Rivergrove, Durham, King City, Washington County, Clackamas County, Multnomah County, Yamhill County

Project Description

Proposed construction of two new commercial buildings and associated on-site parking, landscaping, and other site improvements. Buildings approximately 7,200 square feet and 5,800 square feet.

Permit/Review Type (check one):

- ☑ Land Use / Building Review - Service Provider Permit
- ☐ Emergency Radio Responder Coverage Install/Test
- ☐ LPG Tank (Greater than 2,000 gallons)
- ☐ Flammable or Combustible Liquid Tank Installation (Greater than 1,000 gallons)
  - * Exception: Underground Storage Tanks (UST) are deferred to DEQ for regulation.
- ☐ Explosives Blasting (Blasting plan is required)
- ☐ Exterior Toxic, Pyrophoric or Corrosive Gas Installation (in excess of 810 cu.ft.)
- ☐ Tents or Temporary Membrane Structures (in excess of 10,000 square feet)
- ☐ Temporary Haunted House or similar
- ☐ OLCC Cannabis Extraction License Review
- ☐ Ceremonial Fire or Bonfire (For gathering, ceremony or other assembly)

For Fire Marshal's Office Use Only

TVFR Permit # 2023-0006
Permit Type: SPP-Sherwood
Submittal Date: 1/16/23
Assigned To: DFM Arn
Due Date: NA
Fees Due: NA
Fees Paid: Ø

Approval/Inspection Conditions

(For Fire Marshal's Office Use Only)

This section is for application approval only

0430 1-17-23
Fire Marshal or Designee Date

Conditions:
See approved plans

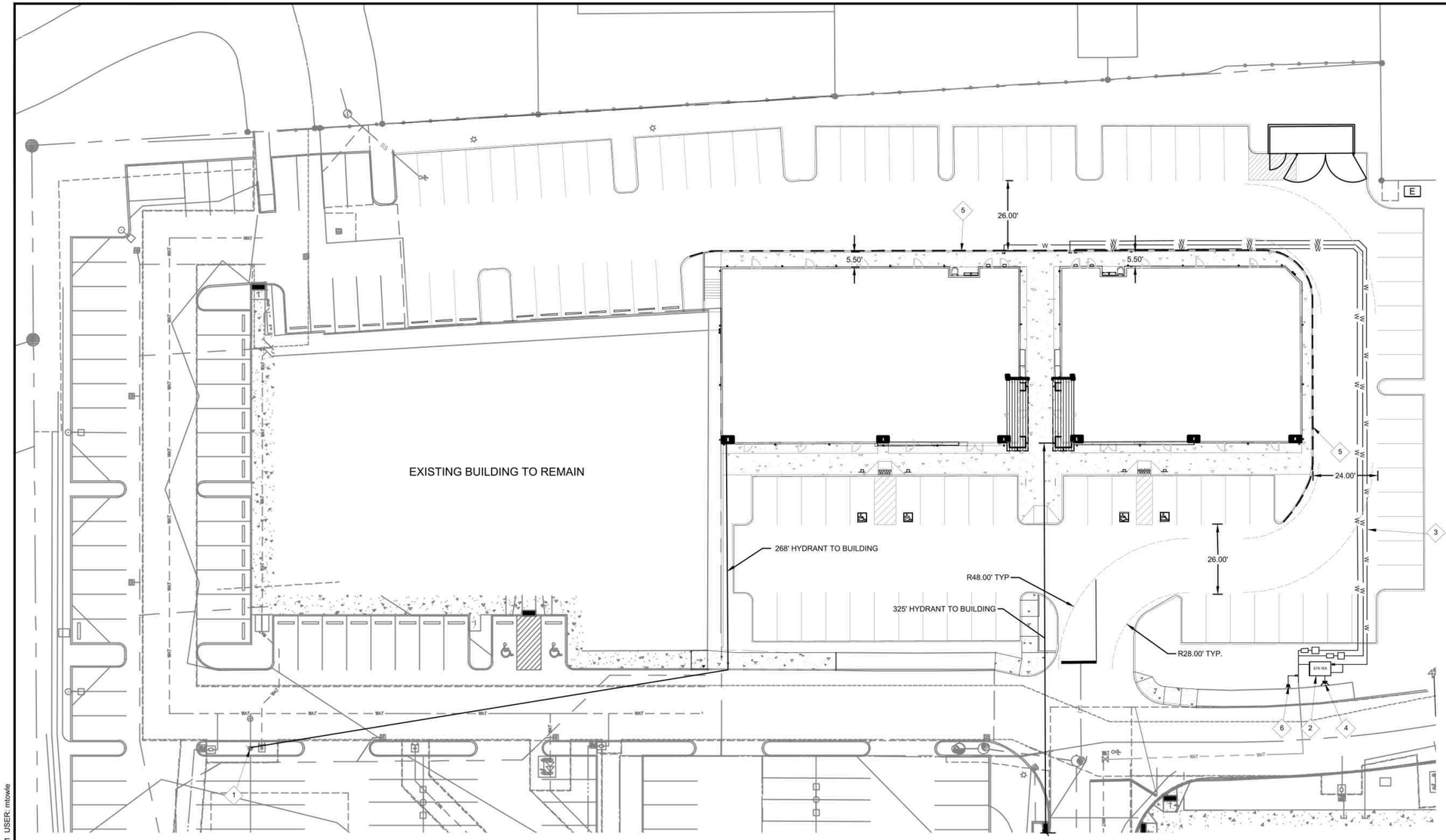
See Attached Conditions: ☒ Yes ☐ No

Site Inspection Required: ☒ Yes ☐ No

This section used when site inspection is required

Inspection Comments:

Final TVFR Approval Signature & Emp ID Date



LEGEND

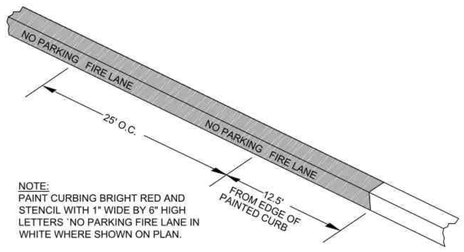
- RIGHT-OF-WAY LINE
- BOUNDARY LINE
- PROPERTY LINE
- CENTERLINE
- CURB
- EDGE OF PAVEMENT
- EASEMENT
- FENCE LINE
- EXISTING SANITARY LINE
- EXISTING STORM LINE
- EXISTING WATER LINE
- ASSUMED GAS LINE
- PROPOSED WATER LINE
- PROPOSED SANITARY LINE
- PROPOSED GAS LINE
- PROPOSED POWER LINE
- PROPOSED COMMUNICATION LINE
- PROPOSED CURB
- WATER VALVE
- PROPOSED STORM CATCH BASIN
- PROPOSED SANITARY SEWER CLEANOUT
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED FDC
- PROPOSED ELECTRIC VAULT
- PROPOSED COMMUNICATION PEDESTAL

KNOX BOXES TO BE INSTALLED ON BUILDING PER TVF&R STANDARDS. COORDINATE KNOX BOX LOCATION WITH TVF&R.

FIRE SERVICE CONSTRUCTION NOTES:

1. EXISTING PUBLIC FIRE HYDRANT
2. PROPOSED 6" DCDA WITH METER LOCATED IN 676-WA VAULT
3. PROPOSED 6" C900 DR18 FIRE WATER LINE
4. PROPOSED FDC
5. INSTALL PAINTED FIRE LANE CURB PER DETAIL ON THIS SHEET
6. PROPOSED PUBLIC FIRE HYDRANT

TVF&R Tualatin Valley Fire & Rescue
APPROVED PLANS
APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.
Deputy Fire Marshal II
TVF&R Permit #2023-0006



NOTE:
PAINT CURBING BRIGHT RED AND STENCIL WITH 1" WIDE BY 6" HIGH LETTERS `NO PARKING FIRE LANE IN WHITE WHERE SHOWN ON PLAN.

NO PARKING FIRE LANE PAINTED CURB DETAIL
NOT TO SCALE

BUILDING DATA

BUILDING	SQUARE FOOTAGE	# OF FLOORS	CONST. TYPE	FIRE FLOW (GPM)
1	13,000 SQ FT	1	V-B	1,500*

*75% FLOW REDUCTION APPLIED DUE TO SPRINKLER SYSTEM (1,500 GPM MINIMUM) - OFC TABLE B105.1

HYDRANT DATA

FIRE FLOW PROVIDED BY CITY OF SHERWOOD FROM OCTOBER 2021 WITHIN CEDAR CREEK PLAZA

STATIC	76 PSI
RESIDUAL	65 PSI
TEST FLOW	1825 GPM
FLOW @ 20PSI*	4395 GPM

*PROJECTED AVAILABLE FLOW AT 20PSI

20 0 20 40
SCALE IN FEET

REVISIONS

REV	DATE	DESCRIPTION	BY

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 15, 2014
MICHAEL TOWLE
EXPIRATION DATE: 06/30/24

DOWL
WWW.DOWL.COM

CEDAR CREEK PLAZA
16814 SW EDY ROAD, SHERWOOD, OR 97140

FIRE SERVICE AND ACCESS PLAN

SE 1/4 S30, T2S, R1W W.M. TL900
WASHINGTON COUNTY, OR

PROJECT 14505.01
DATE 01/13/2023

SHEET
FS-1

Exhibit S

Kenny Werth

From: Kristen Tabscott <kTabscott@pridedisposal.com>
Sent: Wednesday, March 8, 2023 2:35 PM
To: Kenny Werth
Cc: Mike Towle
Subject: RE: [EXT] RE: Cedar Creek Plaza, Lot 2 (Sherwood) Trash Enclosure REVISED

Thank you, this will work for us. If you could give me the exact enclosure dimensions that would be great.

Kristen Tabscott
EXECUTIVE ASSISTANT
–
Pride Disposal & Recycling Company
503-625-6177
pridedisposal.com
Follow the latest Pride news:
Facebook | Twitter | enewsletter

From: Kenny Werth <kwerth@dowl.com>
Sent: Wednesday, March 8, 2023 2:23 PM
To: Kristen Tabscott <kTabscott@pridedisposal.com>
Cc: Mike Towle <mtowle@dowl.com>
Subject: RE: [EXT] RE: Cedar Creek Plaza, Lot 2 (Sherwood) Trash Enclosure REVISED

Kristen,

Please see attached.

Thanks,
Kenny

Kenny Werth
Land Use Planner

DOWL

(971) 280-8641 | office
(971) 229-8321 | direct

dowl.com

From: Kristen Tabscott <kTabscott@pridedisposal.com>
Sent: Wednesday, March 8, 2023 2:19 PM
To: Kenny Werth <kwerth@dowl.com>
Cc: Mike Towle <mtowle@dowl.com>
Subject: RE: [EXT] RE: Cedar Creek Plaza, Lot 2 (Sherwood) Trash Enclosure REVISED

I need you to provide me with a full site plan, all I have is the screenshot below of the update.

Kristen Tabscott
EXECUTIVE ASSISTANT
–
Pride Disposal & Recycling Company
503-625-6177
pridedisposal.com

Follow the latest Pride news:
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From: Kenny Werth <kwerth@dowl.com>
Sent: Wednesday, March 8, 2023 2:18 PM
To: Kristen Tabscott <kTabscott@pridedisposal.com>
Cc: Mike Towle <mtowle@dowl.com>
Subject: RE: [EXT] RE: Cedar Creek Plaza, Lot 2 (Sherwood) Trash Enclosure REVISED

Okay thanks, Kristen. Please let us know if you can confirm 75' of unobstructed straight on access with the revised plan and if this will work.

Kenny Werth
Land Use Planner

DOWL

(971) 280-8641 | office
(971) 229-8321 | direct
dowl.com

From: Kristen Tabscott <kTabscott@pridedisposal.com>
Sent: Wednesday, March 8, 2023 7:17 AM
To: Kenny Werth <kwerth@dowl.com>
Subject: RE: [EXT] RE: Cedar Creek Plaza, Lot 2 (Sherwood) Trash Enclosure REVISED

I will just need to see where there is 75' of unobstructed straight on access if there is then this should work.

Kristen Tabscott
EXECUTIVE ASSISTANT
–
Pride Disposal & Recycling Company
503-625-6177
pridedisposal.com
Follow the latest Pride news:
Facebook | Twitter | enewsletter

From: Kenny Werth <kwerth@dowl.com>
Sent: Wednesday, March 8, 2023 5:37 AM
To: Kristen Tabscott <kTabscott@pridedisposal.com>
Cc: Mike Towle <mtowle@dowl.com>
Subject: Re: [EXT] RE: Cedar Creek Plaza, Lot 2 (Sherwood) Trash Enclosure REVISED

Good morning Kristen,

Are you able to confirm that these revisions would meet Pride Disposal's requirements and can you please provide approval?

Thanks again,
Kenny

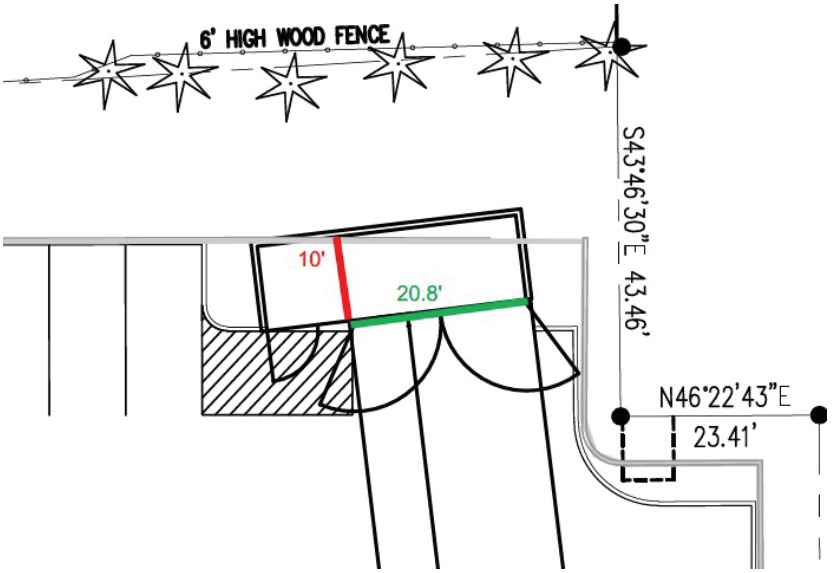
Get Outlook for iOS

From: Kenny Werth
Sent: Monday, February 27, 2023 3:25:41 PM
To: Kristen Tabscott <kTabscott@pridedisposal.com>

Cc: Mike Towle <mtowle@dowl.com>
Subject: RE: [EXT] RE: Cedar Creek Plaza, Lot 2 (Sherwood) Trash Enclosure REVISED

Kristen,

Please see snipped figure below showing width and depth of enclosure. Door opening width is 20.8 feet and the depth of the enclosure is 10 feet.



Kenny Werth
Land Use Planner

DOWL

(971) 280-8641 | office
(971) 229-8321 | direct
dowl.com

From: Kristen Tabscott <kTabscott@pridedisposal.com>
Sent: Monday, February 27, 2023 3:17 PM
To: Kenny Werth <kwerth@dowl.com>
Cc: Mike Towle <mtowle@dowl.com>
Subject: [EXT] RE: Cedar Creek Plaza, Lot 2 (Sherwood) Trash Enclosure REVISED

Hi Kenny,

What are the dimensions of the enclosure? Specifically where it's showing the doors opening?

Kristen Tabscott
EXECUTIVE ASSISTANT
–
Pride Disposal & Recycling Company
503-625-6177
pridedisposal.com
Follow the latest Pride news:
Facebook | Twitter | enewsletter

From: Kenny Werth <kwerth@dowl.com>
Sent: Monday, February 27, 2023 2:07 PM
To: Kristen Tabscott <kTabscott@pridedisposal.com>
Cc: Mike Towle <mtowle@dowl.com>
Subject: Cedar Creek Plaza, Lot 2 (Sherwood) Trash Enclosure REVISED

Hi Kristen,

Thanks for taking my call this morning! Please see the attached revised site plan showing the trash enclosure meeting the 75-foot clear space requirement and confirm that this revision would meet Pride Disposal's requirements.

Thanks,
Kenny

Kenny Werth
Land Use Planner

DOWL
(971) 280-8641 | office
(971) 229-8321 | direct
dowl.com