



AGENDA
City of Gig Harbor Design Review Board
Virtual Meeting of September 22, 2022 at 5:00 pm

Design Review Board and staff will be participating in this meeting remotely via Zoom. Members of the public are encouraged to view and comment during the meeting using the Zoom platform at <https://us06web.zoom.us/j/89568206345> or by calling (253) 215- 8782 and entering Meeting ID 895 6820 6345. Optionally, members of the public may view the live Zoom broadcast in-person at the Gig Harbor Civic Center during the meeting. Please see the Meeting Procedures at the end of this agenda for information on options to make public comment.

- I. Call to Order:**
- II. Roll call:**
- III. Approval of Minutes: June 9, 2022 & August 25, 2022**
- IV. Agenda Items for Formal Review**
 - a. Announcement of Application
 - b. Open Public Meeting Announcement
 - c. Appearance of Fairness Issues
 - d. Staff Report
 - e. Applicant Introduction and Presentation
 - f. Public Comment (See Assistance Memo)
 - g. Discussion and Voting

**Craig Deaver, C.E.S. NW Inc. 429 29th Street NE, Suite D,
Puyallup, WA 98372: PARR PRELIMINARY PLAT:**

(PL-PPLAT-21-0001, PL-DR-21-0171, PL-ALP-22-0003, PL-WET-21-0002 & PL-SEPA-21-0006) The applicant proposes to divide an existing vacant 5.84-acre parcel into eight (8) lots for single-family residential development. The subdivision will also include a public access road, one storm tract, two access tracts, and two open space tracts to accommodate the buffer associated with an on-site Type 4 stream. The site is located on the east side of Canterwood Blvd., approximately 800 feet

south of the intersection of Canterwood Blvd. and 122nd St. Section 25
Township 22 Range 01 Quarter 41. Assessor's Parcel Number:
0122254065

V. Upcoming Meetings

VI. Adjourn

PUBLIC COMMENT & DECORUM

Commenters will be allotted 3 minutes per individual, unless revised by the Chair. In-person comments shall be made from the microphone, first giving the speaker's name and address. When there are 30 seconds remaining, staff will alert you to summarize your comments. At the end of your comments, staff will notify you it has come to the end of your comment period. Anyone making "out of order" comments may be subject to removal from the meeting.

Public comment may be made remotely via Zoom or by phone during designated portions of the meeting. To speak during the meeting, press the Raise Hand button near the bottom of your Zoom window or press *9 on your phone. Please refrain from raising your hand until the Chair has announced that the Design Review Board has opened the public comment portion of the meeting. Your name or the last three digits of your phone number will be called out when it is your turn to speak. When using your phone to call in, you may need to press *6 to unmute yourself. All speakers will have up to three minutes to speak.

All remarks shall be addressed to the Design Review Board as a body and not to any specific Member. All speakers shall be courteous in their language and deportment and shall not engage in or discuss or comment on personalities or indulge in derogatory remarks or insinuations with regard to any Design Review Board, the Chair, or any member of the staff or the public.

There will be no demonstrations during or at the conclusion of any public comment. These guidelines are intended to promote an orderly system of holding a public meeting, to give every person an opportunity to be heard and to ensure that no individuals are embarrassed by voicing their opinions.

AMERICANS WITH DISABILITIES (ADA) ACCOMMODATIONS ADA accommodations can be provided upon request. Those requiring special accommodations should contact the City Clerk at cityclerk@gigharborwa.gov or (253) 853-7613 at least 24 hours prior to the meeting.



DRAFT MINUTES
City of Gig Harbor Design Review Board
Virtual Meeting of June 9, 2022 at 5:00 pm

- I. **Call to Order:** 5:00 pm
- II. **Roll call:** Vice Chair Darrin Filand, Jon Ashlock, Larry Bradbury, Marlene Druker, Vice Chair Filand introduced the two new board members - Brianne Blackburn and Amy Wheeler
Staff: Jeremy Hammar, Associate Planner, Cindy Andrews, Planning Technician and Josh Stecker, City Clerk.
- III. **Approval of Minutes:** February 24th, 2022: Move to approve the minutes of February 24, 2022 as written: Bradbury/Druker – All in favor | Motion carried.
- IV. **Agenda Items for Formal Review**
 - a. Announcement of Application
 - b. Open Public Meeting Announcement
 - c. Appearance of Fairness Issues
 - d. Staff Report
 - e. Applicant Introduction and Presentation
 - f. Public Comment (See Assistance Memo)
 - g. Discussion and Voting
 1. **OPMA Update from City Clerk, Josh Stecker**
 2. **Chair Elections:** Elections have been deferred to the first meeting in August per the Bi-Laws | Vice Chair Darrin Filand will sit in as Chair until August.
 3. **[Jeanne Ratcliffe-Gagliano –7713 Pioneer Way, Suite 1, Gig Harbor, WA 98335](#): NAMES RESIDENCE: SIDING & WINDOWS: (PL-DR-22-0026)**
Application for Alternative design review to bring non-permitted work on an existing building into compliance. The site is located at 3404 Ross Avenue, site is located on Ross Avenue, approximately 115 feet east of intersection with Dorotich Drive. Section 05 Township 21 Range 02. Parcel Number 597000057
 - a. Staff presentation provided by Jeremy Hammar, Associate Planner.
 - b. Applicant presentation provided by Jeanne Ratcliffe – Gagliano with Brandon Swan assisting.
 - c. DRB discussion:

MOTION: To accept the design as it stands with the exception that the planter box is an optional choice for the applicant. The design of the main structure as it exists currently is a superior design and meets the intent of the Design Manual. Ashlock / Bradbury. All in favor | Motion carried.

V. **Upcoming Meetings:** Thursday June 23rd- Cancelled

Good of the Order : Marlene – RFQ for Design Manual

VI. **Adjourn:** Move to adjourn at 6:03 pm Marlene / Ashlock – all in favor – Motion carried.



"THE MARITIME CITY"

COMMUNITY DEVELOPMENT
PLANNING DIVISION

DRAFT MINUTES

**City of Gig Harbor Design Review Board
Meeting of August 25, 2022
Civic Center, 3510 Grandview Street
5:00 PM**

- I. **Call to order** – Jon Ashlock was voted as chair for the evening opening the meeting at 5:04 pm
 - II. **Roll call**: Jon Ashlock sitting in as chair, Larry Bradbury, Brianne Blackburn and Amy Wheeler: absent: Darin Filand, Vice Chair and Marlene Druker.
 - III. **Applicant**: Michelle and Brad Bailey, Carl Halsan and Kenzie Bailey
 - IV. **Approval of Minutes – No Minutes to approve:**
 - V. **Agenda Items for Formal Review.** Review will be conducted in the following order for each item.
 - a. Announcement of Application
 - b. Open Public Meeting Announcement
 - c. Appearance of Fairness Issues
 - d. Staff Report
 - f. Applicant Introduction and Presentation
 - h. Public Comment (See Assistance Memo)
 - i. Discussion and Voting
 1. **BABICH-BAILEY NET SHED, 3723 MOOSE TRAIL, Gig Harbor, WA 98335: BAILEY SINGLE-FAMILY RESIDENCE & ACCESSORY APARTMENT.** (PL-SPR-21-0004, PL-SDP-21-0006, PL-DR-21-0174, PL-NCR-21-0007, PL-SVAR-21-0001, PL-VAR-21-0003, PL-SEPA-21-0008). The proposal includes construction of a new single-family residence with an attached Accessory Apartment. The project is located at 2913 Harborview Drive, site is located on the east side of Harborview Dr, approximately 175 feet from the intersection of Soundview Dr. and Harborview Dr. Sec 08, Tw 21, R 02 Qtr 12. Parcel Number 0221081189
- STAFF PRESENTATION:** Staff presentation provided by Jeremy Hammar, Associate Planner. Mr. Hammar provided a summary of his staff report and recommendation.
- APPLICANT PRESENTATION:** Applicant presentation provided by Carl Halsan of Halsan Frey LLC, agent for the applicant. Mr. Halsan provided the applicant's summary.

DRB DISCUSSION: DRB members discussed the proposal.

MOTION: No Motion was called for.

VI. **Upcoming Meetings:** Meeting of September 8, 2022 Cancelled

VII. **Adjourn:** **MOTION:** Move to adjourn at 5:32 pm. Bradbury / Blackburn. All in favor | Motion carried

Public comment is taken during the formal review portion of the agenda, specific to the application being considered. As a recommending body for project permits, the DRB acts in a quasi-judicial manner and, therefore, does not take general public comment.



**COMMUNITY DEVELOPMENT DEPARTMENT
PLANNING DIVISION
STAFF REPORT**

TO: Design Review Board
FROM: Planning Staff – Jeremy Hammar, Associate Planner
DATE: September 15, 2022

RE: Parr Preliminary Plat (PL-DR-21-0171)
Public Meeting Date: September 22, 2022

I. GENERAL INFORMATION

- A. Owner:** Gary Parr
3573 E L St
Tacoma, WA 98404
- B. Agent:** Craig Deaver, C.E.S. NW Inc.
429 29th Street NE, Suite D
Puyallup, WA 98372

II. PROJECT DESCRIPTION

The applicant proposes to divide an existing vacant 5.84-acre parcel into eight (8) lots for single-family residential development. The subdivision will also include a public access road, one storm tract, two access tracts, and two open space tracts to accommodate the buffer associated with an on-site Type 4 stream.

III. SITE DESCRIPTION

- A. Location:** XXXX 120th Street; the site is located on the east side of Canterwood Blvd., approximately 800 feet south of the intersection of Canterwood Blvd. and 122nd St. Section 25 Township 22 Range 01 Quarter 41.
- B. Assessor's Parcel Number:** 0122254065

- B. Site Area/Acreage:** 5.84 acres
- C. Existing Site Characteristics:**
- 1. Topography:** Site slopes up sharply from Canterwood Blvd before plateauing. Midway across the site, the site slopes down to the east at 30 to 50 percent to a type 4 stream that flows from north to south.
 - 2. Vegetation:** The site is covered with a moderate to dense mixture of conifer and deciduous trees, with an understory of ferns, holly, salal, other native species, and scattered invasive species.
 - 3. Wetlands and Critical Areas:** There is a Type 4 stream on the eastern portion of the site running north/south.
- D. Zoning:**
- 1. Subject parcel:** R-1 – Single-Family Residential
 - 2. Adjacent zoning and current use:**
 - a. North:** Unincorporated Pierce County, Vacant
 - b. East:** Unincorporated Pierce County, Single-Family
 - c. South:** PCD-BP, Hospital
 - d. West:** R-2 – Medium Density Residential, Vacant
- E. Road Access/Utilities:** The site is accessed from Canterwood Blvd. The City provides sewer and water service.

IV. PERTINENT DESIGN REVIEW POLICIES

- A. Comprehensive Plan:** The site is designated as Residential Low. The Community Design Element is directly applicable (pgs. 4-1 – 4-19) while other elements are indirectly applicable.
- B. Gig Harbor Municipal Code:** The subject parcel is zoned Single-Family Residential District (R-1). Chapter 17.16 GHMC contains development and performance standards for this district.
- C. Design Manual:** The Design Review process is outlined in chapter 17.98 GHMC. Section 17.98.055 outlines the process for review of projects by the Design Review Board (DRB). This section states that after a public meeting, the DRB will make a recommendation to the decision maker for approval or denial of the application.
- The DRB shall review an application which does not strictly conform to the specific requirements of the Design Manual under the following criteria: a) whether the alternative design represents an equivalent or superior design solution to what would otherwise be achieved by rigidly applying specific requirements; and b) whether the alternative design meets the intent of the general requirements of the Design Manual.

To best determine the general requirement's intent, the DRB shall consider the specific requirements as appropriate examples of compliance. General requirements include all bold and underlined text in the Design Manual. Specific standards include the more detailed text, which immediately follows the general requirement.

V. BACKGROUND INFORMATION

The subject site was part of the area annexed by City of Gig Harbor in 1997. The site is bordered by vacant parcels to the North and West, Residential development to the East, and a hospital to the South.

The applicant formally applied for its design review application on May 18, 2021. In staff's review of the subject design review permit application, inconsistencies in the applicant's proposed design and the City of Gig Harbor's Design Manual were identified, resulting in the applicant's decision to propose a design alternative to the Design Review Board (DRB). This request is discussed in Section VI of this staff report and in the applicant's narratives included with this staff report as Exhibits A and B.

VI. REQUESTED DRB REVIEW AND ANALYSIS

The applicant has requested that the following item be reviewed by the DRB. See Exhibits of this staff report for the project agent's narrative and plans, respectively, discussing the proposed design. Planning staff has reviewed the materials submitted as Exhibits to this staff report and makes the following analysis, findings and recommendations on the specified Design Manual requirement.

Article II. Neighborhood Context

A. 17.99.160 – Enhancement Corridor Standards

17.99.160.A – Retain significant Trees

Significant trees within 30 feet of the property line abutting the street rights-of-way or City of Tacoma Cushman transmission line properties within the enhancement corridor shall be retained.

1. **Applicant's Request:** Currently there are 63 existing significant trees within the Enhancement Corridor. Of these 1 is dead, 16 must be removed to allow access to the site, 14 are to be removed for frontage/site improvements and 32 are proposed to be retained. After removal and replanting (per Landscape Plans) this landscape design proposes more than double the existing tree quantity with a total of 128 native trees (existing plus proposed new trees). New trees added to Enhancement Corridor will all be from the City's preferred species list, 20 percent beyond the 80 percent required by GHMC 17.78.060 (B)(2)(a). Full request is detailed in Exhibit A to this staff report.

2. **Staff Analysis:** The overall condition of the enhancement corridor will be improved as proposal will remove existing diseased and/or dying trees and eliminate existing invasives. Additionally, the proposal will provide for a more diverse variety of native species and provide for an overall increase in the quantity of trees within the corridor. Due to the nature of the site and the requirement to provide access, retention of all trees within 30 feet of the property line abutting the street right-of-way is unavoidable.

If the Design Review Board agrees with the analysis above, staff suggests the DRB make the following findings and recommendation:

1. **Findings:** The DRB finds that the proposed design alternative meets the intent of the general requirement of GHMC 17.99.160 and represents an equivalent or superior design solution to what would otherwise be achieved by rigidly applying the specific requirements of GHMC 17.99.160.
2. **Recommendation:** The Design Review Board recommends the decision maker accept the proposed design alternative as compliant with the criteria of approval for an alternative design request set forth in GHMC 17.98.055(A).

Article III. Site Design

A. 17.99.240 Natural Site Conditions.

17.99.240.C Maintain Natural topography

Buildings and parking lots shall be designed to fit natural slopes rather than regrading the slope to fit a particular building or parking lot design. Cuts and fills on a site shall be balanced and finished grades shall not include any retaining walls that exceed six feet. Instead, designs shall complement and take advantage of natural topography. Sloped lots may require multileveled buildings, terraced parking lots and/or lower-level parking garages.

1. **Applicant's Request:** Connecting the onsite roadway to Canterwood Blvd NW and constructing the modified Minor Arterial Residential roadway section (2-03), approved under public works variance application EN-22-0023, creates more cut than fill on this project. Some of the cut material is used as fill on Lots 3-7 and Tract A while meeting the City's wall height requirements. This proposed grading uses a combination of terraced six-foot maximum walls and daylight basements at the rear of these lots to maintain natural topography to the greatest extent practicable, similar to the multilevel building cross section figure shown in Article III of the Design Manual (GHMC

17.99.240.C, page 17-192). This design approach provides compliance with the Geotechnical recommendations made by GeoResources in their report dated May 17, 2022. Even with these measures the project will create approximately 7,900 cubic yards of unavoidable export. Full request is detailed in Exhibit B to this staff report.

2. **Staff Analysis:** The excess cut is necessary to provide access to the site while also maintaining natural topography and limiting removal of significant vegetation to the greatest extent feasible.

If the Design Review Board agrees with the analysis above, staff suggests the DRB make the following findings and recommendation:

1. **Findings:** The DRB finds that the proposed design alternative meets the intent of the general requirement of GHMC 17.99.240 and represents an equivalent or superior design solution to what would otherwise be achieved by rigidly applying the specific requirements of GHMC 17.99.240.
2. **Recommendation:** The Design Review Board recommends the decision maker accept the proposed design alternative as compliant with the criteria of approval for an alternative design request set forth in GHMC 17.98.055(A).

VII. PUBLIC NOTICE

Legal notice of the meeting was published in The News Tribune and posted on the subject site by September 15, 2022. In addition, notice was mailed to all property owners within 300 feet of the subject site on September 8, 2022. As of the date of this report, staff has received no public comments in response to the public meeting notice.

Project Planner: Jeremy Hammar, Associate Planner

Date: September 15, 2022

The following documents pertinent to your review are enclosed:

- A. Applicant's Enhancement Corridor Alternative Design Narrative, prepared by David Evans and associates, Inc., dated May 19, 2022.
- B. Applicant's Alternative design statement, prepared by Don Babineau of C.E.S. NW, Inc., dated May 19, 2022.
- C. Applicant's Plan Set, prepared by C.E.S. NW, Inc., dated August 22, 2022.
- D. Applicant's Plan Set – Landscape sheets, prepared by C.E.S. NW, Inc., dated May 23, 2022
- E. Geotechnical report, prepared by GeoResources, dated August 16, 2022.

Prepared on 6-16-2021

Revised with Revision #1, 5-17-2022

Enhancement Corridor Alternative Design Narrative

The proposed landscaping in the Enhancement Corridor represents a superior planting design result than would be achieved by adhering to the landscape requirements in the COGH landscape code included in sections 17.99.160 and 17.78 by addressing the following:

Quantity of Trees: Currently there are 63 existing significant trees within the Enhancement Corridor. Of these 1 is dead, 16 must be removed to allow access to the site, 14 are to be removed for frontage/site improvements and 32 are proposed to be retained. After removal and replanting (per Landscape Plans) this landscape design proposes more than double the existing tree quantity with a total of 128 native trees (existing plus proposed new trees). New trees added to Enhancement Corridor will all be from the City's preferred species list, 20 percent beyond the 80 percent required by GHMC [17.78.060](#) (B)(2)(a).

Proposed Tree Sizes: This landscape design will provide proposed tree plantings in the Enhancement Corridor some of which are larger in size than what is required by COGH code Chapter [17.78](#). Upsized trees shall be as follows:

- 5 of the 25 proposed *Acer circinatum* will be 8' ht. min.
- 2 of the 8 proposed *Abies grandis* will be 8' ht. min.
- 3 of the proposed *Pinus contorta* will be 8' ht. min. and 1 will be 10' ht. min
- 10 of the 38 proposed *Thuja plicata* will be 8' ht., min. and 4 will be 10' ht. min.

Proposed tree heights that are varied will create a visual buffer that is more naturalistic in appearance and helps maintain the scenic beauty which characterizes travel across Gig Harbor Peninsula as required in COGH 17.99.

Diversity of Trees: Existing significant healthy trees in the Enhancement Corridor are three varieties (42 Douglas Fir, 67%, 19 Madrona, 31% and 1 Big-Leaf Maple, 2%, 1 Hemlock which is dead) The proposed trees will provide a mix/variety of native tree species. The trees proposed for the Enhancement Corridor will add at least seven more additional native varieties (38 Western Red Cedar, 41%, 11 Pinus, 12%, 8 Abies, 8%, 6 Tsuga, 6%, 25 Vine Maple, 26%, 3 Big-Leaf Maple, 3%, 3 Corylus, 3% and 2 Bitter Cherry, 2%). This mix/variety of tree species will help discourage monoculture and potential spread of tree borne diseases (see below).

Potential Reduction of Spread of Laminated Root Rot: Per Arborists report of 1/18/2021 within the Type I vegetation description a pocket of Laminated Root Rot (*Coniferiporia weirii*) was found near the northern perimeter buffer. Laminated Root Rot (LRR) primarily affects tree species such as Hemlock and Douglas Fir (the primary tree being removed from the enhancement corridor). LRR spreads primarily through root-to-root contact between infected and uninfected trees. LRR can thus be reduced by not

replacing trees that are susceptible (such as Douglas Fir) but instead planting with the proposed native trees that are resistant such as (Abies, Acer, Pinus & Thuja). This mix of trees can help reduce the continued infestation of existing trees with LRR and provide for a healthier canopy of trees.

Reinvigoration of Existing Soils: Disturbed areas in the Enhancement Corridor proposed to be replanted with trees as described above and understory include a mix of native shrubs and groundcover. Replanting will include the addition of new organic/mineral rich soils and compost. Addition of such soils and mulch will provide much needed organics and aeration to existing soils promoting stronger root growth and healthier trees.

Elimination of Invasive Weeds: Clearing existing understory in areas to be replanted will result in removal of existing invasive plants. The creation of new understory in areas to be planted will provide a desirable understory with native species such as Mahonia, Salal, Ribes, Sword fern and Vaccinium. In response to this (and per Chapter [17.78.060](#) (B)(2)(c) GHMC) all areas to be landscaped shall be covered with live groundcover vegetation which are designed to cover at least 75 percent of the ground area within three years.

Wall Design South of Road A: Replacement of the wall with a wall of similar height will maintain existing elevations above the wall within the Enhancement Corridor south of Road A. Limiting grade change in this area will allow existing trees to remain.

CES ♦ NW
INCORPORATED
CIVIL ENGINEERING & SURVEYING

Parr Preliminary Plat | PL-PPLAT-21-0001**Design Review Board 09.22.2022****Exhibit B**

May 19, 2022

Gig Harbor
Community Development - Planning Division
3510 Grandview Street
Gig Harbor WA 98335

**RE: Parr Property Preliminary Plat – Alternative Design Statement – Maintaining Natural Topography
(CES #20095)**

Dear Design Review Board Members,

The proposed grading plan is a superior design solution to what would otherwise be achieved by rigidly applying the requirements in Gig Harbor Municipal Code (GHMC) 17.99.240. The developable portion of the site is elevated above Canterwood Blvd NW by approximately 8 to 12 feet with an existing retaining wall and embankment running along the project's frontage within the right-of-way. Connecting the onsite roadway to Canterwood Blvd NW and constructing the modified Minor Arterial Residential roadway section (2-03), approved under public variance application EN-22-0023, creates more cut than fill on this project. Some of the cut material is used as fill on Lots 3-7 and Tract A while meeting the City's wall height requirements. This proposed grading uses a combination of terraced six-foot maximum walls and daylight basements at the rear of these lots to maintain natural topography to the greatest extent practicable, similar to the multilevel building cross section figure shown in Article III of the Design Manual (GHMC 17.99.240.C, page 17-192). This design approach provides compliance with the Geotechnical recommendations made by GeoResources in their report dated May 17, 2022. Even with these measures the project will create approximately 7,900 cubic yards of unavoidable export.

The project meets all other City of Gig Harbor Public Works geometric road design standards. Strict adherence to GHMC 17.99.240 would result in a plat road which would not meet roadway design parameters and Public Works standards. The construction of the frontage improvements will require that the existing wall within Canterwood Blvd NW's right-of-way be relocated towards Tract B and Lot 8 without impacting the existing vegetation within the Enhancement Corridor. Currently, the existing wall exceeds the maximum 6-foot height as specified in GHMC 17.99.240; therefore, the relocated wall will not be able to meet this requirement. If the proposed relocated wall height cannot be approved by the Design Review Board, the significant trees within the adjacent enhancement corridor will need to be removed and the corridor regraded at approximately 2:1 to accommodate the required frontage improvements along Canterwood Blvd NW.

We trust that the grading shown on the preliminary plat is a superior design since it maintains the intent of the code while providing for the required frontage improvements along Canterwood Blvd and an onsite roadway that meets the Public Work geometric requirements.

Respectfully,

Don Babineau

Don Babineau
Senior Planner

NE 1/4, SE 1/4, SECTION 25, TOWNSHIP 22 N, RANGE 1 E, W.M.

PARR ACRES

PRELIMINARY PLAT ENGINEERING

LEGAL DESCRIPTION:

LOT 1, PIERCE COUNTY LARGE LOT NO. 2970, ACCORDING TO SURVEY RECORDED IN VOLUME 30 OF LARGE LOTS, PAGE 70, BEING A PORTION OF NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 25, TOWNSHIP 22 NORTH, RANGE 1 EAST OF THE WILLAMETTE MERIDIAN, RECORDS OF PIERCE COUNTY AUDITOR.

EXCEPT THAT PORTION CONVEYED TO PIERCE COUNTY BY DEED RECORDED JANUARY 11, 1994 UNDER RECORDING NO. 9401110663.

SITUATE IN THE CITY OF GIG HARBOR, COUNTY OF PIERCE, STATE OF WASHINGTON.

SITE ADDRESS:

11917 CANTERWOOD BLVD. NW
GIG HARBOR, WA 98332

PARCEL NUMBER:

0122254065

BASIS OF BEARING:

NAD 83-2011 (EPOCH 2010.00), WASHINGTON STATE PLANE, SOUTH ZONE, (PER THE WASHINGTON STATE REFERENCE NETWORK). THE EAST LINE OF THE SOUTHEAST QUARTER OF SEC. 25, TWP. 22N., RGE. 1E. W.M., WHICH BEARS N2°22'15"E.

VERTICAL DATUM:

NAVD88 (PER THE WASHINGTON STATE REFERENCE NETWORK).

UTILITIES:

WATER: CITY OF GIG HARBOR
SEWER: CITY OF GIG HARBOR
POWER: PENINSULA LIGHT
PHONE: CENTURYLINK
FIRE: FPD#005 GIG HARBOR
SCHOOL: PENINSULA SCHOOL DISTRICT

SITE STATISTICAL BREAK DOWN

EXISTING ZONING: (R1) SINGLE FAMILY RESIDENTIAL
GROSS SITE AREA: 229,344 S.F.(5.26 AC.)
-ROAD R.O.W.: 13,098 S.F.(0.30 AC.)
-STREAM AND STREAM BUFFER: 29,946 S.F.(0.69 AC.)
-SHARE ACCESS TRACTS: 3,521 S.F.(0.08 AC.)
NET BUILDABLE LAND AREA: 182,779 S.F.(4.19 AC.)

TOTAL LOTS PROPOSED: 8
SMALLEST PROPOSED LOT: 7,500 S.F.
LARGEST LOT AREA: 11,354 S.F.
AVERAGE LOT AREA: 8,929 S.F.
MIN. LOT WIDTH REQUIRED: 0.7 PERCENT OF THE LOT AREA
MIN. DENSITY REQUIRED: NONE
MAX. DENSITY: 4 D.U. PER ACRE
DENSTY PROVIDED: 1.91 D.U. PER ACRE

IMPERVIOUS SURFACE

ONSITE ROADWAY IMPROVEMENTS: 14,545 SF (0.33 ACRES)
(INCLUDES SHARED ACCESS)
OFFSITE ROADWAY IMPROVEMENTS: 5,060 SF (0.12 ACRES)
TOTAL IMPERVIOUS: 19,605 SF (0.45 ACRES)

BUILDING SETBACKS:

MIN. PORCH SETBACK: 12 FEET
MIN. HOUSE SETBACK: 20 FEET
MIN. GARAGE SETBACK: 26 FEET
MIN. SIDE YARD SETBACK: 8 FEET
MIN. REAR YARD SETBACK: 30 FEET

SURVEY BY:

C.E.S. NW INC
429 - 29TH STREET NE, SUITE D
PUYALLUP, WA 98372
(253) 848-4282

ENGINEER:

C.E.S. NW INC
429 - 29TH STREET NE, SUITE D
PUYALLUP, WA 98372
(253) 848-4282

DEVELOPER:

IVORY, LLC
33400 8TH AVE. S., SUITE 230
FEDERAL WAY, WA. 98003
(253) 517-8188

FIRE FLOW NOTE:

FIRE HYDRANTS MUST BE FLOW TESTED PRIOR TO FINAL PLAT.
TESTING MUST BE WITNESSED BY THE CITY FIRE MARSHAL.

PROJECT No. PL-PPLAT-21-0001
Firm's PROJECT No. 20095



C.E.S. NW INC.
CIVIL ENGINEERING & SURVEYING

429 - 29TH ST. NE, SUITE D
PUYALLUP, WA 98372
(253) 848-4282

ROADWAY NOTE:

AT THE TIME OF CIVIL PERMIT INTAKE ALL PROPOSED PUBLIC AND PRIVATE ROADWAYS DEPICTED IN THIS PRELIMINARY PLAN SET SHALL COMPLY WITH MAX. SLOPE PERCENTAGES AND ALL OTHER REQUIREMENTS, PER THE MOST CURRENT CITY OF GIG HARBOR PUBLIC WORKS STANDARDS*

DRIVEWAY APPROACH NOTE:

AT THE TIME OF CIVIL PERMIT INTAKE ALL PROPOSED DRIVEWAY APPROACH LOCATIONS DEPICTED IN THIS PRELIMINARY PLAN SET SHALL COMPLY WITH MAX. SLOPE PERCENTAGES AND ALL OTHER REQUIREMENTS, PER THE MOST CURRENT CITY OF GIG HARBOR PUBLIC WORKS STANDARDS.

GRADING QUANTITIES

CUT = 9,800 CY
FILL = 1,900 CY
NET = 7,900 CY CUT
NOTE: THESE QUANTITIES ARE PROVIDED FOR PLANNING PURPOSES ONLY. CONTRACTORS SHOULD VARY VALUES

STORMWATER STANDARDS

CITY OF GIG HARBOR
2016 STORMWATER MANAGEMENT & DEVELOPMENT MANUAL

PUBLIC WORKS STANDARDS

CITY OF GIG HARBOR
2018 PUBLIC WORKS STANDARDS MANUAL

SHEET INDEX

PPLT1 GIG HARBOR COVER SHEET & KEY INDEX MAP
PPLT2 EXISTING CONDITIONS MAP
PPLT3 PRELIMINARY PLAT MAP
PPLT4 GRADING PLAN
PPLT5 CROSS SECTIONS
PPLT6 UTILITY SYSTEM PLAN
PPLT7 CANTERWOOD BLVD NW - PLAN & PROFILE NORTH
PPLT8 CANTERWOOD BLVD NW - PLAN & PROFILE SOUTH
PPLT9 ROAD 'A', TRACT 'D' & 'E' - PLAN & PROFILE
PPLT10 INFILTRATION VAULT - PLAN & SECTION
PPLT11 SIGHT DISTANCE PLAN AND PROFILE NORTH
PPLT12 SIGHT DISTANCE PLAN AND PROFILE SOUTH

L1 TREE RETENTION PLAN
L2 EXISTING TREE LIST - RETAIN TREES
L3 EXISTING TREE LIST - REMOVE TREES
L4 PLANTING PLAN
L5 BUFFER PLANTING
L6 AND ALTERNATIVE LANDSCAPE STANDARDS
L7 PLANTING NOTES AND DETAILS
ENHANCEMENT CORRIDOR ELEVATIONS

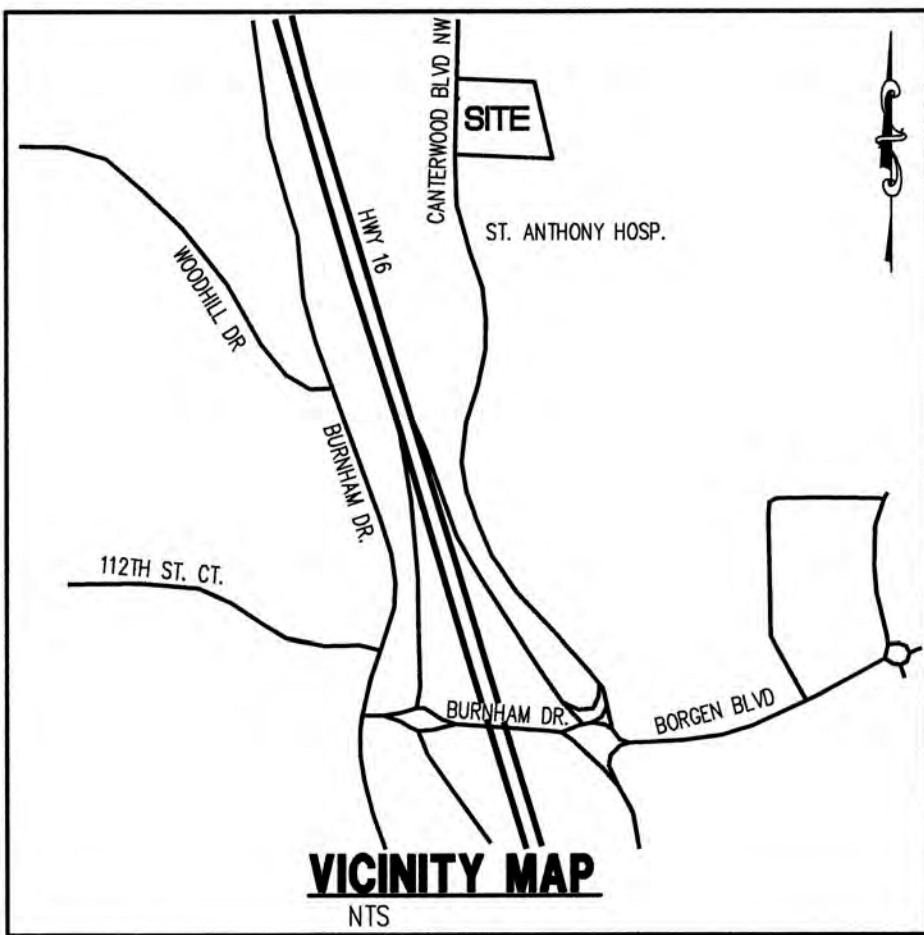
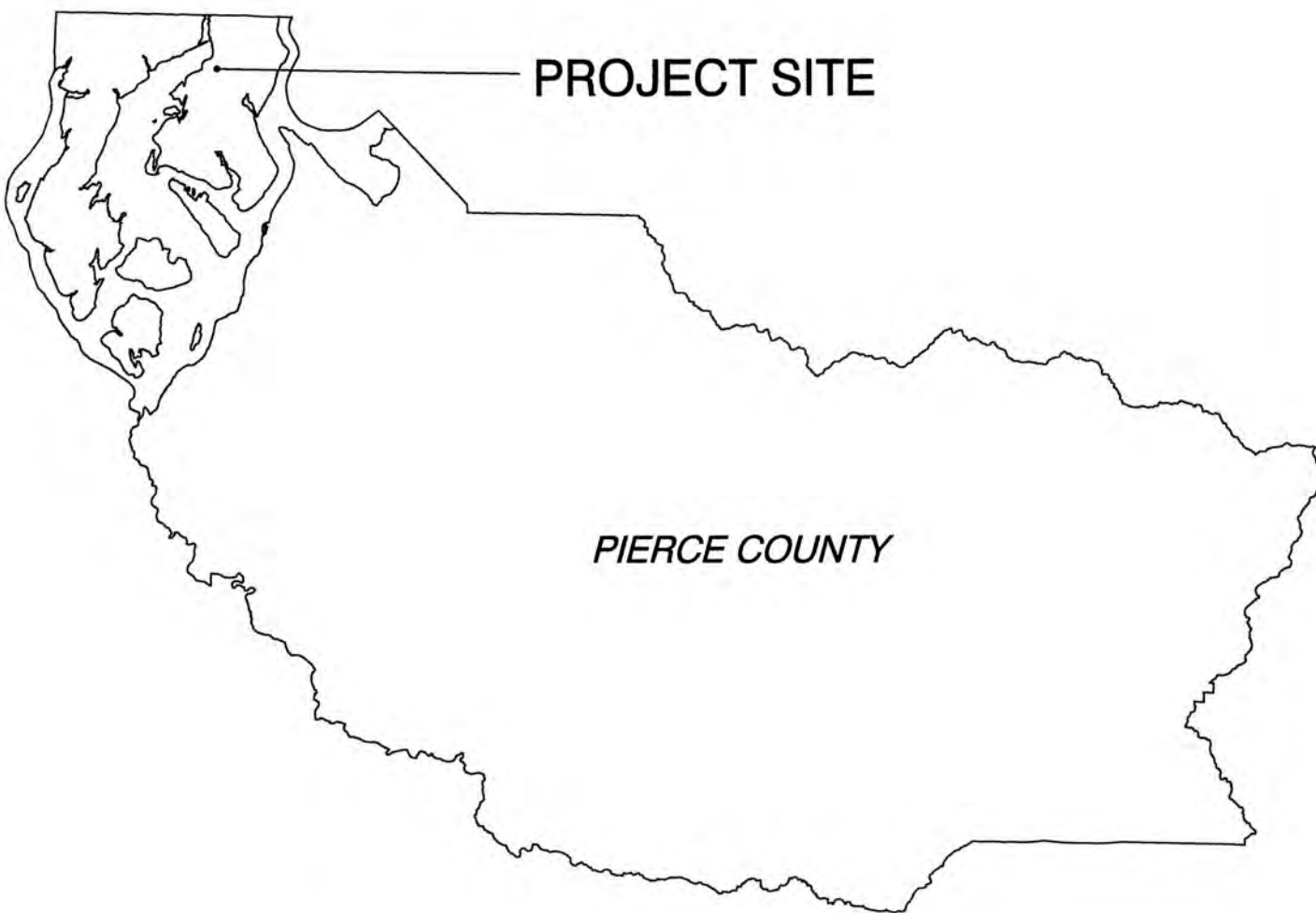
LEGEND

EXISTING	DESCRIPTION	PROPOSED
	MONUMENT	
	MONUMENT LINE	
	PROPERTY LINE	
	RIGHT OF WAY LINE	
	EASEMENT LINE	
	BUILDING SETBACK LINE	
	CHAIN LINK FENCE	
	WOOD FENCE	
	CURB & GUTTER	
	EDGE OF PAVEMENT	
	CONTOURS	
	STREET SIGN	
	STORM DRAIN CATCH BASIN	
	STORM DRAIN MANHOLE	
	STORM DRAIN CLEANOUT	
	STORM DRAIN LINE	
	ROOF DRAIN LINE	
	SANITARY SEWER MANHOLE	
	SANITARY SEWER CLEANOUT	
	SANITARY SEWER LINE	
	SANITARY SEWER STUB	
	FIRE HYDRANT	
	WATER VALVE	
	WATER METER	
	THRUST BLOCKING	
	WATER MAIN	
	LUMINAIRE	
	OVER HEAD POWER	
	POWER/UTILITY POLE	
	GUY WIRE	
	POWER VAULT	
	GAS MAIN	
	GAS VALVE	
	TELEPHONE LINE	
	TELEPHONE RISER	
	MAIL BOX	
	SOIL TEST PIT	
	ASPHALT CONCRETE	
	CEMENT CONCRETE	
	ASPHALT OVERLAY	
	PERK FILTER	

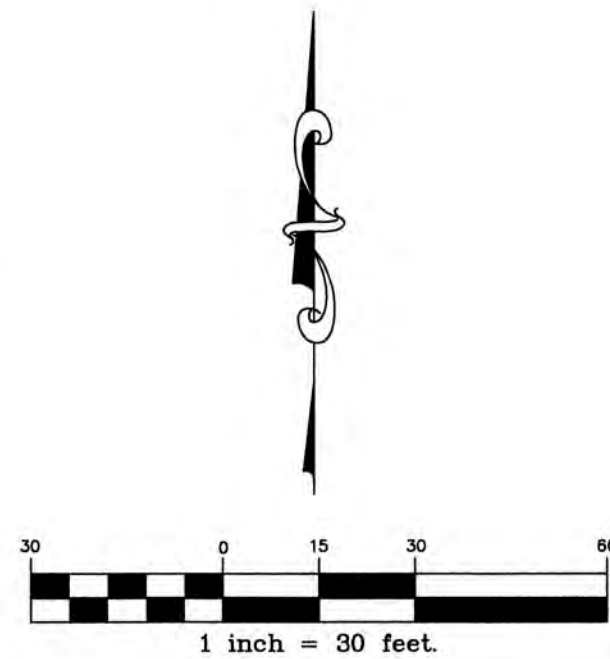
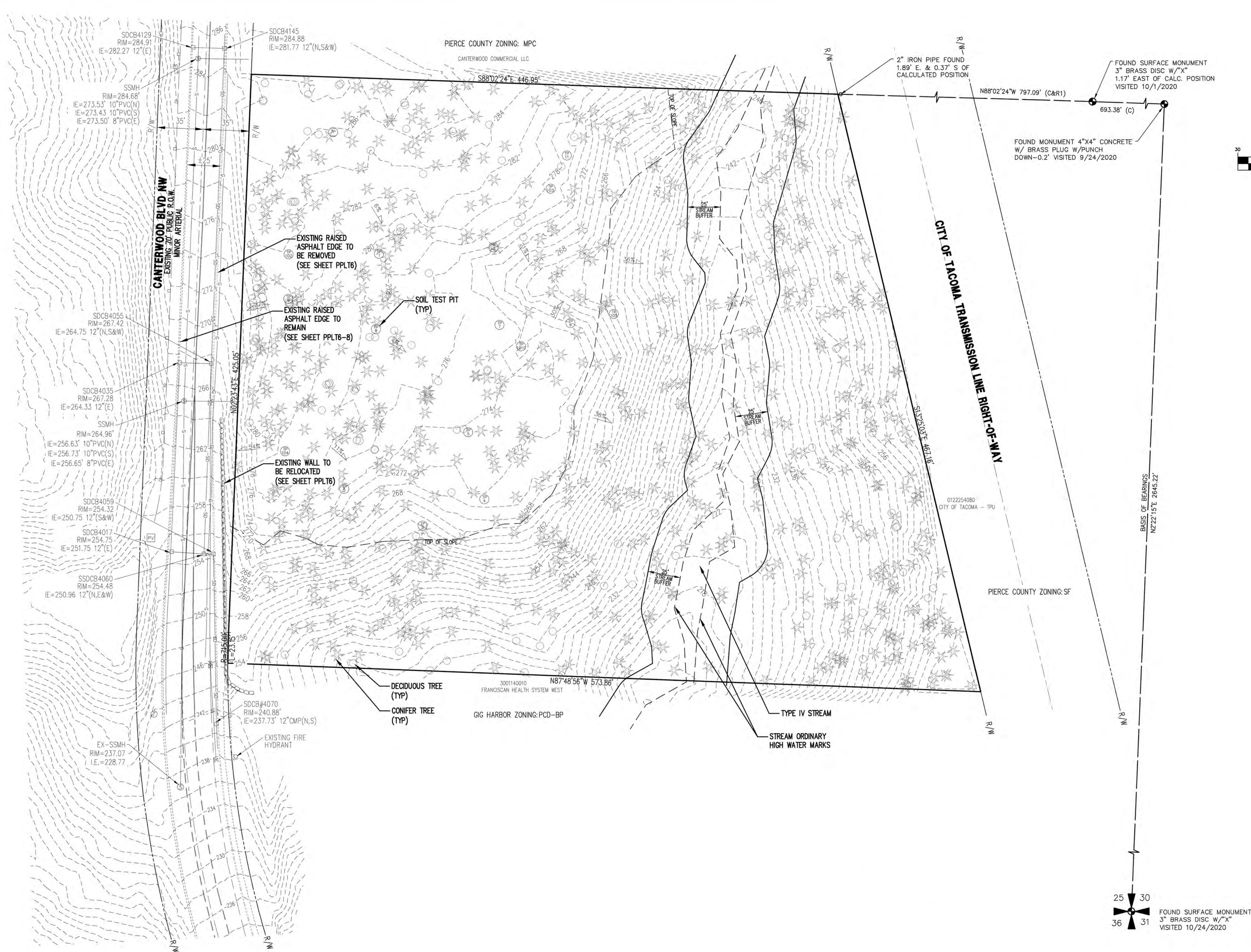
CALL 48 HOURS
BEFORE YOU DIG
DIAL 811

VICINITY MAP

SCALE: N.T.S.



SHEET PPLT1
1 OF 19



25 30
36 31
FOUND SURFACE MONUMENT
3" BRASS DISC W/"X"
VISITED 10/24/2020

**CALL 48 HOURS
BEFORE YOU DIG
DIAL 811**

REVISIONS	
1	REVISED PER CITY COMMENTS - DAB- 05/19/2022

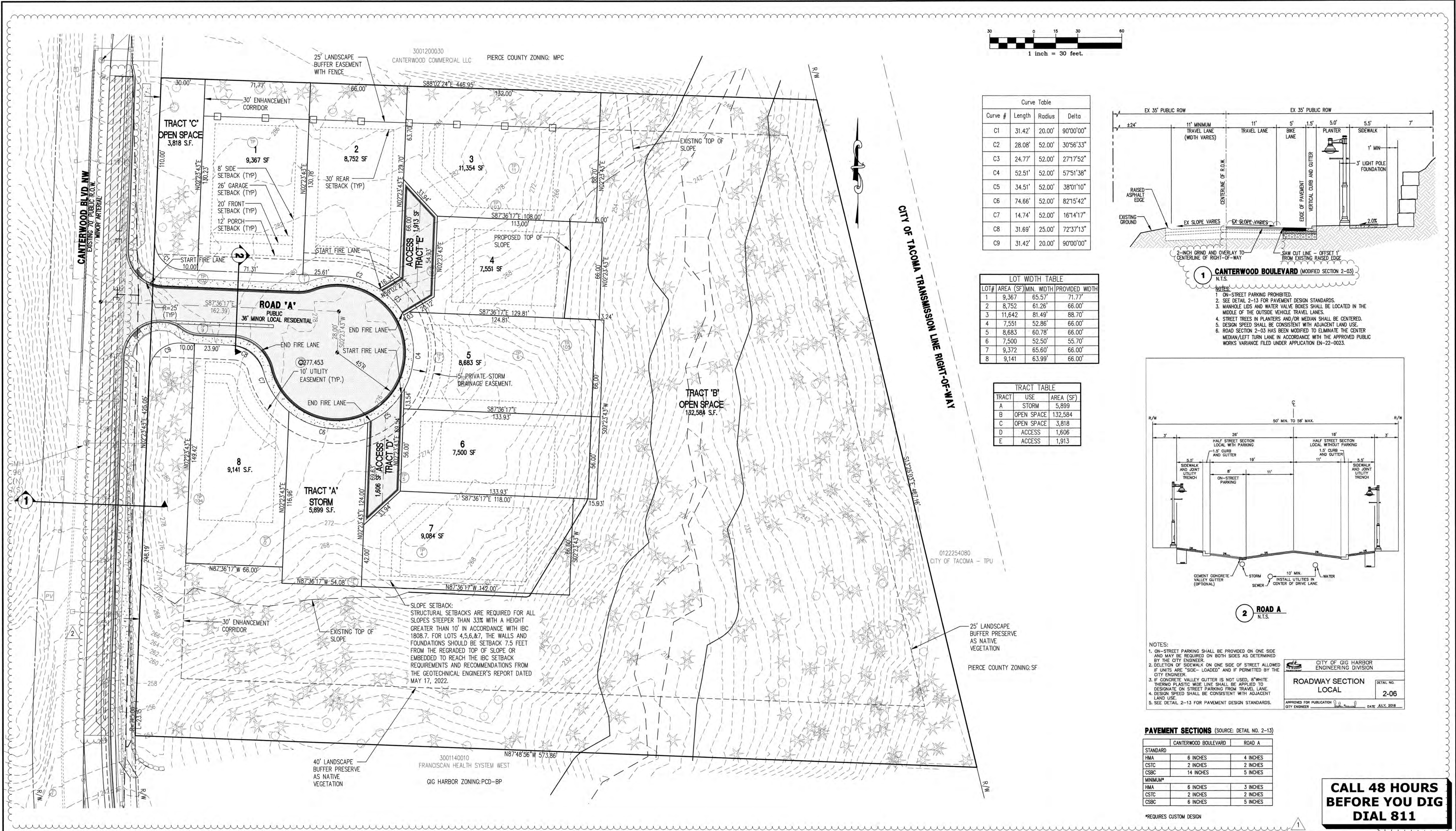
C.E.S. NW INC.
CIVIL ENGINEERING & SURVEYING

PRIVATE DEVELOPMENT	
C.E.S. NW INC. 429 - 29TH ST. NE, SUITE D PUYALLUP, WA 98372 (253) 848-4282 CESERVICES@CESNWINC.COM	DESIGNED BY: DPS
	DRAWN BY: DAB
	CHECKED BY: DPS
	APPROVED BY: DPS
	SCALE: 1"=30'
	OTHER:

PARR ACRES
NE 1/4, SE 1/4, SEC. 25
TWP. 22 N., RGE. 1 E., W.M.

EXISTING CONDITIONS MAP	

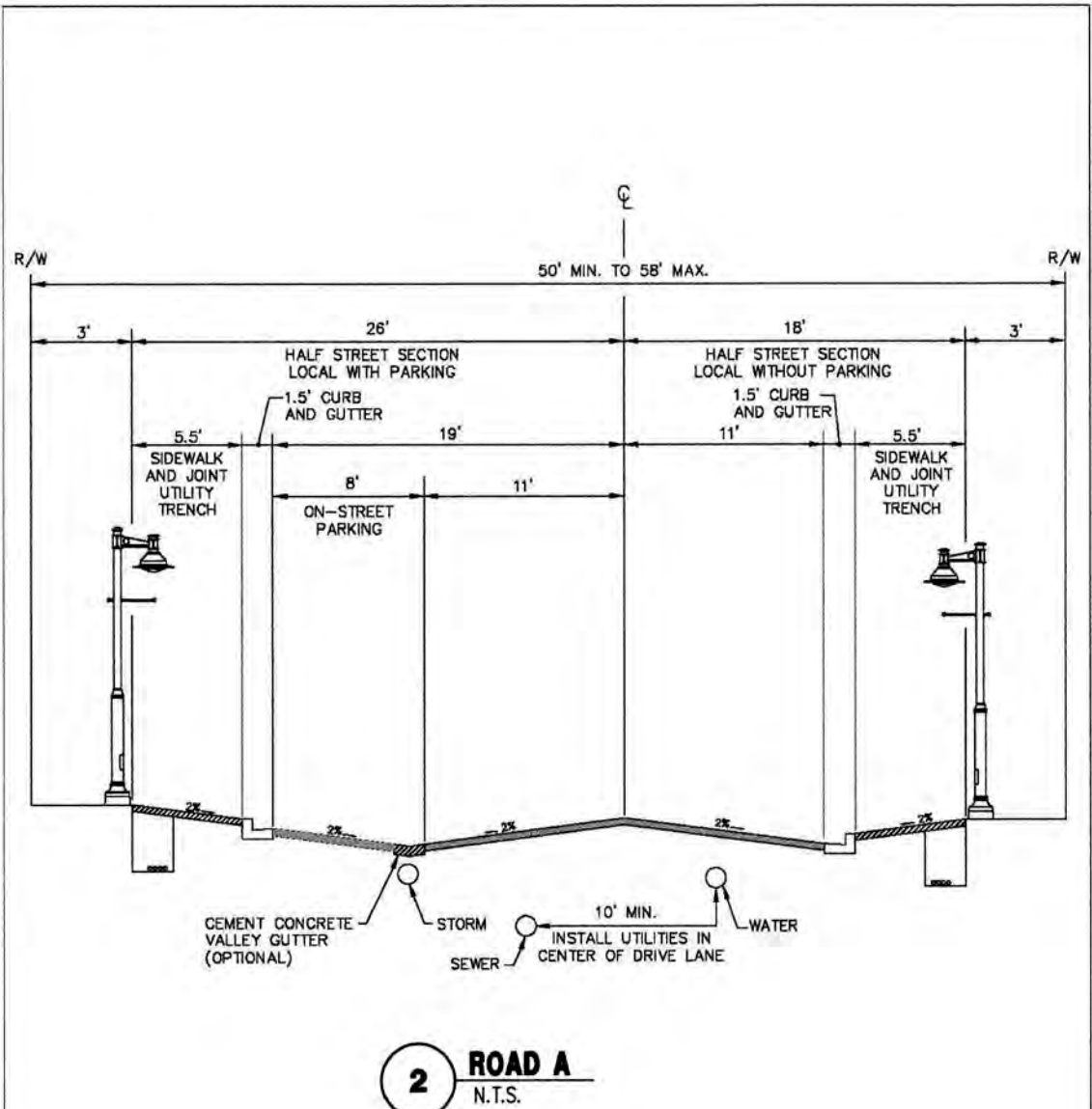
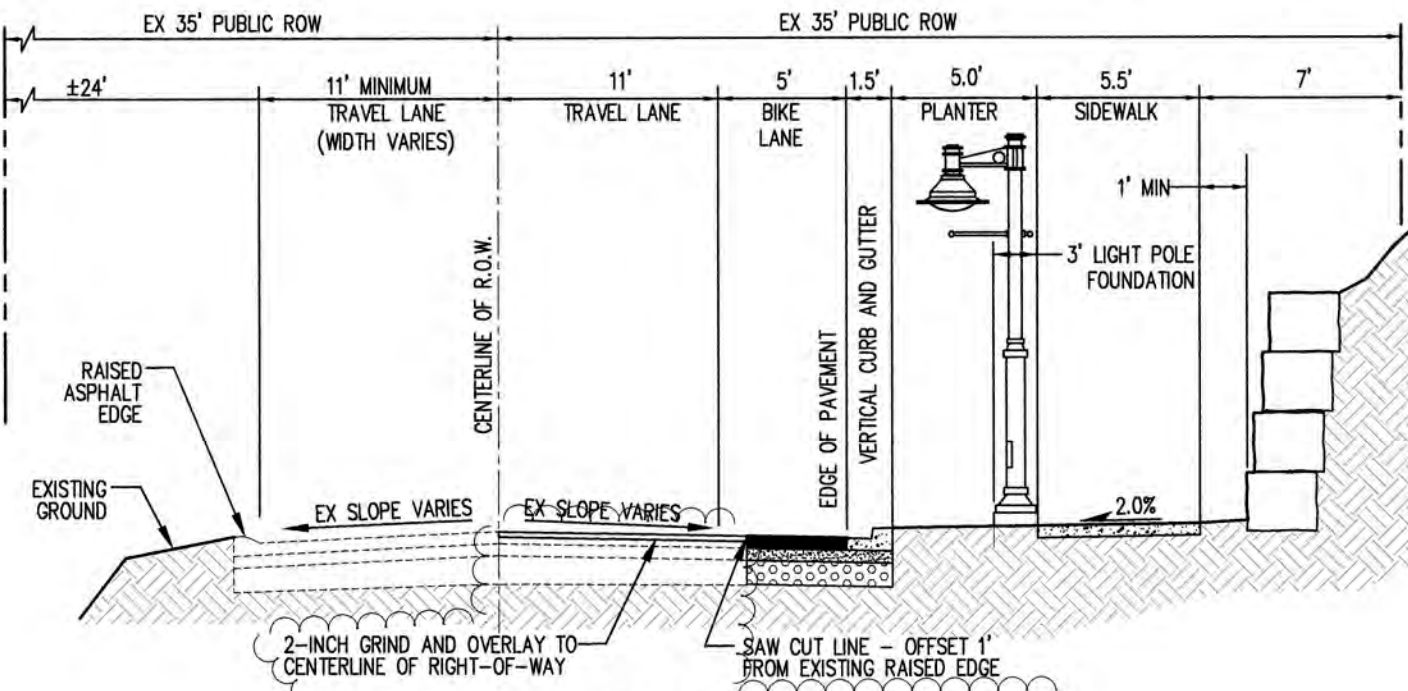
PERMIT NO. PL-PPLAT-21-0001	
DRAWING NO. 1 PPLT2	
SHEET OF 2 19	



Curve Table			
Curve #	Length	Radius	Delta
C1	31.42'	20.00'	90°00'00"
C2	28.08'	52.00'	30°56'33"
C3	24.77'	52.00'	27°17'52"
C4	52.51'	52.00'	57°51'38"
C5	34.51'	52.00'	38°01'10"
C6	74.66'	52.00'	82°15'42"
C7	14.74'	52.00'	16°14'17"
C8	31.69'	25.00'	72°37'13"
C9	31.42'	20.00'	90°00'00"

LOT#	AREA (SF)	MIN. WIDTH	PROVIDED WIDTH
1	9,367	65.57'	71.77'
2	8,752	61.26'	66.00'
3	11,642	81.49'	88.70'
4	7,551	52.86'	66.00'
5	8,683	60.78'	66.00'
6	7,500	52.50'	55.70'
7	9,372	65.60'	66.00'
8	9,141	63.99'	66.00'

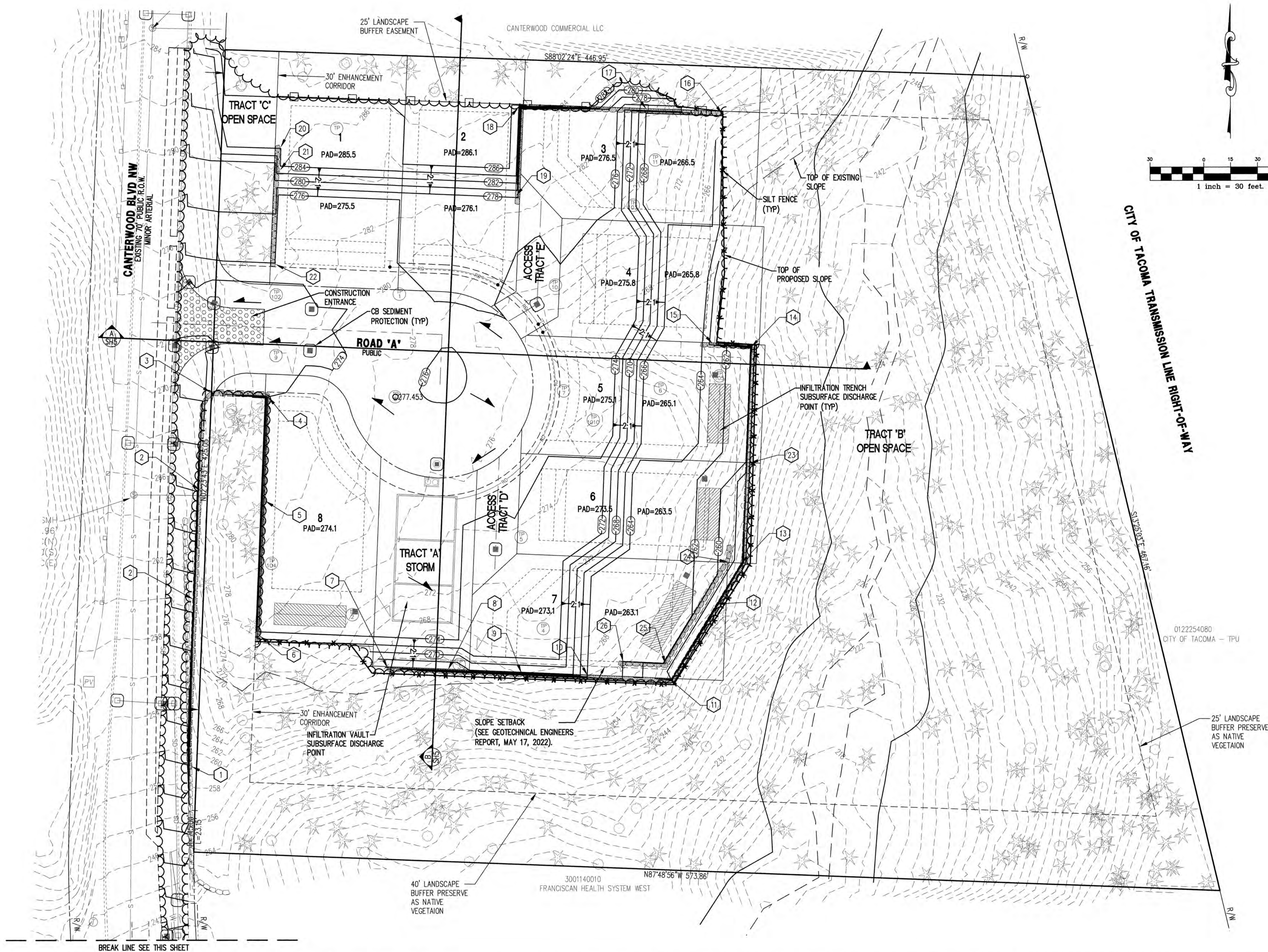
TRACT TABLE		
TRACT	USE	AREA (SF)
A	STORM	5,899
B	OPEN SPACE	132,584
C	OPEN SPACE	3,818
D	ACCESS	1,606
E	ACCESS	1,913



PAVEMENT SECTIONS (SOURCE: DETAIL NO. 2-13)		
	CANTERWOOD BOULEVARD	ROAD A
STANDARD		
HMA	6 INCHES	4 INCHES
CSTC	2 INCHES	2 INCHES
CSBC	14 INCHES	5 INCHES
MINIMUM*		
HMA	6 INCHES	3 INCHES
CSTC	2 INCHES	2 INCHES
CSBC	6 INCHES	5 INCHES

**CALL 48 HOURS
BEFORE YOU DIG
DIAL 811**

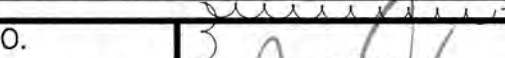
REVISIONS			PRIVATE DEVELOPMENT	DESIGNED BY: DPS	PARR ACRES NE 1/4, SE 1/4, SEC. 25 TWP. 22 N., RGE. 1 E., W.M.		PERMIT NO. PL-PPLAT-21-0001	
			C.E.S. NW INC. 429 - 29TH ST. NE, SUITE D PUYALLUP, WA 98372 (253) 848-4282 CESERVICES@CESNWINC.COM	DRAWN BY: DAB		PRELIMINARY PLAT MAP	DRAWING NO. PPLT3	
				CHECKED BY: DPS			SHEET OF 3 19	
				APPROVED BY:				
				SCALE: 1"=30'				
2 REVISED PER CITY COMMENTS - DAB- 08/19/2022				OTHER:				
1 REVISED PER CITY COMMENTS - DAB- 05/19/2022								

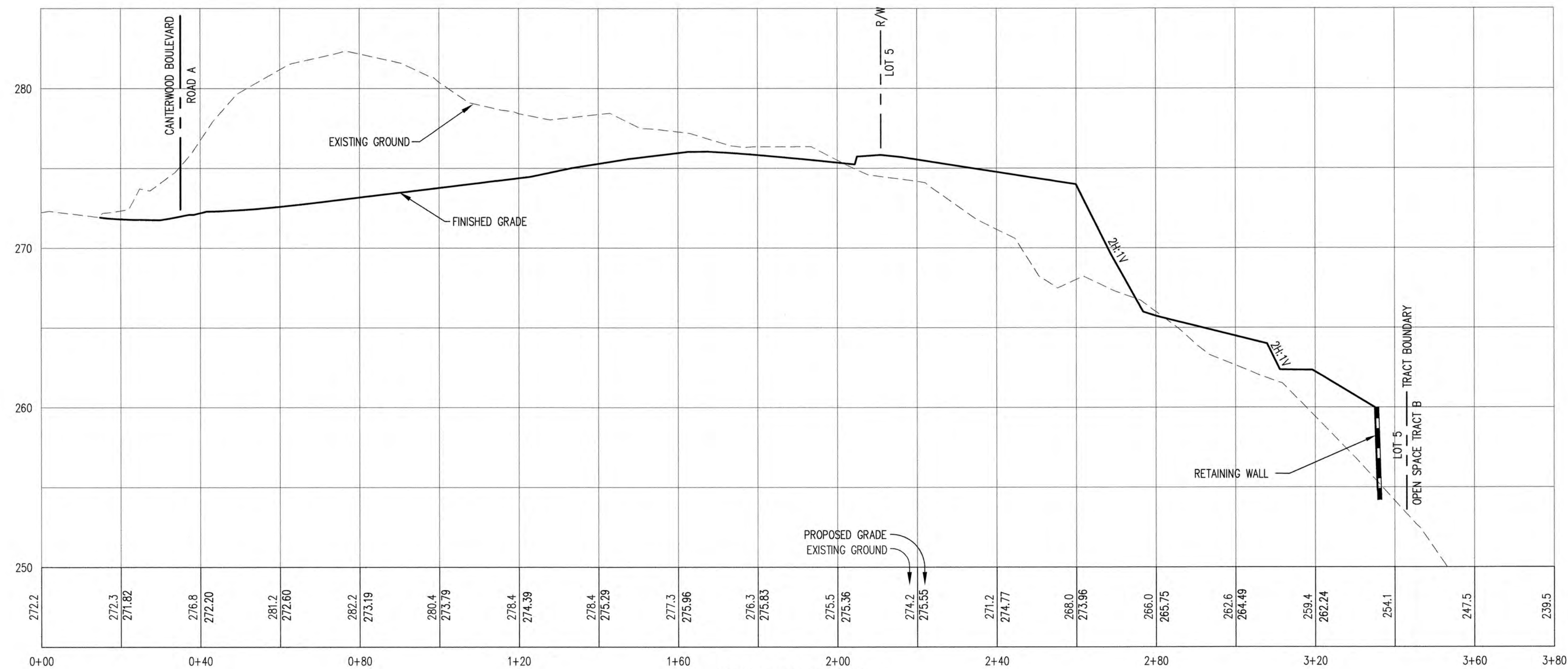


WALL TABLE			
#	T.O.W.	B.O.W.	DELTA
1	260.5	252.0	8.5
2	270.3	260.7	9.6
3	274.0	272.0	2.0
4	280.0	274.0	6.0
5	277.0	276.0	1.0
6	277.0	275.0	2.0
7	266.0	265.0	1.0
8	266.0	260.0	6.0
9	268.0	265.0	3.0
10	264.0	263.0	1.0
11	258.0	252.0	6.0
12	254.0	248.0	6.0
13	256.0	250.0	6.0
14	260.0	254.0	6.0
15	263.0	262.0	2.0
16	267.0	266.0	1.0
17	274.0	268.0	6.0
18	284.0	278.0	6.0
19	278.0	277.0	1.0
20	285.0	284.0	1.0
21	284.0	280.0	4.0
22	277.0	276.0	2.0
23	260.0	256.0	4.0
24	259.5	257.5	2.0
25	263.0	258.5	4.5
26	263.0	262.0	1.0

WALL NOTE:
ALL RETAINING WALLS THAT ARE OVER 4 FEET IN HEIGHT MEASURED FROM THE BOTTOM OF THE FOOTING TO THE TOP OF THE WALL OR SUPPORTING A SURCHARGE REQUIRE APPLICATION AND ISSUANCE OF A BUILDING PERMIT PRIOR TO CONSTRUCTION.

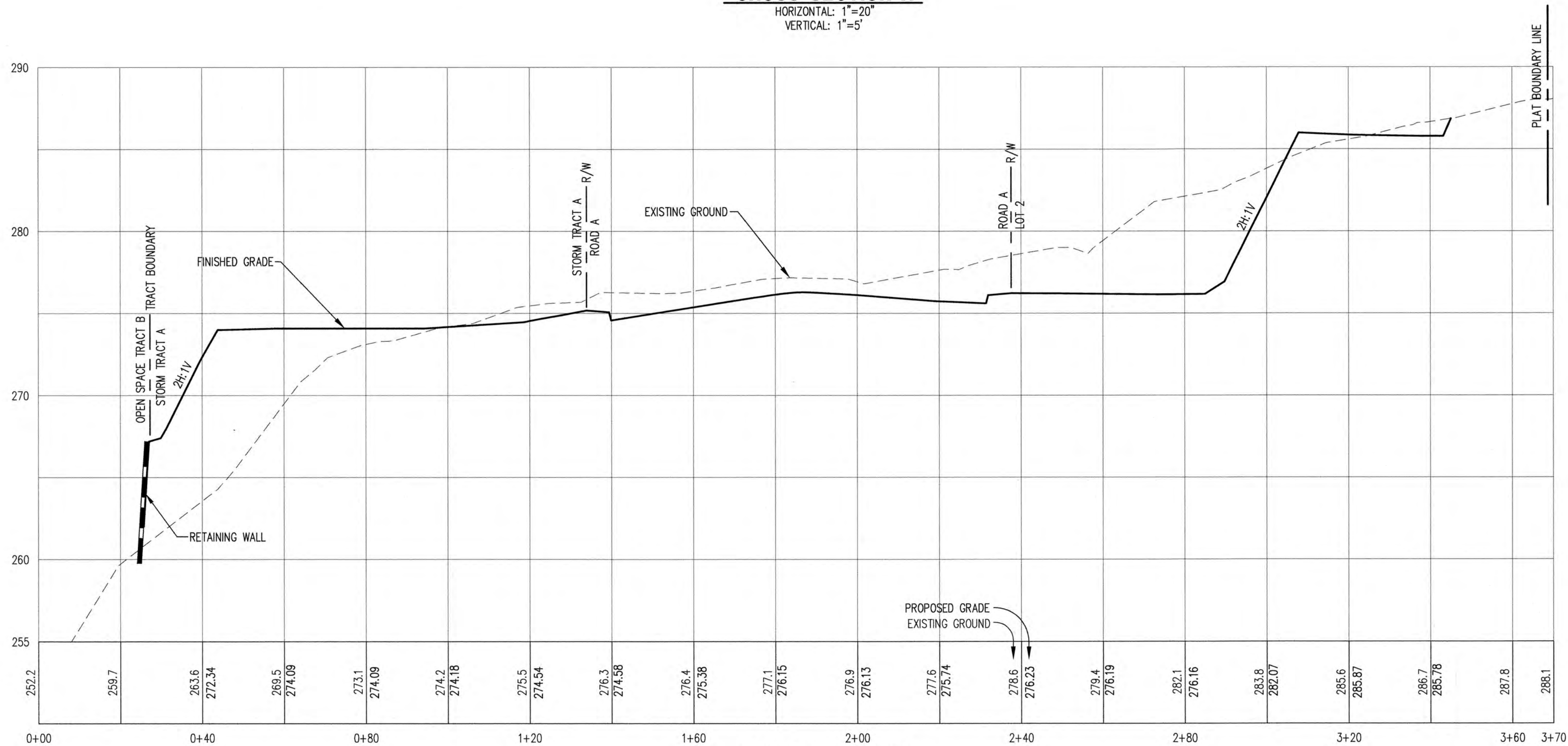
**CALL 48 HOURS
BEFORE YOU DIG
DIAL 811**

REVISIONS		PRIVATE DEVELOPMENT	DESIGNED BY: DPS	PARR ACRES NE 1/4, SE 1/4, SEC. 25 TWP. 22 N., RGE. 1 E., W.M.	GRADING PLAN	PERMIT NO. PL-PPLAT-21-0001	
	C.E.S. NW INC. CIVIL ENGINEERING & SURVEYING	C.E.S. NW INC. 429 - 29TH ST. NE, SUITE D PUYALLUP, WA 98372 (253) 848-4282 CESERVICES@CESNWINC.COM	DRAWN BY: DAB			DRAWING NO. PPLT4	
			CHECKED BY: DPS			SHEET OF 4 19	
			APPROVED BY:				
			SCALE: 1"=30'				
1 REVISED PER CITY COMMENTS - DAB- 05/19/2022			OTHER:				



CROSS SECTION A

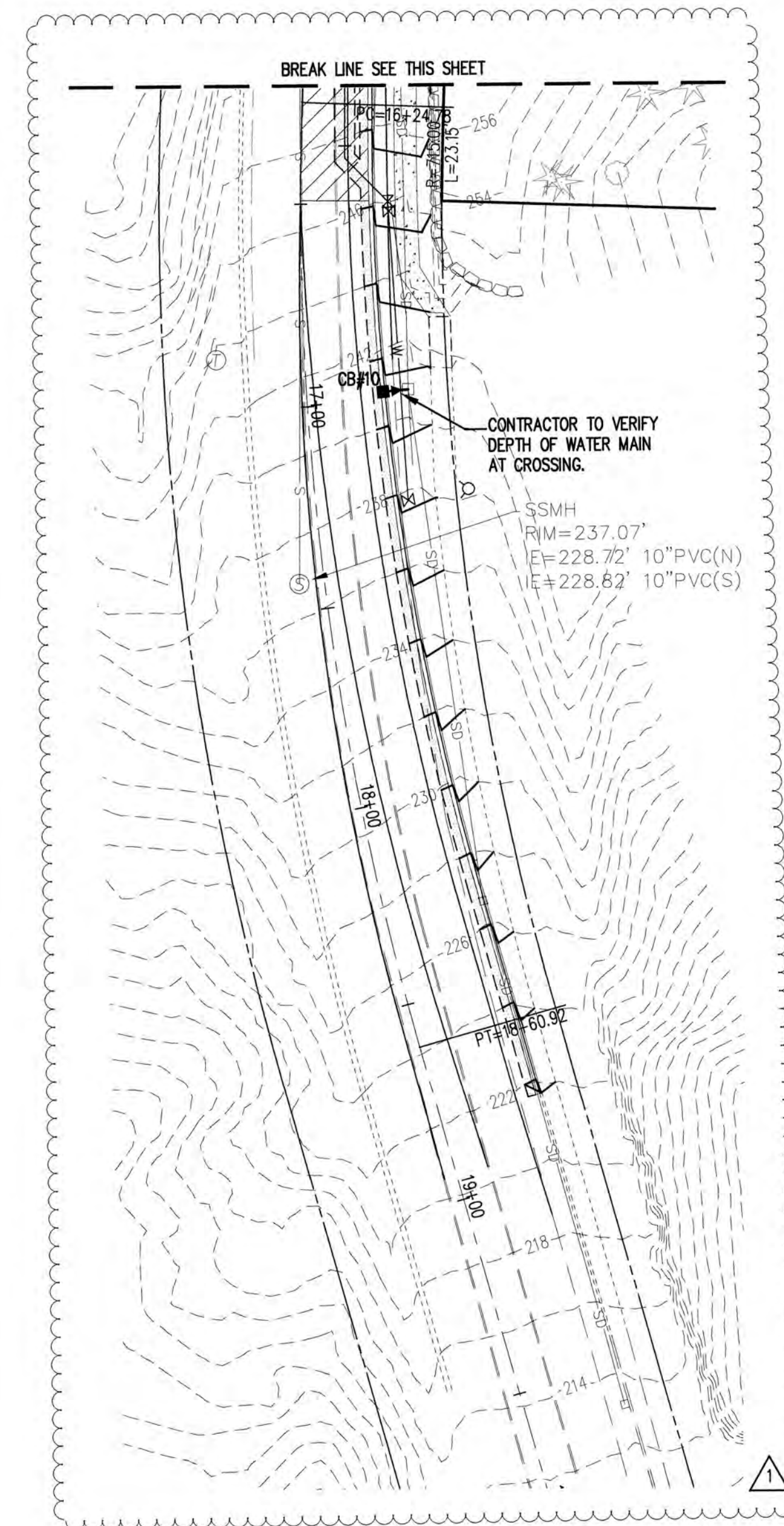
HORIZONTAL: 1"=20'
VERTICAL: 1"=5'



CROSS SECTION B

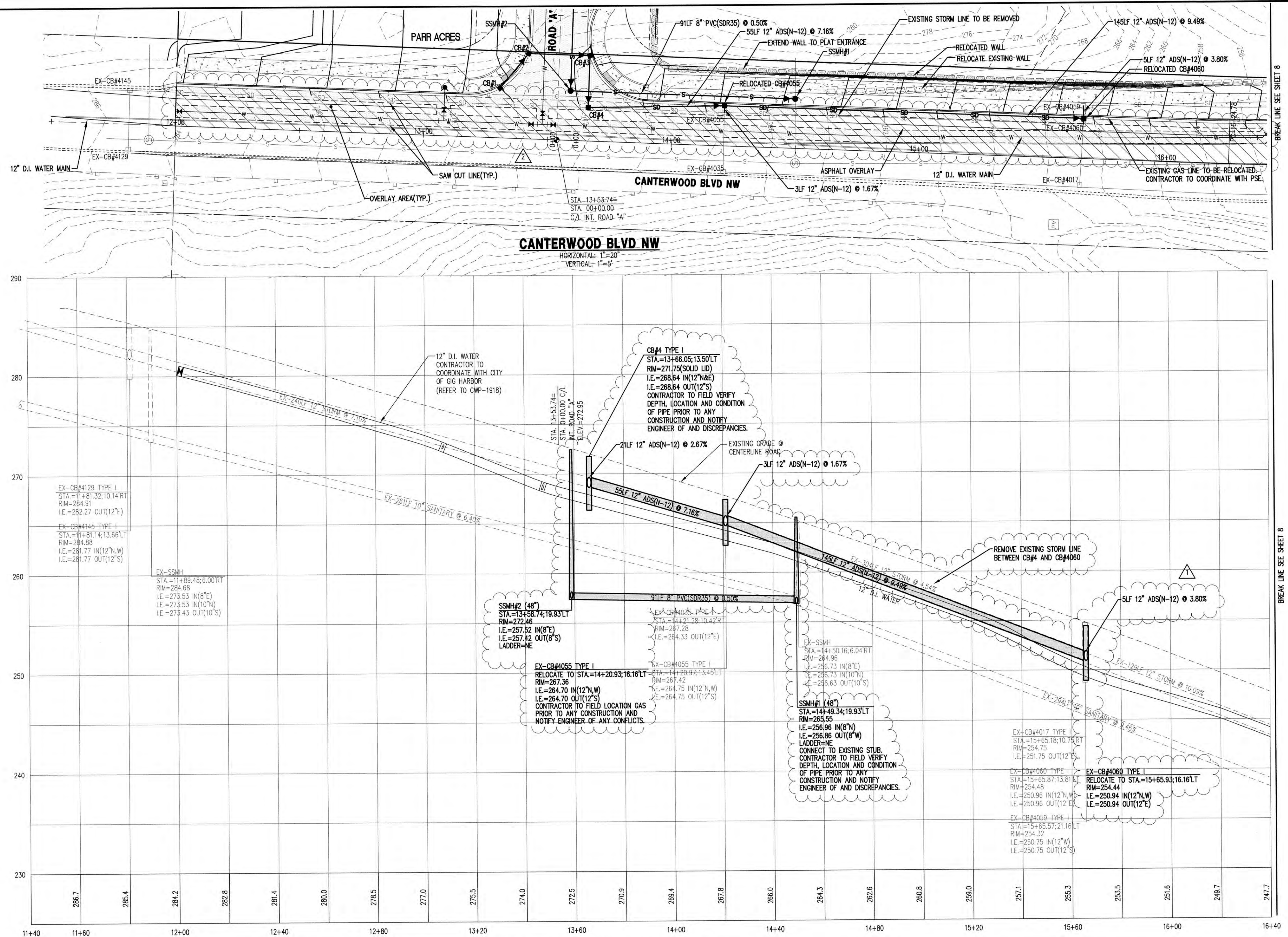
HORIZONTAL: 1"=20'
VERTICAL: 1"=5'

REVISIONS		PRIVATE DEVELOPMENT	DESIGNED BY: DPS	PARR ACRES NE 1/4, SE 1/4, SEC. 25 TWP. 22 N., RGE. 1 E., W.M.	PERMIT NO. PL-PPLAT-21-0001
		C.E.S. NW INC. 429 - 29TH ST. NE, SUITE D PUYALLUP, WA 98372 (253) 848-4282 CESERVICES@CESNWINC.COM	DRAWN BY: DAB		DRAWING NO. PPLT5
			CHECKED BY: DPS		SHEET 5 OF 19
			APPROVED BY:		
			SCALE: 1"=30'		
			OTHER:		
1 REVISED PER CITY COMMENTS - DAB- 05/19/2022					

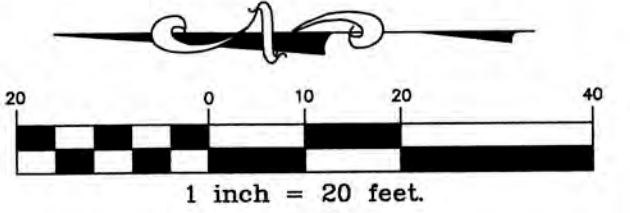


A circular professional engineer seal for Daniel Paul Smith, State of Washington, License No. 27023, Mechanical Engineering. The seal features a portrait of a man in the center, surrounded by the text "DANIEL PAUL SMITH", "STATE OF WASHINGTON", "27023", "REGISTERED", and "MECHANICAL ENGINEER".

REVISIONS 2 REVISED PER CITY COMMENTS – DAB– 08/19/2022 1 REVISED PER CITY COMMENTS – DAB– 05/19/2022		PRIVATE DEVELOPMENT C.E.S. NW INC. CIVIL ENGINEERING & SURVEYING C.E.S. NW INC. 429 - 29TH ST. NE, SUITE D PUYALLUP, WA 98372 (253) 848-4282 CESERVICES@CESNWINC.COM	DESIGNED BY: DPS DRAWN BY: DAB CHECKED BY: DPS APPROVED BY: SCALE: 1"=30' OTHER:	PARR ACRES NE 1/4, SE 1/4, SEC. 25 TWP. 22 N., RGE. 1 E., W.M.	UTILITY SYSTEM PLAN	PERMIT NO. PL-PPLAT-21-0001 DRAWING NO. PPLT6 SHEET 6 OF 19	
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BREAK LINE SEE SHEET 8



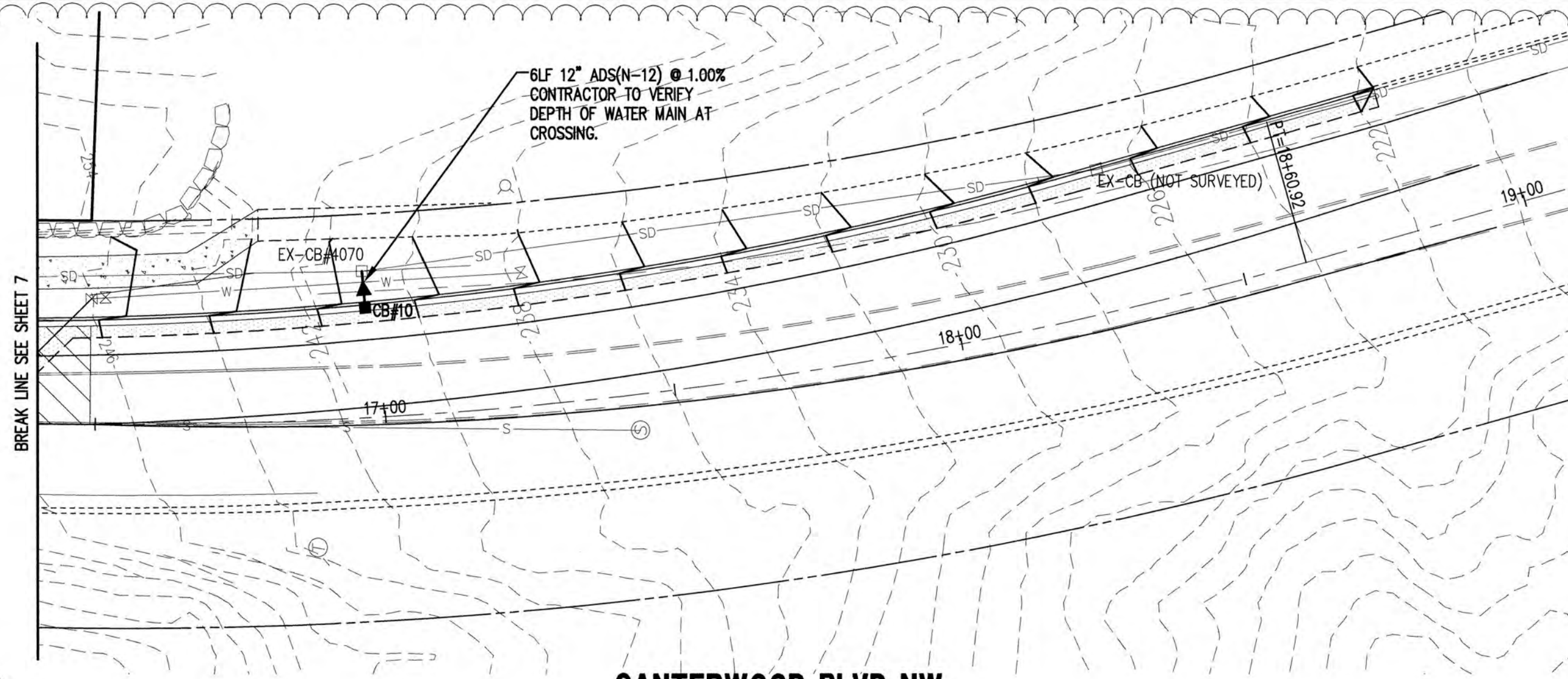
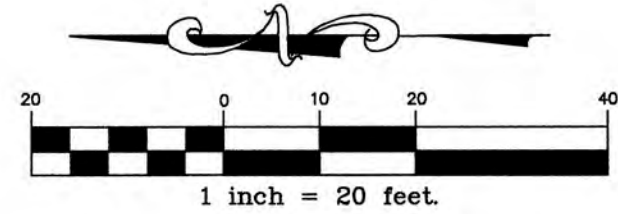
BREAK LINE SEE SHEET 8

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BEFORE YOU DIG
DIAL 811**

REVISIONS			PRIVATE DEVELOPMENT	DESIGNED BY: DPS	PARR ACRES NE 1/4, SE 1/4, SEC. 25 TWP. 22 N., RGE. 1 E., W.M.		PERMIT NO. PL-PPLAT-21-0001
		C.E.S. NW INC. CIVIL ENGINEERING & SURVEYING	C.E.S. NW INC. 429 - 29TH ST. NE, SUITE D PUYALLUP, WA 98372 (253) 848-4282 CESERVICES@CESNWINC.COM	DRAWN BY: DAB		CANTERWOOD BLVD NW PLAN & PROFILE NORTH	DRAWING NO. PPLT7
				CHECKED BY: DPS			SHEET OF 7 19
				APPROVED BY:			
				SCALE: 1"=20'			
2 REVISED PER CITY COMMENTS - DAB- 08/19/2022				OTHER:			
1 REVISED PER CITY COMMENTS - DAB- 05/19/2022							

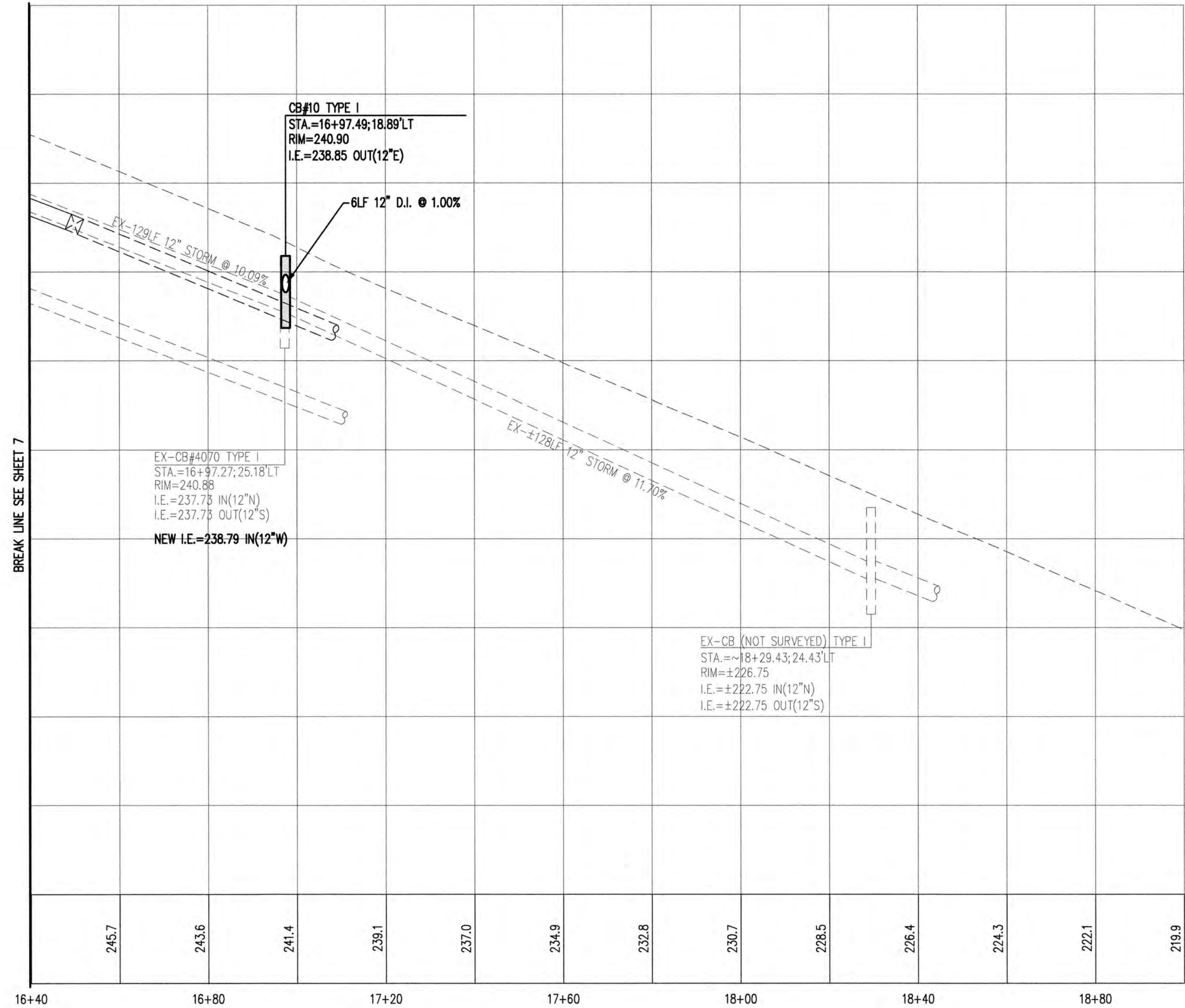
PAUL SMITH
STATE OF WASHINGTON
47023
REGISTERED PROFESSIONAL ENGINEER

8-4-22



CANTERWOOD BLVD NW

HORIZONTAL: 1"=20'
VERTICAL: 1"=5'



16+40 16+80 17+20 17+60 18+00 18+40 18+80

REVISIONS

1 REVISED PER CITY COMMENTS - DAB- 05/19/2022

C.E.S. NW INC.
CIVIL ENGINEERING & SURVEYING

PRIVATE DEVELOPMENT

C.E.S. NW INC.
429 - 29TH ST. NE, SUITE D
PUYALLUP, WA 98372
(253) 848-4282
CESERVICES@CESNWINC.COM

DESIGNED BY:	DPS
DRAWN BY:	DAB
CHECKED BY:	DPS
APPROVED BY:	
SCALE:	1"=20'
OTHER:	

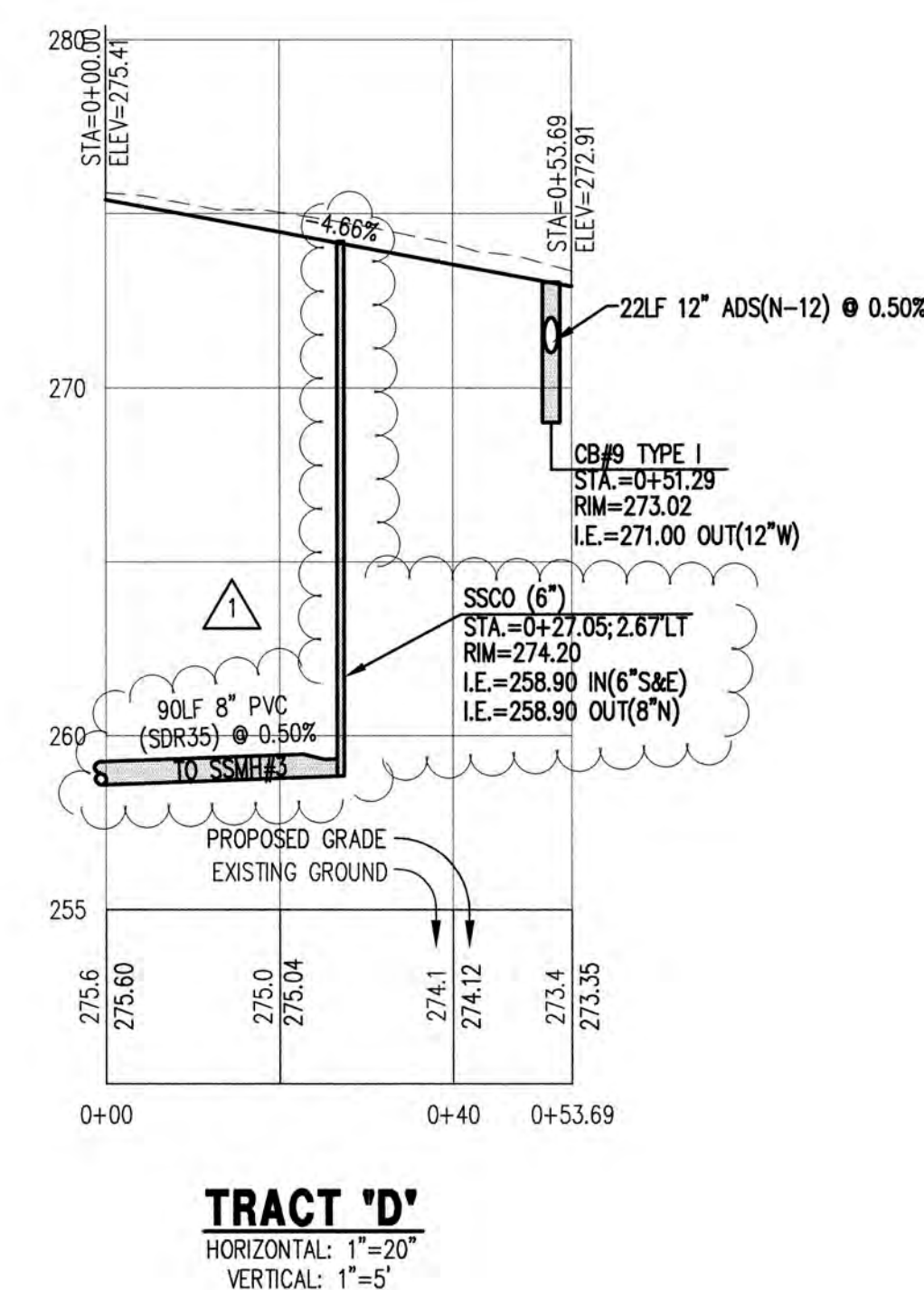
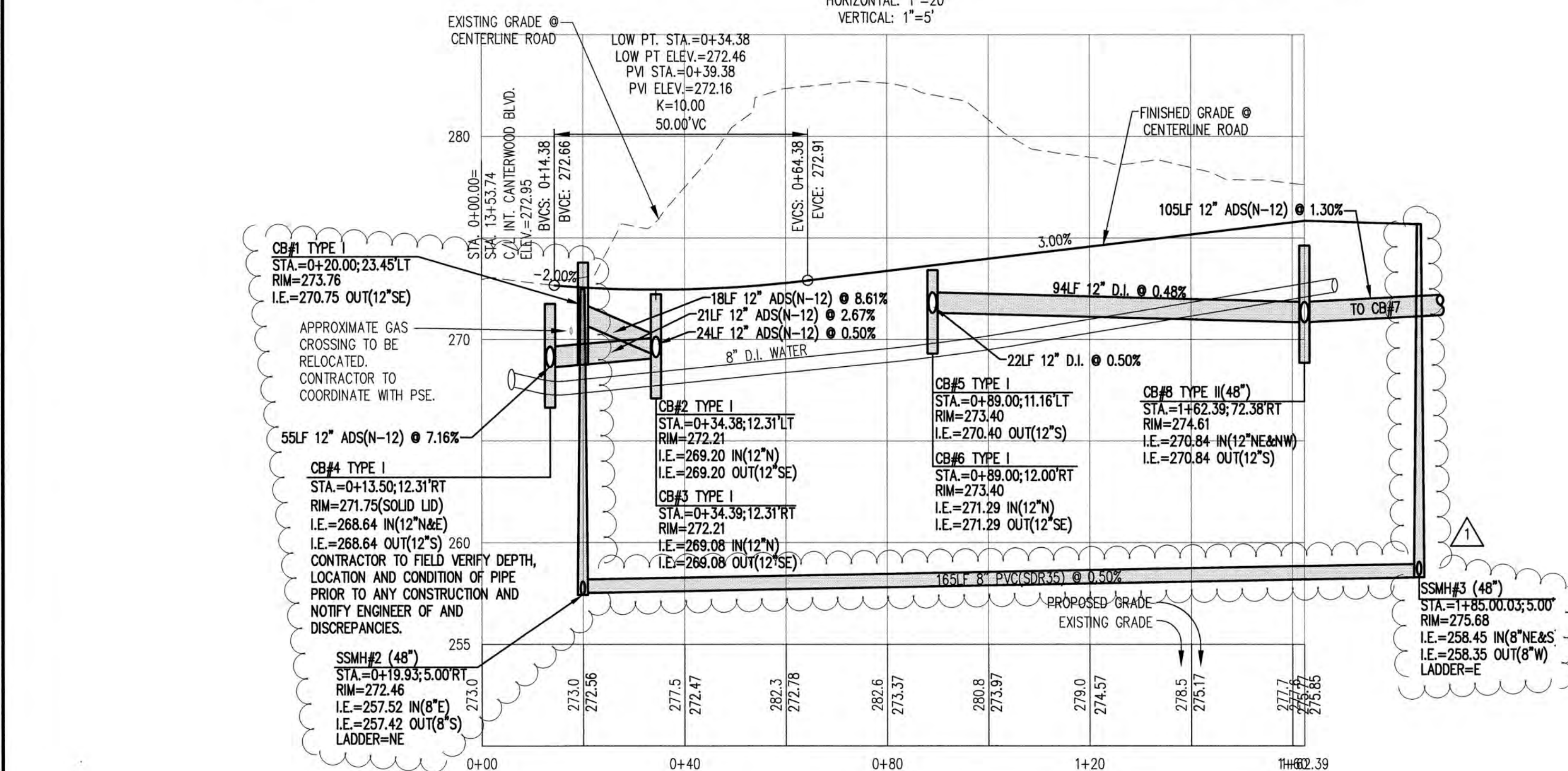
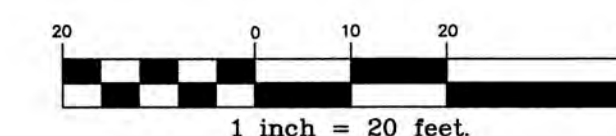
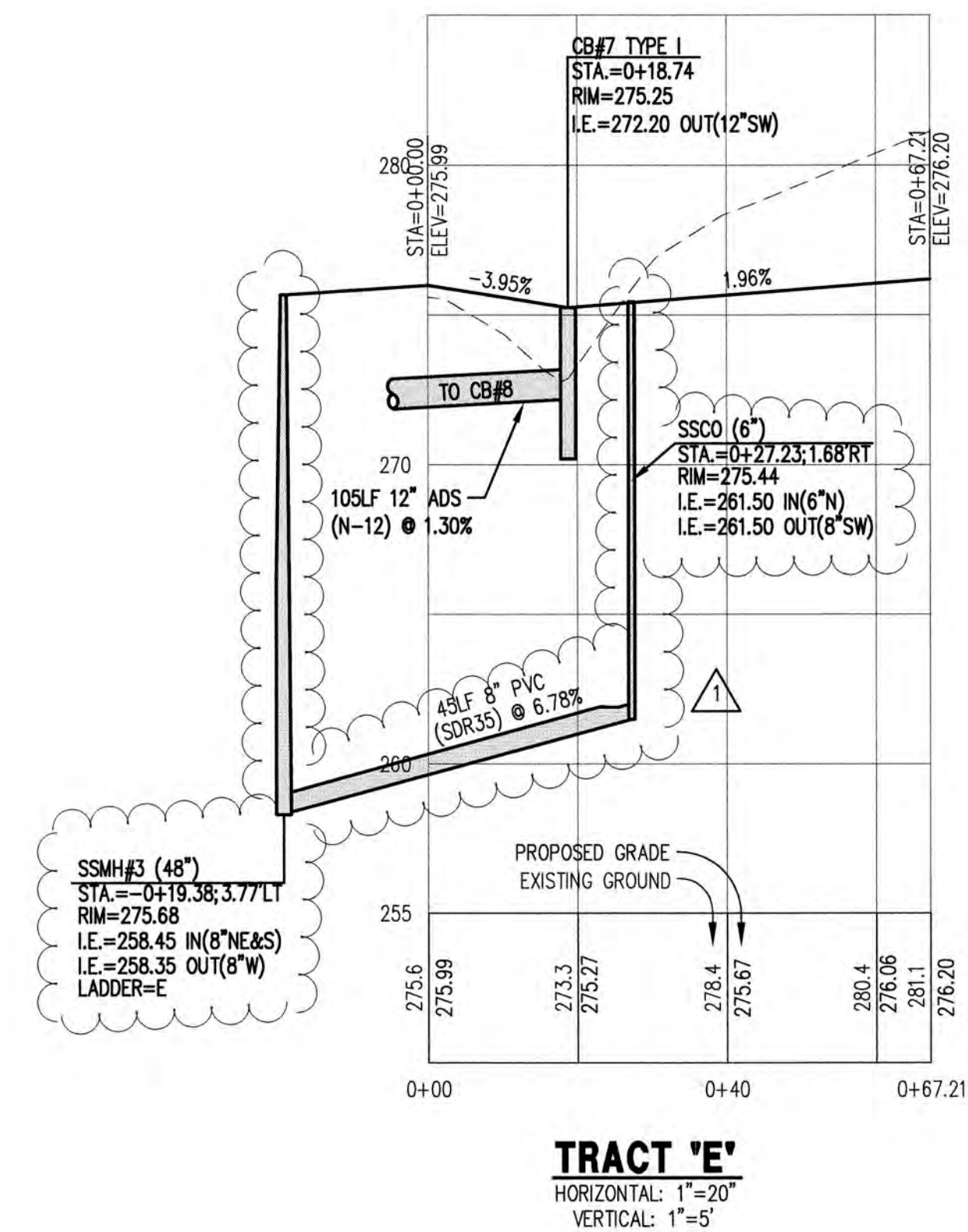
PARR ACRES
NE 1/4, SE 1/4, SEC. 25
TWP. 22 N., RGE. 1 E., W.M.

CANTERWOOD BLVD NW
PLAN & PROFILE SOUTH

PERMIT NO.	PL-PPLAT-21-0001
DRAWING NO.	PPLT8
SHEET	8 OF 19

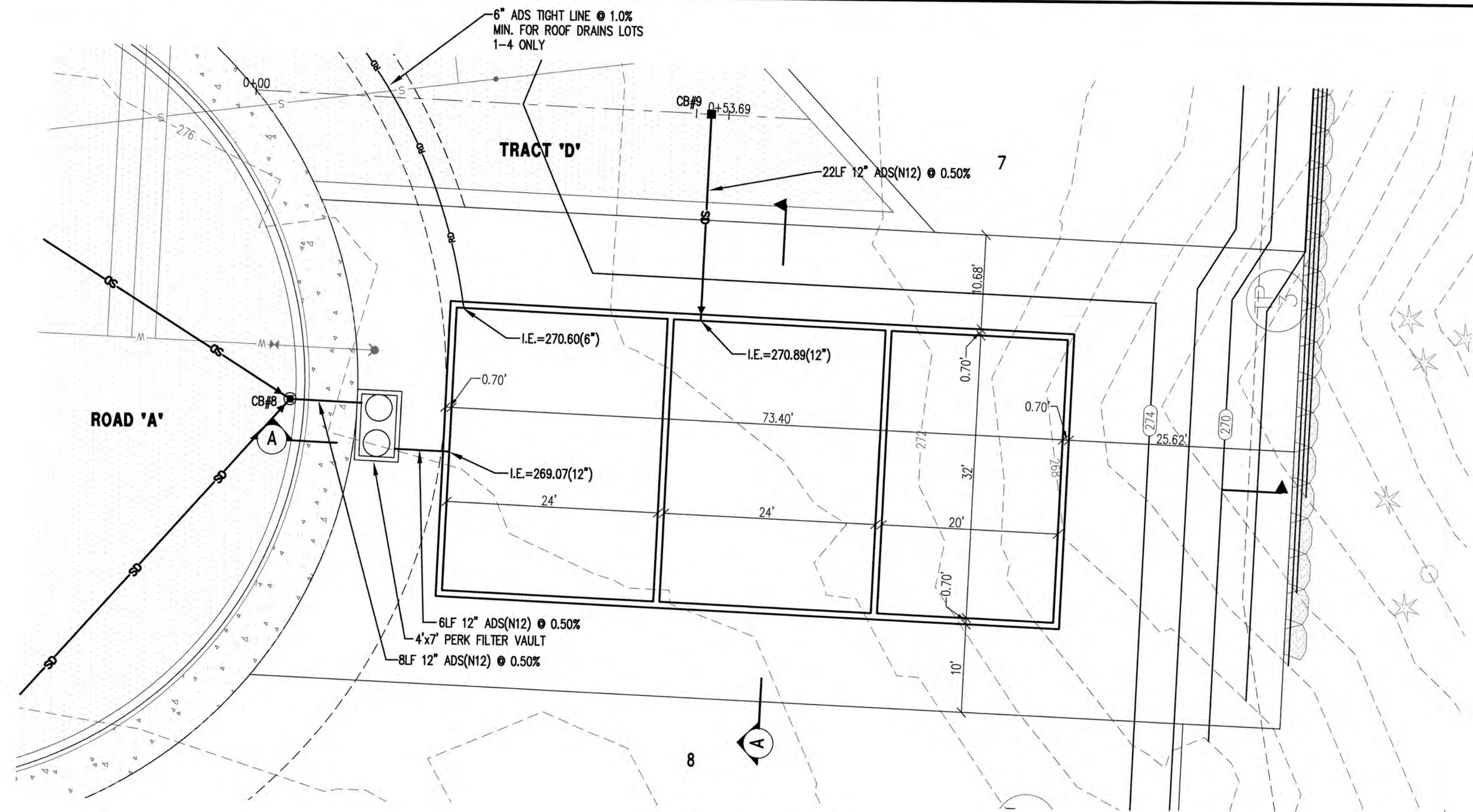


**CALL 48 HOURS
BEFORE YOU DIG
DIAL 811**

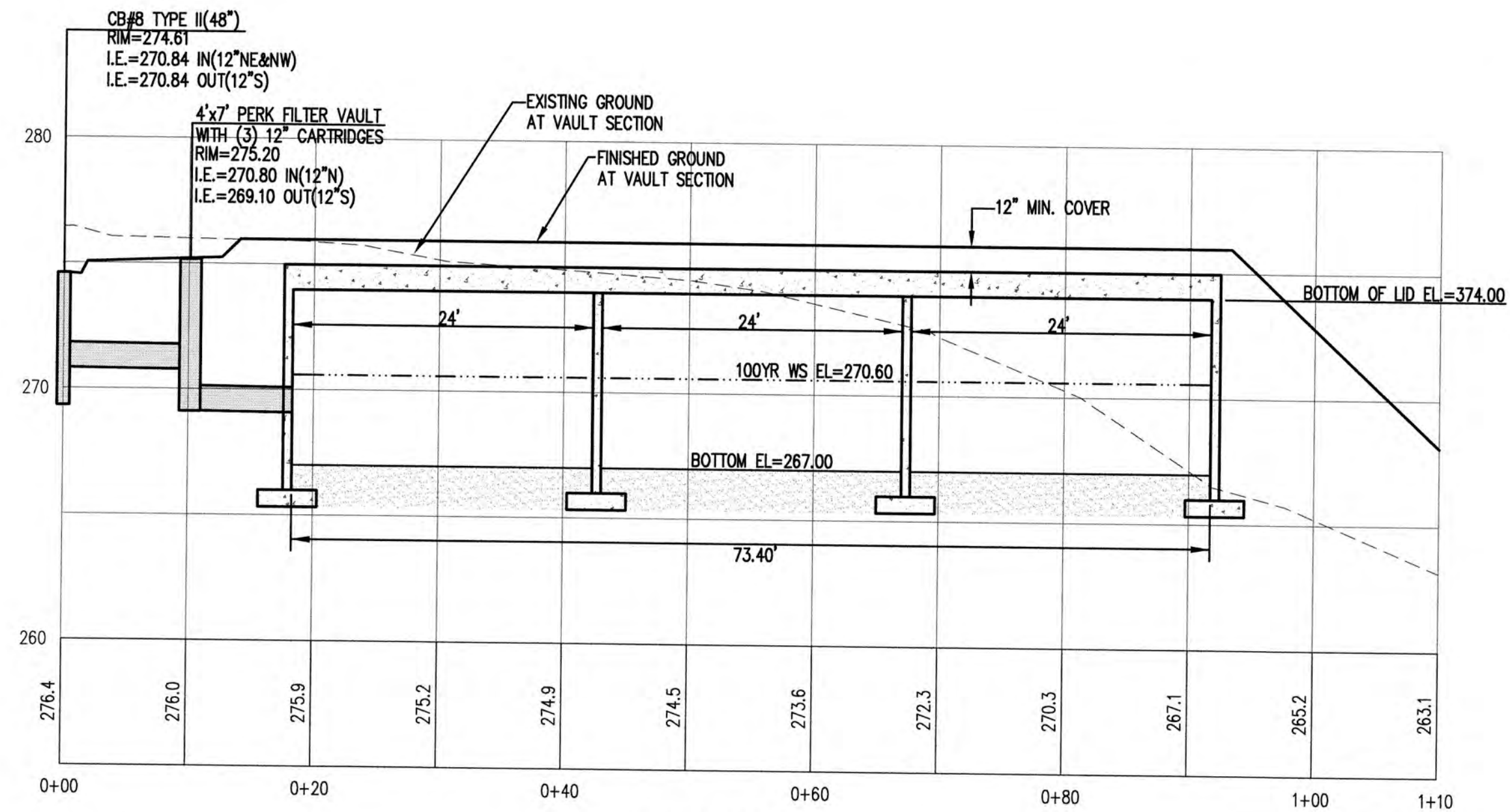


**CALL 48 HOURS
BEFORE YOU DIG
DIAL 811**

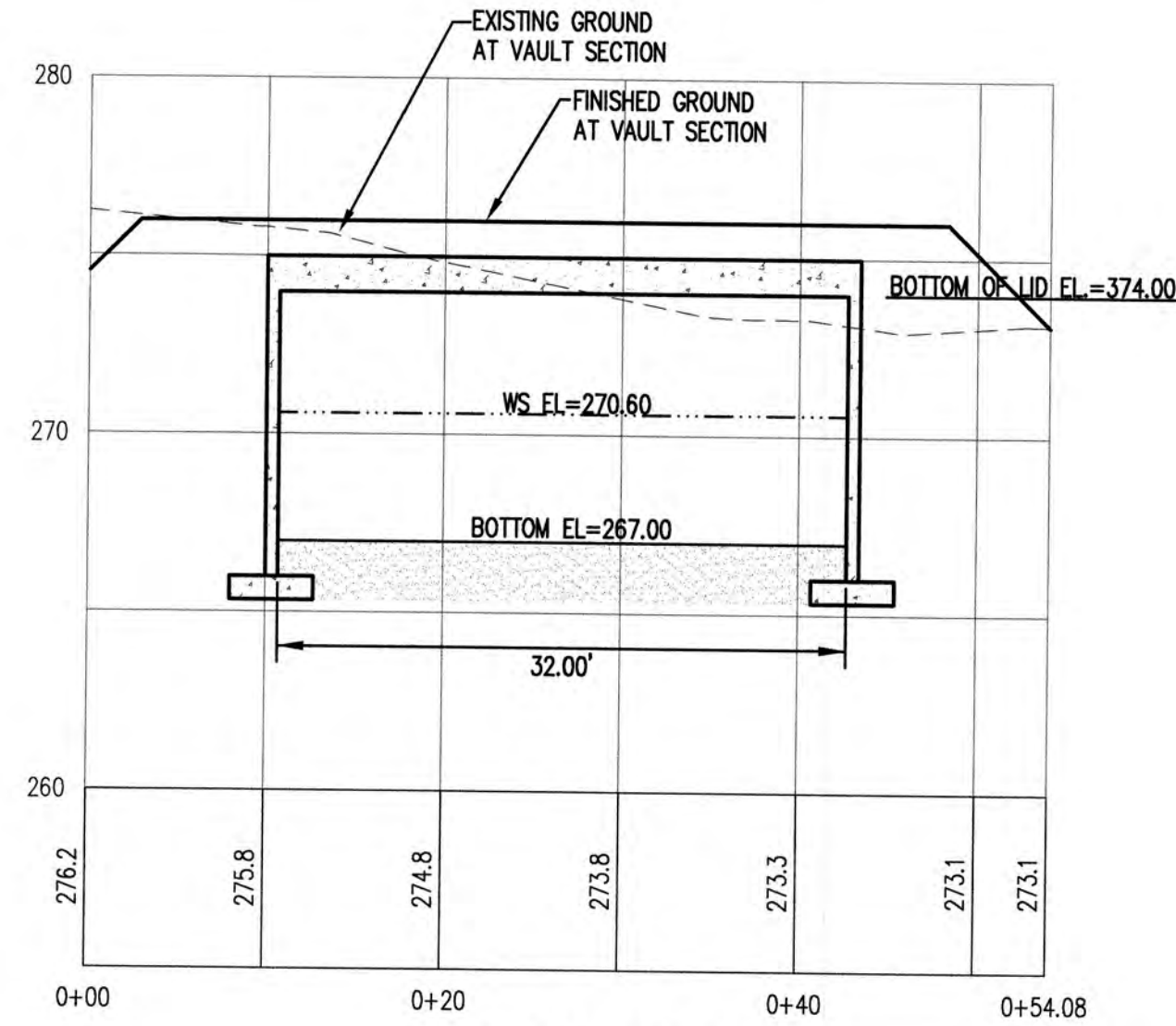
REVISIONS			PRIVATE DEVELOPMENT	DESIGNED BY: DPS	PARR ACRES NE 1/4, SE 1/4, SEC. 25 TWP. 22 N., RGE. 1 E., W.M.		PERMIT NO. PL-PPLAT-21-0001	
				DRAWN BY: DAB		ROAD "A", TRACT "D" & "E" PLAN & PROFILES	DRAWING NO. PPLT9	
				CHECKED BY: DPS			SHEET 9 OF 18	
				APPROVED BY:				
				SCALE: 1"=30'				
2 REVISED PER CITY COMMENTS - DAB- 08/19/2022			C.E.S. NW INC. 429 - 29TH ST. NE, SUITE D PUYALLUP, WA 98372 (253) 848-4282 CESERVICES@CESNWINC.COM	OTHER:				
1 REVISED PER CITY COMMENTS - DAB- 05/19/2022								



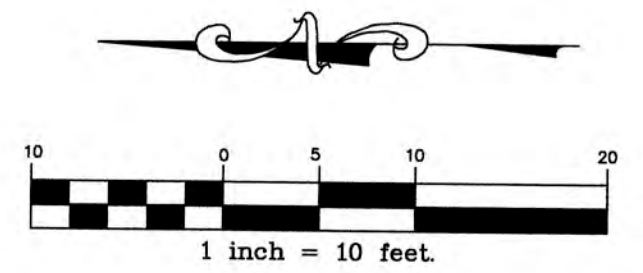
INFILTRATION VAULT
HORIZONTAL: 1"=10'



SECTION A-A
HORIZONTAL: 1"=10'
VERTICAL: 1"=5'



SECTION B-B
HORIZONTAL: 1"=10'
VERTICAL: 1"=5'



**CALL 48 HOURS
BEFORE YOU DIG
DIAL 811**

REVISIONS
1
REVISED PER CITY COMMENTS - DAB - 05/19/2022

C.E.S. NW INC.
CIVIL ENGINEERING & SURVEYING

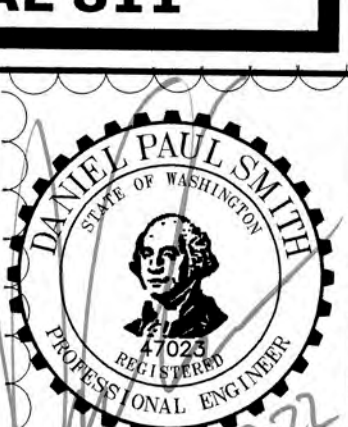
PRIVATE DEVELOPMENT
C.E.S. NW INC.
429 - 29TH ST. NE, SUITE D
PUYALLUP, WA 98372
(253) 848-4282
CESERVICES@CESNWINC.COM

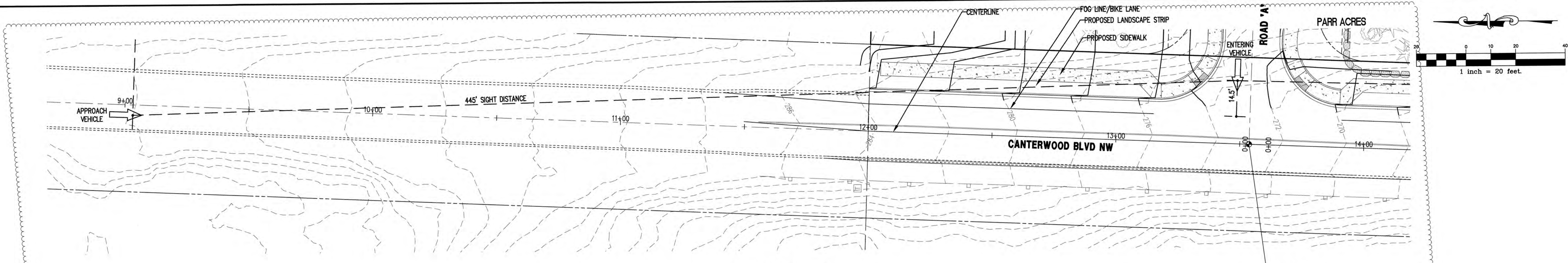
DESIGNED BY: **DPS**
DRAWN BY: **DAB**
CHECKED BY: **DPS**
APPROVED BY:
SCALE: **1"=10'**
OTHER:

PARR ACRES
NE 1/4, SE 1/4, SEC. 25
TWP. 22 N., RGE. 1 E., W.M.

INFILTRATION VAULT
PLAN & SECTIONS

PERMIT NO.
PL-PPLAT-21-0001
DRAWING NO.
PPLT10
SHEET **10** OF **19**

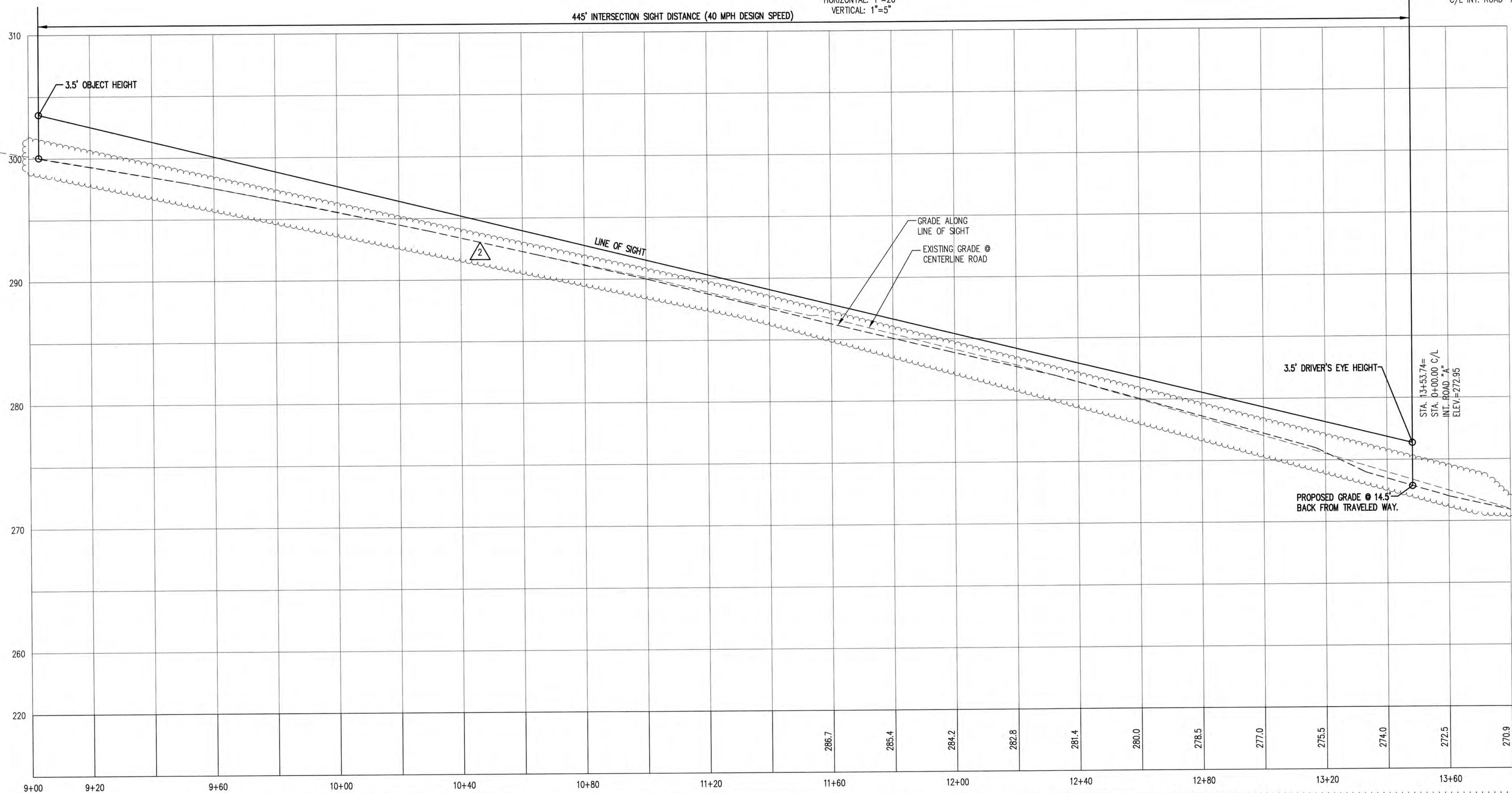




CANTERWOOD BLVD NW

HORIZONTAL: 1"=20'
VERTICAL: 1"=5'

445' INTERSECTION SIGHT DISTANCE (40 MPH DESIGN SPEED)



**CALL 48 HOURS
BEFORE YOU DIG
DIAL 811**

REVISIONS

2 REVISED PER CITY COMMENTS - DAB- 08/19/2022
1 REVISED PER CITY COMMENTS - DAB- 05/19/2022

C.E.S. NW INC.
CIVIL ENGINEERING & SURVEYING

PRIVATE DEVELOPMENT

C.E.S. NW INC.
429 - 29TH ST. NE, SUITE D
PUYALLUP, WA 98372
(253) 848-4282
CESERVICES@CESNWINC.COM

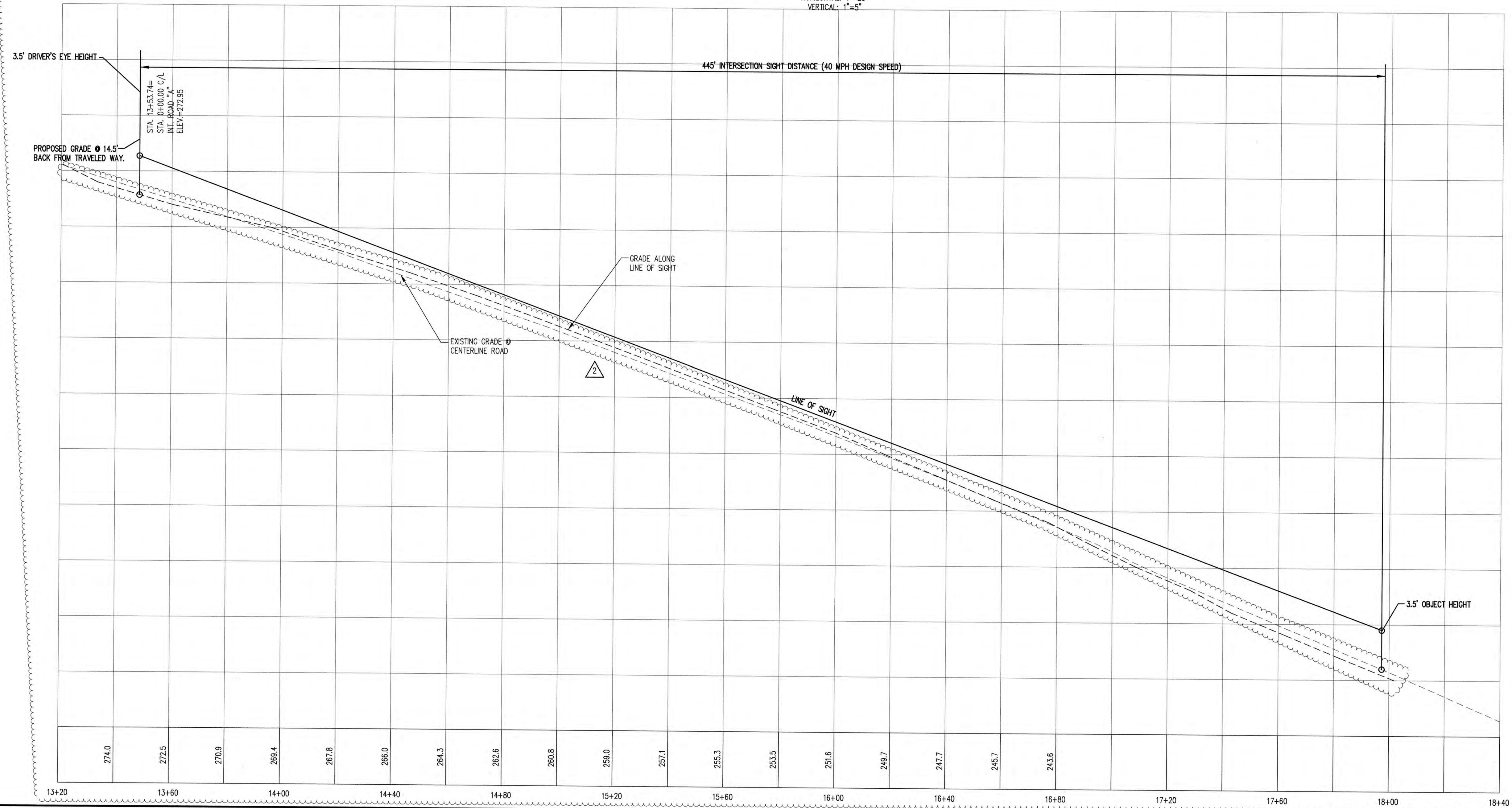
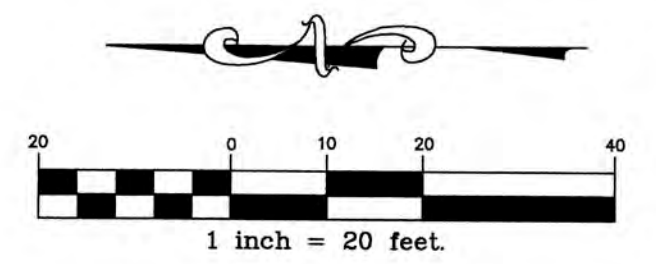
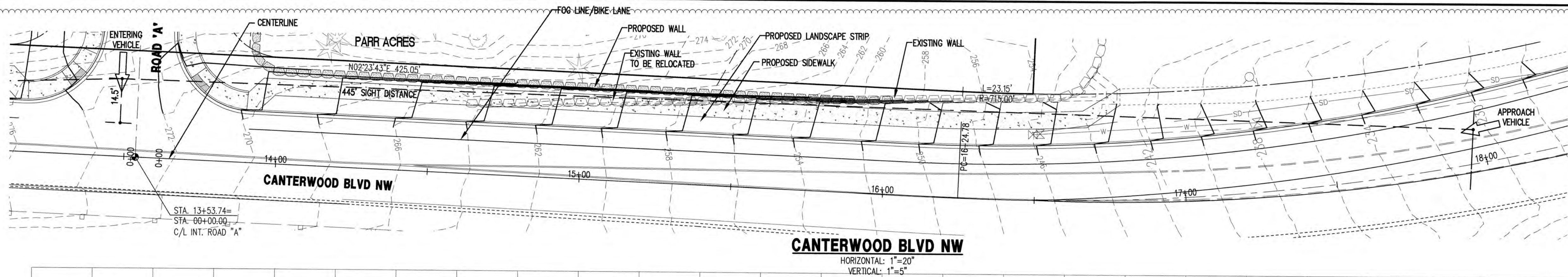
DESIGNED BY: DPS
DRAWN BY: DAB
CHECKED BY: DPS
APPROVED BY:
SCALE: 1"=30'
OTHER:

PARR ACRES
NE 1/4, SE 1/4, SEC. 25
TWP. 22 N., RGE. 1 E., W.M.

CANTERWOOD BLVD NW
SIGHT DISTANCE PLAN - NORTH

PERMIT NO.
PL-PPLAT-21-0001
DRAWING NO.
PPLT11
SHEET OF
11 19





- NOTES:**
1. REQUIRED SITE DISTANCE IS BASED ON TABLE 9-7 OF THE 2018 AASHTO DESIGN MANUAL.
 2. THE EXISTING RETAINING WALL WITHIN THE SIGHT DISTANCE TRIANGLE WILL BE RELOCATED. THERE ARE NO PROPOSED OBSTRUCTIONS ALONG THE VERTICAL OR HORIZONTAL LINES OF SIGHT SHOWN ON THIS PLAN.
 3. NO LANDSCAPING SHALL BE ALLOWED WHERE IT WILL OBSTRUCT REQUIRED SIGHT DISTANCE.

**CALL 48 HOURS
BEFORE YOU DIG
DIAL 811**

REVISIONS	
2	REVISED PER CITY COMMENTS - DAB- 08/19/2022
1	REVISED PER CITY COMMENTS - DAB- 05/19/2022

C.E.S. NW INC.
CIVIL ENGINEERING & SURVEYING

PRIVATE DEVELOPMENT

C.E.S. NW INC.
429 - 29TH ST. NE, SUITE D
PUYALLUP, WA 98372
(253) 848-4282
CESERVICES@CESNWINC.COM

DESIGNED BY: **DPS**
DRAWN BY: **DAB**
CHECKED BY: **DPS**
APPROVED BY:
SCALE: **1"=30'**
OTHER:

PARR ACRES
NE 1/4, SE 1/4, SEC. 25
TWP. 22 N., RGE. 1 E., W.M.

CANTERWOOD BLVD NW
SIGHT DISTANCE PLAN - SOUTH

PERMIT NO.
PL-PPLAT-21-0001

DRAWING NO.
PPLT12

SHEET OF
12 19

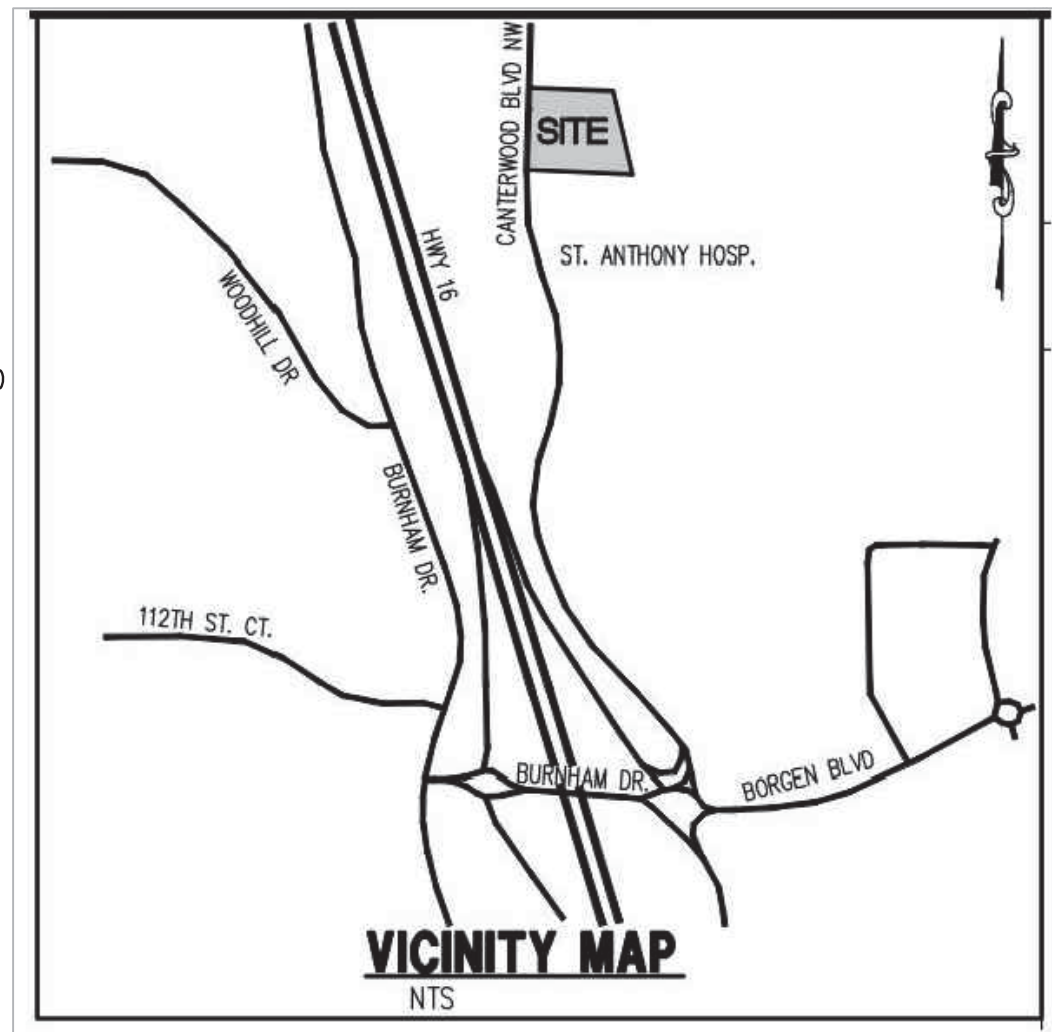
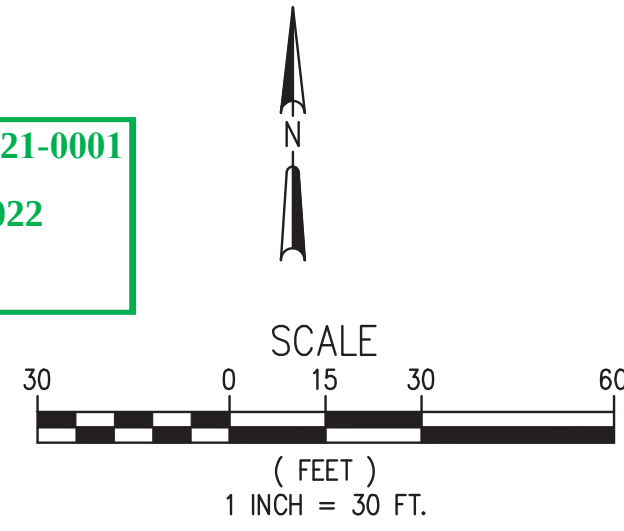
PAUL SMITH
REGISTERED PROFESSIONAL ENGINEER
STATE OF WASHINGTON
47023

A PORTION OF NE 1/4 OF THE SE 1/4 OF SEC. 25, TWP. 22 N., RNG. 1 E
LANDSCAPING = 10'

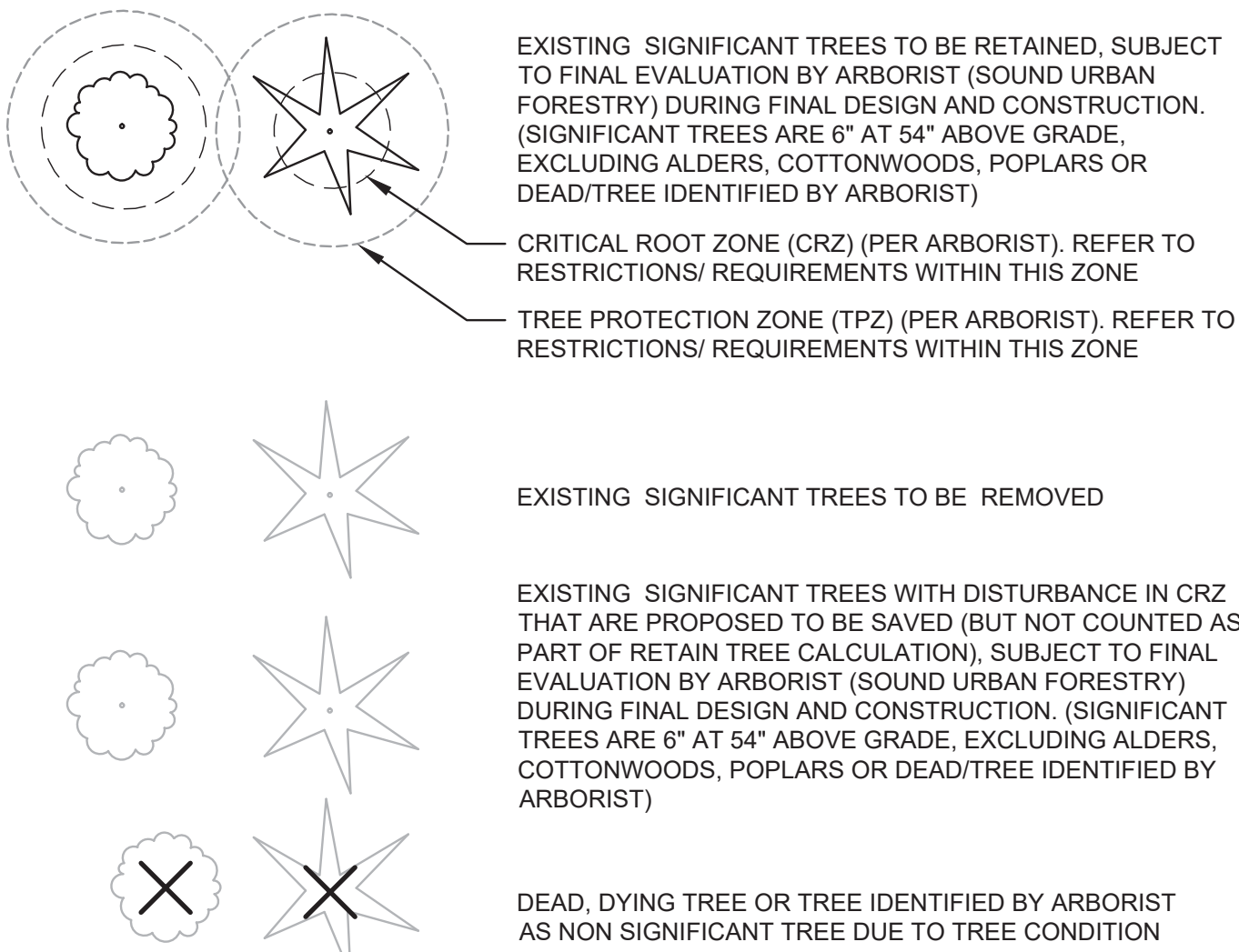
Parr Preliminary Plat | PL-PPLAT-21-0001

Design Review Board 09.22.2022

Exhibit D



TREE RETENTION/REPLACEMENT
NOTES AND LEGEND



NOTE:
TREES THAT ARE NOT SIGNIFICANT (ALDERS, POPLARS, COTTONWOODS) PER COGH SIGNIFICANT TREE DEFINITION ARE NOT SHOWN ON THIS PLAN

PERIMETER BUFFER CALCULATION

THIS INCLUDES THE 30' ENHANCEMENT CORRIDOR ALONG CANTERWOOD, 25' PERIMETER LANDSCAPING ALONG THE NORTH AND EAST PROPERTY BOUNDARIES AND THE 30' ZONE TRANSITION BUFFER ALONG THE SOUTH

REQUIRED AREA IN PERIMETER AREA (25' ON THE NORTH AND EAST, 40' ON THE SOUTH AND 30' ON THE WEST) 53,819 SF

PROPOSED UNDISTURBED PERIMETER LANDSCAPING AREA (AREA OUTSIDE OF CLEARING LIMITS) 140,929 SF

AREA WITH PLANTING ENHANCEMENTS WITHIN UNCLEARED PERIMETER AREAS 8,027 SF

RESTORATION PLANTING WITHIN PERIMETER LANDSCAPING AREA THAT HAS BEEN DISTURBED FOR SITE IMPROVEMENTS 3,900 SF
3,326 SF IN ENHANCEMENT CORRIDOR
574 SF IN PERIMETER BUFFER (NORTH)

PERIMETER BUFFER SHALL MEET THE REQUIREMENTS OF COGH 17.78.060.B.2 AND 17.78.100 ALTERNATIVE LANDSCAPING PLANS. (SEE SHEET L4/L5)

TREE RETENTION CALCULATION

TOTAL EXISTING TREES ON SITE 839 (SEE NOTE 1.)

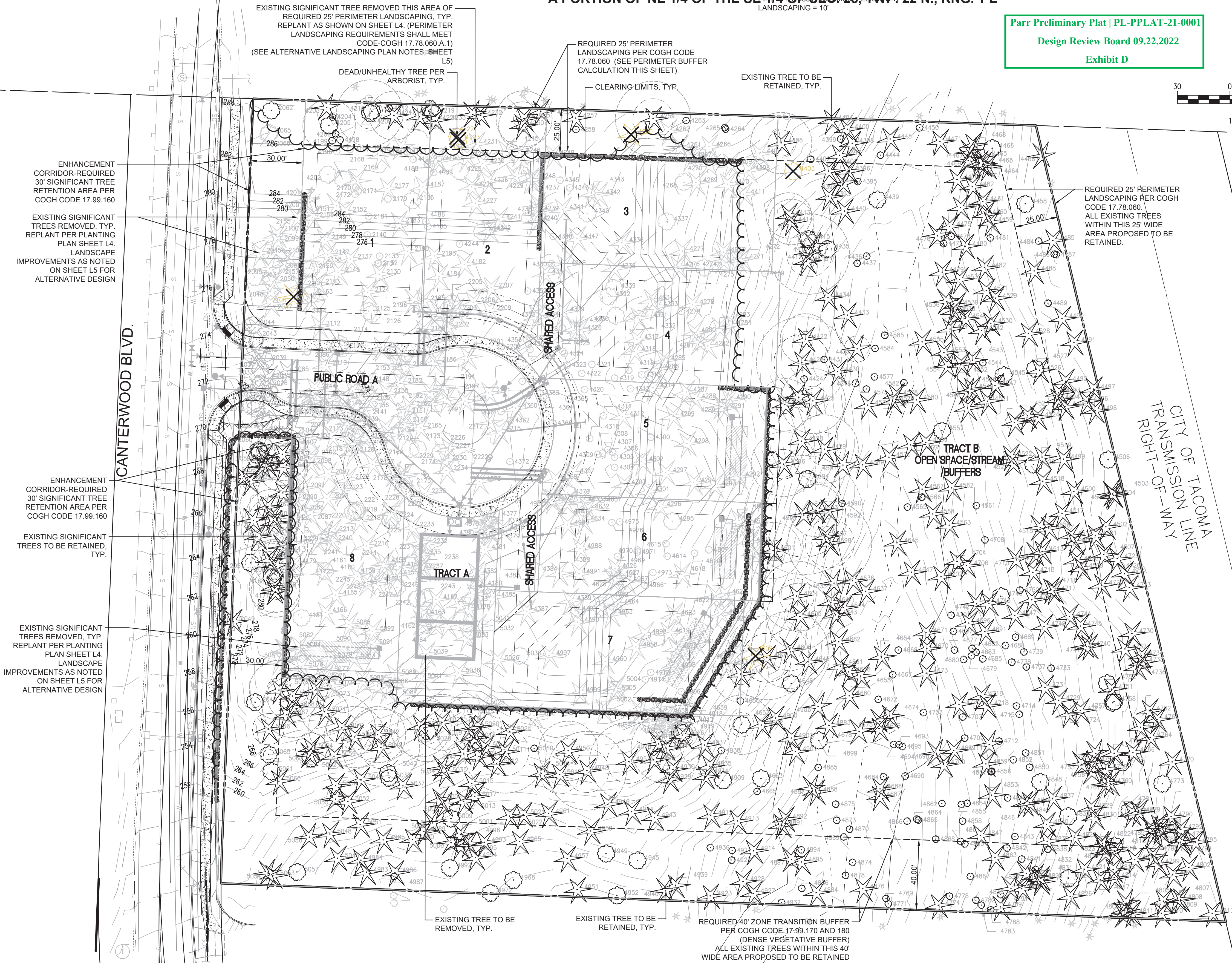
TOTAL REQUIRED RETAIN TREES 210 TREES (25% OF TOTAL)

TOTAL PROPOSED RETAIN TREES 443 TREES (53% OF TOTAL)

- NOTES:
- THESE TREES ARE SIGNIFICANT PER THE COGH SIGNIFICANT TREE DEFINITION. THEY ARE AT LEAST 6" AND EXCLUDE ALDERS/POPLARS AND DEAD TREES.
 - TREE INFORMATION/ASSESSMENT IS PER ARBORIST REPORT DATED 1/18/2021 PREPARED BY SOUND URBAN FORESTRY LLC TREE SURVEY BY C.E.S. NW
 - SEE SHEETS L2 AND L3 FOR LIST OF EXISTING SIGNIFICANT TREES TO BE RETAINED OR REMOVED.

SHEET INDEX

- | | |
|----|---|
| L1 | TREE RETENTION |
| L2 | EXISTING TREE LIST-RETAIN TREES |
| L3 | EXISTING TREE LIST-REMOVE TREES |
| L4 | TREE REPLACEMENT, PERIMETER BUFFER AND FRONTAGE PLANTING PLAN |
| L5 | BUFFER PLANTING/ALTERNATIVE LANDSCAPING STANDARDS |
| L6 | PLANTING NOTES AND DETAILS |
| L7 | ENHANCEMENT CORRIDOR ELEVATIONS |



OWNER/APPLICANT

IVORY, LLC
33400 8TH AVENUE S., SUITE 230
FEDERAL WAY, WA 98003
CONTACT: TONI CAVALLI
253.517.8541
TONI.CAVALLI@AZURENW.COM

LANDSCAPE ARCHITECT

DAVID EVANS AND ASSOCIATES
20300 WOODINVILLE SNOHOMISH RD. NE
WOODINVILLE, WA 98072
CONTACT: DENISE LIFTIN, PLA
425.415.2028
DENISE.LIFTIN@DEAINC.COM

SURVEYOR/ENGINEER

C.E.S. NW
429 29TH STREET NE SUITE D
PUYALLUP, WA 98372
CONTACT: DON BABINEAU
253.848.4282
DBABINEAU@CESNWINC.COM

ARBORIST

SOUND URBAN FORESTRY
1910 EAST 4TH AVENUE, PMB 97
OLYMPIA, WA 98506
CONTACT: KEVIN MCFARLAND
360.870.2511
SUF1234@COMCAST.NET

TREE PROTECTION TECHNIQUES

EXISTING SIGNIFICANT TREES PROPOSED TO BE SAVED SHALL BE PROTECTED DURING CONSTRUCTION WITH A PROTECTIVE BARRICADE. SEE DETAIL ON SHEET L6.

SEE ALSO, ARBORIST REPORT ISSUED DATED 1/18/2021 FOR ADDITIONAL TREE PROTECTION REQUIREMENTS AND FOR WORKING WITHIN AREAS WHERE VEGETATION IS TO REMAIN. ANY WORK WITHIN THE TREE PROTECTION ZONE SHALL BE REVIEWED AND ADJUSTED PER THE ARBORIST'S RECOMMENDATIONS.

DAVID EVANS
AND ASSOCIATES INC.
20300 Woodinville Snohomish Rd NE
Woodinville, WA 98072
Phone: 425.415.2000

PARR ACRES PRELIMINARY PLAT
BUFFER AND FRONTAGE TREE REPLACEMENT LANDSCAPE PLANS

AZURE NW HOMES, LLC
TREE RETENTION

CITY OF GIG HARBOR,

WASHINGTON

DATE: 5/17/2022	BY: DLS
REVIEWED BY: REVIEW BY	COMMENTS: COMMENTS 6/26/21 DLS/DLS
DATE: 5/17/2022	REVISION: 1
NO. 1	REV: 5/17/2022

PRELIMINARY



CHECKED BY: DL
DESIGNED BY: DL
DRAWN BY: DL

FIRST SUBMITTAL DATE: 06/16/2021

PROJECT NO.

AZNWVRY0001

SHEET NO. L1 of 7

EXISTING TREES PROPOSED TO BE RETAINED

TREE NUMBER	DESIGNATION	TREE TYPE	TREE SIZE
2046	RET-EC	MADRONE	6
2049	RET-EC	FIR	10
2051	RET-EC	MADRONE	6
2054	RET-EC	FIR	9
2055	RET-EC	FIR	8
2056	RET-EC	FIR	10
2057	RET-EC	FIR	7
2058	RET-EC	FIR	7
2059	RET-EC	MADRONE	13
2060	RET-EC	MADRONE	10
2061	RET-EC	MADRONE	8
2062	RET-EC	MADRONE	6
2063	RET-EC	FIR	10
2064	RET-EC	FIR	8
2066	RET-EC	FIR	9
2067	RET-EC	FIR	12
2069	RET-EC	FIR	11
2070	RET-EC	FIR	9
2071	RET-EC	FIR	12
2082	RET-EC	FIR	9
2083	RET-EC	FIR	9
4168	RET-EC	MADRONE	6
4169	RET-EC	FIR	9
4171	RET-EC	FIR	8
4174	RET-EC	FIR	8
4176	RET-EC	FIR	16
4194	RET	FIR	10
4203	RET	FIR	13
4205	RET	MADRONE	10
4209	RET	MADRONE	18
4210	RET	MADRONE	12x2
4211	RET	FIR	8
4218	RET	MADRONE	9
4219	RET	MADRONE	9
4220	RET	CEDAR	11
4221	RET	CEDAR	10
4232	RET	CEDAR	10
4233	RET	FIR	13
4245	RET	FIR	7
4250	RET	FIR	7
4251	RET	FIR	12
4252	RET	FIR	12
4257	RET	FIR	11
4259	RET	CEDAR	23
4393	RET	TRH	18
4394	RET	FIR	11
4396	RET	CEDAR	11
4397	RET	CEDAR	22
4398	RET	FIR	13
4400	RET	FIR	16
4401	RET	FIR	19
4404	RET	CEDAR	25
4406	RET	CEDAR	15
4413	RET	CEDAR	6
4414	RET	CEDAR	6
4415	RET	MAPLE	7
4416	RET	CEDAR	14
4417	RET	FIR	26
4418	RET	CEDAR	9
4422	RET	FIR	9
4423	RET	FIR	32
4425	RET	FIR	17
4428	RET	FIR	16
4429	RET	FIR	19
4430	RET	FIR	8
4432	RET	TRH	13
4433	RET	CEDAR	14
4434	RET	FIR	25
4435	RET	MAPLE	10
4439	RET	MAPLE	24
4440	RET	CEDAR	10
4445	RET	FIR	8
4456	RET	CEDAR	18
4458	RET	MAPLE	19
4459	RET	FIR	24
4460	RET	FIR	10
4461	RET	TRH	15
4462	RET	CEDAR	11
4464	RET	FIR	12
4464	RET	FIR	24
4465	RET	FIR	12
4466	RET	CHERRY	9
4467	RET	FIR	10
4468	RET	FIR	14
4469	RET	FIR	18
4470	RET	CEDAR	9
4471	RET	CEDAR	20
4474	RET	FIR	16
4475	RET	FIR	23
4476	RET	CEDAR	13
4479	RET	FIR	24
4480	RET	FIR	22
4482	RET	FIR	23
4485	RET	CEDAR	7
4488	RET	FIR	24
4490	RET	FIR	15
4491	RET	FIR	11
4492	RET	CEDAR	42
4493	RET	FIR	24
4494	RET	CEDAR	19
4495	RET	FIR	21
4496	RET	CEDAR	8
4497	RET	CEDAR	7
4498	RET	FIR	9
4499	RET	FIR	36
4500	RET	FIR	24
4501	RET	CEDAR	18
4502	RET	FIR	16
4503	RET	FIR	20
4504	RET	CEDAR	8
4505	RET	CEDAR	8
4506	RET	CHERRY	10
4507	RET	FIR	11
4508	RET	FIR	13
4509	RET	FIR	9
4511	RET	FIR	12
4512	RET	FIR	9
4513	RET	FIR	6
4514	RET	FIR	8

TREE NUMBER	DESIGNATION	TREE TYPE	TREE SIZE
4515	RET	CEDAR	36
4516	RET	FIR	8
4517	RET	CEDAR	12
4518	RET	FIR	16
4519	RET	CEDAR	16
4520	RET	MAPLE	21
4521	RET	CEDAR	26
4522	RET	CEDAR	17
4523	RET	CEDAR	13
4524	RET	CEDAR	9
4525	RET	FIR	16
4526	RET	CEDAR	6
4527	RET	CHERRY	13
4528	RET	FIR	30
4529	RET	FIR	27
4530	RET	CEDAR	21
4531	RET	CEDAR	10
4532	RET	CEDAR	30
4536	RET	CEDAR	14
4538	RET	CEDAR	7
4539	RET	CEDAR	11
4540	RET	CEDAR	31
4541	RET	FIR	16
4542	RET	CEDAR	8
4543	RET	CEDAR	11
4545	RET	CHERRY	9
4547	RET	CEDAR	7
4548	RET	CEDAR	6
4549	RET	FIR	10
4550	RET	FIR	36
4551	RET	CEDAR	7
4552	RET	FIR	15
4553	RET	CEDAR	10
4554	RET	CEDAR	12
4555	RET	CEDAR	8
4557	RET	MAPLE	33
4559	RET	CEDAR	12
4562	RET	CEDAR	9
4563	RET	TRH	16
4564	RET	FIR	17
4567	RET	CEDAR	28
4570	RET	CEDAR	72
4571	RET	CEDAR	10
4574	RET	CEDAR	12
4578	RET	CEDAR	10
4579	RET	CEDAR	22
4580	RET	CEDAR	6
4589	RET	FIR	6
4591	RET	FIR	13
4592	RET	FIR	12
4593	RET	FIR	10
4594	RET	MAPLE	10
4597	RET	FIR	12
4598	RET	FIR	28
4604	RET	FIR	20
4605	RET	FIR	18
4606	RET	FIR	24
4608	RET	CEDAR	28
4611	RET	CEDAR	8
4616	RET	CEDAR	6
4635	RET	FIR	21
4636	RET	FIR	22
4637	RET	FIR	28
4641	RET	FIR	10
4643	RET	FIR	20
4644	RET	CEDAR	8
4645	RET	CEDAR	19
4646	RET	FIR	30
4647	RET	FIR	19
4648	RET	MAPLE	10
4653	RET	MAPLE	14
4654	RET	CEDAR	25
4655	RET	FIR	22
4656	RET	FIR	23
4660	RET	TRHOLLY	7
4661	RET	CEDAR	8
4662	RET	CEDAR	6
4663	RET	MAPLE	20
4670	RET	FIR	25
4671	RET	CEDAR	12
4673	RET	CEDAR	40
4674	RET	FIR	22
4675	RET	FIR	24
4676	RET	CEDAR	18
4678	RET	CEDAR	8
4686	RET	CEDAR	18
4687	RET	CEDAR	10
4691	RET	FIR	11
4696	RET	FIR	9
4698	RET	FIR	36
4699	RET	CEDAR	24
4700	RET	CEDAR	10
4702	RET	FIR	9
4704	RET	CEDAR	24
4705	RET	FIR	15
4706	RET	CEDAR	6
4710	RET	FIR	10
4711	RET	CEDAR	14
4713	RET	FIR	13
4716	RET	FIR	18
4717	RET	FIR	20
4718	RET	CEDAR	24
4719	RET	CEDAR	14
4720	RET	FIR	13
4722	RET	FIR	14
4723	RET	FIR	14
4724	RET	FIR	20
4725	RET	FIR	9
4727	RET	FIR	20
4729	RET	FIR	24
4730	RET	FIR	17
4731	RET	FIR	16
4732	RET	FIR	14
4734	RET	FIR	7
4735	RET	FIR	14
4736	RET	CEDAR	25
4740	RET	FIR	15
4741	RET	FIR	15
4742	RET	FIR	22

TREE NUMBER	DESIGNATION	TREE TYPE	TREE SIZE
4743	RET	FIR	20
4744	RET	CEDAR	18
4745	RET	CEDAR	18
4746	RET	MADRONE	18
4747	RET	FIR	7
4748	RET	FIR	8
4749	RET	FIR	7
4751	RET	FIR	10
4752	RET	MADRONE	10
4753	RET	FIR	9
4754	RET	CEDAR	12
4755	RET	FIR	6
4756	RET	FIR	8
4757	RET	CHERRY	9
4758	RET	CHERRY	10
4759	RET	FIR	24
4760	RET	FIR	12
4761	RET	FIR	8
4762	RET	CEDAR	13
4763	RET	CEDAR	28
4764	RET	CEDAR	18
4765	RET	CEDAR	14
4766	RET	CEDAR	17
4767	RET	CEDAR	10
4768	RET	CHERRY	10
4770	RET	CEDAR	17
4773	RET	MADRONE	10
4774	RET	FIR	16
4779	RET	FIR	17
4780	RET	FIR	8
4781	RET	MADRONE	8
4784	RET	FIR	16
4785	RET	CEDAR	11
4786	RET	FIR	15
4787	RET	FIR	7
4789	RET	CEDAR	10
4790	RET	FIR	12
4792	RET	CEDAR	9
4793	RET	FIR	10
4794	RET	CEDAR	8
4795	RET	FIR	12
4798	RET	CEDAR	25
4799	RET	FIR	24
4802	RET	CEDAR	18
4803	RET	FIR	22
4804	RET	FIR	12
4805	RET	CEDAR	6
4806	RET	CEDAR	10
4807	RET	CEDAR	16
4808	RET	CEDAR	10
4809	RET	FIR	13
4810	RET	FIR	26
4811	RET	CEDAR	6
4812	RET	FIR	12
4813	RET	CEDAR	16
4814	RET	FIR	12
4815	RET	CEDAR	8
4816	RET	FIR	13
4817	RET	FIR	12
4818	RET	MADRONE	13
4819	RET	FIR	10
4820	RET	FIR	10
4821	RET	FIR	12
4822	RET	FIR	7
4823	RET	FIR	7
4824	RET	MAPLE	7
4825	RET	FIR	9
4826	RET	FIR	10
4827	RET	FIR	8
4828	RET	FIR	6
4829	RET	FIR	8
4830	RET	FIR	10
4831	RET	FIR	8
4833	RET	CEDAR	12
4834	RET	MAPLE	12
4835	RET	FIR	8
4836	RET	FIR	6
4837	RET	CEDAR	9
4839	RET	FIR	25
4840	RET	CEDAR	15
4844	RET	FIR	10
4845	RET	FIR	18
4847	RET	CEDAR	15
4848	RET	CHERRY	6
4853	RET	FIR	10
4859	RET	FIR	12
4863	RET	FIR	7
4876	RET	FIR	30
4883	RET	FIR	28
4884	RET	CEDAR	10
4887	RET	CEDAR	10
4888	RET	CEDAR	9
4891	RET	CEDAR	27
4892	RET	CEDAR	15
4895	RET	CEDAR	14
4897	RET	FIR	9
4899	RET	MAPLE	6
4900	RET	FIR	6
4901	RET	CEDAR	8
4902	RET	CEDAR	8
4903	RET	CEDAR	6
4905	RET	FIR	18
4909	RET	MAPLE	8
4912	RET	CEDAR	42
4913	RET	CEDAR	8
4914	RET	CEDAR	12
4915	RET	MADRONE	12
4916	RET	FIR	13
4923	RET	FIR	22
4924	RET	FIR	20
4925	RET	FIR	9
4926	RET	FIR	11
4927	RET	CEDAR	12
4928	RET	CEDAR	10
4929	RET	FIR	13
4930	RET	CEDAR	35
4934	RET	FIR	9
4935	RET	FIR	13
4937	RET	FIR	8

EXISTING TREES PROPOSED TO BE RETAINED DESIGNATION

RET SIGNIFICANT TREES PROPOSED TO BE RETAINED
RET-EC SIGNIFICANT TREES PROPOSED TO BE RETAINED WITHIN ENHANCEMENT CORRIDOR

TREE NUMBER	DESIGNATION	TREE TYPE	TREE SIZE
4939	RET	CEDAR	8
4940	RET	CEDAR	12
4943	RET	FIR	10
4944	RET	FIR	11
4945	RET	MAPLE	14
4946	RET	CEDAR	36
4948	RET	CEDAR	25
4949	RET	MAPLE	14
4950	RET	CEDAR	14
4951	RET	FIR	12
4952	RET	MAPLE	20
4953	RET	FIR	25
4957	RET	FIR	8
4959	RET	FIR	36
4961	RET	CEDAR	36
4965	RET	FIR	7
4968	RET	MAPLE	18
4972	RET	CHERRY	8
4983	RET	FIR	20
4984	RET	FIR	18
4985	RET	FIR	20
4986	RET	FIR	10
4989	RET	FIR	14
4990	RET	FIR	14
4992	RET	MAPLE	10
4993	RET	FIR	6
4994	RET	FIR	10
4995	RET	FIR	14
4996	RET	FIR	6
5000	RET	FIR	18
5001	RET	FIR	7
5003	RET	FIR	18
5006	RET	FIR	15
5007	RET	FIR	8
5010	RET	MADRONE	27
5011	RET	CEDAR	27
5012	RET	CEDAR	12
5013	RET	FIR	18
5014	RET	CEDAR	7
5015	RET	FIR	18
5016	RET	CEDAR	6
5017	RET	FIR	24
5018	RET	FIR	7
5019	RET	FIR	17
5020	RET	FIR	8
5021	RET	FIR	14
5022	RET	FIR	16
5027	RET	FIR	12
5028	RET	MAPLE	13
5029	RET	FIR	13
5034	RET	FIR	10
5035	RET	FIR	24
5037	RET	FIR	17
5038	RET	MADRONE	10
5040	RET	MADRONE	12
5042	RET	FIR	12
5043	RET	FIR	24
5044	RET	FIR	24
5045	RET	FIR	20
5046	RET	FIR	15
5047	RET	FIR	11
5048	RET	FIR	10
5049	RET	FIR	11
5050	RET	FIR	10
5051	RET	CEDAR	10
5052	RET	FIR	10
5053	RET-EC	FIR	18
5054	RET-EC	FIR	18
5055	RET	CEDAR	18
5056	RET	CEDAR	23
5057	RET	MAPLE	12
5059	RET	FIR	13
5060	RET	FIR	22
5061	RET-EC	MAPLE	30
5062	RET	MADRONE	16
5063	RET	CEDAR	15
5064	RET	FIR	18
5065	RET-EC	MADRONE	6
5066	RET-EC	FIR	18
5067	RET	FIR	7
5068	RET	FIR	15
5069	RET	FIR	15
5070	RET	FIR	18
5071	RET	FIR	7
5072	RET-EC	FIR	14
5075	RET	FIR	9

A PORTION OF NE 1/4 OF THE SE 1/4 OF SEC. 25, TWP. 22 N., RNG. 1 E

EXISTING TREES PROPOSED TO BE REMOVED

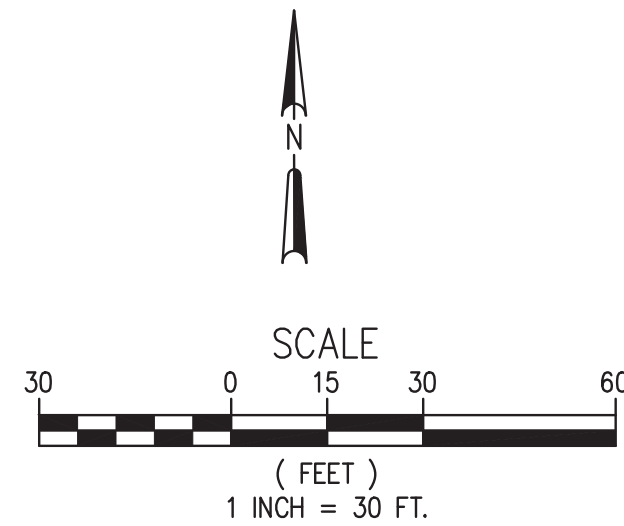
TREE NUMBER	DESIGNATION	TREE TYPE	TREE SIZE
2045	REM 1-EC	FIR	14
2047	REM 1-EC	FIR	18
2048	REM 1-EC	FIR	10
2050	REM 1-EC	FIR	6
2053	REM 1-EC	MADRONE	8
2065	REM 1-EC	MADRONE	9
2068	REM 1-EC	MADRONE	6
2094	REM 1-EC	FIR	17
2095	REM 1-EC	FIR	10
2099	REM 1-EC	FIR	14
2100	REM 1-EC	FIR	11
2105	REM 1-EC	FIR	9
2155	REM 1-EC	FIR	11
4231	REM 1	FIR	13
4261	REM 1	FIR	21
4262	REM 1	FIR	10
4266	REM 1	FIR	24
4267	REM 1	FIR	12
4407	REM 1	CEDAR	23
4613	REM 1	CEDAR	8
5080	REM 1-EC	FIR	8

TREE NUMBER	DESIGNATION	TREE TYPE	TREE SIZE
2012	REM 2	MADRONE	6
2014	REM 2	MADRONE	6
2015	REM 2	MADRONE	6
2017	REM 2	FIR	7
2019	REM 2	MADRONE	8
2021	REM 2	FIR	6
2023	REM 2	FIR	6
2026	REM 2	FIR	13
2030	REM 2	MADRONE	6
2033	REM 2	MADRONE	8
2035	REM 2	FIR	8
2037	REM 2	FIR	6
2039	REM 2	MADRONE	8
2042	REM 2	FIR	20
2043	REM 2	FIR	6
2044	REM 2	MADRONE	8

TREE NUMBER	DESIGNATION	TREE TYPE	TREE SIZE
2077	REM 3	MADRONE	8
2078	REM 3	MADRONE	12
2079	REM 3	MADRONE	8
2080	REM 3	FIR	15
2085	REM 3	FIR	12
2087	REM 3	FIR	8
2088	REM 3	FIR	7
2090	REM 3	FIR	7
2091	REM 3	FIR	14
2093	REM 3	FIR	13
2097	REM 3	FIR	14
2098	REM 3	FIR	7
2102	REM 3	FIR	10
2103	REM 3	FIR	7
2104	REM 3	FIR	16
2107	REM 3	FIR	6
2108	REM 3	FIR	12
2109	REM 3	FIR	16
2110	REM 3	FIR	8
2111	REM 3	FIR	12
2112	REM 3	FIR	14
2113	REM 3	FIR	7
2114	REM 3	MADRONE	8
2115	REM 3	MADRONE	13
2116	REM 3	MADRONE	13
2117	REM 3	FIR	8
2118	REM 3	FIR	6
2119	REM 3	FIR	17
2120	REM 3	FIR	9
2121	REM 3	FIR	23
2122	REM 3	FIR	7
2123	REM 3	FIR	7
2124	REM 3	FIR	15
2125	REM 3	MADRONE	7
2126	REM 3	MADRONE	7
2127	REM 3	FIR	10
2128	REM 3	FIR	16
2129	REM 3	FIR	10
2130	REM 3	FIR	12
2134	REM 3	FIR	6
2135	REM 3	FIR	11
2136	REM 3	FIR	8
2137	REM 3	FIR	14
2138	REM 3	MADRONE	6
2139	REM 3	MADRONE	8
2141	REM 3	FIR	7
2142	REM 3	FIR	7
2143	REM 3	FIR	14
2144	REM 3	FIR	6
2145	REM 3	FIR	14
2146	REM 3	FIR	6
2147	REM 3	FIR	12
2148	REM 3	FIR	6
2149	REM 3	FIR	8
2150	REM 3	FIR	8
2151	REM 3	FIR	12
2152	REM 3	FIR	12
2153	REM 3	FIR	9
2154	REM 3	FIR	7
2156	REM 3	FIR	12
2157	RET	MADRONE	11
2158	REM 3	MADRONE	10
2159	REM 3	MADRONE	10
2160	REM 3	FIR	12
2161	REM 3	FIR	10
2162	REM 3	FIR	6
2163	REM 3	MADRONE	8
2164	REM 3	FIR	11
2165	REM 3	FIR	8
2166	REM 3	MADRONE	6
2168	REM 3	MAPLE	7
2169	REM 3	FIR	13
2173	REM 3	MADRONE	15
2174	REM 3	FIR	6
2175	REM 3	FIR	6
2177	REM 3	CEDAR	7
2178	REM 3	FIR	10
2180	REM 3	FIR	7
2182	REM 3	FIR	12
2183	REM 3	FIR	18
2184	REM 3	FIR	8
2185	REM 3	MADRONE	13
2186	REM 3	FIR	7
2187	REM 3	FIR	10
2188	REM 3	FIR	7
2189	REM 3	FIR	8
2190	REM 3	TRH	14
2191	REM 3	FIR	9
2192	REM 3	FIR	19
2193	REM 3	FIR	18
2194	REM 3	FIR	7
2195	REM 3	FIR	13
2196	REM 3	FIR	15
2197	REM 3	FIR	6
2198	REM 3	FIR	6
2199	REM 3	FIR	12
2200	REM 3	FIR	27
2201	REM 3	FIR	24
2202	REM 3	FIR	6
2203	REM 3	FIR	6
2204	REM 3	MADRONE	15
2205	REM 3	MADRONE	10
2206	REM 3	FIR	6
2207	REM 3	FIR	18
2209	REM 3	FIR	17
2211	REM 3	FIR	7
2212	REM 3	FIR	18
2213	REM 3	FIR	8
2214	REM 3	MADRONE	10
2215	REM 3	FIR	26
2216	REM 3	FIR	12
2218	REM 3	FIR	12
2219	REM 3	MADRONE	12
2220	REM 3	MADRONE	12
2221	REM 3	MADRONE	12
2222	REM 3	MADRONE	16
2223	REM 3	FIR	14
2224	REM 3	MADRONE	10
2225	REM 3	MADRONE	16
2226	REM 3	MADRONE	10

TREE NUMBER	DESIGNATION	TREE TYPE	TREE SIZE
2227	REM 3	FIR	7
2228	REM 3	FIR	9
2229	REM 3	MADRONE	12
2230	REM 3	FIR	16
2231	REM 3	FIR	12
2232	REM 3	FIR	16
2233	REM 3	FIR	12
2234	REM 3	FIR	13
2235	REM 3	FIR	6
2236	REM 3	FIR	6
2237	REM 3	FIR	15
2238	REM 3	FIR	11
2239	REM 3	FIR	6
2240	REM 3	FIR	6
2241	REM 3	FIR	7
2242	REM 3	MADRONE	10
2243	REM 3	MADRONE	9
2244	REM 3	MADRONE	9
2245	REM 3	FIR	16
2246	REM 3	MADRONE	8
2247	REM 3	MADRONE	11
2248	REM 3	FIR	6
4155	REM 3	FIR	12
4156	REM 3	FIR	9
4157	REM 3	CEDAR	16
4158	REM 3	FIR	9
4159	REM 3	FIR	6
4160	REM 3	FIR	7
4161	REM 3	MADRONE	12
4162	REM 3	FIR	14
4163	REM 3	FIR	12
4164	REM 3	FIR	12
4165	REM 3	FIR	10
4166	REM 3	FIR	12
4167	REM 3	FIR	11
4170	REM 3	FIR	7
4172	REM 3	FIR	6
4173	REM 3	FIR	9
4175	REM 3	FIR	9
4177	REM 3	FIR	10
4178	REM 3	FIR	9
4179	REM 3	FIR	6
4180	REM 3	FIR	19
4181	REM 3	MADRONE	13
4182	REM 3	FIR	13
4184	REM 3	FIR	6
4187	REM 3	FIR	6
4190	REM 3	FIR	12
4191	REM 3	FIR	7
4195	REM 3	FIR	7
4200	REM 3	FIR	15
4201	REM 3	FIR	6
4202	REM 3	MADRONE	19
4224	REM 3	TRH	17
4225	REM 3	MADRONE	7
4226	REM 3	FIR	12
4227	REM 3	FIR	6
4229	REM 3	FIR	12
4230	REM 3	CEDAR	13
4236	REM 3	FIR	14
4237	REM 3	FIR	13
4238	REM 3	FIR	15
4239	REM 3	FIR	7
4240	REM 3	FIR	14
4241	REM 3	FIR	10
4242	REM 3	FIR	6
4243	REM 3	MADRONE	6
4246	REM 3	FIR	15
4247	REM 3	MADRONE	7
4248	REM 3	FIR	13
4249	REM 3	TRH	21
4268	REM 3	MADRONE	7
4269	REM 3	CEDAR	25
4270	REM 3	CEDAR	9
4271	REM 3	TRH	10
4272	REM 3	FIR	24
4273	REM 3	CEDAR	10
4274	REM 3	CEDAR	12
4275	REM 3	MAPLE	12
4276	REM 3	CEDAR	33
4277	REM 3	FIR	16
4278	REM 3	FIR	13
4280	REM 3	FIR	19
4281	REM 3	FIR	15
4282	REM 3	FIR	16
4283	REM 3	FIR	25
4284	REM 3	FIR	13
4285	REM 3	FIR	20
4286	REM 3	CEDAR	9
4287	REM 3	FIR	20
4288	REM 3	FIR	20
4289	REM 3	FIR	16
4290	REM 3	FIR	16
4291	REM 3	CEDAR	24
4292	REM 3	CEDAR	30
4293	REM 3	FIR	20
4294	REM 3	CEDAR	27
4295	REM 3	MAPLE	11
4296	REM 3	FIR	17
4297	REM 3	FIR	12
4298	REM 3	TRH	13
4299	REM 3	FIR	19
4301	REM 3	FIR	17
4302	REM 3	FIR	7
4303	REM 3	FIR	8
4312	REM 3	FIR	12
4314	REM 3	FIR	10
4316	REM 3	FIR	13
4317	REM 3	FIR	10
4326	REM 3	FIR	14
4327	REM 3	FIR	7
4329	REM 3	FIR	20
4330	REM 3	MADRONE	12
4332	REM 3	FIR	6
4333	REM 3	CEDAR	8
4334	REM 3	CEDAR	8
4336	REM 3	FIR	9
4337	REM 3	MADRONE	11
4338	REM 3	FIR	18
4339	REM 3	MADRONE	12

TREE NUMBER	DESIGNATION	TREE TYPE	TREE SIZE
4340	REM 3	MADRONE	12
4341	REM 3	FIR	13
4342	REM 3	FIR	12
4343	REM 3	FIR	14
4347	REM 3	FIR	7
4349	REM 3	FIR	18
4351	REM 3	TRH	8
4353	REM 3	FIR	18
4354	REM 3	FIR	9
4360	REM 3	FIR	9
4367	REM 3	FIR	21
4368	REM 3	FIR	25
4369	REM 3	MADRONE	14
4370	REM 3	MADRONE	9
4371	REM 3	FIR	18
4373	REM 3	FIR	9
4375	REM 3	FIR	18
4376	REM 3	FIR	11
4377	REM 3	FIR	17
4378	REM 3	FIR	9
4379	REM 3	FIR	7
4380	REM 3	FIR	12
4381	REM 3	FIR	25
4382	REM 3	FIR	10
4383	REM 3	MADRONE	20
4384	REM 3	MADRONE	20
4385	REM 3	FIR	18
4387	REM 3	FIR	10
4388	REM 3	FIR	9
4389	REM 3	FIR	17
4390	REM 3	FIR	11
4391	REM 3	FIR	10
4392	REM 3	CHERRY	13
4408	REM 3	CEDAR	22
4409	REM 3	TRH	14
4410	REM 3	FIR	12
4411	REM 3	CEDAR	16
4426	REM 3	FIR	7
4427	REM 3	TRH	10
4595	REM 3	CEDAR	48
4596	REM 3	FIR	17
4599	REM 3	CEDAR	16
4600	REM 3	FIR	20
4601	REM 3	FIR	12
4602	REM 3	FIR	18
4603	REM 3	FIR	17
4617	REM 3	FIR	8
4618	REM 3	FIR	21
4619	REM 3	CEDAR	8
4620	REM 3	FIR	20
4621	REM 3	CEDAR	27
4622	REM 3	CEDAR	24
4623	REM 3	FIR	24
4624	REM 3	FIR	17
4625	REM 3	MAPLE	10
4626	REM 3	FIR	22
4627	REM 3	FIR	12
4628	REM 3	FIR	16
4632	REM 3	FIR	10
4633	REM 3	FIR	22
4634	REM 3	FIR	16
4657	REM 3	CEDAR	12
4658	REM 3	FIR	26
4659	REM 3	FIR	14
4988	REM 3	FIR	7
4917	REM 3	MADRONE	13
4918	REM 3	MADRONE	12
4919	REM 3	FIR	24
4920	REM 3	FIR	11
4954	REM 3	FIR	13
4955	REM 3	FIR	10
4956	REM 3	FIR	10
4958	REM 3	FIR	13
4960	REM 3	FIR	20
4962	REM 3	FIR	9



SYMBOL	BOTANICAL / COMMON NAME	MIN. SIZE	CONDITION/REMARKS	QUANTITY
STREET TREES				
	ACER TRUNCATUM 'RUBY SUNSET' / RUBY SUNSET MAPLE	2" CAL.	B&B, MATCHED	2
	PRUNUS SERRULATA 'KWANZAN' / KWANZAN CHERRY	2" CAL.	B&B, MATCHED	9
DECIDUOUS TREES (SEE NOTE 4 BELOW)				
	ACER CIRCINATUM VINE MAPLE	6'8" HT.*	B&B, MATCHED	35
	ACER MACROPHYLLUM BIG LEAF MAPLE	2" CAL.	B&B, MATCHED	5
	CORYLUS CORNUTA HAZELNUT	6' HT.	B&B, MATCHED	7
	PRUNUS EMARGINATA BITTER CHERRY	2" CAL.	B&B, MATCHED	4
CONIFEROUS TREES (SEE NOTE 4 BELOW)				
	ABIES GRANDIS GRAND FIR	6'8" HT.**	B&B, FULL FORM	14
	PINUS CONTORTA 'LATIFOLIA' LODGE POLE PINE	6'8'/10' HT.***	B&B, MATCHED,	16
	THUJA PLICATA WESTERN RED CEDAR	6'8'/10' HT.***	B&B, MATCHED,	57
	TSUGA HETEROPHYLLA WESTERN HEMLOCK	6' HT.	B&B, MATCHED,	6
SHRUBS (UNDERSTORY)				
	MAHONIA AQUIFOLIUM OREGON GRAPE	2 GAL.	CONTAINER	45
	MAHONIA NERVOSA OREGON GRAPE	2 GAL.	CONTAINER	13
	RIBES SANGUINEUM RED FLOWERING CURRANT	2 GAL.	CONTAINER	32
	VACCINIUM OVATUM EVERGREEN HUCKLEBERRY	2 GAL.	CONTAINER	52
GROUNDCOVER (UNDERSTORY)				
AU	ARCTOSTAPHYLOS UVA URSI KINNICKINICK	4" POTS	CONTAINER/18" O.C.	92
GS	GAULTHERIA SHALLON SALAL	1 GAL.	CONTAINER/30" O.C.	500
	POLYSTICHUM MUNITUM SWORD FERN	2 GAL.	CONTAINER	96

	LAWN (SOD OR SEED)	N/A	HIGH QUALITY MIX SELECTED FOR PNW. SEE SPECIFICATION ON SHEET L6
NOTES - ALL PLANTS ARE PREFERRED SPECIES FOR PLANTING (GHMC 17.78.050) - STREET TREES ARE PER CITY APPROVED LIST - CITY OF GIG HARBOR APPROVED STREET TREE LIST (APPENDIX A) PUBLIC WORKS STANDARDS 2017. - INCREASED TREE HEIGHT (EXCEEDING CODE REQUIREMENT SHALL BE AS FOLLOWS) *20% (APPROXIMATE) OF THE SPECIFIED ACER CIRCINATUM SHALL BE 8' HEIGHT. **20% (APPROXIMATE) OF THE SPECIFIED ABIES SHALL BE 8' HEIGHT. ***10% (APPROXIMATE) OF THE SPECIFIED THUJA PLICATA AND PINUS CONTORTA SHALL BE 10' HT., 25% SHALL BE 8' HT AND 65% SHALL BE 6' HT. - SEE SHEET L5 FOR PROPOSED TREE QUANTITIES WITHIN THE 30' ENHANCEMENT CORRIDOR			

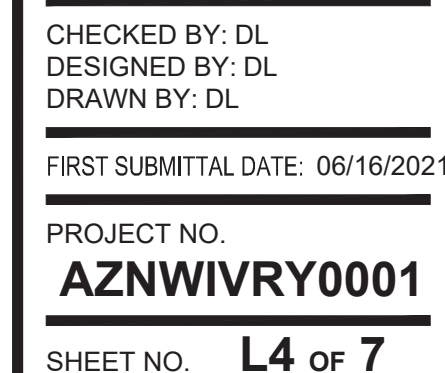
1. SINGLE STEM DECIDUOUS TREES SHALL BE SYMMETRICAL AND MATCHED
2. CONIFEROUS TREES SHALL BE FULL TO BASE, SYMMETRICAL, SINGLE STRAIGHT LEADER.
3. SHRUBS SHALL BE WELL ROOTED, FULL FORMED.
4. GROUNDCOVERS SHALL BE WELL ROOTED AND FULL FORMED.
5. NEW PLANTINGS HAVE BEEN PLACED IN THE APPROXIMATE LOCATION WHERE IT IS EXPECTED THAT THERE IS LIMITED UNDERSTORY WHERE TREES ARE DEADJUNING TO PERMIT THE ARBORIST AND WHERE TREES ARE PROPOSED FOR REMOVAL, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD ADJUST PLANT LOCATIONS TO MINIMIZE DISRUPTION TO EXISTING VEGETATION TO REMAIN.

TEMPORARY IRRIGATION SHALL BE PROVIDED FOR NEW PLANTINGS WITHIN THE PERIMETER BUFFER FOR THREE GROWING SEASONS.

PROPOSED PLANT MATERIAL WITHIN THE PERIMETER BUFFER IS EXPECTED TO BE LOW WATER USE ONCE ESTABLISHED. PROPOSED TREES, SHRUBS AND GROUND COVER ARE NATIVE SPECIES.

THE TEMPORARY IRRIGATION SYSTEM SHALL BE A DESIGN/BUILD SYSTEM.

STREET TREES AND LAWN IN STREET FRONTAGE SHALL BE WATERED WITH AN AUTOMATIC IRRIGATION SYSTEM.



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Save Date: 5/17/2022 7:41 AM E57 Dwg

A PORTION OF NE 1/4 OF THE SE 1/4 OF SEC. 25, TWP. 22 N., RNG. 1 E

ALTERNATIVE LANDSCAPING PLAN DESCRIPTION:
BUFFER PLANTING STANDARDS/PROPOSED BUFFER (APPLIES TO PERIMETER LANDSCAPING (NORTH AND EAST) AND ZONE TRANSITION BUFFER ALONG SOUTH)

EXISTING BUFFER	REQUIRED BUFFER	PROPOSED BUFFER	ALTERNATIVE LANDSCAPING PLANS (PER GHMC 17.78.100)
AS DESCRIBED IN THE SOUND URBAN FORESTRY ARBORIST REPORT DATED JANUARY 18, 2021 AND SUMMARIZED BELOW: TYPE 1 (NW QUADRANT OF THE SITE) INCLUDING THE NORTH 350 LF (APPROX.) OF THE SITE ALONG CANTERWOOD AND THE WEST 290' (APPROX.) OF THE NORTH PERIMETER • DOMINANT SPECIES- DOUG FIR (TYPICALLY 16") WITH SOME WESTERN RED CEDAR, RED ALDER, WESTERN HEMLOCK, MADRONE • TREE COVER IS DENSE TYPE 2 INCLUDES THE SLOPES/RIPARIAN AREA ALONG THE EAST AND SOUTH PORTION OF THE SITE • DOMINANT SPECIES- DOUG FIR (+/-22"), WESTERN RED CEDAR (+/-20") (TYPICALLY 22") WITH SOME RED ALDER, WESTERN HEMLOCK, BIG LEAF MAPLE • TREES ARE WELL SPACED TYPE 1 AND 2 • UNDERSTORY INCLUDES EVERGREEN HUCKLEBERRY, SALAL, OSOBERY, SWORD FERN, HAZELNUT, HEMLOCK AND CEDAR SEEDLINGS REFER TO ARBORIST REPORT FOR ADDITIONAL INFORMATION	BUFFER REQUIREMENTS PER COGH 17.78.060 IF THERE IS NOT AN EXISTING CANOPY, UNDERSTORY, GROUND COVER IT SHALL BE ENHANCED AS FOLLOWS • 80% OF PLANTINGS FROM PREFERRED SPECIES LIST • MIX OF EXISTING AND PROPOSED VEGETATION • PLANTINGS TO ACHIEVE 75% COVERAGE OF GROUND IN 3 YEARS • ENHANCED AREA WILL BE PLANTED WITH 1 DECIDUOUS TREE (2"), 1 EVERGREEN TREE (6"), 3 SHRUBS (3.5' IN 3 YEARS) PER EVERY 200 SF • 40% MIN. OF TREES SHALL BE EVERGREENS	• 100% OF PROPOSED PLANTINGS FROM PREFERRED SPECIES LIST • MIX OF EXISTING AND PROPOSED VEGETATION IS PROPOSED • 92.7% (APPROX) OF REQUIRED PERIMETER AREAS ARE 100% COVERED WITH EXISTING VEGETATION TO REMAIN. • AREAS WITH NEW PLANTINGS WHERE PLANT MATERIAL WAS REMOVED ARE DESIGNED TO ACHIEVE 75% COVERAGE REQUIREMENT WITHIN 3 YEARS. • ENHANCED AREA WILL BE PLANTED WITH 1 DECIDUOUS TREE, 1 EVERGREEN TREE, 3 SHRUBS (3.5' IN 3 YEARS) PER EVERY 200 SF. SOME NEW PLANTINGS WILL EXCEED REQUIRED PLANTING SIZES • ENHANCED AREA WILL BE PLANTED WITH 1 DECIDUOUS TREE, 1 EVERGREEN TREE, 3 SHRUBS (3.5' IN 3 YEARS) PER EVERY 200 SF. SOME NEW PLANTINGS WILL EXCEED REQUIRED PLANTING SIZES • 66% OF PROPOSED TREES SHALL BE EVERGREENS, 69% OF TREES RETAINED IN BUFFER ARE EVERGREENS	• REQUIREMENT EXCEEDED BY 20% • REQUIREMENT IS MET (92.7% OF THE REQUIRED BUFFER IS EXISTING VEGETATION TO REMAIN/7.3% IS NEW LANDSCAPING. INFILL PLANTING IS PROPOSED WITHIN PORTION OF THE NORTH PERIMETER. • REQUIREMENT IS EXCEEDED • ENHANCED AREA WILL BE PLANTED WITH 1 DECIDUOUS TREE, 1 EVERGREEN TREE, 3 SHRUBS (3.5' IN 3 YEARS) PER EVERY 200 SF. SOME NEW PLANTINGS WILL EXCEED REQUIRED PLANTING SIZES. SEE PLANT LIST NOTES FOR UPSIZED PROPOSED TREES. • 40% REQUIREMENT IS EXCEEDED BY 26% FOR ROPOSED TREES AND 29% FOR RETAINED TREES IN REQUIRED PERIMETER BUFFER. OVERALL PERIMETER LANDSCAPING AREA EXCEEDS AREA REQUIRED AS FOLLOWS • BUFFER IN SOUTH 20% ALONG CANTERWOOD EXCEEDS REQUIRED 30' BUFFER WIDTH. (BUFFER WIDTH THIS AREA IS 560' (FULL LENGTH OF PROPERTY). • REQUIRED BUFFER ALONG SOUTH PROPERTY LINE IS 40' WIDE. ADJACENT TO THE DEVELOPMENT AREA THE BUFFER IS 103' WIDE. EAST OF THE DEVELOPMENT AREA THE BUFFER IS THE ENTIRE WIDTH OF THE PROPERTY (APPROX. 450' WIDE) REQUIRED BUFFER ALONG THE NORTH PROPERTY LINE IS 25' WIDE. THIS WIDTH IS MET AT THE DEVELOPMENT AREA. EAST OF THE DEVELOPMENT AREA THE BUFFER IS THE ENTIRE WIDTH OF THE PROPERTY (APPROX. 450' WIDE) • OVERALL BUFFER/PERIMETER AREA WITH EXISTING VEGETATION TO BE RETAINED EXCEEDS REQUIRED SITE BUFFER/PERIMETER. 53,819 SF IS REQUIRED, 140,929 SF IS PROPOSED. (SEE PERIMETER BUFFER CALCULATION SHEET L1)

ALTERNATIVE DESIGN DESCRIPTION:
ENHANCEMENT CORRIDOR COMPARISON ILLUSTRATING IMPROVED DESIGN (APPLIES TO 30' WIDE ENHANCEMENT CORRIDOR PARALLEL CANTERWOOD BLVD.)

EXISTING CORRIDOR		ENHANCEMENT CORRIDOR WITH PROPOSED PLANTING																											
		ALTERNATIVE DESIGN SOLUTIONS EXCEEDING REQUIREMENTS IN COGH 17.99.160 ENHANCEMENT CORRIDOR STANDARDS. THE PLANTINGS PROPOSED IN THIS AREA WILL PROVIDE A SEMI TRANSPARENT SCREEN																											
• QUANTITY OF TREES:	• 63 EXISTING SIGNIFICANT TREES (OF THESE 1 IS DEAD, 16 MUST BE REMOVED TO ALLOW ACCESS TO THE SITE, 14 ARE TO BE REMOVED FOR FRONTAGE/SITE IMPROVEMENTS AND 33 ARE PROPOSED TO BE RETAINED).	• 128 (32 EXISTING PLUS 96 PROPOSED) TOTAL NATIVE TREES (AFTER REMOVAL AND REPLANTING PER LANDSCAPE PLANS). THIS LANDSCAPE DESIGN PROPOSES MORE TREES THAN DOUBLE THE EXISTING TREE QUANTITY (EXISTING PLUS PROPOSED NEW TREES). NEW TREES ADDED TO ENHANCEMENT CORRIDOR WILL ALL BE FROM THE CITY'S PREFERRED SPECIES LIST, 20 PERCENT BEYOND THE 80 PERCENT REQUIRED BY GHMC 17.78.060 (B)(2)(A).																											
• PROPOSED TREE SIZES:	• VARYING HEIGHT OF EXISTING TREES	• THIS LANDSCAPE DESIGN WILL PROVIDE TREE PLANTINGS SOME OF WHICH ARE LARGER IN SIZE THAN WHAT IS REQUIRED BY COGH CODE CHAPTER 17.78. PROPOSED TREE HEIGHTS THAT ARE VARIED WILL CREATE A VISUAL BUFFER THAT IS MORE NATURALISTIC IN APPEARANCE AND HELPS MAINTAIN THE SCENIC BEAUTY WHICH CHARACTERIZES TRAVEL ACROSS GIG HARBOR PENINSULA AS REQUIRED IN COGH 17.99. PROPOSED TREE SIZES WILL BE AS FOLLOWS WITHIN ENHANCEMENT CORRIDOR:																											
PROPOSED TREE QUANTITIES IN ENHANCEMENT CORRIDOR (EC) WITH VARYING PLANTING HEIGHTS																													
		<table><tr><th>TREE SPECIES & MINIMUM PLANTING HEIGHT</th><th>TOTAL PROPOSED (EC) TREES</th><th>6' HT. SIZE AS REQ. BY COGH CODE</th><th>8' HT. UPSIZED TREE EXCEEDS CODE REQUIREMENT</th><th>10' HT. UPSIZED TREE EXCEEDS CODE REQUIREMENT</th></tr><tr><td>ACER CIRCINATUM</td><td>25</td><td>20</td><td>5</td><td>0</td></tr><tr><td>ABIES GRANDIS</td><td>8</td><td>6</td><td>2</td><td>0</td></tr><tr><td>PINUS CONTORTA 'LATIFOLIA'</td><td>11</td><td>7</td><td>3</td><td>1</td></tr><tr><td>THUJA PLICATA</td><td>38</td><td>24</td><td>10</td><td>4</td></tr></table>			TREE SPECIES & MINIMUM PLANTING HEIGHT	TOTAL PROPOSED (EC) TREES	6' HT. SIZE AS REQ. BY COGH CODE	8' HT. UPSIZED TREE EXCEEDS CODE REQUIREMENT	10' HT. UPSIZED TREE EXCEEDS CODE REQUIREMENT	ACER CIRCINATUM	25	20	5	0	ABIES GRANDIS	8	6	2	0	PINUS CONTORTA 'LATIFOLIA'	11	7	3	1	THUJA PLICATA	38	24	10	4
TREE SPECIES & MINIMUM PLANTING HEIGHT	TOTAL PROPOSED (EC) TREES	6' HT. SIZE AS REQ. BY COGH CODE	8' HT. UPSIZED TREE EXCEEDS CODE REQUIREMENT	10' HT. UPSIZED TREE EXCEEDS CODE REQUIREMENT																									
ACER CIRCINATUM	25	20	5	0																									
ABIES GRANDIS	8	6	2	0																									
PINUS CONTORTA 'LATIFOLIA'	11	7	3	1																									
THUJA PLICATA	38	24	10	4																									
• DIVERSITY OF TREES:	• 3 VARIETIES OF EXISTING SIGNIFICANT HEALTHY TREES (39 DOUGLAS FIR, 65%, 19 MADRONA, 32% AND 1 BIG-LEAF MAPLE, 2%, 1 HEMLOCK WHICH IS DEAD)	• 7 ADDITIONAL VARIETIES OF NATIVE TREES (96 TOTAL TREES) WILL BE ADDED TO THE PLANTING OF THE ENHANCEMENT CORRIDOR (38 THUJA PLICATA, 40%, 11 PINUS, 11%, 8 ABIES, 8%, 6 TSUGA, 6%, 25 VINE MAPLE, 26%, 3 ACER MACROPHYLLUM, 3%, 3 CORYLUS, 3% AND 2 PRUNUS EMARGINATA, 2%). THIS MIX/VARIETY OF TREE SPECIES WILL HELP DISCOURAGE MONOCULTURE AND POTENTIAL SPREAD OF TREE BORNE DISEASES (SEE BELOW).																											
• POTENTIAL REDUCTION OF SPREAD OF LAMINATED ROOT ROT:	• PER ARBORISTS REPORT OF 1/18/2021 WITHIN THE TYPE I VEGETATION DESCRIPTION (AN AREA WHICH INCLUDES THE ENHANCEMENT CORRIDOR) A POCKET OF LAMINATED ROOT ROT (CONIFERIPORIA WEIRII) WAS FOUND. LAMINATED ROOT ROT (LRR) PRIMARILY AFFECTS TREE SPECIES SUCH AS HEMLOCK AND DOUGLAS FIR (THE PRIMARY TREE BEING REMOVED FROM THE ENHANCEMENT CORRIDOR). LRR SPREADS PRIMARILY THROUGH ROOT-TO-ROOT CONTACT BETWEEN INFECTED AND UNINFECTED TREES.	• LAMINATED ROOT ROT CAN THUS BE REDUCED BY REPLACING TREES THAT ARE SUSCEPTIBLE (SUCH AS DOUGLAS FIR) BY PLANTING WITH THE PROPOSED NATIVE TREES THAT ARE RESISTANT SUCH AS (ABIES, ACER, PINUS, PRUNUS & THUJA). THIS MIX OF TREES CAN HELP REDUCE THE CONTINUED INFESTATION OF EXISTING TREES WITH LRR AND PROVIDE FOR A HEALTHIER CANOPY OF TREES.																											
• REINVIGORATION OF EXISTING SOILS:	• EXISTING SOILS POTENTIALLY COMPACTED AND DEPLETED OF NUTRIENTS.	• DISTURBED AREAS PROPOSED TO BE REPLANTED WITH TREES AS DESCRIBED ABOVE AND UNDERSTORY (WHICH INCLUDE A MIX OF NATIVE SHRUBS AND GROUND COVER) WILL INCLUDE NEW ORGANIC / MINERAL RICH SOILS AND COMPOST. ADDITION OF SUCH SOILS AND MULCH WILL PROVIDE MUCH NEEDED ORGANICS AND AERATION TO EXISTING SOILS PROMOTING STRONGER ROOT GROWTH AND HEALTHIER TREES.																											
• ELIMINATION OF INVASIVE WEEDS AND REMOVAL OF SMALLER ALDER STARTS AND REPLACEMENT WITH NATIVE PLANS WITH EMPAHSIS ON CONIFERS:	• PRESENCE OF INVASIVE EXISTING WEEDS VERY LIKELY.	• CLEARING EXISTING UNDERSTORY IN AREAS TO BE REPLANTED WILL RESULT IN REMOVAL OF EXISTING INVASIVE PLANTS. THE CREATION OF NEW UNDERSTORY IN AREAS TO BE PLANTED WILL PROVIDE A DESIRABLE UNDERSTORY WITH NATIVE SPECIES SUCH AS MAHONIA, SALAL, RIBES, SWORD FERN AND VACCINIUM. IN RESPONSE TO THIS (AND PER CHAPTER 17.78.060 (B)(2)(C) GHMC) NEW AREAS TO BE LANDSCAPED SHALL BE COVERED WITH LIVE GROUND COVER VEGETATION WHICH ARE DESIGNED TO COVER AT LEAST 75 PERCENT OF THE GROUND AREA WITHIN THREE YEARS.																											
• EXISTING WALL PLUS ADJUSTED NEW WALL OF SIMILAR HEIGHT TO MAINTAIN EXISTING GRADES IN ENHAMCEMENT CORRIDOR SOUTH OF ROAD A:	• AREA IN ENHANCEMENT CORRIDOR NEAREST THE SOUTH PROPERTY LINE HAS FEW SIGNIFICANT TREES AND INCLUDES SMALLER ALDERS.	• WITH A COMBINATION OF EXISTING AND A NEW ADJUSTED WALL SIMILAR IN HEIGHT TO THE EXISTING WALL, GRADES IN THE ENHANCEMENT CORRIDOR SOUTH OF ROAD A WILL REMAIN UNCHANGED AND SIGNIFICANT TREES IN THIS AREA WILL BE RETAINED. THESE TEES WILL BE SUPPLEMENTED WITH ADDITIONAL VEGETATION IN LESS DENSELY VEGETATED AREAS AND/OR WHERE INVASIVE PLANTS AND/OR SMALLER ALDER STARTS ARE REMOVED.	• 66% OF THE TREES PROPOSED IN THIS AREA WILL BE NATIVE CONIFERS IN A MIX OF SIZES DESCRIBED ABOVE.																										

A PORTION OF NE 1/4 OF THE SE 1/4 OF SEC. 25, TWP. 22 N., RNG. 1 E

PLANTING NOTES

GENERAL NOTES

- CONTRACTOR SHALL VERIFY EXISTING SITE CONDITIONS PRIOR TO BEGINNING CONSTRUCTION. NOTIFY OWNER OF DISCREPANCIES, BETWEEN PLANS AND ACTUAL FIELD CONDITIONS.

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO EXISTING UTILITIES OR IMPROVEMENTS RESULTING FROM THEIR WORK. REPAIRS SHALL BE MADE AT NO EXPENSE TO THE OWNER.

- THE CONTRACTOR SHALL NOTIFY THE OWNERS REPRESENTATIVE PRIOR TO BEGINNING CONSTRUCTION, AND SHALL KEEP THE OWNER INFORMED OF PROGRESS OF WORK THROUGHOUT CONSTRUCTION.

- SITE VISITS BY THE LANDSCAPE ARCHITECT TO INSPECT PROGRESS OF WORK AND ITS CONFORMANCE WITH THE PLANS SHALL BE AS DIRECTED BY THE OWNER'S REPRESENTATIVE.

- EXECUTE PERIODIC CLEANING OF THE SITE THROUGHOUT THE CONTRACT PERIOD TO REMOVE WASTE MATERIALS, RUBBISH, PLANT CONTAINERS RESULTING FROM THEIR WORK.

- WRITTEN DIMENSIONS SUPERSEDE SCALED DISTANCES. DIMENSIONS ARE TAKEN FROM THE BACK OF CURB, FACE OF BUILDING OR FACE OF FENCE.

- REFER TO COMPLETE PROJECT PLAN SETS FOR RELATED DISCIPLINES INCLUDING SITE PLAN, GRADING & UTILITY INFORMATION, AS APPLICABLE.

- CONTRACTOR SHALL COORDINATE THEIR WORK WITH ALL OTHER APPLICABLE TRADES, AS NECESSARY.

QUALITY ASSURANCE

- WORK SHALL BE INSTALLED IN CONFORMANCE WITH APPLICABLE LOCAL CODES AND ORDINANCES

- PLANTING SHALL BE PERFORMED BY A LICENSED AND BONDED CONTRACTOR

- CONTRACTOR SHALL OBTAIN NECESSARY PERMITS AND PAY REQUIRED FEES.

- CHEMICAL APPLICATIONS SHALL BE APPLIED BY LICENSED APPLICATOR.

- LATEST ISSUE OF AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY AMERICAN ASSOCIATION OF NURSERYMEN SHALL BE USED TO GRADE NURSERY STOCK, ANSI Z60.1

- PLANT NOMENCLATURE SHALL CONFORM TO THAT USED IN NEW SUNSET WESTERN GARDEN BOOK CURRENT EDITION. NAMES AND VARIETIES NOT LISTED IN THIS REFERENCE SHALL BE THOSE MOST COMMONLY USED IN THE NURSERY TRADE.

PROJECT CONDITIONS

- PLANT DURING PERIODS NORMAL FOR OPTIMUM PLANT GROWTH, AS DETERMINED BY SEASON, WEATHER CONDITIONS, AND ACCEPTED PRACTICE. IF CONTRACTOR CHOOSES TO PERFORM PLANTING OPERATIONS UNDER UNSEASONABLE CONDITIONS, THEY WILL DO SO WITHOUT ADDITIONAL COMPENSATION TO THE CONTRACTOR AND THE CONTRACTOR SHALL ACCEPT FULL RESPONSIBILITY FOR ANY SUBSEQUENT RESULTING LOSSES

SEQUENCING & SCHEDULING

- LANDSCAPE CONTRACTOR SHALL COORDINATE WITH OTHER SITE CONTRACTORS AND OWNER'S REPRESENTATIVE TO DEVELOP A SCHEDULE FOR LANDSCAPE INSTALLATION.

- COORDINATE WITH EARTHWORK CONTRACTOR TO ESTABLISH APPROPRIATE SUBGRADE ELEVATIONS AS REQUIRED BY PLANTING SOIL AND MULCH DEPTHS SPECIFIED HEREIN AND ON THE DRAWINGS.

PRODUCTS:

PLANTS

- PROVIDE PLANTS AS INDICATED ON DRAWINGS.

- PLANT SUBSTITUTIONS SHALL BE APPROVED PRIOR TO DELIVERY TO THE SITE.

- QUANTITIES SHOWN ON DRAWINGS ARE FOR CONTRACTOR'S CONVENIENCE ONLY. CONTRACTOR IS RESPONSIBLE FOR TOTAL NUMBER OF PLANTS REPRESENTED GRAPHICALLY OR BY CALCULATION.

- CONDITION: ALL PLANTS SHALL CONFORM TO THE FOLLOWING MINIMUM REQUIREMENTS:

- NURSERY GROWN, UNLESS OTHERWISE SPECIFIED.
- SUPPLIED IN APPROPRIATE CONTAINER, BALLED OR BURLAPPED, OR BARE ROOT AS SPECIFIED ON DRAWINGS.
- IN VIGOROUS GROWING CONDITION WITH FULL FOLIAGE AND FULLY, SYMMETRICALLY BRANCHED TYPICALLY REPRESENTATIVE OF THE SPECIES.
- PLANTS SHALL MEET GOVERNING REGULATIONS CONCERNING PESTS, WEEDS AND DISEASE & SHALL BE FREE FROM ALL PESTS, DISEASES & WEEDS.
- FULLY AND COMPLETELY ROOTED, BUT NOT ROOTBOUND.
- PLANT GRADING SHALL CONFORM TO ANSI Z60.1.

- STREET TREES: UNIFORM IN APPEARANCE, SIZE AND STRUCTURE.

- OVERSIZED PLANTS: PLANTS LARGER THAN SPECIFIED SIZE MAY BE USED PROVIDING HEIGHT, SPREAD, CALIPER, AND ROOT BALL DIMENSIONS CONFORM TO ANSI Z60.1.

- PLANTS SHALL BE INSPECTED BY THE OWNER'S REPRESENTATIVE AT TIME OF DELIVERY. REJECTED PLANTS SHALL BE REMOVED FROM THE SITE IMMEDIATELY.

SOILS AND COMPOST

SOIL MIX FOR PLANT PIT BACKFILL

- 2-WAY TOPSOIL TO BE APPROVED BY OWNER'S REPRESENTATIVE. TOPSOIL SHALL BE 50% COMPOST AND 50% SAND, SANDY LOAM OR SILTY SAND AND SHALL MEET THE FOLLOWING SPECIFICATIONS
SCREEN SIZE (APPROXIMATE PARTICLE SIZE) 7/16" MAXIMUM
TOTAL NITROGEN 25% MINIMUM
ORGANIC MATTER 10% MINIMUM
PH RANGE 5.5-8.0
CONDUCTIVITY 4 MMHOS/CM MAXIMUM
TOPSOIL MUST BE FREE OF VIABLE PLANTS, PLANT PARTS, OR SEEDS.

STRUCTURAL SOIL FOR STREET TREES ALONG CANTERWOOD BLVD.

- CU STRUCTURAL SOIL SUPPLIED BY PACIFIC TOPSOILS, INC., OR APPROVED EQUAL.

TOPSOIL TYPE A

- TOPSOIL TYPE A SHALL BE COMPOSED OF A THREE-WAY MIX CONSISTING BY VOLUME OF:
3 PARTS SOIL
3 PARTS 5/8-INCH COMPOST
1 PART SAND

SOIL IS CLASSIFIED AS GRAVELLY SAND, WELL-GRADED SAND, POORLY GRADED SAND, OR SILT SAND.

COMPOST SHALL BE A WEED FREE, WELL DECOMPOSED, HUMUS-LIKE MATERIAL DERIVED FROM THE DECOMPOSITION OF GRASS CLIPPINGS, LEAVES, BRANCHES, WOOD AND OTHER ORGANIC MATERIALS. COMPOSTS CONTAINING SHAVINGS, CEDAR SAWDUST, OR STRAW WILL NOT BE PERMITTED. COMPOST SHALL BE PRODUCED AT A PERMITTED SOLID WASTE COMPOSTING FACILITY.

SAND SHALL CONSIST OF 100 PERCENT PASSING THE 3/8-INCH SIEVE, MINIMUM 95 PERCENT PASSING THE #4 SIEVE, AND MAXIMUM OF 5 PERCENT PASSING THE #100 SIEVE.

COMPOST

- COMPOST SHALL BE THE RESULT OF THE BIOLOGICAL DEGRADATION AND TRANSFORMATION OF PLANT DERIVED MATERIALS UNDER CONTROLLED CONDITIONS TO PROMOTE AEROBIC DECOMPOSITION. COMPOST SHALL BE STABLE WITH REGARD TO OXYGEN CONSUMPTION AND CARBON DIOXIDE GENERATION. COMPOST SHALL BE MATURE WITH REGARD TO ITS SUITABILITY FOR SERVING AS A SOIL AMENDMENT. THE COMPOST SHALL HAVE A MOISTURE CONTENT THAT HAS NO VISIBLE FREE WATER OR DUST PRODUCED WHEN HANDLING THE MATERIAL.

SCREEN SIZE (APPROXIMATE PARTICLE SIZE) 7/16" MAXIMUM
MATURITY MEASURE GREATER THAN 80%
TOTAL NITROGEN 5% MINIMUM
MINIMUM ORGANIC MATTER 40%
PH RANGE 6.0-8.5
FOREIGN MATTER BY DRY WEIGHT 0.5% MAXIMUM
SOLUBLE SALT CONTENT LESS THAN 3 MMHOS/CM MAXIMUM
STABILITY 7 OR BELOW

TOPSOIL AND COMPOST SHALL BE TESTED BY THE SUPPLIER WITHIN 90 DAYS OF APPLICATION USING THE SEAL OF TESTING ASSURANCE (STA) PROTOCOL TO MEET THE REQUIREMENTS OF THE US COMPOSTING COUNCIL.

FERTILIZER

- TREES, SHRUBS AND GROUND COVER:

- TOPDRESSING FERTILIZER IN SHRUB BED SHALL BE APPLIED ONLY AS REQUIRED BY RESULTS OF SOIL TESTING FOR PLANT FERTILITY

- SLOW RELEASE OSMOCOTE WITH 6 MONTH MINIMUM LIFE, OR EQUAL

MULCH

- MULCH SHALL BE SPECIFIED COMPOST

ROOT BARRIER

- ROOT BARRIER SHALL BE DEEP ROOT UB 24-2 BY DEEP ROOT. TREE ROOT GUIDE RS-40 BY ROOT SOLUTIONS, ROOT BARRIER PANEL EP-1250 BY NDS, OR APPROVED EQUAL. WIDTH OF ROOT BARRIER SHALL BE 15 FEET LONG CENTERED ON TREE AND SHALL BE 2" DEEP MIN.

PROCEDURES:

EXAMINATION

- EXAMINE SITE AND VERIFY THAT LINES, LEVELS, GRADES ARE ACCEPTABLE AND CONDITION OF EXISTING SOIL IS READY TO RECEIVE WORK.

- START OF WORK SHALL INDICATE CONTRACTOR'S ACCEPTANCE OF EXISTING CONDITIONS.

SOIL PREPARATION

- THIS PROJECT INCLUDES PIT PLANTING OF TREES WITHIN THE EXISTING BUFFER. PREPARE TREE PIT PER THE DETAILS.

- MINIMIZE DAMAGE/COMPACTION TO EXISTING BUFFER SOILS DURING THIS WORK.

FINE GRADING

- RESTORE AREAS AROUND NEW TREE PLANTING TO ORIGINAL CONDITION. RAKE AREA SMOOTH.

TREE & SHRUB PLANTING

- EXCAVATE PLANT PITS TO SIZES INDICATED ON DRAWINGS.

- DO NOT PLANT UNTIL DIRECTION CONCERNING POSITIVE DRAINAGE IS GIVEN BY GENERAL CONTRACTOR.

- FERTILIZE PLANT PITS AT PLANTING WITH AGRIFORM TABLETS, 20-10-5, OR EQUAL. APPLICATION RATE SHALL BE PER MANUFACTURER'S INSTRUCTION

- SET PLUMB FACE FOR BEST APPEARANCE. SET SO ROOT CROWN WILL SETTLE TO APPROPRIATE LEVEL RELATED TO SURROUNDING FINISHED GRADES AFTER SETTLING HAS OCCURRED.

- WATERING: CONSTRUCT WATER BASINS AND THOROUGHLY WATER PLANTS IMMEDIATELY AFTER PLANTING.

- RESTORE FINISHED GRADES BY HAND RAKING. LEAVE WATER BASINS IN PLACE.

- PLACE SPECIFIED MULCH AND HAND RAKE SMOOTH

- FERTILIZE BY TOPDRESSING NEW SHRUB AND TREE PLANTING, WITH PROFESSIONAL'S CHOICE - THE STARTER 4-2-2, OR EQUAL APPLICATION RATE SHALL BE PER MANUFACTURER'S INSTRUCTION

- STAKE TREES AS INDICATED IN DETAILS.

- GROUND COVER PLANTING SHALL BEGIN AT THE FOLLOWING DISTANCES FROM OTHER SITE ELEMENTS 12" FROM DRIPLINE OF CONIFERS, 24" FROM TRUNK OF DECIDUOUS TREE, 18" FROM OUTER BRANCHES OF SHRUBS, 18" FROM ADJACENT HARD SURFACES

MULCHING

- APPLY MULCH (DEPTH PER DETAIL) OF SPECIFIED MULCH TO FINISHED GRADE IN ALL SHRUB AND GROUND COVER BEDS.

- THOROUGHLY WATER MULCHED AREAS TO ENSURE MOISTURE PENETRATION TO THE SOIL.

PERIMETER BUFFER PLANTING NOTES

- WITHIN ENHANCED CORRIDOR AND PERIMETER BUFFERS GRUB WHERE TREES HAVE BEEN REMOVED. REMOVE AND DISPOSE OF ALL DEBRIS FROM VEGETATION REMOVAL.

- REMOVE INVASIVE WEEDS IN AREAS TO RECEIVE NEW PLANTING AT TIME OF PLANTING. LANDSCAPE/MAINTENANCE CONTRACTOR SHALL BE RESPONSIBLE FOR ONGOING INVASIVE PLANT REMOVAL TO AVOID COMPETITION WITH NEW PLANTINGS DURING PLANT ESTABLISHMENT.

- LANDSCAPE/MAINTENANCE CONTRACTOR SHALL BE RESPONSIBLE FOR SUCCESS OF ENHANCED CORRIDOR AND PERIMETER BUFFER PLANTINGS. THIS SHALL INCLUDE AND IS NOT LIMITED TO SUFFICIENT WATERING OF PLANTINGS AND MULCH APPLICATION.

- CUT STUMPS TO GRADE AND LEAVE IN PLACE.

- PLACE 6" MINIMUM OF TOPSOIL (DEEPER AS REQUIRED) TO LEAVE A SMOOTH, CONTINUOUS FINISH GRADE.

- TILL TOPSOIL INTO SUBGRADE TO AN APPROXIMATE TOTAL DEPTH OF 12"

- WHERE TREES AND UNDERSTORY ARE REMAINING IN THE BUFFER, CONTRACTOR SHALL ADJUST PLANTING AS NEEDED TO AVOID DAMAGE TO EXISTING TREES TO REMAIN.

- TREES SHALL NOT BE PLANTED WITHIN UTILITY EASEMENTS NOR 5' FROM UTILITIES.

- DO NOT PLANT TREES WITHIN 5' OF ANY WALLS OR PROPERTY LINE FENCES.

INSPECTION, GUARANTEE & MAINTENANCE

- KEEP AREAS OF WORK CLEAN, NEAT AND ORDERLY WHILE WORK IS IN PROGRESS.

- THE LANDSCAPE CONTRACTOR SHALL CONTACT THE OWNER'S REPRESENTATIVE PRIOR TO BEGINNING CONSTRUCTION. DISCREPANCIES OR OTHER PROBLEMS SHALL BE RESOLVED AT THIS TIME.

- MAINTENANCE PERIOD SHALL BEGIN UPON INSPECTION AND APPROVAL BY OWNER'S REPRESENTATIVE, AND SHALL BE FOR 120 CALENDAR DAYS.

- MAINTENANCE OF NEW PLANTING SHALL CONSIST OF WATERING, CULTIVATING, WEEDING, MULCHING, RESETTling PLANTS TO PROPER GRADES OR UPRIGHT POSITION, RESTORATION OF THE PLANTING SAUCER, AND FURNISHING AND APPLYING SUCH SPRAYS AND INVIGORANTS AS ARE NECESSARY TO KEEP THE PLANTINGS FREE OF INSECTS AND DISEASE AND IN THRIVING CONDITION.

- PLANT MATERIAL SHALL BE IN THRIVING CONDITION ONE YEAR FROM DATE OF FINAL ACCEPTANCE.

- REPLACE NEW PLANT MATERIAL WHICH HAS LOST 30% OR MORE OF THEIR NORMAL FOLIAGE.

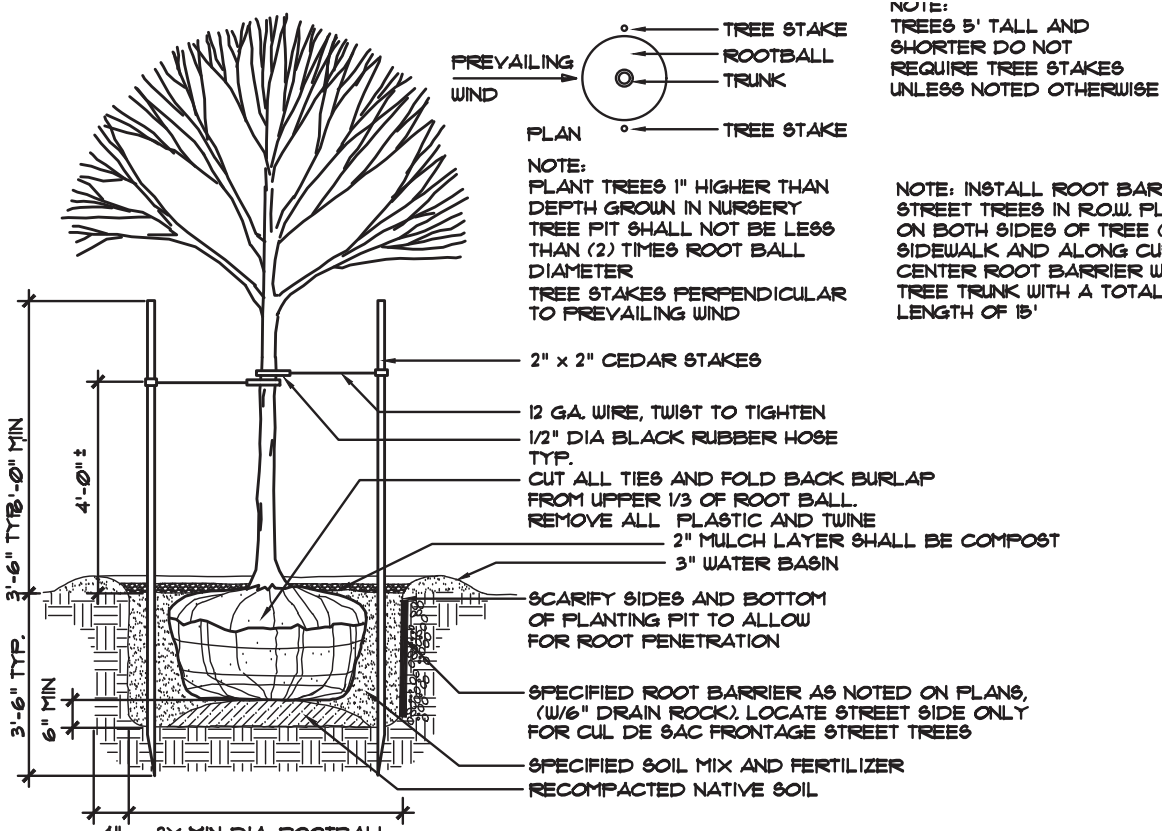
SEED MIXES

Lawn Seed Mix
40% Manhattan V Perennial Ryegrass
30% Orn. Cheeping Fescue
30% Marvel Creeping Red Fescue

Lawn Seed Bed Preparation:
2" compost rototilled to 6" depth
into subgrade. Remove large rocks
from surface prior to seeding.

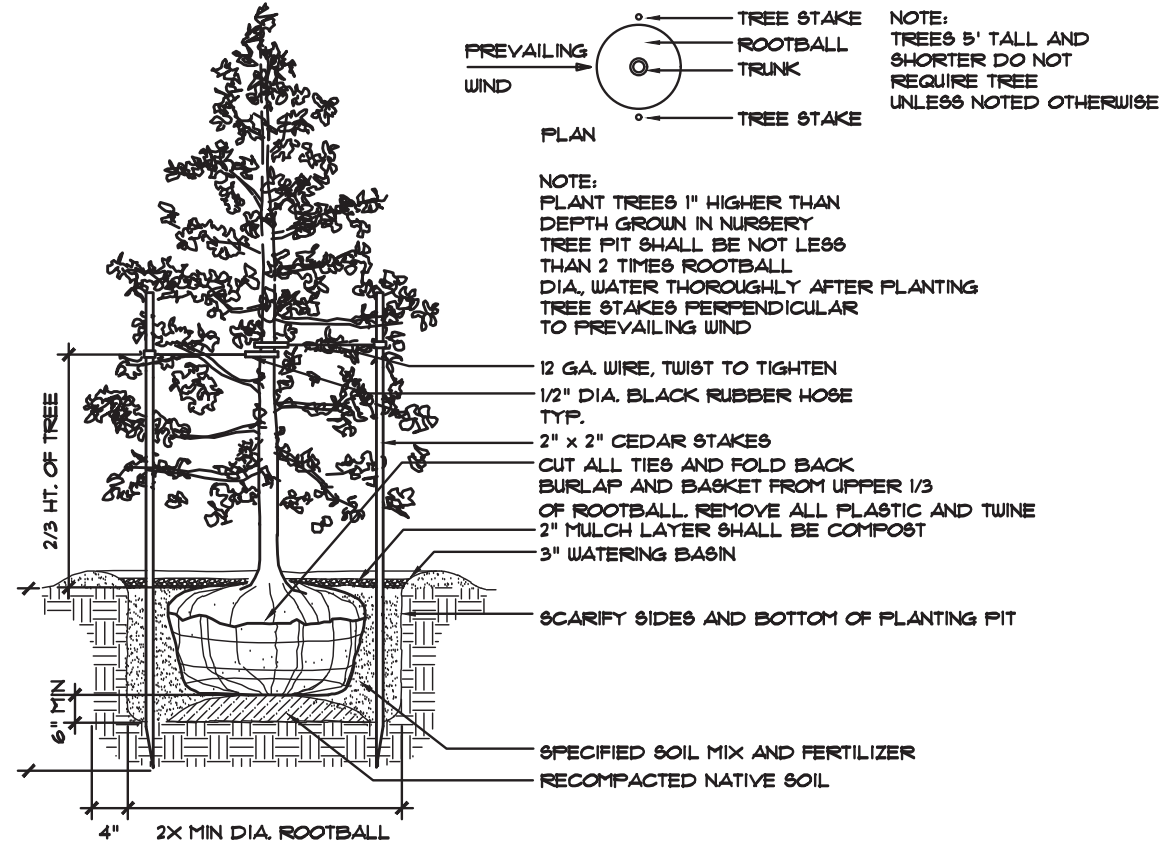
Application rate for all seeding shall be minimum 24 lbs. per acre for areas less than 3:1 slope, and minimum 48 lbs. per acre for areas with slopes of 3:1 or steeper.

Seed mixes are available through:
Clearwater Seed
827 West 1st Ave., Suite 307
Spartan, WI 54281
(309)343-3108



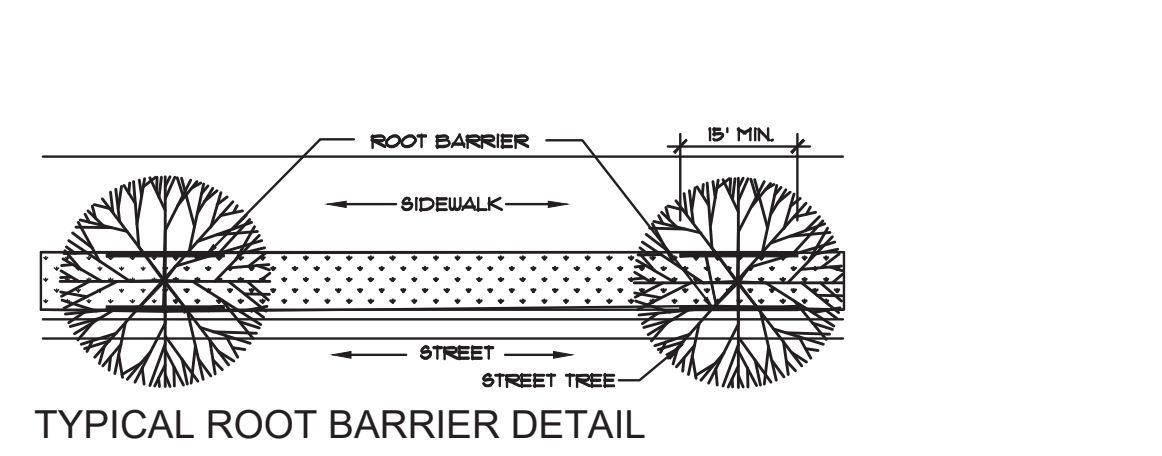
TYPICAL DECIDUOUS/BROADLEAF TREE PLANTING

NOT TO SCALE



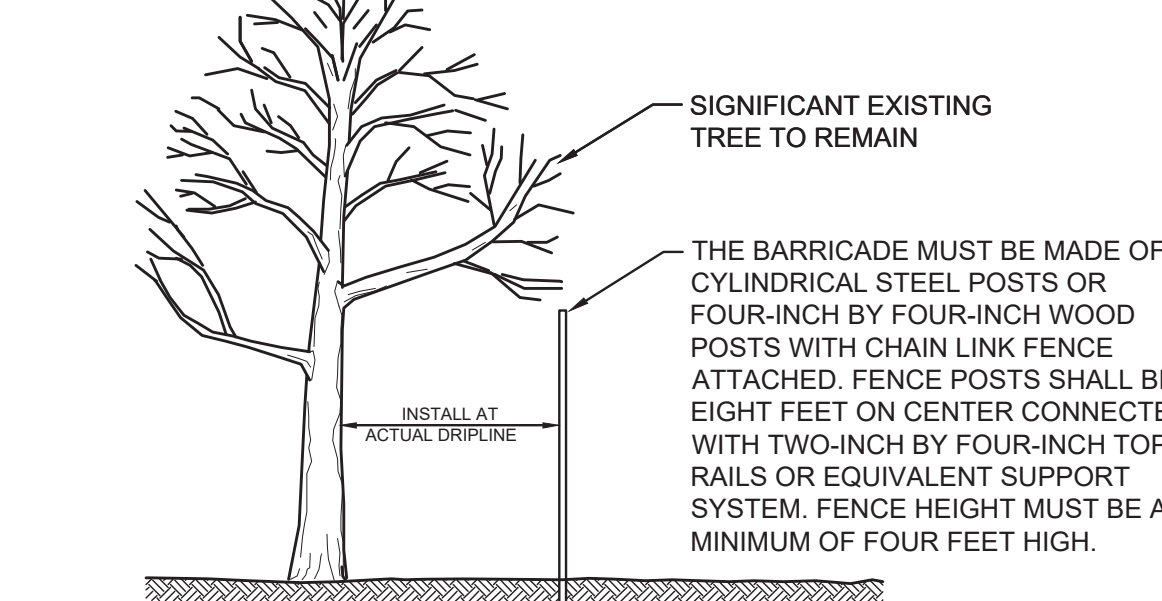
TYPICAL CONIFEROUS TREE DETAIL

NOT TO SCALE



TYPICAL ROOT BARRIER DETAIL

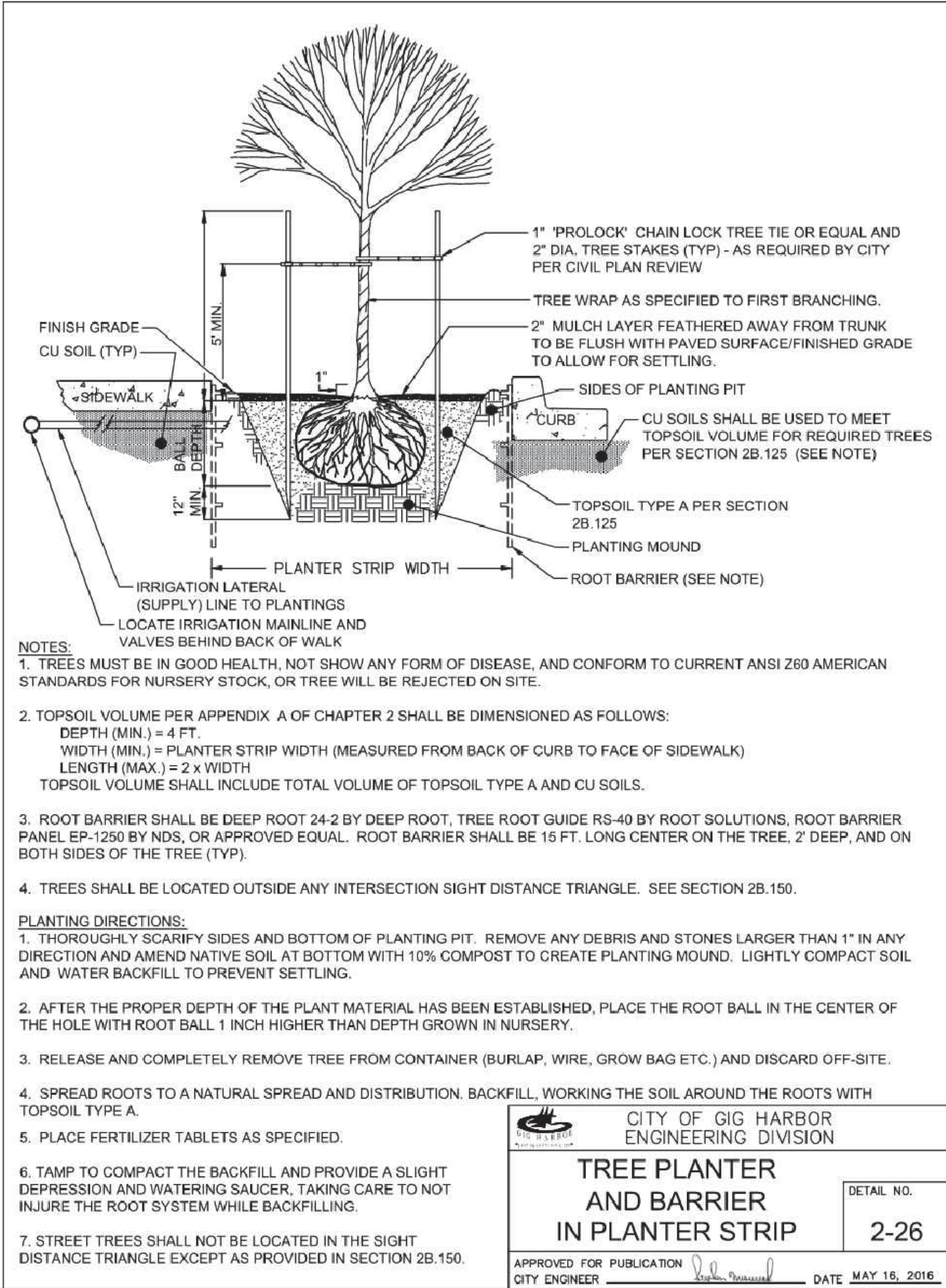
NOT TO SCALE



(SHALL BE PLACED ON THE DEVELOPMENT SIDE ONLY ALONG THE TREE PROTECTION ZONE LINE)

TREE PROTECTION BARRICADE DETAIL

NOT TO SCALE



(FOR FRONTAGE PLANTING ALONG CANTERWOOD BLVD. ONLY)

TYPICAL DECIDUOUS/BROADLEAF TREE PLANTING IN PLANTER STRIP

NOT TO SCALE



DAVID EVANS
AND ASSOCIATES INC.
20300 Woodinville Snohomish Rd NE
Woodinville, WA 98072
Phone: 425.415.2000

PARR ACRES PRELIMINARY PLAT
BUFFER AND FRONTAGE TREE REPLACEMENT LANDSCAPE PLANS

AZURE NW HOMES, LLC

PLANTING NOTES AND DETAILS

CITY OF GIG HARBOR,

WASHINGTON

REVIEWED BY: REVIEW BY	DATE: DATE	BY: BY
DATE: DATE	REVISION: REVISION	COMMENTS: COMMENTS
1	5/17/2022	REV 6 PER SITE PLANCITY COMMENTS 6/26/21 DLJ/SJL

PRELIMINARY



CHECKED BY: DL
DESIGNED BY: DL
DRAWN BY: DL

FIRST SUBMITTAL DATE: 06/16/2021

PROJECT NO.
AZNWIVRY0001

SHEET NO. L6 of 7

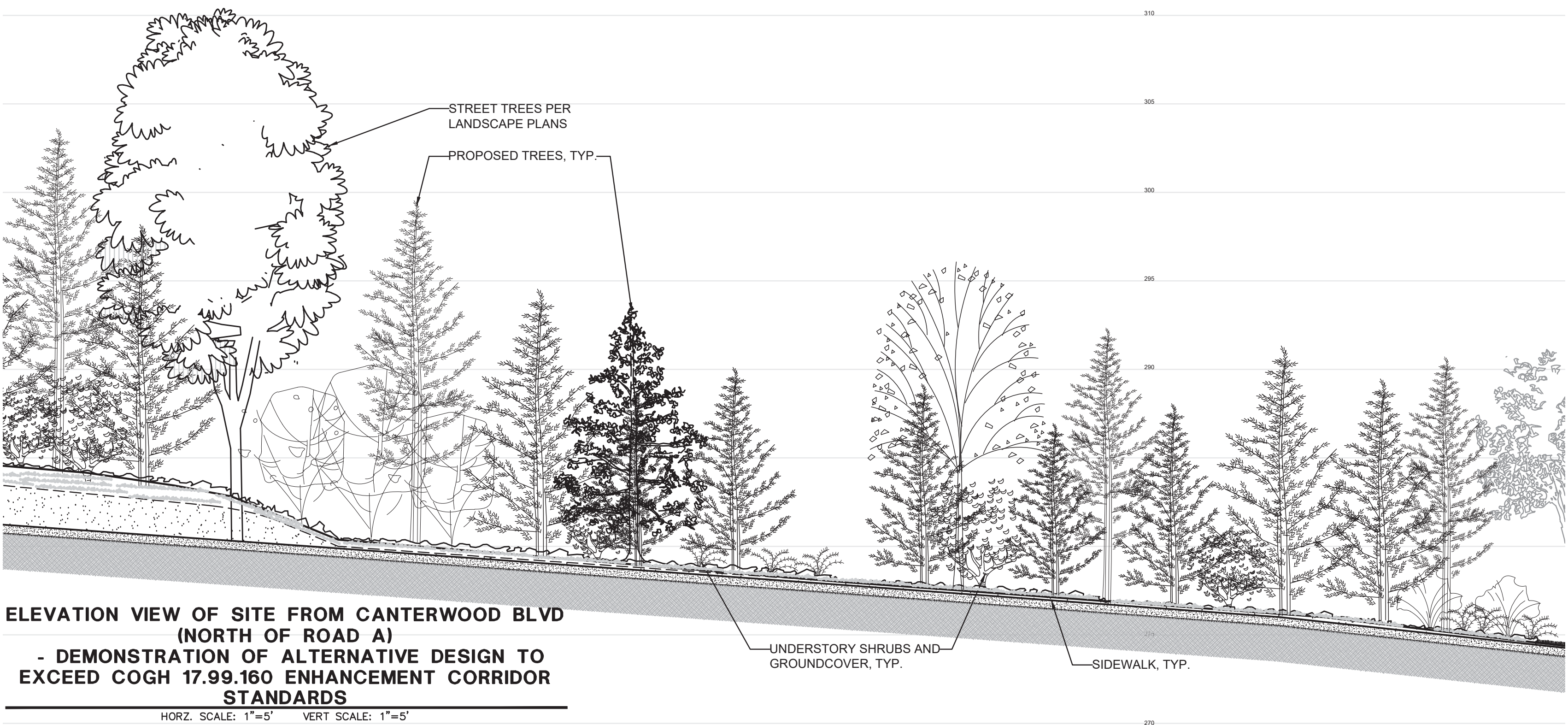
NOTES:

THESE SCALED ELEVATION DIAGRAMS ARE TO DEMONSTRATE HOW THE PARTIAL SCREENING WITH GLIMPSE-THROUGH AREAS OF THIS DEVELOPMENT ALONG CANTERWOOD BLVD. WILL BE PROVIDED SO AS TO MEET CITY OF GIG HARBOR ENHANCEMENT CORRIDOR STANDARDS 17.99.160(B).

NEW TREE AND VEGETATION PLANTINGS WILL BE PLANTED IN A STAGGERED MANNER SUCH THAT A NATURAL GROWTH PATTERN IS ACHIEVED. SUCH PLANTINGS WILL ALSO PROVIDE A SEMI-TRANSPARENT SCREENING (50% TO 70% YEAR-ROUND FOLIAGE COVERAGE) WHEN VIEWED ALONG THE ENHANCEMENT CORRIDOR WHICH COMPLIES WITH CITY OF GIG HARBOR 17.99.160(B)(2).

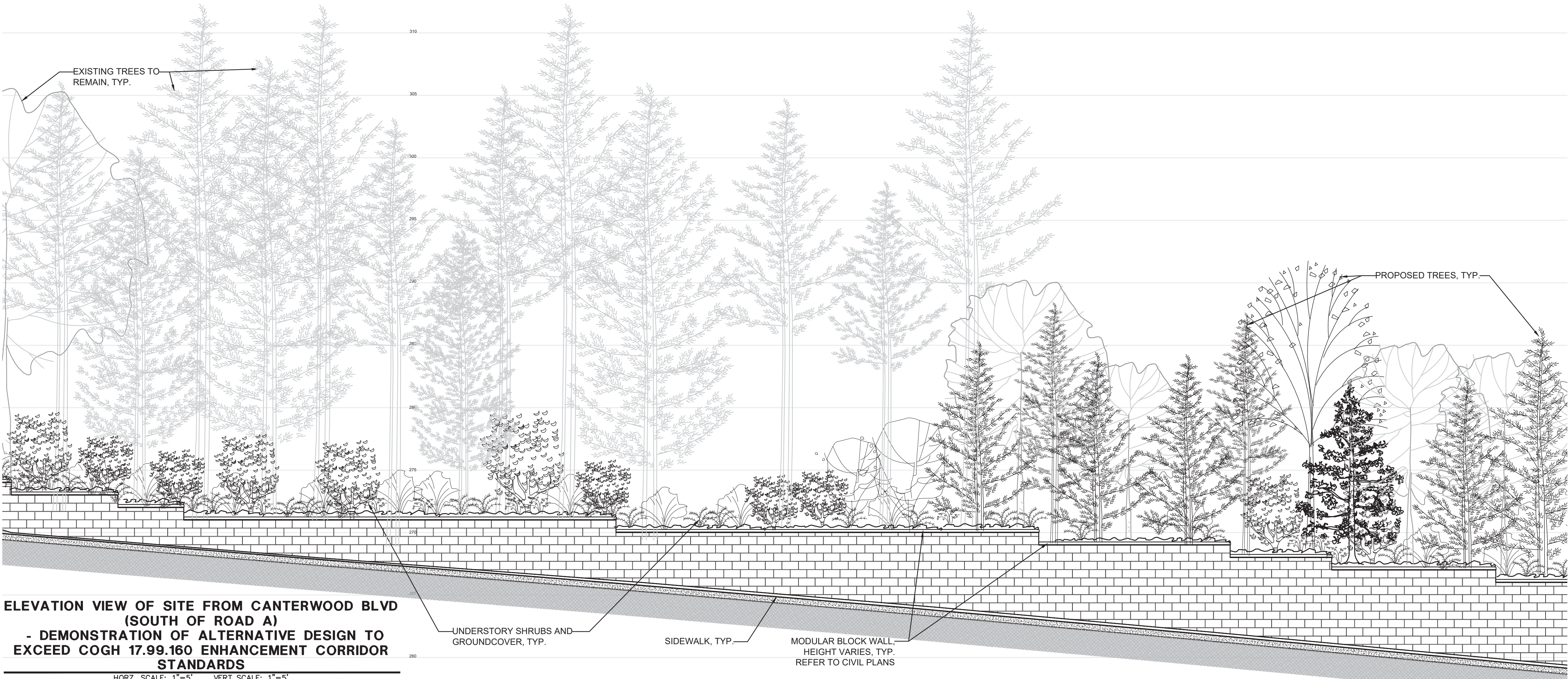
THESE ELEVATIONS DEMONSTRATE WHAT THE SITE WILL LOOK LIKE IN 3-4 YEARS FOLLOWING PLANT INSTALLATION.

REFER TO SHEET L5 FOR ALTERNATIVE DESIGN DESCRIPTION - ENHANCEMENT CORRIDOR



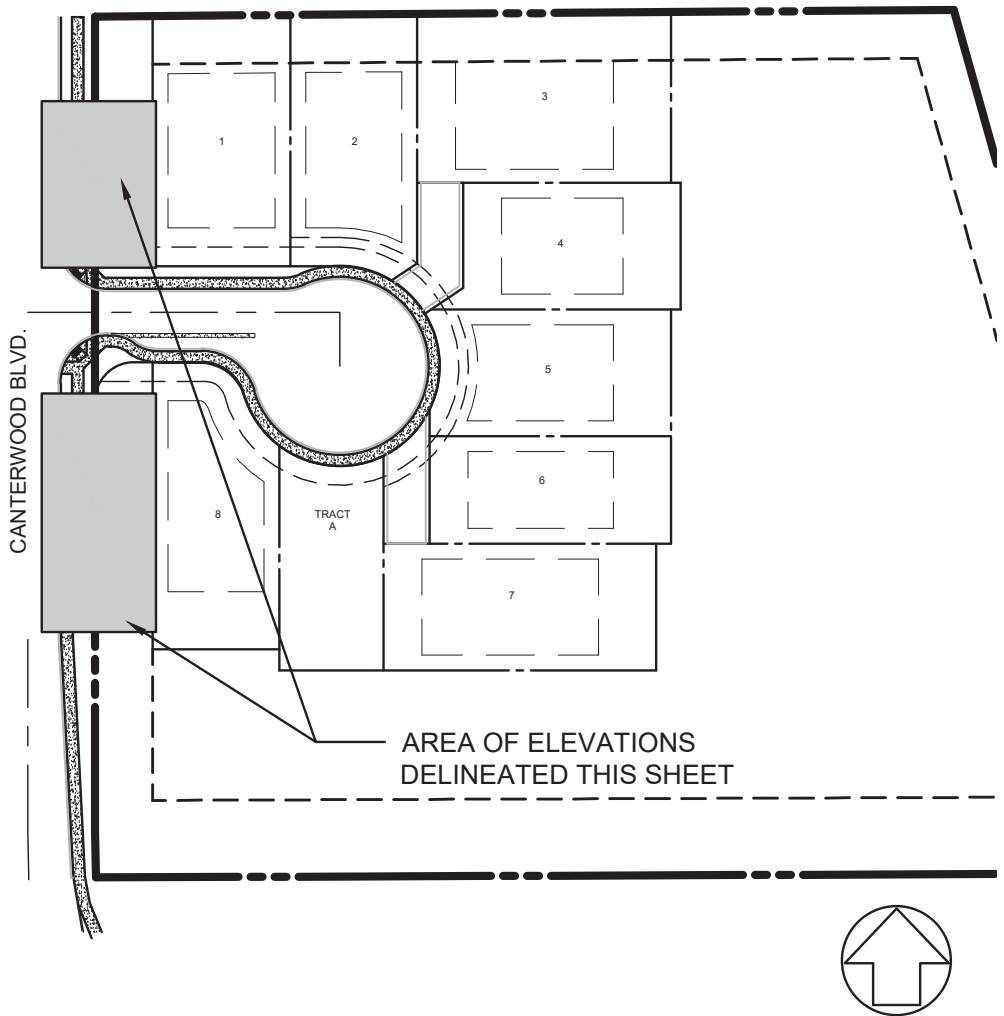
ELEVATION VIEW OF SITE FROM CANTERWOOD BLVD
(NORTH OF ROAD A)
- DEMONSTRATION OF ALTERNATIVE DESIGN TO
EXCEED COGH 17.99.160 ENHANCEMENT CORRIDOR
STANDARDS

HORZ. SCALE: 1"=5' VERT SCALE: 1"=5'



ELEVATION VIEW OF SITE FROM CANTERWOOD BLVD
(SOUTH OF ROAD A)
- DEMONSTRATION OF ALTERNATIVE DESIGN TO
EXCEED COGH 17.99.160 ENHANCEMENT CORRIDOR
STANDARDS

HORZ. SCALE: 1"=5' VERT SCALE: 1"=5'



SITE KEY MAP

1" = 100'

DAVID EVANS
AND ASSOCIATES INC.
20300 Woodinville Snohomish Rd NE
Woodinville, WA 98072
Phone: 425.415.2000

PARR ACRES PRELIMINARY PLAT
BUFFER AND FRONTAGE TREE REPLACEMENT LANDSCAPE PLANS

AZURE NW HOMES, LLC

ENHANCEMENT CORRIDOR
ELEVATIONS - ALTERNATIVE DESIGN

CITY OF GIG HARBOR,

WASHINGTON

REVIEWED BY: REVIEW BY
DATE: REVISION
NO. 1 5/17/22 REV'S PER SITE PLANNING COMMENTS 6/25/21 DLJ/SOL

DATE: DATE
BY: BY

PRELIMINARY

STATE OF WASHINGTON
DENISE LIFTIN
LANDSCAPE ARCHITECT
NO. 523 EXP. 08/09/2022
5/17/2022

CHECKED BY: DL
DESIGNED BY: DL
DRAWN BY: DL

FIRST SUBMITTAL DATE: 06/16/2021

PROJECT NO.
AZNWIVRY0001

SHEET NO. L7 OF 7



August 16, 2022

Azure Northwest
33400 8th Avenue S. Suite 230
Federal Way, Washington 98003

Attn: Toni Cavalli
Toni.Cavalli@azurenw.com

Updated Geotechnical Engineering Report
Proposed Residential Development
xxx – Canterwood Boulevard NW
Gig Harbor, Washington
PN: 0122254065
Doc ID: ParrAcres.CanterwoodBlvd.RGu_2

INTRODUCTION

This updated report presents the results of our geotechnical engineering studies for the proposed residential development to be constructed in Gig Harbor, Washington. The location of the project is shown in the attached Site Location Map, Figure 1. The site consists of a single tax parcel located north of St. Anthony's Hospital. We previously prepared a Geotechnical Engineering report for the proposed project and site; the report was prepared on May 14, 2013, a supplemental letter was prepared on July 3, 2014, **and an *updated Geotechnical Engineering Report* dated December 2, 2020. This version of the updated report addresses the comments made by the City of Gig Harbor (the City) as well as changes to the *Grading Plan* prepared by C.E.S NW that was provided to us on August 16, 2022.**

SITE CONDITIONS

Surface Conditions

The subject site consists of a single tax parcel located along the east side of Canterwood Drive, and adjacent to St. Anthony's Hospital, in the Gig Harbor north area of Pierce County. The parcel is irregular in shape, generally measure 450 feet wide (north to south) by 448 to 676 feet long (east to west) and encompasses about 5.84 acres. The parcel is bounded by Canterwood Boulevard NW on the west, St. Anthony's hospital on the south, the Tacoma Power overhead power lines on the east, and an undeveloped parcel on the north. We understand that the parcel was recently annexed into the City of Gig Harbor.

The undeveloped parcel is roughly at grade with Canterwood Boulevard on the west extent of the parcel with a gentle rise in elevation to a plateaued area. About mid-way across the site (east to west), the site slopes down to the east at 30 to 50 percent hillside to a small seasonal stream that flows from the Canterwood development to the south across the site. The hillside varies in height from about 40 to 50 feet. Total elevation change across the site is on the order of 76 feet. The existing topography is shown on the Site & Exploration Plan, Figure 2 and the Site Vicinity Map, Figure 3.

The site is covered with a moderate to dense mixture of conifer and deciduous trees, with an understory of ferns, holly, salal, other native species, and scattered invasive species (blackberries).

No surface water was observed in the flatter, upland portions of the property. Water was observed in the stream that flows from north to south. As stated in our previous February 11, 2013 letter regarding the designation of the hillside, the stream was flowing within a narrow, shallowly incised stream channel. No other standing or flowing water was noted on the site. No evidence of erosion, soil movement, landslide activity or deep-seated slope instability was observed in the portion of the site where the proposed development will occur, but some undermining and erosion was noted along the lower portions of the drainage.

Site Soils

The USDA Natural Resource Conservation Service (NRCS) Web Soil Survey for Pierce County maps the soils in the area of the site as Harstine gravelly sandy loam (type 16) soils. The Harstine soils are derived from sandy glacial till that form on 6 to 15 percent (16C) and 15 to 30 percent (16D). The Harstine soils are derived from sandy glacial till that form on slopes of 0 to 6 percent (16B), 6 to 15 percent (16C), and 15 to 30 percent (16D). The soils are listed as respectfully having a "slight", "moderate", and "moderate to severe" potential for erosion when exposed. Also, the Harstine soils are listed in hydrologic soils group C, and have a limited ability to support onsite infiltration of collected stormwater. A copy of the NRCS map for the site vicinity is attached as Figure 4. We observed no evidence of surficial erosion beyond the stream at the site during our reconnaissance.

Site Geology

The draft *Geological Map of the Gig Harbor 7.5 minute Quadrangle, Washington* (Troost, K.G., Booth, D.B., and Wells, R.E.) indicates the site is underlain by advanced outwash (Qva) that was deposited during the Vashon Stage of the Fraser Glaciation, approximately 12,000 to 15,000 years ago. An excerpt of the above referenced geologic map is included as Figure 5.

The advance outwash typically consists of a poorly-sorted, lightly stratified mixture of sand and gravel that may locally contain silt and clay that was deposited by meltwaters emanating from the advancing ice mass. The advance outwash was subsequently overridden by the continental ice mass, and as such is considered over-consolidated, and exhibits high strength and low compressibility characteristics where undisturbed. No areas of landslides or landslide debris are mapped on or within the vicinity of the site. An excerpt of the above referenced geologic map is included as Figure 3. The Washington Department of Natural Resources Landslide Inventory map indicates isolated areas of the site as having a "moderate" to "high" shallow landslide susceptibility. Areas to the west of the subject site are mapped as having a "moderate" deep landslide susceptibility. No areas of active or historic landslides are mapped on or within 300 feet of the site from the DNR susceptibility map. A copy of the Washington DNR Landslide Inventory Map is included as Figure 6.

Subsurface Explorations

On April 2, 2013 a representative from GeoResources, LLC (GeoResources) visited the site and monitored the excavation of 12 test pits. We returned to the site on October 6, 2020 to monitor the excavation of five test pits as well as perform two small scale Pilot Infiltration Tests (PITs) in two of the excavated test pits. The test pits were excavated by a backhoe operated licensed earthwork contractor work for GeoResources. The test pits extended to depths ranging from 5 to 10 feet below the existing ground surface. The test pits were located in the field by our representative by pacing



from existing site features. The approximate location of the test pits are indicated on the attached Site Plan as Figure 2 and summarized below in table 1.

TABLE 1:
APPROXIMATE LOCATIONS, ELEVATIONS, AND DEPTHS OF EXPLORATIONS

Test Pit Number	Functional Location	Surface Elevation ¹ (feet)	Termination Depth (feet)	Termination Elevation ¹ (feet)
TP-1	North central portion of the site	280	6½	273½
TP-2	Southwest portion of the site, top of slope	274	7	267
TP-3	South-central portion of the site	262	5	257
TP-4	Southeast portion of upland portion of the site	271	8	263
TP-5	Southeast portion of the site	274	10	264
TP-6	South-central portion of the site	270	7	263
TP-7	West of TP-6	275	7½	267½
TP-8	Central portion of the site	277	10	267
TP-9	West central portion of the site	280	9	271
TP-10	Northeast portion of the site, in top of gulley	275	6½	268½
TP-11	Northeast corner of the upland, by large cedar	277	6	271
TP-12	North-central portion of the site	286	7½	278½
TP-101 ²	Central portion of the site	272	7¼	264¾
TP-102 ²	Northwest portion of the site	284	6¼	277¾
TP-103	North-Central portion of site	277	6¼	270¾
TP-104	Southwest portion of site	280	9¾	270¼
TP-105	Central Portion of site	261	7½	253½
Notes:				
¹ = Surface elevations estimated from Grading Plan by CES NW Inc using NAVD 8 for vertical datum				
² = pilot infiltration test performed				

The specific number, locations, and depths of our explorations were selected based on the configuration of the proposed development, and were adjusted in the field based on consideration for underground utilities, existing site conditions, site access limitations and encountered stratigraphy. The densities presented in the logs were determined by the difficulty of excavation and our experience. Representative soil samples obtained from the test pits were placed in sealed plastic bags and then taken to our laboratory for further examination and testing as deemed necessary. The test pits were then backfilled with the excavated soils and bucket tamped, but not otherwise compacted.

The subsurface explorations excavated as part of this evaluation indicate the subsurface conditions at specific locations only, as actual subsurface conditions can vary across the site. Furthermore, the nature and extent of such variation would not become evident until additional explorations are performed or until construction activities have begun.

The approximate locations and numbers of our test pits are shown on the attached Site & Exploration Plan, Figure 2. The locations shown on Figure 2 were determined by pacing or taping from existing site features and reference points. As such, the locations should only be considered

accurate to the degree implied by our measuring methods. The soils encountered were visually classified in accordance with the Unified Soil Classification System (USCS) and ASTM D: 2488. The USCS is included in Appendix A as Figure A-1, while the descriptive logs of our test pits are included as Figures A-2 and A-7.

Subsurface Conditions

Our test pits encountered slightly variable subsurface conditions that, in our opinion, generally confirmed the mapped stratigraphy. The subsurface conditions encountered in each test pit are included below in Table 2 and description of the various soil types encountered across the site are summarized in the following sections.

Surficial Organic Soils

At the locations explored we observed 3 to 12 inches of forest duff and topsoil. We anticipate that deeper areas of topsoil and forest duff will be encountered in areas of larger trees and in localized depressions across the site.

TABLE 2:
APPROXIMATE THICKNESS, DEPTHS, AND ELEVATION OF ENCOUNTERED SOIL TYPES

Test Pit Number	Thickness of Topsoil (feet)	Thickness of Loose to Medium Dense Sand (feet)	Thickness of Medium Dense Weathered Till	Depth to Dense to Very Dense Glacial Till (feet)	Elevation ¹ of Glacial Till (feet)
TP-1	½	2½	½	3½	276½
TP-2	½	2½	1	4	270
TP-3	½	1½	½	2½	259½
TP-4	⅓	NE	3⅔*	4*	267*
TP-5	⅓	NE	2⅔*	3*	271*
TP-6	½	3	½	4	266
TP-7	⅓	2⅔	2½	5½	269½
TP-8	⅓	NE	2⅔	3*	274*
TP-9	⅓	NE	5⅓	5½*	274½*
TP-10	½	2	½	3	272
TP-11	⅔	2⅓	⅔	3⅔	273⅓
TP-12	½	2	½	3	283
TP-101	¾	3½	½	4¾	267¼
TP-102	¾	NE	2¼	3	281
TP-103	½	NE	¾	1¼	275¾
TP-104	½	6	NE	6½*	273½*
TP-105	½	6¼	NE	6¾	254¼
Notes: • Denotes test pits that were terminated in sandy glacial till/advance outwash ¹ = Surface elevations estimated from Grading Plan by CES NW Inc. using NAVD 8 for vertical datum					

Upper Unconsolidated Sand

Below the surficial forest duff, our test pits typically encountered loose to medium dense poorly graded sand with varying amounts of gravel and silt. We interpret these shallow soils to be recessional outwash deposits. These soils were encountered in all test pits except test pits TP-102 and TP-103.

Glacially Consolidated Soils

Underlying the surficial forest duff and outwash soils, our test pits encountered a medium dense weathered till layer overlying dense to very dense glacial till. These soils were encountered in all test pits. In test pits TP-4, TP-5, TP-8, TP-9, and TP-104, underlying the recessional outwash soils we encountered consolidated poorly graded sand with silt and gravel. We interpret these soils to either be a sandy glacial till or advanced outwash.

Laboratory Testing

Geotechnical laboratory tests were performed on select samples retrieved from the test pits to estimate index engineering properties of the soils encountered. Laboratory testing included visual soil classification per ASTM D2488, moisture content determinations per ASTM D2216, and grain size analyses per ASTM D6913 standard procedures. The results of the laboratory tests are summarized below in Table 3, while graphical output of the results are included in Appendix B.A summary of the laboratory test results is provided in Table 3.

TABLE 3:
LABORATORY TEST RESULTS FOR ON-SITE SOILS

Sample Number	Sample	Gravel Content (percent)	Sand Content (percent)	Silt/Clay Content (percent)	D10 Ratio (mm)
100598	TP-101, S-1, D: 1.75'	17.6	79.5	2.9	0.2663
100599	TP-101, S-2, D: 5.0'	26.5	48.0	25.5	-
100600	TP-102, S-1, D: 1.25'	34.4	50.5	15.1	-
100601	TP-102, S-2, D: 4.0'	5.0	47.8	47.2	-
100605	TP-104, S-2, D: 7.5'	17.6	76.3	6.1	0.0891
100606	TP-103, S-1, D: 3.5'	18.7	57.9	23.4	-

Groundwater Conditions

No groundwater seepage was observed in our test pits at the time of excavation. However, we did observe mottling in several test pit explorations throughout the site which can be indicative of a perched groundwater table. A shallow perched groundwater table can develop when the vertical infiltration of precipitation through a more permeable soil is slowed at depth by a deeper, less permeable soil type (such as outwash over glacial till). It is our opinion that given the mapped and encountered stratigraphy, we anticipate that the site may be prone to a shallow perched groundwater table.

ENGINEERING CONCLUSIONS AND RECOMMENDATIONS

Based on our current understanding of the proposed project and on the results of our geotechnical studies, we have updated the geotechnical recommendations for design and construction of the proposed residential development to reflect changes to the proposed site plan, City ordinances, and building codes since our original report was prepared. Based on our recent site reconnaissance, the site conditions appears unchanged, and the findings of our original report are still applicable. The following sections provide recommendations for seismic design considerations, foundation design, permanent building walls, floor slabs, drainage, pavements, and other pertinent geotechnical design and construction issues.

Hillsides, Ravine Sidewalls and Bluffs per Gig Harbor Critical Areas 18.08.190

The City of Gig Harbor Chapter 18, Section 18.08.190 requires an undisturbed buffer of natural vegetation equal to the height of the ravine, sidewall, or bluff, as measured on a horizontal plane. A buffer may be reduced upon verification by a qualified professional that the proposed construction method will: i) not adversely impact the stability of the ravine sidewalls; ii) use construction techniques which minimize disruption of existing topography and vegetation; iv) include measures to overcome any geological, soils, and hydrologic constraints of the site. If the minimum rear setback established in the zoning district, pursuant to GHMC Title 17.

- A. Disturbance Limitations. If a hillside, ravine sidewall or bluff is located on or adjacent to a development site, all activities on the site shall be in compliance with the following requirements:
 - 1. Ravine Sidewalls and Bluffs
 - a. Buffers. An undisturbed buffer of natural vegetation equal to the height of the ravine sidewall or bluff shall be established and maintained from the top, toe and sides of all ravine sidewalls and bluffs. All buffers shall be measured on a horizontal plane.
 - b. Buffer Delineation. The edge of a buffer shall be clearly staked, flagged, and fenced prior to any site clearing or construction. Markers shall be clearly visible and weather-resistant. Site clearing shall not commence until such time that the project proponent or authorized agent for the project proponent has submitted written notice to the city that the buffer requirements of this section have been met. Field marking of the buffer shall remain in place until all phases of construction have been complete and an occupancy permit has been issued by the city.
 - c. Buffer Reduction. A buffer may be reduced upon verification by a qualified professional and supporting environmental information to the satisfaction of the city that the proposed construction method will:
 - i. Not adversely impact the stability of ravine sidewalls;
 - ii. Not increase erosion and mass movement potential of ravine sidewalls;
 - iii. Use construction techniques which minimize disruption of existing topography and vegetation;
 - iv. Includes measures to overcome any geological, soils and hydrologic constraints of the site. The buffer may be reduced to no less than the

minimum rear yard setback established in the respective zoning district, pursuant to GHMC Title 17.

- d. Building Setback Lines. A building setback line of 10 feet is required from the edge of any buffer or a ravine wall or bluff.
2. Hillsides of 15 Percent Slope and Greater – Studies Required. Developments on hillsides shall comply with the following requirements:
 - a. Site Analysis Reports Required. The following chart sets forth the level of site analysis report required to be developed based upon the range of the slope of the site and adjacent properties.

We previously addressed the critical areas slope designation in our February 1, 2013 letter. In that letter, we discussed the slope on the site is more consistent with a hillside than a ravine, and as such, buffers and setbacks should be determined based on the hillside designation and not ravine designation. We understand that original letter was reviewed and approved by the City. As stated in the letter, based on our site observations and experience, it is our opinion that the slopes and intermittent stream valley were carved out by the past glaciation and appear to have been stable since that time. Accordingly, it is our opinion that slopes should be classified as “hillsides”, and not as a “ravine sidewall”.

Therefore, based on the encountered subsurface conditions and the condition of the isolated incised ravine sidewall, it is our opinion from a geotechnical engineering standpoint that the prescriptive buffer from the hillside can be reduced to the minimum “side yard” setback.

Landslide Hazards per Gig Harbor Critical Areas Chapter 18.08.192

The Gig Harbor Critical Areas Ordinance defines a landslide hazard area as those areas which are susceptible to risk of mass movement due to a combination of geologic, topographic and hydrologic factors.

Some of the slopes at the site do exceed 33 percent, however no evidence of landslides or landslide activity was observed or is mapped within the vicinity of the site. There are no intersecting or adverse geologic contacts mapped or interpreted at the site. No springs or groundwater seepage were observed at the ground surface. No evidence of landslide activity or significant erosion were observed at the site at the time of our site visit. No planes of weakness or rock fall hazards were observed at the site. The geologic map does not identify any areas of landslide debris or mass wasting on or within 300 feet of the site.

In our opinion, the site does not constitute an active landslide hazard area. Because no evidence of landslide activity or active landslide hazards were observed at the site, no prescriptive buffer should be imposed by the City.

Erosion Hazards per Gig Harbor Critical Areas 18.08.192

Erosion Hazard Areas are defined as “those areas which are vulnerable to erosion due to natural characteristics including vegetative cover, soil texture, slope, gradient or which have been induced by human activity. Those areas which are rated severe or very severe for building site development on slopes or cut banks, in accordance with the United States Department of Agriculture (USDA) Soil Conservation Service Soil (SCS) Survey for Pierce County Area (February 1979), are included”. The subject property is located in an area mapped by the Soil Conservation Service as Harstine gravelly sandy loam (16B, 16C and 16D) soils. The erosion hazards for these soils



are described in the soil survey as “moderate” to “moderate to severe”. The Harstine soils do not meet the technical criteria for an erosion hazard.

Recommended Setback

All structures will require a building setback from slopes steeper than 3H:1V (Horizontal:Vertical) or 33 percent with greater than 10 feet in vertical height to satisfy requirements of the 2018 IBC Section 1808.7. The prescriptive setback can be evaluated and reduced, and/or a structural setback provided, by a licensed geotechnical engineer. The setback distance is calculated based on the vertical height of the slope. The typical setback from the top of the slope equals one third the height of the slope while a setback from the toe of the slope equals one half the height of the slope. The slope north-south oriented slope in the eastern portion of the site slopes down at greater than 33 percent and has a vertical height of approximately 46 feet. As such, a minimum setback of approximately 16 feet from the top of the slope should be applied in accordance with the 2018 IBC.

The newest *Grading Plan* prepared by C.E.S NW shows that the proposed wall will be constructed in areas steeper than 33 percent for lots 4, 5, 6, and 7 as well as storm tract A. These walls should be setback 7.5 feet from the regraded top of slope or embedded to reach the IBC setback requirements. A typical structural setback detail is included as Figure 10.

Seismic Design

The site is located in the Puget Sound region of western Washington, which is seismically active. Seismicity in this region is attributed primarily to the interaction between the Pacific, Juan de Fuca, and North American plates. The Juan de Fuca plate is subducting beneath the North American plate at the Cascadia Subduction Zone (CSZ). This produces both intercrustal (between plates) and intracrustal (within a plate) earthquakes. In the following sections we discuss the design criteria and potential hazards associated with the regional seismicity.

Seismic Site Class

Based on our explorations and the subsurface units mapped at the site, we interpret the structural site conditions to correspond to a seismic Site Class “D” in accordance with the **2018** IBC documents and American Society of Civil Engineers (ASCE) standard **7-16** Chapter 20 Table 20.3-1. This is based on inferred SPT blow counts for the soils encountered in our test pit explorations. These conditions are assumed to be representative for the subsurface across the site.

Design parameters

The U.S. Geological Survey (USGS) completed probabilistic seismic hazard analyses (PSHA) for the entire country in November 1996, which were updated and republished in 2002 and 2008. We used the *ATC Hazard by Location* website to estimate seismic design parameters at the site. Table 4, below, summarizes the recommended design parameters.

TABLE 4:
2018 IBC PARAMETERS FOR DESIGN OF SEISMIC STRUCTURES

Spectral Response Acceleration (SRA) and Site Coefficients for Existing Conditions	Short Period
Mapped SRA	$S_s = 1.527g$
Site Coefficients (Site Class D)	$F_a = 1.000$
Maximum Considered Earthquake SRA	$S_{MS} = 1.537g$
Design SRA	$S_{DS} = 1.025g$

Peak Ground Acceleration

The mapped peak ground acceleration (PGA) for this site is 0.563g. To account for site class, the PGA is multiplied by a site amplification factor (F_{PGA}) of **1.1** for a resulting PGA_M of **0.719g**.

Seismic Hazards

Earthquake-induced geologic hazards may include liquefaction, lateral spreading, slope instability, and ground surface fault rupture. Liquefaction is a phenomenon where there is a reduction or complete loss of soil strength due to an increase in pore water pressure in soils. The increase in pore water pressure is induced by seismic vibrations. Liquefaction primarily affects geologically recent deposits of loose, uniformly graded, fine-grained sands and granular silts that are below the groundwater table. In our opinion, the potential for liquefaction and lateral spreading is not significant because of the dense nature of the on-site soils and the groundwater depth. This coincides with the conditions observed in the explorations performed at the site. Because of the relatively low susceptibility of site soils to liquefaction, it is our opinion that the likelihood of lateral spreading is also relatively low.

Based on our review of the Department of Natural Resources Geologic Hazards Map (Geologic Information Portal), the site is located about 0.15 miles south and 0.93 miles north of the Tacoma Fault Zone (Figure 7). No evidence of ground fault rupture was observed in the subsurface explorations or our site reconnaissance. Therefore, in our opinion, the proposed structure should have no greater risk for ground fault rupture than other structures located in the area.

Foundation Support

Based on the encountered subsurface conditions across the site, we recommend that spread footings for the future residences be founded on the dense glacial till or weathered till soils, the medium dense recessional outwash soils, or on structural fill that extends to suitable native soils. The soil at the base of the excavations should be disturbed as little as possible. All loose, soft or unsuitable material should be removed.

Shallow Foundation Support

We recommend a minimum width of 24-inches for isolated footings and at least 18-inches for continuous footings founded on structural fill that extends to suitable native soils. The footings may be designed with a maximum allowable bearing pressure of 2,500 psf (pounds per square foot) for combined dead and long-term live loads. The structural fill should be placed and compacted in accordance with the **"Structural Fill"** section of this report. The allowable bearing value may be

increased by one-third for transient loads such as those induced by seismic events or wind loads. The weight of the footing and any overlying backfill may be neglected. All footing elements should be embedded at least 18 inches below surrounding grades for frost protection.

Lateral loads may be resisted by friction on the base of footings and floor slabs and as passive pressure on the sides of footings. We recommend that an allowable coefficient of friction of 0.35 be used to calculate friction between the concrete and the underlying structural fill. Passive pressure may be determined using an allowable equivalent fluid density of 350 pcf (pounds per cubic foot) where structural fill is adjacent to footings. Factors of safety have been applied to these values.

We estimate that total settlements of footings designed and constructed as recommended above will be less than 1 inch over a 50-foot length, for the anticipated load conditions, with differential settlements between comparably loaded footings of ½ inch or less. Typical building settlements within granular soils occur essentially as loads are being applied; however, due to the fines content of the site soils, a portion of the estimated settlement could occur over a longer period of time.

Floor Slab Support

Slab-on-grade floors, where constructed, should be supported on the medium dense to dense, native soils or compacted structural fill. We recommend that a vertical modulus of subgrade reaction equal to 200 pounds per cubic inch (pci) be used in the design of the floor slab-on-grade on dense, glacially overridden soil or on compacted structural fill.

To provide firm bedding for floor slabs, we recommend areas be prepared as described in construction considerations section. The exposed soils should be compacted to at least 95 percent of the maximum dry density (MDD) as determined by the modified Proctor (ASTM D: 1557) maximum dry density and to a dense and unyielding condition. All fill under slab-on-grade floors, including backfill for footing excavations, overexcavated areas, utilities, etc., should consist of compacted structural fill. Structural fill requirements are discussed in a later section of this report.

Assuming the below-grade building areas are constructed with long-term drainage, a capillary break should be installed. At-grade structures should also have a capillary break. For a capillary break, we recommend that a minimum 4-inch-thick, per the IBC, layer of washed pea gravel (¾ inch to No. 8 sieve size) or clean, 5/8-inch clean crushed rock (less than 2 percent passing the No. 200 sieve) and a vapor retarder consisting of plastic sheeting be placed beneath floor slabs, as shown in Figure 9. If pea gravel is used, a 2-inch layer of clean crushed rock can be placed over the washed pea gravel to provide a firmer working surface on which to place the reinforcement. The vapor retarder should be placed on top of the capillary break material where floors are covered with carpet, linoleum, or other floor covers and the space is heated.

Prior to placing pea gravel and/or crushed rock for a working surface or capillary break, the exposed subgrade surface should be evaluated by a representative of our firm and compacted as needed to achieve a dense, unyielding condition. If used, the crushed rock should be compacted to 95 percent of the maximum dry density (MDD) as determined by ASTM D: 1557.

We estimate that the settlement of the floor slabs designed and constructed as recommended, will be ½-inch or less over a span of 50 feet.

Subgrade/Basement Walls

Based on existing topography, we anticipate that the structures along the top of the hillside (east side of the proposed development) will require subgrade or basement walls. Utility or stormwater vaults may also be constructed below grade. The lateral pressures acting on subgrade and retaining walls (such as basement walls) will depend upon the nature and density of the soil behind the wall. It is also dependent upon the presence or absence of hydrostatic pressure.

If the walls are backfilled with granular well-drained soil, the design static active pressure may be taken as 35 pcf (equivalent fluid density). Active pressures assume the wall is allowed to move to develop the active condition. For the condition of an inclined back slope, higher lateral pressures would act on the walls. For a 3H:1V (Horizontal to Vertical) slope above the wall, the active pressure may be taken as 48 pcf; for a 2H:1V back slope condition, a wall design pressures of 55 pcf may be assumed. If the walls are constrained from moving, a static at-rest lateral earth pressure of 55 pcf should be used. These design values assume a level backslope and drained conditions as described below. If basement walls taller than 6 feet are required, as seismic surcharge of 11H should be included where required by the code. If walls will be constructed with a backslope and will be braced or otherwise restrained against movement, we should be notified so that we can evaluate the anticipated conditions and recommend an appropriate at-rest earth pressure.

Adequate drainage behind any retaining structure is imperative. Positive drainage which controls the development of hydrostatic pressure can be accomplished by placing a zone of coarse sand and gravel behind the walls. The granular drainage material should contain less than 5 percent fines. The drainage zone should extend horizontally at least 18 inches from the back of the wall. The drainage zone should also extend from the base of the wall to within 1 foot of the top of the wall. The drainage zone should be compacted to approximately 90 percent of the MDD as determined by ASTM D: 1557. Over-compaction should be avoided as this can lead to excessive lateral pressures.

A minimum 4-inch diameter perforated or slotted PVC pipe should be placed in the drainage zone along the base and behind the wall to provide an outlet for any accumulated water and direct accumulated water to an appropriate discharge location. We recommend that a nonwoven geotextile filter fabric be placed between the drainage material and the remaining wall backfill to reduce silt migration into the drainage zone. The infiltration of silt into the drainage zone can, with time, reduce the permeability of the granular material. The filter fabric should be placed such that it fully separates the drainage material and the backfill, and should be extended over the top of the drainage zone. A typical detail showing below grade well drainage is provided as Figure 8.

Lateral loads may be resisted by friction on the base of footings and as passive pressure on the sides of footings and the buried portion of the wall, as described in the **"Foundation Support"** section.

Site Drainage

All ground surfaces, pavements and sidewalks at the site should be sloped away from structures. The site should also be carefully graded to ensure positive drainage away from all structures and property lines. Surface water runoff from the roof area, driveways, perimeter footing drains, and wall drains, should be collected, tightlined, and conveyed to an appropriate discharge point.

We recommend that footing drains are installed for the residence in accordance with IBC **2018** IBC, Section 1805.4.2, and basement walls (if utilized) have a wall drain as describe above and shown on Figure 8. The roof drain should not be connected to the footing drain.

Temporary Excavations

All job site safety issues and precautions are the responsibility of the contractor providing services/work. The following temporary cut/fill slope guidelines are provided for planning purposes only. Temporary cut slopes will likely be necessary during grading operations or utility installation. Un-shored, temporary excavation slopes may be used where planned excavation limits will not undermine Canterwood Boulevard to the east, associated utilities, interfere with other construction, or extend beyond the approved construction limits. Where there is not enough area for sloped excavations, temporary shoring should be provided. If shallow temporary shoring is required, we recommend that it be designed to withstand the lateral earth pressures provided in the basement wall section of this report.

All excavations at the site associated with confined spaces, such as utility trenches and retaining walls, must be completed in accordance with local, state, or federal requirements including the Washington Administrative Code (WAC) and Washington Industrial Safety and Health Administration (WISHA). Excavation, trenching, and shoring is covered under the WAC 296-155 Part N.

Based on the WAC 296-155-66401, it is our opinion that the upper weathered soils at the site would be classified as Type C soils, while the lower glacially consolidated soils would be classified as Type A soils. According to WAC 296-155-66403, for temporary excavations of less than 20 feet in depth, the side slopes in Type C soils should be sloped at a maximum inclination of 1½H:1V or flatter from the toe to top of the slope, and Type A soils should be laid back at a slope inclination of 0.75H:1V or flatter. All exposed slope faces should be covered with a durable reinforced plastic membrane during construction to prevent slope raveling and rutting during periods of precipitation. These guidelines assume that all surface loads are kept at a minimum distance of at least one half the depth of the cut away from the top of the slope and that significant seepage is not present on the slope face. Flatter cut slopes will be necessary where significant raveling or seepage occurs, or if construction materials will be stockpiled along the slope crest.

Where it is not feasible to slope the site soils back at these inclinations, a retaining structure should be considered. Retaining structures greater than 4-feet in height (bottom of footing to top of structure) or that have slopes of greater than 15 percent above them, should be engineered per Washington Administrative Code (WAC 51-16-080 item 5). This information is provided solely for the benefit of the owner and other design consultants and should not be construed to imply that GeoResources assumes responsibility for job site safety. It is understood that job site safety is the sole responsibility of the project contractor.

Permanent Cut and Fill Slopes

Permanent slopes in soil should be no steeper than 2H:1V. Fill slopes constructed on grades that are steeper than 5H:1V should be constructed in accordance with Appendix J, Section J107 of the 2018 IBC and should utilize proper keying and benching methods. Fill should be "keyed" into the undisturbed native soils by cutting a series of horizontal benches. The benches should be 1½ times the width of the equipment used for grading and be a maximum of 3 feet in height. Subsurface drainage may be required in areas where significant seepage is encountered during grading.



Collected drainage should be directed to an appropriate discharge point. Surface drainage should be directed away from all slope faces.

All slopes should be protected from erosion. Typical erosion control BMPs as adopted by the City of Gig Harbor Stormwater Management and Site Development Manual should be sufficient for proposed site grading activities. Additionally, permanent slopes should be planted with a mulch, hardy vegetative groundcover or armored with quarry spalls as soon as feasible after grading is completed.

Infiltration Recommendations

This updated report was prepared to address Volume III, Section 3.4.5 of the City of Gig Harbor 2016 Stormwater Management & Site Development Manual (SMSDM) and to address the feasibility of onsite stormwater infiltration. The following sections discuss the feasibility of each BMP associated with Minimum requirement #5.

Soil Preservation and Amendment (Ecology BMP T5.13)

Soil preservation/retention and protection within the proposed roadway and building lots will not be feasible because of required cuts and fills required to support the proposed development.

Downspout Infiltration Systems (Ecology BMP T5.10A)

Test pits TP-5, TP-8, TP-9, TP-101, TP-104, and TP-105 encountered recessional outwash soils **near the proposed cul-de-sac, or at similar elevations**, to depths of 6.75 to 10.0 feet deep, therefore infiltration does appear feasible for lots 5, 6, 7, and 8.

Based on our visual classification and experience, the soils in the areas of these test pits are similar to those in which the small scale pilot infiltration test (PIT-1) was conducted, therefore we recommend a preliminary design infiltration rate of 2.1 inches per hour be used for the infiltration facilities located within recessional outwash observed in the vicinity of test pits TP-5, TP-8, TP-9, TP-101, and TP-104. Appropriate factors of safety for testing and plugging have been applied to these values in accordance with the 2016 SWMSDM. Additional factors of safety for geometry and below grade systems should be applied by the civil engineer.

According to the 2016 SWMSDM, Section 3.8.3, a minimum infiltration rate of 1 inch per hour is required for infiltration trenches, which exceeds the recommended design infiltration rate of the site soils. Therefore, downspout infiltration systems are not feasible for in the soils represented by Pilot Infiltration Test PIT-2.

Downspout Dispersion Systems (Ecology BMP T5.10B)

Based on the provided site plan, downspout dispersion does not appear feasible given the site dimensions, proposed development, and the minimum lengths of required vegetated flow paths.

Concentrated Flow Dispersion (Ecology BMP T5.11)

Based on the provided site plan, concentrated dispersion does not appear feasible given the site dimensions, proposed development, and the minimum lengths of required vegetated flow paths.

Sheet Flow Dispersion (Ecology BMP T5.12)

Based on the provided site plan, downspout dispersion does not appear feasible given the site dimensions, proposed development, and the minimum lengths of required vegetated flow paths.

Permeable Pavement (Ecology BMP T5.15)

Per the 2016 SWMSDM, Volume III, Section 3.5.6, the standard permeable pavement section is approximately 12 inches thick and a minimum vertical separation of 1-foot is required from the bottom of the permeable pavement storage course to an impermeable layer or groundwater table. An impermeable layer was encountered at approximately 0.75 feet below ground surface consistent with weather glacial till. Based on this, it is our opinion that permeable pavement is not feasible in this location unless regrading of the roadway area is performed. We performed two small-scale Pilot Infiltration Tests (PITs) in the area of the proposed driveway and cul de sac area. We performed infiltration test PIT-1 at 2 feet below the existing ground surface in Test Pit TP-101, and PIT-2 at 2 feet below the existing ground surface in Test Pit TP-102. The measured infiltration rates and associated soil types are shown below in Table 5.

TABLE 5:
MEASURED INFILTRATION RATES

Pilot Infiltration Test Number	Soil Type at Approximate Bottom of Infiltration Test	Measured Infiltration Rate (in/hr)	Long Term Infiltration Rate (in/hr)
PIT-1	Brown-grey coarse sand with gravel (outwash)	21.7	2.17
PIT-2	Brown silty sand with gravel (weathered till)	5.8	0.58
Notes: Calculation work sheets for the long term design rates are attached in Appendix C			

Per Appendix III-A of the 2016 SWMSDM correction factors should be added to the measured infiltration rates. For a small-scale pit tests, a correction factor for F_{testing} of 0.5 should be used. A correction factor for F_{plugging} of 0.8 for fine sands and loamy sands should be used. The above long-term rate also includes a correction of 0.25 for geometry but can be modified by the project civil engineer once the actual dimensions of the galleries are determined.

Infiltration into Fill

We understand that because of site grading, some of the lots may attempt to infiltrate into fill soils. The 2016 SWMSDM allows for downspout infiltration and other BMPs to use structural fill for infiltration provided the fill is placed and compacted under the direct supervision of a geotechnical engineer or professional civil engineer with geotechnical expertise, and if the measured infiltration rate is at least 8 inches per hour, based on methods described in Appendix III-A of the 2016 SWMSDM.

We reviewed WSDOT Standard Specification for various aggregate types. Based on the range of grain size for various aggregate types, and using Method 3. Soil Grain Size Analysis from Volume

III of the 2016 SWMSDM, imported fill that meets the gradation requirements of *Gravel Backfill for Drains* (WSDOT 9-03.12(4) and *Gravelly Backfill for Drywells* (WSDOT 9-13.12 (5) should provide a measured rate in excess of 8 inches per hour. Material that meets the coarse fraction of *Backfill for Sand Drains* (WSDOT 9-13.13), *Sand Drainage Blanket* (WSDOT 9-13.13(1), or *Select Borrow* (WSDDOT 9-003.14(2) also appear to provide rates in excess of 8 inches per hour, but the actual gradation of one of these soil types would need to be further delineated, as material with significant sand will not support 8 inches per hour. We highly recommend doing field verification testing using the EPA Falling Head to confirm the actual rate and to size the facilities.

Water Quality Treatment

Additionally, LID systems for water quality require Cation Exchange Capacity (CEC) of at least 5mEq/100g and a minimum organic content of 1 percent in order for the native soils to be used as a treatment layer beneath water quality facilities, such as permeable pavement. The results of the tests performed by Spectra Laboratories indicate that the CEC for the upper weathered outwash at the site is about 3.46 mEq/100g and that the organic content is about 1.74 percent, exceeding the requirements of the 2016 SWMSDM for organic content but not the requirement for CEC. The results of the tests performed by Spectra Laboratories indicate that the CEC for the upper weathered glacial till soils at the site is about 6.61 mEq/100g and that the organic content is about 3.25 percent, exceeding the requirement of the 2016 SWMSDM. Based on the above, soil amendments will be required to provide water quality treatment for stormwater infiltrated on site.

Construction Consideration

We recommend that a representative from our firm be onsite at the time of excavation of the proposed infiltration facilities to verify that the soils encountered during construction are consistent with the soils observed in our subsurface explorations. In-situ infiltration testing should also be performed at the time of construction to verify the recommended infiltration rate per the 2016 SWMSDM.

Appropriate design, construction and maintenance measures will be required to ensure the infiltration rate can be effectively maintained over time. Stormwater Best Management Practices (BMPs) in accordance with the 2016 SWMSDM, Volume II, Section 3.3 should be included in the project plans and specifications to minimize the potential for fines contamination of Low Impact Development BMPs utilized at the site.

Suspended solids could clog the underlying soil and reduce the infiltration rate. To reduce potential clogging of the infiltration systems, the infiltration system should not be connected to the stormwater runoff system until after construction is complete and the site area is landscaped, paved or otherwise protected. Additional measures may also be taken during construction to minimize the potential of fines contamination of the proposed infiltration system, such as utilizing an alternative storm water management location during construction or leaving the bottom of the permanent systems 1 to 2 feet high, and subsequently excavating to the finished grade once the site soils have been stabilized. All contractors working on the site (builders and subcontractors) should divert sediment laden stormwater away from proposed infiltration facilities during construction and landscaping activities. No concrete trucks should be washed or cleaned, and washout areas should not be within the vicinity of the proposed infiltration facilities. After construction activities have been completed, periodic sweeping of the paved areas will help extend the life of the infiltration system.

All proposed infiltration facilities should be designed and constructed in accordance with the 2016 SWMSDM. All minimum separation, setback requirements and infeasibility criteria per 2016 SWMSDM should be considered prior to the selection, design and location of any stormwater facility for the proposed development.

EARTHWORK RECOMMENDATIONS

Site Preparation

We recommend that the site be cleared of all vegetation, including roots, stumps, forest duff, topsoil, previously placed fill and any construction debris from beneath the site where buildings, parking lots, driveways, retaining walls, and structural fill will be placed. Organic topsoil is not suitable for use as structural fill but may be used for limited depths in non-structural areas. Stripping depths ranging from 4 to 12 inches should be expected to remove these unsuitable soils. Areas of thicker topsoil or organic debris may be encountered in areas of heavy vegetation or depressions.

In areas to be filled, the exposed soil surface (after clearing and stripping and prior to any fill placement or foundation construction) should be compacted using a vibratory roller. The subgrade soils should be proof-rolled and, if necessary, compacted to achieve at least 95 percent of the MDD as determined by ASTM D: 1557. The proof-rolling operations should consist of several passes of a heavy (10-ton or heavier static weight) vibratory roller or loaded dump truck to confirm the surface is in a dense, unyielding condition. The density of the subgrade should be evaluated by an experienced field representative from our firm by probing with a steel T-probe. Areas that are wet, soft, loose, or yielding under the compaction process should be further compacted, removed, and reconditioned, or replaced with compacted structural fill so that a dense and unyielding condition is achieved.

Structural Fill

Structural fill should be placed in horizontal lifts of appropriate thickness to allow adequate and uniform compaction of each lift. Fill should be compacted to at least 95 percent of MDD (as determined in accordance with ASTM D: 1557).

The appropriate lift thickness will depend on the fill characteristics and compaction equipment use, but is typically limited to 6 to 12 inches. The suitability of onsite material for use as structural fill will depend on the gradation and moisture content of the soil. As the amount of fines (material passing US No. 200 sieve) increases, soil becomes increasingly sensitive to small changes in moisture content and adequate compaction becomes more difficult to achieve. During wet weather, we recommend use of well-graded sand and gravel with less than 5 percent (by weight) passing the US No. 200 sieve based on that fraction passing the 3/4-inch sieve, such as "Gravel Backfill for Walls" (WSDOT 9-03.12(2)). If prolonged dry weather prevails during the earthwork and foundation installation phase of construction, higher fines content (up to 10 to 12 percent) could be acceptable.

Material placed for structural fill should be free of debris, organic matter, trash and cobbles greater than 6-inches in diameter. The moisture content of the fill material should be adjusted as necessary for proper compaction, and should be within 2 percent of optimum moisture.

Suitability of On-Site Materials as Fill

During dry weather construction, any non-organic on-site soil may be considered for use as structural fill; provided it meets the criteria described above in the “**Structural Fill**” section and can be compacted as recommended. If the soil material is over-optimum in moisture content when excavated, it will be necessary to aerate or dry the soil prior to placement as structural fill.

The native outwash soils generally consisted of sand with minor amount of silt and gravel. These soils are generally comparable to “common borrow” material and will be suitable for use as structural fill over a wider range of moisture content. Conversely, the glacial till contains a considerably higher fines content and will be difficult to impossible to reuse as structural fill at their current moisture content or during periods of extended precipitation.

We recommend that completed graded-areas be restricted from traffic or protected prior to wet weather conditions. The graded areas may be protected by paving, placing asphalt-treated base, a layer of free-draining material such as pit run sand and gravel or clean crushed rock material containing less than 5 percent fines, or some combination of the above.

Erosion Control

Weathering, erosion and the resulting surficial sloughing and shallow land sliding are natural processes. To manage and reduce the potential for these natural processes, we recommend erosion hazards be mitigated by applying Best Management Practices (BMPs), as outlined in the City of Gig Harbor Stormwater Management and Site Development Manual. Temporary erosion control BMPs should be installed at the site prior to the beginning of clearing, grading, or other construction activities, and should be updated and maintained throughout construction until final site stabilization is established. Temporary erosion control BMPs may include, but are not limited to:

- Silt fencing and appropriate soil stockpiling techniques to prevent silty stormwater from leaving the site,
- Jute matting, hydroseeding, or plastic covering to protect exposed soils,
- Straw wattles, quarry spall armoring, check dams, or other energy attenuation BMPs to slow the flow of stormwater over slopes and within drainage channels, and,
- Swales and berms to convey construction stormwater away from the slope.

Where native vegetated is removed because of clearing and grading activities, a dense vegetative groundcover, grass lawn, or native vegetation should be reestablished as soon as feasible. Permanent erosion control, such as mulched landscaping areas, groundcovers, hardscaping, or grass lawns, should be established as soon as feasible once final grades have been completed. All permanent erosion control methods should be maintained after construction activities have been completed.

We recommend earthwork activities be completed during the dry season (May 1 through September 30), and that any exposed soil areas be stabilized during the wet season (October 1 through April 30).

Wet Weather and Wet Condition Considerations

In the Puget Sound area, the Washington State Department of Ecology generally defines the wet season as beginning October 1st and continuing through about April 30th, although rainy periods could occur at any time of year. Therefore, it is strongly encouraged that earthwork be scheduled

during the dry weather months. Most of the soil at the site have a high fines content and are highly susceptible to changes in water content and tends to become unstable and impossible to proof-roll and compact if the moisture content exceeds the optimum.

In addition, during wet weather months, the groundwater levels could increase, resulting in seepage into site excavations. Performing earthwork during dry weather would reduce these problems and costs associated with rainwater, construction traffic, and handling of wet soil. However, should wet weather/wet condition earthwork be unavoidable, the following recommendations are provided:

- The ground surface in and surrounding the construction area should be sloped as much as possible to promote runoff of precipitation away from work areas and to prevent ponding of water.
- Work areas or slopes should be covered with plastic, when not being worked. The use of sloping, ditching, sumps, dewatering, and other measures should be employed as necessary to permit proper completion of the work.
- Earthwork should be accomplished in small sections to minimize exposure to wet conditions. That is, each section should be small enough so that the removal of unsuitable soils and placement and compaction of clean structural fill could be accomplished on the same day. The size of construction equipment may have to be limited to prevent soil disturbance. It may be necessary to excavate soils with a backhoe, or equivalent, and locate them so that equipment does not pass over the excavated area. Thus, subgrade disturbance caused by equipment traffic would be minimized.
- Fill material should consist of clean, well-graded, sand and gravel, such as *Gravel Backfill for Walls* (WSDOT Standard Specification 9-03.12(2)).
- No exposed soil should be left uncompacted and exposed to moisture. A smooth-drum vibratory roller, or equivalent, should roll the surface to seal out as much water as possible.
- In-place soil or fill soil that becomes wet and unstable and/or too wet to suitably compact should be removed and replaced with clean, granular soil (see gradation requirements above).
- Excavation and placement of structural fill material should be observed on a full-time basis by a geotechnical engineer (or representative) experienced in wet weather/wet condition earthwork to determine that all work is being accomplished in accordance with the project specifications and our recommendations.
- Grading and earthwork should not be accomplished during periods of heavy, continuous rainfall.

We recommend that the above requirements for wet weather/wet condition earthwork be incorporated into the contract specification.

Additional Services and Construction Observation

We recommend that GeoResources, LLC be retained to review those portions of the plans and specifications pertaining to the foundations, shoring, and earthwork to evaluate if they are in accordance with the recommendations presented in this report.



Additionally, we recommend GeoResources be retained to observe the geotechnical aspects of construction, particularly the fill placement and compaction, drainage systems, and retaining wall construction. This observation would allow us to verify the subsurface conditions as they are exposed during construction and to determine that work is accomplished in accordance with our recommendations contained herein. If conditions encountered during construction differ from those anticipated, we can provide recommendations for the conditions encountered.

LIMITATIONS

We have prepared this report for use by Azure Northwest, and other members of the design team, for use in the design of a portion of this project. The data used in preparing this report and this report should be provided to prospective contractors for their bidding or estimating purposes only. Our report, conclusions and interpretations are based on our subsurface explorations, data from others and limited site reconnaissance, and should not be construed as a warranty of the subsurface conditions.

Variations in subsurface conditions are possible between the explorations and may also occur with time. A contingency for unanticipated conditions should be included in the budget and schedule. Sufficient monitoring, testing and consultation should be provided by our firm during construction to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes should the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork and foundation installation activities comply with contract plans and specifications.

The scope of our services does not include services related to environmental remediation and construction safety precautions. 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.

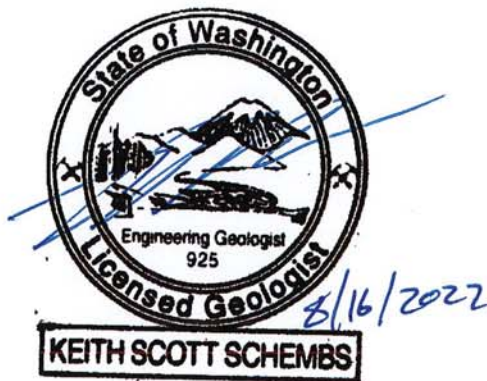
If there are any changes in the loads, grades, locations, configurations or type of facilities to be constructed, the conclusions and recommendations presented in this report may not be fully applicable. If such changes are made, we should be given the opportunity to review our recommendations and provide written modifications or verifications, as appropriate.



We have appreciated the opportunity to be of service to you on this project. If you have any questions or comments, please do not hesitate to call at your earliest convenience.

Respectfully submitted,
GeoResources, LLC

Davis Carlsen, GIT
Staff Geologist



Keith S. Schembs, LEG
Principal



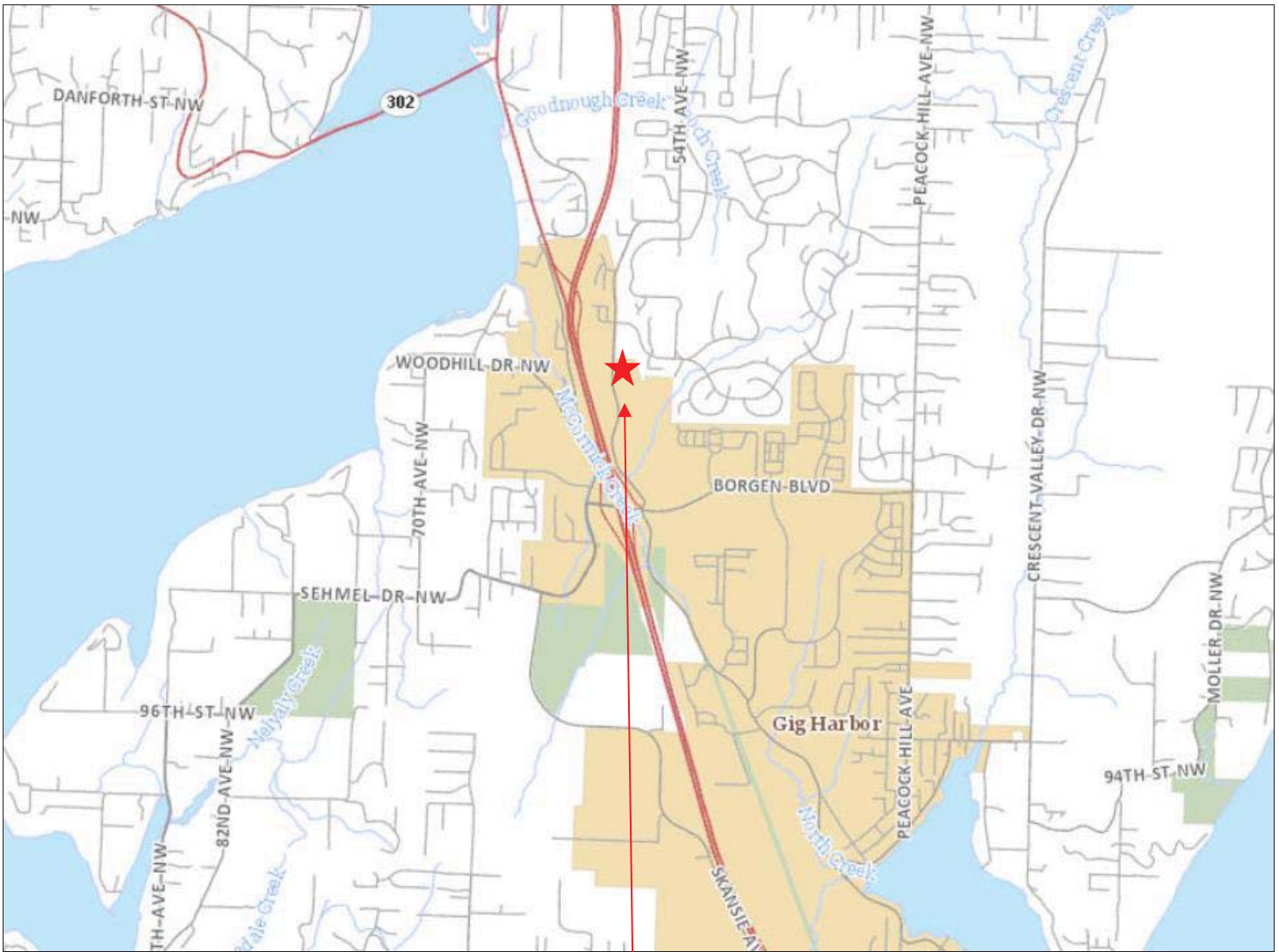
Eric W. Heller, PE, LG
Senior Geotechnical Engineer

DC:KSS:EWH/dc

DocID: AzureNW.CanterwoodBlvd.RGu

Attachments:

- Figure 1: Site Location Map
- Figure 2: Site & Exploration Plan
- Figure 3: Site Vicinity Map
- Figure 4: NRCS Soils Map
- Figure 5: Geologic Map
- Figure 6: Landslide Susceptibility Map
- Figure 7: Fault Hazards Map
- Figure 8: Typical Drainage and Backfilling Detail
- Figure 9: IBC Appendix J Detail
- Appendix A - Subsurface Explorations
- Appendix B - Laboratory Test Results
- Appendix C - Infiltration Calculation Worksheets



Approximate Site Location

Map created from Pierce County Public GIS (<http://matterhornwab.co.pierce.wa.us/publicgis/>)



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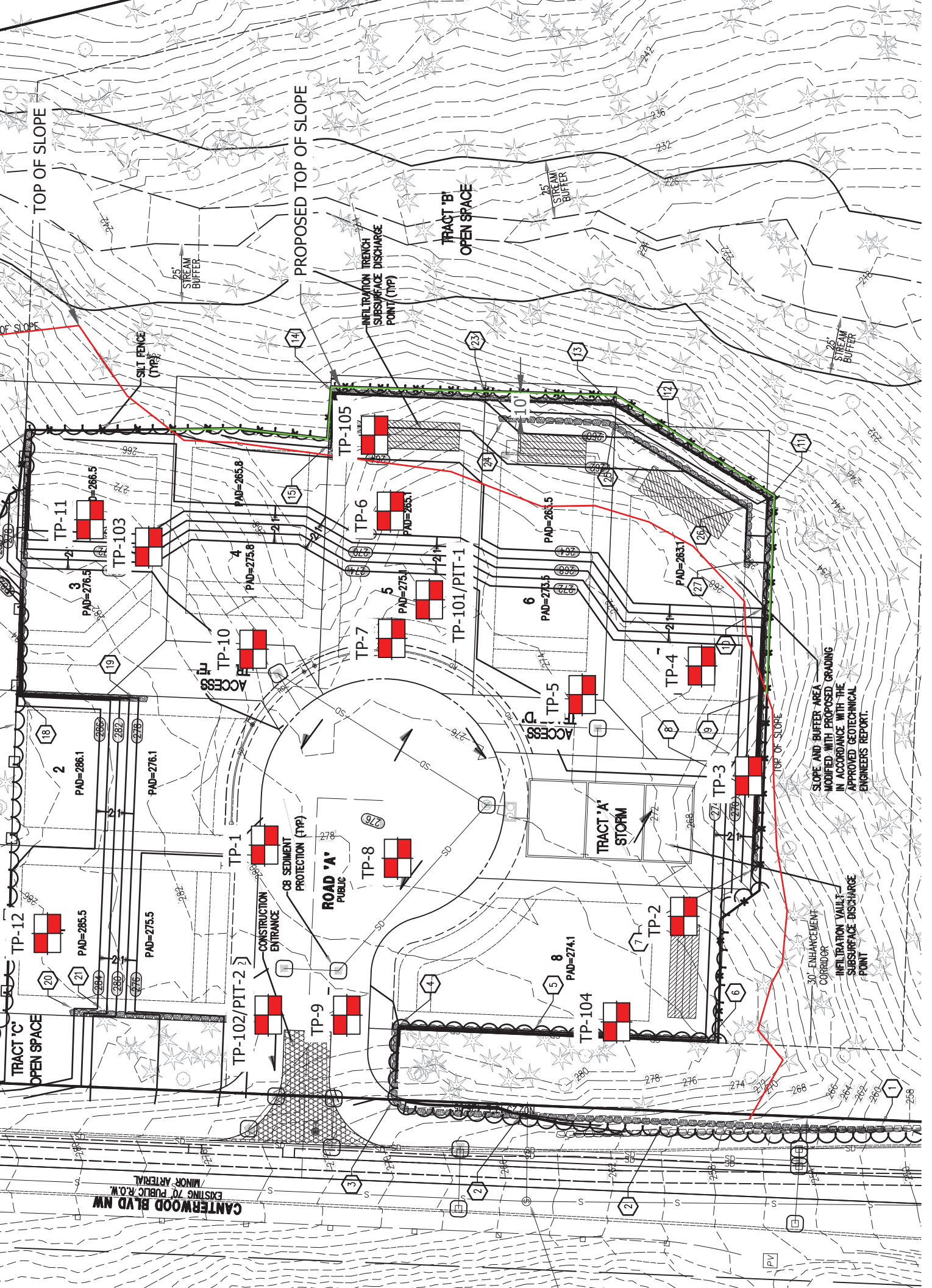
Site Location Map

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Figure 1





Approximate Site Location

Map created from Pierce County Public GIS (<http://matterhornwab.co.pierce.wa.us/publicgis/>)



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Site Vicinity Map

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Figure 3



Approximate Site Location

Map created from Web Soil Survey (<http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>)

Soil Type	Soil Name	Parent Material	Slopes	Erosion Hazard	Hydrologic Soils Group
16B	Harstine gravelly ashy sandy loam	Sandy glacial drift with an influence of volcanic ash over dense glaciomarine deposits	0 to 6	Slight	C
16C			6 to 15	Moderate	
16D			15 to 30	Moderate to Severe	



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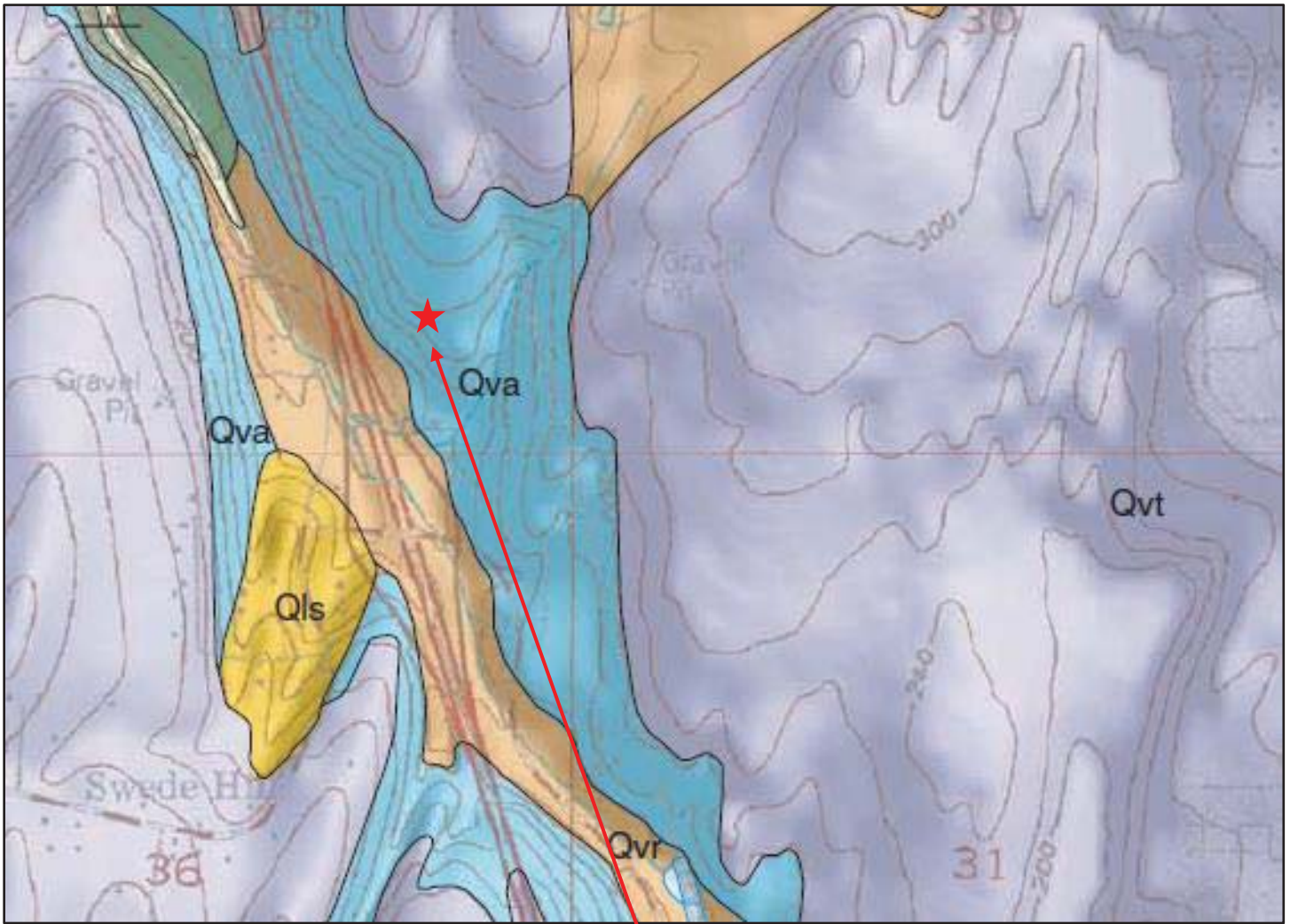
NRCS Soils Map

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Figure 4



Approximate Site Location

An excerpt from the draft *Geologic Map of the Gig Harbor 7.5-minute Quadrangle, Pierce County, Washington*

Qvr	Recessional outwash deposits
Qva	Advance outwash deposits



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Geologic Map

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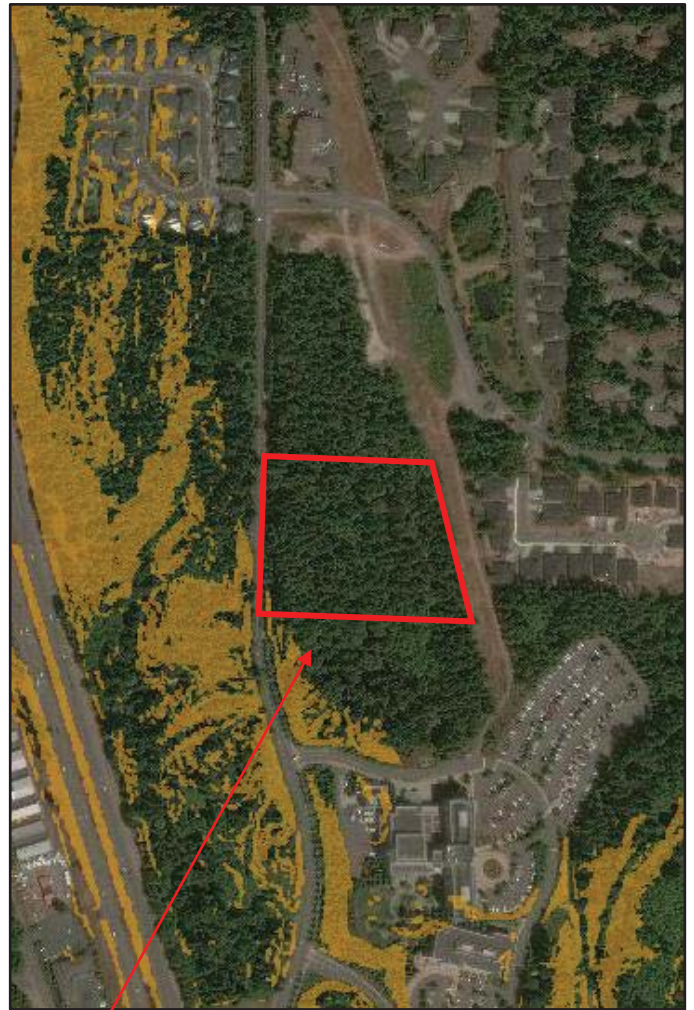
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Figure 5



Shallow Susceptibility

- Moderate
- High



Deep Susceptibility

- Moderate
- High

Approximate Site Location

Map created from the Washington State Department of Natural Resources (Information Portal <https://geologyportal.dnr.wa.gov/>)



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Landslide Susceptibility Map

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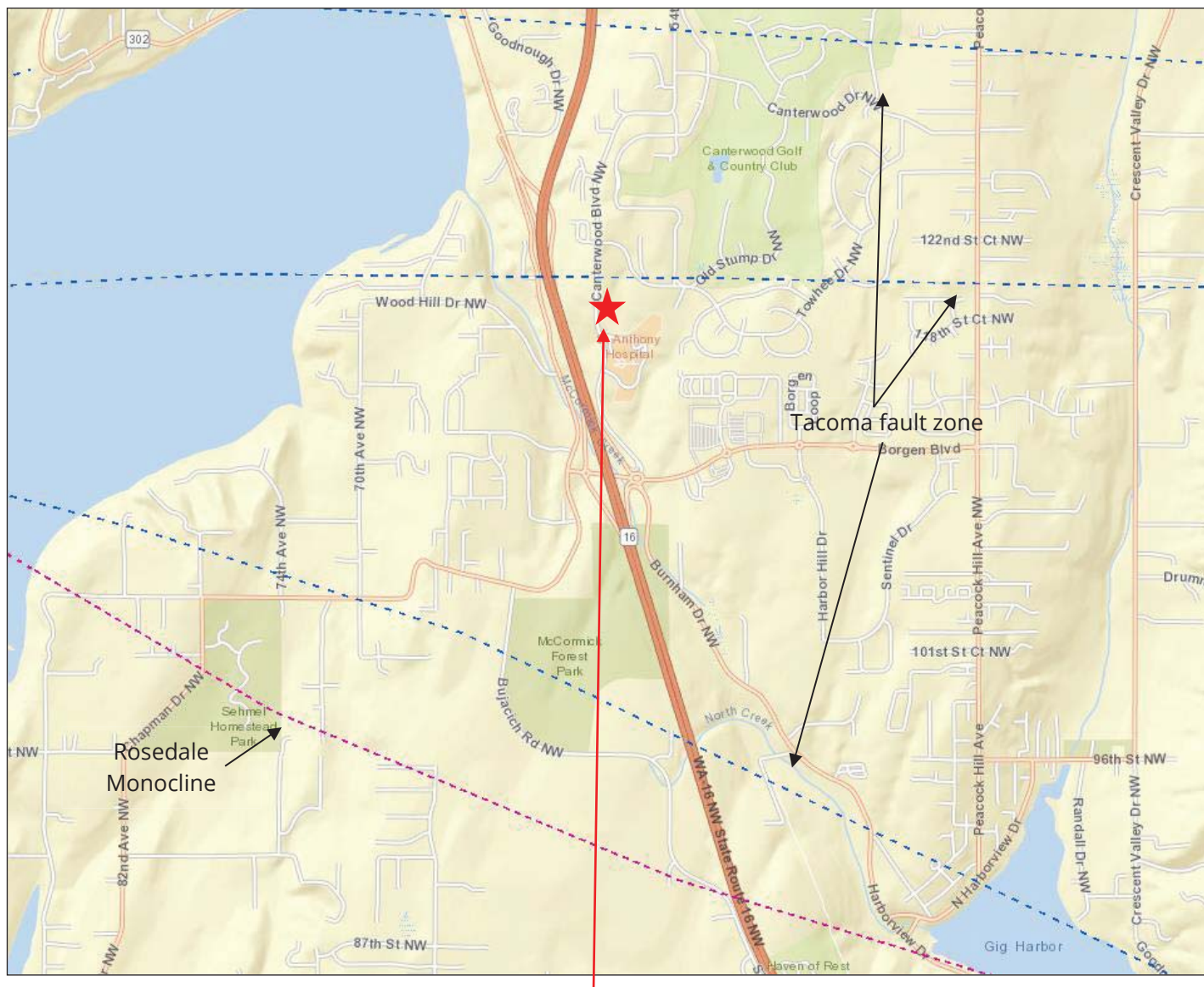
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Figure 6



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Approximate Site Location

Map created from Washington DNR Geologic Information Portal
<http://fortress.wa.gov/dnr/protectiongis/geology/?Theme=wigm>

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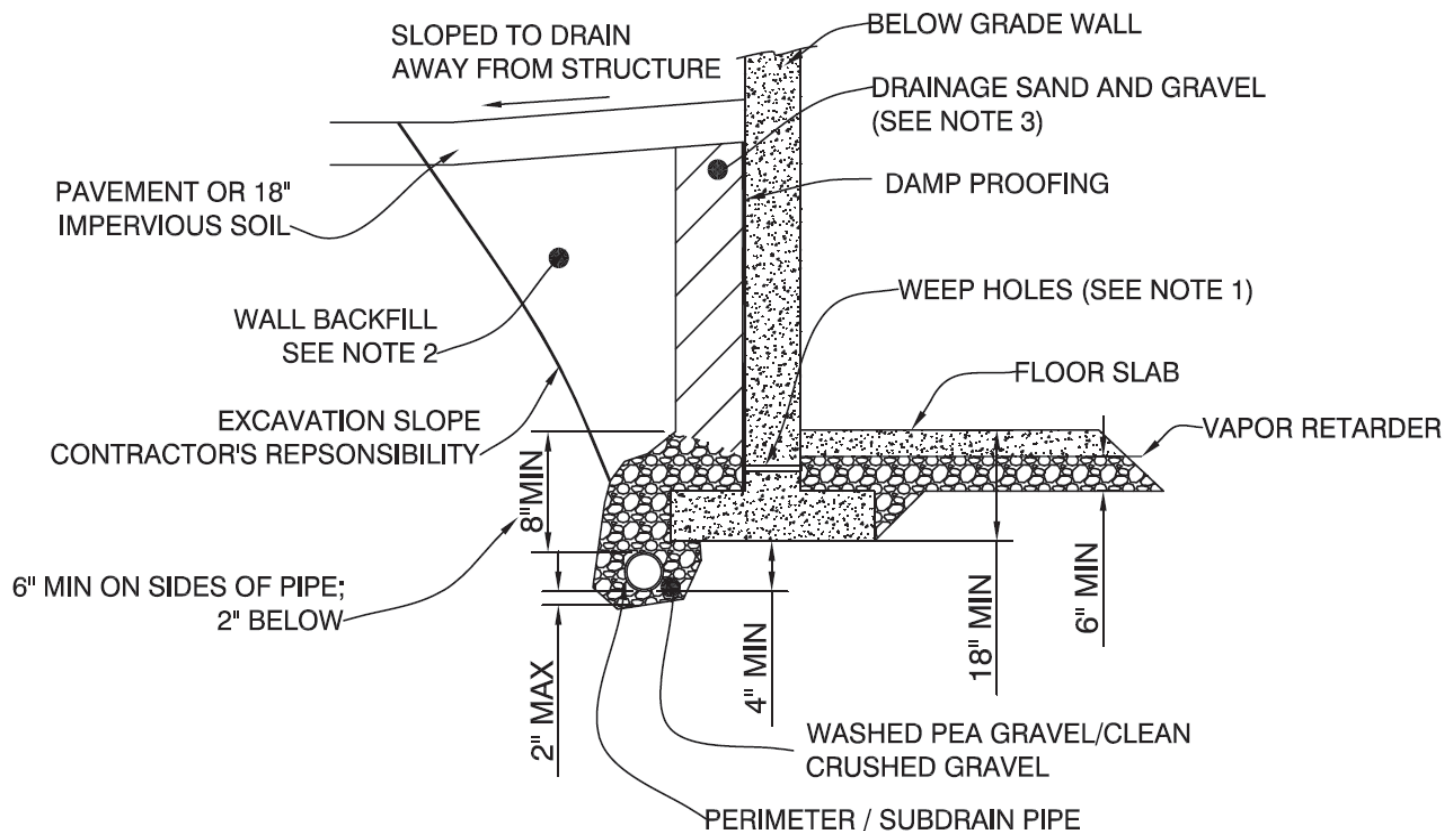
Fault Hazards Map

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Figure 7



Notes

- Washed pea gravel/crushed rock beneath floor slab could be hydraulically connected to perimeter/subdrain pipe. Use of 1" diameter weep holes as shown is one applicable method. Crushed gravel should consist of 3/4" minus. Washed pea gravel should consist of 3/8" to No. 8 standard sieve.
- Wall backfill should meet WSDOT Gravel Backfill for Walls Specification 9-03-12(2).
- Drainage sand and gravel backfill within 18" of wall should be compacted with hand-operated equipment. Heavy equipment should not be used for backfill, as such equipment operated near the wall could increase lateral earth pressures and possibly damage the wall. The table below presents the drainage sand and gravel gradation.
- All wall back fill should be placed in layers not exceeding 4" loose thickness for light equipment and 8" for heavy equipment and should be densely compacted. Beneath paved or sidewalk areas, compact to at least 95% Modified Proctor maximum density (ASTM: 01557-70 Method C). In landscaping areas, compact to 90% minimum.
- Drainage sand and gravel may be replaced with a geocomposite core sheet drain placed against the wall and connected to the subdrain pipe. The geocomposite core sheet should have a minimum transmissivity of 3.0 gallons/minute/foot when tested under a gradient of 1.0 according to ASTM 04716.
- The subdrain should consist of 4" diameter (minimum), slotted or perforated plastic pipe meeting the requirements of AASHTO M 304; 1/8-inch maximum slot width; 3/16- to 3/8-inch perforated pipe holes in the lower half of pipe, with lower third segment unperforated for water flow; tight joints; sloped at a minimum of 6"/100' to drain; cleanouts to be provided at regular intervals.
- Surround subdrain pipe with 8 inches (minimum) of washed pea gravel (2" below pipe" or 5/8" minus clean crushed gravel. Washed pea gravel to be graded from 3/8-inch to No.8 standard sieve.
- See text for floor slab subgrade preparation.

Materials

Drainage Sand and Gravel		3/4" Minus Crushed Gravel	
Sieve Size	% Passing by Weight	Sieve Size	% Passing by Weight
3/4"	100	3/4"	100
No 4	28-56	1/2"	75 - 100
No 8	20-50	1/4"	0 - 25
No 50	3-12	No 100	0 - 2
No 100	0-2	(by wet sieving)	(non-plastic)

Typical Drainage and Backfilling Detail

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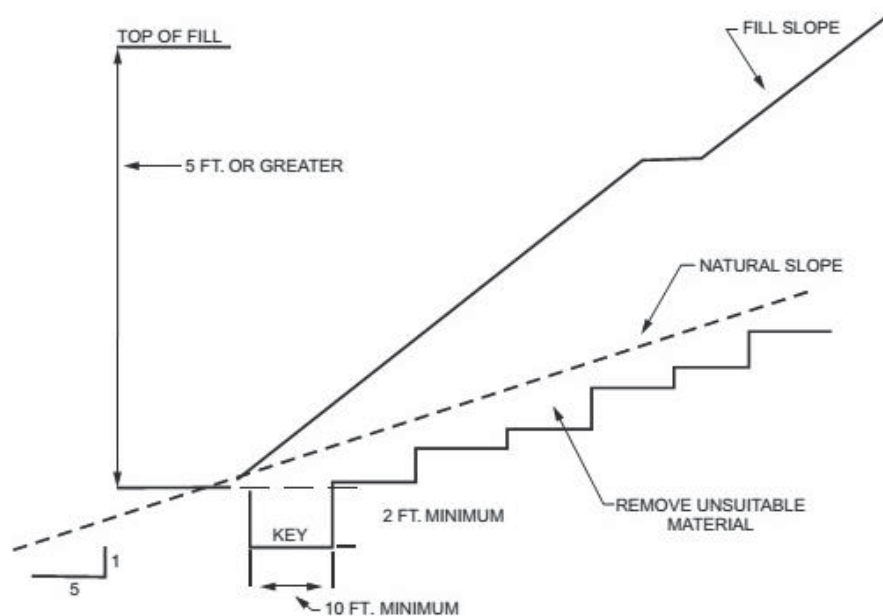
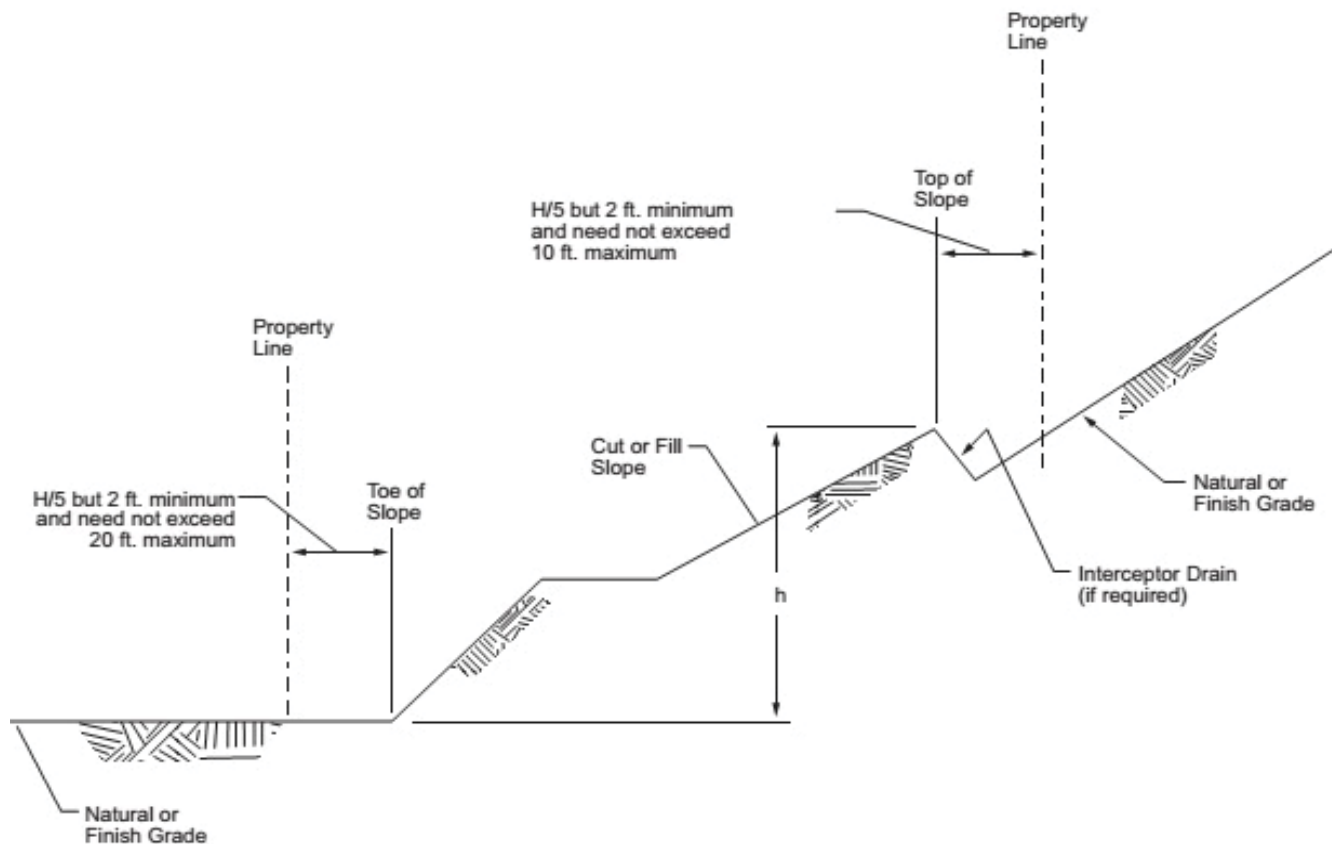
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Figure 8



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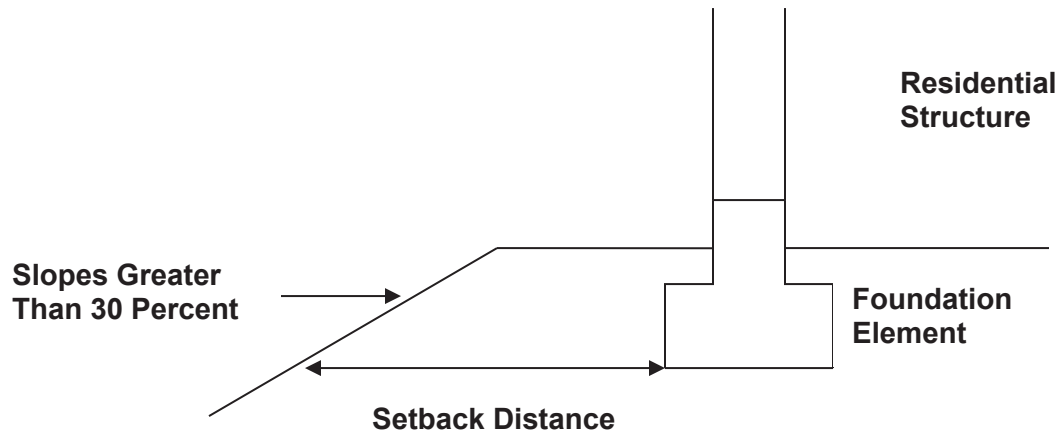


Preliminary - Not for Construction

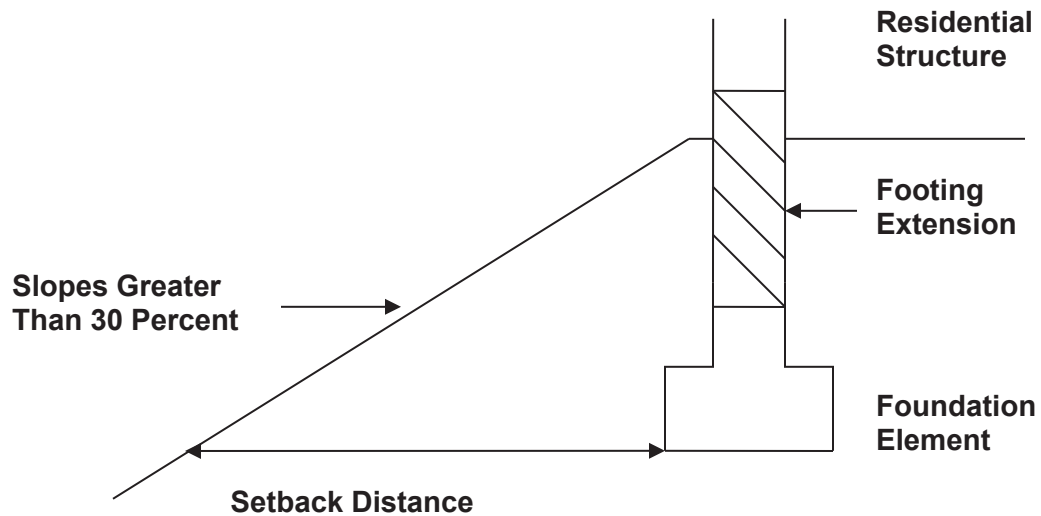
IBC APPENDIX J DETAIL

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Conventional Footing



Footing Extension



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Typical Structural Setback Detail

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Figure 10

Appendix A

Subsurface Explorations

SOIL CLASSIFICATION SYSTEM

MAJOR 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 GRAVEL	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
			GP	POORLY-GRADED GRAVEL
		GRAVEL WITH FINES	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SAND More than 50% Of Coarse Fraction Passes No. 4 Sieve	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND
			SP	POORLY-GRADED SAND
		SAND WITH FINES	SM	SILTY SAND
			SC	CLAYEY SAND
FINE GRAINED SOILS More than 50% Passes No. 200 Sieve	SILT AND CLAY Liquid Limit Less than 50	INORGANIC	ML	SILT
			CL	CLAY
	SILT AND CLAY Liquid Limit 50 or more	ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
			INORGANIC	MH
		ORGANIC		CH
			OH	ORGANIC CLAY, ORGANIC SILT
HIGHLY ORGANIC SOILS			PT	PEAT

NOTES:

- Field classification is based on visual examination of soil in general accordance with ASTM D2488-90.
- Soil classification using laboratory tests is based on ASTM D2487-90.
- Description of soil density or consistency are based on interpretation of blow count data, visual appearance of soils, and or test data.

SOIL MOISTURE MODIFIERS:

- Dry- Absence of moisture, dry to the touch
- Moist- Damp, but no visible water
- Wet- Visible free water or saturated, usually soil is obtained from below water table



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Unified Soils Classification System

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Figure
A-1

Test Pit TP- 1

Location: North central portion of the site

Approximate Elevation: 280

Depth (feet)	Soil Type	Soil Description
0 - 0.5		Forest Duff
0.5 - 3.0	SP	Brown/Tan SAND with some silt and gravel (loose to medium dense, moist)
3.0 - 3.5	SM	Brown/Gray silty SAND with gravel (medium dense to dense, moist) (weathered till)
3.5 - 6.5	SM	Gray silty SAND with gravel and some cobbles (very dense, moist) (glacial till)

No caving observed.

No groundwater seepage observed.

Test Pit TP- 2

Location: Southwest portion of the site, top of slope

Approximate Elevation: 274

Depth (feet)	Soil Type	Soil Description
0 - 0.5		Forest Duff
0.5 - 3.0	SP	Brown/Tan SAND with some silt and gravel (loose to medium dense, moist)
3.0 - 4.0	SM	Brown/Gray silty SAND with gravel (medium dense to dense, moist) (weathered till)
4.0 - 7.0	SM	Gray silty SAND with gravel and some cobbles (very dense, moist) (glacial till)

No caving observed.

No groundwater seepage observed.

Test Pit TP- 3

Location: South central portion of the site

Approximate Elevation: 262

Depth (feet)	Soil Type	Soil Description
0 - 0.5		Forest Duff
0.5 - 2.0	SP	Brown/Tan SAND with some silt and gravel (loose to medium dense, moist)
2.0 - 2.5	SM	Brown/Gray silty SAND with gravel (medium dense to dense, moist) (weathered till)
2.5 - 5.0	SM	Gray silty SAND with gravel and some cobbles (very dense, moist) (glacial till)

No caving observed.

No groundwater seepage observed.

Excavated on: April 2, 2013

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May 2022

Figure A-2



Test Pit TP- 4

Location: Southeast portion of upland portion of the site

Approximate Elevation: 271

Depth (feet)	Soil Type	Soil Description
0 - 0.3		Forest Duff
0.3 - 4.0	SP	Gray gravelly SAND with trace silt (medium dense, moist) (weathered advanced outwash?)
4.0 - 6.5	SP	Gray gravelly SAND with trace silt (dense, moist) (advanced outwash/sandy till)
6.5 - 8.0	SP	Gray fine-medium SAND with some silt (dense, moist)

No caving observed.

No groundwater seepage observed.

Test Pit TP- 5

Location: Retaining walls between Building C/B

Approximate Elevation: 274

Depth (feet)	Soil Type	Soil Description
0 - 0.3		Forest Duff
0.3 - 3.0	SP	Gray gravelly SAND with trace silt (medium dense, moist) (weathered advanced outwash?)
3.0 - 10.0	SP	Gray gravelly SAND with trace silt (dense, moist) (advanced outwash/sandy till)

No caving observed.

No groundwater seepage observed.

Test Pit TP- 6

Location: South central portion of the site

Approximate Elevation: 270

Depth (feet)	Soil Type	Soil Description
0 - 0.5		Forest Duff
0.5 - 3.5	SP	Brown/Tan SAND with some silt and gravel (loose to medium dense, moist)
3.5 - 4.0	SM	Brown/Gray silty SAND with gravel (medium dense to dense, moist) (weathered till)
4.0 - 7.0	SM	Gray silty SAND with gravel and some cobbles (very dense, moist) (glacial till)

No caving observed.

No groundwater seepage observed.

Excavated on: April 2, 2013

Test Pit Logs

Proposed Residential Development

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Gig Harbor, Washington

PN: 0122254065

Test Pit TP- 7

Location: West of TP-6

Approximate Elevation: 275

Depth (feet)	Soil Type	Soil Description
0 - 0.3		Forest Duff
0.3 - 1.0	SP	Tan SAND with some silt and gravel (loose, moist)
1.0 - 3.0	SP	Gray gravelly SAND with trace silt (loose to medium dense, moist)
3.0 - 5.5	SP	Gray gravelly SAND with trace silt (dense, moist)
5.5 - 7.5	SM	Gray silty SAND with gravel (very dense, moist) (glacial till)

Moderate to severe caving observed from 4-8 feet.

Test Pit TP- 8

Location: Central portion of site

Approximate Elevation: 277

Depth (feet)	Soil Type	Soil Description
0 - 0.3		Forest Duff
0.3 - 3.0	SP	Gray gravelly SAND with trace silt (medium dense, moist) (weathered advanced outwash?)
3.0 - 10.0	SP	Gray gravelly SAND with some silt and trace cobbles (dense, moist) (advanced outwash/sandy till)

No caving observed.

No groundwater seepage observed.

Test Pit TP- 9

Location: West central portion of the site

Approximate Elevation: 280

Depth (feet)	Soil Type	Soil Description
0 - 0.3		Forest Duff
0.3 - 5.5	SP	Gray gravelly SAND with trace silt (medium dense, moist) (weathered advanced outwash?)
5.5 - 9.0	SP	Gray gravelly SAND with some silt and trace cobbles (dense, moist) (iron oxide staining at 6-7') (advanced outwash/sandy till)

No caving observed.

No groundwater seepage observed.

Excavated on: April 2, 2013



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Test Pit Logs

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May 2022

Figure A-4

Test Pit TP- 10

Location: Northeast portion of the site, top of gully

Approximate Elevation: 275

Depth (feet)	Soil Type	Soil Description
0 - 0.5		Forest Duff
0.5 - 2.5	SP	Brown/Tan SAND with some silt and gravel (loose to medium dense, moist)
2.5 - 3.0	SM	Brown/Gray silty SAND with gravel (medium dense to dense, moist) (weathered till)
3.0 - 6.5	SM	Gray silty SAND with gravel and some cobbles (very dense, moist) (glacial till)

No caving observed.

No groundwater seepage observed.

Test Pit TP- 11

Location: Northeast corner of the upland site, by large cedar

Approximate Elevation: 277

Depth (feet)	Soil Type	Soil Description
0 - 0.6		Forest Duff
0.6 - 1.5	SP	Brown/Tan SAND with some silt and gravel (loose to medium dense, moist)
1.5 - 3.0	SM	Gray silty SAND with some gravel (loose, moist)
3.0 - 3.6	SM	Tan/Gray silty SAND with gravel and some cobbles (medium dense to dense, moist) (weathered glacial till)
3.6 - 6.0	SM	Gray silty SAND with gravel and some cobbles (dense to very dense, moist) (glacial till)

No caving observed.

No groundwater seepage observed.

Test Pit TP- 12

Location: North-central portion of the site

Approximate Elevation: 286

Depth (feet)	Soil Type	Soil Description
0 - 0.5		Forest Duff
0.5 - 2.5	SP	Brown/Tan SAND with some silt and gravel (loose to medium dense, moist)
2.5 - 3.0	SM	Brown/Gray silty SAND with gravel (medium dense to dense, moist) (weathered till)
3.0 - 7.5	SM	Gray silty SAND with gravel and some cobbles (very dense, moist) (glacial till)

No caving observed.

No groundwater seepage observed.

Excavated on: April 2, 2013



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Test Pit Logs

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Figure A-5

Test Pit TP-101

Location: Central portion of site
Approximate Elevation: **272** feet

Depth (feet)	Soil Type	Soil Description
0.0 - 0.75		Forest Duff
0.75 - 1.25	SP	Brown coarse SAND with gravel (loose to med. dense, dry to moist) (weathered outwash)
1.25 - 4.25	SP	Grey coarse SAND with gravel, occasional cobbles (medium dense, dry to moist) (recessional outwash)
4.25 - 4.75	SM	Brown silty SAND with gravel (dense, moist) (weathered till)
4.75 - 7.25	SM	Grey silty SAND with gravel (dense to very dense, moist) (glacial till)

Terminated at 7.25 feet below ground surface.

Mottling observed at 4.5 feet below ground surface

No caving observed.

No groundwater seepage observed.

Infiltration testing performed at a depth of 2 feet

Test Pit TP-102

Location: Northwest portion of site
Approximate Elevation: **284** feet

Depth (feet)	Soil Type	Soil Description
0.0 - 0.75		Forest Duff
0.75 - 3.0	SM	Brown silty SAND with gravel (dense, moist) (weathered till)
3.0 - 6.25	SM	Grey silty SAND with gravel (dense to very dense, moist) (glacial till)

Terminated at 6.25 feet below ground surface.

Slight mottling at 2.5 feet below ground surface

No caving observed.

No groundwater seepage observed.

Infiltration testing performed at a depth of 1.5 feet

Logged by: DC

Excavated on: **October 6, 2020**



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Test Pit Logs

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May 2022

Figure A-6

Test Pit TP- 103

Location: North-central portion of site
Approximate Elevation: **277** feet

Depth (feet)	Soil Type	Soil Description
0.0 - 0.5		Forest Duff
0.5 - 1.25	SM	Brown silty SAND with gravel (medium dense to dense, dry to moist) (weathered till)
1.25 - 6.25	SM	Tan to grey silty SAND with gravel (dense, moist) (glacial till)

Terminated at 6.25 feet below ground surface.
Mottling observed at 3.0 feet below ground surface
No caving observed.
No groundwater seepage observed.

Test Pit TP- 104

Location: Southwest portion of site
Approximate Elevation: **280** feet

Depth (feet)	Soil Type	Soil Description
0.0 - 0.5		Forest Duff
0.5 - 1.75	SP	Brown coarse SAND with gravel (loose to med. dense, dry to moist) (weathered outwash)
1.75 - 6.5	SP	Grey coarse SAND with gravel, occasional cobbles (medium dense, dry to moist) (recessional outwash)
6.5 - 9.75	SP	Grey poorly graded SAND with silt and gravel, lightly cemented (medium dense, moist) (advanced outwash)

Terminated at 9.75 feet below ground surface.
Slight mottling at 6.5 feet below ground surface
Significant caving observed 2.0 – 6.5 feet below ground surface
No groundwater seepage observed.

Test Pit TP- 105

Location: Central portion of site
Approximate Elevation: **261** feet

Depth (feet)	Soil Type	Soil Description
0.0 - 0.5		Duff/Topsoil
0.5 - 1.25	SP	Brown coarse SAND with gravel (loose to med. dense, dry to moist) (weathered outwash)
1.25 - 6.5	SP	Grey coarse SAND with gravel, occasional cobbles (medium dense, dry to moist) (recessional outwash)
6.75 - 7.5	SM	Grey silty SAND, slight laminations (dense to very dense, moist) (glacial till)

Terminated at 7.5 feet below ground surface.
Slight mottling observed at 6.75 feet below ground surface
Significant caving observed at 3.0 – 6.75 feet below ground surface

Logged by: DC

Excavated on: **October 6, 2020**



Test Pit Logs

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PN: 0122254065

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October
May 2022

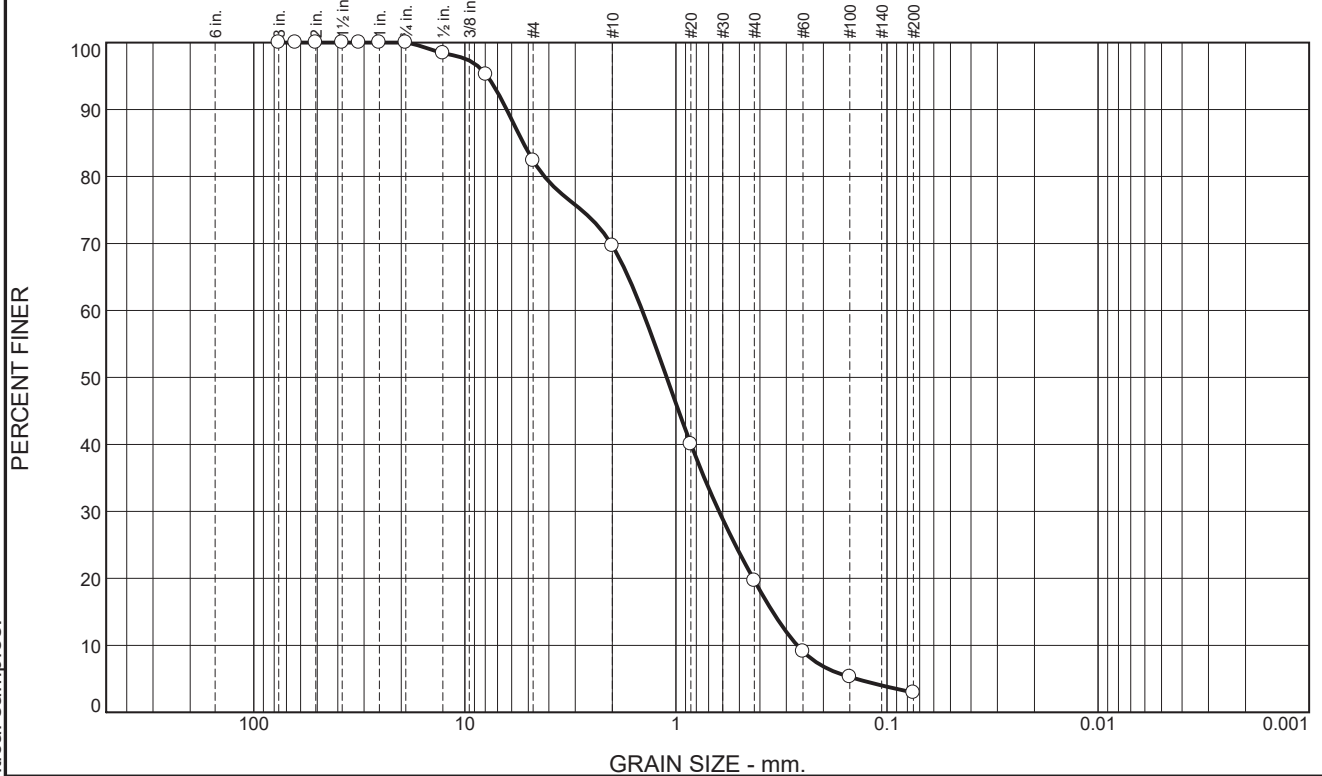
Figure A-7

Appendix B

Laboratory Test Results

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	17.6	12.7	50.0	16.8	2.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3.0	100.0		
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.25	100.0		
1	100.0		
.75	100.0		
.5	98.4		
.3125	95.2		
#4	82.4		
#10	69.7		
#20	40.1		
#40	19.7		
#60	9.1		
#100	5.3		
#200	2.9		

* (no specification provided)

Material Description		
Poorly Graded SAND with Gravel		
Atterberg Limits LL= NV PI= NP Coefficients D₉₀= 6.3381 D₈₅= 5.2852 D₆₀= 1.4443 D₅₀= 1.1061 D₃₀= 0.6240 D₁₅= 0.3476 D₁₀= 0.2663 C_u= 5.42 C_c= 1.01 Classification USCS= SP AASHTO= A-1-b Remarks Moisture: 4.9		

Location: TP-101 S-1

Sample Number: 100598

Depth: 1.75'

Date: 10/7/2020

GeoResources, LLC

Fife, WA

Client: AzureNW

Project: AzureNW.Canterwood

Project No:

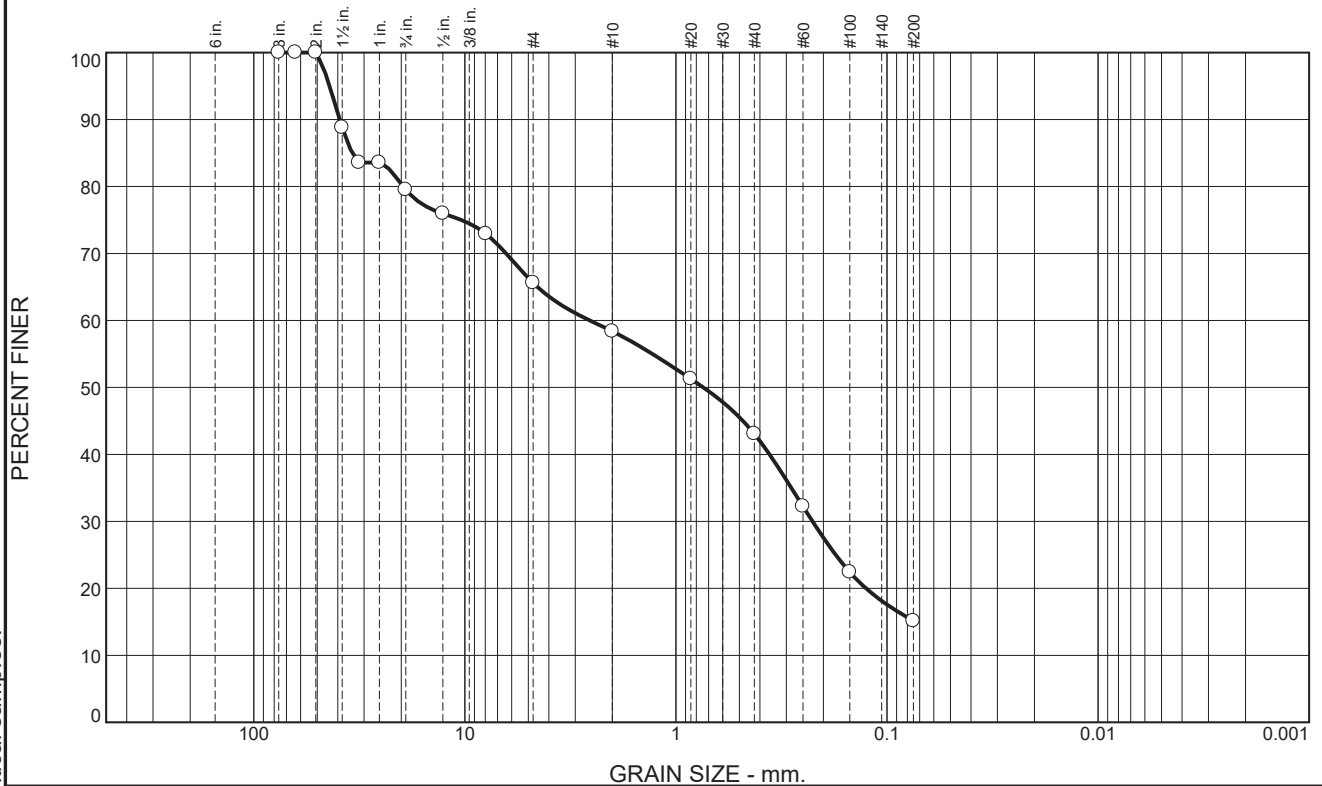
Figure

Tested By: DC/DS

Checked By: KSS

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	20.5	13.9	7.2	15.3	28.0	15.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3.0	100.0		
2.5	100.0		
2.0	100.0		
1.5	88.8		
1.25	83.6		
1	83.6		
.75	79.5		
.5	76.0		
.3125	72.9		
#4	65.6		
#10	58.4		
#20	51.3		
#40	43.1		
#60	32.2		
#100	22.4		
#200	15.1		

* (no specification provided)

Material Description
 Silty SAND with Gravel

Atterberg Limits
 PL= NP LL= NV PI= NP

Coefficients
 D₉₀= 39.1668 D₈₅= 34.1730 D₆₀= 2.5573
 D₅₀= 0.7415 D₃₀= 0.2252 D₁₅=
 D₁₀= C_u= C_c=

Classification
 USCS= SM AASHTO= A-1-b

Remarks
 Moisture: 7.0%

Location: TP-102 S-1

Sample Number: 100600

Depth: 1.25'

Date: 10/6/2020

GeoResources, LLC

Fife, WA

Client: AzureNW

Project: AzureNW.Canterwood

Project No:

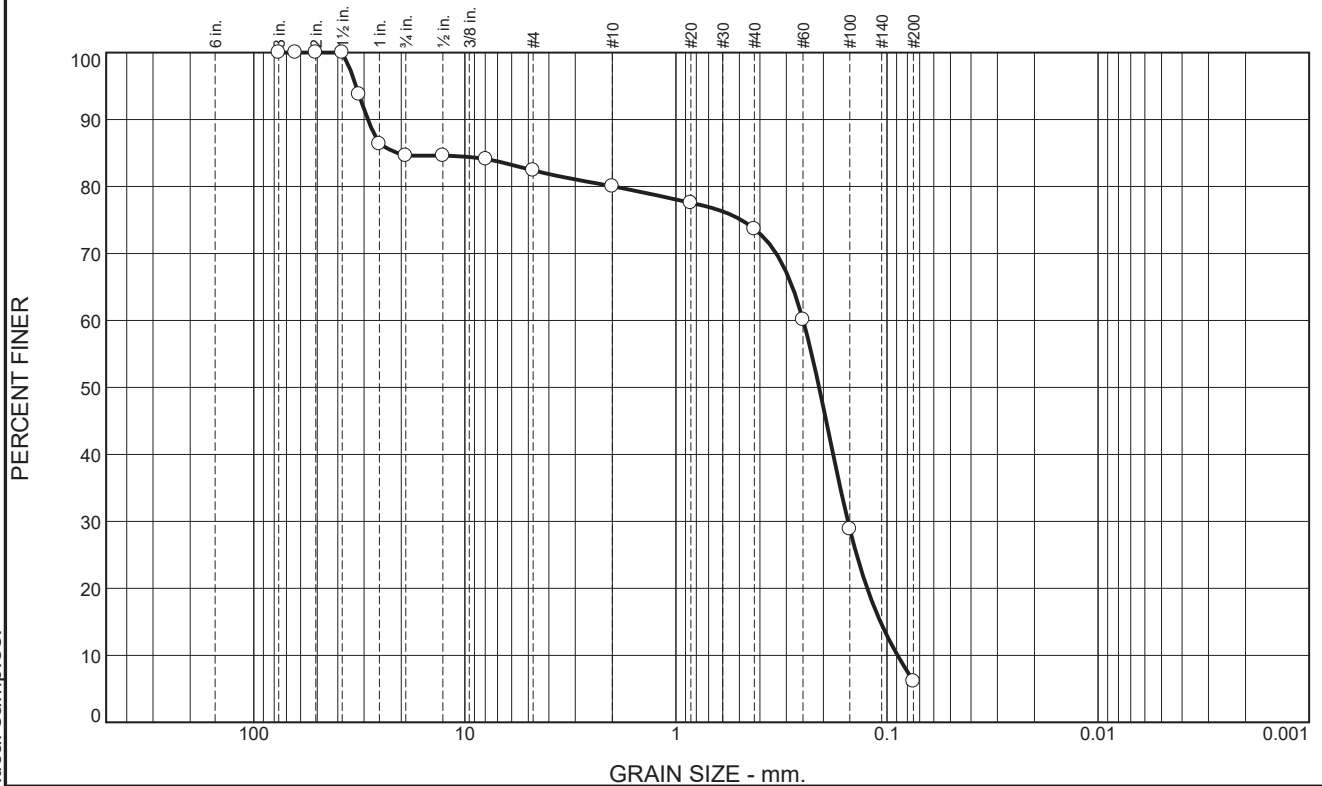
Figure

Tested By: DC/DS

Checked By: KSS

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	15.4	2.2	2.4	6.3	67.6	6.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3.0	100.0		
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.25	93.7		
1	86.4		
.75	84.6		
.5	84.6		
.3125	84.1		
#4	82.4		
#10	80.0		
#20	77.6		
#40	73.7		
#60	60.1		
#100	28.9		
#200	6.1		

* (no specification provided)

<u>Material Description</u>		
Poorly Graded SAND with Silt and Gravel.		
<u>Atterberg Limits</u>		
PL= NP	LL= NV	PI= NP
<u>Coefficients</u>		
D ₉₀ = 28.8028	D ₈₅ = 20.8262	D ₆₀ = 0.2493
D ₅₀ = 0.2095	D ₃₀ = 0.1530	D ₁₅ = 0.1074
D ₁₀ = 0.0891	C _u = 2.80	C _c = 1.05
<u>Classification</u>		
USCS= SP-SM	AASHTO= A-3	
<u>Remarks</u>		
MOisture: 3.1		

Location: TP-104 S-2

Sample Number: 100605

Depth: 7.5'

Date: 10/7/2020

GeoResources, LLC

Fife, WA

Client: AzureNW

Project: AzureNW.Canterwood

Project No:

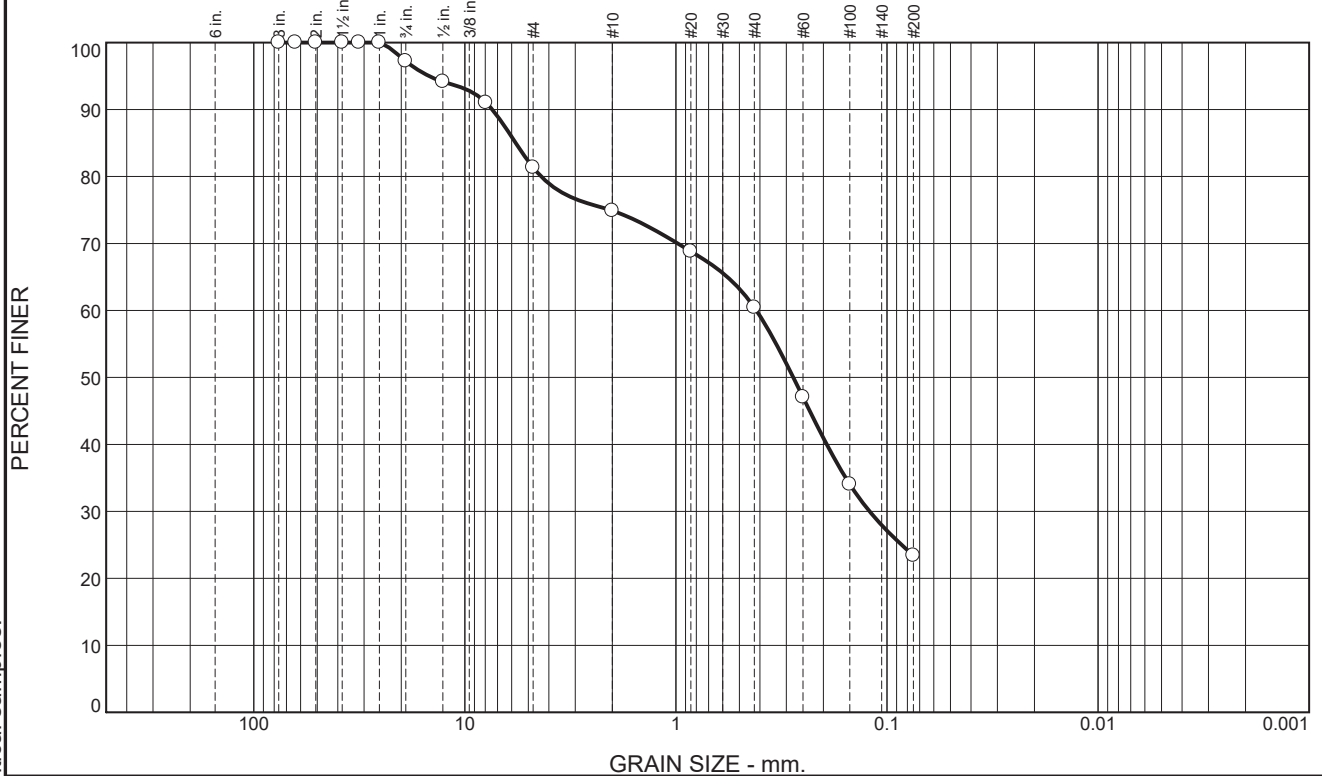
Figure

Tested By: DC/DS

Checked By: KSS

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.8	15.9	6.4	14.5	37.0	23.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3.0	100.0		
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.25	100.0		
1	100.0		
.75	97.2		
.5	94.2		
.3125	91.0		
#4	81.3		
#10	74.9		
#20	68.8		
#40	60.4		
#60	47.1		
#100	34.0		
#200	23.4		

* (no specification provided)

Material Description		
Silty SAND with Gravel		
Atterberg Limits PL= NP LL= NV PI= NP Coefficients D₉₀= 7.4118 D₈₅= 5.7401 D₆₀= 0.4156 D₅₀= 0.2779 D₃₀= 0.1209 D₁₅= D₁₀= C_u= C_c= Classification USCS= SM AASHTO= A-2-4(0) Remarks Moisture: 4.1%		

Location: TP-103 S-1

Sample Number: 100606

Depth: 3.5'

Date: 10/7/2020

GeoResources, LLC

Fife, WA

Client: AzureNW

Project: AzureNW.Canterwood

Project No:

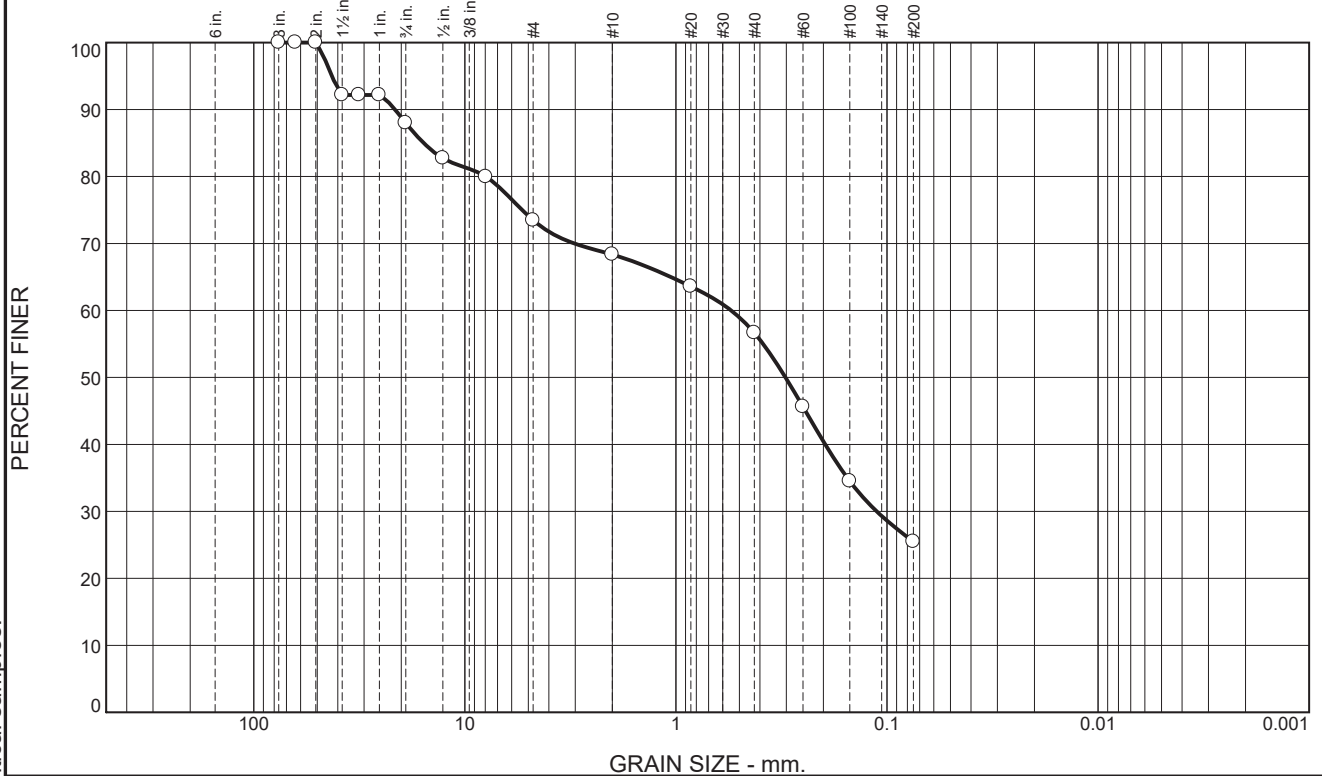
Figure

Tested By: DC/DS

Checked By: KSS

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.0	14.5	5.2	11.6	31.2	25.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3.0	100.0		
2.5	100.0		
2.0	100.0		
1.5	92.2		
1.25	92.2		
1	92.2		
.75	88.0		
.5	82.7		
.3125	80.0		
#4	73.5		
#10	68.3		
#20	63.6		
#40	56.7		
#60	45.6		
#100	34.5		
#200	25.5		

* (no specification provided)

Material Description		
Silty SAND with Gravel		
Atterberg Limits PL= NP LL= NV PI= NP Coefficients D₉₀= 21.4218 D₈₅= 15.6711 D₆₀= 0.5472 D₅₀= 0.3026 D₃₀= 0.1119 D₁₅= D₁₀= C_u= C_c= Classification USCS= SM AASHTO= A-2-4(0) Remarks Moisture: 5.8%		

Location: TP-101 S-2
Sample Number: 100599 Depth: 5'

Date: 10/6/2020

GeoResources, LLC

Client: AzureNW
Project: AzureNW.Canterwood

Fife, WA

Project No:

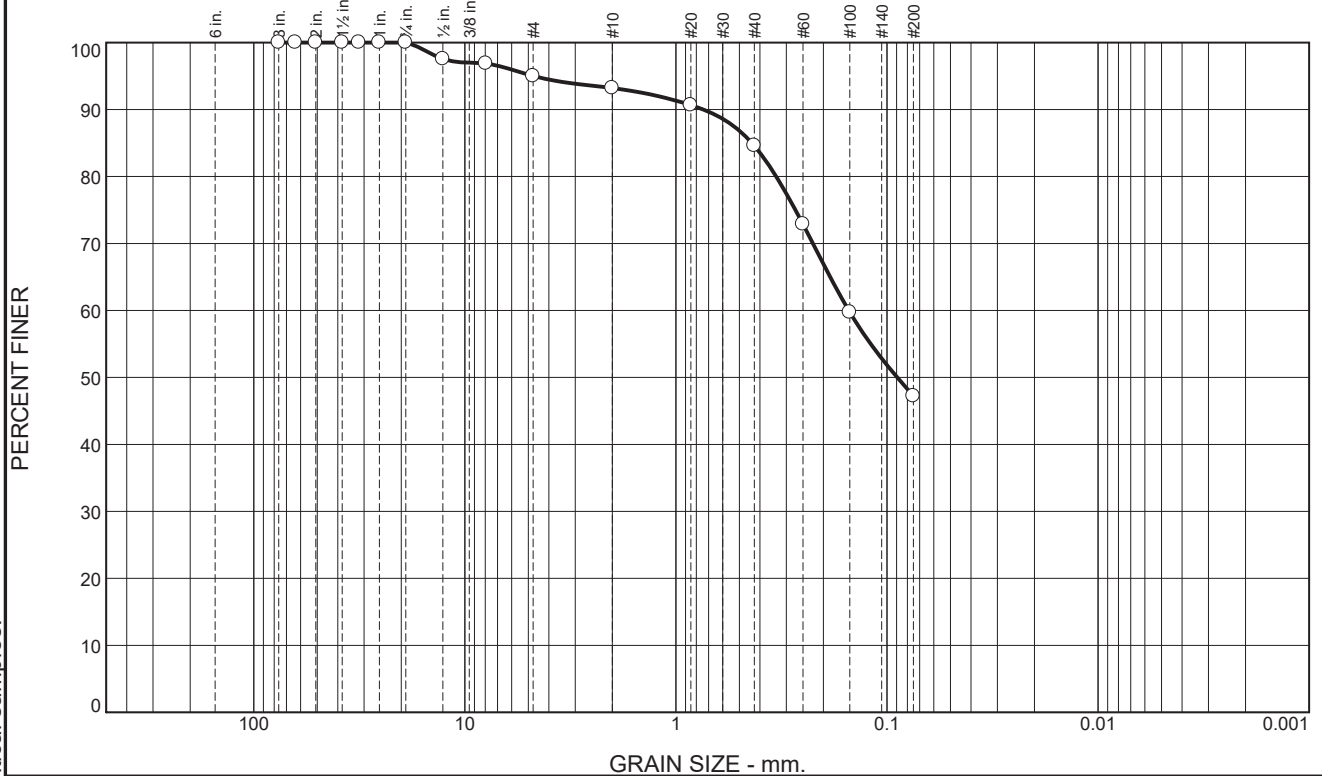
Figure

Tested By: DC

Checked By: KSS

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.0	1.8	8.6	37.4	47.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3.0	100.0		
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.25	100.0		
1	100.0		
.75	100.0		
.5	97.6		
.3125	96.9		
#4	95.0		
#10	93.2		
#20	90.7		
#40	84.6		
#60	72.9		
#100	59.7		
#200	47.2		

* (no specification provided)

Material Description		
Silty SAND		
PL= NP	Atterberg Limits LL= NV	PI= NP
D ₉₀ = 0.7412 D ₅₀ = 0.0894 D ₁₀ =	Coefficients D ₈₅ = 0.4363 D ₃₀ = C _u =	D ₆₀ = 0.1518 D ₁₅ = C _c =
USCS= SM	Classification AASHTO= A-4(0)	
Moisture: 10.8%		
Remarks		

Location: TP--102 S-2
Sample Number: 100601 Depth: 4'

Date: 10/6/2020

GeoResources, LLC

Client: AzureNW
Project: AzureNW.Canterwood

Fife, WA

Project No:

Figure

Tested By: DC

Checked By: KSS