Cascade Christian Schools - Elementary Portables
811 21st ST SE
Puyallup, WA 98372
Parcel #: 0420352148, 0420263083 (Annexed)
Owner: Cascade Christian Schools

DRAINAGE CONTROL REPORT

Vader ENGINEERING

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Stormwater Site Plan (SSP)
("Drainage Report")

Cascade Christian Schools
811 21st ST SE
Puyallup, WA 98372

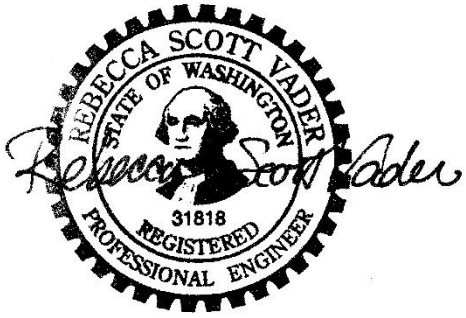
Parcel(s): 0420352148

Permit No: PRGR20231060
(Associated current applications: PLPRE20230117, PRCCP20220589, PRDE20241092)

Permit Application July 30, 2024

Revisions Resubmitted October 4, 2024

The following report has been prepared in conformance with sound engineering principles and standards, with the best available site and technical information at the time of analysis. The report contained herein has been prepared by the undersigned Professional Engineer Licensed in the State of Washington.



Rebecca Scott Vader, PE

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OVERVIEW

This Storm Drainage Report is a supplement to the overall campus Master Plan Drainage Plan and is submitted as supporting documentation for permits required by the for the construction of the proposed Project, a phase of a larger effort.

New development will follow the stormwater requirements set in Puyallup's adopted 2019 Department of Ecology (DOE) Stormwater Manual for Western Washington, and the local jurisdiction in Title 21. The format lays out the section names, the order of presentation, and the contents of each section, as well as the names and content of certain of the figures and tables.

The Drainage Report has a main body, which documents the results of the design processes:

Step 1: Site Analysis: Collect and Analyze Information on Existing Conditions.
Step 2: Prepare Preliminary Development Layout.
Step 3: Perform Offsite Analysis.
Step 4: Determine the Applicable Minimum Requirements.
Step 5: Select Permanent Stormwater Controls.
Step 6: Prepare CSWPPP.
Step 7: Report on Project.
Step 8: Have jurisdictional check for compliance.

In the Permit Application submittal, the appendices to the Report contain the calculations as well as other required documents such as the *Construction Storm Water Pollution Prevention Plan* and the *Maintenance and Source Control Plan*, which in turn contain appended forms, checklists, and other aids.

The facilities are designed in accordance with the City of Puyallup Standards Section 200. LID is the preferred and commonly used approach to site development.

Note to Reader: Since these reports draw heavily on reference documents, lists, and standards, in certain areas of the report, typical items may be included in the text to indicate that they were considered, but ~~struck through~~ to show that they are not applicable to this project. Correspondingly, tables and lists may have <u>underlined</u> or **bold** text to indicate selected items.

EXISTING SITE CONDITIONS

The proposed Cascade Christian School improvements for the Elementary Portables will include combining of one previously developed property that had a detached single-family home and garage accessed from 21st Street SE into the existing campus consisting of a junior/senior high school site. Most campus parking is on the west side near 21st Street SE. There is an existing track and field and stormwater detention pond in the center and north area of the campus, respectively, and the east side abutting 25th Street SE are baseball and softball fields.

The current stormwater system on the existing campus was designed as part of the previously approved TIR by AHBL dated November 1995, and will include improvements from the concurrent CUP Permit for the track and field area (#PRCCP20220589), which together provide the overall stormwater design for the entire build out of the current campus. There was a TIR updated in 2016 by Abbey Road Group and confirmed the pond volume, bioswale sizing, and other criteria for the current campus were still current. These are attached for reference.

The campus drainage pond constructed during Phase 1A, the initial development in 1995, handles the detention requirements for the previous planned projects. The storm detention pond was designed to match or fall below discharge at 50% of the 2-year, the 10-year storm, and the 100-year storm. The pond was sized to retain stormwater the fully developed school property area of 17.00 acres, which is originally defined as 41% impervious area; see the flow control section for more information. Water Quality treatment for the traffic bearing surfaces is routed through an existing bioswale recently maintained as part of the Track & Field project.

Stormwater from the developed campus site is to remain conveyed through the existing developed storm conveyance system to the detention pond and released to the storm drain conveyance system in 21st Street East through an outlet system onsite. That surface water is conveyed north to Deer Creek and the Puyallup River on the north side of East Pioneer. Sizing to confirm this downstream capacity was last performed in 2016 by the Abbey Road Group.

The exception to this will be for proposed drainage improvements for the annexed parcel and other site improvements which propose on-site stormwater management BMPs to the maximum extent feasible.

Please refer to *Figures 1 – 3,* following, to aid in the description. Please also see works by other professionals done earlier in the Master Plan. Items of note:

- Survey was most recently performed by Abbey Road Group, March 25, 2016
- Soils investigations are performed by Earth Consultants, Inc.; A soil investigation of the annexed land In Work Area 1 is in progress by Earth Consultants and will be made available upon completion
- Vegetation to be protected by tract or easement: N/A
- The watershed, or basin, where the site is located is geologically within the Deer Creek Basin, which discharges to the Puyallup River and then to Commencement Bay of Puget Sound.

- Notable critical areas mapped, if any, see figures, are discussed below.
- The previously developed commercial site is on a slope of <5% overall.

An extensive, existing drainage system drains the site, as well as conveys bypass for onflow drainage from properties upstream to the south and east. According to previous TIRs for the school site, the onflow system was first constructed as a 16- inch cedar box culvert. The system has been maintained and upgraded with a 12-inch concrete pipe and most recently an 8-inch perforated pipe. Several laterals connect to the mainline described above. The combined onflow bypasses the onsite drainage system and discharges west to 21st through a 48" conveyance that then drains north to Pioneer Way, where it eventually connects with what is mapped as Unnamed Creek and referred to previously as Deer Creek.

A site visit was performed 3-14-24 by a representative of Vader Engineering. This visit found that the existing drainage system is currently well maintained and functions at its designed capacity. The on-flow drainage bypass system will not be impacted by this project.

No other reports that impose more restrictive conditions on the drainage were found. More detail is shown in the Offsite Analysis section.

The following tabulates the existing site data:

Table 1 – Parcel Data

Addresses:	811 21st ST SE (Will Include annexed property after BLA)
Parcel Number:	0420352148, 0420263083 (Annexed)
Site Area:	756,448 SF (17.37 AC)
Total Developed Site:	756,448 SF (no native conditions on site)
Project/Clearing Area:	33,439 SF
Impervious Site* Area:	Please see table 1, below.
Zoning:	RS-04/RS-08
Soils (See Appendix):	NRCS Survey Mapped as Puyallup Fine Sandy Loam Site Test Pits: Medium Dense Silty Sand
Infiltration Rates:	0.35 in/hr (Design), Refer to Soils Report

Utilities at the site: If needed, special installation measures to avoid conflict with stormwater quantity and quality control features are listed with the utility.

Water: City of Puyallup
Sewer: City of Puyallup
Power: City of Puyallup
Communications: Private provider
Gas: PSE

Fuel Tanks: No evidence of fuel tanks found; tanks not considered likely with site history.

Figure 1 – Vicinity Map

Property, Roads, Geographic Areas, Watersheds

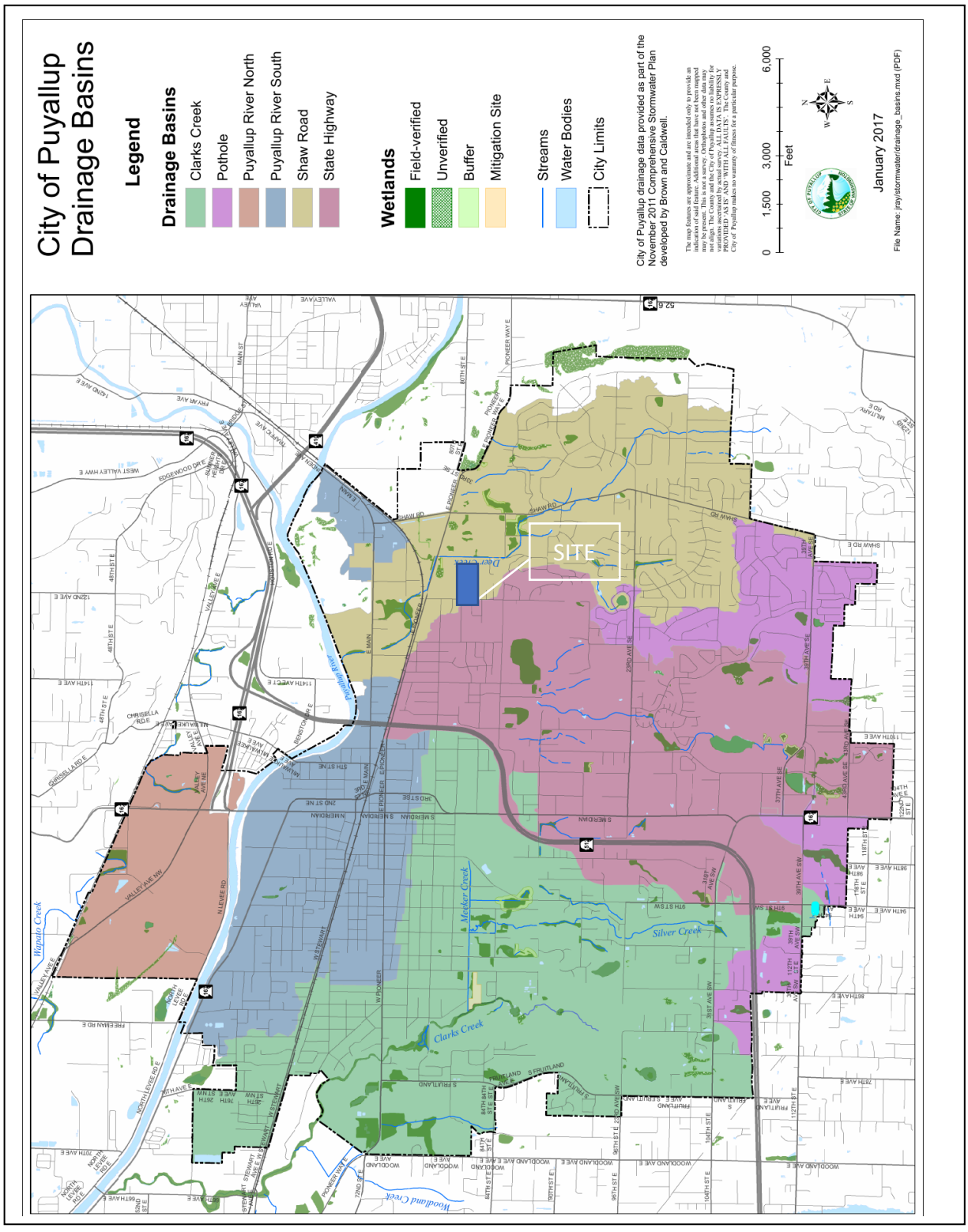


Figure 2 – Basin Map and flow path

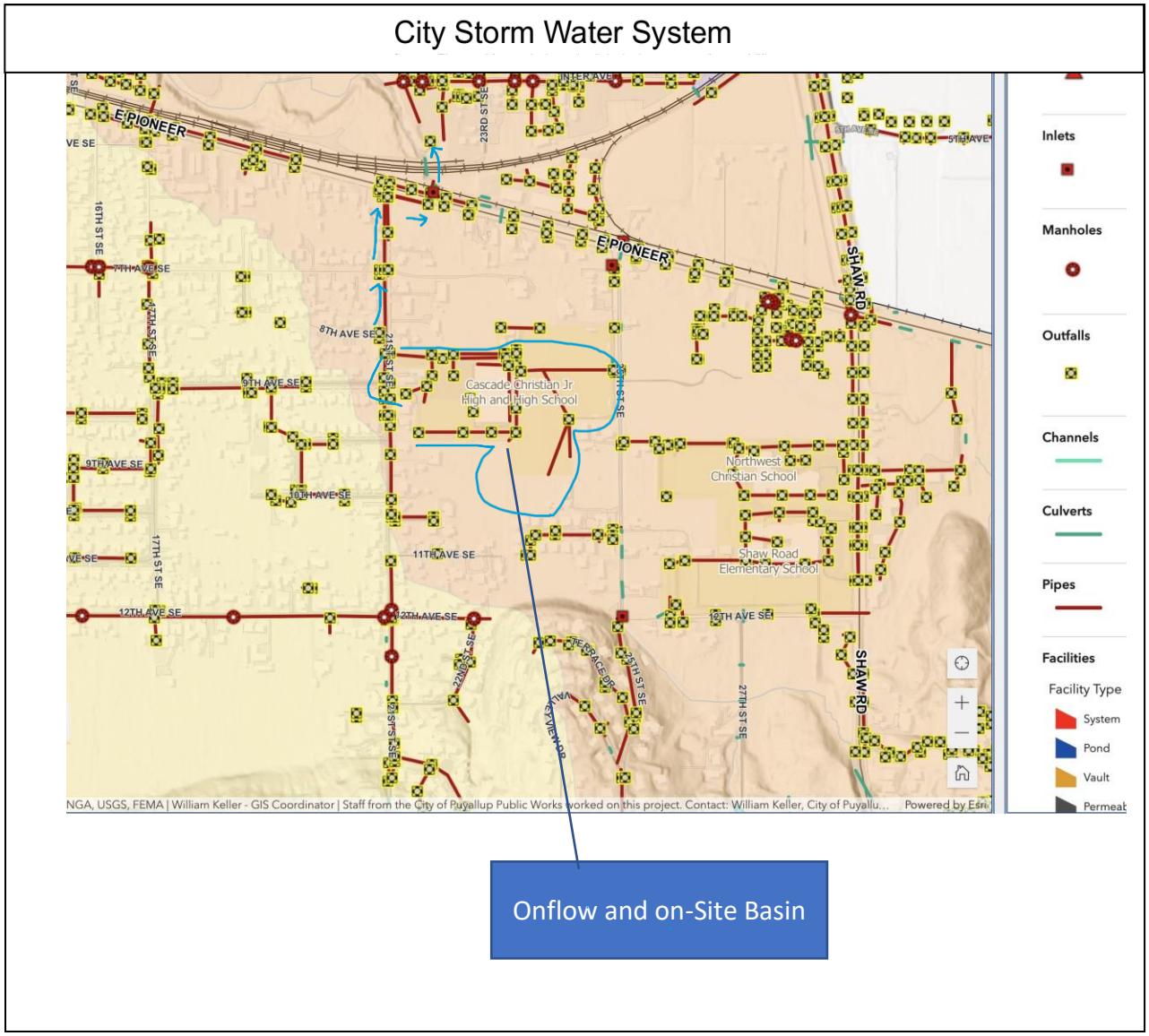
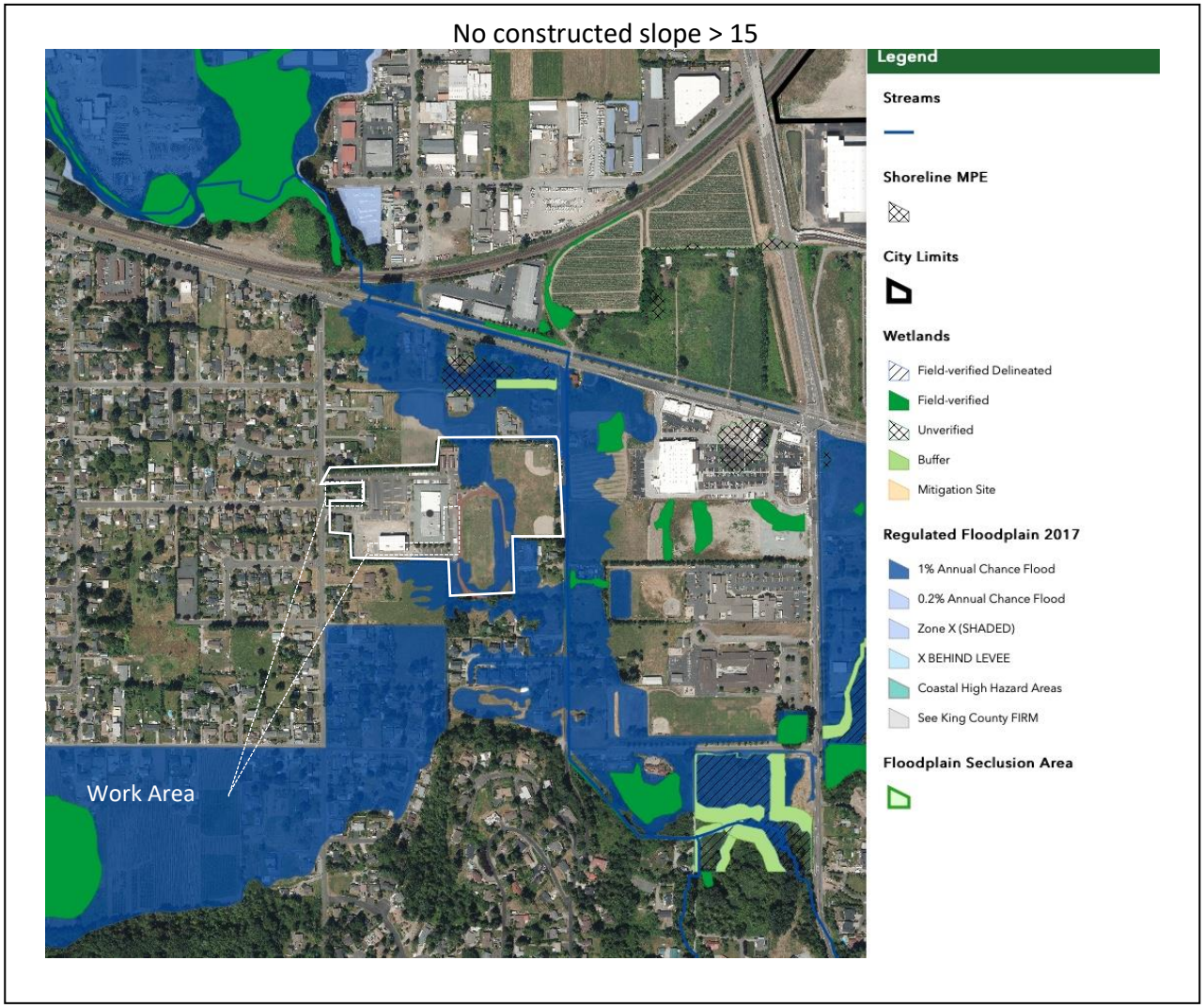


Figure 3 – Critical Areas: Streams, Wetlands, and Floodplains Map



PROJECT DESCRIPTION:

The project intends to add parking, paving work, landscaping, and series of temporary wet and dry portable outlying buildings to support elementary classrooms near the junior high and high school buildings on the existing school site located at 811 21st ST SE in the jurisdiction of Puyallup, Washington. This project will be on-site work only, retaining current accesses from the public road and served by existing public water, sewer, and power, with onsite service extensions. Stormwater will continue to be collected on-site and additional on-site conveyance will be provided with drain connections for the annexed property to discharge to the existing stormwater infrastructure available on the school site.

This Elementary Portables project is divided into two Work Areas subbasins, as depicted in the Basin Summary in Table 2. The two subbasins will comprise of the existing school parcel plus property annexed into and analyzed together as part of the overall campus.

Please refer to *Figure 4 – Site Plan and Figure 5-Site Development* to aid in the project description and show the development layout.

The layout must consider:

Avoid critical areas: None in work areas.

Preserve natural (forest) areas: None in vicinity.

Consider best use of mixed soil types: Locate infiltration where depth and type are favorable.

Minimize impervious areas: Meet landscaping ratios established by jurisdiction.

Maintain & Use Natural Drainage Patterns: Use Infiltration where possible. Retain constructed conveyances already in place.

Figure 4 – Landscape Architect Site Plan

See attached plans.

Figure 5 – Site Development Plan

See attached plans.

Existing and Proposed Land Use Areas

Existing

Project Area:
SITE SIZE: 756448 SF/17.37 AC (INCL. ANNEXED PARCEL)
DEVELOPED AREA: 100%
IMPERVIOUS AREA: 6.40 ACRES
PERVIOUS AREA: 10.97 ACRES
OPEN SPACE AREA:
PARKING (ASPHALT) AREA: 278467 SF/6.39 AC.
LANDSCAPE AREA: 477981 SF/10.97 AC.

Proposed

TOTAL SITE.....772,587 SQ. FT. (17.736 ACRE

PROJECT WORK AREA 1:
CLEARING LIMITS.....25,310 SQ. FT.

PRO. ASPHALT.....4,865 SQ. FT.
PRO. CONCRETE.....42 SQ. FT.
PRO. ROOF.....10,752 SQ. FT.

PROJECT WORK AREA 2:
CLEARING LIMITS.....8,129 SQ. FT.

PRO. ASPHALT.....4,420 SQ. FT.
PRO. CONCRETE.....80 SQ. FT.
PRO. ROOF.....1,904 SQ. FT.

Parcel 1 = Existing School Property #0420352148
Parcel 2 = Parcel for Lot Combination 'Annexation' #0420263083

Table 2 – Basin Summary

Basin ID	Drains From	Drains To	Future offsite Discharge flow	Length to Facility
Parcel 1 (Work Area 2	Paving, Roofs, Playfields, Landscaping	Existing Detention Pond	no change anticipated	varies
Parcel 2 (Work Area 1)	Paving, Temporary Portable Roofs, Landscaping	Existing Detention Pond	additional runoff managed by existing capacity	varies

Table 3 - Schedule of Drainage Feature Locations and Structures

Stormwater Additions Schedule							
Pipes – PVC SDR 35, rigid HDPE, or A-2000 PVC							
Designation	**Dia.**	**Material**	**Length**	**From**	**To**	**Slope**	**Remarks**
Perforated Pipe Connection (PPC)	6" perf in Washed rock Bottom 2' x 10'			Sheet flow, yard drains, downspouts	Ex. CB #7, 6" PVC discharge	0%	LID BMP
Downspout (DS) to Splash pads or tightlines	metal, smooth wall ABS, rigid HDPE, or PVC			Roof	3 to DS Dispersion, 3 to PPC	0.5%	LID BMP
Conveyance Swale	n/a	vegetated	108 LF	Landscape & Portable nos. 1,3,5 Downspouts	YD #1	0.5%	See Landscape for planting plan.
Yard Drain 1		YD	0 LF in	Swale	YD #2		Beehive
Yard Drain 2		YD	46 LF 6" HDPE in	YD #1	CB #1		Solid Locking
Catch Basin 1		Type 1	84 LF 6" HDPE in				Grate
Catch Basin 2		Type 1	88 LF 6" PVC	CB#1	Existing CB #5		Solid Locking Saddle mount CB
Yard Drain 3		YD	22 LF 6" PVC	Perforated Pipe Connection	CB #2		Solid Locking
Yard Drain 4		YD	100 + 20 LF 6" PVC	Downspout tightlines Portables 2,4,6	Perforated Pipe Connection		Solid Locking Lid, downturn elbow

Figure 6 – Work Map

See attached plans.

OFFSITE ANALYSIS

Task 1: Study Area Definitions and Maps

Please refer to Figures above to aid in the description of the Offsite Analysis. The study area was extended to at least 0.25 miles downstream. Upstream conditions were studied previously and not substantially changed. Please see the previous TIRs for complete analysis of upstream and the overall parcel.

Emergency services located along the flow path? None

Environmentally Sensitive Areas in flow path? None

Task 2: Resource Review

The following resources and documents were reviewed in preparing this analysis. Pertinent excerpts from these resources have been included in this study.

1. Stormwater, FEMA & Critical Areas Maps for area.
2. Survey filed with the State of Washington.
3. Soil Survey and previous Soils Investigations.
4. Local Project Data from previous phases of the Master Plan.

Task 3: Field Inspection

Preliminary Field inspection was performed by a representative of Vader Engineering on 3-14-24. Observations were later updated with the findings on the City records.

Field inspection to be completed with final drainage report after access granted to annexed properties.

Task 4: Downstream Drainage System Description and Existing and Potential Problems

Please see *Figure 7 below* to aid in the following description.

Figure 7- Downstream Map Pierce GIS Terrain

The parcel data from Pierce County lists the following categories of possible Site Constraints, and refers to City of Puyallup. Figure 3 from Puyallup Maps a 1% flood chance along one side of the track, which is acceptable since it is not near the areas of work. It does not map any of the following.

- Aquifer Recharge Area: Not mapped.
- Erosion Hazard: Not mapped.
- Fish and Wildlife Habitat: Not mapped.

- Floodway: Not mapped.
- Landslide: Not mapped.
- Mine Hazard: Not mapped.
- Resource Land: Not mapped.
- Right-Of-Way Need Area: Not mapped.
- Volcanic Hazard: Not mapped.
- Wetlands: Not mapped.

Bypass drainage from the project which will not be controlled? No.

For emergency overflow or other instances where rainwater may be conveyed downstream, the available flow paths are:

North in constructed conveyance, to the existing creek which flows northwest, to connect to the Puyallup River.

No drainage issues are known to persist within the immediate downstream area, and the street and City storm system are in good condition and relatively new. Both options will be used as overflow pathways for convenient portions of the site.

Task 5: Mitigation of Existing or Potential Problems

The following mitigations are proposed so that no drainage issues are anticipated from this proposed re-development if constructed according to the design:

- Erosion Potential: Provide TESC measures until the project is stabilized.

DETERMINE APPLICABLE MINIMUM REQUIREMENTS

Western Washington Phase II Municipal Stormwater Permit

Section 3. Applicability of the Minimum Requirements

3.1 Thresholds

Not all of the Minimum Requirements apply to every development or redevelopment project. The applicability varies depending on the project type and size. This section identifies thresholds that determine the applicability of the Minimum Requirements to projects. Use the flow charts in Figures 3.1, 3.2, and 3.3 to determine which of the Minimum Requirements apply. The Minimum Requirements themselves are presented in Section 4 of this Appendix.

Use the thresholds in sections 3.2 and 3.3 at the time of application for a subdivision, plat, short plat, building permit, or other construction permit. The plat or short plat approval shall identify all stormwater BMPs that are required for each lot. For projects involving only land disturbing activities, (e.g., clearing or grading), the thresholds apply at the time of application for the permit allowing or authorizing that activity. Note the exemption in Section 1 for forest practices other than Class IV General.

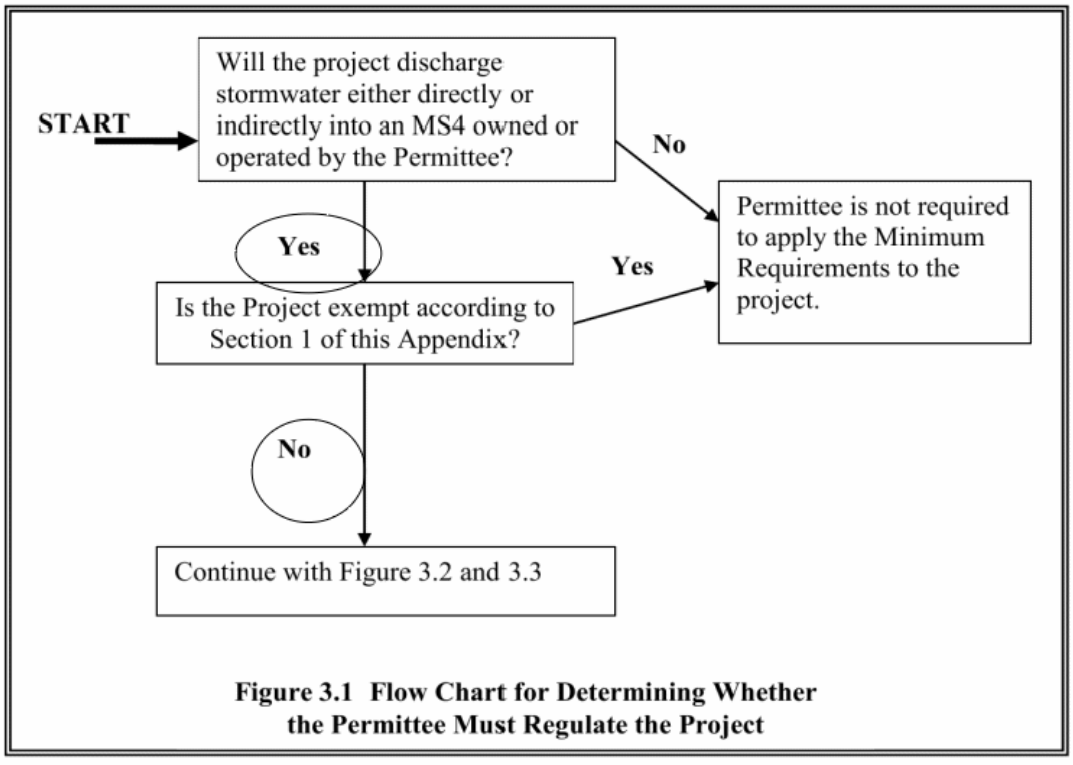
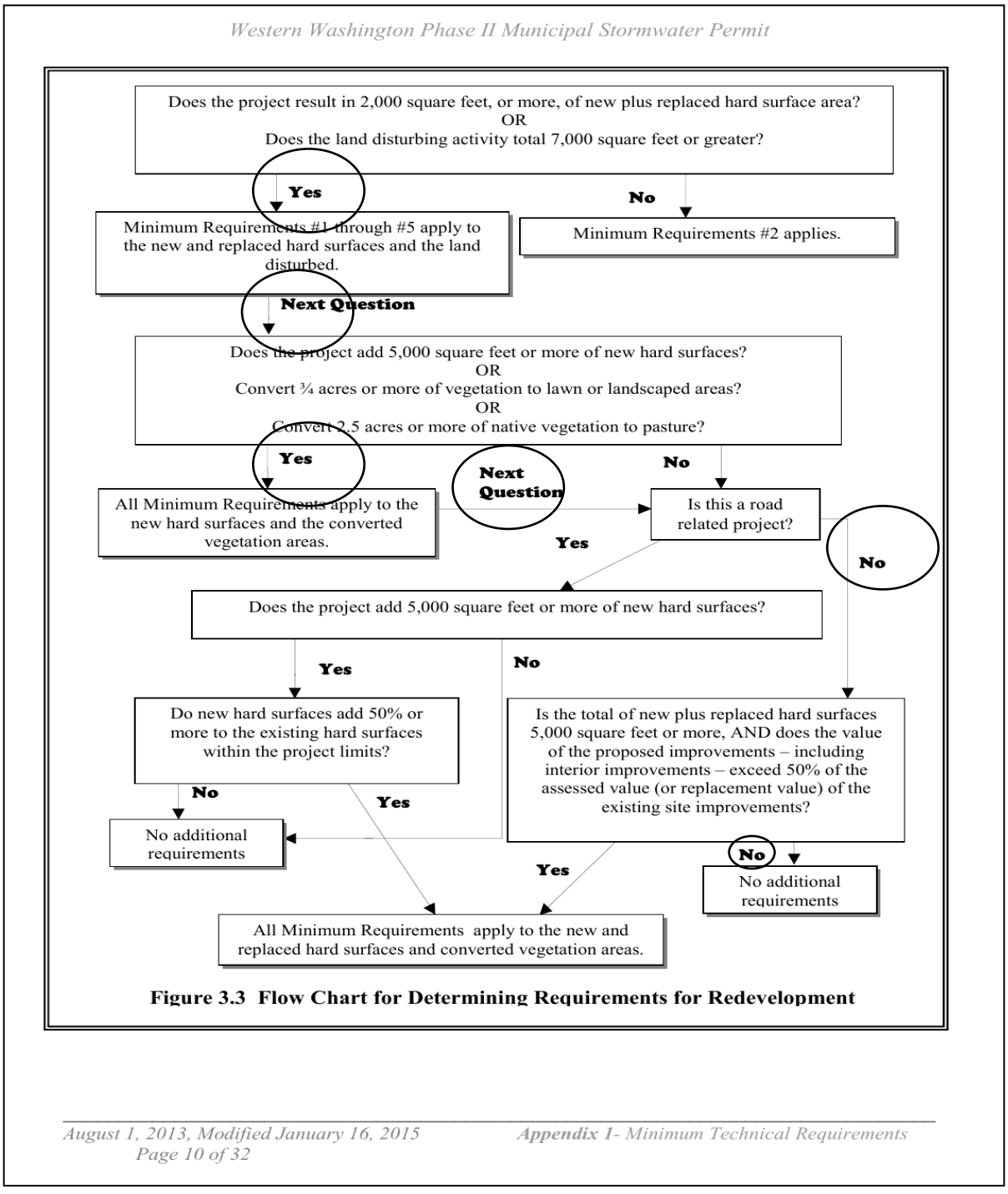


Figure 3.1 Flow Chart for Determining Whether the Permittee Must Regulate the Project

Since at least 35% of the overall site area is already hard surface, the redevelopment flow chart was selected. *Figure 8- Flow Chart for Determining Requirements* displays the applicable design analysis for the project.

Figure 8 – DOE SMMWW: Minimum Requirements for Redevelopment



A. MINIMUM REQUIREMENTS SUMMARY

MINIMUM REQUIREMENT #1: Preparation of Stormwater Site Plans

A set of stormwater drawings submitted with this report constitute the Stormwater Site Plans.

MINIMUM REQUIREMENT #2: Construction Stormwater Pollution Prevention (CSWPPP)

All new and redevelopment projects are responsible for preventing erosion and discharge of sediment and other pollutants into waters. A 13-point *Construction SWPPP* is referenced as *Appendix B* of this report. (Will be provided with final plan).

MINIMUM REQUIREMENT #3: Source Control of Pollution

All Known, Available, and Reasonable techniques (AKART) for ongoing protection of stormwater from pollutants sourced from the project are described in the *Operations*, *Maintenance, and Source Control Manual*. Typical source control measures are proposed for parking, building, and grounds maintenance.

MINIMUM REQUIREMENT #4: Preservation of Natural Drainage Systems & Outfall

The stormwater from the site will continue to discharge to the existing on-site school drainage system and then by public conveyances to the natural location in a manner that does not cause significant adverse impact to the receiving waters and downstream properties.

MINIMUM REQUIREMENT #5: On-site Stormwater Management

This project uses List # 2 for LID approach, finding that Perforated Pipe connections are the on-site stormwater management BMPs feasible at this site in Work Area 1. Pervious Landscape surfaces that are disturbed will meet the soil amendment standard.

In Work Area 2, all impervious areas added or replaced are within the footprint of surfaces previously designated for the detention pond and will still be routed to the detention pond to control quantity, and through the bioswale for quality as applicable, so there is no room to insert LID BMPs. Please refer to Step IV of this report.

MINIMUM REQUIREMENT #6: Runoff Treatment

With the project being part of a larger multi-phase project totaling more than 5,000 SF of pollution-generating hard surface (PGHS) or ¾ Acre of PG Pervious Surface, Treatment is required and is already provided for full build-out PGIS within the main campus. This existing capacity treats new surfaces in Work Area 2.

In Work Area 1, downspouts from three (3) portables are dispersed into 25 ft flowpaths in the proposed landscape area for runoff pretreatment, and a downturned-elbow sediment basin provides pretreatment to the balance of Work Area 1.

MINIMUM REQUIREMENT #7: Flow Control

This project is not Flow Control exempt and must meet the requirements from the 2019 Manual. This is achieved by the existing detention pond on-site installed in 1995 for the build -

out of the existing junior high and high school developments. The pond is sized to a capacity capable of managing the annexed parcel in Work Area 1, since the projected build out is not complete. Please see Step IV, Permanent Stormwater Controls for more information.

All impervious areas added or replaced in Work Area 2 are within the footprint of surfaces previously designated for the detention pond and will still be routed to the detention pond to control quantity.

MINIMUM REQUIREMENT #8: Wetlands Protection

In addition to #7, this requirement applies to projects whose stormwater discharges into a wetland; either directly, or, through a conveyance system. Not Applicable for this system. Please see Section 5, Permanent Stormwater Controls.

MINIMUM REQUIREMENT #9: Operation and Maintenance

This will be provided in the final plan. Stormwater Operations are to be described in the *Operations Maintenance and Source Control Manual,* referenced as *Appendix C*. A sample log of actions is to be provided. This is kept onsite in the district office, or otherwise reasonable access to the site, and transferred with the property to future owners.

OPTIONAL GUIDANCE #1: Financial Liability

Bond and liability assurances will be provided by the proponent or a representative of the proponent (Contractor) prior to start of construction to ensure construction compliance. The owner will be responsible for on-going cost of private maintenance.

OPTIONAL GUIDANCE #2: Offsite Analysis and Mitigation

Projects that discharge off site must address potential impacts to water quality, erosion, slope stability and drainage impacts, and propose mitigation for predicted impacts. This Analysis concurs with the Previous TIR that determined no mitigation was triggered.

SELECT PERMANENT STORMWATER CONTROLS

This section addresses the analysis and design of the drainage flow controls and water quality measures. Selection of Flow Control Facilities starts by:

- Following the LID Flow chart to determine the required list, then;
- If using the LID Performance Standard, select any combination of BMPs that achieves performance standard. Move to Step II, if not, then;
- Following the priority listings for that LID List and analyzing the infeasibility criteria to determine the first feasible BMP for each of 3 surface types.
    - Once a BMP is selected it is sized.
    - Placed on the design drawings.
    - No other On-site Stormwater LID BMPS is necessary for that surface.
- Apply any LID credits generated toward
    - Flow control (peak and/or duration matching).
    - Treatment design (basic or enhanced).

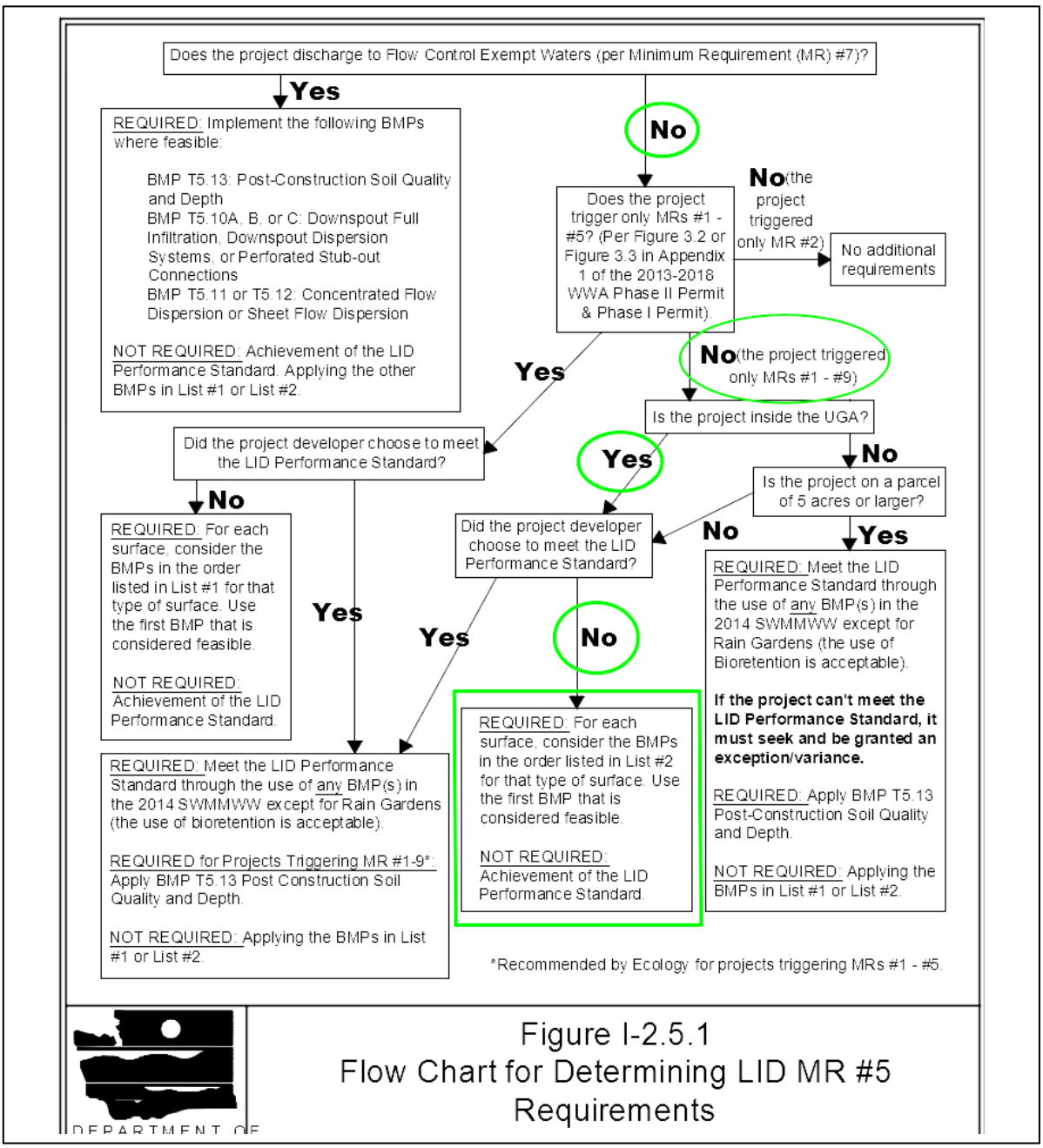
This repeats until all surfaces are accounted for.

Additional analysis of components such as the conveyance system, and in cases with potential for high groundwater, buoyancy resistance, are also addressed in this section.

Step I: Determine and Read the Applicable Minimum Requirements

The Flow Chart for LID requirements, *Figure 9*, below, indicates that this project is to either follow List #2, or meet the Performance Standard.

Figure 9 – DOE SMMWW: Flow Chart for LID MR #5 Requirements



B. Onsite Stormwater Management

The following On-site Stormwater Management BMPs were selected to meet List #2.

Table 4 - LID BMP Analysis

From List #2, Table I-3.2, Volume 1, Chapter 3, Stormwater Management Manual for Western Washington

Surfaces and their BMPs	Feasibility Analysis
Lawn and landscaped areas:	
Post-Construction Soil Quality and Depth in accordance with BMP T5.13: Post-Construction Soil Quality and Depth.	**Feasible, Selected.** BMP T5.13 Post-Construction Soil Quality and Depth to be provided for proposed pervious areas within clearing limits – See notes on drainage plan.
Roofs:	
1a. Full Dispersion in accordance with BMP T5.30: Full Dispersion	**Not Feasible.** Site does not consist of required 65% site area (or a threshold discharge area on the site) in a forest or native vegetated condition, therefore full dispersion not feasible.
1b. Downspout Full Infiltration Systems in accordance with BMP T5.10A: Downspout Full Infiltration	**Not Feasible.** Design infiltration rate of 0.35 in/hr leaves no suitable location for the expected prescriptive size of an infiltration trench facility, therefore infiltration not feasible.
2. Bioretention in accordance with BMP T7.30: Bioretention Cells, Swales, and Planter Boxes.	**Not Feasible.** Nearest CBs are too shallow for required bioretention underdrain depth and pipe conveyance, therefore bioretention not feasible.
3. Downspout Dispersion Systems in accordance with BMP T5.10B: Downspout Dispersion Systems	**Not Feasible.** Insufficient lengths available for dispersion flowpath, therefore downspout dispersion not feasible. Partial 25' flowpaths are feasible, but not at the prescribed full 50' flowpath.

4. Perforated Stub-out Connections in accordance with BMP T5.10C: Perforated Stub-out Connections	**Feasible, Selected.** See section Step IV below for design info.
Other Hard Surfaces:	
1. Full Dispersion in accordance with BMP T5.30: Full Dispersion	**Not Feasible.** Site does not consist of required 65% site area (or a threshold discharge area on the site) in a forest or native vegetated condition, therefore full dispersion not feasible.
2. Permeable pavement in accordance with BMP T5.15: Permeable Pavements	**Not Feasible.** Design infiltration rate of 0.35 in/hr, and proposed areas of soil compaction below portable footings, leaves unconstructably small area of plaza suitable for pervious paving, therefore pervious paving infiltration not feasible.
3. Bioretention in accordance with BMP T7.30: Bioretention Cells, Swales, and Planter Boxes.	**Not Feasible.** Nearest CBs are too shallow for required bioretention underdrain depth and pipe conveyance, therefore bioretention not feasible.
4a. Sheet Flow Dispersion in accordance with BMP T5.12: Sheet Flow Dispersion 4b. Concentrated Flow Dispersion in accordance with BMP T5.11: Concentrated Flow Dispersion.	**Not Feasible.** Insufficient lengths available for dispersion flowpath, therefore dispersion not feasible.
Collect and convey	**Feasible, Selected.** All above stormwater management BMPs are not feasible, therefore all other hard surface areas to sheet flow to nearest CB and convey to existing downstream detention pond.

Step II: Select Source Control BMPS

Source control is applied by project type from the BMPs listed in Vol IV of the SWMMWW. There are Operational BMPS that are presented as Applicable and additional measures presented as Recommended. The Source Control areas for this project are:

- S411 BMPs for Landscaping and Lawn/ Vegetation Management
- S417 BMPs for Maintenance of Stormwater Drainage and Treatment Systems
- S421 BMPs for Parking and Storage of Vehicles and Equipment
- S424 BMPs for Roof/ Building Drains at Manufacturing and Commercial Buildings

Please see the *Operations, Maintenance, and Source Control Manual* for this project for more detail about the selected BMPs.

Step III: Determine threshold Discharge Areas and Applicable Requirements for Treatment, Flow Control, and Wetlands Protection

Part 1 Read the Definitions.
Read DOE SWMWW Volume 1 Section 2.3.

Part 2: Outline the threshold discharge areas.
The entire onsite project is within 1 threshold discharge area.

Part 3: Determine amount of Pollution-generating hard surfaces (including pervious pavements, if any) and pollution-generating pervious surfaces
The replaced Pollution Generating Surfaces (PGS) are the gravel parking stalls that will be asphalted. These are bay 20 and 21 on the eastern parking area. Please see tabulation of proposed land use areas for Phase 5 in the attached civil drawings.

Part 4: Compute total effective impervious and converted vegetation areas (in each discharge area, if applicable).
The Total Effective Impervious and Converted Vegetation Areas are tabulated in Appendix A.
No tree credits are sought for the project.

Part 5: Use an approved continuous runoff model (e.g., WWHM) with 15-minute timestep to determine whether there is an 0.15 cfs increase in 100-year return frequency flow. (0.1 cfs increase for 1-hr timestep).
Drainage calculations are available in Appendix A that demonstrate the site is sufficiently managed by an existing detention pond.

Step IV: Select Flow Control BMPs and Facilities

Part 1: Determine whether you can infiltrate.
The soils do not meet the needs for Flow Control BMP for Full Infiltration. A long-term design infiltration rate of 0.35 in/hr was determined by the summer 2024 infiltration testing, which in combination with proposed soil compaction around the proposed footings, will not be conducive to infiltrating runoff.

Part 2: Use an approved continuous simulation runoff model to size detention. (Refer to Volume III, Chapter 2)
The proposed runoff calculations are included in Appendix A.

Existing Detention Pond capacity was sized with an as-built volume of 55,461 CF, or 2,054 cubic yards for stormwater detention. The detention pond was originally modeled for retaining runoff from a fully developed school site according to the original TIR by AHBL dated November 1995. Fully developed conditions are defined as “approximately 41 percent of the site” as “impervious area”. For the then 17-acre property, this creates a capacity of impervious area of approximately 7.0 acres. The pond volume was confirmed in 2016 by Abbey Road. For full supporting information, please see those reports and calculations submitted under previous permits, they are too voluminous to include here.

Existing impervious areas pre-project total approximately 6.10 acres using available survey information and aerial imagery. This project proposes added impervious area for the proposed portables and plaza, plus 4 new parking stalls previously planned for a roof area. Replaced impervious also includes 21 re-surfaced stalls. However, a proposed post-portables project will convert the area to additional parking aisles, therefore the majority of the annexed parcel will be assumed impervious traffic-bearing area. For design purposes, only the Landscape Area will be an assumed pervious area of 0.07 acres, leaving 0.30 acres as impervious area. The resulting impervious area for the existing school development plus annex parcel totals 6.40 acres. Consequently, the proposed total impervious area is less than the capacity impervious area of 7.0 acres.

Flow Control Summary: The existing detention system will fully mitigate flow from new and replaced pervious areas and hardscapes.

Step V: Select Treatment Facilities. (Refer to Chapter 2 of Volume V)

Step V: Select Treatment Facilities

Run-off from existing Traffic-bearing surfaces is already collected and treated via an existing Bioswale. Proposed Traffic-bearing surfaces draining to the bioswale will not be measurably increased, so no additional treatment is proposed.

Step VI: Review Selection of BMPs and Facilities

The City of Puyallup is the review jurisdiction and will make a determination of the adequacy of the proposal, recapped as:

- Retain existing systems to maximum extent practicable.
- Minimize new impervious effects by siting over existing hard surfaces.
- Use detention for flow control and bioswale treament for the new and replaced area.
- Provide soil amendment for disturbed landscape pervious areas.
- Overflows release at existing discharges to the public system..

Step VII: Permanent Stormwater Control Plan

Please see the drawings to aid in the description of the stormwater control plan. The permanent stormwater control plan uses amended soils to reduce runoff from disturbed landscape pervious areas, and a detention pond for new roof and pavement areas to meet the Flow Control standard. This section presents the remainder of the stormwater components.

HYDROLOGIC ANALYSIS

The hydrologic analysis was performed in a combination of new and prior calculations presented in Appendix A.

CONVEYANCE SYSTEM HYDRAULIC ANALYSIS AND DESIGN

Additional conveyance pipes are used for some roof drains and connections to public conveyance and must carry at least the 25-year flow event as sized interior to the CAD program and confirmed with Chezy-Manning's equation. The pipes are generally provided with 3 feet of cover under traffic bearing areas, and 1 ft under pedestrian or landscape areas. Pipe slopes shall achieve 3 FPS flow rates (when flowing full) to provide cleaning velocity. New pipes are laid at a minimum 0.5% slope. See appendix A for calculations.

The following will be provided with the final design submittal:
Conveyance Summary with references and sources of information for:

Channels: Open Channel Flow Calculator
Pipes & Culverts: Open Channel Flow Calculator
Roof Drains: Open Channel Flow Calculator
Pavement Gutters: N/A
Nomographs and explanatory tables: When applicable.

SOIL AMENDMENT ANALYSIS

Any topsoil and duff from the cleared and graded areas will be stockpiled for re-use as soil amendment. The majority of the new site is an existing residential property with buildings and pavements, so there will be less available organic soil than some raw land sites. In the event of a topsoil shortfall, amendment mulch will be purchased. The Puyallup Standards for Soil

Amendment and Depth is provided on the drawing sheets with the erosion control notes and details.

BOUYANCY RESISTANCE
Not applicable, small diameter and perforated pipe in ground will not significantly displace water, and groundwater was not observed or indicated at the project elevations. Structures are expected to terminate well above highest groundwater and/or be concrete designed to resist buoyancy by the manufacturer.

CSWPPP TEMPORARY EROSION AND SEDIMENT CONTROL ANALYSIS AND DESIGN

Please refer to Appendix B – Construction SWPPP of this report for the full details of the Temporary Erosion and Sediment Control Plan for the construction period. For convenience during construction this is provided as a separate document.

Erosion and Sedimentation Control Analysis and Design
There is not more than an acre of disturbance on this project, so a Construction NPDES permit from Washington State Department of Ecology is not triggered. Proposed temporary measures possible for this project will include the following BMP's:

- Perimeter protection via filter fences, vegetated buffers, and straw or triangular wattles.
- Stabilized construction entrance (existing paving)
- Cover Measures such as straw mulch, hydroseed or other mulching and planting method to stabilize unworked areas.
- Surface Water Control with permanent conveyance and temporary drainage swales to the discharge
- Catch Basin protection for existing catch basins on site, such as filters with gravel outlets, socks, or fabric liners.
- Sediment retention from a temporary sediment trap.
- Maintenance of TESC.

Final stabilization will be hard surfacing and planted landscaping per Landscape Architect plans.

Pollution Prevention and Spill Control Criteria
Basic construction activities that will occur during this project will be subject to preventative measures to avoid impacting stormwater. During construction, demolition is expected to be the primary potential source of pollution beyond sedimentation.

For ongoing source control activities related to the educational use, maintenance practices, and solid waste, please see the measures presented in Appendix D*, Operations, Maintenance and Source Control,* submitted under its own cover for easier reference by workers.

REPORT ON PROJECT

A. SPECIAL REPORTS AND STUDIES

Soils Report(s)

Geotechnical Report by Earth Solutions NW, LLC

Prepared: Jule 31, 2024

Other Previous TIR and Figures Submitted under separate cover:

See Original Stormwater Detention Pond Calcs in Appendix A

Wetlands Delineation: N/A Fish & Wildlife: N/A Forest Practices: N/A

Reports and Studies to be appended to this report include the *Construction Storm Water Pollution Prevention Plan* and the *Operations, Maintenance, and Source Control Plan.* These plans detail specific maintenance activities, frequencies, responsible parties, equipment needs, and triggering conditions for the construction period and ongoing operations, respectively.

OTHER PERMITS

Agency	Permit/Approval	If Applicable, requirements that affect project *
Tacoma-Pierce County Health Department	Onsite Sewage Disposal and Well Permits	
Washington State Department of Transportation (WSDOT)	Developer/Local Agency Agreement	
Ecology	Short Term Water Quality Modification Approval	
Washington State Fish and Wildlife	Hydraulic Project Approval	
Washington State Department of Ecology	Dam Safety Permit	
United States Army Corps of Engineers	Section 10 Permit	
United States Army Corps of Engineers	Section 401 Certification	
United States Army Corps of Engineers	Section 404 Permit	
Local Jurisdiction	Shoreline Permit	
Local Jurisdiction	Building Permit	Setbacks, coverage, etc.
Local Jurisdiction	Wetlands Permit	
Local Jurisdiction	Demo Permit	TESC

- If blank, does not apply.

B. BOND QUANTITIES, FACILITY SUMMARIES AND DECLARATION OF COVENANT

Bond and liability assurances will be provided by the representative of the Proponent (Contractor) prior to start of construction.

Facility summaries are listed in the *Maintenance Manual.*

Declaration of Covenants are Legal instruments employed to guarantee preservation of drainage systems and access for maintenance purposes:

Declaration of Maintenance Access Covenant: Recording #_____TBD
ROW Dedications: N/A
Easements: Existing drainage bypass access and water main easements

Check Compliance with Applicable Minimum Requirements.

This analysis was coordinated with the overall master plan, the proposal for the building permit and the recommendations of the geotechnical studies and landscape architect. Compliance checks are made by the jurisdiction at submittal, and by the Erosion Control Lead and Inspector during the construction of the design.

Appendix A: Calculations

Hydrologic Simulation

Report results from MGSFlood 4 simulations were not necessary for the proposed improvements and anticipated stormwater runoff. Calculations prepared by the Rational Method are included below:

Since no significant measurable increase in traffic-bearing impervious is added and water quality treatment capacity exists, no new water quality features are sized.

Flow Rate - Rational Method

The anticipated runoff from the proposed improvements can be estimated with a run-off calculation typically refered to as the Rational Method , which uses the formula:

Q = CIA
Where C = .98 for pavement
I = 25-year rainfall intensity from NOAA isopluvials: 3.0 in.
A = Area in Acres: 0.30 ac. Impervious added

Q = 0.98 * 3.5 * 0.3 ac. = 1.03 cfs additional runoff from the proposed project at the 25-year mark

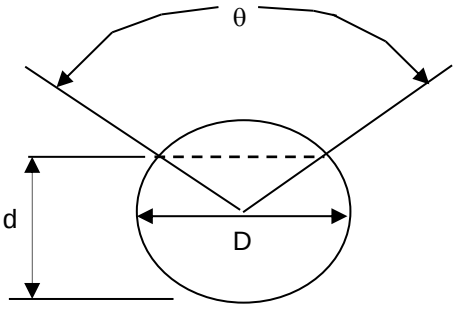
Conveyances - Chezy-Manning Method

See attached calculations.

CHEZY-MANNING'S EQUATION FOR PIPE FLOW

Project: misc | Pipe ID: generalized for flow capacity check
By: AMS | Design Criteria
Date: 24.08.02

Clear Data Entry Cells



INPUT

D=	6	inches
d=	5.5	inches
n=	0.01	mannings coeff
θ=	67.1	degrees
S=	0.005	slope in/in

Chezy-Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P
A=cross sectional area
P=wetted perimeter
S=slope of channel
n=Manning's roughness coefficient

$V=(1.49/n)R_h^{2/3}S^{1/2}$
Q=V x A

Solution to Mannings Equation				
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs
0.19	1.28	0.15	2.93	0.55

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

	Input flow	V= Q/A calculated velocit FLOW	GOALS
25 yr		5.87	> 2 FPS OK
50 year			<5 FPS if channel
100 year	1.1		not overtopping

Since Q = C*I*A

if C = 0.55 rolling 3-6 Res/ac

I=	
25 yr	3
50 year	3.5
100 year	4

Basin Area supported by this pi		to pass	Acre	Basin SF	Supported
If C =	0.55	25 yr	0.3352	14601	SF
		50 yr	0.2873	12515	
		100 yr	0.2514	10951	

Created 2018 by: Vader Labs based on a version by Mike O'Shea mdo version 12.8.00 VE 8.13.18

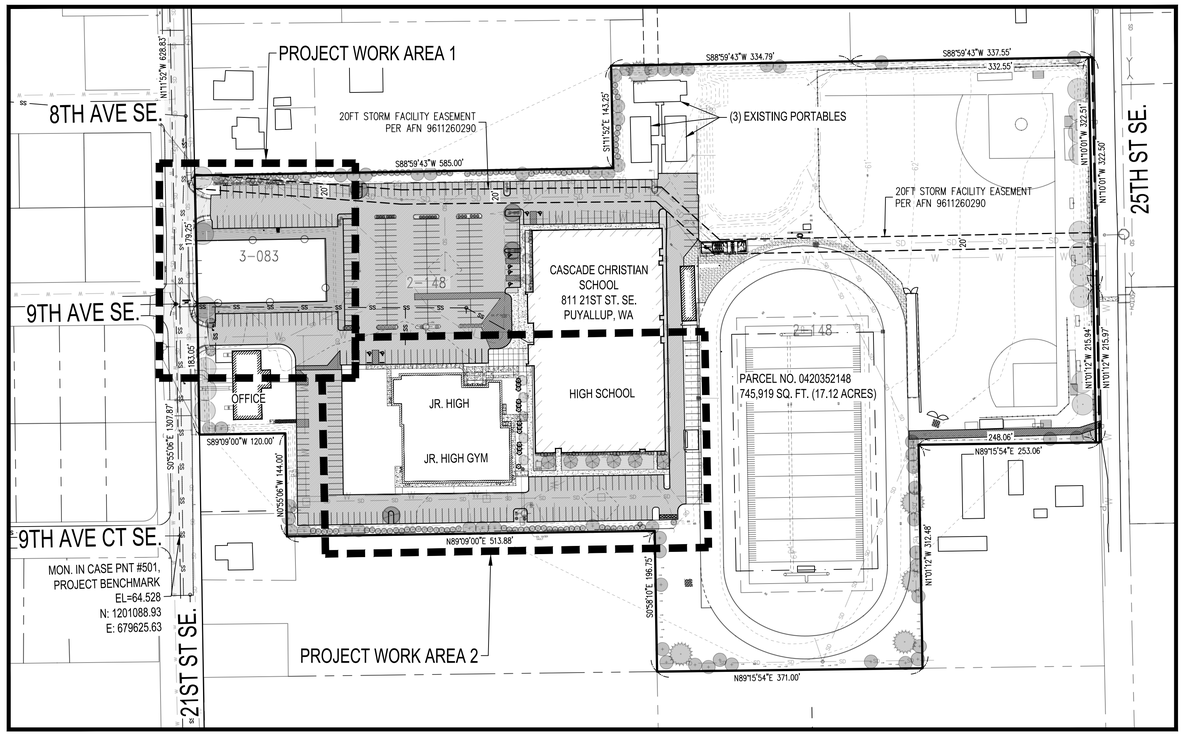
CASCADE CHRISTIAN SCHOOL CAMPUS - ELEMENTARY SCHOOL PORTABLES

COVER SHEET & EXISTING CONDITIONS

A PORTION OF THE S 1/2 OF SECTION 26 AND N 1/2 OF SECTION 35, TOWNSHIP 20 NORTH, RANGE 4 EAST, W.M.
PIERCE COUNTY, WASHINGTON (CITY OF PUYALLUP)

VICINITY MAP
NOT TO SCALE

NORTH



EXISTING CONDITIONS
SCALE: 1" = 100'

NORTH
1" = 100'
0 50 100 200

BASIS OF BEARING

MONUMENTED CENTERLINE OF 21ST STREET EAST, THAT BEING N0°43'16"E

DATUM

VERTICAL DATUM:
NAVD 88 - BASED ON PIERCE COUNTY GIS

CONTOUR INTERVAL: 2'

HORIZONTAL DATUM:
NAD 83-91 (WASHINGTON STATE SOUTH ZONE)

SITE BENCHMARK

MONUMENT IN CASE WITH 3" BRASS DISK, 0.8' BELOW RIM,
POINT NUMBER 501
AT INTX. 9TH AVE. CT E., & 21ST ST. E.
ELEVATION=64.528.

PROJECT SPECIFICATIONS

PROJECT AREA:
PROPOSED USE: PRIVATE RELIGIOUS EDUCATION
SITE SIZE: 756448 SF/17.37 AC (INCL. ANNEXED PARCEL)
DEVELOPED AREA: 100%
IMPERVIOUS AREA: 6.40 ACRES
PERVIOUS AREA: 10.97 ACRES
OPEN SPACE AREA:
PARKING (ASPHALT) AREA: 278467 SF/6.39 AC.
LANDSCAPE AREA: 477981 SF/10.97 AC.
MIN LOT SIZE: 8,000 SF/4,000 SF
MIN LOT DEPTH: 90'/80'
MIN LOT WIDTH: 60'/40'
MAX SITE COVERAGE: 45%/50%
SITE COVERAGE: 50%

SET BACKS:

	BUILDING	YARD
FRONT:	20'/15'	30'
SIDE:	16'/5'	30'
REAR:	20'/15'	30'
SIDE STREET:	15'/10'	12'
LOT WIDTH:	60'/40'	
LOT LENGTH:	90'/80'	

SITE DATA

ASSESSORS/TAX PARCEL NUMBER: 0420352148, 0420263083 (ANNEXED)
PARCEL/SITE SIZE: 756,448 (17.37 AC)
SECTION/TOWNSHIP/RANGE: 35/20/04
DEVELOPMENT JURISDICTION: CITY OF PUYALLUP
SITE ADDRESS: 815 21ST ST. SE
PUYALLUP, WA 98372
ZONING: RS-08/RS-04
DENSITY: 5 DU/8 DU PER ACRE
PRESENT USE: PRIVATE RELIGIOUS EDUCATION
SENSITIVE AREAS: N/A
WETLANDS: NO
FLOOD PLAIN HAZARD AREAS: YES (FEMA 100 YEAR)
EROSION HAZARD AREAS: NO
LANDSLIDE HAZARD AREAS: NO
COAL MINE HAZARD AREAS: NO
SEISMIC HAZARD AREAS: YES
CREEKS/STREAMS: NO
LAKES: NO
STEEP SLOPES(10% OR GREATER): NO
VOLCANIC: YES
WILDLIFE HABITAT: NO
SHORELINE CLASSIFICATION: N/A
IMPERVIOUS AREAS: 6.40 AC. (UPDATED)
PERVIOUS AREAS: 10.97 AC. (UPDATED)
ADJACENT ZONING DESIGNATIONS & USE:
NORTH: RS-04 (HIGH URBAN DENSITY SINGLE-FAMILY RESIDENTIAL ZONE)
SOUTH: RS-08 (MEDIUM URBAN DENSITY SINGLE-FAMILY RESIDENTIAL ZONE)
EAST: RS-04/RS-08 (HIGH & MEDIUM URBAN DENSITY SINGLE-FAMILY RESIDENTIAL ZONE)
WEST: RS-08 (MEDIUM URBAN DENSITY SINGLE-FAMILY RESIDENTIAL ZONE)

UTILITIES

SEWER:	WATER:	GAS:
CITY OF PUYALLUP 1100 39TH AVE SE PUYALLUP, WA 98374 (253) 840-5550	CITY OF PUYALLUP 1100 39TH AVE SE PUYALLUP, WA 98374 (253) 840-5550	PUGET SOUND ENERGY 6905 S 228TH ST KENT, WA 98032 (253) 395-6954
FIRE:	**CABLE:**	**POWER:**
PUYALLUP FIRE 902 7TH ST NW PUYALLUP, WA 98371 (253) 845-6666	COMCAST 2200 N 30TH ST TACOMA, WA (253) 572-1100	PUGET SOUND ENERGY 6905 S 228TH ST KENT, WA 98032 (253) 395-6954
SCHOOL::	**REFUSE:**	**TELEPHONE:**
PUYALLUP SCHOOL DIST. 302 2ND ST E PUYALLUP, WA 98371 (253) 841-1301	DM DISPOSAL 3600 PORT OF TACOMA RD SUITE 505 TACOMA, WA 98424 (253) 845-6955	QWEST PHONE COMPANY 955 LIND SW RENTON, WA 98055 (425) 228-6092

LEGAL DESCRIPTIONS

PARCEL 0420352148:
SECTION 35 TOWNSHIP 20 RANGE 04 QUARTER 21 :
PARCEL "A" OF DBLR 95-12-11-0261 COMMENCING AT THE INTERSECTION OF 21ST ST SE & 9TH AVE SE BEING ON SECTION LINE BETWEEN SECTIONS 26 & 35 THENCE EAST ALONG SAID SECTION LINE 30 FEET TO EASTERLY R/W LINE OF SAID 21ST ST SE & POINT OF BEGINNING THENCE CONTINUE EAST ALONG SAID SECTION LINE 181 FEET THENCE NORTH 01°11'52" WEST 88 FEET THENCE SOUTH 88°59'43" WEST 181 FEET TO EASTERLY R/W LINE OF 21ST ST SE THENCE NORTH ALONG SAID R/W LINE 91.25 FEET THENCE EAST PARALLEL WITH SECTION LINE 585 FEET THENCE NORTH 01°11'52" WEST 143.25 FEET THENCE EAST PARALLEL WITH SECTION LINE 672.34 FEET TO WESTERLY R/W OF 25TH ST SE THENCE SOUTH ALONG SAID R/W 322.5 FEET TO SECTION LINE THENCE CONTINUE ALONG SAID WESTERLY R/W LINE OF 25TH ST SE 215.97 FEET THENCE SOUTH 89°15'54" WEST 253.06 FEET THENCE SOUTH 01°01'12" EAST 312.48 FEET THENCE SOUTH 89°15'54" WEST 371 FEET TO EAST LINE OF NORTHWEST OF NORTHEAST OF NORTHWEST THENCE NORTH ALONG SAID SUBDIVISION 196.75 FEET TO SOUTHEAST CORNER OF NORTH 1/2 OF NORTHWEST OF NORTHEAST OF NORHTWEST THENCE WEST ALONG SAID SUBDIVISION 513.88 FEET TO SOUTHEAST CORNER OF SOUTH 144 FEET OF WEST 150 FEET OF NORTH 1/2 OF NORTHWEST OF NORTHEAST OF NORTHWEST THENCE N 00°55'06" WEST 144 FEET THENCE SOUTH 89°09' WEST 120 FEET TO SAID EASTERLY R/W OF 21ST ST SE THENCE NORTH ALONG 183.05 FEET TO POINT OF BEGINNING OUT OF 2-145, 2-010 & 04-20-26-3-007 SEG H-0611 JU 1/23/96JU
PARCEL 0420263083: (PER AFN 4643203)
THE SOUTH 88 FEET OF THE WEST 181 FEET OF THE FOLLOWING DESCRIBED PROPERTY:
COMMENCING AT A POINT ON THE SOUTH BOUNDARY OF SECTION 26, TOWNSHIP 20 NORTH, RANGE 4 EAST OF THE WILLAMETTE MERIDIAN IN PIERCE COUNTY, WASHINGTON, 377.55 FEET WEST OF THE QUARTER SECTION CORNER IN THE SOUTH BOUNDARY OF SAID SECTION, SAID POINT BEING SOUTHWEST CORNER OF PREMISES HERETOFORE CONVEYED TO ALFRED SCHLEFEREIT BY DEED RECORDED IN BOOK 333 OF DEED AT PAGE 481: THENCE RUNNING NORTH ALONG WEST BOUNDARY OF SAID SCHLEFEREIT PREMISES, 322.5 FEET; THENCE WEST 363 FEET MORE OR LESS, TO A POINT 585 FEET EAST OF THE EAST LINE OF 21ST STREET SOUTHEAST; THENCE SOUTH ALONG A LINE PARALLEL WITH AND 585 FEET EAST OF SAID STREET TO A POINT 179.25 FEET NORTH OF THE SOUTH BOUNDARY OF SAID SECTION; THENCE WEST PARALLEL WITH SOUTH BOUNDARY OF SAID SECTION 585 FEET, MORE OR LESS, TO EAST BOUNDARY OF 21ST STREET SOUTHEAST; THENCE SOUTH 179.25 FEET TO SOUTH BOUNDARY OF SAID SECTION; THENCE EAST 948 FEET TO THE POINT OF BEGINNING.
SITUATE IN THE COUNTY OF PIERCE, STATE OF WASHINGTON.

SURVEY REFERENCES

1. PIERCE COUNTY ROS FOR BLA/LOT CONSOLIDATION CASE NO. 95-84-010, PER AFN 9512110261.
2. SURVEY FIELD WORK PERFORMED DURING THE 3rd WEEK OF MARCH, 2021 USING GPS EQUIPMENT BY ABBEY ROAD GROUP LAND DEVELOPMENT SERVICES COMPANY, LLC, ROBERT L. "LES" HILLEBRAND, PLS.

TOPOGRAPHIC / SURVEY NOTE

THE EXISTING CULTURAL AND TOPOGRAPHICAL DATA SHOWN ON THESE DRAWINGS HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, VADER ENGINEERING CANNOT ENSURE ACCURACY AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THAT INFORMATION OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DRAWINGS AS A RESULT.

PROJECT INFO

OWNER:
CASCADE CHRISTIAN SCHOOLS
DON JOHNSON
815 21ST ST SE
PUYALLUP, WA 98372
(253) 841-1776

ARCHITECT:
JEFF BROWN ARCHITECTURE
JEFF BROWN, AIA NCARB
12181 C ST. S.
TACOMA, WA 98444
(253) 606-8324 W
JEFF@JEFFBROWNARCHITECTURE.COM

LANDSCAPE ARCHITECT:
JGM LANDSCAPE ARCHITECTS INC. PS
CRAIG LEWIS, PLA, ASLA
12610 N.E. 104TH STREET
SEATTLE, WA 98033
(425) 454-5723 OFFICE
(206) 795-3196 CELL
CRAIG@JGM-INC.COM

CIVIL ENGINEER:
VADER ENGINEERING
REBECCA VADER, PE
6817 27TH ST. W #65353
TACOMA, WA 98464
TEL: 253-363-2065

TOPOGRAPHIC SURVEYOR:
ABBEY ROAD GROUP LAND DEV. SERVICES COMPANY
LES HILLEBRAND
P.O. BOX 1224
PUYALLUP, WA 98371
(253) 435-3699 W
LES.HILLEBRAND@ABBEYROADGROUP.COM

CONTRACTOR:
MOUNTAIN CONSTRUCTION
KEN SCHMIDT
7457 S. MADISON ST.
TACOMA, WA 98409
(253) 474-5281
(253) 365-3974 CELL
KEN@MOUNTAINCONST.COM

ESCL:
BRAD HINES BMA SOLUTIONS
3160 84TH CT. E
EDGEWOOD, WA 98371
TEL: 253-736-3213

CONSTRUCTION EMERGENCY CONTACT:
KEN SCHMIDT
TEL: 253-365-3974

OWNER EMERGENCY CONTACT:
RAY OSSMAN
TEL: 253-332-1216

APPROVED

BY _____
CITY OF PUYALLUP
ENGINEERING SERVICES

DATE _____

NOTE: THIS APPROVAL IS VOID AFTER 1 YEAR FROM APPROVAL DATE.
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS. FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE ENGINEERING SERVICES MANAGER.

SHEET INDEX

BEFORE YOU DIG CALL
1-800-424-5555
NOT LESS THAN 48 HOURS BEFORE BEGINNING EXCAVATION WHERE ANY UNDERGROUND UTILITIES MAY BE LOCATED.

CASCADE CHRISTIAN SCHOOL CAMPUS ELEMENTARY SCHOOL PORTABLES

COVER SHEET & EXISTING CONDITIONS

SITE ADDRESS:
811 21ST ST SE
PUYALLUP, WA 98372

SCOTT VADER — STATE OF WASHINGTON — 21818 — REGISTERED PROFESSIONAL ENGINEER

VADER
ENGINEERING
6817 27TH ST W, #65353
TACOMA, WA 98464
253.363.2065
rvader@vaderengineering.com

NO.	REVISION

PROJECT NO: 2409
SCALE: 1" = 100'
DESIGNED: RSV
DRAWN: BDS
SAVED: 10/5/2024
PLOT DATE: 10/5/2024

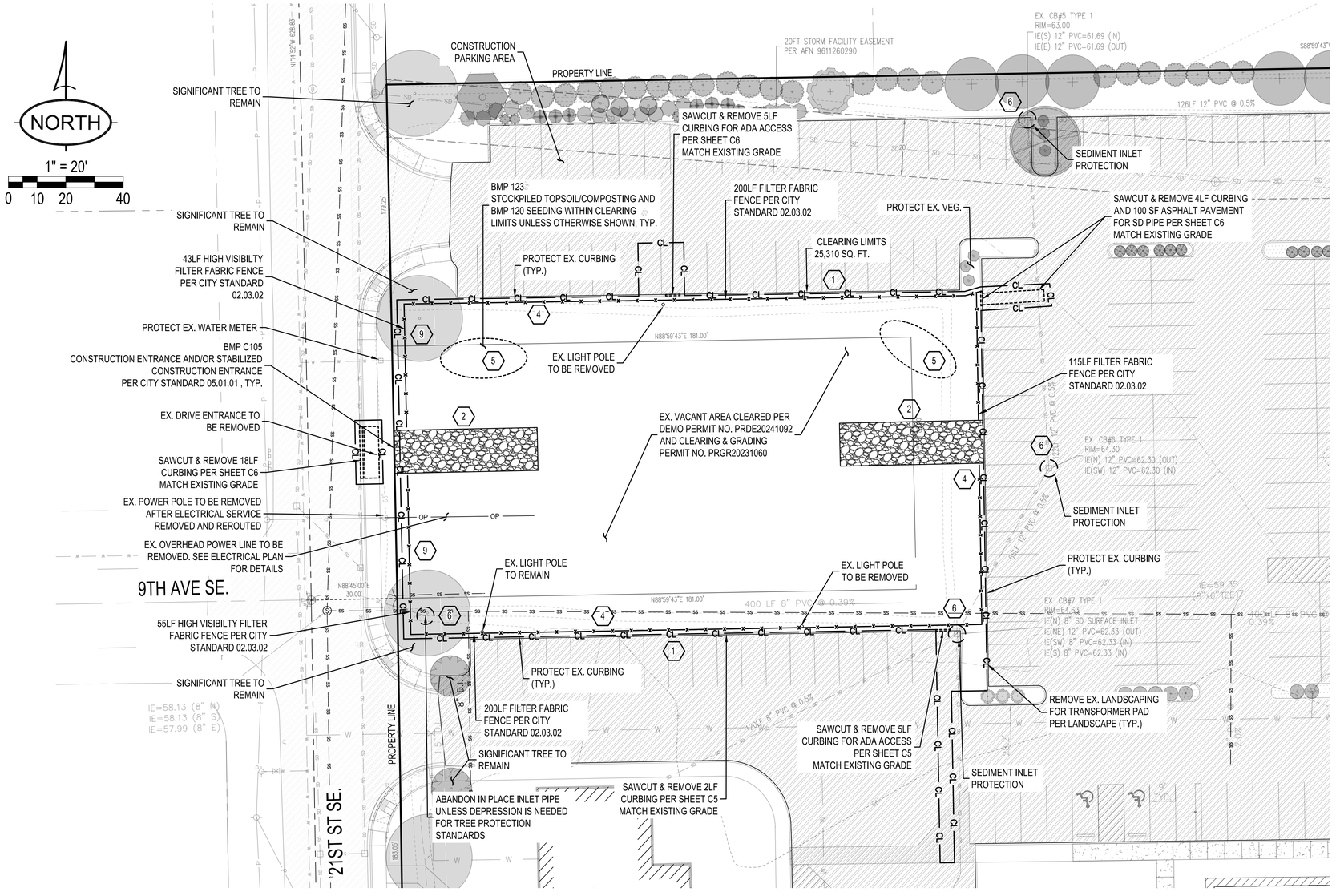
C1

SHEET 1 OF 10

CASCADE CHRISTIAN SCHOOL CAMPUS - ELEMENTARY SCHOOL PORTABLES

CSWPP PLAN - PROJECT WORK AREA 1

A PORTION OF THE S 1/2 OF SECTION 26 AND N 1/2 OF SECTION 35, TOWNSHIP 20 NORTH, RANGE 4 EAST, W.M.
PIERCE COUNTY, WASHINGTON (CITY OF PUYALLUP)



BASIS OF BEARING

MONUMENTED CENTERLINE OF 21ST STREET EAST, THAT BEING N0°43'16"E

DATUM

VERTICAL DATUM:
NAVD 88 - BASED ON PIERCE COUNTY GIS

CONTOUR INTERVAL: 2'

HORIZONTAL DATUM:
NAD 83-91 (WASHINGTON STATE SOUTH ZONE)

SITE BENCHMARK

MONUMENT IN CASE WITH 3" BRASS DISK, 0.8' BELOW RIM, POINT NUMBER 501
AT INTX. 9TH AVE. CT E., & 21ST ST. E.
ELEVATION=64.528.

CUT & FILLS

1,500 CU. YDS. - FILL
0 CU. YDS. - CUT

1,500 CU. YDS. NET - FILL

NOTE:
CUTS AND FILLS ARE PROVIDED FOR PERMIT PURPOSES ONLY. CONTRACTOR SHALL MAKE HIS OWN DETERMINATION AS TO NECESSARY CUT AND FILL QUANTITIES.

LOT AREAS

TOTAL SITE.....772,587 SQ. FT. (17.736 ACRES)

PROJECT WORK AREA 1:
CLEARING LIMITS.....25,310 SQ. FT.

PRO. ASPHALT.....4,865 SQ. FT.
PRO. CONCRETE.....42 SQ. FT.
PRO. ROOF.....10,752 SQ. FT.

PROJECT WORK AREA 2:
CLEARING LIMITS.....8,129 SQ. FT.

PRO. ASPHALT.....4,420 SQ. FT.
PRO. CONCRETE.....80 SQ. FT.
PRO. ROOF.....1,904 SQ. FT.

SYMBOL LEGEND

- SAWCUT LINE
- TEMPORARY CONSTRUCTION FENCE
- BMP 235 WATTLES OR FILTER FABRIC FENCE
- CL CLEARING LIMITS

CSWPPP NOTES & KEY

1. CLEARING & GRADING LIMITS
2. STABILIZE ENTRANCE & CIRCULATION, C107 AND SWEEP PAVEMENT AS NEEDED
3. PREVENT SEDIMENTATION OF INFILTRATION FACILITIES, BMP C235 WATTLES (N/A)
4. SEDIMENT CONTROLS BMP C235 WATTLES AND STABILIZE SOILS, BMP C120-126, 140
5. PROTECT SLOPES, BMP C120, 121, STOCKPILE SLOPES BMP C122, 123
6. PROTECT DRAIN INLETS WITH FILTER INSERT
7. PROTECT CHANNELS PROPOSED (N/A)
8. MAINTAIN BMPS, INSPECT WEEKLY. REMOVE TEMPORARY BMPS WITHIN 30 DAYS OF FINAL STABILIZATION, BMP C160
9. CONSTRUCTION OR HIGH VISIBILITY FENCE OR CONES WHERE ADJACENT TO PUBLIC TRAVEL DURING TIME OF CONSTRUCTION
10. PROVIDE TREE PROTECTION

CONSTRUCTION SEQUENCE

1. HOLD A PRECONSTRUCTION MEETING WITH THE CITY OF PUYALLUP AND OBTAIN REQUIRED PERMITS.
2. ESTABLISH CLEARING AND GRADING LIMITS
3. CONSTRUCT TEMPORARY CONSTRUCTION ENTRANCE
4. CONSTRUCT PERIMETER DITCHES, SILT FENCES, AND OTHER EROSION AND CONTROL DEVICES AS SHOWN ON THE PLAN.
5. CONSTRUCT PROTECTION DEVICES FOR CRITICAL AREAS AND SIGNIFICANT TREES PROPOSED FOR RETENTION.
6. SCHEDULE AN EROSION CONTROL INSPECTION WITH THE CITY OF PUYALLUP.
7. GRADING ACTIVITIES MAY ONLY COMMENCE AFTER ALL DRAINAGE AND EROSION CONTROL MEASURES ARE IN PLACE PER THE APPROVED PLAN.
8. IDENTIFY EROSION CONTROL MEASURES WHICH REQUIRE REGULAR MAINTENANCE.
9. EROSION AND SEDIMENT CONTROLS MAY ONLY BE REMOVED ONCE THE SITE IS STABILIZED TO THE CITY OF PUYALLUP SITE INSPECTOR'S SATISFACTION.

CONSTRUCTION SCHEDULE:
BEGIN (MONTH, YEAR): _____, _____
END (MONTH, YEAR): _____, _____

TREE PROTECTION NOTE

EX. TREES TO REMAIN ARE TO BE PROTECTED ACCORDING TO THE BEST MANAGEMENT PRACTICES AND RECOMMENDATIONS PROVIDED IN THE ASSOCIATED ARBORIST REPORT. SEE TREE PROTECTION FENCING DETAIL SHEET C9.

DISPOSE OF REMOVED DEBRIS AT AN APPROVED SITE.

PARKING NOTE

EXISTING PARKING SHALL REMAIN OPEN FOR SCHOOL USE UNTIL REPLACEMENT PARKING IS AVAILABLE.

APPROVED

BY _____
CITY OF PUYALLUP
ENGINEERING SERVICES

DATE _____

NOTE: THIS APPROVAL IS VOID AFTER 1 YEAR FROM APPROVAL DATE.
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS. FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE ENGINEERING SERVICES MANAGER.

BEFORE YOU DIG CALL
1-800-424-5555
NOT LESS THAN 48 HOURS BEFORE BEGINNING EXCAVATION WHERE ANY UNDERGROUND UTILITIES MAY BE LOCATED.

CASCADE CHRISTIAN SCHOOL CAMPUS ELEMENTARY SCHOOL PORTABLES

CSWPP PLAN - PROJECT WORK AREA 1

SITE ADDRESS:
811 21ST ST SE
PUYALLUP, WA 98372

VADER ENGINEERING
6817 27TH ST W, #65353
TACOMA, WA 98464
253.363.2065
rvader@vaderengineering.com

NO.	REVISION

PROJECT NO: 2409
SCALE: 1" = 20'
DESIGNED: RSV
DRAWN: BDS
SAVED: 10/5/2024
PLOT DATE: 10/5/2024

C2

SHEET 2 OF 10

CASCADE CHRISTIAN SCHOOL CAMPUS - ELEMENTARY SCHOOL PORTABLES

CSWPP PLAN - PROJECT WORK AREA 2

A PORTION OF THE S 1/2 OF SECTION 26 AND N 1/2 OF SECTION 35, TOWNSHIP 20 NORTH, RANGE 4 EAST, W.M.
PIERCE COUNTY, WASHINGTON (CITY OF PUYALLUP)

SYMBOL LEGEND

- SAWCUT LINE
- TEMPORARY CONSTRUCTION FENCE
- BMP 235 WATTLES OR FILTER FABRIC FENCE
- CL — CLEARING LIMITS

CSWPPP NOTES & KEY

1. CLEARING & GRADING LIMITS
2. STABILIZE ENTRANCE & CIRCULATION, C107 AND SWEEP PAVEMENT AS NEEDED
3. PREVENT SEDIMENTATION OF INFILTRATION FACILITIES, BMP C235 WATTLES (N/A)
4. SEDIMENT CONTROLS BMP C235 WATTLES AND STABILIZE SOILS, BMP C120-126, 140
5. PROTECT SLOPES, BMP C120, 121, STOCKPILE SLOPES BMP C122, 123
6. PROTECT DRAIN INLETS WITH FILTER INSERT
7. PROTECT CHANNELS PROPOSED (N/A)
8. MAINTAIN BMPS, INSPECT WEEKLY. REMOVE TEMPORARY BMPS WITHIN 30 DAYS OF FINAL STABILIZATION, BMP C160
9. CONSTRUCTION OR HIGH VISIBILITY FENCE OR CONES WHERE ADJACENT TO PUBLIC TRAVEL DURING TIME OF CONSTRUCTION
10. PROVIDE TREE PROTECTION

TREE PROTECTION NOTE

EX. TREES TO REMAIN ARE TO BE PROTECTED ACCORDING TO THE BEST MANAGEMENT PRACTICES AND RECOMMENDATIONS PROVIDED IN THE ASSOCIATED ARBORIST REPORT. SEE TREE PROTECTION FENCING DETAIL SHEET C9.

DISPOSE OF REMOVED DEBRIS AT AN APPROVED SITE.

PARKING NOTE

EXISTING PARKING SHALL REMAIN OPEN FOR SCHOOL USE UNTIL REPLACEMENT PARKING IS AVAILABLE.

CONSTRUCTION SEQUENCE

1. HOLD A PRECONSTRUCTION MEETING WITH THE CITY OF PUYALLUP AND OBTAIN REQUIRED PERMITS.
2. ESTABLISH CLEARING AND GRADING LIMITS
3. CONSTRUCT TEMPORARY CONSTRUCTION ENTRANCE
4. CONSTRUCT PERIMETER DITCHES, SILT FENCES, AND OTHER EROSION AND CONTROL DEVICES AS SHOWN ON THE PLAN.
5. CONSTRUCT PROTECTION DEVICES FOR CRITICAL AREAS AND SIGNIFICANT TREES PROPOSED FOR RETENTION.
6. SCHEDULE AN EROSION CONTROL INSPECTION WITH THE CITY OF PUYALLUP.
7. GRADING ACTIVITIES MAY ONLY COMMENCE AFTER ALL DRAINAGE AND EROSION CONTROL MEASURES ARE IN PLACE PER THE APPROVED PLAN.
8. IDENTIFY EROSION CONTROL MEASURES WHICH REQUIRE REGULAR MAINTENANCE.
9. EROSION AND SEDIMENT CONTROLS MAY ONLY BE REMOVED ONCE THE SITE IS STABILIZED TO THE CITY OF PUYALLUP SITE INSPECTOR'S SATISFACTION.

CONSTRUCTION SCHEDULE:
BEGIN (MONTH, YEAR): _____, _____
END (MONTH, YEAR): _____, _____

NORTH
1" = 20'
0 10 20 40

BASIS OF BEARING

MONUMENTED CENTERLINE OF 21ST STREET EAST, THAT BEING N0°43'16"E

DATUM

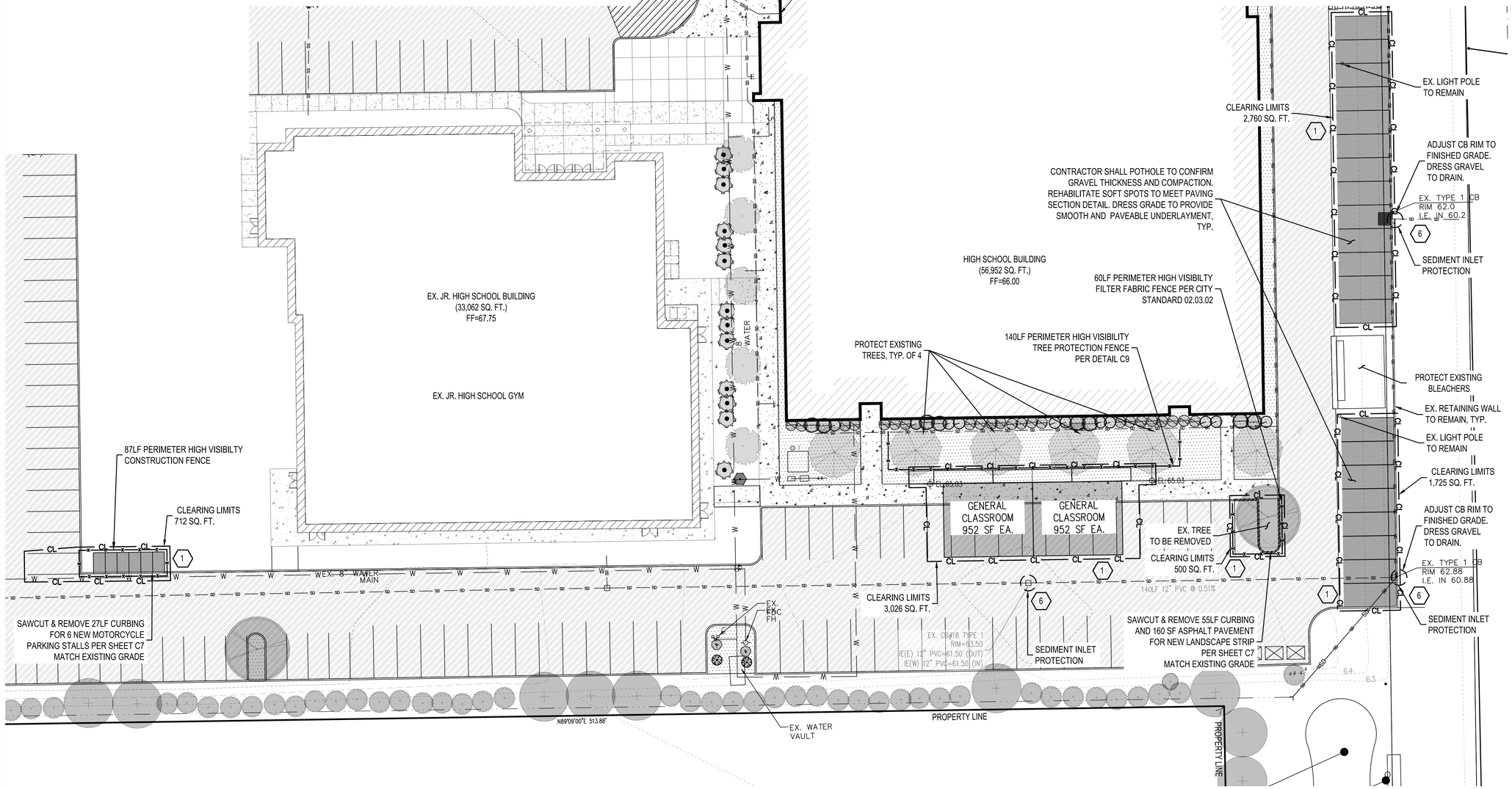
VERTICAL DATUM:
NAVD 88 - BASED ON PIERCE COUNTY GIS

CONTOUR INTERVAL: 2'

HORIZONTAL DATUM:
NAD 83-91 (WASHINGTON STATE SOUTH ZONE)

SITE BENCHMARK

MONUMENT IN CASE WITH 3" BRASS DISK, 0.8' BELOW RIM, POINT NUMBER 501
AT INTX. 9TH AVE. CT E., & 21ST ST. E.
ELEVATION=64.528.



APPROVED

BY _____
CITY OF PUYALLUP
ENGINEERING SERVICES

DATE _____

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CASCADE CHRISTIAN SCHOOL CAMPUS ELEMENTARY SCHOOL PORTABLES

CSWPP PLAN - PROJECT WORK AREA 2

SITE ADDRESS:
811 21ST ST SE
PUYALLUP, WA 98372

SCOTT VADER — STATE OF WASHINGTON — 21818 — REGISTERED PROFESSIONAL ENGINEER

VADER ENGINEERING
6817 27TH ST W, #65353
TACOMA, WA 98464
253.363.2065
rvader@vaderengineering.com

NO.	REVISION

PROJECT NO: 2409
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SAVED: 10/5/2024
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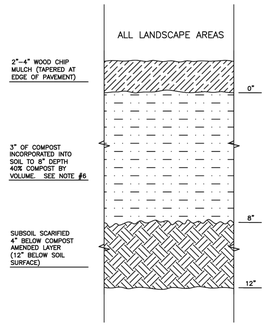
C3
SHEET 3 OF 10

CASCADE CHRISTIAN SCHOOL CAMPUS - ELEMENTARY SCHOOL PORTABLES

CSWPPP NOTES & DETAILS

A PORTION OF THE S 1/2 OF SECTION 26 AND N 1/2 OF SECTION 35, TOWNSHIP 20 NORTH, RANGE 4 EAST, W.M.
PIERCE COUNTY, WASHINGTON (CITY OF PUYALLUP)



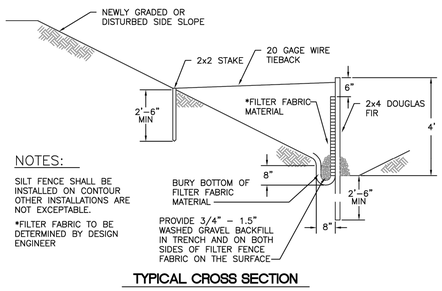
NOTES:

1. ALL SOIL AREAS DISTURBED OR COMPACTED DURING CONSTRUCTION, AND NOT COVERED BY BUILDINGS OR PAVEMENT, SHALL BE AMENDED WITH COMPOST AS DESCRIBED BELOW.
2. SUBSOIL SHOULD BE SCARIFIED (LOOSENED) 4 INCHES BELOW AMENDED LAYER, TO PRODUCE 12-INCH DEPTH OF UN-COMPACTED SOIL, EXCEPT WHERE SCARIFICATION WOULD DAMAGE TREE ROOTS OR AS DETERMINED BY THE ENGINEER. SEE NOTE BELOW REGARDING PLANTING STEPS FOR STREET TREES.
3. COMPOST SHALL BE TILLED IN TO 8 INCH DEPTH INTO EXISTING SOIL, OR PLACE 8 INCHES OF COMPOST-AMENDED SOIL, PER SOIL SPECIFICATION.
4. PLANTING BEDS SHALL RECEIVE 3 INCHES OF COMPOST TILLED IN TO 8-INCH DEPTH, OR MAY SUBSTITUTE 8" OF IMPORTED SOIL CONTAINING 35-40% COMPOST BY VOLUME. MULCH AFTER PLANTING, WITH 4 INCHES OF ARBORIST WOOD CHIP MULCH OR APPROVED EQUAL (6" OF LOOSE WOOD CHIPS AT THE TIME OF PLANTING TO ALLOW SETTLING TO 4").
5. SETBACKS: TO PREVENT UNEVEN SETTLING, DO NOT COMPOST-AMEND SOILS WITHIN 3 FEET OF UTILITY INFRASTRUCTURES (POLES, VAULTS, METERS ETC.). WITHIN ONE FOOT OF PAVEMENT EDGE, CURBS AND SIDEWALKS SOIL SHOULD BE COMPACTED TO APPROXIMATELY 95% PROCTOR TO ENSURE A FIRM SURFACE.
6. SEE SECTION 8.2(8) OF THE VMS FOR SOIL AMENDMENT AND INSTRUCTION PROCEDURES FOR STREET TREE PLANTER STRIPS. ALL STREET TREE PLANTER STRIPS SHALL RECEIVE 40% COMPOST AMENDED SOIL TO THE FULL DEPTH OF THE STREET TREE ROOTBALL.

CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

SOIL AMENDMENT AND DEPTH

DRAWN BY	CHECKED BY	APPROVED BY	REVISED BY	CITY STANDARD
LINDA LIAN	CHRIS BEALE	COLLEEN HARRIS	XXXX	
FILE NAME: I:\DWG\COMMON\STDS\CITYSTDS\8TK01.02.08		DATE APPROVED: 06/01/2015	DATE REVISED: XX/XX/XX	SCALE: 3:1	01.02.08a

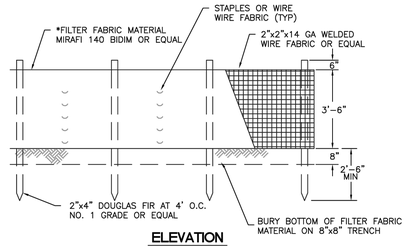


NOTES:

SILT FENCE SHALL BE INSTALLED ON CONTOUR OTHER INSTALLATIONS ARE NOT EXCEPTABLE.

*FILTER FABRIC TO BE DETERMINED BY DESIGN ENGINEER

TYPICAL CROSS SECTION



ELEVATION

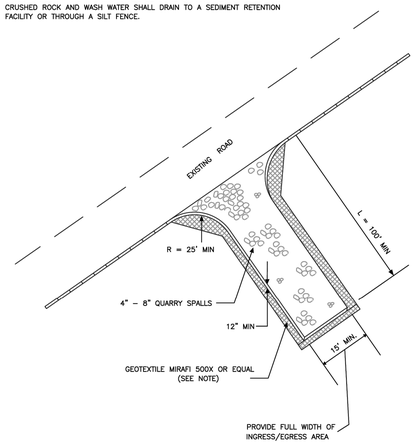
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

SILTATION FENCE

DRAWN BY	CHECKED BY	APPROVED BY	REVISED BY	CITY STANDARD
LINDA LANSING	LINDA LIAN	COLLEEN HARRIS	XXXX	
FILE NAME: F:\DWG\COMMON\STDS\CITY\2009\02_SD\02.03.02		DATE APPROVED: 09/01/1992	DATE REVISED: 06/01/2003	SCALE: NTS	02.03.02

NOTE:

1. GEOTEXTILE MIRAFI 500 X OR APPROVED EQUAL SHALL BE PLACED UNDER THE ENTIRETY OF THE TEMPORARY ENTRANCE.
2. ADDITIONAL ROCK SHALL BE ADDED PERIODICALLY TO MAINTAIN PROPER FUNCTION OF THE PAD.
3. IF THE PAD DOES NOT ADEQUATELY REMOVE THE MUD FROM THE VEHICLE'S WHEELS, THE WHEELS SHALL BE HOSED OFF BEFORE THE VEHICLE ENTERS A PAVED STREET. THE WASHING SHALL BE DONE ON AN AREA COVERED WITH CRUSHED ROCK AND WASH WATER SHALL DRAIN TO A SEDIMENT RETENTION FACILITY OR THROUGH A SILT FENCE.



CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

TEMPORARY CONSTRUCTION ENTRANCE

DRAWN BY	CHECKED BY	APPROVED BY	REVISED BY	CITY STANDARD
JDM EDWIN-SVOBODA	LINDA LIAN	COLLEEN HARRIS	XXXX	
FILE NAME: F:\DWG\COMMON\STDS\CITY\2009\05_GRD\05.01\05.01.01		DATE APPROVED: 07/01/2009	DATE REVISED: XX/XX/XX	SCALE: 1:40	05.01.01

1. ALL LIMITS OF CLEARING AND AREAS OF VEGETATION PRESERVATION AS PRESCRIBED ON THE PLANS SHALL BE CLEARLY FLAGGED IN THE FIELD AND OBSERVED DURING CONSTRUCTION.

2. ALL REQUIRED SEDIMENTATION AND EROSION CONTROL FACILITIES MUST BE CONSTRUCTED AND IN OPERATION PRIOR TO ANY LAND CLEARING AND/OR OTHER CONSTRUCTION TO ENSURE THAT SEDIMENT LADEN WATER DOES NOT ENTER THE NATURAL DRAINAGE SYSTEM. THE CONTRACTOR SHALL SCHEDULE AN INSPECTION OF THE EROSION CONTROL FACILITIES PRIOR TO ANY LAND CLEARING AND/OR CONSTRUCTION. ALL EROSION AND SEDIMENT FACILITIES SHALL BE MAINTAINED IN A SATISFACTORY CONDITION AS DETERMINED BY THE CITY, UNTIL SUCH TIME THAT CLEARING AND/OR CONSTRUCTION IS COMPLETED AND THE POTENTIAL FOR ON-SITE EROSION HAS PASSED. THE IMPLEMENTATION, MAINTENANCE, REPLACEMENT, AND ADDITIONS TO THE EROSION AND SEDIMENTATION CONTROL SYSTEMS SHALL BE THE RESPONSIBILITY OF THE PERMITEE.

3. THE EROSION AND SEDIMENTATION CONTROL SYSTEM FACILITIES DEPICTED ON THESE PLANS ARE INTENDED TO BE MINIMUM REQUIREMENTS TO MEET ANTICIPATED SITE CONDITIONS. AS CONSTRUCTION PROGRESSES AND UNEXPECTED OR SEASONAL CONDITIONS DICTATE, FACILITIES WILL BE NECESSARY TO ENSURE COMPLETE SILTATION CONTROL ON THE SITE. DURING THE COURSE OF CONSTRUCTION, IT SHALL BE THE OBLIGATION AND RESPONSIBILITY OF THE PERMITEE TO ADDRESS ANY NEW CONDITIONS THAT MAY BE CREATED BY HIS ACTIVITIES AND TO PROVIDE ADDITIONAL FACILITIES, OVER AND ABOVE THE MINIMUM REQUIREMENTS, AS MAY BE NEEDED TO PROTECT ADJACENT PROPERTIES, SENSITIVE AREAS, NATURAL WATER COURSES, AND/OR STORM DRAINAGE SYSTEMS.

4. APPROVAL OF THESE PLANS IS FOR GRADING, TEMPORARY DRAINAGE, EROSION AND SEDIMENTATION CONTROL ONLY. IT DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT STORM DRAINAGE DESIGN, SIZE OR LOCATION OF PIPES, RESTRICTORS, CHANNELS, OR RETENTION FACILITIES.

5. ANY DISTURBED AREA WHICH HAS BEEN STRIPPED OF VEGETATION AND WHERE NO FURTHER WORK IS ANTICIPATED FOR A PERIOD OF 30 DAYS OR MORE, MUST BE IMMEDIATELY STABILIZED WITH MULCHING, GRASS PLANTING, OR OTHER APPROVED EROSION CONTROL TREATMENT APPLICABLE TO THE TIME OF YEAR IN QUESTION. GRASS SEEDING ALONE WILL BE ACCEPTABLE ONLY DURING THE MONTHS OF APRIL THROUGH SEPTEMBER INCLUSIVE. SEEDING MAY PROCEED OUTSIDE THE SPECIFIED TIME PERIOD WHENEVER IT IS IN THE INTEREST OF THE PERMITEE BUT MUST BE AUGMENTED WITH MULCHING, NETTING, OR OTHER TREATMENT APPROVED BY THE CITY.

6. IN CASE EROSION OR SEDIMENTATION OCCURS TO ADJACENT PROPERTIES, ALL CONSTRUCTION WORK WITHIN THE DEVELOPMENT THAT WILL FURTHER AGGRAVATE THE SITUATION MUST CEASE, AND THE OWNER/CONTRACTOR WILL IMMEDIATELY COMMENCE RESTORATION METHODS. RESTORATION ACTIVITY WILL CONTINUE UNTIL SUCH TIME AS THE AFFECTED PROPERTY OWNER IS SATISFIED.

7. NO TEMPORARY OR PERMANENT STOCKPILING OF MATERIALS OR EQUIPMENT SHALL OCCUR WITHIN CRITICAL AREAS OR ASSOCIATED BUFFERS, OR THE CRITICAL ROOT ZONE FOR VEGETATION PROPOSED FOR RETENTION.

CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

GRADING, EROSION, AND SEDIMENTATION CONTROL NOTES

DRAWN BY	CHECKED BY	APPROVED BY	REVISED BY	CITY STANDARD
JDM EDWIN-SVOBODA	LINDA LIAN	COLLEEN HARRIS	LINDA LIAN	
FILE NAME: F:\DWG\COMMON\STDS\CITY\2009\05_GRD\05.01\05.02.01		DATE APPROVED: 07/01/2009	DATE REVISED: 11/18/2014	SCALE: 1:1	05.02.01

APPROVED

BY _____
CITY OF PUYALLUP
ENGINEERING SERVICES

DATE _____

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CASCADE CHRISTIAN SCHOOL CAMPUS ELEMENTARY SCHOOL PORTABLES

CSWPPP NOTES & DETAILS

SITE ADDRESS:
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SCOTT VADER — STATE OF WASHINGTON — 21818 — REGISTERED PROFESSIONAL ENGINEER

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C3

CASCADE CHRISTIAN SCHOOL CAMPUS - ELEMENTARY SCHOOL PORTABLES

CSWPPP NOTES & DETAILS

A PORTION OF THE S 1/2 OF SECTION 26 AND N 1/2 OF SECTION 35, TOWNSHIP 20 NORTH, RANGE 4 EAST, W.M.
PIERCE COUNTY, WASHINGTON (CITY OF PUYALLUP)

GRADING, EROSION AND SEDIMENTATION CONTROL NOTES:

1. ALL WORK IN CITY RIGHT-OF-WAY REQUIRES A PERMIT FROM THE CITY OF PUYALLUP. PRIOR TO ANY WORK COMMENCING, THE GENERAL CONTRACTOR SHALL ARRANGE FOR A PRECONSTRUCTION MEETING AT THE DEVELOPMENT SERVICES CENTER TO BE ATTENDED BY ALL CONTRACTORS THAT WILL PERFORM WORK SHOWN ON THE ENGINEERING PLANS, REPRESENTATIVES FROM ALL APPLICABLE UTILITY COMPANIES, THE PROJECT OWNER AND APPROPRIATE CITY STAFF. CONTACT ENGINEERING SERVICES TO SCHEDULE THE MEETING (253) 841-5568. THE CONTRACTOR IS RESPONSIBLE TO HAVE THEIR OWN APPROVED SET OF PLANS AT THE MEETING.
2. AFTER COMPLETION OF ALL ITEMS SHOWN ON THESE PLANS AND BEFORE ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL OBTAIN A "PUNCH LIST" PREPARED BY THE CITY'S INSPECTOR DETAILING REMAINING ITEMS OF WORK TO BE COMPLETED. ALL ITEMS OF WORK SHOWN ON THESE PLANS SHALL BE COMPLETED TO THE SATISFACTION OF THE CITY PRIOR TO ACCEPTANCE OF THE WATER SYSTEM AND PROVISION OF SANITARY SEWER SERVICE.
3. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION (HEREINAFTER REFERRED TO AS THE "STANDARD SPECIFICATIONS"), WASHINGTON STATE DEPARTMENT OF TRANSPORTATION AND AMERICAN PUBLIC WORKS ASSOCIATION, WASHINGTON STATE CHAPTER, LATEST EDITION, UNLESS SUPERSEDED OR AMENDED BY THE CITY OF PUYALLUP CITY STANDARDS FOR PUBLIC WORKS ENGINEERING AND CONSTRUCTION (HERINAFTER REFERRED TO AS THE "CITY STANDARDS").
4. A COPY OF THESE APPROVED PLANS AND APPLICABLE CITY DEVELOPER SPECIFICATIONS AND DETAILS SHALL BE ON SITE DURING CONSTRUCTION.
5. ANY REVISIONS MADE TO THESE PLANS MUST BE REVIEWED AND APPROVED BY THE DEVELOPER'S ENGINEER AND THE CITY ENGINEER PRIOR TO ANY IMPLEMENTATION IN THE FIELD. THE CITY SHALL NOT BE RESPONSIBLE FOR ANY ERRORS AND/OR OMISSIONS ON THESE PLANS.
6. THE CONTRACTOR SHALL HAVE ALL UTILITIES VERIFIED ON THE GROUND PRIOR TO ANY CONSTRUCTION. CALL (811) AT LEAST TWO WORKING DAYS HOURS IN ADVANCE. THE OWNER AND HIS/HER ENGINEER SHALL BE CONTACTED IMMEDIATELY IF A CONFLICT EXISTS.
7. ALL LIMITS OF CLEARING AND AREAS OF VEGETATION PRESERVATION AS PRESCRIBED ON THE PLANS SHALL BE CLEARLY FLAGGED IN THE FIELD AND OBSERVED DURING CONSTRUCTION.
8. ALL REQUIRED SEDIMENTATION AND EROSION CONTROL FACILITIES MUST BE CONSTRUCTED AND IN OPERATION PRIOR TO ANY LAND CLEARING AND/OR OTHER CONSTRUCTION TO ENSURE THAT SEDIMENT LADEN WATER DOES NOT ENTER THE NATURAL DRAINAGE SYSTEM. THE CONTRACTOR SHALL SCHEDULE AN INSPECTION OF THE EROSION CONTROL FACILITIES PRIOR TO ANY LAND CLEARING AND/OR OTHER CONSTRUCTION. ALL EROSION AND SEDIMENT FACILITIES SHALL BE MAINTAINED IN A SATISFACTORY CONDITION AS DETERMINED BY THE CITY, UNTIL SUCH TIME THAT CLEARING AND/OR CONSTRUCTION IS COMPLETED AND THE POTENTIAL FOR ON-SITE EROSION HAS PASSED. THE IMPLEMENTATION, MAINTENANCE, REPLACEMENT, AND ADDITIONS TO THE EROSION AND SEDIMENTATION CONTROL SYSTEMS SHALL BE THE RESPONSIBILITY OF THE PERMITTEE.
9. THE EROSION AND SEDIMENTATION CONTROL SYSTEM FACILITIES DEPICTED ON THESE PLANS ARE INTENDED TO BE MINIMUM REQUIREMENTS TO MEET ANTICIPATED SITE CONDITIONS. AS CONSTRUCTION PROGRESSES AND UNEXPECTED OR SEASONAL CONDITIONS DICTATE, FACILITIES WILL BE NECESSARY TO ENSURE COMPLETE SILTATION CONTROL ON THE SITE. DURING THE COURSE OF CONSTRUCTION, IT SHALL BE THE OBLIGATION AND RESPONSIBILITY OF THE PERMITTEE TO ADDRESS ANY NEW CONDITIONS THAT MAY BE CREATED BY HIS ACTIVITIES AND TO PROVIDE ADDITIONAL FACILITIES, OVER AND ABOVE THE MINIMUM REQUIREMENTS, AS MAY BE NEEDED TO PROTECT ADJACENT PROPERTIES, SENSITIVE AREAS, NATURAL WATER COURSES, AND/OR STORM DRAINAGE SYSTEMS.
10. APPROVAL OF THESE PLANS IS FOR GRADING, TEMPORARY DRAINAGE, EROSION AND SEDIMENTATION CONTROL ONLY. IT DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT STORM DRAINAGE DESIGN, SIZE OR LOCATION OF PIPES, RESTRICTORS, CHANNELS, OR RETENTION FACILITIES.
11. ANY DISTURBED AREA WHICH HAS BEEN STRIPPED OF VEGETATION AND WHERE NO FURTHER WORK IS ANTICIPATED FOR A PERIOD OF 30 DAYS OR MORE, MUST BE IMMEDIATELY STABILIZED WITH MULCHING, GRASS PLANTING, OR OTHER APPROVED EROSION CONTROL TREATMENT APPLICABLE TO THE TIME OF YEAR IN QUESTION. GRASS SEEDING ALONE WILL BE ACCEPTABLE ONLY DURING THE MONTHS OF APRIL THROUGH SEPTEMBER INCLUSIVE. SEEDING MAY PROCEED OUTSIDE THE SPECIFIED TIME PERIOD WHENEVER IT IS IN THE INTEREST OF THE PERMITTEE BUT MUST BE AUGMENTED WITH MULCHING, NETTING, OR OTHER TREATMENT APPROVED BY THE CITY.
12. IN CASE EROSION OR SEDIMENTATION OCCURS TO ADJACENT PROPERTIES, ALL CONSTRUCTION WORK WITHIN THE DEVELOPMENT THAT WILL FURTHER AGGRAVATE THE SITUATION MUST CEASE, AND THE OWNER/CONTRACTOR WILL IMMEDIATELY COMMENCE RESTORATION METHODS. RESTORATION ACTIVITY WILL CONTINUE UNTIL SUCH TIME AS THE AFFECTED PROPERTY OWNER IS SATISFIED.
13. NO TEMPORARY OR PERMANENT STOCKPILING OF MATERIALS OR EQUIPMENT SHALL OCCUR WITHIN CRITICAL AREAS OR ASSOCIATED BUFFERS, OR THE CRITICAL ROOT ZONE FOR VEGETATION PROPOSED FOR RETENTION.

SOIL AMENDMENT NOTES:

CHOOSE 1 OF 3 OPTIONS FOR SOIL AMENDMENT IN ANY AREAS WHERE TOPSOIL REMOVED AND IMPERVIOUS NOT PLACED.

ROOT ZONES WHERE TREES ROOTS LIMIT THE DEPTH OF INCORPORATION OF AMENDMENTS ARE EXEMPTED FROM THIS REQUIREMENT. PROTECT FENCE AND THESE ROOT ZONES FROM STRIPPING OF SOIL, GRADING, OR COMPACTION TO THE MAXIMUM EXTENT PRACTICAL.

SCARIFY SUBSOILS AT LEAST 4 INCHES FOR A FINISHED MAXIMUM DEPTH OF 12 INCHES OF UNCOMPACTED SOIL. INCORPORATE SOME OF THE UPPER MATERIAL TO AVOID STRATIFIED LAYERS WHERE FEASIBLE.

ONCE SOIL IS AMENDED, PROTECT FROM COMPACTION AND EROSION.

OPTION 1: AMEND SOILS WITH ORGANIC COMPOST

USE COMPOST AND OTHER MATERIALS THAT MEET THE FOLLOWING ORGANIC CONTENT REQUIREMENTS:

- FOR PRE-APPROVED AMENDMENT RATES USE THE COMPOST SPECIFICATION FOR BIORETENTION, WITH THE EXCEPTION THAT THE COMPOST MAY HAVE UP TO 35% BIOSOLIDS OR MANURE. THE COMPOST SHALL HAVE ORGANIC MATTER CONTENT OF AT LEAST 40% AND NOT MORE THAN 65%. THE CARBON TO NITROGEN RATIO SHALL BE BELOW 25:1 FOR GENERAL USE AND NO MORE THAN 35:1 FOR PLANTINGS COMPOSED ENTIRELY OF PLANTS NATIVE TO THE PUGET SOUND LOWLANDS REGION.

- CALCULATED AMENDMENT RATES SHALL NOT EXCEED THE CONTAMINANT LIMITS IN TABLE 220-B, TESTING PARAMETERS, WAC 173-350-220. ASSURE THAT THE RESULTING SOIL IS CONDUCIVE TO THE TYPE OF VEGETATION TO BE ESTABLISHED.

1.A. LAWN AREA SHALL BE AMMENDED TO 5% ORGANIC CONTENT

PLACE 1.75" COMPOST AND TILL TO AN 8" DEPTH. CHECK TO CONFIRM THE FOLLOWING:

ACHIEVE AN ORGANIC MATTER CONTENT OF 4% MINIMUM AS MEASURED BY THE LOSS-ON-IGNITION TEST (ASTM D2974 OR TMECC 05.07A.)

WATER OR ROLL TO COMPACT OT 85 % MAXIMUM DRY DENSITY, RAKE TO SMOOTH, AND REMOVE SURVADE WOODY DEBRIS AND ROCKS LARGER THAN 1 " DIAMETER.

1.B. LANDSCAPE AREAS SHALL BE AMMENDED TO 10% ORGANIC CONTENT

PLACE 3" COMPOST AND TILL TO AN 8" DEPTH. CHECK TO CONFIRM THE FOLLOWING:
- ACHIEVE AN ORGANIC MATTER CONTENT OF 8% MINIMUM AS MEASURED BY THE LOSS-ON-IGNITION TEST (ASTM D2974 OR TMECC 05.07A.)
- ACHIEVE A PH FROM 6.0 TO 8.0 OR MATCHING THE PH OR THE ORIGONAL UNDISTURBED SOIL.
- ACHIEVE A MINIMUM DEPTH OF 8 INCHES.

AFTER PLANTING, MULCH BEDS WITH 2 TO INCHES OF ORANIC MATERIAL SUCH AS ABROBISTS CHIPS, BARK, SHREDDED LEAVES, COMPOST, ETC. DO NOT USE FINE BARK BECAUSE IT CAN SEAL THE SURFACE.

OPTION 2: SOIL STOCKPILING

REMOVE AND STOCKPILE THE DUFF LAYER AND THE ENTIRE DEPTH OF NATIVE TOPSOIL UP TO A MAX OF 3 FEET. TEMPORARILY STABILIZE ON SITE IN A DESIGNATED, CONTROLLED AREA, NOT ADJACENT TO PUBLIC RESOURCES OR CIRITCAL AREAS.

REAPPLY TO PORTIONS OF THE SITE BROUGHT TO FINAL GRADE. OVER-EXCAVATE CUT SECTIONS IF NECESSARY TO PLACE AT LEAST THE SAME DEPTH OF TOPSOIL THAT WAS ON SITE PRE-DEVELOPMENT, UP TO A MAXIMUM OF 3 FEET.

RIP ANY CEMENTED TILL LAYERS TO A DEPTH OF 6 INCHES IN CUT SECTIONS AND MIX STOCKPILED TOPSOIL THOROUGHLY INTO THE RIPPED TILL TO PROVIDE A GRADUAL TRANSITION BETWEEN TILL AND TOPSOIL.

PLACE TOPSOIL IN LIFTS NOT GREATER THAN 1 FOOT DEEP AND COMPACT TO A DENSITY THAT MATCHES EXISITNG CONDITIONS.

OPTION 3: IMPORTING SOIL

LAWN AREAS USE A MIX AT LEAST 20 % BY VOLUME COMPOST WITH REMAINING MINERAL SOIL CONTAINING NO MORE THAN 5% PASSING THE US#200 SIEVE.

LANDSCAPE AREAS USE A MIX AT LEAST 35% BY VOLUME COMPOST WITH MINERAL SOIL CONTAINING NO MORE THAN 5% PASSING THE US#200 SIEVE.

FILL NOTES:

FOR CLEAN FILL ONLY.

IF CONTAMINATION OF SOIL OR GROUNDWATER IS INDICATED OR DISCOVERED DURING PROPOSED WORK, CONDUCT TESTING ON THE MEDIA. IF CONTAMINATION IS CONFIRMED BY SAMPLING, NOTIFY THE DOE ENVIRONMENTAL REPORT TRACKING SYSTEM COORDINATOR AT (360) 407-6300.

BMP C123 PLASTIC COVERING NOTES:

1. PLASTIC SHEETING SHALL HAVE A MINIMUM THICKNESS OF 6 MILS AND SHALL MEET THE REQUIREMENTS OF THE STATE STANDARD SPECIFICATIONS SECTION 9-14.5.
2. COVERING SHALL BE INSTALLED AND MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR TIRES ON ROPES WITH A MAXIMUM 10-FOOT GRID SPACING IN ALL DIRECTIONS. ALL SEAMS SHALL BE TAPED OR WEIGHTED DOWN FULL LENGTH AND THERE SHALL BE AT LEAST A 12 INCH OVERLAP OF ALL SEAMS.
3. CLEAR PLASTIC COVERING SHALL BE INSTALLED IMMEDIATELY ON AREAS SEEDED BETWEEN NOVEMBER 1 AND MARCH 31 AND REMAIN UNTIL VEGETATION IS FIRMLY ESTABLISHED.
4. WHEN THE COVERING IS USED ON UN-SEEDED SLOPES, IT SHALL BE KEPT IN PLACE UNTIL THE NEXT SEEDING PERIOD.
5. PLASTIC COVERING SHEETS SHALL BE BURIED TWO FEET AT THE TOP OF SLOPES IN ORDER TO PREVENT SURFACE WATER FLOW BENEATH SHEETS.
6. PROPER MAINTENANCE INCLUDES REGULAR CHECKS FOR RIPS AND DISLODGED ENDS.
7. PLASTIC COVERING MAY BE USED ON DISTURBED AREAS THAT REQUIRE COVER MEASURES FOR LESS THAN 30 DAYS, EXCEPT AS STATED BELOW.
8. PLASTIC IS PARTICULARLY USEFUL FOR PROTECTING CUT AND FILL SLOPES AND STOCKPILES. NOTE: THE RELATIVELY RAPID BREAKDOWN OF MOST POLYETHYLENE SHEETING MAKES IT UNSUITABLE FOR LONG-TERM (GREATER THAN 6 MONTHS) APPLICATIONS.
9. DUE TO RAPID RUNOFF CAUSED BY PLASTIC COVERING, DO NOT USE THIS METHOD UPSLOPE OF AREAS THAT MIGHT BE ADVERSELY IMPACTED BY CONCENTRATED RUNOFF. SUCH AREAS INCLUDE STEEP AND/OR UNSTABLE SLOPES.
10. PLASTIC SHEETING MAY RESULT IN INCREASED RUNOFF VOLUMES AND VELOCITIES, REQUIRING REQUIRING ADDITIONAL ONSITE MEASURES TO COUNTERACT THE INCREASES. CREATING A TROUGH WITH WATTLES OR OTHER MATERIAL CAN CONVEY CLEAN WATER AWAY FROM THESE AREAS.
11. WHENEVER PLASTIC IS USED TO PROTECT SLOPES INSTALL WATER COLLECTION MEASURES AT THE BASE OF THE SLOPE. THESE MEASURES INCLUDE PLASTIC-COVERED BERMS, CHANNELS AND PIPES USED TO CONVEY CLEAN RAINWATER AWAY FROM BARE SOIL AND DISTURBED AREAS. DO NOT MIX CLEAN RUNOFF FROM PLASTIC COVERED SLOPE WITH DIRTY RUNOFF FROM A PROJECT.

TEMPORARY EROSION AND SEDIMENTATION CONTROL MAINTENANCE REQUIREMENTS

1. EROSION AND SEDIMENTATION CONTROL FACILITIES SHALL BE INSPECTED AFTER EACH STORM EVENT AND DAILY DURING PROLONGED RAINFALL.
2. NECESSARY REPAIRS OR REPLACEMENT OF FACILITIES SHALL BE ACCOMPLISHED PROMPTLY.
3. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR WHEN THE LEVEL OF DEPOSITION REACHES APPROXIMATELY ONE-HALF THE MAXIMUM POTENTIAL DEPTH.
4. SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE ESC FACILITIES ARE NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.
5. TEMPORARY EROSION AND SEDIMENTATION CONTROL FACILITIES SHALL BE MAINTAINED BY:

BMP C123 STOCKPILED TOPSOIL NOTES:

1. STOCKPILES SHALL BE STABILIZED (WITH PLASTIC COVERING OR OTHER APPROVED DEVICE) DAILY BETWEEN NOVEMBER 1 AND MARCH 31.
2. IN ANY SEASON, SEDIMENT LEACHING FROM STOCKPILES MUST BE PREVENTED.
3. TOPSOIL SHALL NOT BE PLACED WHILE IN FROZEN OR MUDDY CONDITION, WHEN THE SUBGRADE IS EXCESSIVELY WET, OR WHEN CONDITIONS EXIST THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING OR PROPOSED SODDING OR SEEDING.
4. PREVIOUSLY ESTABLISHED GRADES ON THE AREAS TO BE TOPSOILED SHALL BE MAINTAINED ACCORDING TO THE APPROVED PLAN.
5. SIDE SLOPES OF THE STOCKPILE SHALL NOT EXCEED 2H: 1V

APPROVED

BY _____
CITY OF PUYALLUP
ENGINEERING SERVICES

DATE _____

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BEFORE YOU DIG
CALL
1-800-424-5555
NOT LESS THAN 48 HOURS BEFORE BEGINNING EXCAVATION WHERE ANY UNDERGROUND UTILITIES MAY BE LOCATED.

CASCADE CHRISTIAN SCHOOL CAMPUS ELEMENTARY SCHOOL PORTABLES

CSWPPP NOTES & DETAILS

SITE ADDRESS:
811 21ST ST SE
PUYALLUP, WA 98372

SCOTT VADER — REGISTERED PROFESSIONAL ENGINEER — STATE OF WASHINGTON — 31818

VADER
ENGINEERING
6817 27TH ST W, #65353
TACOMA, WA 98464
253.363.2065
rvader@vaderengineering.com

NO.	REVISION

PROJECT NO: 2409
SCALE: N/A
DESIGNED: RSV
DRAWN: BDS
SAVED: 10/5/2024
PLOT DATE: 10/5/2024

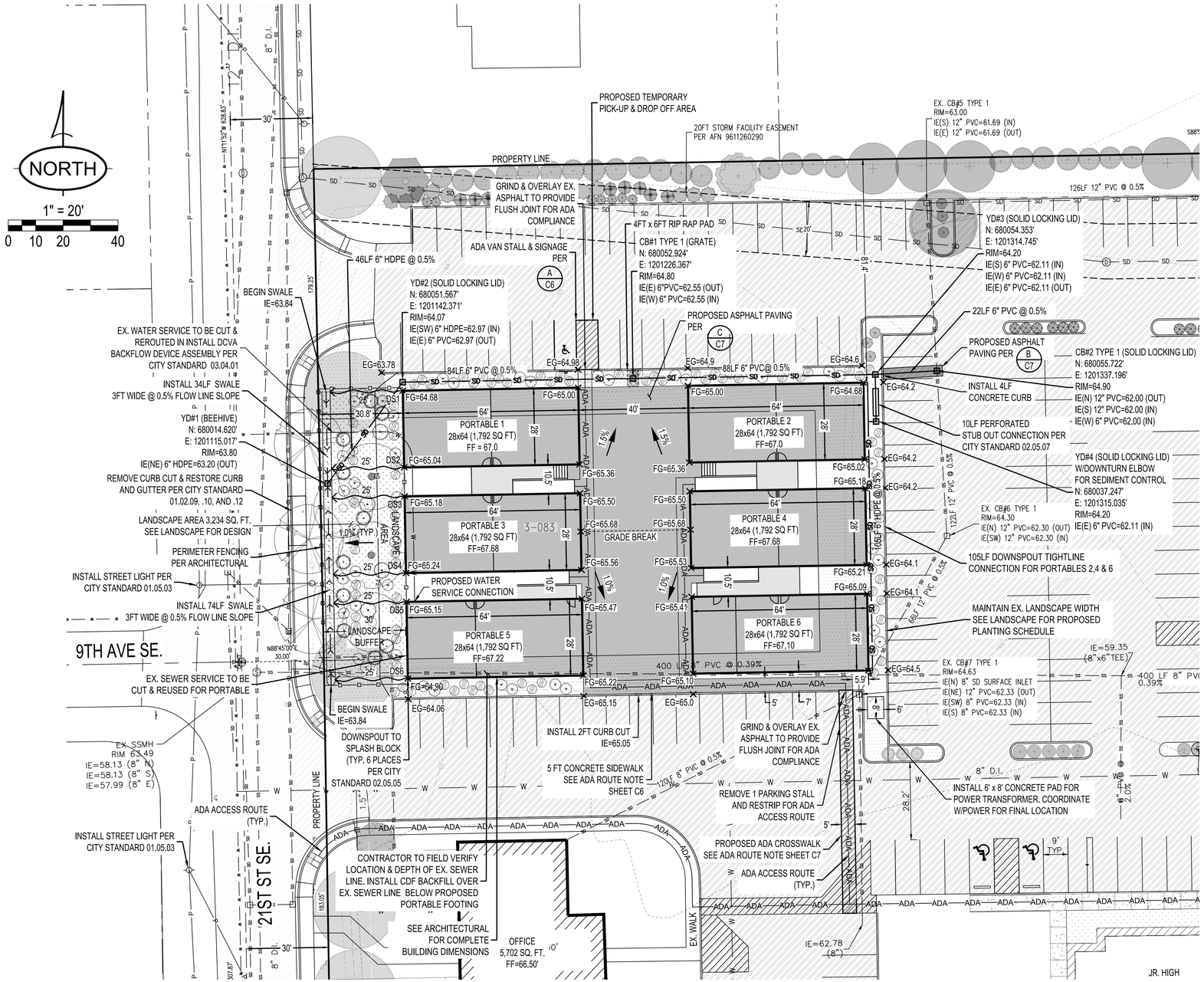
C5

SHEET 5 OF 10

CASCADE CHRISTIAN SCHOOL CAMPUS - ELEMENTARY SCHOOL PORTABLES

GRADING, DRAINAGE & UTILITIES PLAN - PROJECT WORK AREA 2

A PORTION OF THE S 1/2 OF SECTION 26 AND N 1/2 OF SECTION 35, TOWNSHIP 20 NORTH, RANGE 4 EAST, W.M.
PIERCE COUNTY, WASHINGTON (CITY OF PUYALLUP)



BASIS OF BEARING

MONUMENTED CENTERLINE OF 21ST STREET EAST, THAT BEING N0°43'16"E

DATUM

VERTICAL DATUM:
NAVD 88 - BASED ON PIERCE COUNTY GIS

CONTOUR INTERVAL: 2'

HORIZONTAL DATUM:
NAD 83-91 (WASHINGTON STATE SOUTH ZONE)

SITE BENCHMARK

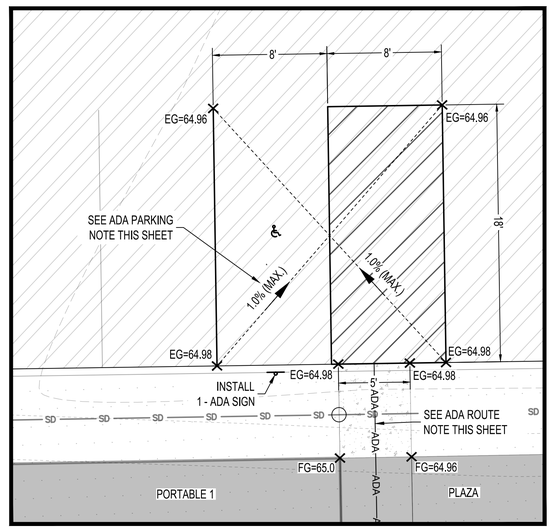
MONUMENT IN CASE WITH 3" BRASS DISK, 0.8' BELOW RIM, POINT NUMBER 501
AT INTX. 9TH AVE. CT E., & 21ST ST. E.
ELEVATION=64.528.

ADA ROUTE

CONTRACTOR TO FIELD VERIFY ADA COMPLIANCE ALONG PROPOSED ACCESSIBILITY ROUTE. FIELD VERIFY EXISTING PAVEMENT MAINTAINS MAX 2% CROSS SLOPE ALONG ADA ROUTE AND MAX 5% RUNNING SLOPES. FOR NEW PAVEMENT, DESIGN TO MAX 1.5% CROSS SLOPE AND MAX 4% RUNNING SLOPE WHERE POSSIBLE. NOTE, DESIGN TO MAX 1.5% SLOPES IN ALL DIRECTIONS AT RAMP LANDINGS, PATH INTERSECTIONS, AND TURNS ALONG PATH.WHERE NECESSARY, DESIGN NEW ADA RAMPS TO MAX 7.5% RUNNING SLOPE AND 1.5% CROSS SLOPE. INSTALL DETECTABLE WARNING STRIPS AT ENDS OF ADA ROUTE BEFORE ENTERING A CROSS WALK, PER ADA STANDARDS.GRIND/OVERLAY ASPHALT PAVEMENT AS NECESSARY TO ACHIEVE ADA COMPLIANT GRADES. USE CONCRETE PAVEMENT FOR IMPROVED GRADING ACCURACY OF ADA COMPLIANCE.

ADA PARKING

CONTRACTOR TO FIELD VERIFY ADA COMPLIANCE WITHIN PROPOSED ADA PARKING AREAS. FIELD VERIFY EXISTING PAVEMENT MAINTAINS MAX 2% SLOPE IN ALL DIRECTIONS. FOR NEW PAVEMENT, DESIGN TO MAX 1.0% SLOPE WHERE POSSIBLE.GRIND/OVERLAY ASPHALT PAVEMENT AS NECESSARY TO ACHIEVE ADA COMPLIANT GRADES. USE CONCRETE PAVEMENT FOR IMPROVED GRADING ACCURACY OF ADA COMPLIANCE.



A C6 **ADA-VAN PARKING STALL DETAIL**

SCALE: 1" = 5'

APPROVED

BY _____
CITY OF PUYALLUP
ENGINEERING SERVICES

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CASCADE CHRISTIAN SCHOOL CAMPUS ELEMENTARY SCHOOL PORTABLES

GRADING, DRAINAGE & UTILITIES PLAN - PROJECT WORK AREA 2

SITE ADDRESS:
811 21ST ST SE
PUYALLUP, WA 98372

SCOTT VADER — REGISTERED PROFESSIONAL ENGINEER — STATE OF WASHINGTON — 21819

VADER ENGINEERING
6817 27TH ST W, #65353
TACOMA, WA 98464
253.363.2065
rvader@vaderengineering.com

NO.	REVISION

PROJECT NO: 2409
SCALE: 1" = 20'
DESIGNED: RSV
DRAWN: BDS
SAVED: 10/5/2024
PLOT DATE: 10/5/2024

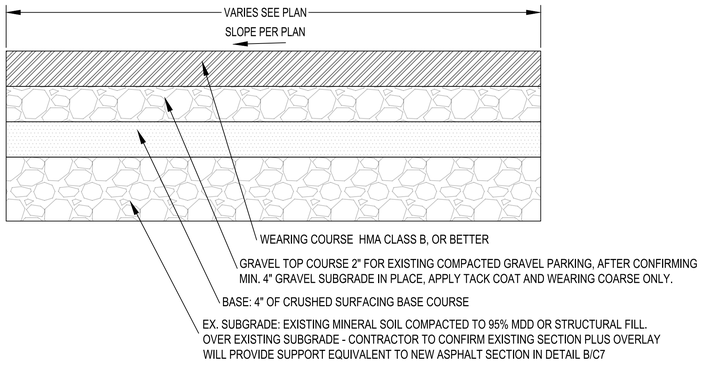
C6

SHEET 6 OF 10

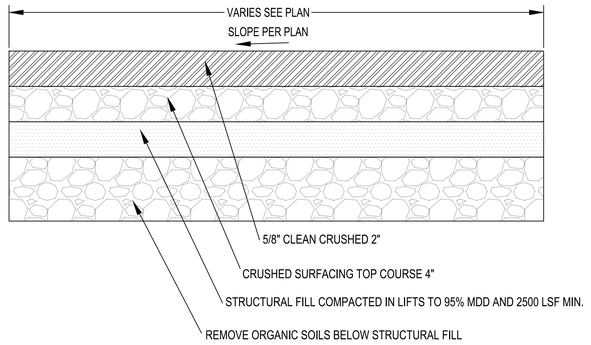
CASCADE CHRISTIAN SCHOOL CAMPUS - ELEMENTARY SCHOOL PORTABLES

GRADING, DRAINAGE & UTILITIES PLAN - PROJECT WORK AREA 2

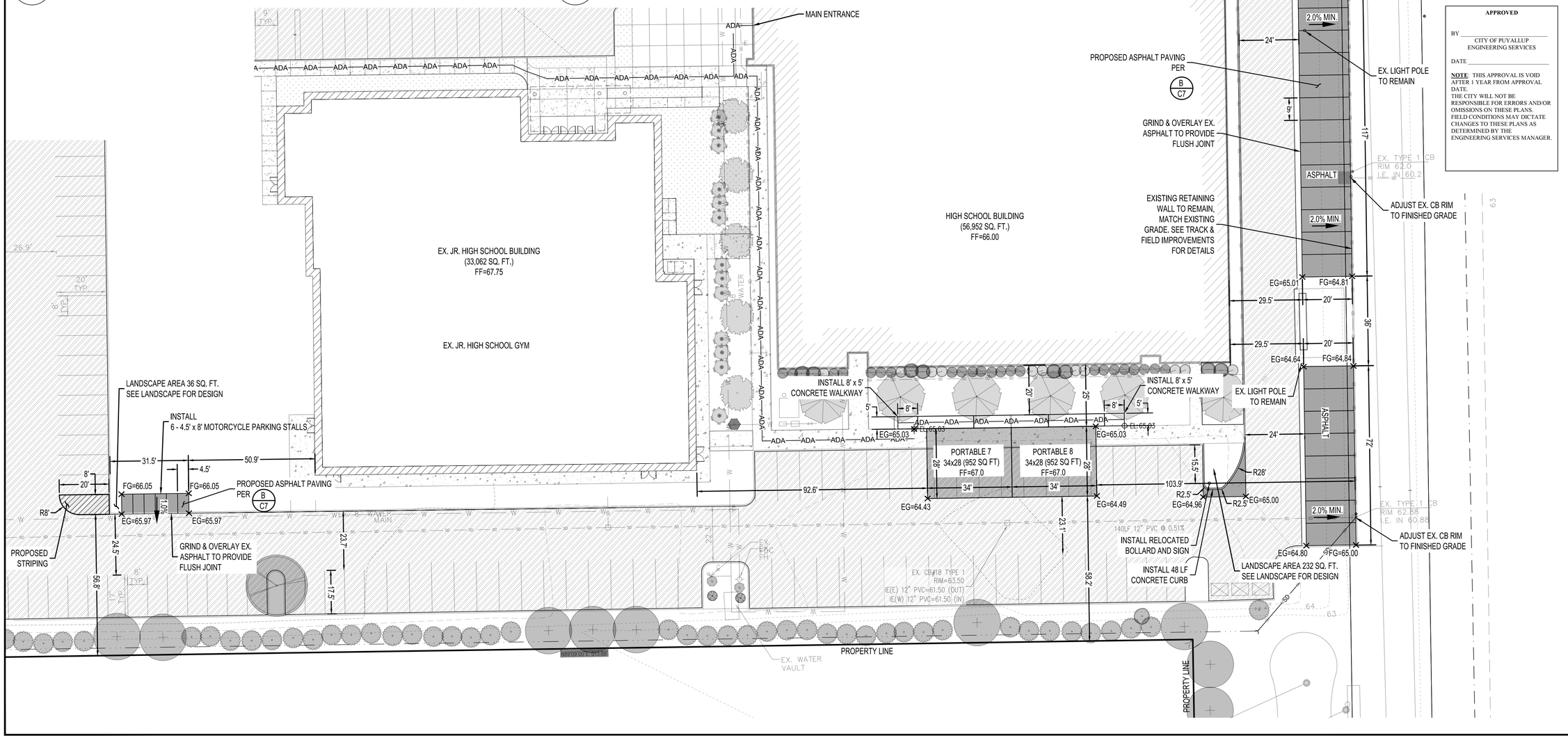
A PORTION OF THE S 1/2 OF SECTION 26 AND N 1/2 OF SECTION 35, TOWNSHIP 20 NORTH, RANGE 4 EAST, W.M.
PIERCE COUNTY, WASHINGTON (CITY OF PUYALLUP)

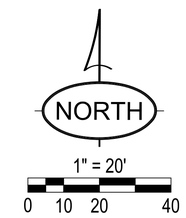


B/C7 **ASPHALT SECTION (TYPICAL)** N.T.S.



C/C7 **PORTABLE FILL SECTION (TYPICAL)** N.T.S.





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SITE BENCHMARK
MONUMENT IN CASE WITH 3" BRASS DISK, 0.8' BELOW RIM, POINT NUMBER 501 AT INTX. 9TH AVE. CT E., & 21ST ST. E. ELEVATION=64.528.

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C7

SHEET 7 OF 10

CASCADE CHRISTIAN SCHOOL CAMPUS - ELEMENTARY SCHOOL PORTABLES

NOTES & DETAILS

A PORTION OF THE S 1/2 OF SECTION 26 AND N 1/2 OF SECTION 35, TOWNSHIP 20 NORTH, RANGE 4 EAST, W.M.
PIERCE COUNTY, WASHINGTON (CITY OF PUYALLUP)

STORMWATER NOTES:

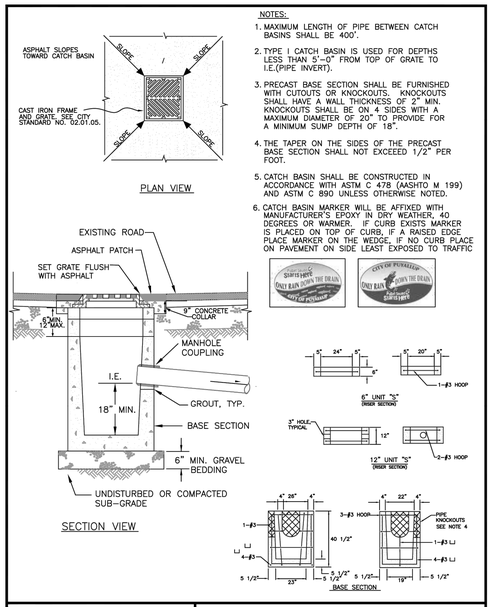
1. ALL WORK IN CITY RIGHT-OF-WAY REQUIRES A PERMIT FROM THE CITY OF PUYALLUP. PRIOR TO ANY WORK COMMENCING, THE GENERAL CONTRACTOR SHALL ARRANGE FOR A PRECONSTRUCTION MEETING AT THE DEVELOPMENT SERVICES CENTER TO BE ATTENDED BY ALL CONTRACTORS THAT WILL PERFORM WORK SHOWN ON THE ENGINEERING PLANS, REPRESENTATIVES FROM ALL APPLICABLE UTILITY COMPANIES, THE PROJECT OWNER AND APPROPRIATE CITY STAFF. CONTACT ENGINEERING SERVICES TO SCHEDULE THE MEETING (253) 841-5568. THE CONTRACTOR IS RESPONSIBLE TO HAVE THEIR OWN APPROVED SET OF PLANS AT THE MEETING.
2. AFTER COMPLETION OF ALL ITEMS SHOWN ON THESE PLANS AND BEFORE ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL OBTAIN A "PUNCH LIST" PREPARED BY THE CITY'S INSPECTOR DETAILING REMAINING ITEMS OF WORK TO BE COMPLETED. ALL ITEMS OF WORK SHOWN ON THESE PLANS SHALL BE COMPLETED TO THE SATISFACTION OF THE CITY PRIOR TO ACCEPTANCE OF THE WATER SYSTEM AND PROVISION OF SANITARY SEWER SERVICE.
3. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION (HEREINAFTER REFERRED TO AS THE "STANDARD SPECIFICATIONS"), WASHINGTON STATE DEPARTMENT OF TRANSPORTATION AND AMERICAN PUBLIC WORKS ASSOCIATION, WASHINGTON STATE CHAPTER, LATEST EDITION, UNLESS SUPERSEDED OR AMENDED BY THE CITY OF PUYALLUP CITY STANDARDS FOR PUBLIC WORKS ENGINEERING AND CONSTRUCTION (HEREINAFTER REFERRED TO AS THE "CITY STANDARDS").
4. A COPY OF THESE APPROVED PLANS AND APPLICABLE CITY DEVELOPER SPECIFICATIONS AND DETAILS SHALL BE ON SITE DURING CONSTRUCTION.
5. ANY REVISIONS MADE TO THESE PLANS MUST BE REVIEWED AND APPROVED BY THE DEVELOPER'S ENGINEER AND THE ENGINEERING SERVICES STAFF PRIOR TO ANY IMPLEMENTATION IN THE FIELD. THE CITY SHALL NOT BE RESPONSIBLE FOR ANY ERRORS AND/OR OMISSIONS ON THESE PLANS.
6. THE CONTRACTOR SHALL HAVE ALL UTILITIES VERIFIED ON THE GROUND PRIOR TO ANY CONSTRUCTION. CALL (811) AT LEAST TWO WORKING DAYS IN ADVANCE. THE OWNER AND HIS/HER ENGINEER SHALL BE CONTACTED IMMEDIATELY IF A CONFLICT EXISTS.
7. ANY STRUCTURE AND/OR OBSTRUCTION WHICH REQUIRE REMOVAL OR RELOCATION RELATING TO THIS PROJECT, SHALL BE DONE SO AT THE DEVELOPER'S EXPENSE.
8. DURING CONSTRUCTION, ALL EXISTING AND NEWLY INSTALLED DRAINAGE STRUCTURES SHALL BE PROTECTED FROM SEDIMENTS.
9. ALL STORM MANHOLES SHALL CONFORM TO CITY STANDARD DETAIL NO. 02.01.01. FLOW CONTROL MANHOLE/OIL WATER SEPARATOR SHALL CONFORM TO CITY STANDARD DETAIL NO. 02.01.06 AND 02.01.07.
10. MANHOLE RING AND COVER SHALL CONFORM TO CITY STANDARD DETAIL 06.01.02.
11. CATCH BASINS TYPE I SHALL CONFORM TO CITY STANDARD DETAIL NO.02.01.02 AND 02.01.03 AND SHALL BE USED ONLY FOR DEPTHS LESS THAN 5 FEET FROM TOP OF THE GRATE TO THE INVERT OF THE STORM PIPE.
12. CATCH BASINS TYPE II SHALL CONFORM TO CITY STANDARD DETAIL NO.02.01.04 AND SHALL BE USED FOR DEPTHS GREATER THAN 5 FEET FROM TOP OF THE GRATE TO THE INVERT OF THE STORM PIPE.
13. CAST IRON OR DUCTILE IRON FRAME AND GRATE SHALL CONFORM TO CITY STANDARD DETAIL NO.02.01.05. GRATE SHALL BE MARKED WITH "DRAINS TO STREAM". SOLID CATCH BASIN LIDS (SQUARE UNLESS NOTED AS ROUND) SHALL CONFORM TO WSDOT STANDARD PLAN B-30.20-04 (OLYMPIC FOUNDRY NO. SM60 OR EQUAL). VANED GRATES SHALL CONFORM TO WSDOT STANDARD PLAN B-30.30-03 (OLYMPIC FOUNDRY NO. SM60V OR EQUAL).
14. STORMWATER PIPE SHALL BE ONLY PVC, CONCRETE, DUCTILE IRON, OR DUAL WALLED POLYPROPYLENE PIPE.

A. THE USE OF ANY OTHER TYPE SHALL BE REVIEWED AND APPROVED BY THE ENGINEERING SERVICES STAFF PRIOR TO INSTALLATION.
B. PVC PIPE SHALL BE PER ASTM D3034, SDR 35 FOR PIPE SIZE 15-INCH AND SMALLER AND F679 FOR PIPE SIZES 18 TO 27 INCH. MINIMUM COVER ON PVC PIPE SHALL BE 3.0 FEET.
C. CONCRETE PIPE SHALL CONFORM TO THE WSDOT STANDARD SPECIFICATIONS FOR CONCRETE UNDERDRAIN PIPE. MINIMUM COVER ON CONCRETE PIPE SHALL NOT LESS THAN 3.0 FEET.
D. DUCTILE IRON PIPE SHALL BE CLASS 50, CONFORMING TO AWWA C151. MINIMUM COVER ON DUCTILE IRON PIPE SHALL BE 1.0 FOOT.
E. POLYPROPYLENE PIPE (PP) SHALL BE DUAL WALLED, HAVE A SMOOTH INTERIOR AND EXTERIOR CORRUGATIONS AND MEET WSDOT 9-05.24(1). 12-INCH THROUGH 30-INCH PIPE SHALL MEET OR EXCEED ASTM F2736 AND AASHTO M330, TYPE S, OR TYPE D. 36-INCH THROUGH 60-INCH PIPE SHALL MEET OR EXCEED ASTM F2881 AND AASHTO M330, TYPE S, OR TYPE D. TESTING SHALL BE PER ASTM F1417. MINIMUM COVER OVER POLYPROPYLENE PIPE SHALL BE 3-FEET.

15. TRENCHING, BEDDING, AND BACKFILL FOR PIPE SHALL CONFORM TO CITY STANDARD DETAIL NO. 06.01.01.
16. STORM PIPE SHALL BE A MINIMUM OF 10 FEET AWAY FROM BUILDING FOUNDATIONS AND/OR ROOF LINES.
17. ALL STORM DRAIN MAINS SHALL BE TESTED AND INSPECTED FOR ACCEPTANCE AS OUTLINED IN SECTION 406 OF THE CITY OF PUYALLUP SANITARY SEWER SYSTEM STANDARDS.
18. ALL TEMPORARY SEDIMENTATION AND EROSION CONTROL MEASURES, AND PROTECTIVE MEASURES FOR CRITICAL AREAS AND SIGNIFICANT TREES SHALL BE INSTALLED PRIOR TO INITIATING ANY CONSTRUCTION ACTIVITIES.

GENERAL NOTES:

1. ALL WORK IN CITY RIGHT-OF-WAY REQUIRES A PERMIT FROM THE CITY OF PUYALLUP. PRIOR TO ANY WORK COMMENCING, THE GENERAL CONTRACTOR SHALL ARRANGE FOR A PRECONSTRUCTION MEETING AT THE DEVELOPMENT SERVICES CENTER TO BE ATTENDED BY ALL CONTRACTORS THAT WILL PERFORM WORK SHOWN ON THE APPROVED ENGINEERING PLANS, REPRESENTATIVES FROM ALL APPLICABLE UTILITY COMPANIES, THE PROJECT OWNER AND APPROPRIATE CITY STAFF. CONTACT ENGINEERING SERVICES AT (253-841-5568) TO SCHEDULE THE MEETING. THE CONTRACTOR IS RESPONSIBLE TO HAVE THEIR OWN SET OF APPROVED PLANS AT THE MEETING.
2. AFTER COMPLETION OF ALL ITEMS SHOWN ON THESE PLANS AND BEFORE ACCEPTANCE OF THE PROJECT THE CONTRACTOR SHALL OBTAIN A "PUNCH LIST" PREPARED BY THE CITY'S INSPECTOR DETAILING REMAINING ITEMS OF WORK TO BE COMPLETED. ALL ITEMS OF WORK SHOWN ON THESE PLANS SHALL BE COMPLETED TO THE SATISFACTION OF THE CITY PRIOR TO ACCEPTANCE OF THE WATER SYSTEM AND PROVISION OF SANITARY SEWER SERVICE.
3. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION (HEREINAFTER REFERRED TO AS THE "STANDARD SPECIFICATIONS"), WASHINGTON STATE DEPARTMENT OF TRANSPORTATION AND AMERICAN PUBLIC WORKS ASSOCIATION, WASHINGTON STATE CHAPTER, LATEST EDITION, UNLESS SUPERSEDED OR AMENDED BY THE CITY OF PUYALLUP CITY STANDARDS FOR PUBLIC WORKS ENGINEERING AND CONSTRUCTION (HEREINAFTER REFERRED TO AS THE "CITY STANDARDS").
4. A COPY OF THESE APPROVED PLANS AND APPLICABLE CITY DEVELOPER SPECIFICATIONS AND DETAILS SHALL BE ON SITE DURING CONSTRUCTION.
5. ANY REVISIONS MADE TO THESE PLANS MUST BE REVIEWED AND APPROVED BY THE DEVELOPER'S ENGINEER AND THE CITY PRIOR TO ANY IMPLEMENTATION IN THE FIELD. THE CITY SHALL NOT BE RESPONSIBLE FOR ANY ERRORS AND/OR OMISSIONS ON THESE PLANS.
6. THE CONTRACTOR SHALL HAVE ALL UTILITIES VERIFIED ON THE GROUND PRIOR TO ANY CONSTRUCTION. CALL (811) AT LEAST TWO WORKING DAYS IN ADVANCE. THE OWNER AND HIS/HER ENGINEER SHALL BE CONTACTED IMMEDIATELY IF A CONFLICT EXISTS.
7. ANY STRUCTURE AND/OR OBSTRUCTION THAT REQUIRES REMOVAL OR RELOCATION RELATING TO THIS PROJECT SHALL BE DONE SO AT THE DEVELOPER'S EXPENSE.
8. LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE TRUE ELEVATIONS AND LOCATIONS OF HIDDEN UTILITIES. ALL VISIBLE ITEMS SHALL BE THE ENGINEER'S RESPONSIBILITY.
9. THE CONTRACTOR SHALL INSTALL, REPLACE, OR RELOCATE ALL SIGNS, AS SHOWN ON THE PLANS OR AS AFFECTED BY CONSTRUCTION, PER CITY STANDARDS.
10. POWER, STREET LIGHT, CABLE, AND TELEPHONE LINES SHALL BE IN A TRENCH LOCATED WITHIN A 10-FOOT UTILITY EASEMENT ADJACENT TO PUBLIC RIGHT-OF-WAY. RIGHT-OF-WAY CROSSINGS SHALL HAVE A MINIMUM HORIZONTAL SEPARATION FROM OTHER UTILITIES (SEWER, WATER, AND STORM) OF 5 FEET.
11. ALL CONSTRUCTION SURVEYING FOR EXTENSIONS OF PUBLIC FACILITIES SHALL BE DONE UNDER THE DIRECTION OF A WASHINGTON STATE LICENSED LAND SURVEYOR OR A WASHINGTON STATE LICENSED PROFESSIONAL CIVIL ENGINEER.
12. DURING CONSTRUCTION, ALL PUBLIC STREETS ADJACENT TO THIS PROJECT SHALL BE KEPT CLEAN OF ALL MATERIAL DEPOSITS RESULTING FROM ON-SITE CONSTRUCTION, AND EXISTING STRUCTURES SHALL BE PROTECTED AS DIRECTED BY THE CITY.
13. CERTIFIED RECORD DRAWINGS ARE REQUIRED PRIOR TO PROJECT ACCEPTANCE.
14. A NPDES STORMWATER GENERAL PERMIT MAY BE REQUIRED BY THE DEPARTMENT OF ECOLOGY FOR THIS PROJECT. FOR INFORMATION CONTACT THE DEPARTMENT OF ECOLOGY, SOUTHWEST REGION OFFICE AT (360)407-6300.
15. ANY DISTURBANCE OR DAMAGE TO CRITICAL AREAS AND ASSOCIATED BUFFERS, OR SIGNIFICANT TREES DESIGNATED FOR PRESERVATION AND PROTECTION SHALL BE MITIGATED IN ACCORDANCE WITH A MITIGATION PLAN REVIEWED AND APPROVED BY THE CITY'S PLANNING DIVISION. PREPARATION AND IMPLEMENTATION OF THE MITIGATION PLAN SHALL BE AT THE DEVELOPER'S EXPENSE.

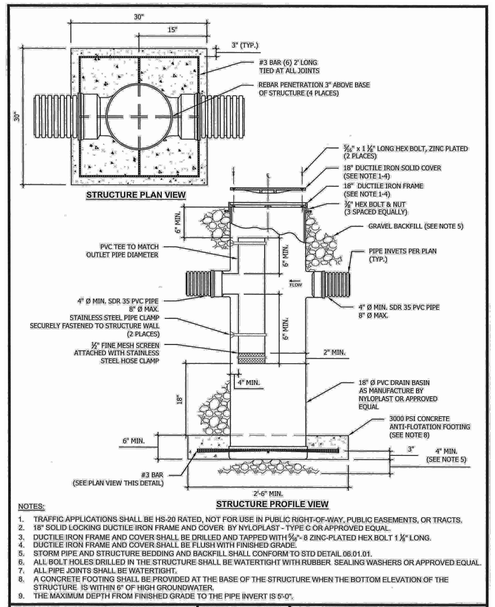


CITY OF PUYALLUP — DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

CATCH BASIN TYPE 1 (AREA DRAIN)

DRAWN BY	CHECKED BY	APPROVED BY	REVISED BY	CITY STANDARD
LINDA LANSING	LINDA LIAN	COLLEEN HARRIS	XXX	
FILE NAME: P:\DWG\COMMON\STDS\CITY\20NAD_SD\02.01.02		DATE APPROVED: 06/01/1992	DATE REVISED: 06/01/2003	SCALE: N/A

02.01.02

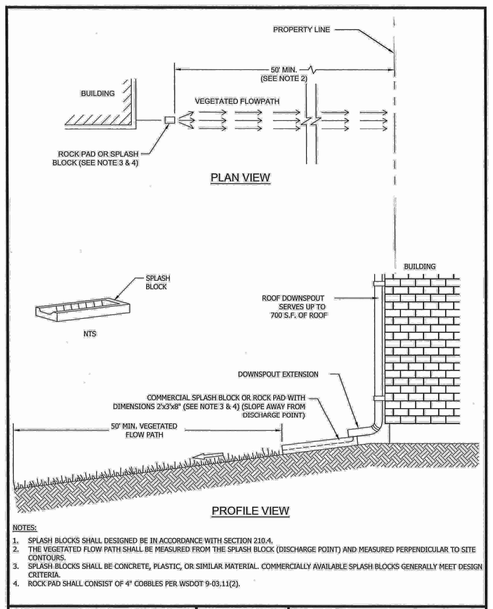


NOTES:
1. TRAFFIC APPLICATIONS SHALL BE HS-20 RATED, NOT FOR USE IN PUBLIC RIGHT-OF-WAY, PUBLIC EASEMENTS, OR TRACTS.
2. 18" SOLID LOCKING DUCTILE IRON FRAME AND COVER BY NYLOPLAST - TYPE C OR APPROVED EQUAL.
3. DUCTILE IRON FRAME AND COVER SHALL BE DRILLED AND TAPPED WITH 5/8"-8 ZINC-PLATED HEX BOLT 1 1/8" LONG.
4. DUCTILE IRON FRAME AND COVER SHALL BE FLUSH WITH FINISHED GRADE.
5. STORM PIPE AND STRUCTURE BEDDING AND BACKFILL SHALL CONFORM TO STD DETAIL 06.01.01.
6. ALL BOLT HOLES DRILLED IN THE STRUCTURE SHALL BE WATERTIGHT WITH RUBBER SEALING WASHERS OR APPROVED EQUAL.
7. ALL PIPE JOINTS SHALL BE WATERTIGHT.
8. A CONCRETE FOOTING SHALL BE PROVIDED AT THE BASE OF THE STRUCTURE WHEN THE BOTTOM ELEVATION OF THE STRUCTURE IS WITHIN 6" OF HIGH GROUNDWATER.
9. THE MAXIMUM DEPTH FROM FINISHED GRADE TO THE PIPE INVERT IS 5'-0".

CITY OF PUYALLUP — PUBLIC WORKS AND DEVELOPMENT ENGINEERING

YARD DRAIN

SCALE: N/A	DATE REVISED: 05/05/2021	CITY STANDARD
FILE NAME: P:\Shared Drawings\City Standards\2019\02 - PART 2 - STANDARD DETAILS\CAD\2019\02.05.02		02.05.02

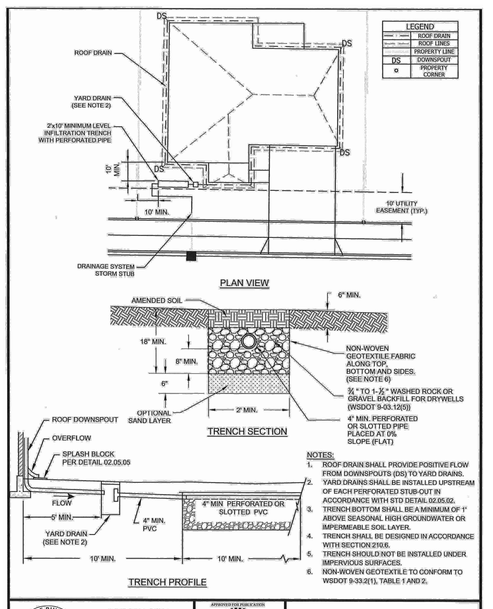


NOTES:
1. SPLASH BLOCKS SHALL DESIGNED BE IN ACCORDANCE WITH SECTION 210.4.
2. THE VEGETATED FLOW PATH SHALL BE MEASURED FROM THE SPLASH BLOCK (DISCHARGE POINT) AND MEASURED PERPENDICULAR TO SITE CONTOURS.
3. SPLASH BLOCKS SHALL BE CONCRETE, PLASTIC, OR SIMILAR MATERIAL. COMMERCIALLY AVAILABLE SPLASH BLOCKS GENERALLY MEET DESIGN CRITERIA.
4. ROCK PAD SHALL CONSIST OF 4" COBBLES PER WSDOT 9-03.11(2).

CITY OF PUYALLUP — PUBLIC WORKS AND DEVELOPMENT ENGINEERING

DOWNSPOUT SPLASHBLOCK

SCALE: NTS	DATE REVISED: 04/11/2023	CITY STANDARD
FILE NAME: Y:\Shared Drawings\City Standards\2019\02 - PART 2 - STANDARD DETAILS\CAD\2019\02.05.05		02.05.05



NOTES:
1. ROOF DRAIN SHALL PROVIDE POSITIVE FLOW FROM DOWNSPOUTS (DS) TO YARD DRAINS.
2. YARD DRAINS SHALL BE INSTALLED UPSTREAM OF EACH PERFORATED STUB-OUT IN ACCORDANCE WITH STD DETAIL 02.05.02.
3. TRENCH BOTTOM SHALL BE A MINIMUM OF 1' ABOVE SEASONAL HIGH GROUNDWATER OR IMPERMEABLE SOIL LAYER.
4. TRENCH SHALL BE DESIGNED IN ACCORDANCE WITH SECTION 210.6.
5. TRENCH SHOULD NOT BE INSTALLED UNDER IMPERVIOUS SURFACES.
6. NON-WOVEN GEOTEXTILE TO CONFORM TO WSDOT 9-33.2(1), TABLE 1 AND 2.

CITY OF PUYALLUP — PUBLIC WORKS AND DEVELOPMENT ENGINEERING

PERFORATED STUB-OUT CONNECTION

SCALE: NTS	DATE REVISED: 05/05/2021	CITY STANDARD
FILE NAME: Y:\Shared Drawings\City Standards\2019\02 - PART 2 - STANDARD DETAILS\CAD\2019\02.05.07		02.05.07

APPROVED

BY _____
CITY OF PUYALLUP
ENGINEERING SERVICES

DATE _____

NOTE: THIS APPROVAL IS VOID AFTER 1 YEAR FROM APPROVAL DATE.
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS. FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE ENGINEERING SERVICES MANAGER.

BEFORE YOU DIG CALL 1-800-424-5555
NOT LESS THAN 48 HOURS BEFORE BEGINNING EXCAVATION WHERE ANY UNDERGROUND UTILITIES MAY BE LOCATED.

CASCADE CHRISTIAN SCHOOL CAMPUS ELEMENTARY SCHOOL PORTABLES

NOTES & DETAILS

SITE ADDRESS:
811 21ST ST SE
PUYALLUP, WA 98372

SCOTT VADER — REGISTERED PROFESSIONAL ENGINEER — STATE OF WASHINGTON — 21818 — 5/16/25

VADER ENGINEERING
6817 27TH ST W, #65353
TACOMA, WA 98464
253.363.2065
rvader@vaderengineering.com

NO.	REVISION

PROJECT NO: 2409
SCALE: N/A
DESIGNED: RSV
DRAWN: BDS
SAVED: 10/5/2024
PLOT DATE: 10/5/2024

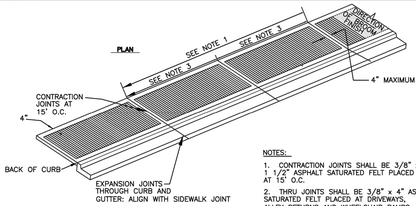
C8

SHEET 8 OF 10

CASCADE CHRISTIAN SCHOOL CAMPUS - ELEMENTARY SCHOOL PORTABLES

NOTES & DETAILS (2)

A PORTION OF THE S 1/2 OF SECTION 26 AND N 1/2 OF SECTION 35, TOWNSHIP 20 NORTH, RANGE 4 EAST, W.M.
PIERCE COUNTY, WASHINGTON (CITY OF PUYALLUP)



MINIMUM SIDEWALK WIDTHS

5'(RS ZONES) SINGLE FAMILY RESIDENTIAL AREAS (DETACHED DWELLINGS)
8'(RS ZONES) COMMERCIAL USES, WHEN REQUIRED BY DEVELOPMENT SERVICES MANAGER
8'(RM ZONES) MEDIUM AND HIGH DENSITY MULTI-FAMILY RESIDENTIAL AREAS
8'(ML ZONES) INDUSTRIAL AREAS
8'(CG, CBD ZONES) COMMERCIAL AREAS
8'(PF ZONES) PUBLIC FACILITIES AREAS
8'(F ZONES) FAIR AREAS
* MATCH GREATEST WIDTH FOR ANY ADJACENT ZONE

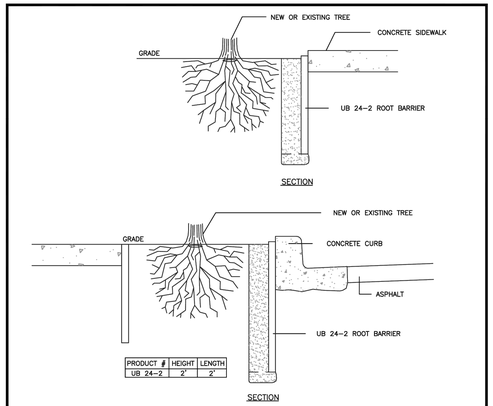
NOTES:

1. CONTRACTION JOINTS SHALL BE 3/8" x 1 1/2" ASPHALT SATURATED FELT PLACED AT 15' O.C.
2. THRU JOINTS SHALL BE 3/8" x 4" ASPHALT SATURATED FELT PLACED AT DRIVEWAYS, ALLEY RETURNS AND WHEELCHAIR RAMPS AND RADII.
3. V-GROOVEMARKS SHALL BE 1/8" DEEP AND 1/4" WIDE PLACED AT 5' O.C. FOR 5' SIDEWALKS AND 7.5' O.C. FOR 8' SIDEWALKS.
4. ALL JOINTS SHALL BE CLEAN AND EDGED TO A 1/4" RADIUS. JOINTS SHALL BE FLUSH WITH THE FINISHED SURFACE.
5. ALL UTILITY POLES AND STREET SIGN POSTS IN SIDEWALK AREA NOT REQUIRED TO BE RELOCATED SHALL HAVE A SQUARE SECTION OF CONCRETE SURROUNDED BY 3/8" EXPANSION JOINT MATERIAL AROUND THE POLE. THE JOINT SHALL BE NO CLOSER THAN 6" TO ANY SIDE OF THE POLE.
6. FORMS SHALL BE EITHER WOOD OR STEEL AND SHALL MEET ALL REQUIREMENTS OF THESE SPECIFICATIONS.
7. CONCRETE SHALL BE CLASS 3000 COMMERCIAL CONCRETE, 5.5 SACK MINIMUM, AASHTO GRADING 467 COARSE AGGREGATE, NO FLY ASH.
8. SIDEWALK MINIMUM UNOBSTRUCTED CLEAR WIDTH SHALL BE 4', EXCLUSIVE OF THE WIDTH OF THE CURB.
9. GRATINGS, ACCESS COVERS, JUNCTION BOXES, CABLE VAULTS, PULL BOXES AND OTHER APPURTENANCES WITHIN THE SIDEWALK (RIGHT-OF-WAY) MUST HAVE SLIP RESISTANT SURFACE AND MATCH THE GRADE OF THE SIDEWALK.
10. CURB RAMPS SHALL BE CONSTRUCTED AT INTERSECTIONS USING A DESIGN PREPARED BY A LICENSED PROFESSIONAL ENGINEER. WHEN A RAMP DESIGN FAILS TO MEET ALL APPLICABLE DESIGN STANDARDS, THE ENGINEER SHALL DOCUMENT WHY THE PROPOSED RAMP ACHIEVES DESIGN STANDARDS TO THE MAXIMUM EXTENT FEASIBLE.

CITY OF PUYALLUP	SIDEWALK WITHOUT PLANTING STRIP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS	CITY STANDARD 01.02.01

DRAWN BY	CHECKED BY	APPROVED BY	REVISED BY	SCALE
RSV	LINDA LIAN	COLLEEN HARRIS	LINDA LIAN	1:8
DATE APPROVED: 07/01/2009	DATE REVISED: 10/21/11			

FILE NAME: F:\DWG\COMMON\STDS\CITY\2009\01_STR\01-02\01-02.01



PRODUCT #	HEIGHT	LENGTH
UB 24-2	2'	2'

SECTION

NOTES:

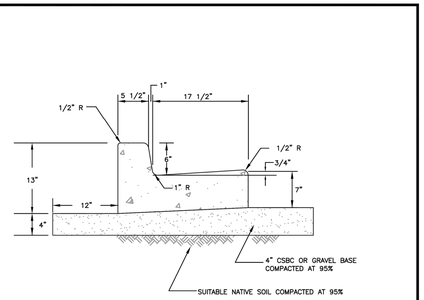
1. ROOT BARRIERS SHALL BE REQUIRED IN ALL STREET TREE PLANTING INSTALLATIONS WHETHER NEW OR EXISTING, WHEN STREET TREES ARE INSTALLED IN RIGHT-OF-WAY OR IN A PLANTING EASEMENT*.
2. ROOT BARRIERS USED SHALL BE DeepRoot ROOT BARRIERS OR EQUIVALENT.
3. UB - 24 SHALL BE USED
4. ROOT BARRIERS SHALL BE INSTALLED IF REQUIRED BY THE CITY.
5. INSTALLATION OF ROOT BARRIERS TO BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
6. THE PANEL SHALL BE INSTALLED SO THE VERTICAL RIBS FACE THE ROOTS OF THE TREE. A MINIMUM OF FOUR (4) PANELS SHALL BE INSTALLED ON EACH SIDE OF ROOT BALL FOR 8' OF PROTECTION.
7. FOR PRODUCT INFORMATION VISIT:
   http://www.deeproot.com/template.php?sec=products&nav=treeRoot&content=rb_app&sub=2&lsel=1

*"PLANTING EASEMENT" SHALL MEAN THAT PORTION OF LAND MADE AVAILABLE AS A PUBLIC EASEMENT FOR THE PURPOSE OF PLANTING AND MAINTAINING CITY STREET TREES. ALL STREET TREES PLANTED WITHIN A PLANTING EASEMENT SHALL BE PLANTED WITHIN THREE FEET OF RIGHT-OF-WAY.

CITY OF PUYALLUP	ROOT BARRIER DETAIL
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS	CITY STANDARD 01.02.03

DRAWN BY	CHECKED BY	APPROVED BY	REVISED BY	SCALE
RSV	CHRIS HEALE	COLLEEN HARRIS	LINDA LIAN	1:1
DATE APPROVED: 07/01/2009	DATE REVISED: 08/01/2015			

FILE NAME: F:\DWG\COMMON\STDS\CITY\2009\01_STR\01-02\01-02.03



NOTES:

1. CONTRACTION JOINTS SHALL BE 3/8" x 2 1/4" ASPHALT SATURATED FELT PLACED IN ALL EXPOSED SURFACES OF CURB AND GUTTER AND SPACED AT 15' MAX. 10' MIN. O.C.
2. THRU JOINTS SHALL BE 3/8" ASPHALT SATURATED FELT PLACED AT POINTS OF TANGENCY ON CURVES, AT CATCH BASINS, AND AT EDGES OF ALLEY AND DRIVEWAYS. THE MAXIMUM DISTANCE BETWEEN THRU JOINTS SHALL BE 100'.
3. CONCRETE SHALL BE CLASS 3000 COMMERCIAL CONCRETE, 5.5 SACK MINIMUM, AASHTO GRADING 467 COARSE AGGREGATE, NO FLY ASH.
4. FORMS SHALL BE STEEL UNLESS PRIOR APPROVAL IS GIVEN BY THE CITY ENGINEER. FORMS SHALL BE SET TRUE TO LINE AND GRADE AND SECURELY STAKED PRIOR TO CONCRETE PLACEMENT. FULL DEPTH DIVISION PLATES ARE ONLY TO BE USED WHERE THRU JOINTS ARE TO BE PLACED.
5. THE 1" RADIUS ON THE UPPER FACE OF THE CURB MAY BE FORMED BY AN EDGER TOOL OR BUILT INTO THE FACE FORM. THE 1" RADIUS AT THE BOTTOM FACE OF THE CURB SHALL BE FORMED BY THE FACE FORM.

CITY OF PUYALLUP	CURB AND GUTTER
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS	CITY STANDARD 01.02.09

DRAWN BY	CHECKED BY	APPROVED BY	REVISED BY	SCALE
RSV	LINDA LIAN	COLLEEN HARRIS	Linda Lian	1:1
DATE APPROVED: 07/01/2009	DATE REVISED: 04/23/13			

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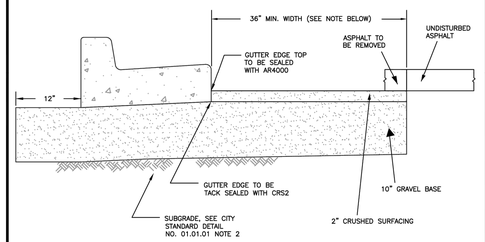
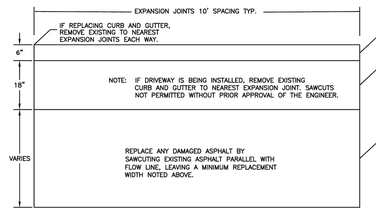


NOTE: THE 36" MINIMUM PAVEMENT PATCH SHALL BE INCREASED IN WIDTH IF THE RESULTING MEET LINE WOULD LIE WITHIN A LANE WHEEL PATH.

SCALE: 1:1



PLAN VIEW

SCALE: 1:2

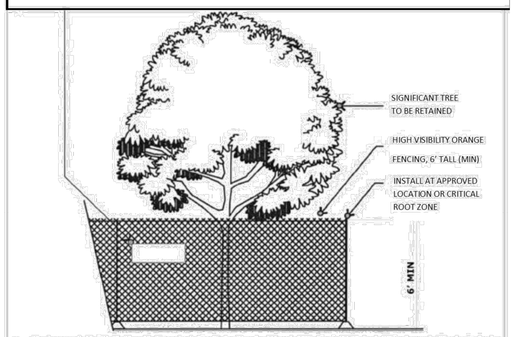
CITY OF PUYALLUP	CURB CUT
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS	CITY STANDARD 01.02.10

DRAWN BY	CHECKED BY	APPROVED BY	REVISED BY	SCALE
RSV	LINDA LIAN	COLLEEN HARRIS	XXXX	NARES
DATE APPROVED: 07/01/2009	DATE REVISED: XX/XX/XX			

FILE NAME: F:\DWG\COMMON\STDS\CITY\2009\01_STR\01-02\01-02.10

TREE PROTECTION ZONE (TPZ)

NO ENTRY. NO GRADE CHANGES, STORAGE/STOCKPILING OF MATERIALS OR EQUIPMENT, PLACEMENT OF FILL OR TOP SOIL, TRENCHING OR VEHICULAR/FOOT TRAFFIC PERMITTED WITHIN THE TPZ. THIS TREE BARRIER SHALL NOT BE REMOVED WITHOUT AUTHORIZATION FROM PUYALLUP PLANNING DEPARMENT. - SUBJECT TO FINES AND ENFORCEMENT ACTION BY THE CITY – TO REPORT VIOLATIONS OR FOR MORE INFORMATION—CALL (253) 864.4165



- MINIMUM SIX (6) FOOT HIGH TEMPORARY HIGH VISIBILITY ORANGE CONSTRUCTION FENCING SHALL BE PLACED AT THE CRITICAL ROOT ZONE OR DESIGNATED LIMIT OF DISTURBANCE ON APPROVED FINAL LANDSCAPE PLAN SET. FENCING SHALL BE INSTALLED USING POSTS DRIVEN INTO GROUND—PIER BLOCKS SHALL NOT BE USED. AVOID POSTS DRIVEN INTO ROOTS LARGER THAN 1" DIAMETER. FENCING SHALL BE INSTALLED PRIOR TO WORK COMMENCING ON SITE AND REMAIN IN PLACE THROUGHOUT ALL PHASES OF CONSTRUCTION.--CALL THE CITY'S PLANNING DIVISION WITH REQUESTS TO MODIFY THE LOCATION OF THE TREE PROTECTION FENCING—(253) 864-4165.
- TREATMENT OF ROOTS EXPOSED DURING CONSTRUCTION: FOR ROOTS OVER ONE (1) INCH DIAMETER DAMAGED DURING CONSTRUCTION, MAKE A CLEAN STRAIGHT CUT TO REMOVE DAMAGED PORTION OF ROOT. ALL EXPOSED ROOTS SHALL BE TEMPORARILY COVERED WITH DAMP BURLAP TO PREVENT DRYING AND COVERED WITH SOIL AS SOON AS POSSIBLE. OTHER PRE-TREATMENT MEASURES MAY BE REQUIRED TO PROTECT ROOT SYSTEM—SEE APPROVED TREE PROTECTION OR FINAL LANDSCAPE PLAN FOR FURTHER DETAILS.
- NO STOCKPILING OF MATERIALS, VEHICULAR TRAFFIC/PLACEMENT OF TOP SOIL OR FILL MATERIAL, STORAGE OF EQUIPMENT OR MACHINERY SHALL BE ALLOWED WITHIN THE LIMITS OF THE ESTABLISHED FENCING. FENCING SHALL NOT BE MOVED OR REMOVED UNLESS APPROVED BY THE CITY PLANNING DIVISION. WORK WITHIN PROTECTION FENCE SHALL BE DONE MANUALLY UNDER THE SUPERVISION OF THE ON-SITE ARBORIST WITH PRIOR WRITTEN APPROVAL BY THE CITY PLANNING DIVISION.
- THE ABOVE REFERENCED TPZ SIGNS SHALL BE PLACED EVERY 15 FEET ALONG THE FENCING AND SHALL REMAIN IN PLACE THROUGHOUT ALL PHASES OF CONSTRUCTION

TREE PROTECTION FENCING DETAIL
(for public and private trees)

APPROVED

BY _____
CITY OF PUYALLUP
ENGINEERING SERVICES

DATE _____

NOTE: THIS APPROVAL IS VOID AFTER 1 YEAR FROM APPROVAL DATE.
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS. FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE ENGINEERING SERVICES MANAGER.

BEFORE YOU DIG CALL
1-800-424-5555
NOT LESS THAN 48 HOURS BEFORE BEGINNING EXCAVATION WHERE ANY UNDERGROUND UTILITIES MAY BE LOCATED.

CASCADE CHRISTIAN SCHOOL CAMPUS ELEMENTARY SCHOOL PORTABLES

NOTES & DETAILS (2)

SITE ADDRESS:
811 21ST ST SE
PUYALLUP, WA 98372

VADER ENGINEERING
6817 27TH ST W, #65353
TACOMA, WA 98464
253.363.2065
rvader@vaderengineering.com

NO.	REVISION

PROJECT NO: 2409
SCALE: N/A
DESIGNED: RSV
DRAWN: BDS
SAVED: 10/5/2024
PLOT DATE: 10/5/2024

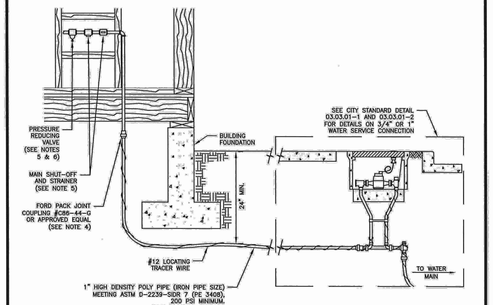
C9

SHEET 9 OF 10

CASCADE CHRISTIAN SCHOOL CAMPUS - ELEMENTARY SCHOOL PORTABLES

NOTES & DETAILS (3)

A PORTION OF THE S 1/2 OF SECTION 26 AND N 1/2 OF SECTION 35, TOWNSHIP 20 NORTH, RANGE 4 EAST, W.M.
PIERCE COUNTY, WASHINGTON (CITY OF PUYALLUP)



NOTES

1. SERVICE LINE MAY BE 200 PSI POLY PIPE IN UNCONTAMINATED SOILS. IN SOILS THAT MAY CONTAIN HYDROCARBONS USE 1" "K" COPPER PIPE.
2. PIPE TO BE BEDDED WITH MATERIAL FREE OF ROCKS.
3. POLY PIPE SHOULD BE PLACED IN THE TRENCH IN A SNAKELIKE FASHION (NOT STRAIGHT WITHOUT SLACK). THIS WILL ACCOMMODATE GROUND MOVEMENT AND KEEP PRESSURE OFF THE FITTINGS.
4. PLASTIC WATER SERVICE PIPING MAY TERMINATE WITHIN A BUILDING, PROVIDED THE CONNECTION TO THE POTABLE WATER DISTRIBUTION SYSTEM SHALL BE ACCESSIBLE. SEE THE CURRENT UNIFORM PLUMBING CODE FOR MORE INFORMATION.
5. THE MAIN SHUT-OFF VALVE, PRESSURE REDUCING VALVE, AND STRAINER SHALL BE LOCATED INSIDE THE BUILDING IN AN ACCESSIBLE LOCATION. THEY SHOULD BE LOCATED BEFORE ANY BRANCH CONNECTIONS, AND PROTECTED FROM FREEZING. THE MAIN SHUT-OFF VALVE SHALL BE BRASS.
6. ALL PROPERTIES WITH WATER SERVICE CONNECTIONS LOCATED SOUTH OF 15TH AVE SE AND SOUTH OF 15TH AVE SW SHALL HAVE AN APPROVED PRIVATELY OWNED AND PRIVATELY MAINTAINED PRESSURE REDUCING VALVE (PRV) LOCATED ON THEIR WATER SERVICE LINE.
7. ALL PROPERTIES WITH IRRIGATION BRANCH CONNECTIONS LOCATED SOUTH OF 15TH AVE SE AND SOUTH OF 15TH AVE SW SHOULD HAVE AN APPROVED PRIVATELY OWNED AND PRIVATELY MAINTAINED PRESSURE REDUCING VALVE (PRV) LOCATED ON THEIR IRRIGATION BRANCH LINE.
8. ALL INSTALLATIONS WITHIN TWO (2) FEET OF THE BUILDING SHALL COMPLY WITH THE CURRENT UNIFORM PLUMBING CODE.

CITY OF PUYALLUP
PUBLIC WORKS AND DEVELOPMENT ENGINEERING

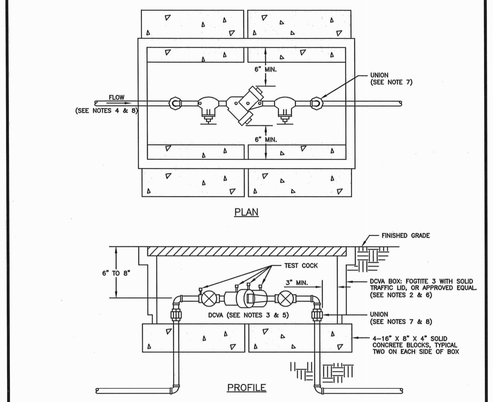
APPROVED FOR PUBLICATION

PRIVATE WATER SERVICE LINES

(NOT TO SCALE)

CITY STANDARD 03.03.04

FILE NAME: F:\DWG\COMMON\STD\CITY\2009\01_STD\01.03\01.03.04.DWG



NOTES:

1. BACKFLOW ASSEMBLY MUST BE SELECTED FROM WASHINGTON STATE DEPARTMENT OF HEALTH'S LIST OF BACKFLOW PREVENTION ASSEMBLIES APPROVED FOR INSTALLATION IN WASHINGTON STATE, LATEST EDITION.
2. THE DCVA SHALL BE INSTALLED WITH ADEQUATE SPACE TO FACILITATE MAINTENANCE AND TESTING. IT SHALL BE TESTED AFTER INSTALLATION, BY A WASHINGTON STATE CERTIFIED BACK-FLOW ASSEMBLY TESTER, TO INSURE ITS SATISFACTORY OPERATION BEFORE OCCUPANCY, AND ANNUALLY THEREAFTER. SEND TEST RESULTS TO: CITY OF PUYALLUP, WATER QUALITY OPERATIONS, 1100 39TH AVE SE, PUYALLUP, WA 98374.
3. DCVA MUST BE PURCHASED AS A UNIT. NO MODIFICATIONS TO THE ASSEMBLY ARE ALLOWED.
4. DCVA SHALL BE PLACED IMMEDIATELY DOWNSTREAM OF WATER METER. WHEN IRRIGATION OR A NON FLOW-THROUGH FIRE SPRINKLER SYSTEM IS CONNECTED OFF THE DOMESTIC WATER LINE, DCVA SHALL BE PLACED IMMEDIATELY DOWNSTREAM OF THE BRANCH CONNECTION.
5. DCVA SHALL BE SIZED EQUAL OR COMPARABLE TO METER SIZE.
6. METER BOX SHALL BE LARGE ENOUGH TO ALLOW THE MINIMUM SETBACKS ILLUSTRATED ABOVE. METER BOX LID SHALL BE A TRAFFIC LID WITH A H-20 LOADING.
7. DIELECTRIC UNIONS MUST BE USED TO SEPARATE DISSIMILAR MATERIALS.
8. USE ONLY BRASS OR COPPER BETWEEN THE METER AND THE UNION ON THE CUSTOMER'S SIDE OF THE DCVA.

CITY OF PUYALLUP
OFFICE of THE CITY ENGINEER

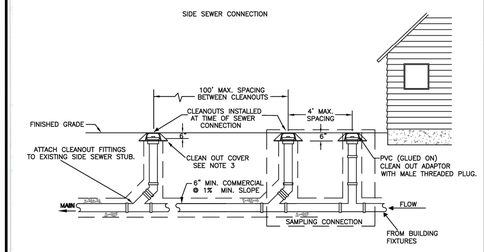
APPROVED FOR PUBLICATION

2" AND SMALLER DOUBLE CHECK VALVE ASSEMBLY INSTALLATION

(NOT TO SCALE)

CITY STANDARD 03.04.01

FILE NAME: F:\DWG\COMMON\STD\CITY\2009\01_STD\01.03\01.03.01-2.DWG



NOTES:

1. SAMPLING CONNECTION SHALL BE INSTALLED OUT SIDE WITH UNOBSTRUCTED ACCESS AT ALL TIMES.
2. A SAMPLING CONNECTION SHALL BE INSTALLED FOR EACH COMMERCIAL / RETAIL UNIT OR SPACE.
3. CLEAN OUT AND SAMPLING CONNECTION COVERS:
   A) FOR NON-VEHICULAR TRAFFIC INSTALLATIONS USE "CARSON" MODEL 910 GREEN YARD BOX WITH BOLT DOWN LID MARKED SEWER OR APPROVED EQUAL.
   B) FOR ASPHALT, GRAVEL, OR TRAFFIC INSTALLATIONS SEE CITY STANDARD DETAIL NO. 04.03.05 FRAME AND COVER SECTION.
4. EACH CLEANOUT ASSEMBLY SHALL CONSIST OF: ONE CLEANOUT ADAPTER, HUB x FEMALE, FIPT, PVC SI AND ONE CLEANOUT PLUG, MOPT WITH RAISED NUT, PVC SDR35.

CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

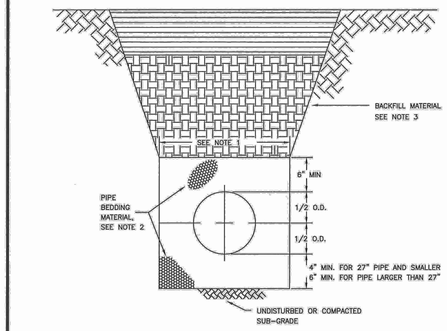
COMMERCIAL SIDE SEWER CONNECTION WITH SAMPLING CONNECTION

CITY STANDARD 04.03.04

DRAWN BY	CHECKED BY	APPROVED BY	REVISED BY
DM ERWIN-SVOBODA	LINDA LIAN	COLLEEN HARRIS	LINDA LIAN

FILE NAME: F:\DWG\COMMON\STD\CITY\2009\04_SEW\04.03.04

DATE APPROVED	DATE REVISED	SCALE
07/01/2009	10/23/13	NA



1. TRENCHING SHALL MEET THE REQUIREMENTS OF SECTION 7-08.3(1)A AND 2-06.3(1) OF THE WSDOT SPECIFICATIONS.
2. BEDDING MATERIAL SHALL CONFORM TO 9-03.12(3) GRAVEL BACKFILL FOR PIPE ZONE BEDDING.
3. GRAVEL BACKFILL SHALL CONFORM TO 9-03.12(1)A GRAVEL BACKFILL FOR FOUNDATIONS, CLASS A.

CITY OF PUYALLUP
OFFICE of THE CITY ENGINEER

PIPE TRENCHING BEDDING AND BACKFILL

CITY STANDARD 06.01.01

DRAWN BY	CHECKED BY	APPROVED BY	REVISED BY	DATE REVISED
DM ERWIN-SVOBODA	TED HILL	MARK PALMER	S. STOCKMAN	10/23/13

FILE NAME: F:\DWG\COMMON\STD\CITY\STD\DWG XMSC\06.01\06.01.01

DATE APPROVED	SCALE	NO.
07/01/2009	NA	XXXXXXX XXXXXXX

APPROVED

BY _____
CITY OF PUYALLUP
ENGINEERING SERVICES

DATE _____

NOTE: THIS APPROVAL IS VOID AFTER 1 YEAR FROM APPROVAL DATE.
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS. FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE ENGINEERING SERVICES MANAGER.

NOTES:

1. CENTERLINE STRIPE FOR CHANNELIZATION SHALL BE DETAIL B OR DETAIL C AS DIRECTED BY CITY. CENTERLINE STRIPE FOR ALL COLLECTORS SHALL BE DETAIL D WITH TYPE 2YY RPM SPACED AT 80' INTERVALS ON TANGENTS AND HORZ. CURVES WITH A RADIUS OF 5000' OR MORE AND 40' INTERVALS ON HORZ. CURVES LESS THAN 5000'. CENTERLINE STRIPE FOR ARTERIALS SHALL BE DETAIL E WITH RPM SPACING AS PREVIOUSLY DEFINED.
2. ROADS, UNLESS OTHERWISE DETERMINED BY THE CITY, (ARTERIALS & COLLECTORS) LONGITUDINAL LINES SHALL BE PAINTED. APPLIED 14 MILS WHEN WET.
3. NO PASSING ZONES IN ONE DIRECTION OR BOTH SHALL BE CLEARLY MARKED WITH CENTERLINE STRIPE, DETAIL B OR DETAIL C OR COMBINATION OF DETAIL D AND DETAIL E.
4. ON WIDE INTERSECTIONS SPACE TYPE 1 OR 2 RPM 4 FEET ON CENTER.

RAISED PAVEMENT MARKERS

TYPE 2 RPM (REFLECTIVE)
RAISED FACE COLORS

TYPE 2WR	WHITE AND RED
TYPE 2YR	YELLOW AND RED
TYPE 2YY	YELLOW AND YELLOW
TYPE 2W	WHITE — ONE SIDE ONLY
TYPE 2Y	YELLOW — ONE SIDE ONLY

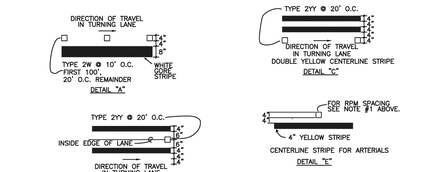
TYPE 1 RPM COLORS

TYPE 1W	WHITE
TYPE 1Y	YELLOW

*TYPE 3 RPM COLORS

TYPE 3W	8" RUMBLE BAR — WHITE
TYPE 3Y	8" RUMBLE BAR — YELLOW

* CITY MAY REQUIRE REFLECTIVE.



SCALE: 1:4

SKIP STRIPE PATTERN FOR CENTERLINES AND LANE LINES.
DETAIL "D"

SCALE: 1:20

CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

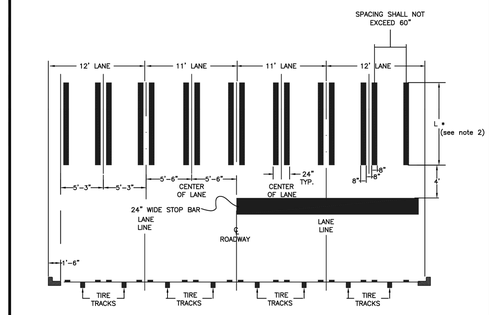
PAVEMENT MARKING DETAILS

CITY STANDARD 01.03.10

DRAWN BY	CHECKED BY	APPROVED BY	REVISED BY	CITY STANDARD
DM ERWIN-SVOBODA	LINDA LIAN	COLLEEN HARRIS	XXXX	01.03.10

FILE NAME: F:\DWG\COMMON\STD\CITY\2009\01_STD\01.03\01.03.10

DATE APPROVED	DATE REVISED	SCALE
07/01/2009	XX/XX/XX	VARIES



NOTES:

1) FOR ALL ROADWAYS, THE LONGITUDINAL LINES SHALL BE CENTERED ON THE LANE LINES AND IN THE CENTER OF THE TRAVELED PORTION OF THE LANE TO MINIMIZE TIRE WEAR. THE SPACING BETWEEN THE LONGITUDINAL LINES SHALL NOT EXCEED 60".

* 2) THE LENGTH OF A CROSSWALK SHALL BE 8' ACROSS RESIDENTIAL STREETS, 10' ACROSS COLLECTORS AND MINOR ARTERIALS AND 12' ACROSS PRINCIPAL ARTERIALS. HOWEVER, THE LENGTH OF A CROSSWALK SHALL BE 8' ACROSS SIDE STREETS ALONG COLLECTORS AND MINOR ARTERIALS AND 12' ACROSS SIDE STREETS ALONG PRINCIPAL ARTERIALS.

3) STOP BAR WHEN USED WITH A CROSSWALK SHALL BE PLACED FOUR FEET IN ADVANCE OF AND PARALLEL TO THE CROSSWALK ALL STOP BARS SHALL BE 24" WIDE.

4) PAVEMENT MARKINGS, INCLUDING CROSSWALKS, SHALL BE TYPE A LIQUID HOT APPLIED THERMOPLASTIC. PER STANDARD SPECIFICATIONS, SECTION 9-34 PAVEMENT MARKING MATERIAL, 9-34.1 GENERAL.

CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

CROSSWALK DETAIL

CITY STANDARD 01.03.11

DRAWN BY	CHECKED BY	APPROVED BY	REVISED BY	CITY STANDARD
DM ERWIN-SVOBODA	LINDA LIAN	COLLEEN HARRIS	LINDA LIAN	01.03.11

FILE NAME: F:\DWG\COMMON\STD\CITY\2009\01_STD\01.03\01.03.11

DATE APPROVED	DATE REVISED	SCALE
07/01/2009	09/12/2013	NA

BEFORE YOU DIG CALL
1-800-424-5555
NOT LESS THAN 48 HOURS BEFORE BEGINNING EXCAVATION WHERE ANY UNDERGROUND UTILITIES MAY BE LOCATED.

CASCADE CHRISTIAN SCHOOL CAMPUS ELEMENTARY SCHOOL PORTABLES

NOTES & DETAILS (3)

SITE ADDRESS:
811 21ST ST SE
PUYALLUP, WA 98372

SCOTT VADER — 21818 — REGISTERED PROFESSIONAL ENGINEER — STATE OF WASHINGTON

VADER ENGINEERING
6817 27TH ST W, #65353
TACOMA, WA 98464
253.363.2065
rvader@vaderengineering.com

NO.	REVISION

PROJECT NO: 2409
SCALE: N/A
DESIGNED: RSV
DRAWN: BDS
SAVED: 10/5/2024
PLOT DATE: 10/5/2024

C10
SHEET 10 OF 10

FIGURE 4
STORM CALCULATIONS

Ambrosia Builders
Building for a Lifetime.

Job # 03-143
Date 3-21-16
Subject Pond Volume

Existing Pond Volume Calculation

design overflow elevation = 61'
design pond bottom = 57'
overflow design 100-yr WSE = 59.46' Vol = 55,461cf
* bioswale = 200' length (design)
8' width (design)
0.5% slope (design)

actual width of swale: varies 2'-8'
actual length of swale: 180'
actual slope of swale: $\frac{58.9-58}{180}$ = 0.5%

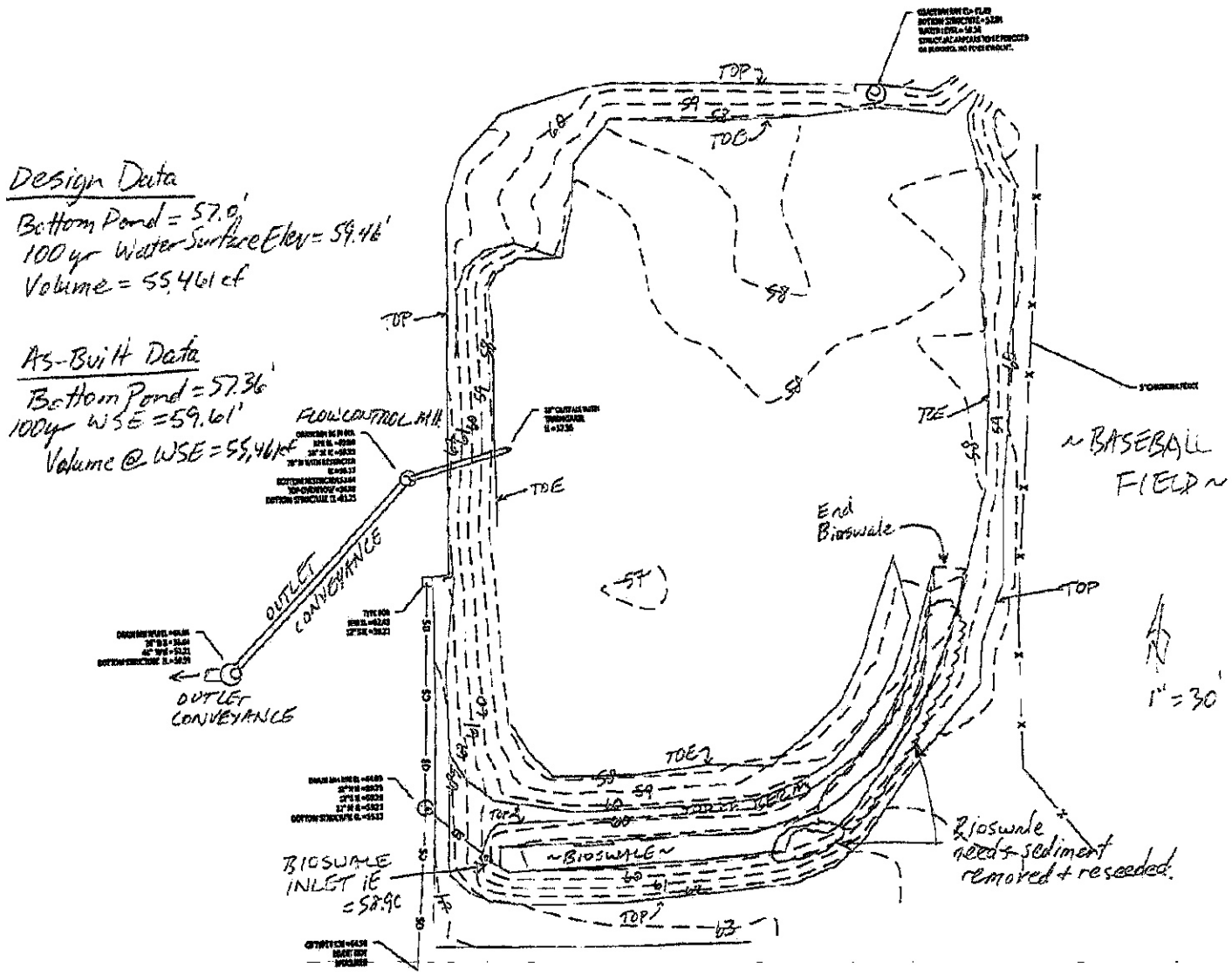
Bioswale needs to be maintained (remove sediment)

Pond Asbuilt Volume

	El (ft)	Area (sf)	Volume (cf)	Σ Vol (cf)
EL PIPED OUTLET	57.36	0	0	0
	57.50	22,017	3082	3,082
AREAS INCLUDE BIOSWALE	58.00	23,143	11,290	14,372
	58.50	24,698	11,960	26,332
	59.00	27,859	13,139	39,471
	59.50	29,518	14,344	53,815
	60.00	31,697	15,304	69,119

Design Vol. Achieved @ El 55,461cf = 59.61'

Ambrosia Builders
P.O. Box 581 • 923 Shaw Rd E, Suite B • Puyallup, WA 98371
Office: 253.435.3684 • Fax: 253.841.1753


Design Data
Bottom Pond = 57.0'
100 yr Water Surface Elev = 59.46'
Volume = 55,461 cf
As-Built Data
Bottom Pond = 57.36'
100y WSE = 59.61'
Volume @ WSE = 55,461 cf
FLOW CONTROL MH
OUTLET CONVEYANCE
OUTLET CONVEYANCE
TOP
TOE
End Bioswale
~BASEBALL FIELD~
~BIOSWALE~
BIOSWALE INLET IE = 58.90
Bioswale needs sediment removed + reseeded.
1" = 30'

STAGE STORAGE TABLE

CUSTOM STORAGE ID No. S
Description:

STAGE (ft)	STORAGE ---cf---	STORAGE --Ac-Ft-
57.00	0.0000	0.0000
57.10	1236	0.0284
57.20	2471	0.0567
57.30	3707	0.0851
57.40	4943	0.1135
57.50	6178	0.1418
57.60	7414	0.1702
57.70	8650	0.1986

STAGE (ft)	STORAGE ---cf---	STORAGE --Ac-Ft-
57.80	9886	0.2269
57.90	11121	0.2553
58.00	12357	0.2837
58.10	15126	0.3473
58.20	17895	0.4108
58.30	20665	0.4744
58.40	23434	0.5380
58.50	26203	0.6015

STAGE (ft)	STORAGE ---cf---	STORAGE --Ac-Ft-
58.60	28972	0.6651
58.70	31742	0.7287
58.80	34511	0.7923
58.90	37280	0.8558
59.00	40049	0.9194
59.10	43401	0.9963
59.20	46752	1.0733
59.30	50103	1.1502

STAGE (ft)	STORAGE ---cf---	STORAGE --Ac-Ft-
59.40	53454	1.2271
59.50	56805	1.3041
59.60	60156	1.3810
59.70	63507	1.4579
59.80	66858	1.5349
59.90	70210	1.6118
60.00	73561	1.6887
60.00	73561	1.6887

Design Stage Storage of Pond

End of document.

Page inserted for duplex print spacing.

Appendix D Soils Information

Please see the Geotechnical Engineering Study
By Earth Consultants NW, LLC
July 31, 2024

And

NRCS Soil Survey Report

Note: Site-specific soils information is useful for determining infiltration rates, foundation designs, and other vulnerabilities on sites, such as potential for slope failure (landslides). These investigations supplement published general information, such soil maps, topography when the site is near a steep slope, or when there are mapped wetlands and areas high groundwater or restrictive layers that do not offer much potential for infiltration.

July 31, 2024
ES-4556.02

Earth Solutions NW LLC
Geotechnical Engineering, Construction
Observation/Testing and Environmental Services

Cascade Christian Schools
815 – 21st Street Southeast
Puyallup, Washington 98372

Attention: Ray Ossman

Subject: Infiltration Evaluation
Cascade Christian School
819 – 21st Street Southeast
Puyallup, Washington

Greetings:

As requested, Earth Solutions NW, LLC (ESNW) has prepared this infiltration evaluation for the proposed project. A summary of our fieldwork, laboratory analyses, and relevant geotechnical recommendations are provided in this letter report.

Project & Site Description

The subject site is located directly east of the intersection between 21st Street Southeast and 9th Avenue Southeast in Puyallup, Washington. The approximate site location is illustrated on the attached Vicinity Map (Plate 1). The site consists of a single tax parcel (Pierce County Parcel Number 042026-3083) and totals about 0.37 acres. The site is currently developed with a single-family residence, detached garage, and associated residential improvements. Topography on the subject site is relatively level, and in general, is approximately two to four feet lower than the surrounding parcels. Vegetation across the subject site consists of moderately sized trees and landscaping areas.

We understand the proposed project includes the demolition and removal of the existing single-family residence and site features. Subsequently, the site will be redeveloped with six portable classrooms and associated infrastructure improvements. A rain garden facility located along the western property frontage is currently proposed for post-construction stormwater management. Permeable surfaces may also be used within the plaza area on site. Based on review of the referenced site plan, we understand that the site will be raised about two feet.

Subsurface Conditions

An ESNW representative observed, logged, and sampled two test pits on June 17, 2024. The test pits were excavated at accessible areas of the site using a mini-trackhoe and operator retained by the client. The approximate locations of the test pits are depicted on Plate 2 (Test Pit Location Plan). Please refer to the attached soil logs for a more detailed description of the subsurface conditions. Representative soil samples collected during the test pit exploration were evaluated in general accordance with Unified Soil Classification System (USCS) and United States Department of Agriculture (USDA) methods and procedures. Additionally, two samples were submitted for organic content (OC) and cation exchange capacity (CEC).

Topsoil

Topsoil was observed extending to a depth of approximately 12 inches below the existing ground surface (bgs) at the test pit locations. The topsoil was characterized by dark brown color, minor root intrusions, and the presence of fine organic material.

Fill

Fill was not encountered at the test pit locations during the June 2024 subsurface exploration. Based on the topographic differences between the subject site and the surrounding area, we do not anticipate significant amounts of fill to be present on the subject site.

Native Soil

Underlying topsoil, native soil encountered at the test pit locations consisted primarily of silty sand (USCS: SM). An area of sandy silty (USCS: ML) was also encountered at test location TP-1 beginning at a depth of approximately seven and one-half feet bgs. In-situ soil density was generally characterized as loose to medium dense and in-situ soil moisture contents were characterized as moist to wet at the time of exploration. The maximum exploration depth was approximately nine and one-half feet bgs.

Geologic Setting

Geologic mapping identifies alluvium (Qa) across the site. Alluvium deposits consist primarily of loose, stratified fluvial silts, sands, and gravels deposited through fluvial events. The Web Soil Survey (WSS) indicates Briscot loam and Puyallup fine sandy loam as the primary soil units underlying the site. Both the Briscot and Puyallup series soils formed in alluvium settings. Based on our field observations, on-site native soils are representative of alluvium deposits.

Groundwater

The local groundwater table was observed at test location TP-2 at a depth of approximately nine and one-half feet bgs during the June 2024 fieldwork. The presence of groundwater (seepage and/or the local table), flow rates, and elevations fluctuate depending on many factors, including precipitation duration and intensity, the time of year, and soil conditions. In general, the groundwater table is higher during the winter, spring, and early summer months. Based on our experience within the Puyallup River Valley, seasonal fluctuations and relatively shallow exposures of the groundwater table can be anticipated in the area.

Infiltration Evaluation

ESNW completed a small-scale Pilot Infiltration Test (PIT) to evaluate the feasibility of pursuing on-site infiltration, from a geotechnical standpoint. In our opinion, based on the results of in-situ infiltration testing, field observations, and laboratory analyses, the proposed rain garden infiltration system is feasible from a geotechnical standpoint.

The infiltration test was completed at TP-1 in general accordance with the Department of Ecology Stormwater Management Manual for Western Washington, as adopted by the City of Puyallup. The PIT was completed at a depth of roughly three feet bgs and within a representative section of native silty sand. For infiltration facilities interfacing with the silty sand, the following design values (as based on the result of the PIT) may be used:

Location	Test Depth	K_{sat} initial	CF_V	CF_T	CF_M	K_{sat} design
TP-1	3.0 ft	1.5 in/hr.	0.55	0.5	0.9	0.35 in/hr.

Care should be taken while working in the proposed rain garden so as to not inadvertently compact or alter the infiltration characteristics of the native soil to be exposed at the facility subgrade. Furthermore, the rain garden should not be used for temporary erosion control or as a sediment pond unless the area is left high or other means of subgrade protection is incorporated into the sediment pond design. Given the relatively low design infiltration rate, it is our opinion that an overflow be incorporated into the facility design. ESNW should review final drainage plans as well as observe the infiltration facility excavation to confirm anticipated soil types are exposed at the facility subgrade.

As noted in the *Groundwater* section of this letter, the local groundwater table was observed at a depth of approximately nine and one-half feet bgs during the time of testing. A minimum vertical separation (dependent on the stormwater mitigation system to be implemented) should be maintained from the seasonal high groundwater elevation. As such, completion of a groundwater monitoring program may be prudent as part of the facility design. ESNW would be pleased to provide groundwater monitoring services, when requested.

Soil Treatment Capacity

Two representative soil samples were collected and submitted for OC and CEC testing to determine if the native soil can effectively serve as a treatment layer for the rain garden facility. The results of the soil quality testing are provided in the following table.

Sample Location and Depth	Depth (Ft.)	OC Results (Percent)	CEC Results (meq/100g)
TP-1	3.0	1.4	5.0
TP-2	2.5	1.0	3.8

In general, an OC percentage of at least 1.0 and a CEC result of at least 5.0 meq/100g are considered the minimum target standards for soils to be considered acceptable for stormwater treatment. Based on the results of the laboratory testing, it appears that the native soils have the potential to provide adequate treatment of stormwater runoff. ESNW should be contacted to further evaluate soils intended for use as stormwater treatment during construction.

Limitations

This report has been prepared for the exclusive use of Cascade Christian Schools and its representatives. The recommendations and conclusions provided in this letter are professional opinions consistent with the level of care and skill that is typical of other members in the profession currently practicing under similar conditions in this area. A warranty is not expressed or implied. Variations in the soil and groundwater conditions observed at the test pit locations may exist and may not become evident until construction. ESNW should reevaluate the conclusions in this report if variations are encountered.

Additional Services

ESNW should be retained to provide additional geotechnical services in. sociation with this project, including testing and consulting services during construction. ESNW should have an opportunity to review final project plans with respect to the geotechnical recommendations provided in this letter.

We appreciate the opportunity to be of service to you and trust this letter meets your current needs. Should you have any questions, or require additional information, please call.

Sincerely,

EARTH SOLUTIONS NW, LLC

Samuel E. Suruda, L.G.
Senior Staff Geologist

State of Washington
Engineering Geologist
19110613
Licensed Geologist
07/31/2024
Chase G. Halsen

Chase G. Halsen, L.G., L.E.G.
Project Manager

HENRY T. WRIGHT
STATE OF WASHINGTON
53803
REGISTERED
PROFESSIONAL ENGINEER
07/31/2024

Henry T. Wright, P.E.
Associate Principal Engineer

Attachments: Plate 1 – Vicinity Map
Plate 2 – Test Pit Location Plan
Subsurface Exploration Logs
Grain Size Distribution

cc: JBA, LLC
Attention: Songyi Cho

References:

- 2019 Stormwater Management Manual for Western Washington, prepared by the Washington State Department of Ecology, dated July 2019

- Geologic Map of the Tacoma 1:100,000-scale Quadrangle, produced by J.E. Schuster, A.A. Cabibbo, J.F. Schilter, and I.J. Hubert, Washington

- Phase 5 – Site Plan, produced by Vader Engineering, dated May 27, 2024

- Soil Survey of Pierce County Area, endorsed by the USDA Soil Conservation Service, issued February 1979

- WSS, maintained by the Natural Resources Conservation Service under the USDA

NORTH

Reference:
Pierce County, Washington
OpenStreetMap.org

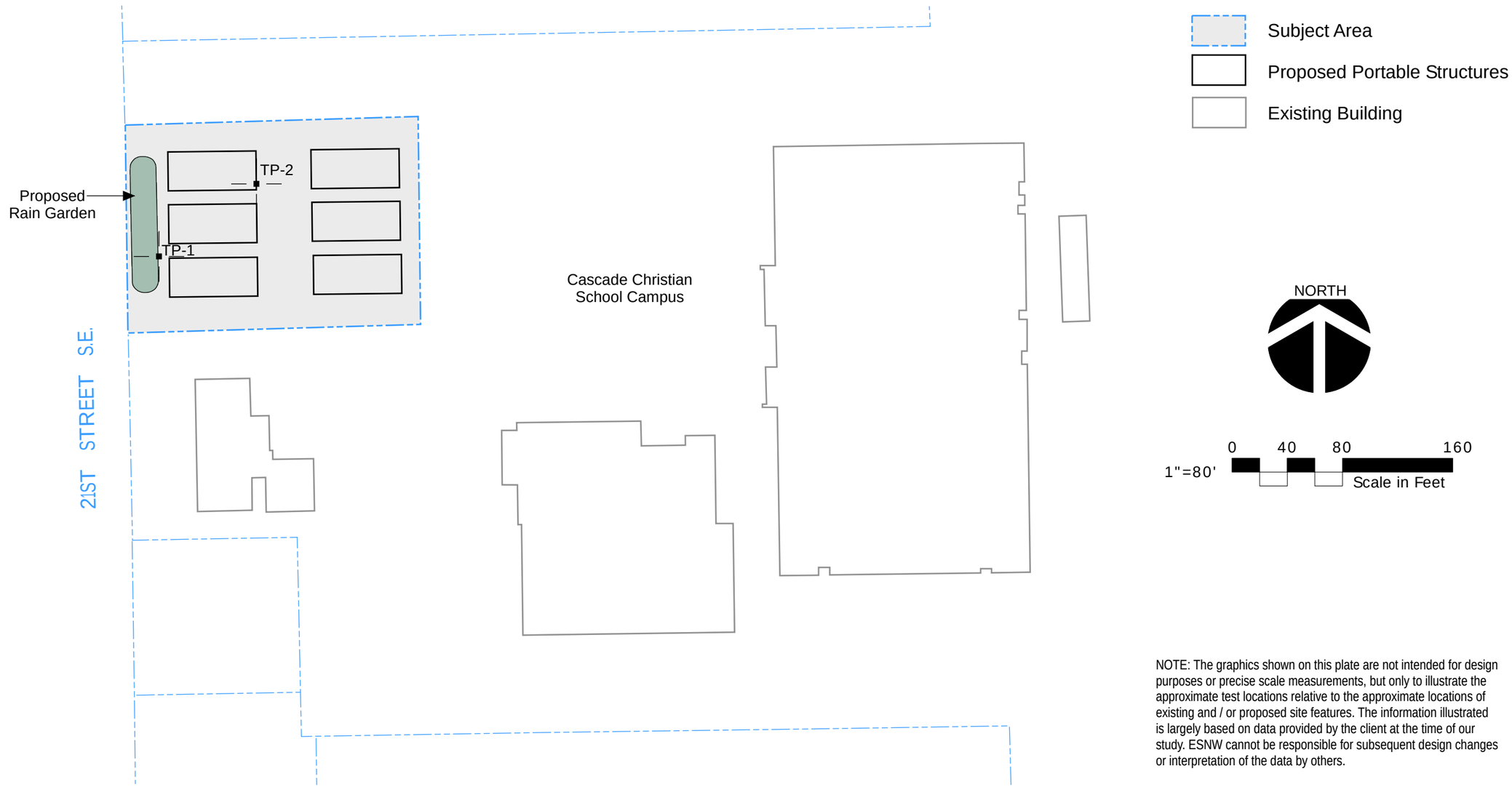
NOTE: This plate may contain areas of color. ESNW cannot be responsible for any subsequent misinterpretation of the information resulting from black & white reproductions of this plate.

Earth Solutions NW LLC

Geotechnical Engineering, Construction Observation/Testing and Environmental Services

Vicinity Map
Cascade Christian School
Puyallup, Washington

Drawn CAM	Date 07/09/2024	Proj. No. 4556.02
Checked SES	Date July 2024	Plate 1



LEGEND

TP-1 — Approximate Location of ESNW Test Pit, Proj. No. ES-4556.02, June 2024

Subject Area

Proposed Portable Structures

Existing Building

NORTH

0 40 80 160

1"=80' Scale in Feet

NOTE: The graphics shown on this plate are not intended for design purposes or precise scale measurements, but only to illustrate the approximate test locations relative to the approximate locations of existing and / or proposed site features. The information illustrated is largely based on data provided by the client at the time of our study. ESNW cannot be responsible for subsequent design changes or interpretation of the data by others.

NOTE: This plate may contain areas of color. ESNW cannot be responsible for any subsequent misinterpretation of the information resulting from black & white reproductions of this plate.

Test Pit Location Plan
Cascade Christian School
Puyallup, Washington

Earth Solutions NW LLC
Geotechnical Engineering, Construction Observation/Testing and Environmental Services

Drawn	CAM
Checked	SES
Date	07/09/2024
Proj. No.	4556.02
Plate	2

Coarse-Grained Soils - More Than 50% Retained on No. 200 Sieve	Gravels - More Than 50% of Coarse Fraction Retained on No. 4 Sieve	< 5% Fines	GW	Well-graded gravel with or without sand, little to no fines
			GP	Poorly graded gravel with or without sand, little to no fines
		> 12% Fines	GM	Silty gravel with or without sand
			GC	Clayey gravel with or without sand
	Sands - 50% or More of Coarse Fraction Passes No. 4 Sieve	< 5% Fines	SW	Well-graded sand with or without gravel, little to no fines
			SP	Poorly graded sand with or without gravel, little to no fines
		> 12% Fines	SM	Silty sand with or without gravel
			SC	Clayey sand with or without gravel
Fine-Grained Soils - 50% or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less Than 50		ML	Silt with or without sand or gravel; sandy or gravelly silt
			CL	Clay of low to medium plasticity; lean clay with or without sand or gravel; sandy or gravelly lean clay
			OL	Organic clay or silt of low plasticity
	Silts and Clays Liquid Limit 50 or More		MH	Elastic silt with or without sand or gravel; sandy or gravelly elastic silt
			CH	Clay of high plasticity; fat clay with or without sand or gravel; sandy or gravelly fat clay
			OH	Organic clay or silt of medium to high plasticity
Highly Organic Soils			PT	Peat, muck, and other highly organic soils
Fill			FILL	Made Ground

Moisture Content

Dry - Absence of moisture, dusty, dry to the touch

Damp - Perceptible moisture, likely below optimum MC

Moist - Damp but no visible water, likely at/near optimum MC

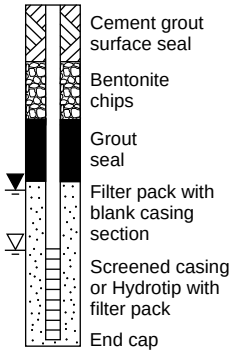
Wet - Water visible but not free draining, likely above optimum MC

Saturated/Water Bearing - Visible free water, typically below groundwater table

Symbols

ATD = At time of drilling

Static water level (date)



Terms Describing Relative Density and Consistency

Coarse-Grained Soils:

Density	SPT blows/foot
Very Loose	< 4
Loose	4 to 9
Medium Dense	10 to 29
Dense	30 to 49
Very Dense	≥ 50

Fine-Grained Soils:

Consistency	SPT blows/foot
Very Soft	< 2
Soft	2 to 3
Medium Stiff	4 to 7
Stiff	8 to 14
Very Stiff	15 to 29
Hard	≥ 30

Test Symbols & Units

Fines = Fines Content (%)

MC = Moisture Content (%)

DD = Dry Density (pcf)

Str = Shear Strength (tsf)

PID = Photoionization Detector (ppm)

OC = Organic Content (%)

CEC = Cation Exchange Capacity (meq/100 g)

LL = Liquid Limit (%)

PL = Plastic Limit (%)

PI = Plasticity Index (%)

Component Definitions

Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

Modifier Definitions

Percentage by Weight (Approx.)	Modifier
< 5	Trace (sand, silt, clay, gravel)
5 to 14	Slightly (sandy, silty, clayey, gravelly)
15 to 29	Sandy, silty, clayey, gravelly
≥ 30	Very (sandy, silty, clayey, gravelly)

Classifications of soils in this geotechnical report and as shown on the exploration logs are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates, and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D2487 and D2488 were used as an identification guide for the Unified Soil Classification System.

Earth Solutions NW LLC

Geotechnical Engineering, Construction Observation/Testing and Environmental Services

EXPLORATION LOG KEY

Earth Solutions NW LLC
15365 NE 90th Street, Suite 100
Redmond, WA 98052
Office (425) 449-4704 | esnw.com
Branch Office: Pasco, WA

TEST PIT NUMBER TP-1

PROJECT NUMBER ES-4556.02 **PROJECT NAME** Cascade Christian School
DATE STARTED 6/17/24 **COMPLETED** 6/17/24 **GROUND ELEVATION**
EXCAVATION CONTRACTOR Client Provided **LATITUDE** 47.18441 **LONGITUDE** -122.26666
LOGGED BY SES **CHECKED BY** CGH **GROUND WATER LEVEL:**
NOTES ▽ **AT TIME OF EXCAVATION**
SURFACE CONDITIONS Grass **AFTER EXCAVATION**

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0			TPSL		Dark brown TOPSOIL, minimal root intrusions
				1.0	
					Dark brown silty SAND, medium dense, moist
2.5					
	GB	MC = 14.1 Fines = 23.9 OC = 1.4	SM		-infiltration test at 3' [USDA Classification: slightly gravelly loamy SAND] -becomes wet (post-test)
5.0					
	GB	MC = 25.2 Fines = 27.4			[USDA Classification: loamy SAND]
7.5				7.5	
			ML		Gray sandy SILT, medium dense, wet
	GB	MC = 30.1 Fines = 62.2		8.5	[USDA Classification: LOAM]

Test pit terminated at 8.5 feet below existing grade. No groundwater encountered during excavation. No caving observed.

LIMITATIONS: Ground elevation (if listed) is approximate; the test location was not surveyed. Coordinates are approximate and based on the WGS84 datum. Do not rely on this test log as a standalone document. Refer to the text of the geotechnical report for a complete understanding of subsurface conditions.

Earth Solutions NW LLC
15365 NE 90th Street, Suite 100
Redmond, WA 98052
Office (425) 449-4704 | esnw.com
Branch Office: Pasco, WA

TEST PIT NUMBER TP-2

PROJECT NUMBER ES-4556.02 **PROJECT NAME** Cascade Christian School

DATE STARTED 6/17/24 **COMPLETED** 6/17/24 **GROUND ELEVATION**

EXCAVATION CONTRACTOR Client Provided **LATITUDE** 47.18457 **LONGITUDE** -122.26647

LOGGED BY SES **CHECKED BY** CGH **GROUND WATER LEVEL:**

NOTES ▽ **AT TIME OF EXCAVATION** 9.5 ft

SURFACE CONDITIONS Grass **AFTER EXCAVATION**

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0			TPSL		Dark brown TOPSOIL, shallow root intrusions
				1.0	Dark brown silty SAND, loose to medium dense, damp
2.5	GB	MC = 12.4 Fines = 21.8 OC = 1.0			[USDA Classification: loamy SAND]
					-becomes gray
5.0					-becomes wet
			SM		
	GB	MC = 35.6			
7.5					
	GB	MC = 24.3		9.5	▽ -groundwater table at 9.5'

Test pit terminated at 9.5 feet below existing grade. Groundwater table encountered at 9.5 feet during excavation. No caving observed.

LIMITATIONS: Ground elevation (if listed) is approximate; the test location was not surveyed. Coordinates are approximate and based on the WGS84 datum. Do not rely on this test log as a standalone document. Refer to the text of the geotechnical report for a complete understanding of subsurface conditions.

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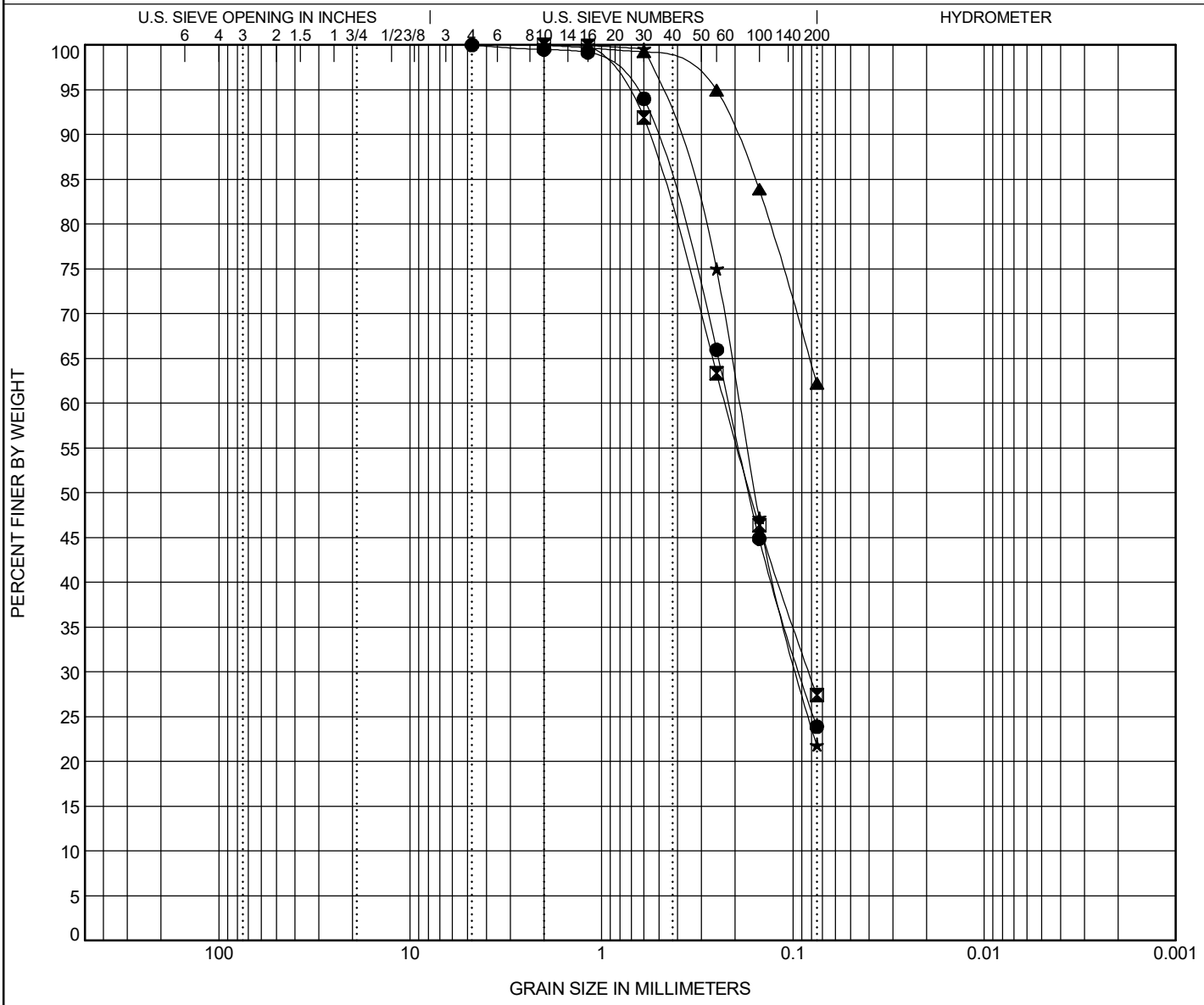
Redmond, WA 98052
Office (425) 449-4704 | esnw.com
Branch Office: Pasco, WA

GRAIN SIZE DISTRIBUTION

PROJECT NUMBER ES-4556.02 **PROJECT NAME** Cascade Christian School



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	Cc	Cu
●	TP-01	3.00ft.	**USDA: Dark Brown Slightly Gravelly Loamy Sand. USCS: SM.**		
⊠	TP-01	5.00ft.	**USDA: Dark Brown Loamy Sand. USCS: SM.**		
▲	TP-01	8.50ft.	**USDA: Dark Brown Loam. USCS: Sandy ML.**		
★	TP-02	2.50ft.	**USDA: Dark Brown Loamy Sand. USCS: SM.**		

Specimen Identification			D100	D60	D30	D10	LL	PL	PI	%Silt	%Clay
●	TP-01	3.0ft.	**4.75**	**0.216**	**0.092**					**23.9**	
⊠	TP-01	5.0ft.	**2**	**0.226**	**0.082**					**27.4**	
▲	TP-01	8.5ft.	**2**							**62.2**	
★	TP-02	2.5ft.	**2**	**0.19**	**0.094**					**21.8**	

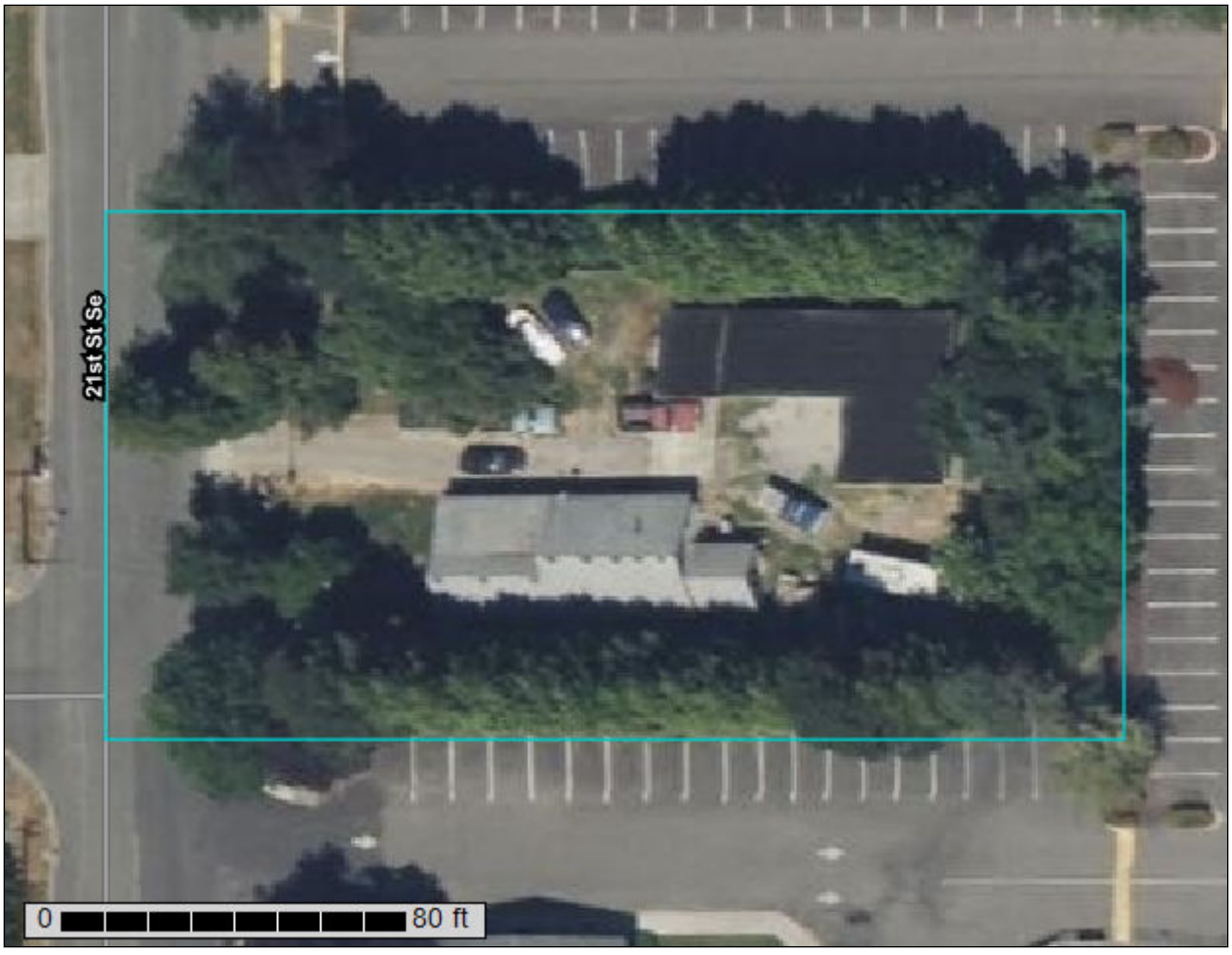
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Pierce County Area, Washington



July 1, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:395 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 5 10 20 30

Feet: 0 15 30 60 90

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: Pierce County Area, Washington
Survey Area Data: Version 19, Aug 29, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 31, 2022—Aug 8, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6A	Briscot loam	0.1	19.4%
31A	Puyallup fine sandy loam	0.5	80.6%
Totals for Area of Interest		**0.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Pierce County Area, Washington

6A—Briscot loam

Map Unit Setting

National map unit symbol: 2hrc
Elevation: 20 to 250 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 160 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Briscot, drained, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Briscot, Drained

Setting

Landform: Flood plains
Parent material: Alluvium

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 38 inches: stratified fine sand to silt loam
H3 - 38 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 35 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: F002XA007WA - Puget Lowlands Wet Forest
Forage suitability group: Seasonally Wet Soils (G002XN202WA)
Other vegetative classification: Seasonally Wet Soils (G002XN202WA)
Hydric soil rating: Yes

Minor Components

Briscot, undrained

Percent of map unit: 5 percent
Landform: Flood plains
Other vegetative classification: Seasonally Wet Soils (G002XN202WA)
Hydric soil rating: Yes

31A—Puyallup fine sandy loam

Map Unit Setting

National map unit symbol: 2hq9
Elevation: 0 to 390 feet
Mean annual precipitation: 35 to 60 inches
Mean annual air temperature: 50 degrees F
Frost-free period: 170 to 200 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Puyallup and similar soils: 85 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Puyallup

Setting

Landform: Terraces, flood plains
Parent material: Alluvium

Typical profile

H1 - 0 to 13 inches: ashy fine sandy loam
H2 - 13 to 29 inches: loamy fine sand
H3 - 29 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 48 to 79 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A
Ecological site: F002XA008WA - Puget Lowlands Riparian Forest
Forage suitability group: Droughty Soils (G002XN402WA)
Other vegetative classification: Droughty Soils (G002XN402WA)
Hydric soil rating: No

Minor Components

Briscot, undrained

Percent of map unit: 2 percent

Landform: Depressions
Other vegetative classification: Seasonally Wet Soils (G002XN202WA)
Hydric soil rating: Yes

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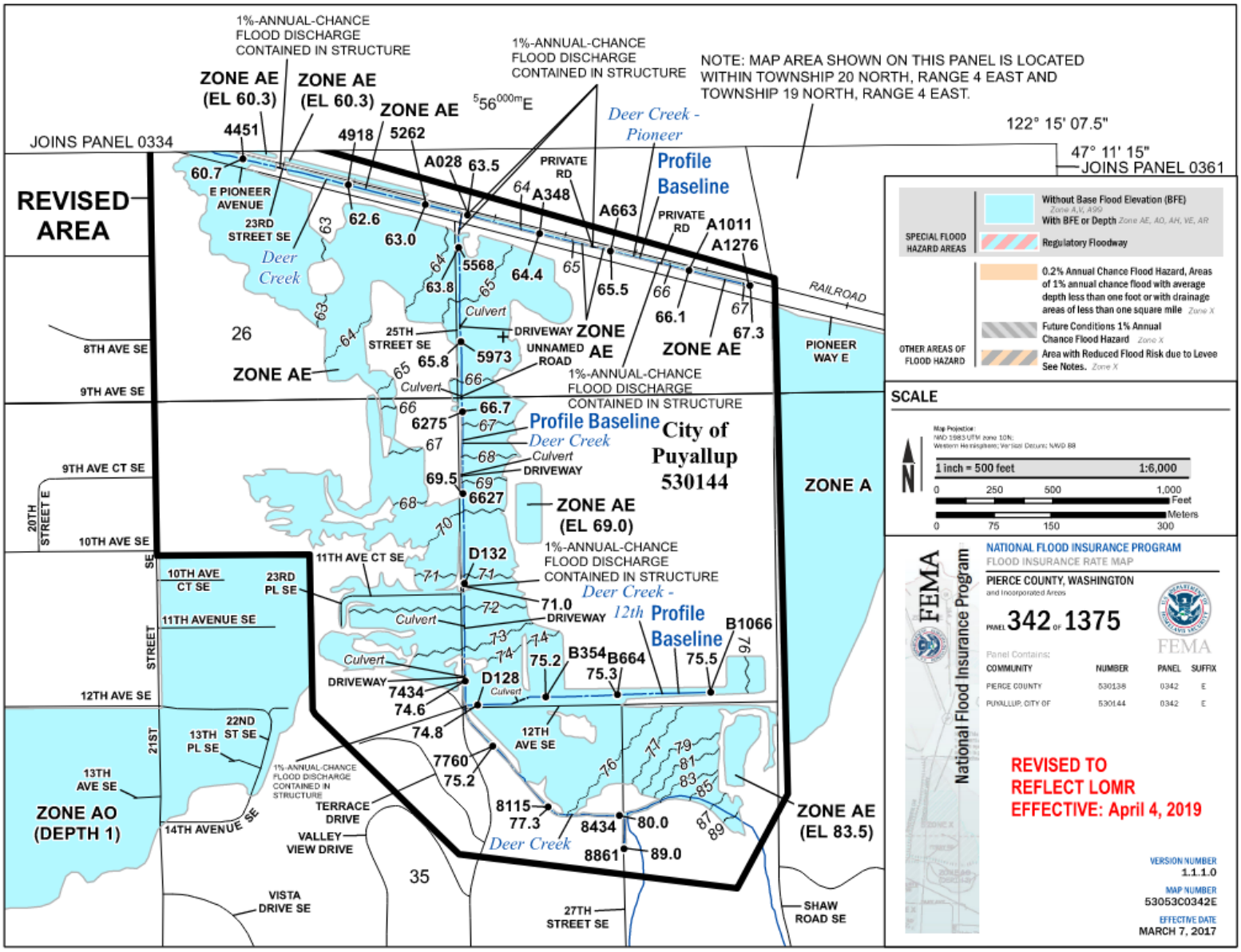
Appendix E: FEMA LOMR Determination

See attached.



Arborist Report

Prepared for:

Cascade Christian Schools

819 21st St SE

Puyallup, WA

8/4/2024

STEVE THE ARBORIST, LLC.

P O Box 2515 Belfair, WA. 98528 253-858-5474 Licensed Insured

Cascade Christian School

819 21st St SE

Puyallup, WA

8/4/2024

.

Upon the request of the school district an onsite inspection was preformed on all significant trees remaining on site.

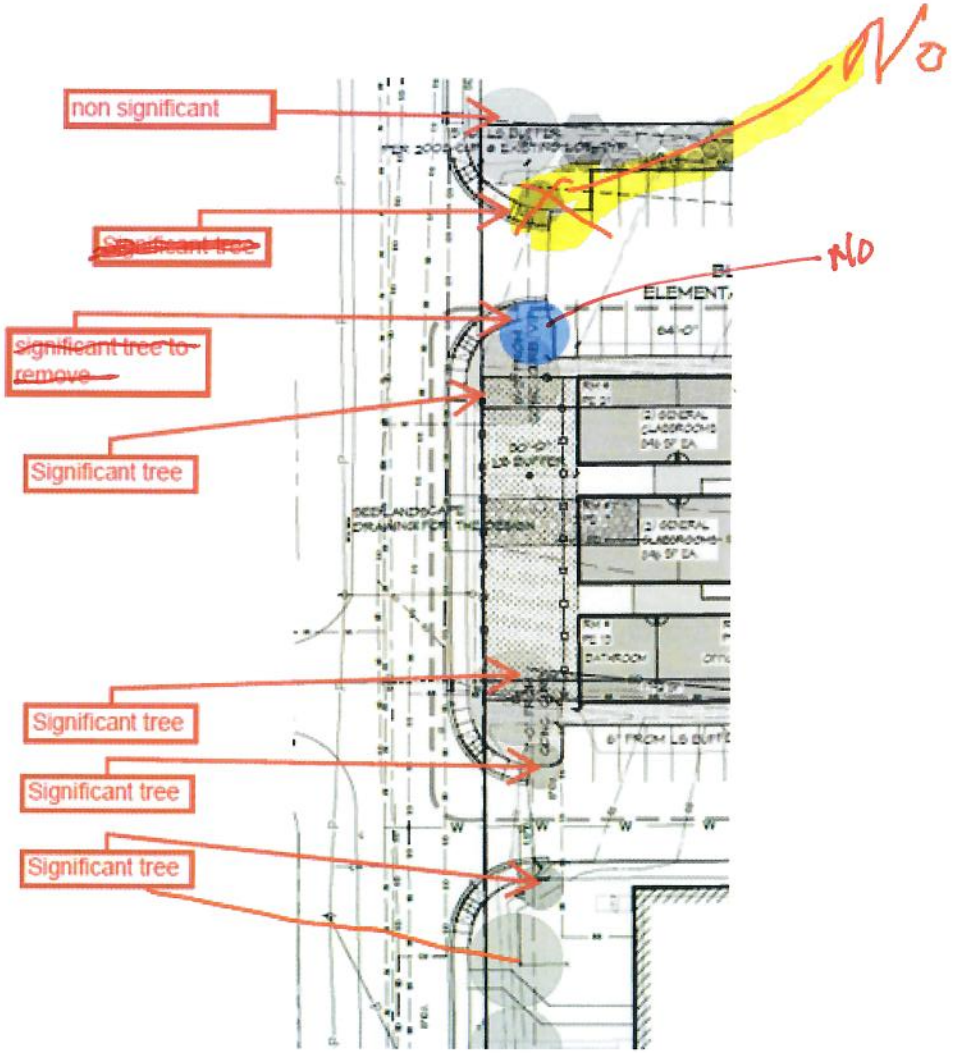
Five trees were identified as significant, all five trees are to remain and be protected during construction activities.

The significant trees will have no impact on the proposed rain garden and are to be protected with Tree Protection Zones (TPZ).

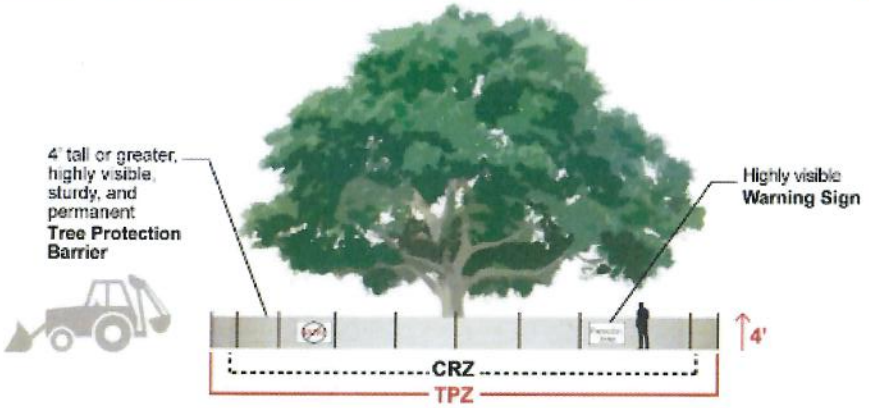
Trim up the 5 significant trees for line of sight and health and install a TPZ for each tree.

Remove one decayed Flowering Plum with a DBH of 12" near entrance from 26th St SE.

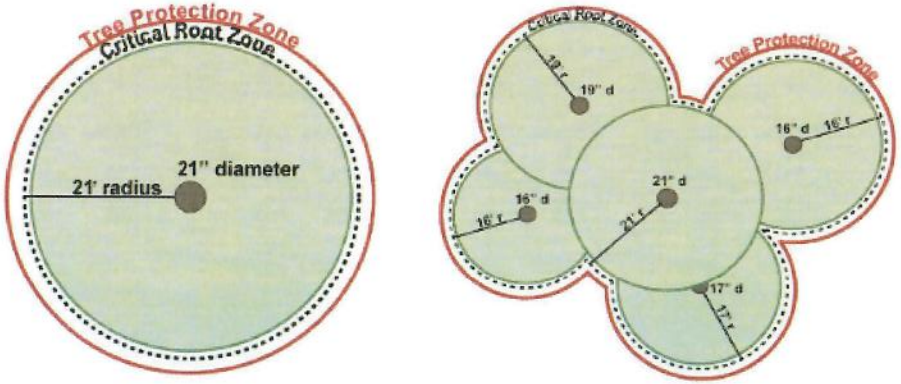
Steven J Wortinger PN-7076A TRAQ


non significant
~~Significant tree~~
~~significant tree to remove~~
Significant tree
Significant tree
Significant tree
Significant tree
No
No

Tree protection barrier encloses the Tree Protection Zone and is at least 4' tall, highly visible, sturdy, permanent and has warning signs on or near it for the duration of any construction activities.



Tree Protection Zone (TPZ) is an area where construction activities are prohibited or restricted to prevent injury to preserved trees, especially during pre- construction and construction, and includes the Critical Root Zone and/or beyond.



Best Management Practices

To promote the health of trees and stands of trees before, during, and after construction activities, follow these basic BMPs:

Planning Phase

1. Before assessing trees and other site structures and conditions, mark the site boundaries on plans and in the field to delineate which trees and stands of trees will be inventoried.

2. Perform a tree inventory that includes at minimum the location, size, and health of each tree and delineates quality stands of trees. Scope of the inventory should be based on communication and needs of the project team (developer, planner, engineer, architect

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