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GEOTECHNICAL ENGINEERING REPORT

Bonney Lake High School Expansion
Bonney Lake, Washington

Prepared for

Sumner-Bonney Lake School District

Prepared by

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Project: NWW0163

February 26, 2026

Geosyntec consultants

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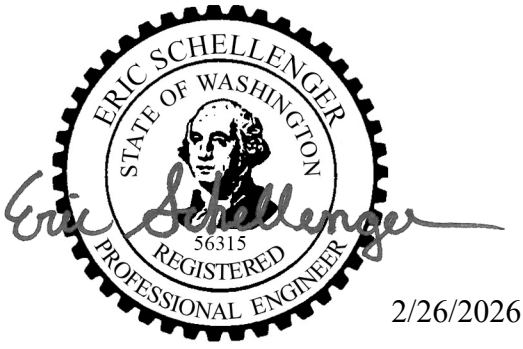

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EXECUTIVE SUMMARY

Geosyntec Consultants, Inc. (Geosyntec; formerly Aspect Consulting) completed a geotechnical engineering study to support design and construction of the proposed Bonney Lake High School Expansion in Bonney Lake, Pierce County, Washington. Key conclusions and recommendations from our study are summarized below:

- In the location of the proposed addition, the Site is underlain by up to approximately 18 feet of fill, followed by native recessional outwash soil, followed by dense, glacially consolidated soil (glacial till). In the locations of the athletic field improvements, the Site is underlain by fill of limited thickness and/or near-surface glacial till. While zones of wet soil/seepage were observed in some of our explorations, we did not observe a regional groundwater table within the depths explored.
- The excavation to reach foundation subgrade for Level 1 of the addition is anticipated to expose existing fill and be within a few feet of the underlying native recessional outwash soil. We recommend the existing fill soil below foundations be removed and replaced with structural fill. The proposed Level 1 foundations can be designed as spread footings that bear directly on the structural fill over native recessional outwash soils.
- Up to approximately 18 feet of fill is present below the entrance and welcome center at Level 2. To mitigate the potential for excessive differential settlement between the Level 1 and Level 2 foundations, we recommend using deep foundations (auger cast piles) to support Level 2 foundation loads. The use of deep foundations at Level 2 will also mitigate the need to design the adjacent basement wall for additional lateral earth pressures from footing surcharge.
- Slabs-on-grade can be used for floor areas at Levels 1 and 2. The slabs-on-grade can bear on properly-prepared native soil or fill soil subgrade.
- We expect that cantilever soldier piles with timber lagging will be feasible to support the below-grade excavation for Level 1. The temporary shoring should be designed to account for anticipated overexcavation to El 650.5 below the Level 1 footings.
- The soil profile below the addition classifies as seismic Site Class D in accordance with the American Society of Civil Engineers (ASCE) Standard ASCE/SEI 7-16, Minimum Design Loads and Associated for Buildings and Other Structures (ASCE, 2016).
- The near-surface soils beneath the athletic fields consist of low permeability fill and glacial till. To mitigate the risk of seasonal or permanently wet subgrade conditions directly below the fields and/or ponding of surface water on the fields, we recommend installing a network of underdrains with a layer of drainage aggregate beneath the new turf.

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1. INTRODUCTION

Geosyntec Consultants, Inc. (Geosyntec; formerly Aspect Consulting) completed a geotechnical engineering study for the Sumner-Bonney Lake School District (District) to support design and construction of the proposed Bonney Lake High School Expansion (Project) in Bonney Lake, Pierce County, Washington (Site; Figure 1). This report presents the geotechnical data collected at the Site, our key geotechnical findings and conclusions, and provides our geotechnical engineering recommendations for design and construction of the Project.

1.1 Project Description

Based on our review of the current Project Plans, dated December 17, 2025, the Project proposes to construct a new three-level addition to the existing high school, to make improvements to parking and queueing, and to convert the surfacing of existing athletic fields from natural grass to synthetic turf.

The proposed 16,000-square foot addition is to be located on the south side of the school adjacent to the main entrance. The footprint of the addition will extend into an existing staff parking lot, which will be modified to create a new queueing lane and to relocate parking stalls. The proposed finished floor elevation for the lowest level of the addition (Level 1) is elevation (El) 655.70[1], and the existing ground surface elevation within the footprint of the proposed addition ranges between approximately El 670 and 655. Accounting for a few additional feet of excavation to reach perimeter footing subgrade, we anticipate an excavation depth up to about 17 to 18 feet will be necessary. Additionally, foundations and a floor slab are proposed at Level 2 in the southeast corner of the addition for the entrance and welcome center.

Two existing natural grass softball fields will be converted to a new synthetic turf softball field and a synthetic turf multi-use field. The existing natural grass baseball field will be converted to a synthetic turf baseball field.

[1] All elevations in this report are relative to the North American Vertical Datum of 1988 (NAVD88).

2. SITE CONDITIONS

The following sections present the Site's surface and subsurface conditions.

2.1 Surface Conditions

2.1.1 School Addition

The location of the proposed addition is a largely developed area just south of the existing school building. Approximately one-fourth of the addition footprint (western section of the footprint) will be located in a lower elevation area (ground surface El 655) that is currently covered by a concrete walkway. Approximately three-fourths of the addition footprint (eastern section) will be located in a higher elevation area (ground surface El 668 to 670) that is currently covered by a staff parking lot with concrete sidewalks and walkways that connect the parking lot to the school's main entrance. A flight of stairs and a vegetated slope with a switchback concrete pathway connect these higher and lower elevation areas.

2.1.2 Athletic Fields

The two existing softball fields cover an area measuring approximately 500 feet in length by 225 feet in width. The ground surface elevation across the area descends gently from approximately El 679 at the south end to El 673 at the north end. A concrete block retaining wall up to approximately 12 feet in height supports the western edge of the field area. Each softball field has a dirt infield, natural grass outfield, and adjacent dugouts and bleachers.

The ground surface elevation across the baseball field varies between El 683 at the north end (home plate) to El 678 at the south end (center field at fence line). The baseball field has a natural grass and dirt infield, natural grass outfield, and adjacent dugouts, bleachers, and other features (batting cage, bullpen) typical of baseball fields.

2.2 Subsurface Conditions

Our characterization of subsurface conditions at the Site is based on the results of our subsurface explorations and our review of geotechnical data previously collected at the Site by others.

2.2.1 Geology

Geologic mapping indicates the Site is underlain by glacial drift, which primarily consists of glacial till (Crandall 1963) in the area. Glacial till is a diamict of unsorted, unstratified cobbles, gravel, sand, silt, clay, and occasional boulders deposited directly beneath the glacial ice during the most recent glaciation between 10,000 and 15,000 years ago. The enormous weight of the glacial ice compressed/consolidated the glacial till to a dense state.

As discussed in the following section, the glacial till was observed in our explorations and was mantled by fill and native recessional outwash.

2.2.2 Subsurface Explorations

Our subsurface explorations at the Site consisted of 10 borings, designated GB-01 through GB-10, and 9 hand-tool explorations, designated GH-01 through GH-09, at the approximate locations

shown on Figure 2. GB-01 through GB-03 were completed to depths ranging between 21.5 and 40.3 feet below ground surface (bgs) at the location of the proposed addition. Borings GB-04 through GB-010 and GH-01 through GH-09 were completed to depths of up to about 9 feet bgs in the softball and baseball fields for the purposes of evaluating stripping depths, drainage, and light pole foundation design. The description of the exploration methods are provided in Appendix A.

2.2.3 Subsurface Explorations by Others

We reviewed geotechnical data and information from a previous geotechnical engineering report prepared by Associated Earth Sciences, Inc (AESI) to support design and construction of the original school improvements (AESI 2001). The logs of 28 test pits and 4 borings were included in the report.

2.2.4 Stratigraphy

Based on the results of our subsurface explorations, our review of the previous AESI exploration logs, and our review of the grading plans for the original high school construction, we identified three soil units at the Site: fill, recessional outwash, and glacial till. Descriptions and distribution of these units, as observed in our explorations and described by others, are summarized below. For additional details regarding the composition and distribution of these soil units, please refer to the exploration logs provided in Appendix A.

2.2.4.1 Fill

We observed fill in each of our borings at the location of the proposed addition and in a few of our borings at the athletic fields. We observed the depth of the fill at the addition location ranging between approximately 8 feet bgs in the low area (vicinity of GB-01) and 17.5 feet bgs in the high area (vicinity of GB-02 and GB-03). The presence of fill in these areas is consistent with our interpretation of the Bonney Lake High School Phase 2 grading plans (Warner Engineering 2003) and the information shown on AESI's test pit logs, as summarized below:

- The *Existing Conditions* sheet (C.01) shows that prior to the Phase 2 work (Phase 2 included the original school, driveways and parking lots, and athletic fields construction), the school site was graded to establish rough grades for these improvements. AESI's test pits in these areas were completed at the original ground surface prior to any grading activities, and the logs indicate an approximately 12-inch-thick layer of topsoil was present. Based on the pre- and post-grading elevation contours, and accounting for a stripping depth on the order of 12 inches based on the topsoil thicknesses shown on the AESI test pit logs, we estimate that fills on the order of 15 to 17 feet tall were placed in the existing high area (i.e., staff parking lot and concrete walkways at the main entrance to the school) and fills on the order of 3 to 5 feet tall were placed in the existing low area (concrete walkway below the staircase).
- The *Paving, Grading, and Storm Plan* sheet (Sheet C2.8) indicate that finished grades for staff parking lot, concrete walkways, and other hardscapes in these areas were relatively similar to the post-grading grades described above (i.e., any additional cuts or fills were limited).

We observed the depth of the fill in the borings at the athletic fields ranges between 1 and 5 feet bgs.

The fill typically consists of loose to dense, sand and gravel with varying amounts of silt. Based on our observations of the fill material, our review of the 2001 AESI geotechnical report, and review of a separate Phase II construction recommendations letter (AESI 2002) that included a summary of the Phase 1 grading activities, the fill consists of native soil (recessional outwash and glacial till) that was derived from cuts around the Site. We understand that in non-building pad areas, fills were graded with little or no segregation of recessional outwash and glacial till soils (i.e., the fill materials were mixed; AESI 2002).

2.2.4.2 Recessional Outwash

We observed recessional outwash below the fill in our borings at the location of the proposed addition. We did not observe recessional outwash in our explorations at the athletic fields. The observed thickness of the recessional outwash ranges between about 5 and 17.5 feet bgs. The recessional outwash typically consists of loose to medium dense to dense gravel with silt, sand, and cobbles (GP-GM) and sand with varying amounts of silt and gravel (SP-SM and SM).

2.2.4.3 Glacial Till

Below the recessional outwash in the borings at the location of the proposed addition, and below the surficial grass and topsoil layer and fill at the athletic fields, we observed glacial till that extended to the bottom of each exploration. Glacial till typically consists of very dense silty sand with varying amounts of gravel (SM), and in some of the explorations in the athletic fields we observed the glacial till is weathered to a medium dense state near the top.

2.2.5 Groundwater

We did not observe a regional static groundwater table within the depths explored. We observed groundwater seepage or wet soils at the top of the glacial till unit that is consistent with perched groundwater at the recessional outwash and glacial till contact. Groundwater levels at the Site are expected to fluctuate seasonally with changes in precipitation.

3. GEOTECHNICAL ENGINEERING CONCLUSIONS AND RECOMMENDATIONS

Our geotechnical engineering conclusions and recommendations for the Project are presented in detail in the following sections.

3.1 Earthquake Engineering

The Site is located within a region of active tectonic forces associated with the interaction of the offshore Juan de Fuca Plate, the Pacific Plate, and the onshore North American Plate. Seismic hazards include strong ground shaking from earthquakes associated with the Tacoma Fault Zone (TFZ), the Cascadia Subduction Zone (CSZ), and deep intraslab earthquakes. The Site will experience strong ground shaking during earthquakes, which requires that the Project building be designed to meet building code objectives for life safety and collapse prevention.

3.1.1 Ground Response

We assume that seismic design for the addition will be in accordance with the 2021 International Building Code (IBC; ICC 2021), which references the American Society of Civil Engineers (ASCE) Standard ASCE/SEI 7-16, Minimum Design Loads for Buildings and Other Structures (ASCE, 2016) for seismic design. In accordance with these codes, seismic design will consider a "Maximum Considered Earthquake" (MCE) ground motion with a 2 percent probability of exceedance in 50 years, or a return period of 2,475 years.

The effects of Site-specific subsurface conditions on the earthquake ground motion at the ground surface are determined based on the "Site Class." The Site Class is typically correlated to the average standard penetration resistance (N-value) or average shear wave velocity in the upper 100 feet of the soil profile below the building addition. Based on the materials below the proposed addition, which consist of medium dense native recessional outwash overlying dense glacial till, we conclude the soil profile classifies as Site Class D. The design spectral response acceleration parameters adjusted for Site Class D in accordance with the 2021 IBC and ASCE/SEI 7-16 are presented in Table 1.

Table 1: Seismic Design Parameters

Parameter	Recommended Value
Site Class	D
Short Period Spectral Acceleration, Ss (g)	1.211
1-Second Period Spectral Acceleration, S1 (g)	0.417
Design Short Period Spectral Acceleration, SDS (g)	0.820
Design 1-Second Period Spectral Acceleration, SD1 (g)	0.524

Note: Parameters based Risk Category III and the latitude and longitude of the Site: 47.159376°N, -122.168842°W

3.1.2 Liquefaction

Soil liquefaction occurs when loose, saturated, and relatively cohesionless soil deposits temporarily lose strength and stiffness as a result of earthquake ground shaking. Potential effects of soil liquefaction include temporary reduction or loss of shallow and deep foundation bearing capacity and permanent ground deformation. Primary factors that control the triggering of soil liquefaction include intensity and duration of strong ground motion, characteristics of subsurface soils, in situ stress conditions, and depth to groundwater.

Based on the absence of continuous and static groundwater within the depths explored and the presence of medium dense native recessional outwash overlying dense glacial till beneath the building addition foundation, we conclude that liquefaction is not a hazard or design consideration for the Project.

3.2 Building Foundations

At the bottom of the excavation for the lower level of the proposed addition (Level 1), we expect that existing fill soils will still be exposed. The existing fill soils are not suitable for foundation support; however, we anticipate that suitable native recessional outwash soils are within a few feet of the anticipated bottom of the excavation. We recommend the existing fill soils be removed from beneath the foundations (i.e., the footings should be overexcavated) to expose native recessional soils and replaced with structural fill. The proposed Level 1 addition can be supported using spread footings that bear directly on the structural fill over native recessional outwash soils. If native recessional outwash happens to be exposed at footing locations at the bottom of excavation, then overexcavation is not necessary and the Level 1 foundations can bear directly on native recessional outwash soils in these instances. For planning purposes, we anticipate overexcavations for Level 1 footings east of gridline BB on sheet S-121A of the current Project plans, will need to extend to El 646.5 to reach native recessional outwash soils. We anticipate overexcavations for Level 1 footings west of gridline BB will need to extend to El 650.5 to reach native recessional outwash soils. Actual overexcavation depths will be determined on a footing-by-footing basis by Geosyntec during construction based on our observations.

At the proposed entrance and welcome center area at Level 2, approximately 18 feet of fill is present. If spread footings are used at Level 2, there is potential for excessive differential settlement between the Level 1 and Level 2 foundations. Overexcavation below the Level 2 foundations would be cost prohibitive, and therefore we recommend using deep foundations for the Level 2 foundation elements. In our opinion, auger cast piles are suitable for this application. The use of deep foundations at Level 2 will also mitigate the need to design the adjacent basement wall for additional lateral earth pressures from footing surcharge.

In our opinion, two foundation systems for the addition (spread footings at Level 1 and deep foundations at Level 2) can be used in conjunction while controlling total and differential settlements to acceptable amounts to meet the District's performance standard.

Our recommendations for the design of spread footings and auger cast piles are presented below.

3.2.1 Spread Footings

The following sections present allowable bearing pressures, estimated settlements, and lateral load resistance parameters for design of spread footings at Level 1.

3.2.1.1 Allowable Bearing Pressure

Spread footings that bear on undisturbed native recessional outwash soil or structural fill overlying native recessional outwash can be designed for an allowable bearing pressure of 3 kips per square foot (ksf). The allowable bearing pressure may be increased by one-third during short-term wind and seismic loading.

3.2.1.2 Settlement

We estimate spread footings that are designed and constructed in accordance with our recommendations will experience average total settlements of 1 inch or less. Differential settlement can be assumed to be up to one-half of the total settlement. Any settlement will occur rapidly during construction as building loads are applied. We recommend that any closure pours between the new addition and the existing building be delayed as long as practicable to minimize post-construction differential settlement between the two structures.

3.2.1.3 Lateral Load Resistance

Lateral loads will be resisted through passive soil resistance against the embedded sides of the footings and frictional resistance along the base of the footings. We recommend using the allowable passive earth pressure (expressed as an equivalent fluid density) and base friction coefficient presented in Table 2 to calculate resistance to lateral loads. These allowable values include a factor of safety of 1.5.

Table 2. Lateral Load Resistance Parameters for Spread Footings

Allowable Passive Earth Pressure (pcf)[1]	Allowable Friction Coefficient[2]
250	0.37

Notes:
1. pcf: pounds per cubic foot
2. Appropriate for cast-in-place concrete on native recessional outwash or structural fill.

3.2.2 Auger Cast Piles

The following sections present the allowable axial capacity, estimated settlement, and minimum tip elevations for design of auger cast piles at Level 2.

3.2.2.1 Axial Capacity

We calculated the allowable axial compressive and tensile capacities of auger cast piles using static analysis methods for drilled shafts presented in the Federal Highway Administration (FHWA) *Drilled Shafts Manual* (FHWA 2010). We evaluated three different auger cast pile shaft diameters (12, 18, and 24 inches) and assumed that (1) the auger cast piles extend at least 5 feet into the glacial till, and (2) the axial resistance is gained from skin friction within the lower portion of the fill and the recessional outwash, and from skin friction and end bearing (for compressive

resistance) within the glacial till. The recommended allowable axial capacities are provided in Table 3 below and include a factor of safety of 2.0.

Table 3. Auger Cast Pile Axial Capacities

Pile Diameter (inches)	Allowable Axial Compressive Capacity (kips)[1,2]	Allowable Axial Tensile Capacity (kips)[1]
12	112	89
18	184	134
24	268	178

Notes:
1. 1 kip = 1,000 pounds-force
2. Compressive capacity includes end bearing resistance and assume the piles are embedded at least 5 feet into the glacial till.

The allowable axial compressive capacity may be increased by one-third during short-term wind and seismic loading. The capacities provided above assume the pile center-to-center spacing is at least 3 pile diameters and therefore group effects (i.e., reduction in capacity) do not apply. We should be notified to provide reduced axial capacities if center-to-center spacings are less than 3 pile diameters.

Recommendations for auger cast pile construction are discussed in Section 4.8.

3.2.2.2 Minimum Pile Embedment

We recommend embedding the auger cast piles a minimum of 5 feet into the glacial till (minimum pile tip elevation El 628).

3.2.2.3 Settlement

For auger cast piles bearing within the glacial till, we expect total settlements will be 0.5 inches or less. Any settlement will occur rapidly during construction as building loads are applied.

3.2.2.4 Lateral Load Resistance

Lateral loads can be resisted through a combination of passive earth pressure against the buried sides of the pile caps and by the auger cast piles themselves.

To calculate passive earth pressure resistance against the buried sides of the pile caps, an allowable passive earth pressure (expressed as an equivalent fluid density) of 250 pounds per cubic foot (pcf) can be used. This value includes a factor of safety of 1.5 and assumes the reinforced concrete pile caps are embedded in the existing fill. Passive earth pressure resistance within the upper 18 inches of finished grade should be ignored except where the ground is protected/covered by concrete. Friction along the base of the pile-supported foundations should be neglected.

Resistance provided by the auger cast piles during lateral loading can be evaluated using the soil parameters presented in Table 4 below.

Table 4. Soil Parameters for Analysis of Piles Under Lateral Loading

Elevation Range (feet)	LPile Soil Model	Effective Unit Weight (pcf)	Friction Angle (degrees)	Cohesion (psf)	Soil Modulus k (pci)
Above 633	Sand (Reese)	115	32	-	90
Below 633	Silt (Cemented C-Phi)	130	42	200	250

For piles laid out with center-to-center spacings less than 6B in the direction of lateral loading, the group reduction factors (p-multipliers) shown in Table 5 should be applied to account for the reduction in lateral resistance due to group effects.

Table 5. P-Multipliers

Pile Center-to-Center Spacing (in the direction of loading)	P-Multipliers		
	1st Row Piles (Leading Piles)	2nd Row Piles (Trailing Piles)	3rd Row Piles and Higher (Trailing Piles)
3B	0.8	0.4	0.3
5B	1.0	0.85	0.7

Note: B = diameter of pile

Geosyntec will collaborate with the structural engineer as the design progresses to evaluate piles under lateral loading.

3.3 Slabs-on-Grade

The floor slab subgrade at Level 1 will consist of existing fill and/or possibly native recessional outwash, and the subgrade at Level 2 will consist of existing fill. These soils will provide suitable support for slabs-on-grade if prepared properly and compacted in-place to a firm and unyielding condition. Additional recommendations for subgrade preparation are provided in Section 4.5.

Concrete slabs-on-grade should be designed in accordance with the American Concrete Institute (ACI) Committee 360 *Guide to Design of Slabs-on-Ground* (ACI 2010). The slabs should be directly underlain by a 4- to 6-inch-thick layer of capillary break material for moisture control. The capillary break material should consist of free-draining, clean, fine gravel and coarse sand with a maximum particle size of 1 inch and less than 3 percent material passing the U.S. No. 200 sieve by weight (fines). A crushed material is preferred to provide a subgrade surface that is not easily disturbed by workers laying steel rebar and concrete formwork. The capillary break material should be compacted to relatively firm and unyielding condition and evaluated by Geosyntec prior to placement of steel rebar and formwork.

If vapor intrusion and additional moisture control is desired, a vapor barrier should be placed over the capillary break layer. Detailed design and performance issues with respect to vapor intrusion and moisture control as it relates to the interior environment of the structure are beyond the expertise of Geosyntec. A building envelope specialist or contractor should be consulted to address these issues, as needed.

3.4 Temporary Shoring

Temporary shoring is proposed to support the below-grade excavation for Level 1. We recommend designing the temporary shoring assuming the excavation could extend as deep as El 650.5 to account for perimeter footing overexcavation to remove the fill and reach native recessional outwash soils. In our opinion, the excavation depths and soil conditions make cantilever drilled soldier piles and timber lagging feasible.

Our recommendations for design are presented below. Construction recommendations for temporary shoring are presented in Section 4.3.

3.4.1 Cantilever Soldier Pile Lateral Earth Pressures

Cantilever soldier piles should be designed using the active earth pressures shown on Figure 3. The active earth pressures assume level ground exists behind the shoring walls. The active earth pressure acts over the pile center-to-center spacing behind the temporary shoring wall. Seismic lateral earth pressures are excluded because the shoring is temporary.

The allowable passive earth pressures shown include a factor of safety of 1.5. The allowable passive earth pressures should be applied over three shaft diameters (3B) or the soldier pile center-to-center spacing, whichever is less.

Construction/traffic surcharge lateral earth pressure should be applied to the shoring walls, as shown in the table on Figure 3. Additional lateral earth pressures from other types of surcharges should be calculated using the recommended earth pressures shown on Figure 4 and added where appropriate.

We understand the design and construction team are considering temporarily removing soil from behind the shoring wall to reduce the effective shored height and avoid the need for ground anchors (tie backs). If soil is to be removed from behind the wall and the earth pressures presented in Figure 3 are to be used for design, the soil should be removed from within a 9-foot-wide area immediately behind the wall. If it is desired to remove soil from within a narrower area than this, we should be notified to update the lateral earth pressures accordingly.

3.4.2 Recommended Soldier Pile Deflections

In general, the shoring walls are typically designed to limit lateral deflections to 1.0 inch. If sensitive utilities, structures, or improvements that require protection are not present behind the shoring walls, a slightly larger allowable lateral deflection (1.5 to 2 inches) might be acceptable based on the judgement of the shoring designer.

3.4.3 Timber Lagging Design

Temporary lagging should be designed in accordance with the FHWA Geotechnical Engineering Circular No. 4, Table 12—*Recommended Thickness of Temporary Timber Lagging* (FHWA 1999). For lagging design, the soil description may be taken as 'Competent Soils.'

3.5 Below-Grade Walls

3.5.1 Lateral Earth Pressures

Permanent below-grade walls that are constructed against cantilever soldier pile temporary shoring or that are backfilled with structural fill should be designed using an active earth pressure of 35 pcf or an at-rest earth pressure of 55 pcf (the earth pressures are expressed as an equivalent fluid density). The active earth pressure should be used if the top of the wall can yield at least 0.1 percent of the wall height. For non-yielding walls, the at-rest earth pressure should be used.

3.5.1.1 Seismic Lateral Earth Pressures

A temporary additional lateral earth pressure will be exerted on below-grade walls during earthquake shaking. A uniformly distributed seismic lateral earth pressure equal to 7H (where H is the height of the wall) should be added to the earth pressure distribution to account for this.

3.5.2 Lateral Load Resistance

For permanent below-grade walls with footings bearing on and embedded in native recessional outwash soil or structural fill, resistance to lateral loads can be calculated using allowable passive earth pressure and friction coefficient values presented in Table 2.

3.6 Building Addition Subsurface Drainage

3.6.1 Level 1 Below-Grade Walls

Drainage behind basement walls should consist of drainage composite placed on the face of the temporary shoring wall that connects to an interior tightline pipe. Our general recommendation for the elements of this system are as follows:

- The drainage composite should be installed in vertical strips with shingled overlap on the face of the timber lagging. We recommend full coverage of the timber lagging with the drainage composite, with exception to the upper few feet to prevent surface water from being captured.
- The drainage composite should extend down to weephole pipes that penetrate the basement wall slightly above the top of the basement wall footing.
- The weephole pipes should connect to an interior tightline pipe that runs along the inside edge of the basement wall footing and is routed to a suitable point of discharge.

The recommendations presented above should generally be adequate to prevent buildup of hydrostatic pressures behind the basement walls. A building envelope and/or waterproofing expert should be consulted to recommend waterproofing if wet wall areas are not acceptable

3.6.2 Level 1 Foundation Drain

Along the inside of the perimeter footings for Level 1, we recommend installing a foundation drain to collect perched groundwater adjacent to the footings. The foundation drain pipe should be separate from the basement wall drain tightline pipe that will also be along the inside of the perimeter footing adjacent to the basement wall. The foundation drain should consist of 4-inch-diameter (minimum), perforated or slotted, Schedule 40 PVC (or equivalent) with invert to approximately match the bottom of the foundation. The drain pipe should be surrounded by at least 6 inches of washed gravel meeting the requirements for Gravel Backfill for Drains as stated in the Washington State Department of Transportation (WSDOT) *Standard Specifications for Road, Bridge, and Municipal Construction* 9-03.12(4) (Standard Specifications; WSDOT 2026). Cleanouts should be provided for periodic maintenance and the drain pipe should connect to a tightline pipe for discharge to an approved outlet.

3.6.3 Level 2 Foundation Drain

We recommend installing a perimeter foundation drain along the outside the Level 2 perimeter grade beams and pile caps. The perimeter foundation drain(s) should consist of a 4-inch-diameter (minimum) perforated or slotted, Schedule 40 PVC pipe (or equivalent) with invert to approximately match the bottom of the foundation. The drain pipe should be surrounded by at least 6 inches of washed gravel meeting the requirement for Gravel Backfill for Drains as stated in the Standard Specifications (WSDOT 2026). Cleanouts should be provided for periodic maintenance and the drain pipe should connect to a tightline pipe for discharge to an approved outlet.

3.7 Athletic Field Drainage

The subsurface explorations we conducted at the athletic fields indicate that near-surface soils consist of fill and/or glacial till. Both the fill and glacial till have low permeability that can potentially cause seasonal or permanently wet subgrade conditions directly below the fields and/or ponding of surface water on the fields.

To mitigate this potential, we recommend installing a network of underdrains beneath the athletic fields. The field underdrains should consist of perforated drain pipes placed in shallow trenches laterally spaced 15 to 20 feet apart. The drain pipes should have an invert at least 12 inches below the final grade and should be surrounded by washed pea gravel. A layer of high permeability drainage aggregate should be placed and compacted over the field subgrades and underdrains and below the turf. Detailed design of athletic field drainage systems is beyond the expertise of Geosyntec. A specialist should be consulted to design the drainage systems, as needed, and Geosyntec is available to provide geotechnical recommendations related to underdrain design upon request.

3.8 Pavements and Hardscapes

The Site soils are suitable for relatively standard pavement sections. Our recommended hot mix asphalt (HMA) pavement sections for light, medium, and heavy-duty traffic loading are presented in Table 6.

Table 6. Recommended HMA Pavement Sections

Traffic Loading	HMA Thickness (inches)	Crushed Rock Base Course Thickness (inches)
Light (parking stalls for passenger vehicles)	2	4
Medium (drive aisles and queuing/pickup lanes for passenger vehicles)	3	6
Heavy (fire lanes, bus lanes, bus parking)	4	8

We recommend that hardscapes/flatwork be underlain by at least 4 inches of crushed rock top course. This will provide a level working surface on which the hardscapes can be constructed while protecting the underlying subgrade and create a firm bearing layer that is not susceptible to softening, which will support adequate long-term support and performance.

Pavement and hardscape subgrades should be prepared in accordance with the recommendations presented in Section 3.8. Crushed rock base and top course material should meet the requirements for structural fill described in Section 4.6.

3.9 Light Pole Foundations

We understand the Project will include installation of lighting for pavement areas and athletic fields. For design of cast-in-place drilled piers for lighting pole foundations, we recommend using an allowable lateral soil bearing pressure of 2,100 pounds per square foot (psf). The allowable lateral bearing pressure within 2 feet of finished grade should be ignored unless the surface is protected/covered with asphalt or concrete.

4. CONSTRUCTION RECOMMENDATIONS

The following sections present construction recommendations for the Project.

4.1 General Earthwork

We expect that earthwork activities can be accomplished with standard construction equipment suited to working in dense glacially consolidated soils, such as track hoes equipped with toothed buckets. The Contractor should be prepared to encounter and deal with oversized particles, such as cobbles and boulders in the fills and native soils, during excavation.

4.2 Temporary Excavation Slopes

Temporary excavation and slopes should not exceed the limits specified in the local, state, and federal regulations. Temporary shoring will be used where deep excavation is required in the southeast portion of the building addition. Recommendations for temporary shoring are provided in Section 4.3.

The stability of temporary excavations and slopes shall be the responsibility of the Contractor. The fill and recessional outwash classify as Type C soils, and the glacial till classifies as Type A soil in accordance with the Washington Administrative Code (WAC) 296-155 Part N (WSL 2023). Temporary excavation slopes in Type A and C soils are anticipated to stand as steep as 0.75H:1V (horizontal:vertical) and 1.5H:1V, respectively. The presence of seepage may require that temporary excavation slopes be flattened to remain stable.

We also recommend the following for temporary excavations and slopes:

- Surface water should be diverted away from slopes.
- Slopes should be protected using plastic sheets, flash coating, or tarps to control erosion and maintain stability, as necessary.
- The duration that excavations or slopes are open should be minimized.
- Traffic, equipment, and material stockpiles should not be allowed near the top of excavations or slopes.
- The conditions of the excavations and slopes should be periodically observed by a competent person who is a representative of the Contractor to evaluate safety and stability.

4.3 Temporary Shoring Construction

We provide the following recommendations for soldier pile wall temporary shoring construction:

- The Contractor should be prepared to encounter groundwater seepage in the soldier pile shafts. Additionally, the fill and native recessional outwash are expected to be prone to sloughing and caving. Accordingly, the Contractor should be prepared to use temporary casing, drilling mud, or other methods to maintain an open hole and prevent hole

collapse. If there is standing water in the shaft, concrete should be placed with a tremie pipe to displace the water.

- The bottom of the soldier pile shafts should be relatively undisturbed and clear of loose/slough soils and debris prior to placing the beams and filling the shafts with concrete.
- For soldier piles with center-to-center spacing of less than three pile diameters, every other shaft should be drilled and the concrete should be placed and allowed to cure at least 24 hours before adjacent shafts are drilled.
- Excavation for the installation of lagging should be accomplished in 4-foot (maximum) vertical lifts. When the first lift of lagging is complete, the contractor can continue with the excavation in 4-foot lifts until all required lagging has been installed. If caving soils are encountered during excavation, the contractor should be prepared to excavate and install the lagging in shorter lifts. All excavations should be supported by lagging the same working day.
- Any voids that form behind the wall due to caving soils during excavation for lagging should be backfilled with controlled density fill (CDF) or free-draining granular material approved by the geotechnical engineer. Voids should be backfilled the same working day.

4.4 Groundwater Management

The below-grade excavation for the addition will not extend below the regional groundwater table, however, zones of perched groundwater may be encountered during excavation that will need to be managed. Perched groundwater flows are expected to be greatest during the wet season. Based on our experience, we expect perched groundwater that flows into the excavation can be managed using sumps and trash pumps, and flow rates and volume will diminish over time. Perched groundwater may also infiltrate into the relatively permeable subgrade at the bottom of the excavation which would reduce the volume of water to be managed.

4.5 Subgrade Preparation

Pavement, hardscape/flatwork, footings, slabs-on-grade, and athletic field subgrades should be observed and evaluated by Geosyntec prior to placing additional overlying materials to verify they have been prepared in conformance with our recommendations. All subgrades should be compacted to a firm and unyielding condition and clear of vegetation/organics, construction debris, loose or disturbed soil, and standing water prior to construction of overlying improvements or placement of additional fill. We recommend the Contractor pay special attention to compacting slab-on-grade subgrades in existing fill. Cobbles or boulders protruding from subgrades may need to be removed and replaced with structural fill, as directed by the geotechnical engineer.

Subgrade evaluation should include observation of proof-rolling with heavy rubber-tired equipment or manual probing (for areas not accessible to proof-rolling equipment). Soft or disturbed subgrade areas identified during evaluation should be removed to the satisfaction of the geotechnical engineer and replaced with appropriate structural fill material.

The on-site soils are susceptible to disturbance from construction traffic or wet weather. The Contractor is responsible for protecting approved subgrades from disturbance prior to construction of overlying improvements.

4.6 Structural Fill

Soils placed beneath or around foundation elements, walls, utilities, or below pavements should be considered structural fill. For these fill areas, we provide the following recommendations:

- Site-derived soils are likely suitable for re-use as structural fill except for beneath foundations, and subject to evaluation and approval by Geosyntec based on the Contractor's proposed application.
- Imported structural fill to be used below footings where overexcavation is required should consist of Crushed Surfacing, as specified in WSDOT Standard Specification 9-03.9(3) (WSDOT 2026) or lean mix concrete/controlled density fill (CDF).
- Imported structural fill to be used as backfill should consist of Gravel Borrow, as specified in WSDOT Standard Specification 9-03.14(1), or lean mix CDF.
- Structural fill to be used as base course and top course below new pavements and hardscapes should consist of material meeting the requirements of Crushed Surfacing, as specified in WSDOT Standard Specification 9-03.9(3).
- Structural fill should only be placed on a relatively firm and unyielding subgrade.
- Structural fill should be compacted to a relatively firm and unyielding condition to a minimum density of 95 percent of the maximum dry density as determined by ASTM International (ASTM) D1557 (ASTM 2025). Structural fill placed behind walls should be compacted to between 90 to 92 percent of the maximum dry density to avoid overstressing the walls.
- Structural fill should be placed in lifts with a loose thickness no greater than 12 inches when using relatively large compaction equipment, such as a vibrating plate attached to an excavator (hoe pack) or a vibratory smooth drum roller. If small, hand-operated compaction equipment is used to compact structural fill, lifts should not exceed 6 inches in loose thickness.
- Moisture content of the structural fill should be controlled to within 2 to 3 percent of the optimum moisture. Optimum moisture is the moisture content corresponding to the maximum modified proctor dry density.
- Fill placed in softscape, general grading, landscape, or common areas that are not beneath or around structures, utilities, slabs-on-grade, or below paved areas that can accommodate some settlement should be compacted to a relatively firm and unyielding condition.

4.7 Wet Weather Construction

The fill and glacial till soils at the Site are moisture sensitive and may be difficult to handle, prepare, or compact with construction equipment during periods of wet weather. Earthwork is typically most economical when performed under dry weather conditions. If earthwork is to be

performed or fill is to be placed in wet weather or under wet conditions, we provide the following recommendations:

- Earthwork should be performed in small areas to minimize exposure to wet weather. The size and type of construction equipment used may have to be limited to prevent soil disturbance.
- Excavations for foundations and floor slabs should be covered or protected following approval of the subgrade by Geosyntec and should not be left open and exposed.
- Material used as structural fill should consist of clean, granular soil containing less than 7 percent fines.
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller (or equivalent) and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials.
- Excavation and placement of fill should be observed by Geosyntec to verify that all unsuitable materials are removed, and suitable compaction is achieved.
- Local best management practices (BMPs) for erosion control should be strictly followed.

4.8 Auger Cast Pile Installation

We provide the following recommendations related to auger cast pile construction:

- Prior to withdrawal, the Contractor should rotate the auger as the initial grout is pumped to mix any loose cuttings at the bottom of the hole with the grout.
- Grout must be pumped under pressure through the hollow stem as the auger is withdrawn. The rate of auger withdrawal should remain constant to mitigate the potential for pile necking. The grout level should be maintained at least 10 feet above the auger tip at all times.
- Steel reinforcement should be placed in the fresh grout column immediately after the auger is completely withdrawn. Appropriately sized and spaced centralizers should be placed on the reinforcement to provide the necessary concrete cover.
- Adjacent piles should not be installed on the same day.
- Geosyntec should provide full-time inspection of auger cast pile installation to document the Contractor's means and methods, verify the minimum tip elevations are reached, and record grout pump strokes and calculate the grout volume for each pile.
- In addition to full-time inspection of auger cast pile installation by Geosyntec, we recommend conducting post-installation integrity testing on piles to verify the Contractor is producing acceptable piles. FHWA (2007) provides guidance on pile integrity testing. The most common and economical type of integrity testing for auger cast piles is sonic echo testing, which in our opinion is appropriate for the auger cast piles for this Project.

4.9 Light Pole Foundation Construction

Shaft excavations for light pole foundations might require dealing with sloughing/caving sidewalls where excavations extend through fill soil or where groundwater seeps are encountered. In our experience, such conditions can be managed by making multiple passes to clean out sloughed soil until the sidewalls have stabilized, or with the use of temporary casing. The Contractor should be prepared to use temporary casing, as necessary.

5. REFERENCES

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WSL. 2023. Washington Administrative Code, Chapter 296-155 WAC: Safety Standards for Construction Work. Washington State Legislature. February 20.

6. LIMITATIONS

Work for this project was performed for Sumner-Bonney Lake School District (Client), and this report was prepared consistent with recognized standards of professionals in the same locality and involving similar conditions, at the time the work was performed. No other warranty, expressed or implied, is made by Geosyntec Consultants, Inc. (Geosyntec).

Recommendations presented herein are based on our interpretation of site conditions, geotechnical engineering calculations, and judgment in accordance with our mutually agreed-upon scope of work. Our recommendations are unique and specific to the project, site, and Client. Application of this report for any purpose other than the project should be done only after consultation with Geosyntec.

Variations may exist between the soil and groundwater conditions reported and those actually underlying the site. The nature and extent of such soil variations may change over time and may not be evident before construction begins. If any soil conditions are encountered at the site that are different from those described in this report, Geosyntec should be notified immediately to review the applicability of our recommendations.

Risks are inherent with any site involving slopes and no recommendations, geologic analysis, or engineering design can assure slope stability. Our observations, findings, and opinions are a means to identify and reduce the inherent risks to the Client.

It is the Client's responsibility to see that all parties to this project, including the designer, contractor, subcontractors, and agents, are made aware of this report in its entirety. At the time of this report, design plans and construction methods have not been finalized, and the recommendations presented herein are based on preliminary project information. If project developments result in changes from the preliminary project information, Geosyntec should be contacted to determine if our recommendations contained in this report should be revised and/or expanded upon.

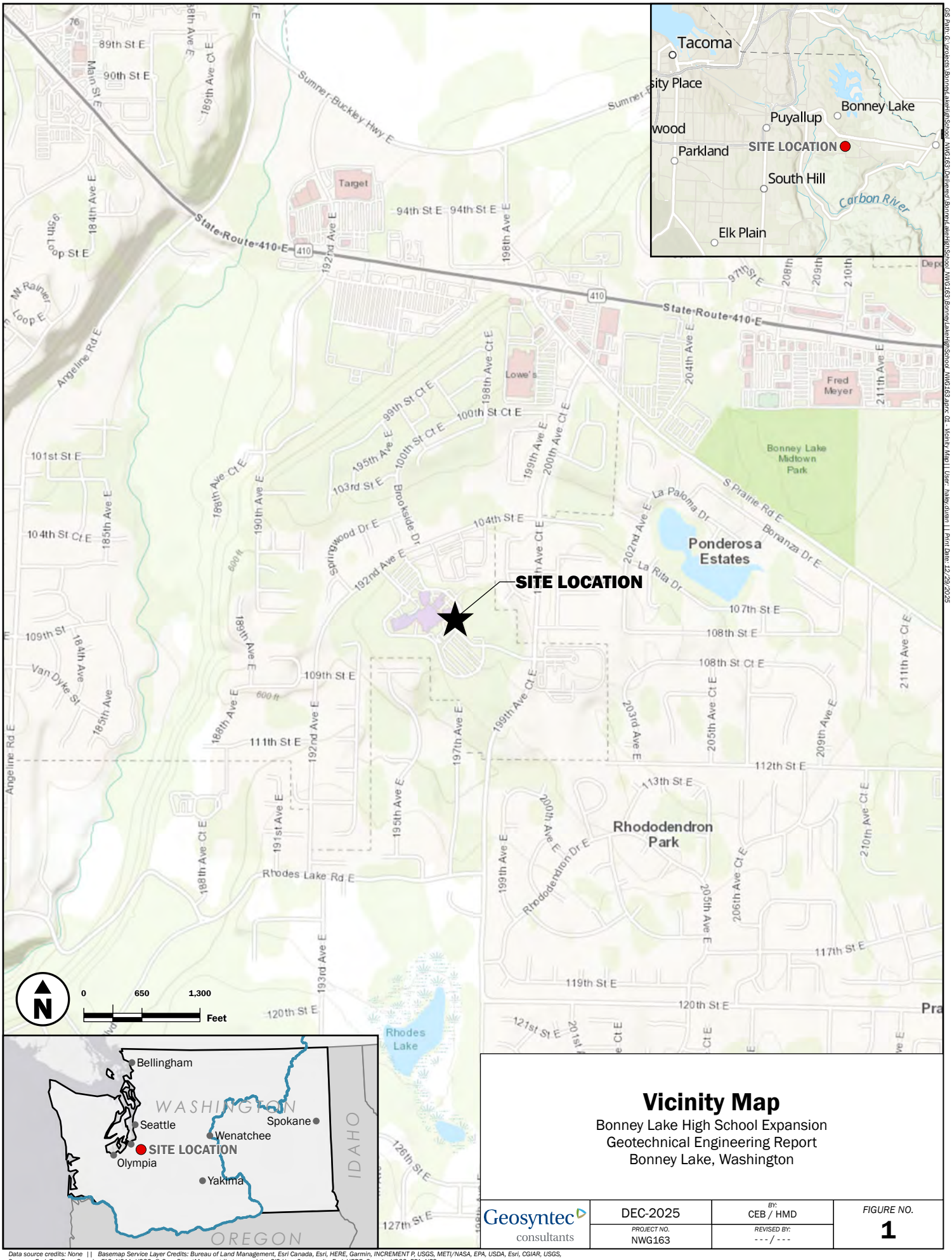
The scope of work does not include services related to construction safety precautions. Site safety is typically the responsibility of the contractor, and our recommendations are not intended to direct the contractor’s site safety methods, techniques, sequences, or procedures. The scope of our work also does not include the assessment of environmental characteristics, particularly those involving potentially hazardous substances in soil or groundwater.

All reports prepared by Geosyntec for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Geosyntec. Geosyntec’s original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Please refer to Appendix B titled “Report Limitations and Guidelines for Use” for additional information governing the use of this report.

We appreciate the opportunity to perform these services. If you have any questions, please call Eric Schellenger, PE, Geotechnical Engineer, at 206-780-7745.

FIGURES

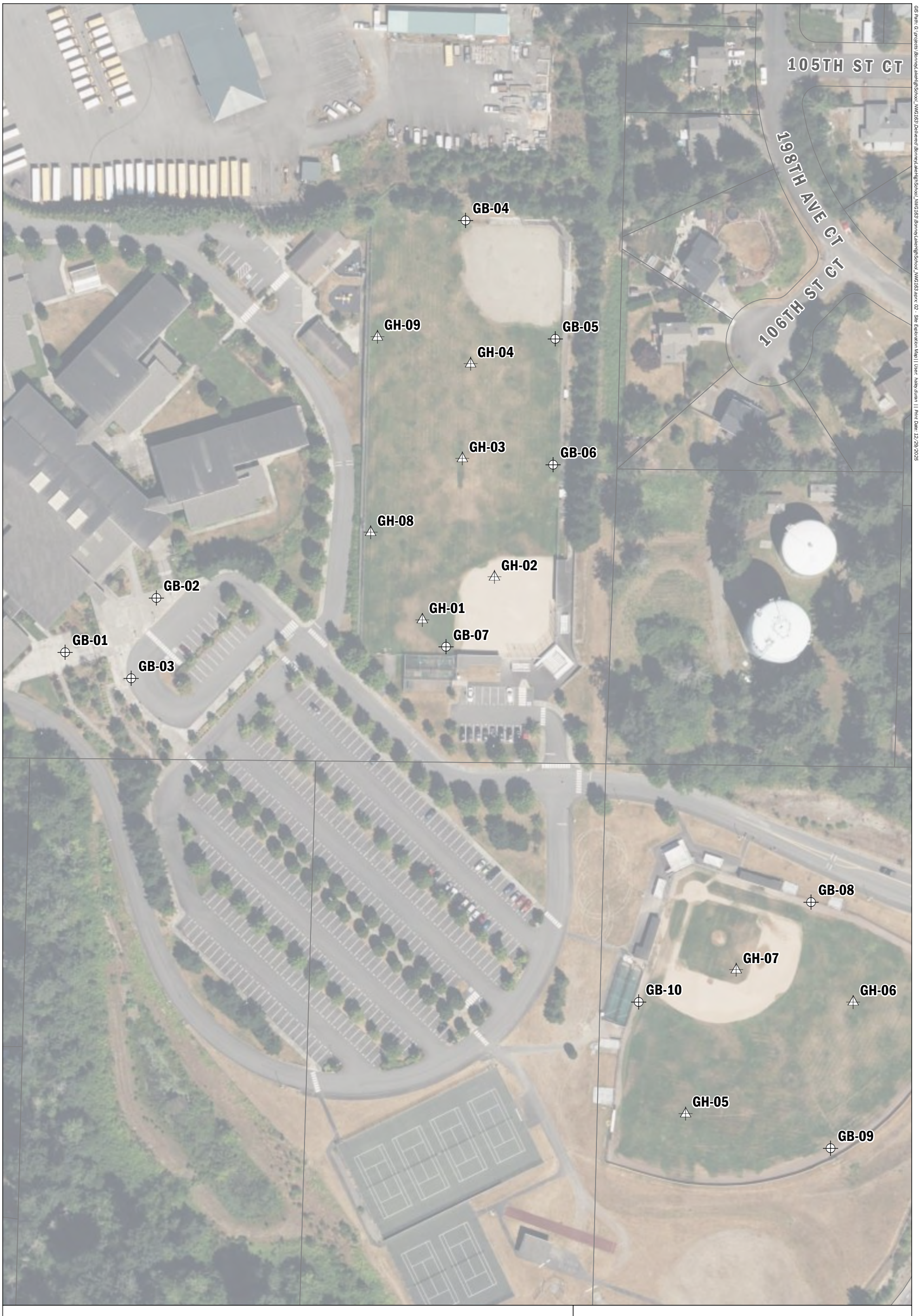


Vicinity Map

Bonney Lake High School Expansion
Geotechnical Engineering Report
Bonney Lake, Washington

Geosyntec consultants	DEC-2025	BY: CEB / HMD	FIGURE NO. 1
	PROJECT NO. NWG163	REVISED BY: ---/---	

Data source credits: None || Basemap Service Layer Credits: Bureau of Land Management, Esri Canada, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA, Esri, CGIAR, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, HERE, Garmin, USGS, EPA, NPS



Boring

Hand Auger

Pierce County Tax Parcel

N

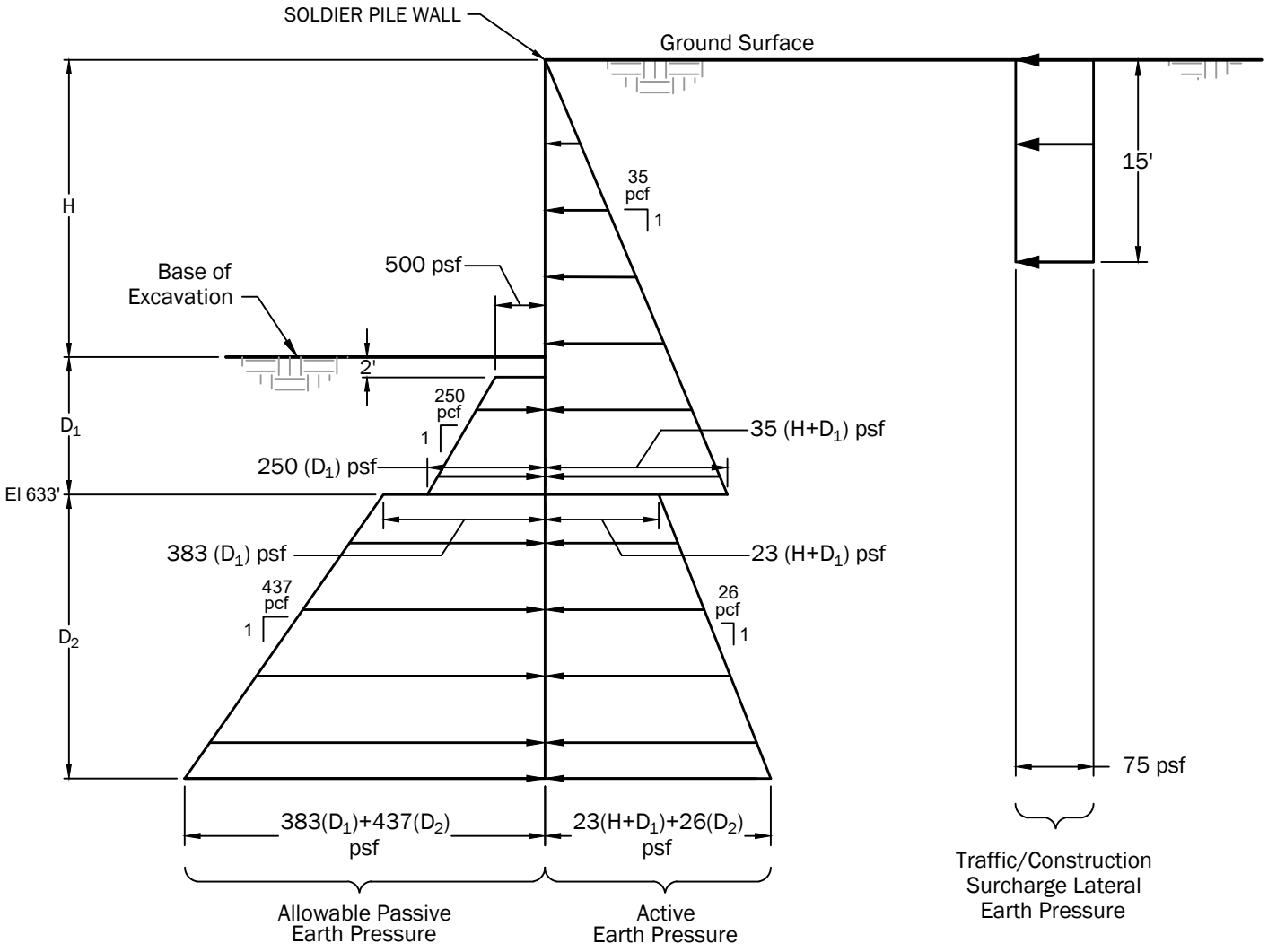
0 75 150 Feet

Site Exploration Map

Bonney Lake High School Expansion
Geotechnical Engineering Report
Bonney Lake, Washington

Geosyntec consultants	DEC-2025	BY: CEB / HMD	FIGURE NO. 2
	PROJECT NO. NWG163	REVISED BY: ---/---	

GIS Path: G:\projects\Bonney Lake High School_NWG163\Delivered\Bonney Lake High School_NWG163\Bonney Lake High School_NWG163.aprx 02 - Site Exploration Map || User: haley.duran || Print Date: 12/29/2025



NOTES:

1. Active earth pressures and surcharge lateral earth pressure act over the pile center-to-center spacing above the base of the excavation and over the concreted pile diameter below the base of the excavation.
2. Passive earth pressure acts over 3 times the soldier pile shaft diameter, or the soldier pile center-to-center spacing, whichever is less.
3. Allowable passive earth pressure includes a factor of safety of 1.5.
4. Additional lateral earth pressures from other loads should be calculated using Figure 4 and added to the earth pressures presented above. Geosyntec should be notified to evaluate additional lateral earth pressures from soil stockpiles, cranes, or other heavy equipment situated behind the shoring.
5. Hydrostatic pressures are excluded because it is assumed that drained conditions will exist.

NOT TO SCALE

LEGEND:

H = Height of Wall, Feet

D_1 = Soldier Pile Embedment Depth above El. 633', Feet

D_2 = Soldier Pile Embedment Depth below El. 633', Feet

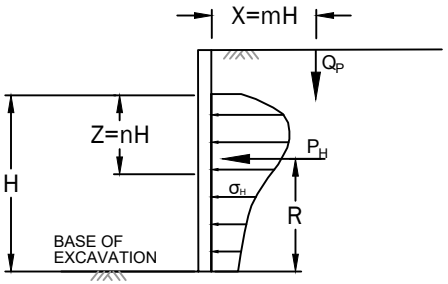
psf = Pounds per Square Foot

Lateral Earth Pressure Diagram
Cantilever Soldier Pile Temporary Shoring

Bonney Lake High School Expansion
Bonney Lake, Washington

Geosyntec consultants	Jan-2026	BY: JMM/CMV	FIGURE NO. 3
	PROJECT NO. NWW0163	REVISED BY: -	

LATERAL EARTH PRESSURE FROM POINT LOAD, Q_P (SPREAD FOOTING)



FOR $m \le 0.4$

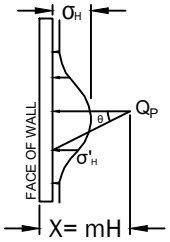
$$\sigma_H = \frac{0.28\, Q_P\, n^2}{H^2\,(0.16 + n^2)^3}$$

FOR $m > 0.4$

$$\sigma_H = \frac{1.77\, Q_P\, m^2\, n^2}{H^2\,(m^2 + n^2)^3}$$

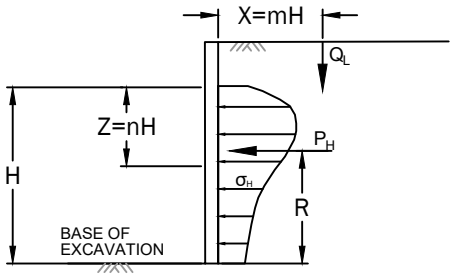
$$\sigma'_H = \sigma_H \cos^2(1.1\,\theta)$$

M	$P_H\left(\frac{H}{Q_P}\right)$	R
0.2	0.78	0.59H
0.4	0.78	0.59H
0.6	0.45	0.48H



Pressures from Point Load Q_P

LATERAL EARTH PRESSURE FROM LINE LOAD, Q_L (CONTINUOUS WALL FOOTING)



FOR $m \le 0.4$

$$\sigma_H = \frac{0.2\, Q_L\, n}{H\,(0.16 + n^2)^2}$$

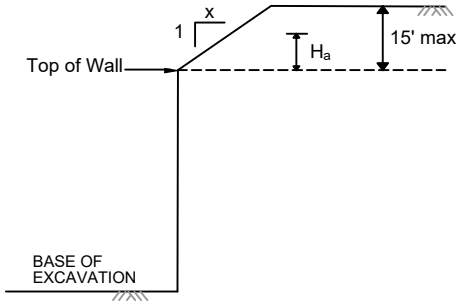
FOR $m > 0.4$

$$\sigma_H = \frac{1.28\, Q_L\, m^2\, n}{H\,(m^2 + n^2)^2}$$

RESULTANT $P_H = \dfrac{0.64\, Q_L}{(m^2 + 1)}$

M	R
0.1	0.60H
0.3	0.60H
0.5	0.56H
0.7	0.48H

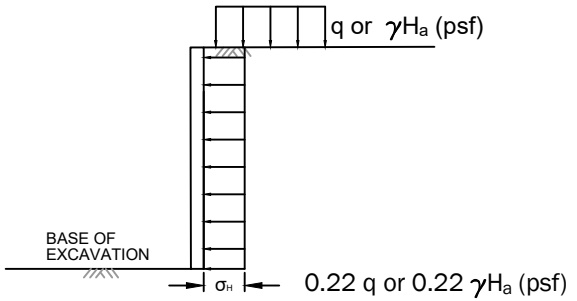
EFFECTIVE HEIGHT, H_a, FOR SLOPED CUTS ABOVE TEMPORARY SHORING



x	Slope Height, ft 5	10	15
1	5	9	12
1 1/2	4	7	9

} Values of H_a

UNIFORM SURCHARGES, q
(FLOOR LOADS, LARGE FOUNDATION ELEMENTS)



σ_H = LATERAL SURCHARGE PRESSURE FROM UNIFORM SURCHARGE

NOT TO SCALE

NOTES

1. Procedures for estimating surcharge pressures shown above are based on Manual 7.02 Naval Facilities Engineering Command, September 1986 (NAVFAC DM 7.02).
2. Lateral earth pressures from surcharge should be added to earth pressures presented in Figure 5 on a case-by-case basis.
3. See report text for where surcharge pressures are appropriate.

Recommended Surcharge Pressures

Bonney Lake High School Expansion
Bonney Lake, Washington

Geosyntec consultants	Jan-2026	BY: ECS / CMV	FIGURE NO. 4
	PROJECT NO. NWW0163	REVISED BY: -	

Geosyntec consultants

APPENDIX A
Geosyntec Subsurface Explorations

A. GEOSYNTEC SUBSURFACE EXPLORATIONS

In December 2025, Geosyntec completed 10 drilled borings (designated GB-01 through GB-10) and 9 hand auger borings (designated GH-01 through GH-09) at the Site. The drilled borings were advanced using hollow-stem auger drilling methods with a track-mounted drill rig operated by Boretec1, Inc. under subcontract to Geosyntec. The hand auger borings were advanced using hand tools by a Geosyntec geologist.

In the drilled borings, we obtained disturbed soil samples by driving a 2-inch split barrel sampler a distance of 18 inches into the soil with a 140-pound hammer free-falling a distance of 30 inches in accordance with ASTM D1586, *Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils* (ASTM 2025). The number of blows required to drive the sampler 18 inches is recorded in three 6-inch intervals. The number of blows required to drive the sampler the last two intervals is known as the blow count. The blow count provides a measure of relative density or consistency of granular and cohesive soils, respectively.

Grab samples were collected from the cuttings/spoils from the hand augers.

A Geosyntec geologist was present throughout the exploration program to observe the drilling procedures, assist in sampling, and to prepare descriptive logs of the explorations. Soils were identified in general accordance with ASTM D2488, *Standard Practice for Description and Identification of Soils* (*Visual-Manual Procedure)* (ASTM 2025). The summary exploration logs represent our interpretation of the contents of the field logs. The stratigraphic contacts shown on the individual summary logs represent the approximate boundaries between soil types; actual transitions may be more gradual. The subsurface conditions depicted are only for the specific date and locations reported, and therefore, are not necessarily representative of other locations and times.

Upon completion, the boreholes were backfilled with 3/8-inch bentonite chips in accordance with requirements of the Washington State Department of Ecology. The hand auger borings were backfilled with the excavated materials.

The approximate locations of these explorations are shown on Figure 2. The exploration locations are based on measurements made in the field and are not surveyed.

Coarse-Grained Soils - More than 50%[1] Retained on No. 200 Sieve	Gravels - More than 50%[1] of Coarse Fraction Retained on No. 4 Sieve	≤5% Fines	GW	Well-graded GRAVEL Well-graded GRAVEL WITH SAND
			GP	Poorly-graded GRAVEL Poorly-graded GRAVEL WITH SAND
		≥15% Fines	GM	SILTY GRAVEL SILTY GRAVEL WITH SAND
			GC	CLAYEY GRAVEL CLAYEY GRAVEL WITH SAND
	Sands - 50%[1] or More of Coarse Fraction Passes No. 4 Sieve	≤5% Fines	SW	Well-graded SAND Well-graded SAND WITH GRAVEL
			SP	Poorly-graded SAND Poorly-graded SAND WITH GRAVEL
		≥15% Fines	SM	SILTY SAND SILTY SAND WITH GRAVEL
			SC	CLAYEY SAND CLAYEY SAND WITH GRAVEL
Fine-Grained Soils - 50%[1] or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50%		ML	SILT SANDY or GRAVELLY SILT SILT WITH SAND SILT WITH GRAVEL
			CL	LEAN CLAY SANDY or GRAVELLY LEAN CLAY LEAN CLAY WITH SAND LEAN CLAY WITH GRAVEL
			OL	ORGANIC SILT SANDY or GRAVELLY ORGANIC SILT ORGANIC SILT WITH SAND ORGANIC SILT WITH GRAVEL
	Silts and Clays Liquid Limit 50% or More		MH	ELASTIC SILT SANDY or GRAVELLY ELASTIC SILT ELASTIC SILT WITH SAND ELASTIC SILT WITH GRAVEL
			CH	FAT CLAY SANDY or GRAVELLY FAT CLAY FAT CLAY WITH SAND FAT CLAY WITH GRAVEL
			OH	ORGANIC CLAY SANDY or GRAVELLY ORGANIC CLAY ORGANIC CLAY WITH SAND ORGANIC CLAY WITH GRAVEL
Highly Organic Soils			PT	PEAT and other mostly organic soils

"WITH SILT" or "WITH CLAY" means 5 to 15% silt and clay, denoted by a "-" in the group name; e.g., SP-SM • "SILTY" or "CLAYEY" means >15% silt and clay • "WITH SAND" or "WITH GRAVEL" means 15 to 30% sand and gravel. • "SANDY" or "GRAVELLY" means >30% sand and gravel. • "Well-graded" means approximately equal amounts of fine to coarse grain sizes • "Poorly graded" means unequal amounts of grain sizes • Group names separated by "/" means soil contains layers of the two soil types; e.g., SM/ML.

Soils were described and identified in the field in general accordance with the methods described in ASTM D2488. Where indicated in the log, soils were classified using ASTM D2487 or other laboratory tests as appropriate. Refer to the report accompanying these exploration logs for details.

1. Estimated or measured percentage by dry weight
2. (SPT) Standard Penetration Test (ASTM D1586)
3. Determined by SPT, DCPT (ASTM STP399) or other field methods. See report text for details.

GEOTECHNICAL LAB TESTS

MC	=	Natural Moisture Content
PS	=	Particle Size Distribution
FC	=	Fines Content (% < 0.075 mm)
GH	=	Hydrometer Test
AL	=	Atterberg Limits
C	=	Consolidation Test
Str	=	Strength Test
OC	=	Organic Content (% Loss by Ignition)
Comp	=	Proctor Test
K	=	Hydraulic Conductivity Test
SG	=	Specific Gravity Test

CHEMICAL LAB TESTS

Organic Chemicals

BTEX	=	Benzene, Toluene, Ethylbenzene, Xylenes
TPH-Dx	=	Diesel and Oil-Range Petroleum Hydrocarbons
TPH-G	=	Gasoline-Range Petroleum Hydrocarbons
VOCs	=	Volatile Organic Compounds
SVOCs	=	Semi-Volatile Organic Compounds
PAHs	=	Polycyclic Aromatic Hydrocarbon Compounds
PCBs	=	Polychlorinated Biphenyls

Metals

RCRA8	=	As, Ba, Cd, Cr, Pb, Hg, Se, Ag, (d = dissolved, t = total)
MTCA5	=	As, Cd, Cr, Hg, Pb (d = dissolved, t = total)
PP-13	=	Ag, As, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, Tl, Zn (d=dissolved, t=total)

FIELD TESTS

PID	=	Photoionization Detector
Sheen	=	Oil Sheen Test
SPT[2]	=	Standard Penetration Test
NSPT	=	Non-Standard Penetration Test
DCPT	=	Dynamic Cone Penetration Test

COMPONENT DEFINITIONS

Descriptive Term		*Size Range and Sieve Number*
Boulders	=	Larger than 12 inches
Cobbles	=	3 inches to 12 inches
Coarse Gravel	=	3 inches to 3/4 inches
Fine Gravel	=	3/4 inches to No. 4 (4.75 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)

ESTIMATED[1] PERCENTAGE

% by Weight		*Modifier*	*% by Weight*		*Modifier*
<1	=	Subtrace	15 to 25	=	Little
1 to <5	=	Trace	30 to 45	=	Some
5 to 10	=	Few	>50	=	Mostly

MOISTURE CONTENT

Dry	=	Absence of moisture, dusty, dry to the touch
Slightly Moist	=	Perceptible moisture
Moist	=	Damp but no visible water
Very Moist	=	Water visible but not free draining
Wet	=	Visible free water, usually from below water table

RELATIVE DENSITY

Non-Cohesive or Coarse-Grained Soils

Density[3]		*SPT*[2] *Blows/Foot*	*Penetration with 1/2" Diameter Rod*
Very Loose	=	0 to 4	≥ 2'
Loose	=	5 to 10	1' to 2'
Medium Dense	=	11 to 30	3" to 1'
Dense	=	31 to 50	1" to 3"
Very Dense	=	> 50	< 1"

CONSISTENCY

Cohesive or Fine-Grained Soils

Consistency[3]		*SPT*[2] *Blows/Foot*	*Manual Test*
Very Soft	=	0 to 1	Penetrated >1" easily by thumb. Extrudes between thumb & fingers.
Soft	=	2 to 4	Penetrated 1/4" to 1" easily by thumb. Easily molded.
Medium Stiff	=	5 to 8	Penetrated >1/4" with effort by thumb. Molded with strong pressure.
Stiff	=	9 to 15	Indented ~1/4" with effort by thumb.
Very Stiff	=	16 to 30	Indented easily by thumbnail.
Hard	=	> 30	Indented with difficulty by thumbnail.

GEOLOGIC CONTACTS

Observed and Distinct — Observed and Gradual — Inferred

Geosyntec consultants

Exploration Log Key

Geosyntec consultants

Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2.	47.1589, -122.1687	GB-01

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Boretec1, Inc.	RTC60	Rope & cathead; 140 lb hammer; 30" drop	655'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Tommy	8.5" OD X 4.25" ID Hollow-Stem Auger	12/22/2025	NA	12.5' (Seep)

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
1	654	Capped with 6 inches of concrete.						**CONCRETE** CONCRETE; 5 inches thick.	1
1	654	Backfilled with drill cuttings.						**FILL** GRAVEL (GP); loose, moist, gray; fine to coarse angular gravel.	1
2	653								2
3	652		S1	▲	3 2 7			SANDY SILT WITH GRAVEL (ML); loose, moist, gray brown; fine to coarse sand; fine to coarse, subangular gravel.	3
4	651	Backfilled with medium bentonite chips.							4
5	650		S2		6 10 10			SILTY SAND WITH GRAVEL (SM); medium dense, moist, brown; fine to medium sand; fine angular gravel; small wood fragments and organics.	5
6	649			▲					6
7	648								7
8	647		S3		5 10 32			SAND WITH SILT AND GRAVEL (SP-SM); dense, moist, gray brown; fine to coarse sand; fine to coarse subangular to subrounded gravel; subtrace organics (wood fragments).	8
9	646			▲				**RECESSIONAL OUTWASH** GRAVEL WITH SILT, SAND, AND COBBLES (GP-GM); very dense, moist, gray brown; fine to coarse sand; fine to coarse subangular to subrounded gravel; crushed rock in sampler indicating presence of cobbles.	9
10	645	Crushed rock in sampler. Blow counts may be overstated due to presence of cobbles.	S4		36 27 24				10
11	644			▲					11
12	643								12
12	643	12/22/2025	S5		50/6"			**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, wet, gray brown; fine to coarse sand; fine to coarse, subangular to subrounded, faceted gravel; socketing.	12
13	642			▲					13
14	641								14
15	640		S6		50/6"			Becomes moist.	15
15	640			▲					15
16	639								16
17	638								17
18	637								18
19	636								19
20	635		S7		33 32 30				20
21	634			▲					21
22	633							Bottom of exploration at 21.5 ft. bgs.	22
23	632								23
24	631								24

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⊣ Liquid Limit

Water Level
- ▽ Water Level (Seepage)

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GB-01
Sheet 1 of 1

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Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2.	47.1591, -122.1682	GB-02

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Boretec1, Inc.	EC95	Rope & cathead; 140 lb hammer; 30" drop	668'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Tommy	8.5" OD X 4.25" ID Hollow-Stem Auger	12/22/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
1	667	Capped with 6 inches of concrete.						**CONCRETE** CONCRETE; 5 inches thick.	1
1	667	Backfilled with drill cuttings.						**FILL** GRAVEL (GP); loose, moist, gray; coarse, subangular gravel.	1
2	666							SILTY SAND WITH GRAVEL (SM); medium dense, moist, gray brown; fine to coarse sand; fine to coarse, subangular to subrounded gravel.	2
3	665		S1	▲	14 8 18				3
4	664	Backfilled with medium bentonite chips.							4
5	663		S2		4 6				5
6	662			▲	7				6
7	661								7
8	660		S3	▲	9 10 13			Becomes with small dark brown organics at 8 feet bgs.	8
9	659								9
10	658		S4		9 7				10
11	657			▲	7				11
12	656								12
13	655		S5		4 4 10			Becomes with iron-oxide staining.	13
14	654			▲					14
15	653		S6		7 8			Becomes very moist and with subtrace organics.	15
16	652			▲	5				16
17	651								17
18	650							**RECESSIONAL OUTWASH** SAND WITH SILT (SP-SM); loose, moist, brown; fine to medium sand.	18
19	649								19
20	648		S7		7 5				20
21	647			▲	5				21
22	646								22
23	645								23
24	644								24

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⊣ Liquid Limit

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GB-02
Sheet 1 of 2

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Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2.	47.1591, -122.1682	**GB-02**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Boretec1, Inc.	EC95	Rope & cathead; 140 lb hammer; 30" drop	668'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Tommy	8.5" OD X 4.25" ID Hollow-Stem Auger	12/22/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
26	642		S8		10 14 12			SAND WITH SILT AND GRAVEL (SP-SM); medium dense, moist, gray brown; fine to coarse sand; fine to coarse, subrounded gravel.	26
27	641								27
28	640								28
29	639								29
30	638		S9		11 9 16			SILTY SAND WITH GRAVEL (SM); medium dense, moist, gray brown; fine to coarse sand; fine to coarse subangular to subrounded gravel.	30
31	637								31
32	636								32
33	635								33
34	634								34
35	633		S10		50/3"			**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, moist, gray brown; fine to coarse sand, fine to coarse faceted gravel; socketing.	35
36	632								36
37	631								37
38	630								38
39	629								39
40	628		S11		50/4"			Bottom of exploration at 40.33 ft. bgs.	40
41	627								41
42	626								42
43	625								43
44	624								44
45	623								45
46	622								46
47	621								47
48	620								48
49	619								49

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⊣ Liquid Limit

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
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Exploration Log GB-02
Sheet 2 of 2

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Bonney Lake High School Expansion - NWW0163 — Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2.	47.1602, -122.1668	**GB-03**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Boretec1, Inc.	EC95	Rope & cathead; 140 lb hammer; 30" drop	668'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Tommy	8.5" OD X 4.25" ID Hollow-Stem Auger	12/22/2025	NA	5' (Seep) 12.5' (Seep)

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
1	667	Capped with 6-inch-thick asphalt patch. Backfilled with drill cuttings.						**ASPHALT** ASPHALT; 3 inches thick over 3 inches of base course.	1
								FILL SILTY SAND WITH GRAVEL (SM); loose, moist, brown; fine to coarse sand; fine to coarse subangular to subrounded gravel.	
2	666								2
3	665		S1	▲	2 2 5				3
4	664	Backfilled with medium bentonite chips.							4
5	663	▽ 12/22/2025			4			Becomes medium dense and wet.	5
6	662		S2	▲	11 10				6
7	661								7
8	660		S3	▲	10 15 13			Becomes moist.	8
9	659								9
10	658		S4		5			Becomes with iron-oxide staining.	10
11	657			▲	7 11				11
12	656								12
13	655	▽ 12/22/2025	S5	▲	3 5 7				13
14	654								14
15	653		S6		5				15
16	652			▲	6 13				16
17	651								17
18	650							**RECESSIONAL OUTWASH** GRAVEL WITH SILT AND SAND (GP-GM); medium dense, very moist, gray brown; fine to coarse sand; fine to coarse, subangular to subrounded gravel.	18
19	649								19
20	648		S7		5				20
21	647			▲	3 13				21
22	646								22
23	645								23
24	644								24

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢ Liquid Limit

Water Level
- ▽ Water Level (Seepage)

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GB-03

Sheet 1 of 2

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Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2.	47.1602, -122.1668	**GB-03**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Boretec1, Inc.	EC95	Rope & cathead; 140 lb hammer; 30" drop	668'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Tommy	8.5" OD X 4.25" ID Hollow-Stem Auger	12/22/2025	NA	5' (Seep) 12.5' (Seep)

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
26	642		S8		49 50/5"			**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, moist, gray brown; fine to coarse sand; fine to coarse subangular to subrounded faceted gravel; socketing.	26
27	641								27
28	640								28
29	639								29
30	638		S9		50/4"				30
31	637							Bottom of exploration at 30.33 ft. bgs.	31
32	636								32
33	635								33
34	634								34
35	633								35
36	632								36
37	631								37
38	630								38
39	629								39
40	628								40
41	627								41
42	626								42
43	625								43
44	624								44
45	623								45
46	622								46
47	621								47
48	620								48
49	619								49

Legend

Sample Type
- No Soil Sample Recovery
- Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⊣ Liquid Limit

Water Level
- Water Level (Seepage)

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GB-03
Sheet 2 of 2

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Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2.	47.1602, -122.1668	**GB-04**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Boretec1, Inc.	EC95	Rope & cathead; 140 lb hammer; 30" drop	674'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Tommy	8.5" OD X 4.25" ID Hollow-Stem Auger	12/22/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%) ● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0		Capped with drill cuttings.						**GRASS AND ROOT ZONE** SILT WITH SAND (ML); loose, moist, dark brown; fine to medium sand; small roots; 3 inches thick.	0
								FILL SANDY SILT WITH GRAVEL (ML); loose, moist, dark brown; fine to medium sand; small roots.	
1	673		S1		12 27 40			**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, moist, gray; fine to coarse sand; fine to coarse subrounded to subangular faceted gravel, socketing.	1
2	672	Backfilled with medium bentonite chips.							2
3	671		S2		48 50/5"				3
4	670								4
5	669		S3		43 45 50/3"				5
6	668							Bottom of exploration at 5.75 ft. bgs.	6
7	667								7
8	666								8
9	665								9

Legend

Sample Type: ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⊣ Liquid Limit

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GB-04

Sheet 1 of 1

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Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2.	47.1599, -122.1664	**GB-05**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Boretec1, Inc.	EC95	Rope & cathead; 140 lb hammer; 30" drop	676'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Tommy	8.5" OD X 4.25" ID Hollow-Stem Auger	12/22/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0		Capped with drill cuttings.						**GRASS AND ROOT ZONE** SILT WITH SAND (ML); loose, moist, dark brown; fine to medium sand; small roots; 3 inches thick.	0
								FILL SANDY SILT WITH GRAVEL (ML); medium dense, moist, dark brown; fine to medium sand; small roots.	
1	675		S1	▲	6 5 8				1
2	674	Backfilled with medium bentonite chips.							2
			S2		50/6"			**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, moist, gray; fine to coarse sand; fine to coarse subrounded to subangular faceted gravel, socketing.	
3	673			●					3
4	672								4
5	671		S3		50/4"				5
								Bottom of exploration at 5.33 ft. bgs.	
6	670								6
7	669								7
8	668								8
9	667								9

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⊣ Liquid Limit

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GB-05
Sheet 1 of 1

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Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2.	47.1595, -122.1664	**GB-06**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Boretec1, Inc.	EC95	Rope & cathead; 140 lb hammer; 30" drop	678'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Tommy	8.5" OD X 4.25" ID Hollow-Stem Auger	12/23/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
		Capped with drill cuttings.						**GRASS AND ROOT ZONE** SILT WITH SAND (ML); loose, moist, dark brown; fine to medium sand; small roots; 3 inches thick.	
								FILL SANDY SILT WITH GRAVEL (ML); loose, moist, dark brown; fine to medium sand; small roots.	
1	677		S1		10 11 23			**VASHON TILL** SILTY SAND WITH GRAVEL (SM); dense, moist, gray; fine to coarse sand; fine to coarse subrounded to subangular faceted gravel, socketing.	1
2	676	Backfilled with medium bentonite chips.	S2		50/6"				2
3	675								3
4	674								4
5	673		S3		24 50/5"			Becomes very dense.	5
6	672							Bottom of exploration at 5.9 ft. bgs.	6
7	671								7
8	670								8
9	669								9

Legend

Sample Type: ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⊣ Liquid Limit

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GB-06
Sheet 1 of 1

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Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2.	47.1589, -122.1669	GB-07

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Boretec1, Inc.	EC95	Rope & cathead; 140 lb hammer; 30" drop	679'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Tommy	8.5" OD X 4.25" ID Hollow-Stem Auger	12/23/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0	679	Capped with drill cuttings.						**GRASS AND ROOT ZONE** SILT WITH SAND (ML); loose, moist, dark brown; fine to medium sand; small roots; 3 inches thick.	0
								FILL SANDY SILT WITH GRAVEL (ML); loose, moist, dark brown; fine to medium sand; small roots.	
1	678		S2		14 20 42			**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, moist, gray; fine to coarse sand; fine to coarse subrounded to subangular faceted gravel, socketing.	1
2	677	Backfilled with medium bentonite chips.							2
3	676		S2		50/5"				3
4	675								4
5	674		S3		29 50/4"				5
6	673							Bottom of exploration at 5.8 ft. bgs.	6
7	672								7
8	671								8
9	670								9

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⊣ Liquid Limit

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GB-07
Sheet 1 of 1

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Geosyntec consultants

Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2.	47.1581, -122.1652	**GB-08**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Boretec1, Inc.	EC95	Rope & cathead; 140 lb hammer; 30" drop	681'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Tommy	8.5" OD X 4.25" ID Hollow-Stem Auger	12/23/2025	NA	1' (ATD)

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%) ● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0	681	Capped with drill cuttings.						**FILL** SAND (SP); loose, moist, brown; coarse sand.	0
								SANDY SILT WITH GRAVEL (ML); loose, moist, dark brown; fine to medium sand; small roots.	
1	680	▽ 2/23/2025 Perched groundwater at 1 foot bgs.	S1		9 10 11			**WEATHERED VASHON TILL** SILTY SAND WITH GRAVEL (SM); medium dense, wet, gray brown; fine to coarse sand; fine to coarse, faceted gravel.	1
2	679	Backfilled with medium bentonite chips.							2
3	678		S2		17 50/5"			**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, moist, gray; fine to coarse sand; fine to coarse subrounded to subangular faceted gravel, socketing.	3
4	677								4
5	676		S3		42 50/3"				5
6	675							Bottom of exploration at 5.75 ft. bgs.	6
7	674								7
8	673								8
9	672								9

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⊣ Liquid Limit

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GB-08
Sheet 1 of 1

_STDLOG_GSLOG0 P:\GINTW\PROJECTS\BONNEY LAKE HIGHSCHOOL ADDITION.GPJ February 25, 2026

Geosyntec consultants

Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2.	47.1573, -122.1651	**GB-09**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Boretec1, Inc.	EC95	Rope & cathead; 140 lb hammer; 30" drop	677'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Tommy	8.5" OD X 4.25" ID Hollow-Stem Auger	12/23/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
		Capped with drill cuttings.						**GRASS AND ROOT ZONE** SILT WITH SAND (ML); loose, moist, dark brown; fine to medium sand; small roots; 3 inches thick.	
								FILL SANDY SILT WITH GRAVEL (ML); loose, moist, dark brown; fine to medium sand; small roots.	
1	676		S1		8 18 23			**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, moist, gray; fine to coarse sand; fine to coarse subrounded to subangular faceted gravel, socketing.	1
2	675	Backfilled with medium bentonite chips.							2
			S2		50/6"				
3	674								3
4	673								4
5	672		S3		8 16 48				5
6	671								6
								Bottom of exploration at 6.5 ft. bgs.	
7	670								7
8	669								8
9	668								9

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⊣ Liquid Limit

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GB-09
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Geosyntec consultants

Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2.	47.1578, -122.1660	**GB-10**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Boretec1, Inc.	EC95	Rope & cathead; 140 lb hammer; 30" drop	681'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Tommy	8.5" OD X 4.25" ID Hollow-Stem Auger	12/23/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%) ● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0		Capped with drill cuttings.						**FILL** SAND (SP); loose, moist, brown; coarse sand.	0
								SANDY SILT WITH GRAVEL (ML); loose, moist, dark brown; fine to medium sand; small roots.	
1	680		S1		8 7 11			SILTY SAND WITH GRAVEL (SM); medium dense, moist, gray brown; fine to coarse sand; fine to coarse subangular gravel; iron-oxide stains; wood fragments.	1
2	679	Backfilled with medium bentonite chips.		▲					2
3	678		S2		12 6 7				3
4	677			▲					4
5	676		S3		8 24 32			**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, moist, gray brown; fine to coarse sand; fine to coarse subrounded to subangular faceted gravel, socketing.	5
6	675			▲					6
7	674								7
8	673		S4	▲	36 50/5"			Bottom of exploration at 8.4 ft. bgs.	8
9	672								9

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⊣ Liquid Limit

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GB-10
Sheet 1 of 1

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Geosyntec consultants

Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2	47.1590, -122.1670	**GH-01**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Geosyntec	3-inch-diameter hand auger	Grab	678'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
CB	Hand tools	12/22/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0	678							**GRASS AND ROOT ZONE** SILT WITH SAND (ML); loose, moist, dark brown; fine to medium sand; small roots; 3 inches thick.	0
								FILL SANDY SILT WITH GRAVEL (ML); loose, moist, dark brown; fine to coarse sand; fine to coarse gravel; small roots.	
1	677	Backfilled with soil cuttings and capped with grass.				T-probe =Less than 1"		**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, moist, gray brown; fine to coarse sand; fine to coarse, subangular to subrounded, faceted gravel.	1
2	676							Bottom of exploration at 1.1 ft. bgs.	2
3	675								3
4	674								4
5	673								5
6	672								6
7	671								7
8	670								8
9	669								9

Legend

Sample Type

Plastic Limit ⊢⊣ Liquid Limit

Water Level — No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GH-01

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Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2	47.1591, -122.1667	**GH-02**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Geosyntec	3-inch-diameter hand auger	Grab	678'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
CB	Hand tools	12/22/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
								FILL SAND (SP); loose, moist, brown; fine to medium sand; small roots; 3 inches thick. SANDY SILT WITH GRAVEL (ML); loose, moist, dark brown; fine to coarse sand; fine to coarse gravel.	
1	677	Backfilled with soil cuttings.				T-probe =Less than 1"		**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, moist, gray brown; fine to coarse sand; fine to coarse, subangular to subrounded, faceted gravel. Bottom of exploration at 1.1 ft. bgs.	1
2	676								2
3	675								3
4	674								4
5	673								5
6	672								6
7	671								7
8	670								8
9	669								9

Legend

Sample Type

Water Level

Plastic Limit ⊢⊣ Liquid Limit

No Water Encountered

See Exploration Log Key for explanation of symbols

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Approved by: ECS

Exploration Log GH-02

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Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2	47.1595, -122.1668	**GH-03**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Geosyntec	3-inch-diameter hand auger	Grab	678'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
CB	Hand tools	12/22/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0	678							**GRASS AND ROOT ZONE** SILT WITH SAND (ML); loose, moist, dark brown; fine to medium sand; small roots; 3 inches thick.	0
								FILL SANDY SILT WITH GRAVEL (ML); loose, moist, dark brown; fine to coarse sand; fine to coarse gravel; small roots.	
1	677	Backfilled with soil cuttings and capped with grass.				T-probe =Less than 1"		**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, moist, gray brown; fine to coarse sand; fine to coarse, subangular to subrounded, faceted gravel.	1
2	676							Bottom of exploration at 1.1 ft. bgs.	2
3	675								3
4	674								4
5	673								5
6	672								6
7	671								7
8	670								8
9	669								9

Legend

Sample Type

Plastic Limit ⊢⊣ Liquid Limit

Water Level — No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GH-03

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Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2	47.1598, -122.1668	**GH-04**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Geosyntec	3-inch-diameter hand auger	Grab	676'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
CB	Hand tools	12/22/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0	676							**GRASS AND ROOT ZONE** SILT WITH SAND (ML); loose, moist, dark brown; fine to medium sand; small roots; 3 inches thick.	0
								FILL SANDY SILT WITH GRAVEL (ML); loose, moist, dark brown; fine to coarse sand; fine to coarse gravel; small roots.	
1	675	Backfilled with soil cuttings and capped with grass.				T-probe =Less than 1"		**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, moist, gray brown; fine to coarse sand; fine to coarse, subangular to subrounded, faceted gravel.	1
2	674							Bottom of exploration at 1.1 ft. bgs.	2
3	673								3
4	672								4
5	671								5
6	670								6
7	669								7
8	668								8
9	667								9

Legend

Sample Type

Plastic Limit ⊢⊣ Liquid Limit

Water Level — No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
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Exploration Log GH-04

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Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2	47.1574, -122.1658	**GH-05**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Geosyntec	3-inch-diameter hand auger	Grab	681'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
CB	Hand tools	12/23/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0	681							**GRASS AND ROOT ZONE** SILT WITH SAND (ML); loose, moist, dark brown; fine to medium sand; small roots; 3 inches thick.	0
								FILL SANDY SILT WITH GRAVEL (ML); loose, moist, dark brown; fine to coarse sand; fine to coarse gravel; small roots.	
1	680	Backfilled with soil cuttings and capped with grass.				T-probe =Less than 1"		**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, moist, gray brown; fine to coarse sand; fine to coarse, subangular to subrounded, faceted gravel.	1
2	679							Bottom of exploration at 1.1 ft. bgs.	2
3	678								3
4	677								4
5	676								5
6	675								6
7	674								7
8	673								8
9	672								9

Legend

Sample Type

Water Level — Plastic Limit ⊢⊣ Liquid Limit — No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GH-05

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Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2	47.1578, -122.1650	**GH-06**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Geosyntec	3-inch-diameter hand auger	Grab	681'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
CB	Hand tools	12/23/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0								**GRASS AND ROOT ZONE** SILT WITH SAND (ML); loose, moist, dark brown; fine to medium sand; small roots; 3 inches thick.	0
								FILL SANDY SILT WITH GRAVEL (ML); loose, moist, dark brown; fine to coarse sand; fine to coarse gravel; small roots.	
1	680	Backfilled with soil cuttings and capped with grass.				T-probe =Less than 1"		**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, moist, gray brown; fine to coarse sand; fine to coarse, subangular to subrounded, faceted gravel.	1
2	679							Bottom of exploration at 1.1 ft. bgs.	2
3	678								3
4	677								4
5	676								5
6	675								6
7	674								7
8	673								8
9	672								9

Legend

Sample Type

Plastic Limit ⊢⊣ Liquid Limit

Water Level — No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GH-06

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Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2	47.1579, -122.1656	**GH-07**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Geosyntec	3-inch-diameter hand auger	Grab	681'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
CB	Hand tools	12/23/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0	681							**GRASS AND ROOT ZONE** SILT WITH SAND (ML); loose, moist, dark brown; fine to medium sand; small roots; 3 inches thick.	0
								FILL SANDY SILT WITH GRAVEL (ML); loose, moist, dark brown; fine to coarse sand; fine to coarse gravel; small roots.	
1	680	Backfilled with soil cuttings and capped with grass.				T-probe =Less than 1"		**VASHON TILL** SILTY SAND WITH GRAVEL (SM); very dense, moist, gray brown; fine to coarse sand; fine to coarse, subangular to subrounded, faceted gravel.	1
2	679							Bottom of exploration at 1.1 ft. bgs.	2
3	678								3
4	677								4
5	676								5
6	675								6
7	674								7
8	673								8
9	672								9

Legend

Sample Type

Water Level — Plastic Limit ⊢⊣ Liquid Limit — No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GH-07

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Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2	47.1593, -122.1673	**GH-08**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Geosyntec	3-inch-diameter hand auger	Grab	673'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
CB	Hand tools	12/23/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
1	672	Backfilled with soil cuttings and capped with grass.						**GRASS AND ROOT ZONE** SILT WITH SAND (ML); loose, moist, dark brown; fine to medium sand; small roots; 3 inches thick. **FILL** SILTY SAND WITH GRAVEL AND COBBLES (SM); loose, moist, dark brown; fine to coarse sand; fine to coarse, subangular to subrounded gravel; small roots and wood fragments; subrounded cobbles up to 5 inches in diameter. Becomes very moist and gray brown.	1
2	671					T-probe =3'			2
3	670							Bottom of exploration at 2.75 ft. bgs. Note: Refusal at 2.75 feet bgs upon gravel and cobbles.	3
4	669								4
5	668								5
6	667								6
7	666								7
8	665								8
9	664								9

Legend

Sample Type

Water Level

Plastic Limit ⊢⊣ Liquid Limit

No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GH-08

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Bonney Lake High School Expansion - NWW0163 Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
10920 199th Ave Ct E, Bonney Lake, Washington, See Figure 2	47.1599, -122.1672	**GH-09**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Geosyntec	3-inch-diameter hand auger	Grab	674'	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
CB	Hand tools	12/23/2025	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
1	673	Backfilled with soil cuttings and capped with grass.						**GRASS AND ROOT ZONE** SILT WITH SAND (ML); loose, moist, dark brown; fine to medium sand; small roots; 3 inches thick. **FILL** SILTY SAND WITH GRAVEL AND COBBLES (SM); loose, moist, dark brown; fine to coarse sand; fine to coarse, subangular to subrounded gravel; small roots and wood fragments; subrounded cobbles up to 5 inches in diameter. Becomes very moist and gray brown.	1
2	672					T-probe =3'			2
3	671							Bottom of exploration at 3 ft. bgs. Note: Refusal at 3 feet bgs upon gravel and cobbles.	3
4	670								4
5	669								5
6	668								6
7	667								7
8	666								8
9	665								9

Legend

Sample Type

Plastic Limit ⊢⊣ Liquid Limit

Water Level — No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: CB
Approved by: ECS

Exploration Log GH-09

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APPENDIX B

Report Limitations and Guidelines for Use

REPORT LIMITATIONS AND GUIDELINES FOR USE

This Report and Project-Specific Factors

Geosyntec Consultants considered a number of unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you
- Not prepared for the specific purpose identified in the Agreement
- Not prepared for the specific real property assessed
- Completed before important changes occurred concerning the subject property, project or governmental regulatory actions

Geoscience Interpretations

The geoscience practices (geotechnical engineering, geology, and environmental science) require interpretation of spatial information that can make them less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Use Guidelines" apply to your project or site, you should contact Geosyntec.

Reliance Conditions for Third Parties

This report was prepared for the exclusive use of the Client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual limitations. Within the limitations of scope, schedule, and budget, our services have been executed in accordance with our Agreement with the Client and recognized geoscience practices in the same locality and involving similar conditions at the time this report was prepared.

Property Conditions Change Over Time

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope instability, or groundwater fluctuations. If any of the described events may have occurred following the issuance of the report, you should contact Geosyntec so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Discipline-Specific Reports Are Not Interchangeable

The equipment, techniques, and personnel used to perform a geotechnical or geologic study differ significantly from those used to perform an environmental study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions, or recommendations (e.g., about the likelihood of encountering underground storage tanks or regulated contaminants). Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

We appreciate the opportunity to perform these services. If you have any questions please contact the Geosyntec Project Manager for this project.