

Appendix A2

Landslide Hazard Assessment

Prepared by Associated Earth Science, Inc.

September 24, 2019



September 24, 2019
Project No. 180070E001

Issaquah School District
5150 220th Avenue SE
Issaquah, Washington 98029

Attention: Mr. Tom Mullins

Subject: Landslide Hazard Assessment
Issaquah High School #4 and Elementary School #17
4221 228th Avenue SE
Issaquah, Washington

Dear Mr. Mullins:

We are pleased to present the findings of the landslide hazard assessment completed for the subject project. This report has been prepared for the exclusive use of the Issaquah School District, and their authorized agents, for specific application to this project. No other warranty, express or implied, is made.

SITE AND PROJECT DESCRIPTION

The subject site is comprised of three parcels totaling approximately 40 acres located at 4441, 4443, and 4461 228th Avenue SE in Issaquah, Washington (King County Parcel Nos. 1624069001, 1624069029, and 1624069031). The location of the site is shown on the “Vicinity Map,” Figure 1.

As shown on Figure 2, a relatively flat to gently sloping plateau is located in the central portion of the property. From this plateau, the topography generally slopes down toward the northeast, east, south, and southwest. Elevations on the property range from a low of approximately 415 feet near the northeastern corner of the site to a maximum of approximately 526 feet in the southern portion of the site. Slope inclinations on the flanks of the plateau are generally about 30 percent or less, but steepen to approximately 40 to 50 percent over a maximum height of approximately 30 feet near the southeast corner of the property. This area classifies as a Steep Slope Hazard Area under the *Issaquah Municipal Code* (IMC). The central portion of the property was previously developed with a church, dormitories, and accessory buildings. These structures were demolished in early 2019. Grading associated with the demolition has resulted in some localized areas of steep slopes in the areas of the former structures. Maximum slope inclinations in these areas were visually estimated to be up to approximately 2H:1V (Horizontal:Vertical).

The central plateau area, including the area of the demolished buildings, generally consists of bare or sparsely vegetated ground with some scattered trees and areas of asphalt pavement. The remainder of the site generally consists of mixed coniferous/deciduous forest with some access roads. A water tank is located in a forested area near the south end of the plateau. The locations of the former buildings and other prominent site features are shown on the 2017 aerial photo included as Figure 2. The topographic contours included on Figure 2 are based on Light Detection and Ranging (LIDAR) data and are representative of conditions prior to building demolition.

Based on review of civil plan sheets prepared by AHBL, dated May 20, 2019, we understand that preliminary development plans for the site consist of a new high school and elementary school. The high school and elementary school buildings will be located in the southern and western portions of the site, respectively. The high school will have a football field and track, baseball and softball fields, tennis courts above a parking structure, surface parking, and space for future portable classrooms. The elementary school will have play areas, surface parking, and space for future portable classrooms. The proposed facility layout is shown in Figure 3.

Maximum cuts for the project will be up to approximately 17 to 18 feet and will be located in the southern portion of the site in the area of the proposed high school building. A maximum fill depth of approximately 41 feet will be located in the northeastern portion of the site in the area of the proposed baseball field. We understand that conceptual plans include the use of mechanically stabilized earth (MSE) walls to facilitate proposed grade changes in some areas.

SUBSURFACE EXPLORATION

Our field study included advancing 31 exploration pits and 12 exploration borings at the site. This information was supplemented by 20 additional exploration pits completed at the site for previous geotechnical studies by Terra Associates, Inc. (Terra) in July 2015 and by Earth Solutions NW (ESNW) in May 2014. These exploration logs were included in a report titled "Geotechnical Report, Madison Pointe," prepared by Terra for Murray Franklyn Companies, Project No. T7252, dated March 18, 2016. A copy of the Terra report was provided to us by the District. It should be noted that the log of ESNW exploration pit TP-2 was not included in the Terra report. The approximate locations of the explorations are shown on Figures 2 and 3. The conclusions and recommendations presented in our report are based on the explorations completed for this study. The number, locations, and depths of our explorations were completed within site and budgetary constraints. Copies of the exploration logs are included in Appendix A.

Because of the nature of exploratory work below ground, extrapolation of subsurface conditions between field explorations is necessary. It should be noted that subsurface conditions between the explorations may differ from those inferred by the boring data due to the random nature of deposition and the alteration of topography by past grading and/or filling. The nature and extent of any variations between the field explorations may not become fully evident until construction. If

variations are observed at that time, it may be necessary to re-evaluate specific recommendations in this report and make appropriate changes.

Exploration Pits

The exploration pits were excavated using a track-mounted excavator. The pits permitted direct, visual observation of subsurface conditions. Materials encountered in the exploration pits were studied and classified in the field by an engineering geologist from our firm. All of the exploration pits were backfilled immediately after examination and logging. Samples collected from the exploration pits were classified in the field and representative portions placed in watertight containers. The samples were then transported to our laboratory for further visual classification and laboratory testing.

Exploration Borings

The exploration borings drilled for our study were completed using a track-mounted, hollow-stem auger drill rig. During the drilling process, samples were generally obtained at 2.5- to 5-foot-depth intervals. The exploration borings were continuously observed and logged by an engineering geologist from our firm. The exploration logs presented in Appendix A are based on the field logs, drilling action, and review of the samples collected.

Disturbed, but representative samples were obtained by using the Standard Penetration Test (SPT) procedure in accordance with *American Society for Testing and Materials* (ASTM) D-1586. This test and sampling method consists of driving a standard 2-inch, outside-diameter, split-barrel sampler a distance of 18 inches into the soil with a 140-pound hammer free-falling a distance of 30 inches. The number of blows for each 6-inch interval is recorded, and the number of blows required to drive the sampler the final 12 inches is known as the Standard Penetration Resistance ("N") or blow count. If a total of 50 is recorded within one 6-inch interval, the blow count is recorded as the number of blows for the corresponding number of inches of penetration. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils; these values are plotted on the boring logs in Appendix A.

The samples obtained from the split-barrel sampler were classified in the field and representative portions placed in watertight containers. The samples were then transported to our laboratory for further visual classification.

Stratigraphy

Detailed descriptions of the sediments encountered in each of the borings are provided on the exploration logs in Appendix A. The explorations generally encountered natural sediments consisting of granular, glacial sediments underlain by weathered sedimentary rock. Fine-grained glacial sediments and/or glacially consolidated non-glacial sediments were also encountered in some locations. In some areas of the site, the natural deposits were overlain by fill soils. The

following section presents more detailed subsurface information organized from the shallowest (youngest) to the deepest (oldest) sediment types.

Fill

Fill soils (those not naturally deposited) were encountered in 11 of the explorations at the site. Where encountered, the existing fill generally consisted of loose to dense, gravelly, silty to very silty sand. Portions of the fill contained trace to abundant quantities of wood debris. In general, the areas where existing fill soils were encountered were located near the former buildings, pavement areas, and property margins. Where encountered in our explorations, the existing fill soils ranged in thickness from approximately 1 to 9 feet. The thicknesses of the existing fill soils encountered in the explorations are summarized in Table 1.

Table 1
Summary of Observed Fill Thicknesses

Exploration	Fill Thickness (feet)
EP-7	1
EP-8	8
EP-9	1
EP-11	6
EP-16	4
EP-18	2
EB-4	2.5
EB-8	4.5
EB-9	2.5
TP-6 (Terra, 2015)	1
TP-5 (ESNW, 2014)	9

Forest Duff/Topsoil

A surficial forest duff/topsoil horizon was encountered in most of our explorations located outside of areas of existing fill or asphalt pavement. Where encountered in our explorations, the thickness of the forest duff/topsoil horizon generally ranged from approximately 2 to 8 inches. Organic topsoil thicknesses shown on the Terra and ESNW exploration logs generally ranged from approximately 6 inches to 2 feet.

Vashon Lodgement Till

With the exception of exploration pit EP-4, the natural sediments encountered in our exploration pits either directly below the ground surface, the surficial topsoil horizon, or the surficial fill layer generally consisted of loose to medium dense, non-stratified, silty to very silty, gravelly sand with

scattered cobbles. These sediments typically became dense to very dense below depths ranging from approximately 6 inches to 6 feet. We interpret these sediments to be representative of Vashon lodgement till. The Vashon lodgement till was deposited directly from basal, debris-laden, glacial ice during the Vashon Stade of the Fraser Glaciation, approximately 12,500 to 15,000 years ago. The high relative density characteristic of the Vashon lodgement till is due to its consolidation by the massive weight of the glacial ice from which it was deposited. The reduced density observed in the upper portion of the till is interpreted to be due to weathering.

Lodgement till sediments were also encountered in the upper portions of exploration borings EB-1, EB-2, EB-5 through EB-9, EB-11, and EB-12, and appear to have been encountered in all of the ESNW and Terra exploration pits except Terra pit TP-6. The Terra and ESNW exploration logs do not consistently identify the geologic units encountered. However, in their report, Terra describes these sediments as consisting of lodgement till. At the locations of exploration borings EB-5, EB-8, EB-11, and EB-12, and in Terra pits TP-4, TP-5, and TP-8, the till extended to depths ranging from approximately 2 to 28 feet. Where encountered elsewhere in the explorations, the till extended beyond the maximum depths explored of approximately 4.5 to 15.5 feet. Exploration borings EB-1, EB-2, and EB-7 met with driller refusal in the till at depths of approximately 10 to 15.5 feet. In addition to cobbles, lodgement till typically contains scattered boulders and the difficult drilling conditions encountered at these locations are likely due to the presence of boulders and/or clusters of cobbles in the till.

Vashon Ice Contact Sediments

Sediments encountered below the weathered till horizon in boring EB-12, approximately 2 feet below the ground surface, generally consisted of stiff to very stiff, fine sandy silt with trace to some gravel. We interpret these sediments to be representative of material deposited by meltwater in close proximity to the glacial ice during Vashon time. At the location of boring EB-12, the ice contact sediments extended to a depth of approximately 14.5 feet.

Olympia Non-Glacial Sediments

Sediments encountered at a depth of approximately 28 feet (below the Vashon lodgement till) in boring EB-11 generally consisted of very dense, tan-gray, fine to medium sand with moderate to high silt content. Below a depth of approximately 33.5 feet, the sediments of this geologic unit consisted of hard, tan silt with trace gravel. The silt was generally massive but contained scattered, thin, sandy lenses. Although we observed no clear, distinguishing features characteristic of a particular geologic unit, their color, gradation, and stratigraphic position below the lodgement till suggest that these sediments may be representative of material deposited during the Olympia non-glacial period. The Olympia non-glacial period occurred prior to the Fraser Glaciation, approximately 30,000 to 60,000 years ago. At the location of exploration boring EB-11, these sediments extended to a depth of approximately 48 feet.

Possession Drift

Sediments encountered below the Vashon lodgement till in boring EB-8 generally consisted of very stiff to hard, blue-gray silt. The silt was generally massive to laminated and contained scattered fine sand partings. These sediments effervesced in hydrochloric acid. We interpret these sediments to be representative of Possession Drift. The Possession Drift was deposited in a glaciomarine environment during the Possession Glaciation, approximately 60,000 to 80,000 years ago. At the location of boring EB-8, the Possession Drift extended beyond the maximum depth explored of approximately 26.5 feet.

Pre-Fraser Till

Sediments encountered below a depth of approximately 48 feet in boring EB-11 generally consisted of very dense, non-stratified, very silty, gravelly sand. Although these sediments appeared texturally similar to the Vashon lodgement till, their stratigraphic position below the suspected Olympia-aged non-glacial sediments indicate that they were deposited during a glacial period prior to the Fraser Glaciation. At the location of boring EB-11, the pre-Fraser till extended to a depth of approximately 68 feet.

Pre-Fraser Silt

Sediments encountered below the pre-Fraser till in boring EB-11 (below a depth of approximately 68 feet) generally consisted of hard silt with lenses and interbeds of very silty, fine sand. Based on their stratigraphic position below the pre-Fraser silt, deposition of these sediments also occurred prior to the Fraser Glaciation. These sediments were non-reactive in hydrochloric acid. At the location of boring EB-11, the pre-Fraser silt extended to a depth of approximately 80 feet.

Blakely Harbor Formation

Sediments encountered below the surficial topsoil horizon in exploration pit EP-4 consisted of loose, brown, very silty sand with some gravel and soft to medium stiff, yellowish-tan silt. These sediments became medium dense to dense below a depth of approximately 5.5 feet. The gravel-sized fraction of these sediments typically consisted of angular sedimentary rock. Similar sediments were encountered either directly below the surficial topsoil horizon, or below the lodgement till or pre-Fraser sediments in exploration borings EB-3 through EB-6, and EB-10 through EB-12. We interpret these sediments to be representative of the Blakely Harbor Formation. The Blakely Harbor Formation consists of a Miocene-aged sedimentary rock composed of sandstone, siltstone, conglomerate, tuff, and volcaniclastic sandstone. It is known to contain interbeds of coal, and in some locations, nearly coherent logs. Where encountered in our explorations, the bedrock was typically weathered and poorly lithified and exhibited physical characteristics more consistent with a non-lithified sediment than well indurated bedrock. However, the density/lithification of these sediments typically increased with depth. Sedimentary

rock is also noted on the exploration logs for Terra pits TP-4 through TP-6, and TP-8. At these locations, the bedrock was encountered at depths ranging from approximately 2.5 to 9 feet.

Exploration borings EB-4 through EB-6, EB-10, and EB-12 met with refusal in the bedrock at depths ranging from approximately 12 to 20 feet. Refusal depths and elevations for these boring locations are summarized below in Table 2. It should be noted that the refusal elevations shown in Table 2 were estimated from the LIDAR based topography shown on Figure 2. The elevations shown in Table 2 should be considered accurate to the degree implied by the methods used to estimate them.

Table 2
Summary of Drilling Refusal Depths in the Blakely Harbor Formation Bedrock

Boring Number	Depth to Drilling Refusal (feet)	Apx. Drilling Refusal Elevation (feet)
EB-4	20	494
EB-5	14	506
EB-6	12	508
EB-10	20	445
EB-12	18	487

Geologic Map Review

Review of the regional geologic map titled *Geologic Map of the Issaquah 7.5' Quadrangle, King County, Washington*, by Booth and Minard (1992) indicates that the area of the site is underlain by Vashon lodgement till with Tertiary sedimentary rock mapped in portions of the southern and eastern parts of the site. Our interpretation of the sediments encountered in our explorations is consistent with the regional geologic map.

Hydrology

Slow to moderately rapid groundwater seepage was observed in 11 of the Associated Earth Sciences, Inc. (AESI) exploration pits. Seepage was also noted on three of the ESNW pits. Specifically, groundwater seepage was encountered in AESI exploration pits EP-4, EP-6, EP-10, EP-11, EP-13 through EP-15, EP-18, EP-19, EP-21, and EP-31, and in ESNW pits TP-1, TP-3, and TP-4. Generally, the seepage was limited to a thin, perched zone in the lower portion of the weathered till horizon within 4 feet of the ground surface. Similarly, shallow, perched seepage was encountered on the surface of the bedrock in exploration pit EP-4. This perched seepage, known as "interflow" occurs when stormwater infiltrates through the relatively permeable, weathered soil horizon and becomes perched atop the underlying, dense, low permeability, unweathered till or bedrock. Accumulation of interflow is typically a seasonal phenomenon. The exploration data indicates that the interflow is not laterally continuous across the site, but rather is limited to

relatively small isolated areas. Deeper perched seepage was encountered in exploration pit EP-6. At this location, the seepage was limited to a thin, perched zone in the unweathered till at a depth of approximately 7 feet. The occurrence or level of seepage below the site likely varies in response to changes in season, precipitation, and other factors.

LANDSLIDE HAZARDS AND RECOMMENDED MITIGATION

Slope inclinations on the site are generally about 30 percent or less, but steepen to approximately 40 to 50 percent over a maximum height of approximately 30 feet in a relatively small area located near the southeast corner of the property. Based on the morphology of the topography in this area, we interpret the steep slope to be a cut slope made for the construction of 228th Avenue SE and the south entrance road into the property.

Section 18.10.390 of the IMC defines Steep Slope Hazard Areas as any ground that rises at an inclination of 40 percent or more within a vertical elevation change of at least 10 feet. Section 18.10.580 of the IMC states that a buffer shall be established at a horizontal distance of 50 feet from the top, toe, and sides of Steep Slope Hazard Areas with an additional 15-foot building setback established from the edge of the buffer. The buffer may be reduced to a minimum of 10 feet upon acceptance by the City of a geotechnical study supporting the buffer reduction. Alteration of steep slopes are generally prohibited under the code with limited alterations allowed for trails, utilities, and surface water conveyance. The City may grant an exemption from the prohibition of steep slope alteration under the following conditions:

1. Where the height of a steep slope is 20 feet or less. In this case, an alteration may be granted upon review and acceptance by the City of a soils report prepared by a geologist or licensed geotechnical engineer demonstrating that no adverse impact will result from the exemption.
2. Where the slope has been created from previous legal grading activities. In this case, any remaining steep slope shall be subject to the protection mechanisms for steep slopes specified in the code.

Steep slope protection mechanisms specified in Section 18.10.580 of the IMC include a factor of safety of at least 1.5.

Review of the May 20, 2019 grading plans prepared by AHBL civil engineers indicates that the project will entail some grading of the steep slopes. A copy of the grading plan prepared for this area is shown in Figure 4. As previously stated, we interpret the steep slopes to consist of cut slopes associated with grading for construction of 228th Avenue SE and the entrance road into the property off of 228th Avenue SE. Consequently, alteration of these slopes is allowed under Section 18.10580D of the IMC, subject to the protection mechanisms specified in the code.

Slope Reconnaissance

We completed a reconnaissance of the steep slopes at the site at the time of our field exploration. During our reconnaissance of these areas, we did not observe any geomorphologic indications of historic landslide activity, such as tension cracks, landslide scarps, or hummocky topography. No emergent seepage or unusually deformed tree trunks indicative of historical or ongoing slope movement were observed.

LIDAR Mapping

LIDAR based imagery is a remote sensing technology that can be used to generate a detailed expression of ground surface topography even in densely vegetated areas. For this reason, LIDAR based topographic imagery can be helpful in distinguishing surface features (such as old landslide features) that may otherwise not be easily recognizable. A LIDAR based shaded relief map of the subject site is included as Figure 5. We did not observe any indications of historic landslide activity during our review of the LIDAR shaded relief map.

Slope Stability Analysis

An analysis of the global stability of the slope in the southeast corner of the site was conducted using the computer program SLOPE/W, version 7.23 by GeoSlope International. The program used the Morgenstern-Price method for evaluating a rotational failure. Input parameters for the analysis included slope geometry, geology, and soil strength parameters. The slope geometry used for our analysis was based on the topography depicted on the civil grading plan along section lines A-A' and B-B' (Figure 4). These sections extend through the steepest and highest portions of the slope. The following cases were analyzed for each of these two sections:

- Existing topographic conditions, static case.
- Existing topographic conditions, seismic case.
- Post-construction (post-grading) conditions, static case.
- Post-construction conditions, seismic case.

Subsurface exploration in this area indicates that the slope is underlain by bedrock with Vashon lodgement till overlying the bedrock in most areas. Because the shear strength of the bedrock is estimated to be equivalent to or stronger than the lodgement till, we conservatively assumed that the native sediments underlying the slope consist entirely of lodgement till. Soil strength parameters used for our analysis were assumed based on typical published values for lodgement till and our prior experience. The soil strength parameters used for our analysis are shown on the SLOPE/W profiles included in Appendix B. For evaluation of slope stability under seismic conditions, a horizontal ground acceleration of 0.26g was used for our analysis. This value is equivalent to ½ of the peak horizontal ground acceleration based on a seismic event with

a 2 percent probability of exceedance in 50 years in accordance with the 2015 *International Building Code* (IBC).

The stability of a slope can be expressed in terms of its factor of safety. The factor of safety of a slope is the ratio between the forces that resist sliding to the forces that drive sliding. For example, a factor of safety of 1.0 would indicate a slope where the driving forces and the resisting forces are exactly equal. Increasing factor of safety values greater than 1.0 indicate increased stability. Factors of safety below 1.0 indicate conditions where the driving forces exceed the resisting forces and landsliding is imminent.

Under static conditions, the minimum calculated factors of safety all exceeded the minimum value of 1.5 specified in the IMC. The IMC does not specify a minimum factor of safety for seismic conditions, but as a typical standard of practice, a factor of safety of 1.1 is generally considered to be a minimum acceptable value. The minimum factors of safety calculated for seismic conditions all exceeded a factor of safety of 1.5. The minimum calculated factors of safety are summarized below in Table 3. Copies of the results of the slope stability analysis are included in Appendix B.

Table 3
Summary of Minimum Calculated Factors of Safety

Section Line	Case	Minimum Factor of Safety
A-A'	Existing Static	2.43
A-A'	Existing Seismic	1.52
A-A'	Post-Construction Static	3.69
A-A'	Post-Construction Seismic	2.13
B-B'	Existing Static	2.64
B-B'	Existing Seismic	1.62
B-B'	Post-Construction Static	2.65
B-B'	Post-Construction Seismic	1.61

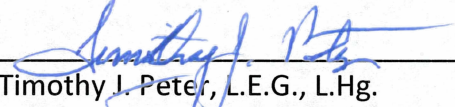
Landslide Hazard Mitigation

Based on our observations and analyses, it is our opinion that the risk of damage to the proposed project by landsliding on the steep slope is low under both static and seismic conditions, with minimum calculated factors of safety exceeding the minimum acceptable value specified in the IMC. This opinion assumes that construction practices for the project will be completed in accordance with the recommendations presented in this report. We recommend that stormwater discharge on or adjacent to the top of the steep slope be avoided as it could increase the potential for accelerated erosion and negatively impact the stability of the slope.

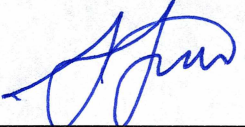
As previously discussed, some areas of steep slope were generated during grading associated with the demolition of the former buildings. Post-demolition topography is not included on the project grading plans and, therefore, these steep slopes are not shown. However, the current grading plans indicate that grading proposed for the project will eliminate any steep slopes resulting from the demolition activities. At the time this report was prepared, development plans for the project were conceptual. We recommend that AESI review the final plans to verify that they comply with our recommendations.

We appreciate this opportunity to be of continued service to you with your project. Should you have any questions, please contact us at your convenience.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington



Timothy J. Peter, L.E.G., L.Hg.
Senior Geologist



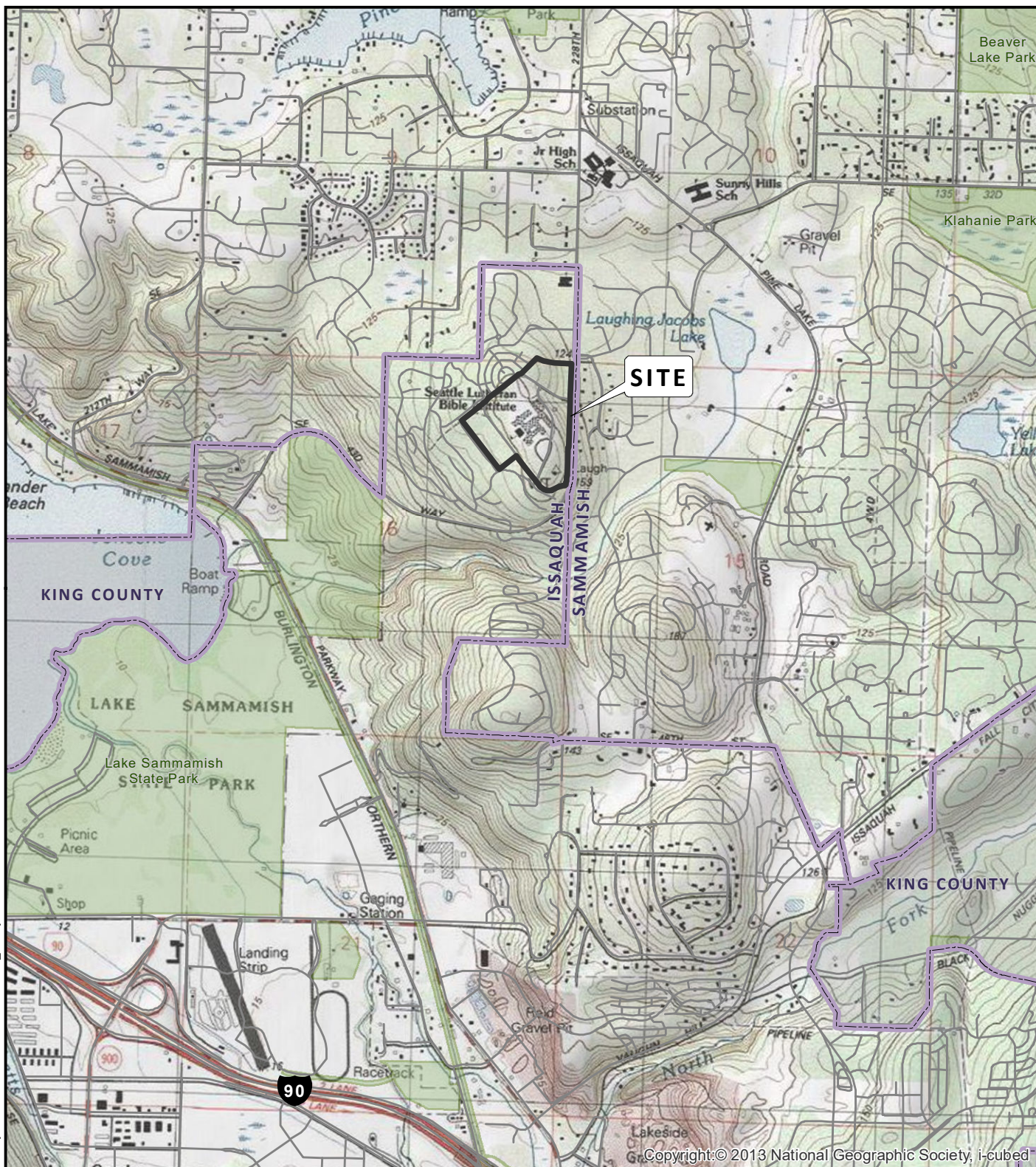
Stephen A. Siebert, P.E.
Associate Geotechnical Engineer



Kurt D. Merriman, P.E.
Senior Principal Engineer

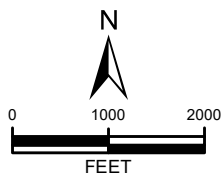
Attachments: Figure 1: Vicinity Map
 Figure 2: 2017 Aerial, LIDAR Based Contours
 Figure 3: Site and Exploration Plan
 Figure 4: Steep Slope Areas
 Figure 5: LIDAR Shaded Relief Map
 Appendix A: Exploration Logs
 Appendix B: SLOPE/W Profiles

Document Path: G:\GIS_Projects\aa\2018\180070 Issaquah HS\mxd\180070E001 F1 VM_IssaquahHS.mxd



DATA SOURCES / REFERENCES:
USGS: 7.5' SERIES TOPOGRAPHIC MAPS, ESRI/I-CUBED/NGS 2013
KING CO: STREETS, CITY LIMITS 1/18, PARCELS 8/18

LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



NOTE: BLACK AND WHITE
REPRODUCTION OF THIS COLOR
ORIGINAL MAY REDUCE ITS
EFFECTIVENESS AND LEAD TO
INCORRECT INTERPRETATION



associated
earth sciences
incorporated

VICINITY MAP

ISSAQUAH HS #4 AND ES #17
ISSAQUAH, WASHINGTON

PROJ NO.	DATE:	FIGURE:
180070E001	9/19	1

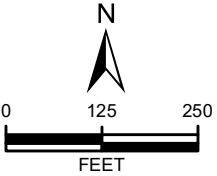


- SITE
- EXPLORATION BORING
- EXPLORATION PIT
- TEST PIT BY EARTH SOLUTIONS NW, 2014
- TEST PIT BY TERRA ASSOCIATES INC., 2015
- PARCEL
- CONTOUR 20 FT
- CONTOUR 5 FT

NOTE:
IMAGE TAKEN PRIOR TO DEMOLITION OF EXISTING STRUCTURES.
DEMO IN PROCESS DEC. 2018 AND DONE BY JUNE 2019.

DATA SOURCES / REFERENCES:
PSLC: KING COUNTY 2016. GRID CELL SIZE IS 3'.
DELIVERY 3 FLOWN 3/2/16 - 3/29/16.
CONTOURS FROM LIDAR
KING CO: STREETS, 1/19, PARCELS 4/19, AERIAL PICTOMETRY INT. 2017
TEST PITS FROM: "GEOTECHNICAL REPORT MADISON POINTE",
BY TERRA ASSOCIATES 11/14/2018

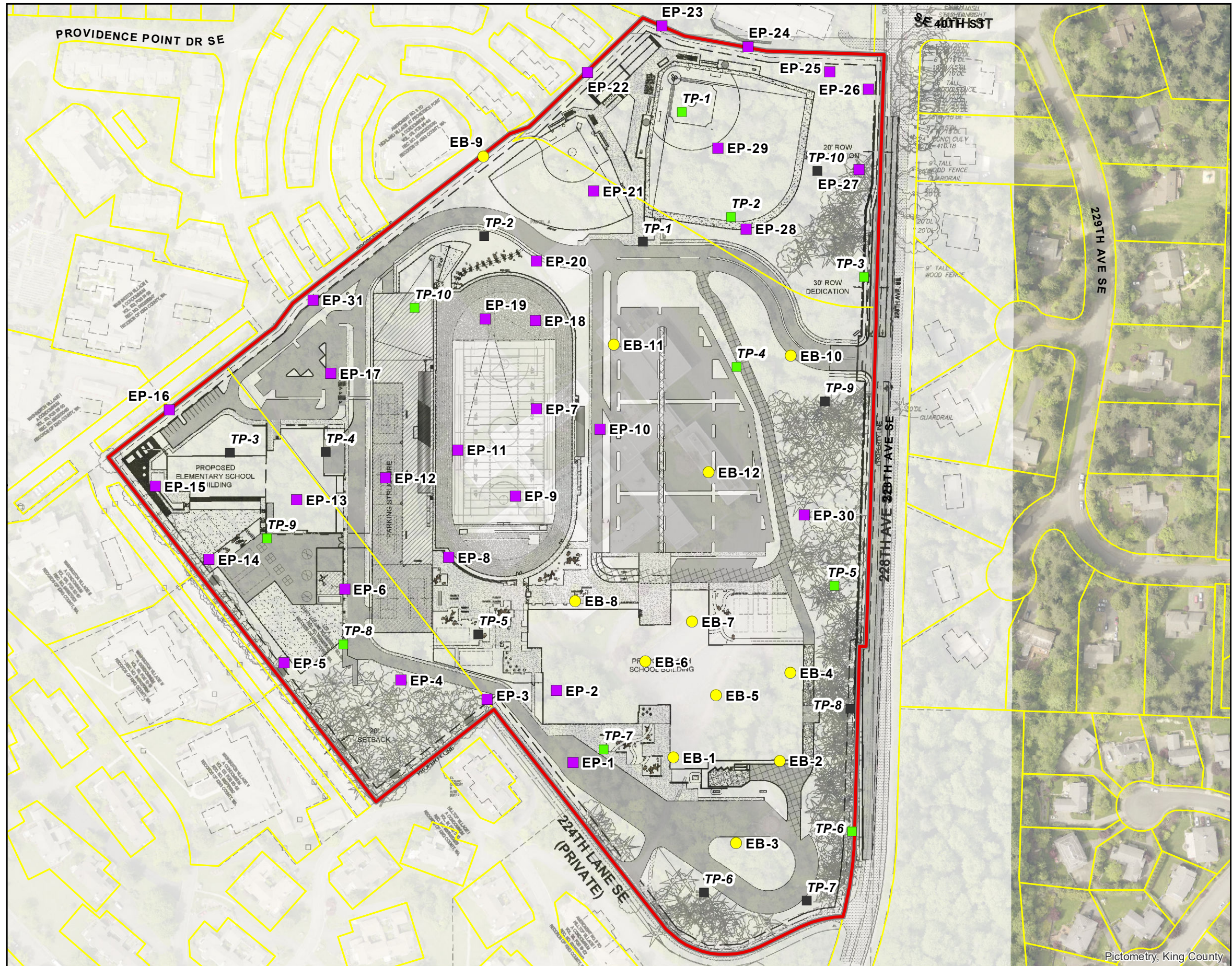
LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION



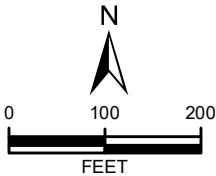
2017 AERIAL LIDAR BASED CONTOURS ISSAQUAH HS #4 AND ES #17 ISSAQUAH, WASHINGTON



- SITE
- EXPLORATION BORING
- EXPLORATION PIT
- TEST PIT BY EARTH SOLUTIONS NW, 2014
- TEST PIT BY TERRA ASSOCIATES INC., 2015
- PARCEL

DATA SOURCES / REFERENCES:
SITE PLAN: ABHL, ELEMENTARY SCHOOL SITE,
ISDHS CHECK SET C7.0, 1/31/19
KING CO: STREETS, 1/19, PARCELS 4/19, AERIAL PICTOMETRY INT. 2017
TEST PITS FROM: "GEOTECHNICAL REPORT MADISON POINTE",
BY TERRA ASSOCIATES 11/14/2018

LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION



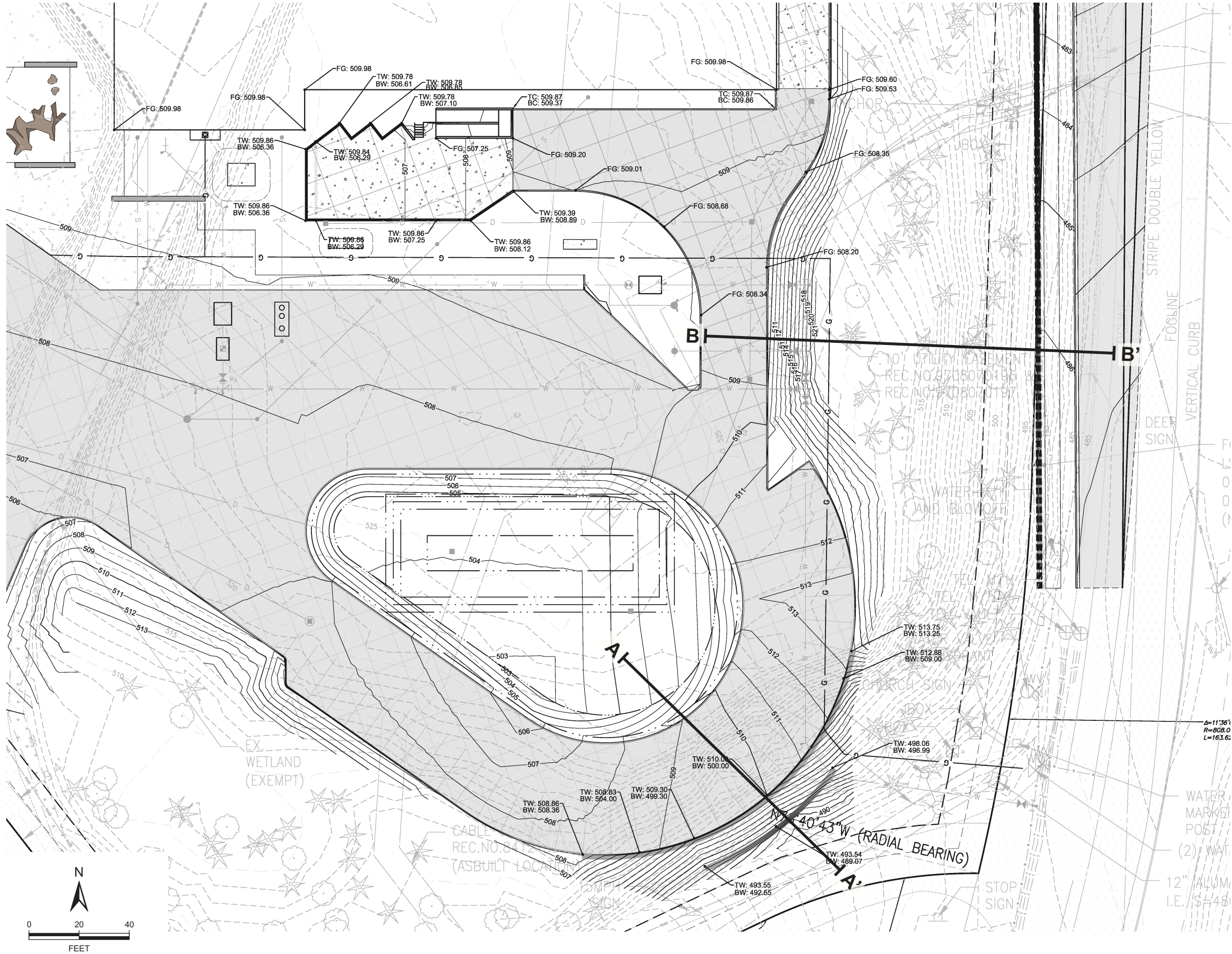
associated
earth sciences
incorporated

SITE AND EXPLORATION PLAN

ISSAQUAH HS #4 AND ES #17
ISSAQUAH, WASHINGTON

PROJ NO.	DATE:	FIGURE:
180070E001	9/19	3

180070 Issaquah HS 180070E001 F4 Slopes.cdr



LEGEND:

CONTOUR INTERVAL = 1'

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

NOTES:
1. BASE MAP REFERENCE: AHBL, ISSAQUAH SCHOOL DISTRICT HIGH SCHOOL #4, GRADING PLAN, SHEET C4.7, FINAL DESIGN, 5/20/19

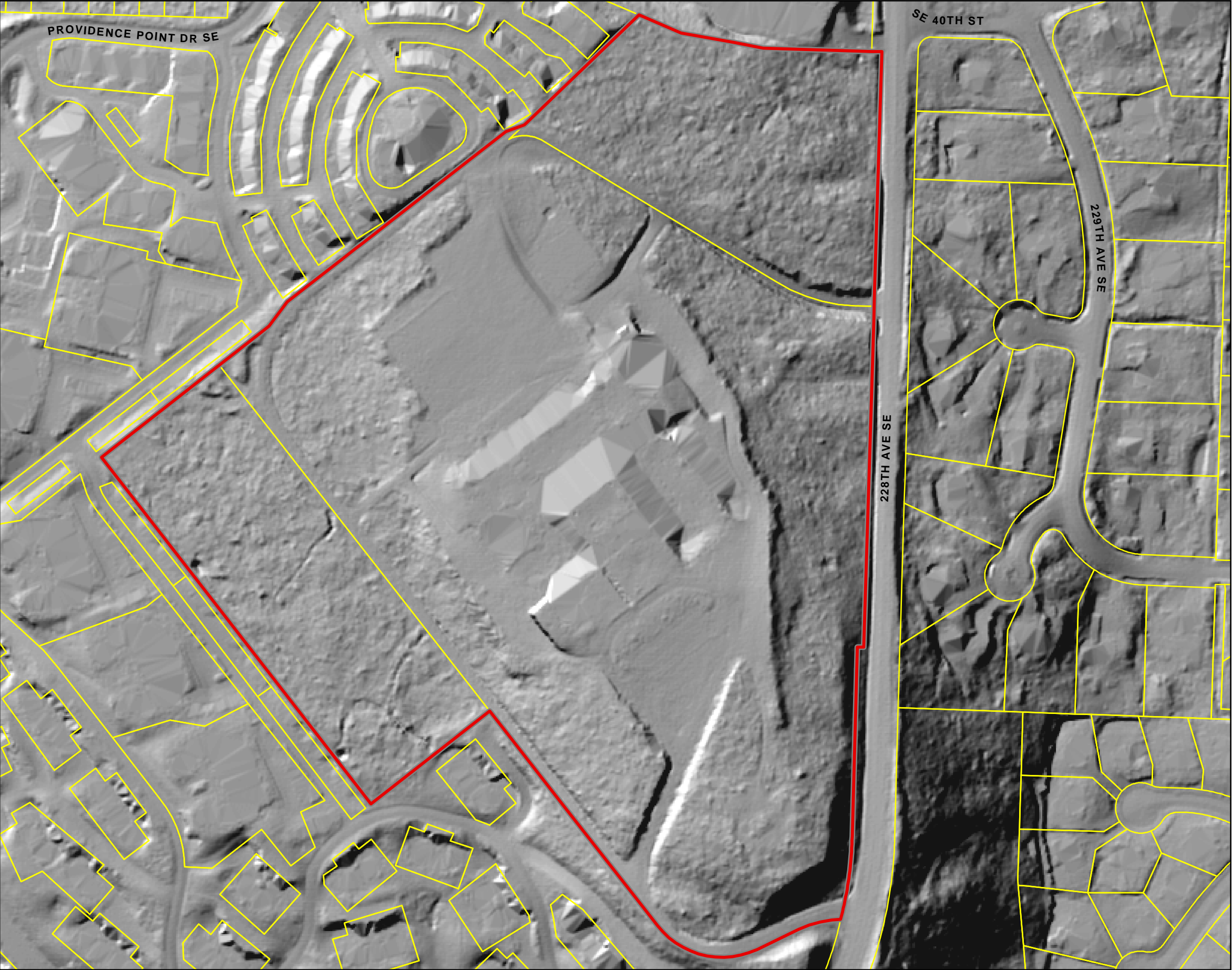
BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION.



STEEP SLOPE AREAS

ISSAQUAH HS #4 AND ES #17
ISSAQUAH, WASHINGTON

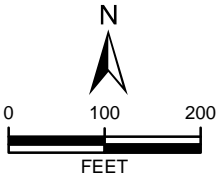
PROJ NO.	DATE:	FIGURE:
180070E001	7/19	4



-  SITE
-  PARCEL

DATA SOURCES / REFERENCES:
SITE PLAN: ABHL, ELEMENTARY SCHOOL SITE,
ISDHS CHECK SET C7.0, 1/31/19
KING CO: STREETS, 1/19, PARCELS 4/19, AERIAL PICTOMETRY INT. 2017

LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION



LIDAR SHADED RELIEF MAP

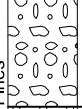
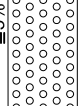
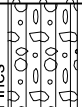

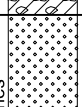
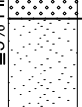
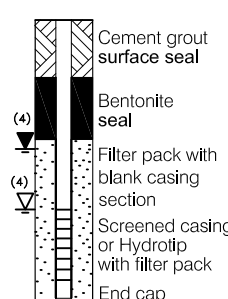

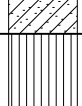
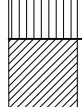
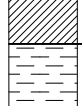
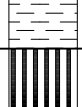
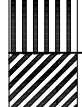
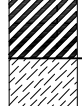
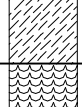

ISSAQUAH HS #4 AND ES #17
ISSAQUAH, WASHINGTON

PROJ NO.	DATE:	FIGURE:
180070E001	8/19	5

APPENDIX A

Exploration Logs

blocks \ dwg \ log_key.dwg LAYOUT: Layout 4 -2014 Qty Chng

Coarse-Grained Soils - More than 50% ⁽¹⁾ Retained on No. 200 Sieve				Terms Describing Relative Density and Consistency																																																																																																																															
Gravels - More than 50% ⁽¹⁾ of Coarse Fraction Retained on No. 4 Sieve																																																																																																																																			



associated
earth sciences
incorporated

Exploration Boring

Project Number
180070E001

Exploration Number
EB-1

Sheet
1 of 1

Project Name Issaquah HS #4 and ES #17

Location Issaquah, WA

Driller/Equipment Advance Drilling Technology / Track Rig

Hammer Weight/Drop 140# / 30 inches

Ground Surface Elevation (ft) 520

Datum NAVD 88

Date Start/Finish 6/25/19, 6/25/19

Hole Diameter (in) 7

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot				Other Tests
								10	20	30	40	
				Asphalt - 3.5 inches								
				Vashon Lodgement Till								
		S-1		Moist, grayish tan, gravelly, very silty, SAND; nonstratified (SM).		16 21 12				▲33		
		S-2		Becomes mottled; some gravel.		7 14 19				▲33		
5		S-3		Contains a lens of gray silt at 5 to 6 feet. Becomes very moist and gravelly below 6 feet.		6 12 23				▲35		
				Refusal on a rock at 7.5 feet. Moved over 2.5 feet and resumed drilling.								
10		S-4		Becomes gray.		19 22 18				▲40		
15		S-5		Bottom of exploration boring at 15.5 feet due to refusal. No groundwater encountered.		50/4"				▲50/4"		
20												
25												

Sampler Type (ST):



2" OD Split Spoon Sampler (SPT)



No Recovery

M - Moisture



3" OD Split Spoon Sampler (D & M)



Ring Sample

▽ Water Level ()



Grab Sample



Shelby Tube Sample



Water Level at time of drilling (ATD)

Logged by: TJP

Approved by: CJK



associated
earth sciences
incorporated

Exploration Boring

Project Number
180070E001

Exploration Number
EB-2

Sheet
1 of 1

Project Name Issaquah HS #4 and ES #17

Location Issaquah, WA

Driller/Equipment Advance Drilling Technology / Track Rig

Hammer Weight/Drop 140# / 30 inches

Ground Surface Elevation (ft) 524

Datum NAVD 88

Date Start/Finish 6/25/19, 6/25/19

Hole Diameter (in) 7

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot				Other Tests
								10	20	30	40	
		S-1		Forest Duff - 4 inches								
				Vashon Lodgement Till								
				Moist, reddish brown, gravelly, very silty, SAND (SM).		6 8 12			▲20			
		S-2		Becomes tan.		6 14 14				▲28		
5		S-3		Blowcounts are likely overstated, pounding on a rock.		50/4"						▲50/4"
				Difficult drilling.								
10		S-4		Becomes mottled and very gravelly.		20 50/5"						▲50/5"
				Bottom of exploration boring at 11 feet due to refusal. No groundwater encountered. Moved over 3 feet and attempted to re-drill. Met refusal at 7.5 feet.								
15												
20												
25												

Sampler Type (ST):



2" OD Split Spoon Sampler (SPT)



3" OD Split Spoon Sampler (D & M)



Grab Sample



No Recovery



Ring Sample



Shelby Tube Sample

M - Moisture



Water Level ()



Water Level at time of drilling (ATD)

Logged by: TJP

Approved by: CJK



associated
earth sciences
incorporated

Exploration Boring

Project Number
180070E001

Exploration Number
EB-3

Sheet
1 of 1

Project Name Issaquah HS #4 and ES #17

Location Issaquah, WA

Driller/Equipment Advance Drilling Technology / Track Rig

Hammer Weight/Drop 140# / 30 inches

Ground Surface Elevation (ft) 525

Datum NAVD 88

Date Start/Finish 6/25/19, 6/25/19

Hole Diameter (in) 7

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot				Other Tests
								10	20	30	40	
5		S-1		Forest Duff / Topsoil - 6 inches Blakely Harbor Formation Moist, mottled light brown, very silty, SAND, trace to some gravel (SM).		2 5 5		▲10				
		S-2				8 8 11			▲19			
		S-3				6 9 13			▲22			
10		S-4		Becomes very moist.		7 11 19				▲30		
15		S-5		Trace fine gravel.		6 9 30					▲39	
20		S-6		Becomes tan gray with heavy orange brown mottling. Contains coal fragments.		12 13 22				▲35		
25		S-7		Becomes gravelly.		28 50/5"						▲50/5"
				Bottom of exploration boring at 26 feet No groundwater encountered.								

Sampler Type (ST):



2" OD Split Spoon Sampler (SPT)



No Recovery

M - Moisture



3" OD Split Spoon Sampler (D & M)



Ring Sample

▽ Water Level ()



Grab Sample



Shelby Tube Sample

▼ Water Level at time of drilling (ATD)

Logged by: TJP

Approved by: CJK



associated
earth sciences
incorporated

Exploration Boring

Project Number
180070E001

Exploration Number
EB-4

Sheet
1 of 1

Project Name Issaquah HS #4 and ES #17

Location Issaquah, WA

Driller/Equipment Advance Drilling Technology / Track Rig

Hammer Weight/Drop 140# / 30 inches

Ground Surface Elevation (ft) 514

Datum NAVD 88

Date Start/Finish 6/25/19, 6/25/19

Hole Diameter (in) 7

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot				Other Tests
								10	20	30	40	
5		S-1		Fill Very moist, reddish brown, very silty, gravelly, SAND; nonstratified (SM).		5 4 5	▲9					
		S-2		Blakely Harbor Formation Very moist, reddish brown, gravelly, very silty, fine SAND; gravel fraction consists of angular sandstone fragments (SM).		2 2 3	▲5					
		S-3		Becomes tan and silty.		4 5 13	▲18					
		S-4		Contains angular gray gravel; poor recovery.		21 50 50/6"						▲50/6"
		S-5				38 50/3"						▲50/3"
		S-6		Becomes gray and more lithified.		50/5"						▲50/5"
20				Bottom of exploration boring at 20 feet due to refusal. No groundwater encountered.								
25												

Sampler Type (ST):



2" OD Split Spoon Sampler (SPT)



No Recovery

M - Moisture



3" OD Split Spoon Sampler (D & M)



Ring Sample

Water Level ()



Grab Sample



Shelby Tube Sample

Water Level at time of drilling (ATD)

Logged by: TJP

Approved by: CJK



associated
earth sciences
incorporated

Exploration Boring

Project Number
180070E001

Exploration Number
EB-5

Sheet
1 of 1

Project Name Issaquah HS #4 and ES #17

Location Issaquah, WA

Driller/Equipment Advance Drilling Technology / Track Rig

Hammer Weight/Drop 140# / 30 inches

Ground Surface Elevation (ft) 520

Datum NAVD 88

Date Start/Finish 6/25/19, 6/25/19

Hole Diameter (in) 7

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot				Other Tests
								10	20	30	40	
5		S-1		Asphalt - 1.5 inches thick Vashon Lodgement Till Moist, brown, very gravelly, very silty, SAND; rounded gravel (SM).			18 19 50/6"					▲ 50/6"
		S-2		Blakely Harbor Formation Moist, gray, silty, SAND; contains angular rock fragments (SM).			22 38 50/6"					▲ 50/6"
		S-3		Orange brown mottling.			28 33 50/3"					▲ 50/3"
		S-4		Becomes more heavily mottled.			18 50/4"					▲ 50/4"
		S-5					50/4"					▲ 50/4"
15				Bottom of exploration boring at 14 feet due to refusal. No groundwater encountered.								
20												
25												

Sampler Type (ST):



2" OD Split Spoon Sampler (SPT)



3" OD Split Spoon Sampler (D & M)



Grab Sample



No Recovery



Ring Sample



Shelby Tube Sample

M - Moisture



Water Level ()



Water Level at time of drilling (ATD)

Logged by: TJP

Approved by: CJK



associated
earth sciences
incorporated

Exploration Boring

Project Number
180070E001

Exploration Number
EB-6

Sheet
1 of 1

Project Name Issaquah HS #4 and ES #17

Location Issaquah, WA

Driller/Equipment Advance Drilling Technology / Track Rig

Hammer Weight/Drop 140# / 30 inches

Ground Surface Elevation (ft) 520

Datum NAVD 88

Date Start/Finish 6/26/19, 6/26/19

Hole Diameter (in) 7

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot				Other Tests
								10	20	30	40	
5		S-1		Asphalt - 2 inches Vashon Lodgement Till Moist, grayish tan, gravelly, very silty, SAND; nonstratified (SM).			8 10 15		▲25			
		S-2		Some gravel.			12 21 27					▲48
		S-3		Trace gravel; contains scattered thin lenses (<1/8 inches thick) of fine sand.			18 11 18		▲29			
10		S-4		Blakely Harbor Formation Gravelly drilling at 9 feet.			50/6"					▲50/6"
		S-5		Moist, yellowish tan to gray, silty, SAND; contains angular rock fragments (SM).			46 50/3"					▲50/3"
15				Bottom of exploration boring at 12.25 feet due to refusal. No groundwater encountered.								
20												
25												

Sampler Type (ST):



2" OD Split Spoon Sampler (SPT)



3" OD Split Spoon Sampler (D & M)



Grab Sample



No Recovery



Ring Sample



Shelby Tube Sample

M - Moisture



Water Level ()



Water Level at time of drilling (ATD)

Logged by: TJP

Approved by: CJK



associated
earth sciences
incorporated

Exploration Boring

Project Number
180070E001

Exploration Number
EB-7

Sheet
1 of 1

Project Name Issaquah HS #4 and ES #17

Location Issaquah, WA

Driller/Equipment Advance Drilling Technology / Track Rig

Hammer Weight/Drop 140# / 30 inches

Ground Surface Elevation (ft) 520

Datum NAVD 88

Date Start/Finish 6/26/19, 6/26/19

Hole Diameter (in) 7

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot				Other Tests
								10	20	30	40	
				Asphalt - 2.5 inches								
				Vashon Lodgement Till								
		S-1		Moist, grayish tan, gravelly, very silty, SAND; nonstratified (SM).		8			▲16			
						6						
						10						
		S-2				10						▲50/5"
						18						
						50/5"						
5		S-3		Poor recovery, driving a rock.		25						▲50/5"
				Very difficult drilling.		50/5"						
		S-4		Becomes yellowish tan, very gravelly.		14						▲50/5"
						46						
						50/5"						
10		S-5		No recovery.		50/1"						▲50/1"
				Bottom of exploration boring at 10 feet due to refusal.								
				No groundwater encountered.								
15												
20												
25												

Sampler Type (ST):



2" OD Split Spoon Sampler (SPT)



No Recovery

M - Moisture



3" OD Split Spoon Sampler (D & M)



Ring Sample

Water Level ()



Grab Sample



Shelby Tube Sample



Water Level at time of drilling (ATD)

Logged by: TJP

Approved by: CJK



associated
earth sciences
incorporated

Exploration Boring

Project Number
180070E001

Exploration Number
EB-8

Sheet
1 of 1

Project Name Issaquah HS #4 and ES #17

Location Issaquah, WA

Driller/Equipment Advance Drilling Technology / Track Rig

Hammer Weight/Drop 140# / 30 inches

Ground Surface Elevation (ft) 520

Datum NAVD 88

Date Start/Finish 6/26/19, 6/26/19

Hole Diameter (in) 7

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6" Blows/ft	Blows/Foot				Other Tests
								10	20	30	40	
5		S-1		Fill Moist, tan, gravelly, very silty, SAND (SM).		1 2 2	▲4					
		S-2		Trace tile debris.		3 3 4	▲7					
		S-3		Vashon Lodgement Till Moist, grayish tan, gravelly, very silty, SAND; nonstratified (SM).		5 10 14		▲24				
10		S-4		Becomes very moist. Drilling action becomes smoother at 12 feet. Drilling action becomes gravelly.		14 25 36						▲61
		S-5				18 36 36						▲72
20		S-6		Becomes mottled with increased moisture. Possession Drift Very moist, blue gray, SILT; contains fine sand partings; massive; effervesces in hydrochloric acid (ML).		16 15 20				▲35		
		S-7		Becomes laminated.		9 12 16				▲28		
25				Bottom of exploration boring at 26.5 feet No groundwater encountered.								

Sampler Type (ST):



2" OD Split Spoon Sampler (SPT)



3" OD Split Spoon Sampler (D & M)



Grab Sample



No Recovery



Ring Sample



Shelby Tube Sample

M - Moisture



Water Level ()



Water Level at time of drilling (ATD)

Logged by: TJP

Approved by: CJK



associated
earth sciences
incorporated

Exploration Boring

Project Number
180070E001

Exploration Number
EB-9

Sheet
1 of 1

Project Name Issaquah HS #4 and ES #17

Location Issaquah, WA

Driller/Equipment Advance Drilling Technology / Track Rig

Hammer Weight/Drop 140# / 30 inches

Ground Surface Elevation (ft) 500

Datum NAVD 88

Date Start/Finish 6/26/19, 6/26/19

Hole Diameter (in) 7

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot				Other Tests
								10	20	30	40	
				Asphalt - 1.5 inches								
				Fill								
		S-1		Moist, grayish tan and brown (mixed), gravelly, very silty, SAND; contains scattered organic debris (SM).		12 16 11			▲27			
				Vashon Lodgement Till								
		S-2		Very moist, tan gray, very silty, gravelly, SAND; nonstratified (SM).		6 9 12			▲21			
5												
		S-3		Becomes tan to grayish tan.		8 16 24				▲40		
10												
		S-4		Becomes moist.		16 24 30					▲54	
15												
		S-5		Becomes very moist.		48 50/1"					▲50/1"	
20												
		S-6				33 50/5"					▲50/5"	
25												
		S-7		Poor recovery.		50/4"					▲50/4"	
				Bottom of exploration boring at 25.5 feet No groundwater encountered.								

Sampler Type (ST):



2" OD Split Spoon Sampler (SPT)



No Recovery

M - Moisture



3" OD Split Spoon Sampler (D & M)



Ring Sample

Water Level ()



Grab Sample



Shelby Tube Sample

Water Level at time of drilling (ATD)

Logged by: TJP

Approved by: CJK



associated
earth sciences
incorporated

Exploration Boring

Project Number
180070E001

Exploration Number
EB-10

Sheet
1 of 1

Project Name Issaquah HS #4 and ES #17

Location Issaquah, WA

Driller/Equipment Advance Drilling Technology / Track Rig

Hammer Weight/Drop 140# / 30 inches

Ground Surface Elevation (ft) 465

Datum NAVD 88

Date Start/Finish 6/26/19, 6/26/19

Hole Diameter (in) 7

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot				Other Tests
								10	20	30	40	
5		S-1		Blakely Harbor Formation Very moist, brown to tan, very silty, gravelly, SAND (SM).		5 5 8		▲13				
		S-2		Becomes moist, grayish tan, silty with angular gravel sized sedimentary rock fragments.		9 15 18			▲33			
		S-3		Becomes tan to yellowish tan.		11 15 22				▲37		
10		S-4		Becomes mottled and fine grained (siltstone); angular rock fragments still present.		50/5"						▲50/5"
15		S-5				13 29 50/5"						▲50/5"
20		S-6		Poor recovery. Bottom of exploration boring at 20 feet due to refusal. No groundwater encountered.		50/2"						▲50/2"
25												

Sampler Type (ST):



2" OD Split Spoon Sampler (SPT)



3" OD Split Spoon Sampler (D & M)



Grab Sample



No Recovery



Ring Sample



Shelby Tube Sample

M - Moisture



Water Level ()



Water Level at time of drilling (ATD)

Logged by: TJP

Approved by: CJK



associated
earth sciences
incorporated

Exploration Boring

Project Number
180070E001

Exploration Number
EB-11

Sheet
1 of 3

Project Name Issaquah HS #4 and ES #17
Location Issaquah, WA
Driller/Equipment Advance Drilling Technology / Track Rig
Hammer Weight/Drop 140# / 30 inches

Ground Surface Elevation (ft) 500
Datum NAVD 88
Date Start/Finish 6/27/19, 6/27/19
Hole Diameter (in) 7

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot				Other Tests
								10	20	30	40	
				Vashon Lodgement Till								
		S-1		Very moist, grayish tan, very silty, gravelly, SAND; nonstratified (SM).		6 9 9			▲18			
		S-2		Becomes moist.		29 50/6"						▲50/6"
5		S-3		Met with refusal at 4 feet; moved over 4 feet and resumed drilling.		4 37 50/5"						▲50/5"
10		S-4		Becomes very moist.		50/3"						▲50/3"
15		S-5		Becomes very moist.		14 50/4"						▲50/4"
20		S-6				50/6"						▲50/6"
25		S-7		Becomes very moist, slightly less gravelly, and slightly more silty.		13 21 30						▲51
				Driller adding water (~1 to 2 gallons). Olympia Nonglacial Sediments ? Drilling action becomes smooth below ~28 feet.								

Sampler Type (ST):



2" OD Split Spoon Sampler (SPT)



No Recovery

M - Moisture



3" OD Split Spoon Sampler (D & M)



Ring Sample

▽ Water Level ()



Grab Sample



Shelby Tube Sample



Water Level at time of drilling (ATD)

Logged by: TJP

Approved by: CJK



associated
earth sciences
incorporated

Exploration Boring

Project Number
180070E001

Exploration Number
EB-11

Sheet
2 of 3

Project Name Issaquah HS #4 and ES #17

Location Issaquah, WA

Driller/Equipment Advance Drilling Technology / Track Rig

Hammer Weight/Drop 140# / 30 inches

Ground Surface Elevation (ft) 500

Datum NAVD 88

Date Start/Finish 6/27/19, 6/27/19

Hole Diameter (in) 7

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot				Other Tests
								10	20	30	40	
		S-8		Moist, tan gray, fine to medium SAND, some silt (SP-SM).		18 30 41						▲ 71
		S-9		Sand becomes tan, silty, and fine grained.		27 39						▲ 50/6"
				Moist, tan, SILT; nonplastic; massive; driller adding water (ML).		50/6"						
35		S-10				11 37						▲ 50/5"
						50/5"						
		S-11		Trace gravel.		27 50/6"						▲ 50/6"
40		S-12		Contains a lens (~3 inches thick) of lightly mottled, fine sandy, silt at ~40.5 feet.		20 39 50						▲ 50/6"
45		S-13				12 20 33						▲ 53
				Pre-Fraser Till								
				Gravelly drilling action at 48 feet.								
50		S-14		Moist, grayish tan, very silty, gravelly, SAND; nonstratified (SM).		20 32 48						▲ 80
55		S-15		Slight increase in moisture content. Becomes very moist and gray.		12 33 50/5"						▲ 50/5"

Sampler Type (ST):



2" OD Split Spoon Sampler (SPT)



No Recovery

M - Moisture



3" OD Split Spoon Sampler (D & M)



Ring Sample

▽ Water Level ()



Grab Sample



Shelby Tube Sample



Water Level at time of drilling (ATD)

Logged by: TJP

Approved by: CJK



associated
earth sciences
incorporated

Exploration Boring

Project Number
180070E001

Exploration Number
EB-11

Sheet
3 of 3

Project Name Issaquah HS #4 and ES #17

Location Issaquah, WA

Driller/Equipment Advance Drilling Technology / Track Rig

Hammer Weight/Drop 140# / 30 inches

Ground Surface Elevation (ft) 500

Datum NAVD 88

Date Start/Finish 6/27/19, 6/27/19

Hole Diameter (in) 7

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6" Blows/6"	Blows/Foot				Other Tests
								10	20	30	40	
		S-16		Driller adding water.		13 33 50/6"						▲50/6"
65		S-17				16 22 27						▲49
				Pre-Fraser Silt Drilling action becomes smooth below 68 feet.								
70		S-18		Moist, mottled tan, SILT; nonplastic; contains thin sand lens (~1 inch thick) at 71 feet; non-reactive in hydrochloric acid (ML).		17 27 40						▲67
75		S-19		Moist, grayish tan, very silty, fine SAND; frequent thin lenses (~2 inches thick) of silt (SM).		16 27 46						▲73
80		S-20		Blakely Harbor Formation Gravelly drilling action at 80 feet. Moist, gray, very silty, gravelly, SAND; nonstratified (SM).		50/6"						▲50/6"
85		S-21		Becomes greenish gray, very gravelly, and contains pink rock fragments.		40 50/3"						▲50/3"
				Bottom of exploration boring at 85.75 feet No groundwater encountered.								

Sampler Type (ST):



2" OD Split Spoon Sampler (SPT)



3" OD Split Spoon Sampler (D & M)



Grab Sample



No Recovery



Ring Sample



Shelby Tube Sample

M - Moisture



Water Level ()



Water Level at time of drilling (ATD)

Logged by: TJP

Approved by: CJK



associated
earth sciences
incorporated

Exploration Boring

Project Number
180070E001

Exploration Number
EB-12

Sheet
1 of 1

Project Name Issaquah HS #4 and ES #17

Location Issaquah, WA

Driller/Equipment Advance Drilling Technology / Track Rig

Hammer Weight/Drop 140# / 30 inches

Ground Surface Elevation (ft) 505

Datum NAVD 88

Date Start/Finish 6/28/19, 6/28/19

Hole Diameter (in) 7

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6" Blows/6"	Blows/Foot				Other Tests
								10	20	30	40	
5		S-1		Vashon Lodgement Till Very moist, mottled tan, very silty, gravelly, SAND; nonstratified (SM).		5 9 9			▲18			
		S-2		Vashon Ice Contact Very moist, mottled tan, fine sandy, SILT, some gravel; nonplastic (ML).		4 5 6			▲11			
		S-3		Trace to some gravel.		4 6 10			▲16			
10		S-4		No gravel. Becomes blue gray below 11 feet.		5 10 15			▲25			
		S-5		Blakely Harbor Formation Gravelly drilling action below 14.5 feet. Moist, purplish gray, silty, fine SAND, trace organics (SM).		15 41 50/4"						▲50/4"
15		S-6		Becomes purplish greenish gray and fine to medium grained with some pebble gravel.		50/5"						▲50/5"
				Bottom of exploration boring at 18 feet due to refusal. No groundwater encountered.								
20												
25												

Sampler Type (ST):



2" OD Split Spoon Sampler (SPT)



3" OD Split Spoon Sampler (D & M)



Grab Sample



No Recovery



Ring Sample



Shelby Tube Sample

M - Moisture



Water Level ()



Water Level at time of drilling (ATD)

Logged by: TJP

Approved by: CJK

LOG OF EXPLORATION PIT NO. EP-1

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	Elev: 505 ft
	Topsoil - 6 inches	
	Weathered Vashon Lodgement Till	
1	Loose, very moist, brown, very silty, gravelly, SAND; abundant roots (SM).	
2	Becomes medium dense and tan below 2 feet.	
3		
	Vashon Lodgement Till	
4	Hard, very moist, grayish tan, fine sandy, SILT; oxidized fracture surfaces; nonstratified (ML).	
5		
6	Trace to some gravel below 6 feet.	
7		
8		
9	Bottom of exploration pit at depth 8.5 feet No seepage. No caving.	
10		
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/12/18

LOG OF EXPLORATION PIT NO. EP-2

Depth (ft)	<p>This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.</p>	
	DESCRIPTION	<u>Elev: 510 ft</u>
	Topsoil - 6 inches	
	Weathered Vashon Lodgement Till	
1	Loose, wet, reddish brown, very silty, gravelly, SAND (SM).	
2	Abundant roots to 2.5 feet.	
	Becomes medium dense, very moist, and grayish tan below 2.5 feet.	
3		
	Vashon Lodgement Till	
4	Very dense, moist, grayish tan, very silty, gravelly, SAND; nonstratified (SM).	
5		
6		
7		
8		
	Bottom of exploration pit at depth 8 feet No seepage. No caving.	
9		
10		
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



a s s o c i a t e d
e a r t h s c i e n c e s
i n c o r p o r a t e d

Project No. 180070E001

12/12/18

LOG OF EXPLORATION PIT NO. EP-3

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	<u>Elev: 485 ft</u>
	Topsoil - 8 inches	
1	Weathered Vashon Lodgement Till Loose, very moist, brown to reddish brown, very silty, gravelly, SAND (SM).	
2	Abundant roots 0 to 2.5 feet. Becomes medium dense, increased moisture, and grayish tan with mottling below 2.5 feet.	
3	Vashon Lodgement Till	
4	Dense, very moist, grayish tan, very silty, gravelly, SAND; scattered cobbles; mottled above 5 feet (sandy till); nonstratified (SM).	
5		
6		
7		
8	Bottom of exploration pit at depth 8 feet No seepage. No caving.	
9		
10		
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/13/19

LOG OF EXPLORATION PIT NO. EP-4

Depth (ft)	<p>This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.</p>	
	DESCRIPTION	<u>Elev: 480 ft</u>
	Topsoil - 10 inches	
1	Blakely Harbor Formation	
	Loose, very moist, brown, very silty, SAND, some gravel; abundant roots (SM).	
2		
	Soft to medium stiff, very moist to wet, yellowish tan, SILT (ML).	
3		
4		
5		
6	Medium dense to dense, very moist, yellowish tan, very silty, fine SAND (SM) and hard, fine sandy, SILT (ML); stratified (sandstone/siltstone).	
7		
8		
9		
	Bottom of exploration pit at depth 9 feet Moderately rapid seepage 2 to 4 feet. Moderate sloughing 2 to 4 feet.	
10		
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



a s s o c i a t e d
e a r t h s c i e n c e s
i n c o r p o r a t e d

Project No. 180070E001

12/12/18

LOG OF EXPLORATION PIT NO. EP-5

Depth (ft)	<p>This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.</p> <p style="text-align: center;">DESCRIPTION</p> <p style="text-align: right;"><u>Elev: 476 ft</u></p>
	Topsoil - 6 inches
	Weathered Vashon Lodgement Till
1	Loose to medium dense, very moist, brown, very silty, gravelly, SAND; scattered cobbles; abundant roots (SM).
2	Blakely Harbor Formation
3	Medium dense to dense, very moist, yellowish tan, very silty, SAND (SM).
4	
5	
6	Becomes very dense below 6 feet.
7	
8	Bottom of exploration pit at depth 7 feet No seepage. No caving.
9	
10	
11	
12	

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



a s s o c i a t e d
e a r t h s c i e n c e s
i n c o r p o r a t e d

Project No. 180070E001

12/13/18

LOG OF EXPLORATION PIT NO. EP-6

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	<div>DESCRIPTION</div> <div>Elev: 482 ft</div>	
	Topsoil - 6 inches	
	Weathered Vashon Lodgement Till	
1	Loose, very moist, reddish brown, very silty, gravelly, SAND (SM). Abundant roots 0 to 2 feet.	
2	Becomes medium dense and tan below 2 feet.	
3	Vashon Lodgement Till	
4	Dense, very moist, mottled grayish tan, very silty, gravelly, SAND; scattered cobbles and boulders; nonstratified (SM).	
5		
6		
7	Wet at 7 feet.	
8		
9	Bottom of exploration pit at depth 9 feet Slow discontinuous seepage at 7 feet. No caving.	
10		
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001
12/13/18

LOG OF EXPLORATION PIT NO. EP-7

Depth (ft)	<p>This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.</p>	
	DESCRIPTION	<u>Elev: 505 ft</u>
	Fill	
1	<p>Loose, very moist, brown, very silty, gravelly, SAND (SM).</p>	
	Vashon Lodgement Till	
2	<p>Very dense, moist, tan gray, very silty, gravelly, SAND; nonstratified (SM).</p>	
3	<p>Very difficult digging.</p>	
4		
5		
6	<p>Bottom of exploration pit at depth 5 feet No seepage. No caving.</p>	
7		
8		
9		
10		
11		
12		

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



a s s o c i a t e d
e a r t h s c i e n c e s
i n c o r p o r a t e d

Project No. 180070E001

12/10/18

LOG OF EXPLORATION PIT NO. EP-8

Depth (ft)	<p>This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.</p>	
	<p style="text-align: center;">DESCRIPTION</p> <p style="text-align: right;"><u>Elev: 500 ft</u></p>	
	Fill	
1	Loose, moist, brown, very silty, gravelly, SAND (SM).	
2		
3	Abundant roots 0 to 4 feet	
4	Becomes tan below 4 feet.	
5		
6		
7		
8	<p style="text-align: center;">Weathered Vashon Lodgement Till</p> <p>Medium dense, moist, reddish brown, very silty, gravelly, SAND (SM).</p>	
9		
10	Clay pipe encountered at 10 feet in north end of excavation.	
11	<p style="text-align: center;">Vashon Lodgement Till</p> <p>Very dense, moist, grayish tan, very silty, SAND, some gravel; nonstratified (SM).</p>	
	<p>Bottom of exploration pit at depth 11 feet No seepage. No caving.</p>	
12		

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/12/18

LOG OF EXPLORATION PIT NO. EP-9

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	<u>Elev: 510 ft</u>
	Fill	
1	Loose, very moist, brown, very silty, SAND, some gravel; contains pockets of clean sand (SM).	
	Vashon Lodgement Till	
2	Very dense, moist, grayish tan, very silty, gravelly, SAND; scattered cobbles and boulders; nonstratified (SM).	
3		
4		
5		
6		
7		
8	Bottom of exploration pit at depth 7 feet No seepage. No caving.	
9		
10		
11		
12		

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/12/18

LOG OF EXPLORATION PIT NO. EP-10

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	<div>DESCRIPTION</div> <div>Elev: 512 ft</div>	
	Weathered Vashon Lodgement Till	
	Loose, very moist, brown, very silty, gravelly, SAND; abundant roots; wet at base (SM).	
1	Vashon Lodgement Till	
	Very dense, very moist, grayish tan, very silty, gravelly, SAND; scattered boulders and cobbles; nonstratified (SM).	
2		
	Becomes moist below ~2.5 feet.	
3		
4		
5		
6		
	Bottom of exploration pit at depth 6 feet Refusal due to boulder. Slow seepage at 1 foot. No caving.	
7		
8		
9		
10		
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/12/18

LOG OF EXPLORATION PIT NO. EP-11

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	Elev: 512 ft
	Fill	
1	Loose, very moist to wet, brown, very silty, gravelly, SAND; contains trace wood debris (SM).	
2	Clay pipe and wires encountered at ~2 and 3 feet.	
3		
4		
5		
6	Vashon Lodgement Till	
7	Very dense, very moist, grayish tan, very silty, gravelly, SAND; nonstratified (SM).	
8	Bottom of exploration pit at depth 7 feet Slow seepage at ~2 feet. Moderately severe caving at ~2 feet.	
9		
10		
11		
12		

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/12/18

LOG OF EXPLORATION PIT NO. EP-12

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	<u>Elev: 492 ft</u>
	Topsoil - 6 inches	
	Weathered Vashon Lodgement Till	
1	Dense, moist to very moist, reddish brown, very silty, gravelly, SAND; abundant roots (SM).	
2		
3		
4	Vashon Lodgement Till	
	Very dense, very moist, grayish tan, very silty, gravelly, SAND; nonstratified (SM).	
5		
6	Bottom of exploration pit at depth 5 feet No seepage. No caving. Broke water line during excavation; repaired.	
7		
8		
9		
10		
11		
12		

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/12/18

LOG OF EXPLORATION PIT NO. EP-13

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	<u>Elev: 485 ft</u>
	Topsoil - 6 inches	
1	Loose, very moist, reddish brown, very silty, gravelly, SAND (SM).	
2	Abundant roots 0 to 2.5 feet. Becomes medium dense and grayish tan below 2.5 feet. Wet at base.	
3	Vashon Lodgement Till	
4	Very dense, moist, grayish tan, very silty, gravelly, SAND; scattered cobbles; nonstratified (SM).	
5		
6		
7		
8	Bottom of exploration pit at depth 8 feet Slow seepage at 3 feet. No caving.	
9		
10		
11		
12		

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/13/18

LOG OF EXPLORATION PIT NO. EP-14

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	Elev: 476 ft
	Topsoil - 6 inches	
	Weathered Vashon Lodgement Till	
1	Loose, very moist, reddish brown, very silty, gravelly, SAND (SM).	
2		
	Wet at 2.5 feet. Abundant roots 0 to 2.5 feet.	
3	Becomes medium dense, very moist, and tan below 3 feet.	
	Vashon Lodgement Till	
4	Dense, very moist, tan, very silty, gravelly, SAND; scattered cobbles; nonstratified (SM).	
	Lightly mottled 3.5 to 4.5 feet. Becomes very dense below 4.5 feet.	
5		
6		
7		
	Bottom of exploration pit at depth 7 feet Slow seepage at 2.5 feet. No caving.	
8		
9		
10		
11		
12		

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/13/18

LOG OF EXPLORATION PIT NO. EP-15

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	<u>Elev: 477 ft</u>
	Topsoil - 8 inches	
1	Weathered Vashon Lodgement Till Loose, very moist, reddish brown, gravelly, very silty, SAND; scattered cobbles (SM).	
2		
3	Wet at 2.5 feet. Abundant roots 0 to 2.5 feet. Becomes medium dense and tan below 2.5 feet.	
4	Vashon Lodgement Till Dense, very moist, grayish tan, very silty, gravelly, SAND; scattered cobbles; nonstratified (SM). Mottled 3.5 to 5 feet.	
5		
6	Becomes very dense below ~6 feet.	
7		
8	Bottom of exploration pit at depth 8 feet Moderately rapid seepage at 2.5 feet. No caving.	
9		
10		
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/13/18

LOG OF EXPLORATION PIT NO. EP-16

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	Elev: 480 ft
	Forest Duff	
	Fill	
1	Very dense, moist, grayish brown, very silty, gravelly, SAND; scattered cobbles (SM).	
2	Medium dense to dense, moist, grayish brown, very gravelly, fine to medium SAND, trace silt; scattered cobbles (SP).	
3	Abundant wood debris below ~2.5 feet. Pockets of silty, sand below 3 feet.	
4	Vashon Lodgement Till	
5	Dense, very moist, gray, very silty, gravelly, SAND; scattered cobbles; nonstratified (SM).	
6	Becomes tan gray below 6 feet.	
7		
8		
9	Bottom of exploration pit at depth 8 feet No seepage. No caving.	
10		
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/13/18

LOG OF EXPLORATION PIT NO. EP-17

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	<u>Elev: 489 ft</u>
	Topsoil - 6 inches	
	Weathered Vashon Lodgement Till	
1	Loose, very moist, reddish brown, very silty, gravelly, SAND (SM).	
2		
	Abundant roots 0 to 3 feet.	
3	Becomes medium dense and tan below 3 feet.	
4		
5	Vashon Lodgement Till	
	Dense, very moist, grayish tan, very silty, gravelly, SAND; scattered cobbles; nonstratified (SM).	
6		
7	Becomes very dense below 7 feet.	
8		
	Bottom of exploration pit at depth 8 feet No seepage. No caving.	
9		
10		
11		
12		

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/13/18

LOG OF EXPLORATION PIT NO. EP-18

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	<u>Elev: 501 ft</u>
	Topsoil - 6 inches	
	Fill	
1	Medium dense, moist to very moist, grayish tan, fine to medium SAND, some silt; scattered wood debris; wet at 2 feet (SP-SM).	
2	Vashon Lodgement Till	
	Very dense, very moist, grayish tan, very silty, gravelly, SAND; nonstratified (SM).	
3		
4		
5	Bottom of exploration pit at depth 4.5 feet Refusal due to a large boulder. Slow seepage at 2 feet. No caving.	
6		
7		
8		
9		
10		
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/12/18

LOG OF EXPLORATION PIT NO. EP-19

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	<div>DESCRIPTION</div> <div>Elev: 502 ft</div>	
	Sod / Topsoil - 6 inches	
	Weathered Vashon Lodgement Till	
1	Medium dense, very moist, brown, gravelly, silty, SAND; wet at 1.5 feet (SM).	
	Vashon Lodgement Till	
2	Very dense, wet, grayish tan, very silty, gravelly, SAND; scattered cobbles; nonstratified (SM).	
3		
4		
5		
6		
7		
	Bottom of exploration pit at depth 7 feet Slow seepage at 1.5 feet. No caving.	
8		
9		
10		
11		
12		

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/12/18

LOG OF EXPLORATION PIT NO. EP-20

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	<div>DESCRIPTION</div> <div>Elev: 499 ft</div>	
	Sod / Topsoil - 6 inches	
	Vashon Lodgement Till	
1	Very dense, very moist, grayish tan, very silty, gravelly, SAND; scattered cobbles; nonstratified (SM). Becomes moist below ~1 foot.	
2		
3		
4	Becomes tan gray below ~4 feet.	
5		
6	Very difficult digging.	
	Bottom of exploration pit at depth 6 feet No seepage. No caving.	
7		
8		
9		
10		
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/12/18

LOG OF EXPLORATION PIT NO. EP-21

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	Elev: 490 ft
	Topsoil - 6 inches	
	Weathered Vashon Lodgement Till	
1	Loose, moist, reddish brown to brown, very silty, gravelly, SAND (SM).	
2	Abundant roots 0 to 2 feet. Becomes medium dense, very moist, and tan below 2 feet.	
3	Wet at 3.5 feet.	
	Vashon Lodgement Till	
4	Very dense, moist, grayish tan, very silty, gravelly, SAND; nonstratified (SM).	
	Mottled 3.5 to 4.5 feet.	
5		
6		
7		
8		
9		
10	Bottom of exploration pit at depth 9.5 feet Slow seepage at 3.5 feet. No caving.	
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/10/18

LOG OF EXPLORATION PIT NO. EP-22

Depth (ft)	<p>This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.</p>	
	DESCRIPTION	<u>Elev: 478 ft</u>
	Topsoil - 8 inches	
1	<p style="text-align: center;">Weathered Vashon Lodgement Till</p> <p>Loose, moist, reddish brown, very silty, gravelly, SAND (SM). Abundant roots 0 to 2 feet.</p>	
2	Becomes medium dense, very moist, and tan below 2 feet.	
3		
4	<p style="text-align: center;">Vashon Lodgement Till</p> <p>Dense, moist, tan, very silty, gravelly, SAND; nonstratified (SM). Mottled 4 to 5 feet. Very dense and grayish tan below 5 feet.</p>	
5		
6		
7		
8		
9	<p>Bottom of exploration pit at depth 8.5 feet No seepage. No caving.</p>	
10		
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



a s s o c i a t e d
e a r t h s c i e n c e s
i n c o r p o r a t e d

Project No. 180070E001

12/10/18

LOG OF EXPLORATION PIT NO. EP-23

Depth (ft)	<p>This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.</p>	
	DESCRIPTION	<u>Elev: 460 ft</u>
	Topsoil - 6 inches	
	Weathered Vashon Lodgement Till	
1	Loose, moist, reddish brown, very silty, gravelly, SAND (SM).	
2	Becomes medium dense and tan below 2 feet. Abundant roots 0 to 2 feet.	
3	Vashon Lodgement Till	
	Very dense, moist, grayish tan, very silty, gravelly, SAND; nonstratified (SM).	
4		
5		
6		
7		
8		
	Bottom of exploration pit at depth 8 feet No seepage. No caving.	
9		
10		
11		
12		

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



a s s o c i a t e d
e a r t h s c i e n c e s
i n c o r p o r a t e d

Project No. 180070E001

12/10/18

LOG OF EXPLORATION PIT NO. EP-24

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	<u>Elev: 445 ft</u>
	Topsoil - 6 inches	
	Weathered Vashon Lodgement Till	
1	Loose, moist, reddish brown, very silty, gravelly, SAND (SM).	
2		
3	Becomes medium dense and tan below 2.5 feet.	
	Vashon Lodgement Till	
4	Very dense, moist, grayish tan, very silty, gravelly, SAND; scattered cobbles and boulders; nonstratified (SM).	
5	Mottled 3.5 to 4.5 feet.	
6		
7		
8		
9		
10	Bottom of exploration pit at depth 9 feet No seepage. No caving.	
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/10/18

LOG OF EXPLORATION PIT NO. EP-25

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION <div>Elev: 425 ft</div>	
	Topsoil - 6 inches	
	Weathered Vashon Lodgement Till	
1	Loose, moist, reddish brown, very silty, gravelly, SAND (SM).	
2		
3	Abundant roots 0 to 3 feet. Becomes medium dense and tan below 3 feet.	
4		
	Vashon Lodgement Till	
5	Very dense, moist, grayish tan, very silty, gravelly, SAND; scattered boulders and cobbles; nonstratified (SM). Mottled 4.5 to 6 feet.	
6		
7		
8		
9		
10		
11	Bottom of exploration pit at depth 10 feet No seepage. No caving.	
12		

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/10/18

LOG OF EXPLORATION PIT NO. EP-26

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	<u>Elev: 420 ft</u>
	Topsoil - 6 inches	
1	Loose, moist, reddish brown, very silty, SAND, some gravel (SM).	
2	Abundant roots 0 to 2 feet. Becomes medium dense, very moist, and tan below 2 feet.	
3	Vashon Lodgement Till	
4	Very dense, moist, grayish tan, very silty, gravelly, SAND; scattered cobbles; nonstratified (SM).	
5	Mottled 3 to 4 feet.	
6		
7		
8	Bottom of exploration pit at depth 8 feet No seepage. No caving.	
9		
10		
11		
12		

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/10/18

LOG OF EXPLORATION PIT NO. EP-27

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	<u>Elev: 425 ft</u>
	Topsoil - 6 inches	
	Weathered Vashon Lodgement Till	
1	Loose, moist, reddish brown, very silty, gravelly, SAND; scattered cobbles (SM). Medium dense, very moist, and tan below 1.5 feet. Abundant roots 0 to 1.5 feet.	
2		
	Vashon Lodgement Till	
3	Very dense, moist, grayish tan, very silty, gravelly, SAND; nonstratified (SM).	
4		
5		
6		
7		
8		
9	Bottom of exploration pit at depth 8 feet No seepage. No caving.	
10		
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/10/18

LOG OF EXPLORATION PIT NO. EP-28

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	<u>Elev: 460 ft</u>
	Topsoil - 6 inches	
	Weathered Vashon Lodgement Till	
1	Loose, moist, reddish brown, very silty, gravelly, SAND (SM).	
2	Abundant roots 0 to 2.5 feet. Becomes medium dense, very moist, and tan below 2.5 feet.	
3		
4	Vashon Lodgement Till	
	Very dense, moist, tan, very silty, gravelly, SAND; scattered cobbles (SM).	
5		
6		
7		
8	Bottom of exploration pit at depth 8 feet No seepage. No caving.	
9		
10		
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/10/18

LOG OF EXPLORATION PIT NO. EP-29

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	<u>Elev: 460 ft</u>
	Topsoil - 6 inches	
1	Weathered Vashon Lodgement Till	
	Loose to medium dense, moist, reddish brown, very silty, gravelly, SAND; abundant roots (SM).	
2		
3		
4	Vashon Lodgement Till	
	Mottled 3.5 to 4.5 feet. Dense to very dense, moist, grayish tan, very silty, gravelly, SAND; scattered cobbles; nonstratified (SM).	
5		
6	Grades to tan gray below ~6 feet.	
7		
8		
9		
10	Bottom of exploration pit at depth 9 feet No seepage. No caving.	
11		
12		

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/10/18

LOG OF EXPLORATION PIT NO. EP-30

Depth (ft)	<p>This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.</p>	
	<p align="center">DESCRIPTION</p> <p align="right"><u>Elev: 485 ft</u></p>	
	Topsoil - 8 inches	
1	<p align="center">Weathered Vashon Lodgement Till</p> <p>Loose, moist, brown, very silty, gravelly, SAND (SM).</p> <p>Abundant roots 0 to 1.5 feet.</p>	
2		
3	<p>Becomes medium dense, very moist, and tan below 2.5 feet.</p>	
4		
5		
6	Vashon Lodgement Till	
7	<p>Dense, moist, light yellowish tan, very silty, gravelly, SAND; scattered cobbles; nonstratified (SM).</p>	
8		
9	<p>Bottom of exploration pit at depth 8 feet No seepage. No caving. Note: The color and density of the Till at this location suggests that it contains a significant percentage of reworked material from the underlying bedrock.</p>	
10		
11		
12		

KCTP3 180070.GPJ August 23, 2019

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
 Approved by: CJK



associated
 earth sciences
 incorporated

Project No. 180070E001

12/13/18

LOG OF EXPLORATION PIT NO. EP-31

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.	
	DESCRIPTION	Elev: 490 ft
	Topsoil - 8 inches	
1	Weathered Vashon Lodgement Till Loose to medium dense, very moist, reddish brown, very silty, gravelly, SAND (SM).	
2		
3	Abundant roots 0 to 3 feet. Wet at 3 feet. Becomes medium dense and grayish tan below 3 feet.	
4	Vashon Lodgement Till Dense, very moist, grayish tan, very silty, gravelly, SAND; scattered cobbles; nonstratified (SM). Mottled 3.5 to 4.5 feet. Becomes very dense below 4.5 feet.	
5		
6		
7		
8		
9	Bottom of exploration pit at depth 8 feet Slow seepage at 3 feet. Minor sloughing at 3 feet.	
10		
11		
12		

Issaquah HS #4 and ES #17 Issaquah, WA

Logged by: TJP
Approved by: CJK



associated
earth sciences
incorporated

Project No. 180070E001

12/13/18



Earth Solutions NW
1805 - 136th Place N.E., Suite 201
Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-1

PAGE 1 OF 1

CLIENT <u>Plateau Campus, LLC</u>	PROJECT NAME <u>Plateau Campus Property</u>
PROJECT NUMBER <u>3333</u>	PROJECT LOCATION <u>Issaquah, Washington</u>
DATE STARTED <u>5/5/14</u>	COMPLETED <u>5/5/14</u>
EXCAVATION CONTRACTOR <u>NW Excavating</u>	GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION METHOD _____	GROUND WATER LEVELS:
LOGGED BY <u>SHA</u>	AT TIME OF EXCAVATION <u>---</u>
CHECKED BY <u>SSR</u>	AT END OF EXCAVATION <u>---</u>
NOTES <u>Depth of Topsoil & Sod 10": bare soil</u>	AFTER EXCAVATION <u>---</u>

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0					TOPSOIL	
		MC = 16.90% Fines = 24.00%	TPSL		1.0	Brown silty SAND with gravel, loose to medium dense, moist (Weathered Till) -mottled with light iron oxide staining, becomes dense
5		MC = 12.50%	SM		-becomes very dense and unweathered, perched seepage	
					Test pit terminated at 7.0 feet below existing grade. Groundwater seepage encountered at 4.0 feet during excavation. Bottom of test pit at 7.0 feet.	



Earth Solutions NW
1805 - 136th Place N.E., Suite 201
Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-3

PAGE 1 OF 1

CLIENT Plateau Campus, LLC

PROJECT NAME Plateau Campus Property

PROJECT NUMBER 3333

PROJECT LOCATION Issaquah, Washington

DATE STARTED 5/5/14

COMPLETED 5/5/14

GROUND ELEVATION _____

TEST PIT SIZE _____

EXCAVATION CONTRACTOR NW Excavating

GROUND WATER LEVELS:

EXCAVATION METHOD _____

AT TIME OF EXCAVATION _____


LOGGED BY SHA

CHECKED BY SSR

AT END OF EXCAVATION _____

NOTES Depth of Topsoil & Sod 12": Ivy

AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			TPSL		TOPSOIL
		MC = 15.70% Fines = 29.10%			Brown silty SAND with gravel, loose to medium dense, moist (Weathered Till)
			SM		-heavy perched seepage
		MC = 8.00%			-becomes very dense and unweathered
5					Test pit terminated at 5.0 feet below existing grade. Groundwater seepage encountered at 1.5 feet during excavation.
					Bottom of test pit at 5.0 feet.



Earth Solutions NW
1805 - 138th Place N.E., Suite 201
Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-4

PAGE 1 OF 1

CLIENT Plateau Campus, LLC

PROJECT NAME Plateau Campus Property

PROJECT NUMBER 3333

PROJECT LOCATION Issaquah, Washington

DATE STARTED 5/5/14

COMPLETED 5/5/14

GROUND ELEVATION _____

TEST PIT SIZE _____

EXCAVATION CONTRACTOR NW Excavating

GROUND WATER LEVELS:

EXCAVATION METHOD _____

AT TIME OF EXCAVATION _____

LOGGED BY SHA

CHECKED BY SSR

AT END OF EXCAVATION _____

NOTES Depth of Topsoil & Sod 18": Ivy

AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					TOPSOIL
		MC = 11.80%	TPSL		
		MC = 12.00%			Brown silty SAND with gravel, loose and medium dense, moist (Weathered Till)
5		MC = 12.10%	SM		-becomes very dense and unweathered
					Test pit terminated at 8.0 feet below existing grade. Groundwater seepage encountered at 3.5 feet during excavation.
					Bottom of test pit at 8.0 feet.



Earth Solutions NW
1805 - 136th Place N.E., Suite 201
Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-5

PAGE 1 OF 1

CLIENT Plateau Campus, LLC

PROJECT NAME Plateau Campus Property

PROJECT NUMBER 3333

PROJECT LOCATION Issaquah, Washington

DATE STARTED 5/5/14

COMPLETED 5/5/14

GROUND ELEVATION _____

TEST PIT SIZE _____

EXCAVATION CONTRACTOR NW Excavating

GROUND WATER LEVELS:

EXCAVATION METHOD _____

AT TIME OF EXCAVATION ---



LOGGED BY SHA

CHECKED BY SSR

AT END OF EXCAVATION ---

NOTES Depth of Topsoil & Sod 6": bare soil

AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			TPSL		0.5 TOPSOIL Brown silty SAND with gravel, medium dense, moist (Fill)
5		MC = 14.30%			-becomes medium dense to dense
			SM		
		MC = 16.80%			-native, unweathered till contact
10					10.0 Test pit terminated at 10.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 10.0 feet.



Earth Solutions NW
1805 - 136th Place N.E., Suite 201
Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-6

PAGE 1 OF 1

CLIENT Plateau Campus, LLC

PROJECT NAME Plateau Campus Property

PROJECT NUMBER 3393

PROJECT LOCATION Issaquah, Washington

DATE STARTED 5/5/14

COMPLETED 5/5/14

GROUND ELEVATION _____

TEST PIT SIZE _____

EXCAVATION CONTRACTOR NW Excavating

GROUND WATER LEVELS:

EXCAVATION METHOD _____

AT TIME OF EXCAVATION —

LOGGED BY SHA

CHECKED BY SSR

AT END OF EXCAVATION —

NOTES Depth of Topsoil & Sod 6": ferns

AFTER EXCAVATION —

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		TPSL		0.5 TOPSOIL Brown silty SAND with gravel, medium dense, moist (Weathered Till)
		SM		-becomes very dense and unweathered
				4.0 Test pit terminated at 4.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 4.0 feet.



Earth Solutions NW
1805 - 136th Place N.E., Suite 201
Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-7

PAGE 1 OF 1

CLIENT Plateau Campus, LLC

PROJECT NAME Plateau Campus Property

PROJECT NUMBER 3333

PROJECT LOCATION Issaquah, Washington

DATE STARTED 5/5/14

COMPLETED 5/5/14

GROUND ELEVATION _____

TEST PIT SIZE _____

EXCAVATION CONTRACTOR NW Excavating

GROUND WATER LEVELS:

EXCAVATION METHOD _____

AT TIME OF EXCAVATION --




LOGGED BY SHA

CHECKED BY SSR

AT END OF EXCAVATION --

NOTES Depth of Topsoil & Sod 12": ferns

AFTER EXCAVATION --

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			TPSL		TOPSOIL
		MC = 15.80%		1.0	Brown silty SAND with gravel, medium dense, moist (Weathered Till)
			SM		-cobbles -becomes very dense and unweathered -cobbles down to terminus of test pit
		MC = 10.40% Fines = 11.30%		4.0	Brown poorly graded GRAVEL with silt and sand, dense, moist
5					
			GP-GM		
		MC = 21.60%			
10					
				13.0	Test pit terminated at 13.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 13.0 feet.



Earth Solutions NW
1805 - 136th Place N.E., Suite 201
Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-9

PAGE 1 OF 1

CLIENT Plateau Campus, LLC

PROJECT NAME Plateau Campus Property

PROJECT NUMBER 3333

PROJECT LOCATION Issaquah, Washington

DATE STARTED 5/5/14

COMPLETED 5/5/14

GROUND ELEVATION _____

TEST PIT SIZE _____

EXCAVATION CONTRACTOR NW Excavating

GROUND WATER LEVELS: _____

EXCAVATION METHOD _____

AT TIME OF EXCAVATION _____

LOGGED BY SHA

CHECKED BY SSR

AT END OF EXCAVATION _____

NOTES Depth of Topsoil & Sod 12": duff

AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					TOPSOIL
		MC = 23.20%	TPSL		1.0 Brown silty SAND with gravel, loose to medium dense, moist (Weathered Till)
			SM		-fractured -cobbles, mottled texture
5					3.0 Brown poorly graded GRAVEL with silt and sand, dense, moist
		MC = 17.20%	GP-GM		
					9.0 Test pit terminated at 9.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 9.0 feet.



Earth Solutions NW
1805 - 138th Place N.E., Suite 201
Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-8

PAGE 1 OF 1

CLIENT Plateau Campus, LLC

PROJECT NAME Plateau Campus Property

PROJECT NUMBER 3333

PROJECT LOCATION Issaquah, Washington

DATE STARTED 5/5/14

COMPLETED 5/5/14

GROUND ELEVATION _____

TEST PIT SIZE _____

EXCAVATION CONTRACTOR NW Excavating

GROUND WATER LEVELS:

EXCAVATION METHOD _____

AT TIME OF EXCAVATION _____


LOGGED BY SHA

CHECKED BY SSR

AT END OF EXCAVATION _____

NOTES Depth of Topsoil & Sod 10": forest duff

AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					TOPSOIL
			TPSL		1.0
					Brown silty SAND with gravel, loose to medium dense, moist (Weathered Till)
					-becomes very dense and unweathered
					-cobbles
5			SM		
		MC = 19.70%			
					8.0
					Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation.
					Bottom of test pit at 8.0 feet.



Earth Solutions NW
1805 - 136th Place N.E., Suite 201
Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-10

PAGE 1 OF 1

CLIENT Plateau Campus, LLC

PROJECT NAME Plateau Campus Property

PROJECT NUMBER 3333

PROJECT LOCATION Issaquah, Washington

DATE STARTED 5/5/14

COMPLETED 5/5/14

GROUND ELEVATION _____

TEST PIT SIZE _____

EXCAVATION CONTRACTOR NW Excavating

GROUND WATER LEVELS:

EXCAVATION METHOD _____

AT TIME OF EXCAVATION —


LOGGED BY SHA

CHECKED BY SSR

AT END OF EXCAVATION —

NOTES Depth of Topsoil & Sod 10": blackberry bushes

AFTER EXCAVATION —

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		TPSL		TOPSOIL
			1.0	Brown silty SAND with gravel, medium dense, moist
		SM		-cobbles and weathered fractured bedrock
			3.0	Brown poorly graded GRAVEL with silt and sand, dense, moist
		GP-GM		
5			5.0	Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.

LOG OF TEST PIT NO. TP-1

FIGURE A-2

PROJECT NAME: Madison Pointe PROJ. NO: T-7252 LOGGED BY: CSD
 LOCATION: Issaquah, Washington SURFACE CONDS: Heavy Understory APPROX. ELEV: 466 Feet
 DATE LOGGED: July 8, 2015 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		Brown silty SAND, fine grained, dry, heavy organic inclusions. (SM) (Topsoil)	Loose	7.1		
2	1					
3		Brown silty SAND with gravel, fine to medium grained, dry, roots. (SM)	Medium Dense	9.5		
4						
5						
6	2					
7		Gray silty SAND with gravel to SAND with silt and gravel, fine to medium grained, dry to moist, cemented. (SM/SP-SM)	Very Dense			
8						
9						
10						
11		Test pit terminated at approximately 10 feet. No groundwater seepage observed.				
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



Terra Associates, Inc.
 Consultants in Geotechnical Engineering
 Geology and
 Environmental Earth Sciences

LOG OF TEST PIT NO. TP-2

FIGURE A-3

PROJECT NAME: Madison Pointe PROJ. NO: T-7252 LOGGED BY: CSD
 LOCATION: Issaquah, Washington SURFACE CONDS: Heavy Understory APPROX. ELEV: 464 Feet
 DATE LOGGED: July 8, 2015 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		Brown silty SAND, fine grained, dry, heavy organic inclusions. (SM) (Topsoil)	Loose			
2	1	Brown silty SAND with gravel, fine to medium grained, dry, roots. (SM)	Medium Dense	9.2		
3						
4	2	Gray silty SAND with gravel, fine to medium grained, dry, cemented. (SM)	Dense	6.5		
5						
6						
7	3	Gray silty SAND with gravel to SAND with silt and gravel, fine to medium grained, moist, cemented. (SM/SP-SM)	Very Dense	8.1		
8						
9						
10						
11		Test pit terminated at approximately 10 feet. No groundwater seepage observed.				
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



**Terra
Associates, Inc.**
 Consultants in Geotechnical Engineering
 Geology and
 Environmental Earth Sciences

LOG OF TEST PIT NO. TP-3

FIGURE A-4

PROJECT NAME: Madison Pointe PROJ. NO: T-7252 LOGGED BY: CSD
 LOCATION: Issaquah, Washington SURFACE CONDS: Moderate Understory APPROX. ELEV: 438 Feet
 DATE LOGGED: July 8, 2015 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: 0 to 3 Feet

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1	1	(6 inches ORGANICS) Brown silty SAND with gravel to SAND with silt and gravel, fine to medium grained, dry, roots. (SM/SP-SM)	Medium Dense	5.7		
2						
3						
4						
5	2	Gray silty SAND with gravel to SAND with silt and gravel, fine to medium grained, dry to moist, cemented, occasional cobble. (SM/SP-SM)	Very Dense	4.9		
6						
7						
8						
9						
10		Test pit terminated at approximately 9 feet. No groundwater seepage observed. Minor caving observed in the upper 3 feet.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



Terra Associates, Inc.
 Consultants in Geotechnical Engineering
 Geology and
 Environmental Earth Sciences

LOG OF TEST PIT NO. TP-4

FIGURE A-5

PROJECT NAME: Madison Pointe PROJ. NO: T-7252 LOGGED BY: CSD
 LOCATION: Issaquah, Washington SURFACE CONDS: Minimal Understory APPROX. ELEV: 480 Feet
 DATE LOGGED: July 8, 2015 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		Brown silty SAND, fine grained, dry, heavy organic inclusions. (SM) (Topsoil)	Loose			
2	1	Gray silty SAND with gravel, fine to medium grained, dry, some roots. (SM)	Dense	9.7		
3						
4						
5	2			23.7		
6						
7		Gray SILTSTONE, moist.	Very Dense			
8						
9	3			25.1		
10		Test pit terminated at approximately 10 feet. No groundwater seepage observed.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



Terra Associates, Inc.
 Consultants in Geotechnical Engineering
 Geology and
 Environmental Earth Sciences

LOG OF TEST PIT NO. TP-5

FIGURE A-6

PROJECT NAME: Madison Pointe PROJ. NO: T-7252 LOGGED BY: CSD
 LOCATION: Issaquah, Washington SURFACE CONDS: Moderate Understory APPROX. ELEV: 490 Feet
 DATE LOGGED: July 8, 2015 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		Brown silty SAND, fine grained, dry, heavy organic inclusions. (SM) (Topsoil)	Loose			
2	1	Brown silty SAND with gravel, fine to medium grained, dry, large roots. (SM)	Medium Dense	9.0		
3						
4						
5						
6	2	Gray-brown silty SAND mixed with pieces of weathered SANDSTONE, fine to medium grained, dry, cobbles. (SM)	Very Dense	11.6		
7						
8		*Sandstone pieces increase with depth, by 9 feet became difficult to excavate with 125 machine				
9						
10		Test pit terminated at approximately 9 feet. No groundwater seepage observed.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



Terra Associates, Inc.
 Consultants in Geotechnical Engineering
 Geology and
 Environmental Earth Sciences

LOG OF TEST PIT NO. TP-6

FIGURE A-7

PROJECT NAME: Madison Pointe PROJ. NO: T-7252 LOGGED BY: CSD
 LOCATION: Issaquah, Washington SURFACE CONDS: Brush/Weeds APPROX. ELEV: 520 Feet
 DATE LOGGED: July 8, 2015 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1	1	(less than 1" ORGANICS) FILL: gray sandy silt, fine grained, dry, roots, minor construction debris, large piece of concrete.	Medium Dense	11.0		
2		Black silty SAND, fine to medium grained, dry, roots, heavy organic inclusions. (SM) (Topsoil)	Medium Dense			
3						
4	2		Dense	56.0		
5						
6		Red-brown SILTSTONE, very weathered, some cobbles, occasional boulders.				
7						
8						
9		@-9' material becomes less weathered, larger pieces	Very Dense			
10	3			46.6		
11		Test pit terminated at approximately 10 feet. No groundwater seepage observed.				
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



Terra Associates, Inc.
 Consultants in Geotechnical Engineering
 Geology and
 Environmental Earth Sciences

LOG OF TEST PIT NO. TP-7

FIGURE A-8

PROJECT NAME: Madison Pointe PROJ. NO: T-7252 LOGGED BY: CSD
 LOCATION: Issaquah, Washington SURFACE CONDS: Heavy Understory APPROX. ELEV: 516 Feet
 DATE LOGGED: July 8, 2015 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		Brown silty SAND, fine grained, dry, heavy organic inclusions. (SM) (Topsoil)	Loose			
2	1	Brown silty SAND with gravel, fine to medium grained, dry, roots. (SM)	Medium Dense	8.0		
3						
4						
5		Gray silty SAND with gravel to SAND with silt and gravel, fine to medium grained, dry, cemented. (SM/SP-SM)	Dense	5.9		
6	2					
7						
8		Test pit terminated at approximately 7 feet. No groundwater seepage observed.				
9						
10						
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



Terra Associates, Inc.
 Consultants in Geotechnical Engineering
 Geology and
 Environmental Earth Sciences

LOG OF TEST PIT NO. TP-8

FIGURE A-9

PROJECT NAME: Madison Pointe PROJ. NO: T-7252 LOGGED BY: CSD
 LOCATION: Issaquah, Washington SURFACE CONDS: Moderate Understory APPROX. ELEV: 482 Feet
 DATE LOGGED: July 8, 2015 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		Brown silty SAND, fine grained, dry, heavy organic inclusions. (SM) (Topsoil)	Loose			
2	1			5.3		
3		Brown SAND with silt and gravel, fine to medium grained, dry, roots. (SP-SM)	Medium Dense			
4						
5			Dense			
6						
7	2	Gray silty SAND with gravel, fine to medium grained, dry to moist, cemented, some cobbles/boulders. (SM/SP-SM)	Very Dense	12.7		
8						
9						
10	3	Red-brown SANDSTONE, moist, weathered, difficult to excavate.	Very Dense	10.7		
11		Test pit terminated at approximately 10 feet. No groundwater seepage observed.				
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



Terra Associates, Inc.
 Consultants in Geotechnical Engineering
 Geology and
 Environmental Earth Sciences

LOG OF TEST PIT NO. TP-9

FIGURE A-10

PROJECT NAME: Madison Pointe PROJ. NO: T-7252 LOGGED BY: CSD
 LOCATION: Issaquah, Washington SURFACE CONDS: Moderate Understory APPROX. ELEV: 482 Feet
 DATE LOGGED: July 8, 2015 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		Brown silty SAND, fine grained, dry, heavy organic inclusions. (SM) (Topsoil)	Loose			
2	1	Brown silty SAND with gravel, fine to medium grained, dry, roots. (SM)	Medium Dense	7.2		
3						
4						
5						
6	2	Gray silty SAND with gravel to SAND with silt and gravel, fine to medium grained, dry to moist, some cementation, occasional cobble/boulder. (SM/SP-SM)		8.0		
7			Very Dense			
8		*Soil becomes less cemented with depth.				
9	3	*At 9 feet soil becomes wet.		11.6		
10						
11		Test pit terminated at approximately 11 feet. No groundwater seepage observed.				
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



Terra Associates, Inc.
 Consultants in Geotechnical Engineering
 Geology and
 Environmental Earth Sciences

LOG OF TEST PIT NO. TP-10

FIGURE A-11

PROJECT NAME: Madison Pointe PROJ. NO: T-7252 LOGGED BY: CSD
 LOCATION: Issaquah, Washington SURFACE CONDS: Moderate Understory APPROX. ELEV: 503 Feet
 DATE LOGGED: July 8, 2015 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		Brown silty SAND, fine grained, dry, heavy organic inclusions. (SM) (Topsoil)	Loose			
2	1	Brown silty SAND with gravel, fine to medium grained, dry, roots. (SM)	Medium Dense	5.9		
3			Dense			
4			Very Dense			
5	2			9.6		
6						
7		Gray silty SAND with gravel, fine to medium grained, dry to moist, cemented, occasional cobble. (SM)				
8						
9						
10						
11						
12		Test pit terminated at approximately 11 feet. No groundwater seepage observed.				
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

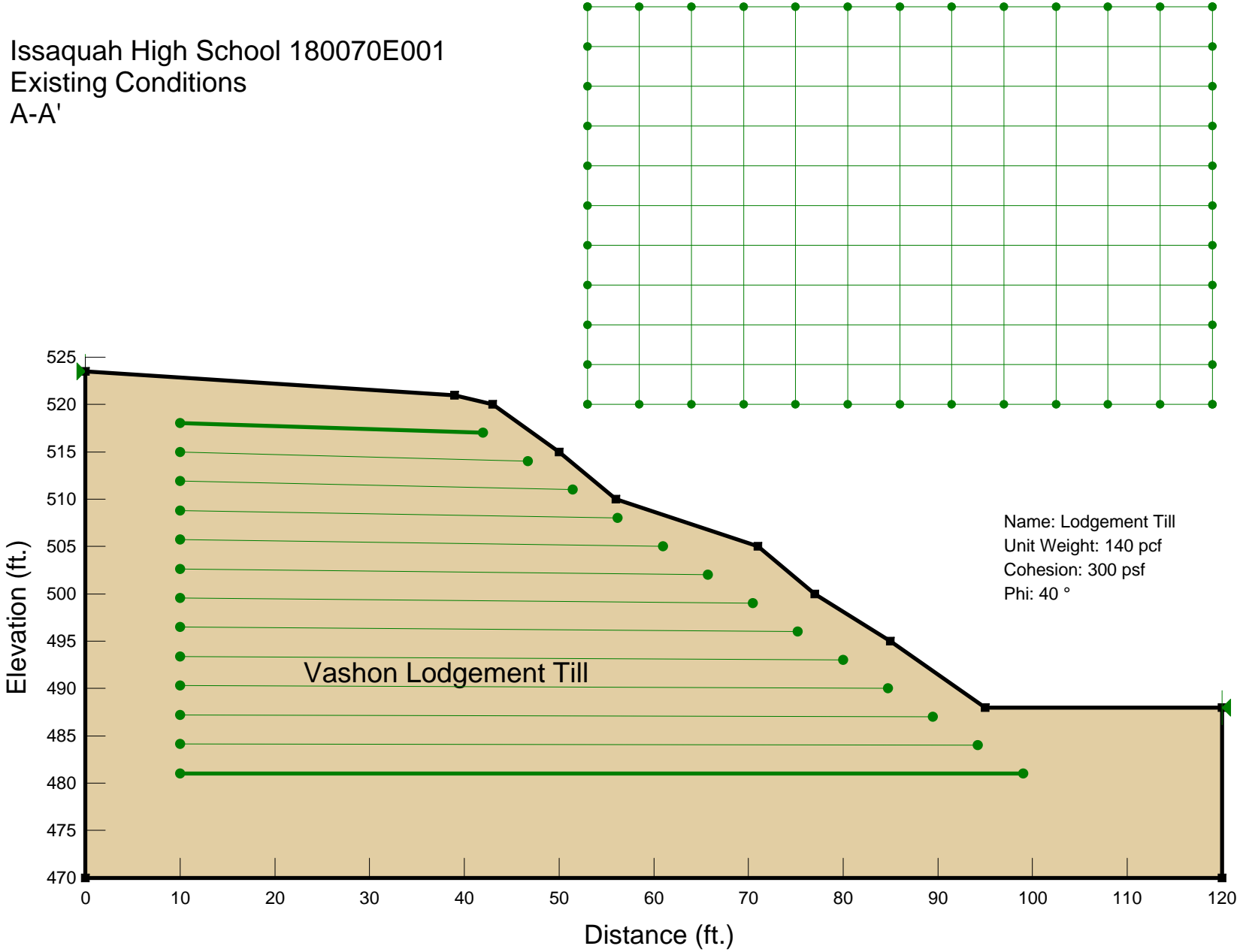


Terra Associates, Inc.
 Consultants in Geotechnical Engineering
 Geology and
 Environmental Earth Sciences

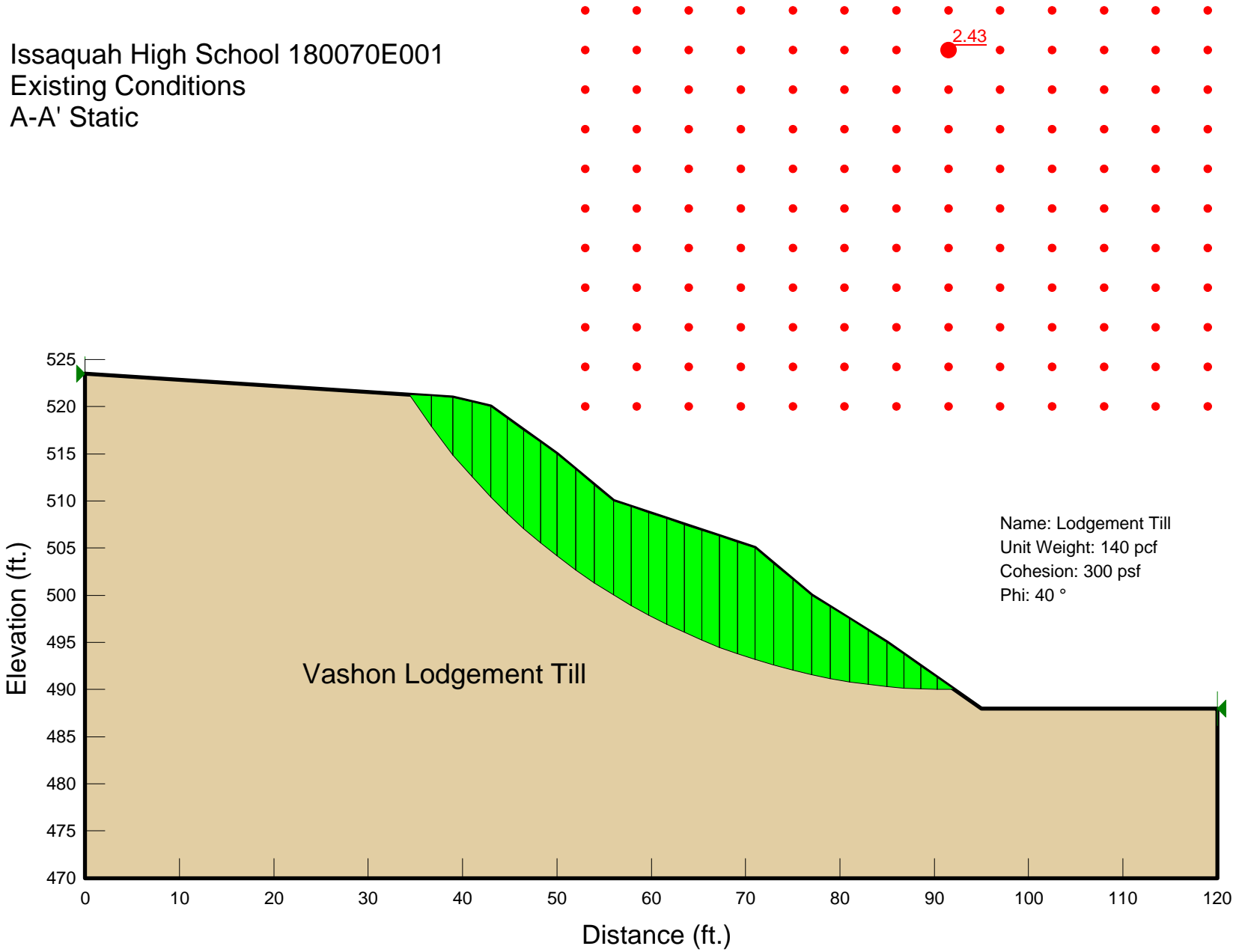
APPENDIX B

SLOPE/W Profiles

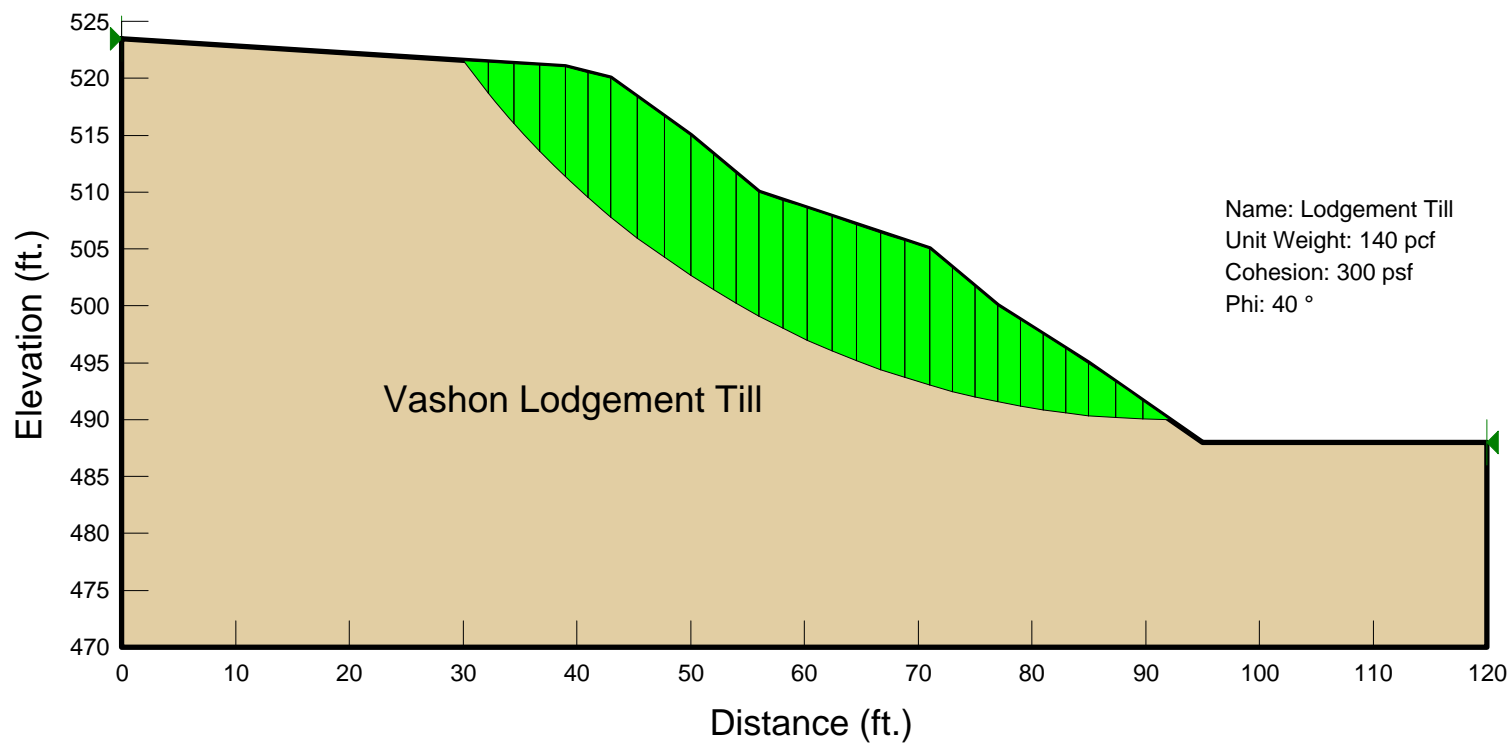
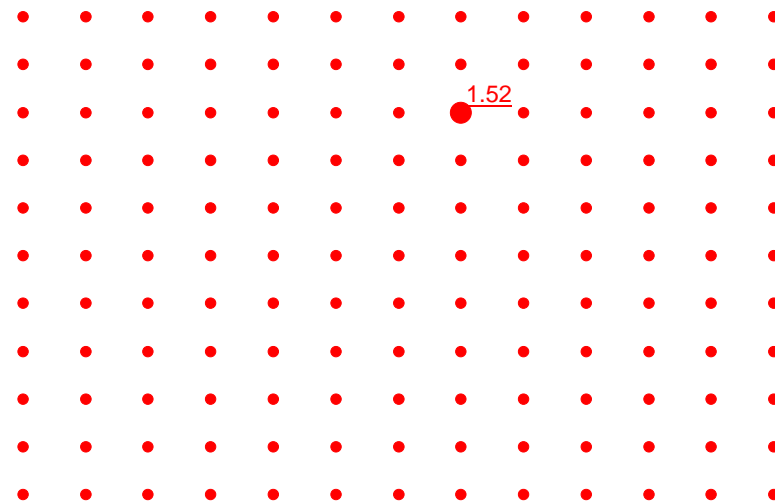
Issaquah High School 180070E001
Existing Conditions
A-A'



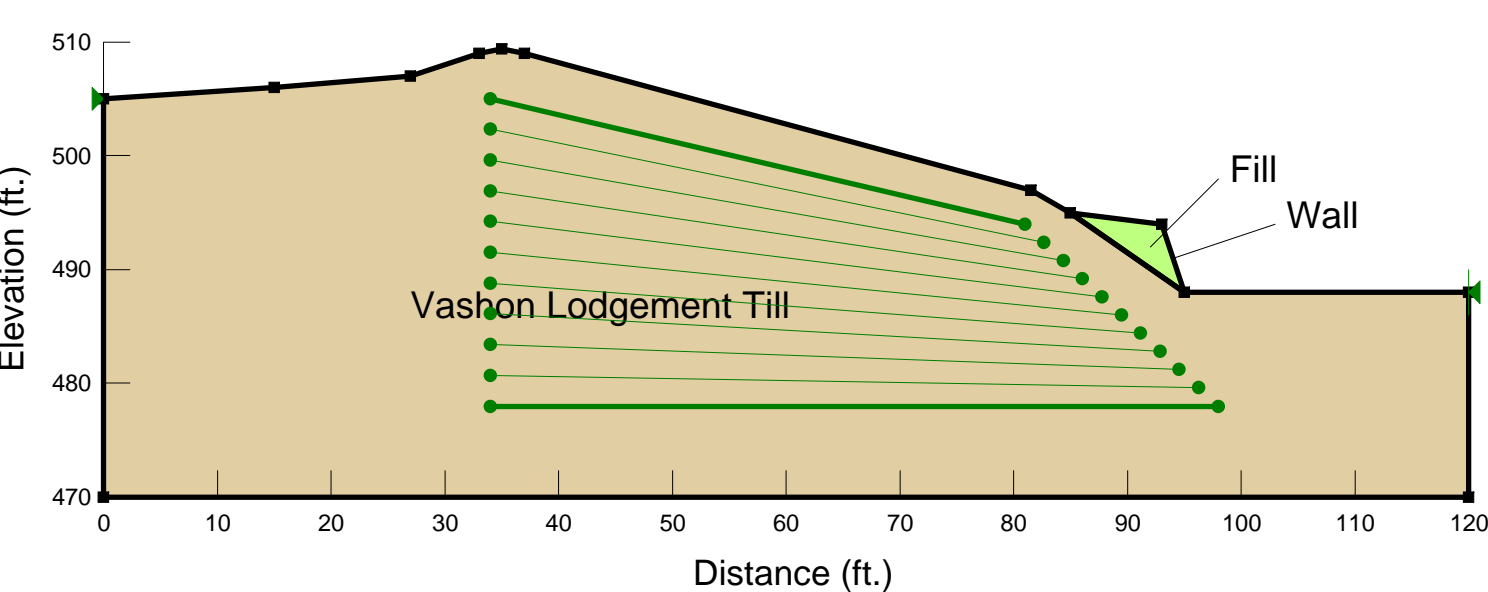
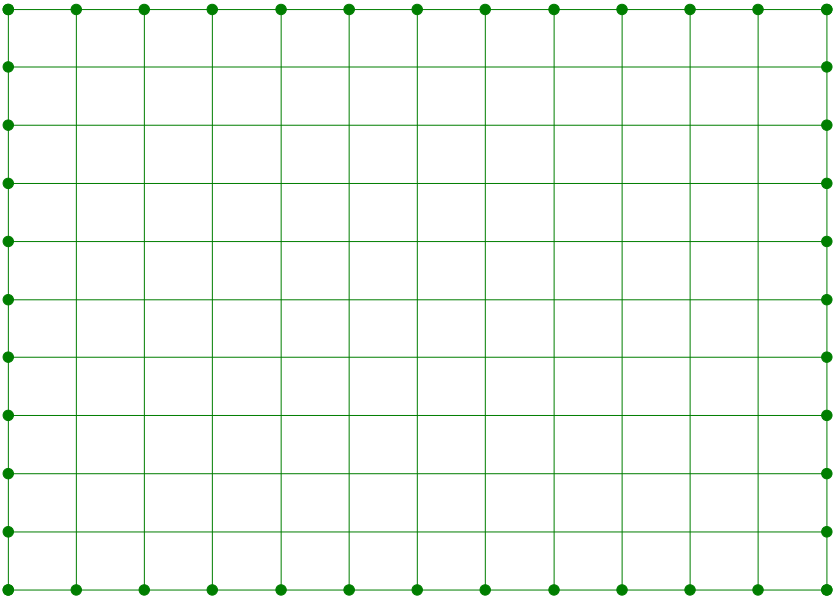
Issaquah High School 180070E001
Existing Conditions
A-A' Static



Issaquah High School 180070E001
Existing Conditions
A-A' Seismic - 0.26g



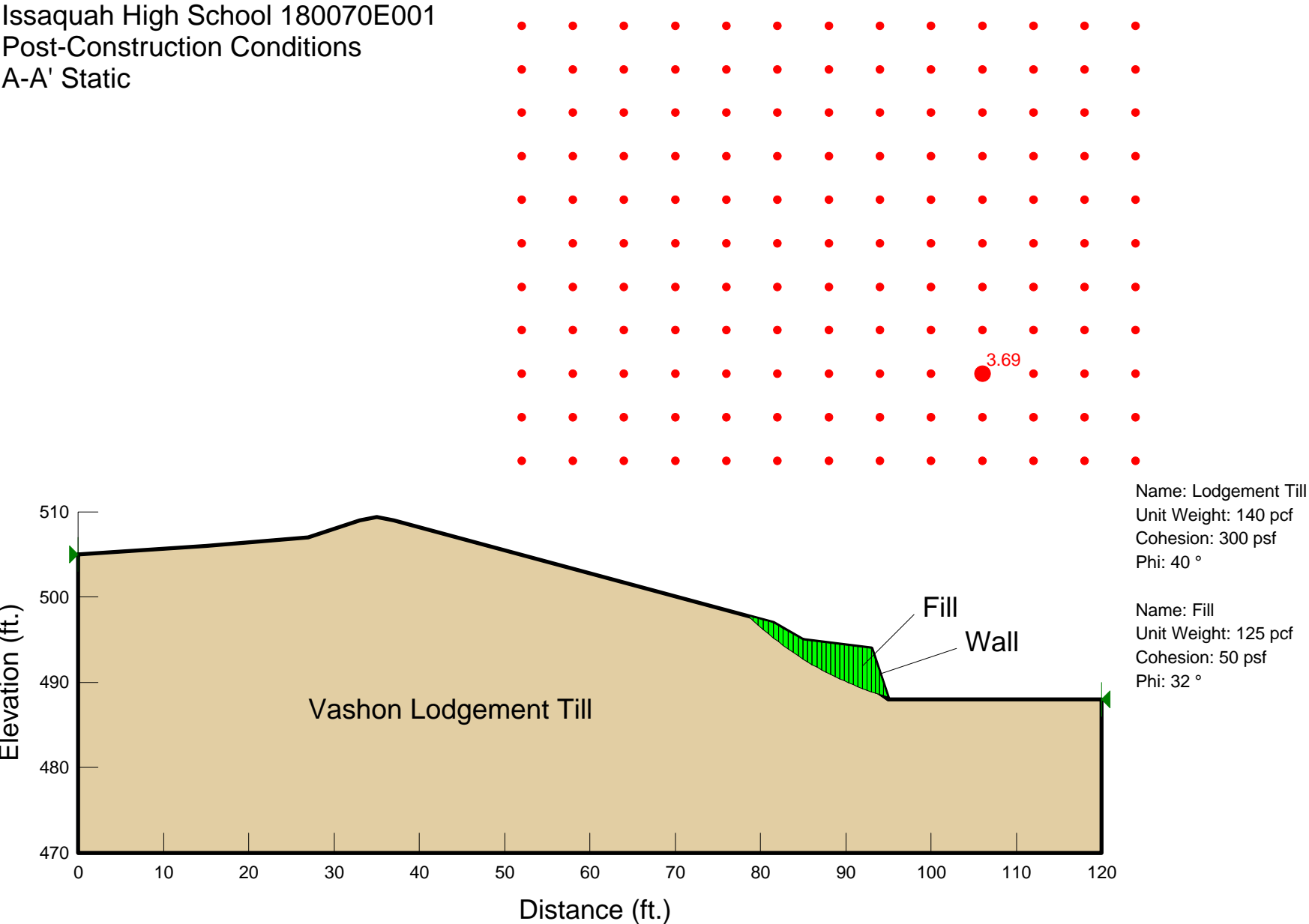
Issaquah High School 180070E001
Post-Construction Conditions
A-A'



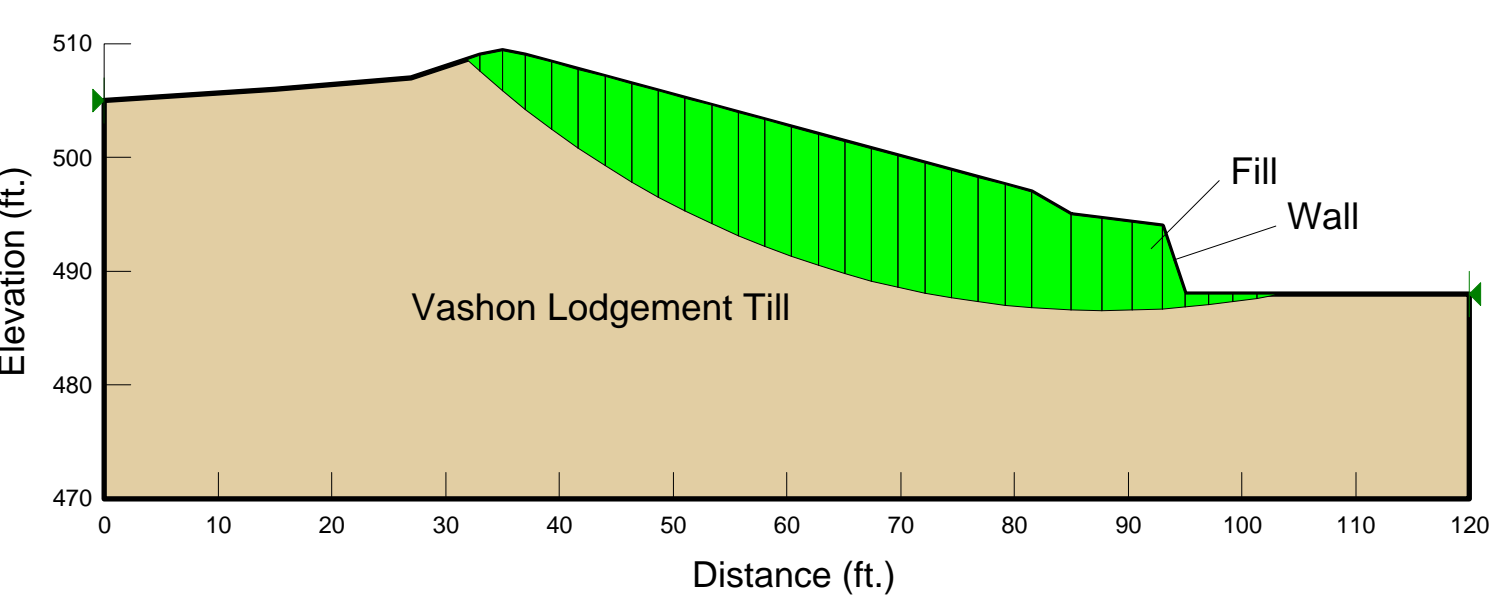
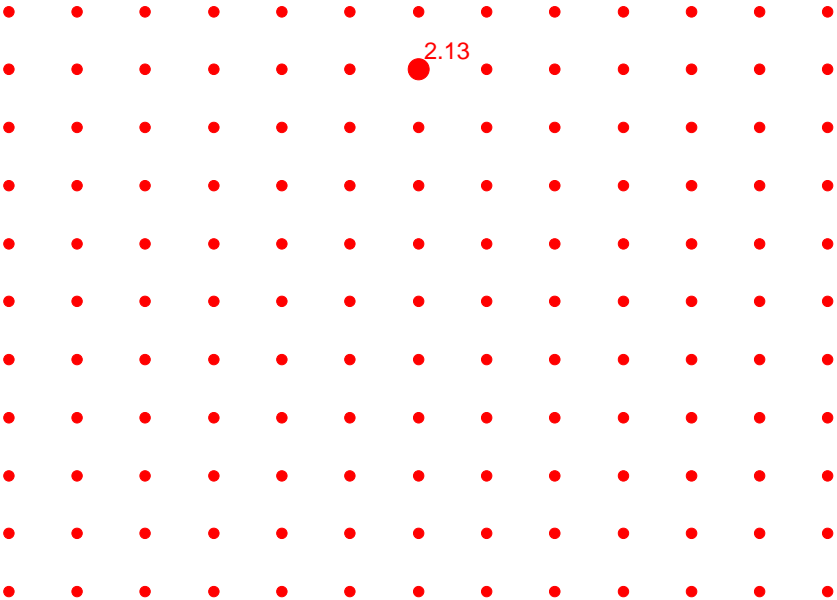
Name: Lodgement Till
Unit Weight: 140 pcf
Cohesion: 300 psf
Phi: 40 °

Name: Fill
Unit Weight: 125 pcf
Cohesion: 50 psf
Phi: 32 °

Issaquah High School 180070E001
Post-Construction Conditions
A-A' Static



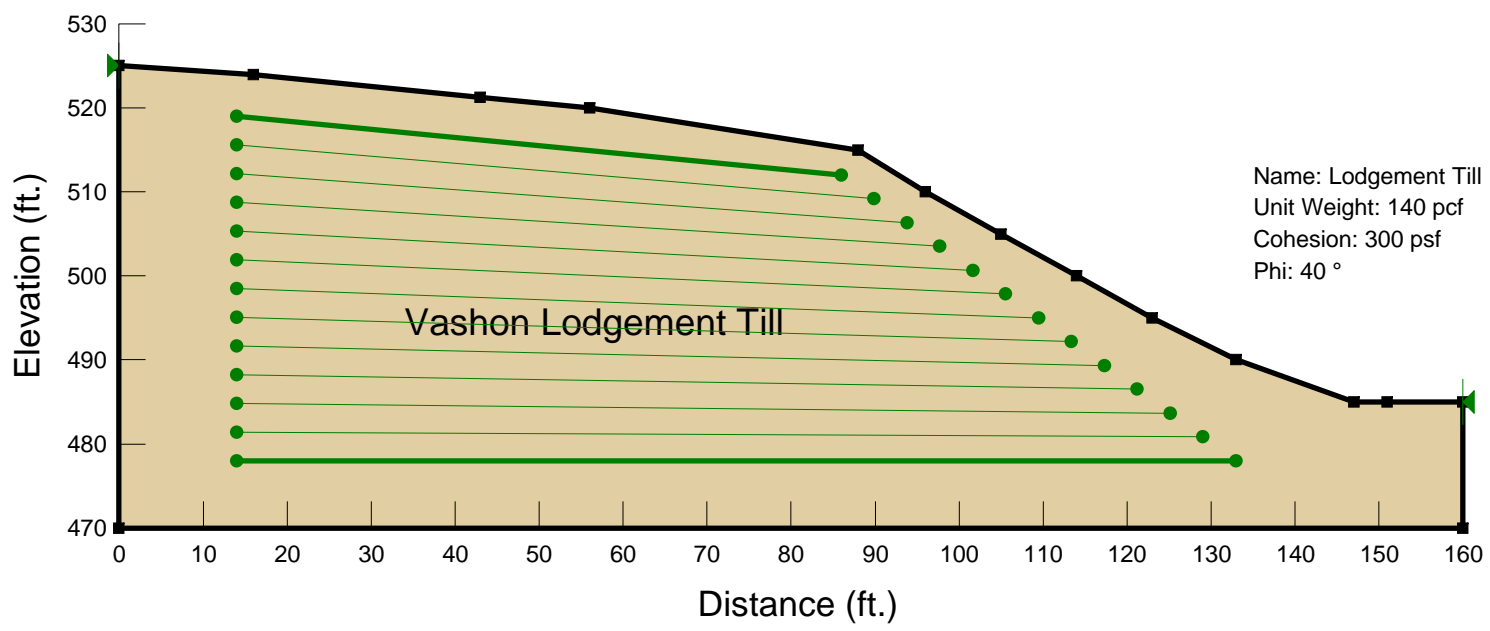
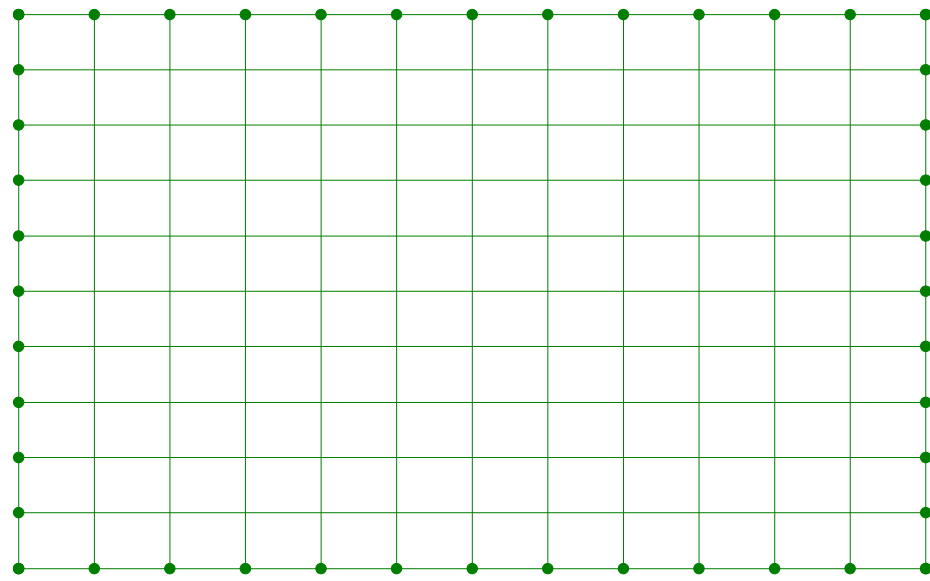
Issaquah High School 180070E001
Post-Construction Conditions
A-A' Seismic - 0.26g



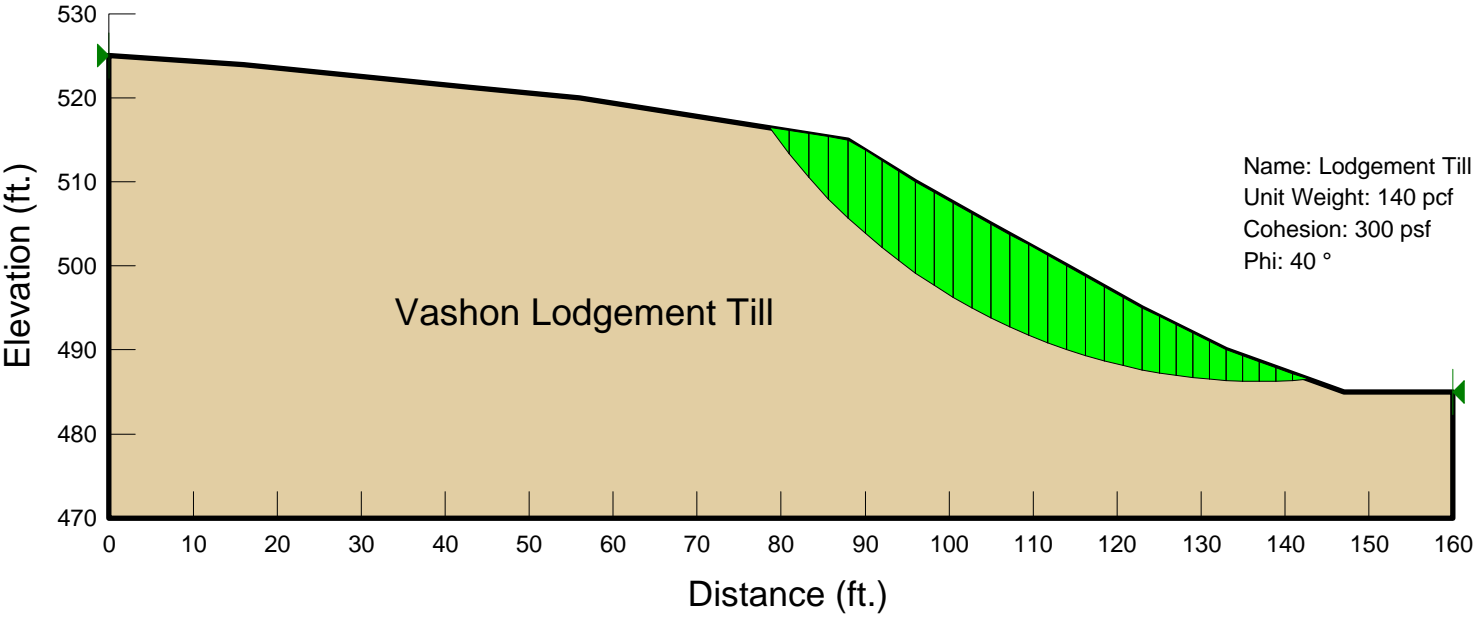
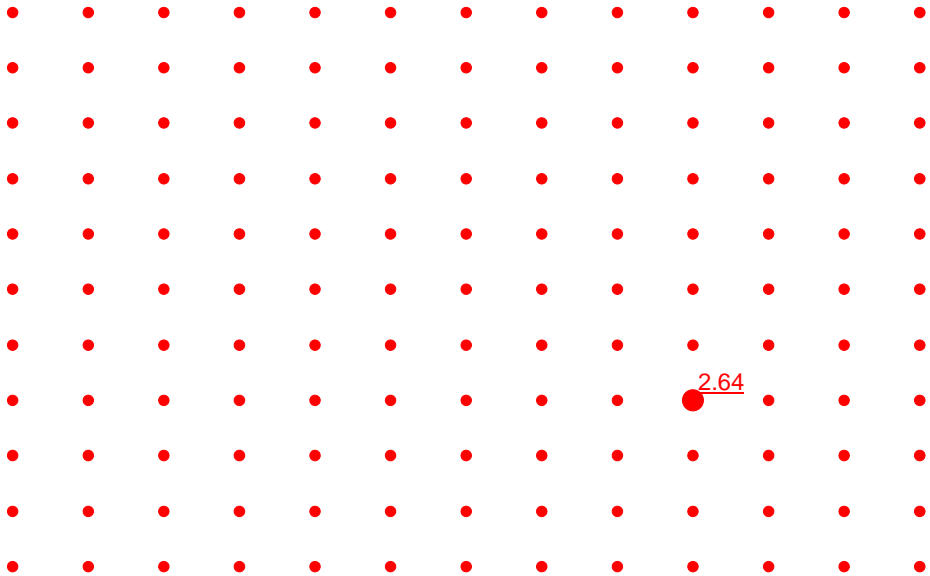
Name: Lodgement Till
Unit Weight: 140 pcf
Cohesion: 300 psf
Phi: 40 °

Name: Fill
Unit Weight: 125 pcf
Cohesion: 50 psf
Phi: 32 °

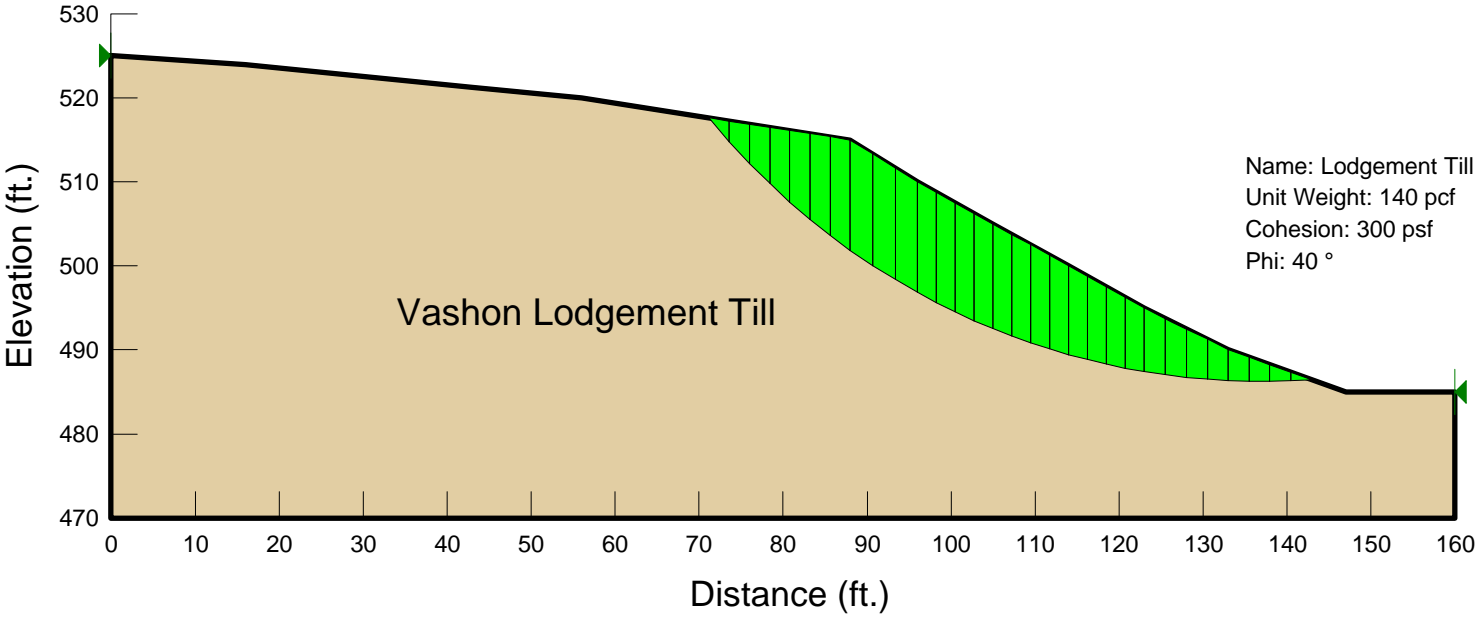
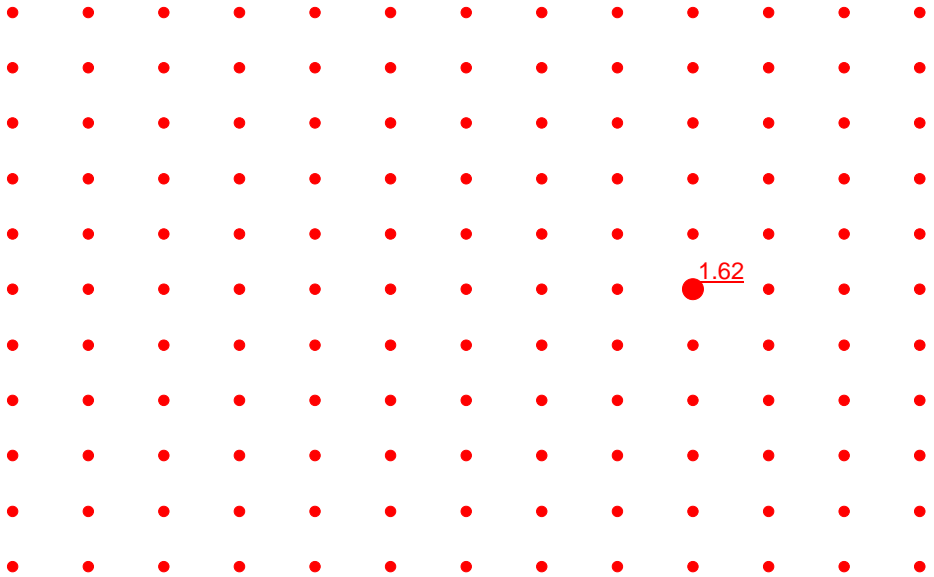
Issaquah High School 180070E001
Existing Conditions
B-B'



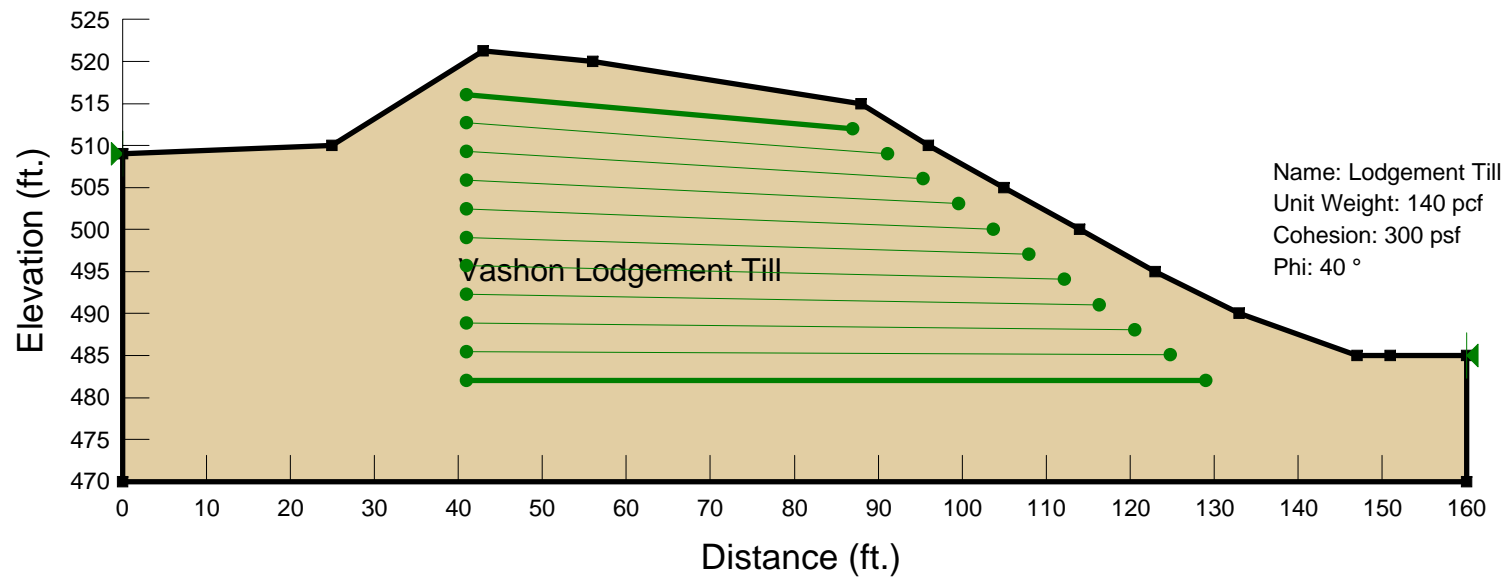
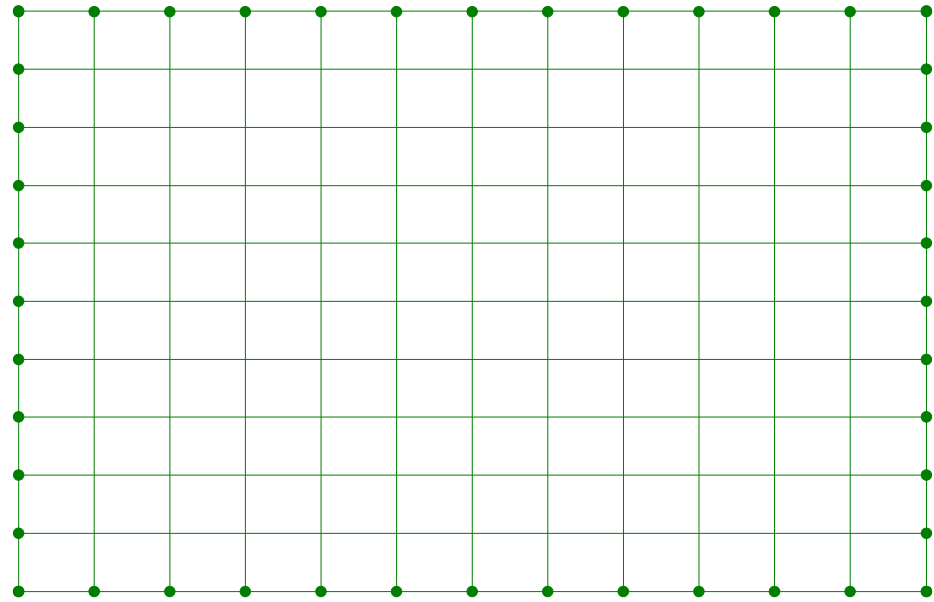
Issaquah High School 180070E001
Existing Conditions
B-B' Static



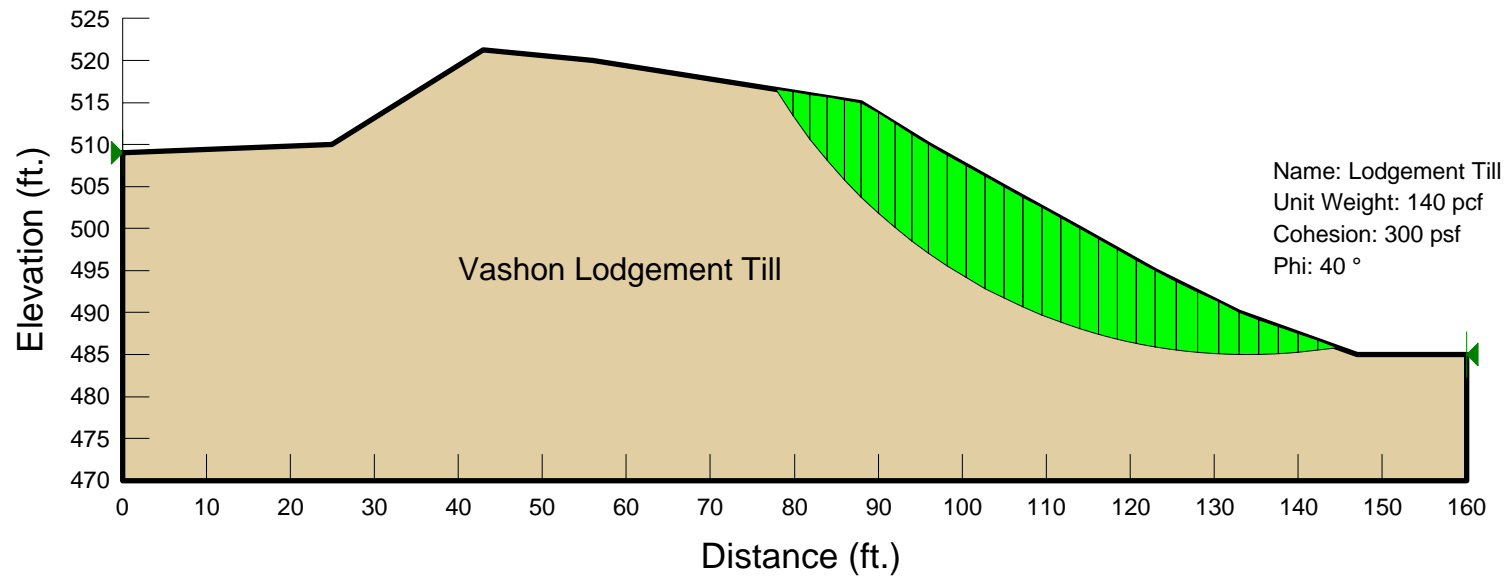
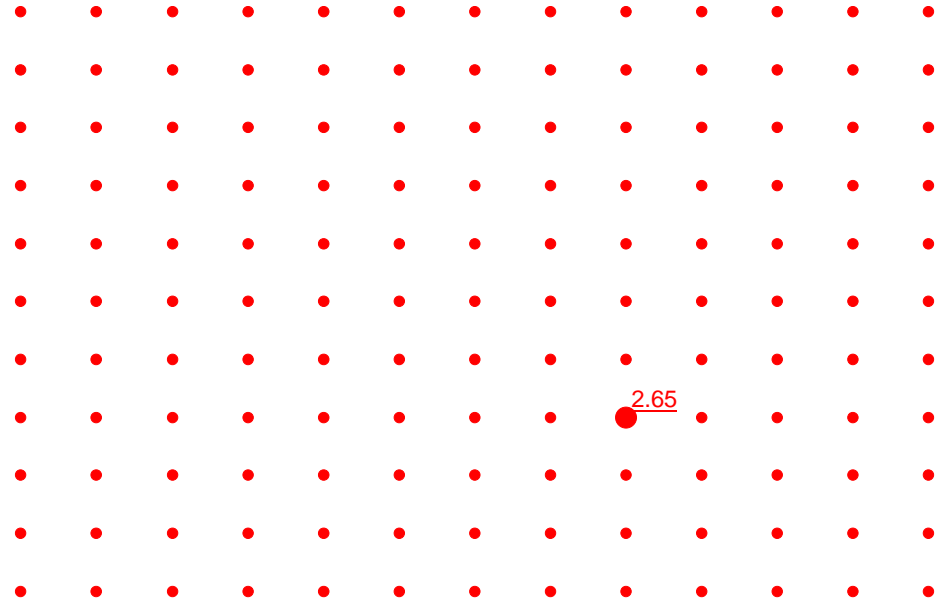
Issaquah High School 180070E001
Existing Conditions
B-B' Seismic - 0.26g



Issaquah High School 180070E001
Post-Construction Conditions
B-B'



Issaquah High School 180070E001
Post-Construction Conditions
B-B' Static



Issaquah High School 180070E001
Post-Construction Conditions
B-B' Seismic - 0.26g

