Geotechnical Engineering Services Report

Greenline Business Park
Former Weyerhaeuser Site
Federal Way, Washington

for

Federal Way Campus, LLC

September 19, 2017

GeoEngineers
Earth Science + Technology

Geotechnical Engineering Services Report

Greenline Business Park
Former Weyerhaeuser Site
Federal Way, Washington

for

Federal Way Campus, LLC

September 19, 2017

GeoEngineers

1101 South Fawcett Avenue, Suite 200
Tacoma, Washington 98402
253.383.4940

Geotechnical Engineering Services Report

Greenline Business Park
Former Weyerhaeuser Site
Federal Way, Washington

File No. 22247-003-00

September 19, 2017

Prepared for:

Federal Way Campus, LLC
11100 Santa Monica Blvd., Suite 850
Los Angeles, California 90025

Attention: Tom Messmer, Vice President - Special Projects

Prepared by:

GeoEngineers, Inc.
1101 South Fawcett Avenue, Suite 200
Tacoma, Washington 98402
253.383.4940

State of Washington
Licensed Geologist
STEPHEN WAYNE HELVEY
9/19/17

Stephen W. Helvey, LG, LEG, LHG
Senior Engineering Geologist

DEBRA C. OVERBAY
STATE OF WASHINGTON
29247
REGISTERED
PROFESSIONAL ENGINEER
9/19/17

Debra C. Overbay, PE
Associate

SWH:DCO:tt

Table of Contents

LIST OF FIGURES

APPENDICES

INTRODUCTION AND PROJECT UNDERSTANDING

This report presents the results of our geotechnical engineering services for the proposed Greenline Business Park, to be located generally in the north part of the former Weyerhaeuser Federal Way Campus site. The approximate location of the site is shown in Figure 1, Vicinity Map and Figures 2 and 3, Site Plan.

The proposed development area covers about 146 acres, located in the north part of the former Weyerhaeuser Campus. The project site is bounded by Interstate 5 and a meadow area to the west, an office building and undeveloped property to the north, Weyerhaeuser Way South to the east and South 336th Street to the south. The project site wraps around the north, west and south sides of an existing Weyerhaeuser (WTC) building. The existing conditions are shown in Figure 2.

GeoEngineers provided preliminary geotechnical studies in July and September 2016 for previously considered warehouse developments on this site. Previous development considerations comprised four warehouse buildings, ranging in size from 775,500 to 133,000 square feet.

We understand the currently proposed development includes three buildings within the project site, Buildings A, B, and C. The location of the proposed structures is shown in Figure 3. The proposed buildings are rectangular and range from 638,000 square feet to 147,500 square feet in plan dimension. Parking and loading dock areas are planned around the building perimeters. Four ponds are planned within the west and southwest portions of the site. A fifth pond is planned to be located east of the northeast corner of the site, east of Weyerhaeuser Way South. We understand the ponds will likely detain stormwater and will not be designed for infiltration.

The north part of the site is relatively flat and slopes slightly downward to the east. The south part of the site generally slopes downward to the south/southeast. We understand that cuts and fills are planned for the site to achieve level building pads. The distribution of planned cuts and fills are shown in Appendix A, Greenline Business Park Site Plan and Cross Sections. Excavations of up to about 15 feet below existing grade are planned for the north part of the site, north of Building “A.” Fills up to about 15 feet thick are planned for the south portion of the site, at the south end of proposed Building “B.”

Geologic materials mapped within and around the site comprise Vashon-age glacial till. As previously stated, we completed subsurface explorations (test pits) and performed preliminary design studies for others (KG Investment) on the subject site. We understand that this information is available for this project.

SCOPE OF SERVICES

The purpose of our services is to provide preliminary geotechnical engineering recommendations for the proposed Greenline Business Park development. Federal Way Campus, LLC authorized our services on June 30, 2017. GeoEngineers performed the following tasks:

1. Review readily available published geologic data and our in-house files for existing information on soil and groundwater conditions in the project vicinity.

2. Review the proposed Greenline Business Park project plans provided by the design team. This includes a proposed clearing and grading plan and site cross sections. Copies of these documents are contained in Appendix A.
3. Review the previously completed subsurface explorations and compare the depth and distribution of these explorations with the currently proposed development. Develop an exploration plan to supplement the existing data. Mobilize to the site to locate the proposed explorations. Coordinate utility locates for the explorations using the One-Call utility notification center and a private utility locate subcontracted to GeoEngineers.
4. Supplement the existing subsurface data by completing six test pit excavations and three borings. The borings extended to depths of about 20 feet below ground surface (bgs).
5. Perform laboratory tests on selected soil samples obtained from the supplemental explorations to evaluate pertinent engineering characteristics. Bulk samples were obtained from the test pits directly from the backhoe bucket. Driven soil samples were collected from the borings. Tests included moisture content determinations, fines content determinations and particle size analyses.
6. Characterize site conditions based on our site observations, existing data review and the results of our supplemental subsurface exploration and testing.
7. Develop preliminary recommendations for site preparation and earthwork based on the data and our understanding of the proposed site development. We include an evaluation of the suitability of on-site soil for use as structural fill beneath the building and pavement areas. We also discuss gradation criteria for imported fill, possible adverse effects of weather on construction activities and suitability of on-site soil during wet weather conditions.
8. Provide geotechnical seismic design information in accordance with 2015 International Building Code (IBC) criteria. We also present our opinion on the potential for liquefaction and lateral spreading at the site.
9. Provide general shallow foundation design recommendations, including suitable bearing materials, allowable soil bearing pressure, subgrade preparation criteria, lateral load resistance values and estimated post-construction settlements.
10. Provide recommendations for support of on-grade floor slabs, including modulus of subgrade reaction, capillary break, vapor retarder and underslab drainage, as appropriate.
11. Provide layer thickness recommendations for asphalt concrete (AC) pavement design sections, including subgrade preparation and typical pavement sections for heavy and light traffic areas based on our experience.
12. Provide a discussion of suitability of site soils for stormwater infiltration.

SITE CONDITIONS

Surface Conditions

The site slopes down to the west and south from about Elevation 450 feet in the northwest to about Elevation 394 feet in the south.

The north portion of the site is presently occupied by existing access roads, asphalt-paved parking areas and landscaped/forested areas. The southwest and west parts of the site are occupied by a grass-covered meadow/field area. The remainder of the site is vegetated with a moderate to thick stand of second or third growth fir, cedar and deciduous trees with a moderate to thin understory of brush. We observed a generally thinner understory of ferns and brush in part of the proposed east pond area. A network of trails including a gravel road and foot paths exists within some of the forested areas. A small, man-made pond is located within the central part of the site.

Mapped Geologic Conditions

General geologic conditions in the site vicinity were evaluated by reviewing "Geologic Map of the Poverty Bay 7.5 Minute Quadrangle, King and Pierce Counties, Washington, 2004" prepared for the United States Geological Survey (USGS). Native geologic materials mapped at and in the site vicinity consist of Vashon-age Glacial Till (map symbol Qvt). Vashon till was deposited by and directly beneath the advancing Vashon-age glacier as it moved south through the site area. The deposit typically consists of a dense to very dense mixture of silt, sand, gravel, cobbles and some boulders.

Subsurface Conditions

Subsurface soil and groundwater conditions at the site were evaluated by reviewing logs of test pit explorations completed at the site in July and August 2016, and supplementary explorations completed in July 2017. Details of the supplementary field exploration and laboratory testing programs are presented in Appendix B. Supplementary exploration logs and results of the laboratory testing program are also presented in Appendix B.

Logs and laboratory testing data for test pits completed in the northern portion of the site in July 2016 are contained in Appendix C. Similarly, logs and laboratory testing data for test pits completed at the site in August 2016 are contained in Appendix D. The approximate locations of all the explorations are shown in Figures 2 and 3.

Summary of Soil Conditions

Varying thicknesses of forest duff and/or topsoil and sod were encountered from ground surface to depths ranging from about 1 to 18 inches in most of the explorations. All explorations encountered and were terminated in glacial deposits. Dense to very dense glacial till was typically encountered beneath a loose to dense or stiff to very stiff weathered till.

Loose to dense fill was encountered above the native glacial deposits in the following test pit explorations:

- July 2016 test pits TP-3, TP-15, TP-16, TP-20, TP-23, TP-24 and TP-30. The fill extends to depths ranging between about 2 and 7.5 feet at the test pit locations.
- August 2016 test pits TP-5 through TP-7, TP-10, TP-12, TP-15, TP-20, TP-24, TP-25, TP-27, TP-29 and TP-31. The fill extends to depths ranging between 1.75 and 5.5 feet at the test pit locations.

Fill was not encountered in the supplemental explorations completed for this study. Fill encountered in the 2016 explorations consisted of medium dense silty sand and appeared to be reworked native till materials.

Weathered till and unweathered till generally comprised a mixture of silty gravel and silty sand with varying amounts of gravel and occasional cobbles and boulders. Layers or lenses of medium stiff to hard silt with sand and gravel was present within the weathered glacial till at the location of the following explorations:

- July 2016 test pit TP-1
- August 2016 test pits TP-1, TP-17, TP-20 and TP-27
- July 2017 test pits TP-3N, TP-4N, TP-7N

This material may exist in other portions of the site not explored by our test pits and borings.

Laboratory testing on samples of fill, weathered and unweathered till encountered in our explorations yielded fines contents (material passing the U.S. No. 200 sieve) ranging from 26 to 94 percent. In-place moisture contents ranged from 6 to 26 percent.

Recessional outwash was encountered to the full depth explored in test pit TP-5N, located in a proposed pond area in the northeast corner of the site. This material comprised medium dense to dense silty sand and sand with silt. Fines contents of the outwash ranged from 7 to 19 percent. Percent moisture ranged from 4.5 to 8.

Groundwater

Groundwater was not observed in any of the test pits at the time of excavation. Groundwater was encountered in the three borings at depths ranging from 17.5 to 20 feet bgs. Based on our experience a seasonal, perched groundwater table often forms on top of the dense to very dense glacial till material or where relatively permeable weathered till or surficial fill or outwash overlies the till. We expect groundwater seepage amounts and the depths at which it occurs will vary with season and precipitation. Zones of shallow perched groundwater should be expected/anticipated during the wetter winter and early spring months. Groundwater encountered in the borings may represent seepage in the cleaner lenses of the glacial till or a deeper, regional groundwater table.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of our subsurface exploration and testing program, it is our opinion that the site is generally suited for the proposed warehouse structure development. We understand that cuts and fills will be required to create level building surfaces at the site.

A summary of the primary geotechnical considerations for the proposed buildings is provided below. The summary is presented for introductory purposes only and should be used in conjunction with the detailed recommendations presented in this report.

- The native and fill soils contain a moderate to very high percentage of fines and are very sensitive to small changes in moisture content. These soils are susceptible to disturbance from construction traffic when the moisture content is more than a few percent above the optimum moisture content for compaction. These soils will be difficult, if not impossible, to work or compact when wet or if earthwork is performed in wet weather. Therefore, we recommend that earthwork be performed during the

normally drier periods of the year. Moisture conditioning of site soils will be required in order to obtain the required compaction.

- We anticipate that some of the native and fill soils will only be suitable for use as structural fill during extended periods of dry weather. The silt soils encountered in some of the test pits will not be suitable for use as structural fill regardless of weather conditions. We recommend imported granular soils be used for structural fill if construction occurs during periods of wet weather.
- Up to 15 feet of cuts and fills will be required to establish site grades. We recommend graded areas be protected before the onset of rainy weather because of the highly moisture sensitive character of much of the on-site soil.
- We recommend constructing temporary haul roads underlain by quarry spalls or coarse crushed ballast material to help protect subgrades from disturbance and degradation under construction traffic.
- Shallow foundations may be designed using an allowable bearing pressure of 3,000 pounds per square foot (psf) where footings are founded on structural fill or the recompacted surficial native soils. If dense native till is exposed at foundation level, the allowable bearing pressure can be increased to 5,000 psf. Where existing fill is exposed at footing subgrade, we recommend a minimum 2-foot-thick zone of structural fill underlie the footings. All new fill placed at the site should be compacted to the structural fill standard described in this report.
- We recommend floor slabs be underlain by a minimum 4-inch-thick capillary break consisting of coarse grained aggregate with negligible sand or silt (similar to AASHTO Grading No. 67).

Site Development and Earthwork

Site development work will likely include removing existing trees and vegetation, stripping of forest duff, stripping of AC drive and parking areas, stripping of topsoil and root layers, excavation in the approximate center of proposed Building B and the north parts of proposed Buildings B and C, and placing fill in select portions of the proposed building sites to achieve level building pads. We recommend that the existing storm pond at the site, near the south edge of proposed Building C, be drained and disconnected from stormwater delivery systems prior to earthwork.

The site soils are highly moisture sensitive due to moderate to very high fines content. Grading and reuse of the on-site soils at this site will only be practical during the dry season (typically July through September). Moisture conditioning necessary to obtain proper compaction of on-site soil will likely not be practical during the cooler and wetter winter months. Accordingly, we recommend a contingency be included in the project budget and schedule for export of unsuitable wet on-site soil and import of select granular soil if earthwork will occur in the winter months.

Stripping and Clearing

The existing trees, shrubs, grass, topsoil, unsuitable native soils, AC, unused utilities and unsuitable fill soils should be stripped and removed from all proposed building and pavement areas. Based on our explorations, the depth of stripping to remove unsuitable surface organic materials should generally vary between 6 and 12 inches. Greater stripping depths will be required to remove localized zones of loose or organic-rich soil and tree roots, and to remove unsuitable materials within the pond. The primary root systems for trees and shrubs should be completely removed. Required stripping depths should be

evaluated based on observations during the stripping operation. Stripped organic material should be transported off site for disposal or processed and used as fill in landscaping areas.

Existing fill was encountered in TP-7, TP-27 and TP-31 (4.5- to 5.5-foot depth). Unsuitable fills might be present in other parts of the site not explored by our test pits and borings. The contractor should be prepared to selectively remove debris or other unsuitable materials if encountered in existing fill at this site.

AC within existing road and parking areas should be removed, or pulverized and utilized on site as approved by the geotechnical engineer. Abandoned subgrade utilities should be anticipated and removed as necessary throughout the site particularly near the existing parking lots and roads.

Unsuitable materials including organic and soft soil deposits within the pond should be stripped and removed during mass grading. Stormwater piping and other delivery system features should also be removed.

Subgrade Evaluation

After stripping and excavation to planned subgrade is complete we recommend the exposed soil be proofrolled or probed and then compacted to a firm and unyielding condition. If dry weather conditions persist, we recommend that the subgrade be evaluated by proofrolling with a loaded dump truck or similar heavy rubber-tired construction equipment to identify soft, loose or unsuitable areas. The proofrolling should be conducted prior to placing fill. If the subgrade is prepared during or exposed to wet weather, we recommend that it be evaluated by probing with a steel probe rod.

The proofrolling/probing should be observed by a qualified geotechnical engineer, who will evaluate the suitability of the subgrade and identify any areas of yielding, which are indicative of soft or loose soil. If soft or otherwise unsuitable areas revealed during proofrolling cannot be compacted to a stable and uniformly firm condition, we recommend that: (1) the subgrade soils be scarified (e.g., with a ripper or a farmer's disc), aerated and recompacted, or (2) the unsuitable soils be excavated to firm soil and replaced with structural fill, as recommended by the geotechnical engineer.

Excavation

We anticipate large dozers with rippers may be required for mass grading where the subgrade comprises unweathered glacial till. Conventional earthmoving equipment in proper working order should be capable of making necessary excavations for utilities and footings. We recommend that footing and trench excavations be performed using a smooth-blade bucket to prevent excessive disturbance of the excavation base.

Boulders and large cobbles are often present in glacial till and recessional outwash deposits in the area and will likely be encountered during grading and/or utility excavations. Accordingly, the contractor should be prepared to remove boulders, if encountered. Boulders may be removed from the site or buried in landscape areas. Voids caused by boulder removal must be backfilled with structural fill.

Excavation Support

Shallow excavations (4 feet or less) in dense glacial deposits should stand at near vertical inclinations, provided groundwater seepage is not present in the cut face. Excavations deeper than 4 feet must be shored or laid back at a stable slope if workers are required to enter.

Shoring for utility excavations must conform with the provisions of Title 296 Washington Administrative Code (WAC), Part N, "Excavation, Trenching and Shoring." Regardless of the soil type encountered in the excavation, shoring, trench boxes or sloped sidewalls will be required under Washington Industrial Safety and Health Act (WISHA). While this report describes certain approaches to excavation and dewatering, the contract documents should specify that the contractor is responsible for selecting excavation and dewatering methods, monitoring the excavations for safety and providing shoring, as required, to protect personnel and adjacent structures.

Wet Weather Construction

Trafficability of the on-site soils will be severely limited during wet weather, or if the subgrade moisture content is more than a few percentage points above optimum. When wet, the on-site soils are susceptible to disturbance and generally will not provide adequate support for construction equipment. The on-site soils will be difficult, if not impossible, to adequately work or compact during periods of wet weather.

Site Grading

If site grading and fill placement occurs during wet weather conditions the following recommendations should be included in the development plan. Stripping and site preparation should be accomplished using track-mounted equipment and subgrade protection measures should be used. For example, a track-mounted excavator equipped with a smooth-edged bucket could be used working from the currently developed surface or a granular pad and loading into trucks supported on granular haul roads or working outward from the stripped surface. If the site subgrade is wet, it should be evaluated by probing with a steel rod, rather than by proofrolling. Soil that is disturbed during site preparation activities during wet conditions, as well as soft or loose zones identified during probing, should be removed and replaced with compacted structural fill.

Granular Haul Roads and Working Blankets

Wet weather construction in the silty native or fill soils will require granular haul roads and granular pads under the building structures to protect the subgrade. If the pavement areas are constructed during wet weather, they will also require a granular working blanket.

The use of granular haul roads will be necessary for support of construction traffic during the rainy season (typically from October through June). Based on our experience, 18 to 24 inches of sand and gravel (which could be gravel base or fill material), crushed rock or quarry spalls with little to no fines will be necessary to provide support for construction equipment. Use of a geotextile fabric can reduce mixing of the subgrade and road support materials. It also may reduce the thickness of surfacing required. If gravel base material is used, the temporary roads could be constructed above the finished subgrades and extra material bladed onto other areas of the site when the roads are no longer necessary.

Wet-Weather Fill

We recommend fill placed during wet weather be select granular fill (pit run) or crushed rock as described in the "Fill Materials" section of this report.

Erosion and Sedimentation Control

The site will be susceptible to erosion during wet weather conditions, particularly if large segments of exposed subgrades are exposed to rainfall. Development and implementation of an Erosion and Sedimentation Control Plan should reduce the project impact on erosion-prone areas. The Plan should be

designed in accordance with applicable city, county and/or state standards. The Plan should incorporate basic planning principles, including:

- scheduling grading and construction to reduce soil exposure;
- re-vegetating or mulching denuded areas;
- directing runoff away from exposed soils;
- reducing the length and steepness of slopes with exposed soils;
- decreasing runoff velocities;
- preparing drainage ways and outlets to handle concentrated or increased runoff;
- confining sediment to the project site; and
- inspecting and maintaining control measures frequently.

Some sloughing erosion and raveling of exposed or disturbed soil on slopes should be expected, particularly if the work is completed during the wet season. We recommend that disturbed soil be restored promptly so that surface runoff does not become channeled.

Temporary erosion protection should be used and maintained in areas with exposed or disturbed soils to help reduce erosion and transport of sediment to adjacent areas and receiving waters. Permanent erosion protection should be provided by paving, structure construction or landscape planting.

Until the permanent erosion protection is established and the site is stabilized, site monitoring may be required by qualified personnel who will evaluate the effectiveness of the erosion control measures and recommend repairs and/or modifications as appropriate. Provision for modifications to the erosion control system based on monitoring observations should be included in the Erosion and Sedimentation Control Plan.

Fill Materials

The workability of material used as structural fill will depend on the gradation and moisture content of the soil. As the amount of fines (material passing the U.S. No. 200 sieve) increases, soil becomes increasingly sensitive to small changes in moisture content and adequate compaction becomes more difficult, if not impossible to achieve. We recommend that select granular fill or crushed rock be used as structural fill during the rainy season. The following paragraphs summarize the material requirements for fill and backfill.

On-site Soils

The native glacial till soils may be considered for use as structural fill during periods of extended dry weather, provided they can be properly moisture conditioned. Soils encountered in our explorations, particularly the silt materials, will be difficult, if not impossible, to work or adequately compact during periods of wet weather or if the in-place moisture condition of these soils is over optimum during dry weather. On-site materials used as structural fill must be free of roots, organic matter and other deleterious materials and particles larger than 3 inches in diameter.

Select Granular Fill

Select granular fill (pit run) must consist of imported well-graded sand, sandy gravel, or crushed rock with a maximum particle size of 3 inches and less than 5 percent passing a U.S. No. 200 sieve. Organic matter, debris, or other deleterious material must not be present. Granular fill used during periods of prolonged dry weather may have up to 12 percent passing a U.S. No. 200 sieve.

Pipe Bedding

Trench backfill for the bedding and pipe zone must consist of well-graded granular material with a maximum particle size of ¾ inch and less than 5 percent passing the U.S. No. 200 sieve. The material must be free of roots, debris, organic matter, and other deleterious material.

Crushed Rock

Crushed rock fill must consist of clean, durable, crushed angular rock that has a maximum particle size of 4 inches, is well graded between coarse and fine sizes, and has less than 5 percent fines (material finer than a U.S. No. 200 sieve). A smaller maximum particle size will be required for some applications as discussed in other sections of this report. Gravel materials should be crushed to have at least two fractured faces. Organic matter, debris, or other deleterious material must not be present.

Fill Placement and Compaction

Fill soils should be compacted at a moisture content near optimum. The maximum allowable moisture content varies with the soil gradation, and should be evaluated during construction. Clayey soils and other fine granular soils may be difficult or impossible to compact during persistent wet conditions.

Fill and backfill material should be placed in uniform, horizontal lifts, and uniformly densified with vibratory compaction equipment. The maximum lift thickness will vary depending on the material, compaction equipment used, and possibly weather conditions, but should generally not exceed 10 inches in loose thickness if select granular fill, as described in this report, is used. Thinner lifts will be required if on-site materials are used as structural fill. Typical loose lift thicknesses for re-used glacial till material should be no thicker than 4 inches to achieve the recommended compaction. Thinner lift thicknesses may be required depending on soil and site conditions.

Area Fills and Bases

Fill placed to raise site grades and aggregate base materials under foundations, slabs, and pavements should be placed on a prepared subgrade that consists of firm, inorganic native soils or compacted fill. Fill must be compacted to at least 95 percent of the maximum dry density (MDD) determined by ASTM International (ASTM) Test Method D 1557 (modified Proctor). Where footings are founded on existing fill, the upper 2 feet of fill should be recompacted to the structural fill criteria (95 percent), or excavated and replaced with import structural fill. In pavement areas, the compaction criteria can be reduced to 92 percent below a depth of 2 feet from finished subgrade.

During wet weather or in areas that are particularly sensitive to subgrade disturbance, we recommend placing a woven geotextile between the subgrade and the first lift of fill. The first lift, provided it is select granular fill, should be 10 inches thick and should be densified by static rolling until it supports the vibratory compaction equipment.

Slope Fill Placement

Based on our understanding of the proposed development, earth fills will be placed on existing sloping ground. In such cases we recommend that the material be placed and compacted using hillside grading techniques, as provided below.

The constructed fill should be benched into the existing slope face. Bench excavations should be level and extend into the slope face until a vertical step of about 3 feet is constructed. The upper layer of organic soil beneath the existing slope face should be removed and wasted. The remaining soil excavated from each bench can be spread into the next lift of structural fill. A typical cross-sectional drawing of slope fill is shown on Figure 4, Schematic Drawing Hillside Fill.

Trench Backfill

Backfill in the bedding and pipe zone should be compacted to 90 percent of the MDD as determined by ASTM Test Method D 1557, or as recommended by the pipe manufacturer.

In nonstructural areas, trench backfill above the pipe zone should be compacted to at least 85 percent of the MDD as determined by ASTM Test Method D 1557. Suitable native soils or select granular soils should be acceptable in non-structural areas.

Within structural areas, trench backfill placed above the pipe zone at depths greater than 2 feet below the finished subgrade, must be compacted to at least 92 percent of the MDD as determined by ASTM Test Method D 1557 and to 95 percent MDD when placed within 2 feet of finished subgrade. Trench backfill in structural areas should consist of select granular fill or crushed rock as described in the previous sections.

Temporary and Permanent Slopes

We recommend that permanent cut and fill slopes be inclined no steeper than 2H:1V (horizontal to vertical). Flatter cut slopes may be necessary in areas where persistent groundwater seepage or zones of soft or loose soils are encountered. Temporary cut slopes should be inclined no steeper than about 1½H:1V. A steeper temporary cut of 1H:1V is feasible in the glacial till soils, provided seepage is not present. Surface loads should be kept at a minimum distance of at least one-half the depth of the cut away from the top of temporary slopes.

Temporary cut slopes and shoring must comply with the provisions of Title 296 WAC, Part N, “Excavation, Trenching and Shoring.” The contractor performing the work must have the primary responsibility for protection of workmen and adjacent improvements, determining whether shoring is required, and for establishing the safe inclination for open-cut slopes.

Fill slopes should be carefully compacted on the slope face. Alternatively, the fill embankment can be over-built and cut back to expose properly compacted soil.

To reduce the potential for erosion, newly constructed slopes should be planted or hydroseeded shortly after completion of grading. Some sloughing and raveling of the slopes should be expected until the vegetation is established. This may require localized repairs and reseeding. Temporary covering, such as heavy plastic sheeting, jute fabric, loose straw, or excelsior matting should be used to protect unvegetated slopes during periods of rainfall.

Groundwater and Drainage Considerations

We recommend that pavement surfaces be sloped so that surface drainage flows away from the buildings. We recommend that all roof drains be collected in tightlines and routed into the storm drain system. Perched groundwater will likely develop on top of the very dense glacial till in unpaved areas during the rainy season, which may impact construction activities. We recommend a perimeter footing drain be constructed around the building footprint to capture perched groundwater zones. This is critical on glacial till sites due to the potential for perched groundwater flow, moving laterally on the glacial till contact and within cleaner sand seams in the till.

Seismic Design Considerations

2015 IBC Seismic Design

We recommend the parameters in Table 1 for use in seismic design in accordance with 2015 IBC.

TABLE 1. SEISMIC DESIGN PARAMETERS

2015 IBC Seismic Design Parameters	
Spectral Response Acceleration at Short Periods (S_S)	1.29g
Spectral Response Acceleration at 1-Second Periods (S_1)	0.49g
Site Class	C
Design Peak Ground Acceleration (PGA)	0.54g
Design Spectral Response Acceleration at Short Periods (S_{DS})	0.86g
Design Spectral Response Acceleration at 1-Second Periods (S_{D1})	0.43g

Liquefaction Potential

Liquefaction refers to a condition where vibration or shaking of the ground, usually from earthquake forces, results in development of excess pore pressures in loose, saturated soils and subsequent loss of strength in the deposit of soil so affected. In general, soils that are susceptible to liquefaction include loose to medium dense sands to silty sands that are below the water table. Based on the soil type, and relative density of the soils encountered, it is our opinion that the potential for liquefaction within the proposed development portion of the site area is low.

Lateral Spreading Potential

Lateral spreading related to seismic activity typically involves lateral displacement of large, surficial blocks of non-liquefied soil when a layer of underlying soil loses strength during seismic shaking. Lateral spreading usually develops in areas where sloping ground or large grade changes (including retaining walls) are present. Based on our understanding of the subsurface conditions and current site topography, it is our opinion that the risk of lateral spreading is low.

Ground Rupture

Because of the anticipated infrequent seismic event recurrence, the site location with respect to the nearest known active crustal faults and the presence of thick glacial deposits overlying bedrock, it is our opinion that the risk of ground rupture at the site due to crustal faulting is low.

Foundation Support

Shallow Foundations

We anticipate that warehouse-type buildings can be supported on continuous wall or isolated column footings established on undisturbed native soils, on structural fill placed over undisturbed native soils, or on a minimum 2-foot thickness of structural fill overlying existing fill soils. For preliminary purposes, we recommend that isolated column and continuous wall footings have minimum widths of 24 and 18 inches, respectively.

The exterior footings should be established at least 18 inches below the lowest adjacent grade. The recommended minimum footing depth is greater than the anticipated frost depth. Interior footings can be founded a minimum of 12 inches below the top of the floor slab.

Bearing Capacity

We recommend that footings founded on recompacted surficial soils or new structural fill be proportioned using a maximum allowable soil bearing pressure of 3,000 psf. If the building footings are founded on undisturbed dense to very dense glacial till a maximum allowable soil bearing pressure of 5,000 psf could be considered. However, footing embedment would likely be greater than the minimum value for frost protection. Where existing fill is exposed at footing subgrade elevation, we recommend a minimum 2-foot zone of structural fill underlie the footing. These bearing pressures apply to the total of dead and long-term live loads and may be increased by one-third when considering earthquake or wind loads. This is a net bearing pressure. The weight of the footing and overlying backfill can be ignored in calculating footing sizes.

Footing Bearing Surface Preparation

Footing excavations should be performed using a smooth-edged bucket to limit bearing surface disturbance. Loose or disturbed materials present at the base of footing excavations should be removed or compacted. Foundation bearing surfaces should not be exposed to standing water. If water infiltrates and pools in the excavation, it must be removed and the bearing surface reevaluated before placing structural fill or reinforcing steel.

We recommend that an experienced geotechnical engineer observe all foundation excavations before placing reinforcing steel in order to confirm that adequate bearing surfaces have been achieved and that the soil conditions are as anticipated. Unsuitable foundation subgrade soils must be removed and replaced with structural fill as recommended by the geotechnical engineer. It may be prudent to place a thin mud mat of lean concrete to protect the bearing surface if footing excavations are to remain open in wet weather.

Foundation Settlement

We estimate that settlements of footings designed and constructed as recommended will be less than ¾ inch, for the anticipated loading conditions. Differential settlements between comparably loaded isolated column footings or along 50 feet of continuous footing will be less than ½ inch. Settlement is expected to occur rapidly as loads are applied.

Lateral Resistance

The ability of the soil to resist lateral loads is a function of frictional resistance, which can develop on the base of footings and slabs and the passive resistance, which can develop on the face of below-grade

elements of the structure as these elements tend to move into the soil. For footings and floor slabs founded in accordance with the recommendations presented above, the allowable frictional resistance may be computed using a coefficient of friction of 0.35 applied to vertical dead-load forces. The allowable passive resistance on the face of footings, grade beams or other embedded foundation elements may be computed using an equivalent fluid density of 300 pounds per cubic foot (pcf) for undisturbed on-site soils or structural fill extending out from the face of the foundation element a distance at least equal to two and one-half times the depth of the element.

The passive earth pressure and friction components may be combined provided that the passive component does not exceed two-thirds of the total. The passive earth pressure value is based on the assumptions that the adjacent grade is level and that groundwater remains below the base of the footing throughout the year. The top foot of soil should be neglected when calculating passive lateral earth pressures unless the foundation area is covered with pavement or is inside a building.

The lateral resistance values include a safety factor of approximately 1.5.

Building Pad and Floor Slabs

A modulus of subgrade reaction of 150 pounds per cubic inch (pci) can be used for designing the building floor slab provided that the subgrade has been prepared in accordance with the "Subgrade Evaluation" section.

We recommend that on-grade slabs be underlain by a minimum 4-inch-thick capillary break layer to reduce the potential for moisture migration into the slab. The capillary break material should consist of a coarse aggregate with negligible sand or silt similar to AASHTO Grading No. 67. The material should be placed as recommended in the "Fill Placement and Compaction" section.

A vapor retarder should be used as necessary to control moisture penetration through the slab. This is especially important in areas where floor coverings, adhesives or tiles are planned.

Retaining Structures

Retaining structures for loading docks or other building walls that are free to rotate slightly around the base should be designed for active earth pressures using an equivalent fluid unit weight of 35 pcf. This value is based on the following assumptions:

1. The walls will not be restrained against rotation when the backfill is placed.
2. The backfill is level.
3. The backfill for a distance of at least 12 inches behind the wall consists of free-draining granular materials.
4. Hydrostatic pressures will be controlled by a back drain.

If retaining walls are restrained against rotation during backfilling, they should be designed for an at-rest equivalent fluid unit weight of 55 pcf. Surcharge loads applied closer than one-half of the wall height should be considered as uniformly distributed horizontal pressures equal to one-third of the distributed vertical surcharge pressure. Footings for retaining walls should be designed as recommended for shallow foundations.

Backfill should be placed and compacted as recommended in the "Fill Placement and Compaction" section of this report. The backfill should include drainage provisions to prevent hydrostatic pressures from developing behind walls. Measures should be taken to prevent overcompaction of the backfill behind the wall. This can be done by placing the zone of backfill located within 5 feet of the wall in lifts not exceeding 6 inches in loose thickness and compacting this zone with hand-operated equipment such as a vibrating plate compactor or jumping jack.

Pavement Recommendations

Pavement Design

Based on our experience, we provide typical asphalt concrete (AC) and Portland cement concrete (PCC) pavement sections below. These pavement sections are typical for commercial facilities in this area but may not be adequate for heavy construction traffic loads such as those imposed by concrete transit mixers, dump trucks or cranes or for unusual design traffic conditions. Additional pavement thickness may be necessary to prevent pavement damage during construction or if anticipated truck traffic for this facility is higher than typical. We can provide a specific design if detailed truck traffic loading information is provided. The recommended sections assume that final improvements surrounding the pavement will be designed and constructed such that stormwater or excess irrigation water from landscape areas does not accumulate below the pavement section or pond on pavement surfaces.

Pavement subgrade must be prepared as previously described. Crushed surfacing base course and subbase must be moisture conditioned to near optimum moisture content and compacted to at least 95 percent of MDD (ASTM D 1577).

Crushed surfacing base course must conform to applicable sections of 4-04 and 9-03.9(3) of the Washington State Department of Transportation (WSDOT) Standard Specifications. Hot mix asphalt must conform to applicable sections of 5-04, 9-02 and 9-03 of the WSDOT Standard Specifications. PCC must conform to applicable sections of 5-05, 9-01 and 9-03 of the WSDOT Standard Specifications.

Standard-Duty AC Pavement – Automobile Driveways and Parking Areas

- 2 inches of hot mix asphalt, class ½ inch, PG 58-22
- 4 inches of crushed surfacing base course
- 6 inches of subbase consisting of select granular fill to provide uniform grading and pavement support, to maintain drainage, and to provide separation from fine-grained subgrade soil
- Native subgrade or structural fill prepared in accordance with the "Site Development and Earthwork" section

Heavy-Duty AC Pavement – Areas Subject to Truck Traffic

- 3 inches of hot mix asphalt, class ½ inch, PG 58-22
- 6 inches of crushed surfacing base course
- 6 inches of subbase consisting of select granular fill to provide a uniform grading surface and pavement support, to maintain drainage, and to provide separation from fine-grained subgrade soil
- Native subgrade or structural fill prepared accordance with the "Site Development and Earthwork" section

PCC Pavement – Areas Subject to Heavy Truck Traffic

- 6 inches of PCC pavement (28-day compressive strength of 6,000 pound per square inch [psi] and a modulus of rupture of 600 psi)
- 6 inches of crushed surfacing base course
- Native subgrade or structural fill prepared accordance with the "Site Development and Earthwork" section

Stormwater Infiltration Evaluation

As previously described the site soils generally consist of weathered till over unweathered till. Grain-size distribution analyses of these soils indicate fines contents ranging between about 26 and 95 percent. The unweathered till is typically in a dense to very dense condition and has very low permeability with respect to the vertical and horizontal flow of water.

Based on the soil gradation data, and our experience, it is our opinion there is very limited infiltration potential at this site. Because of these factors we recommend that stormwater detention be used for site development.

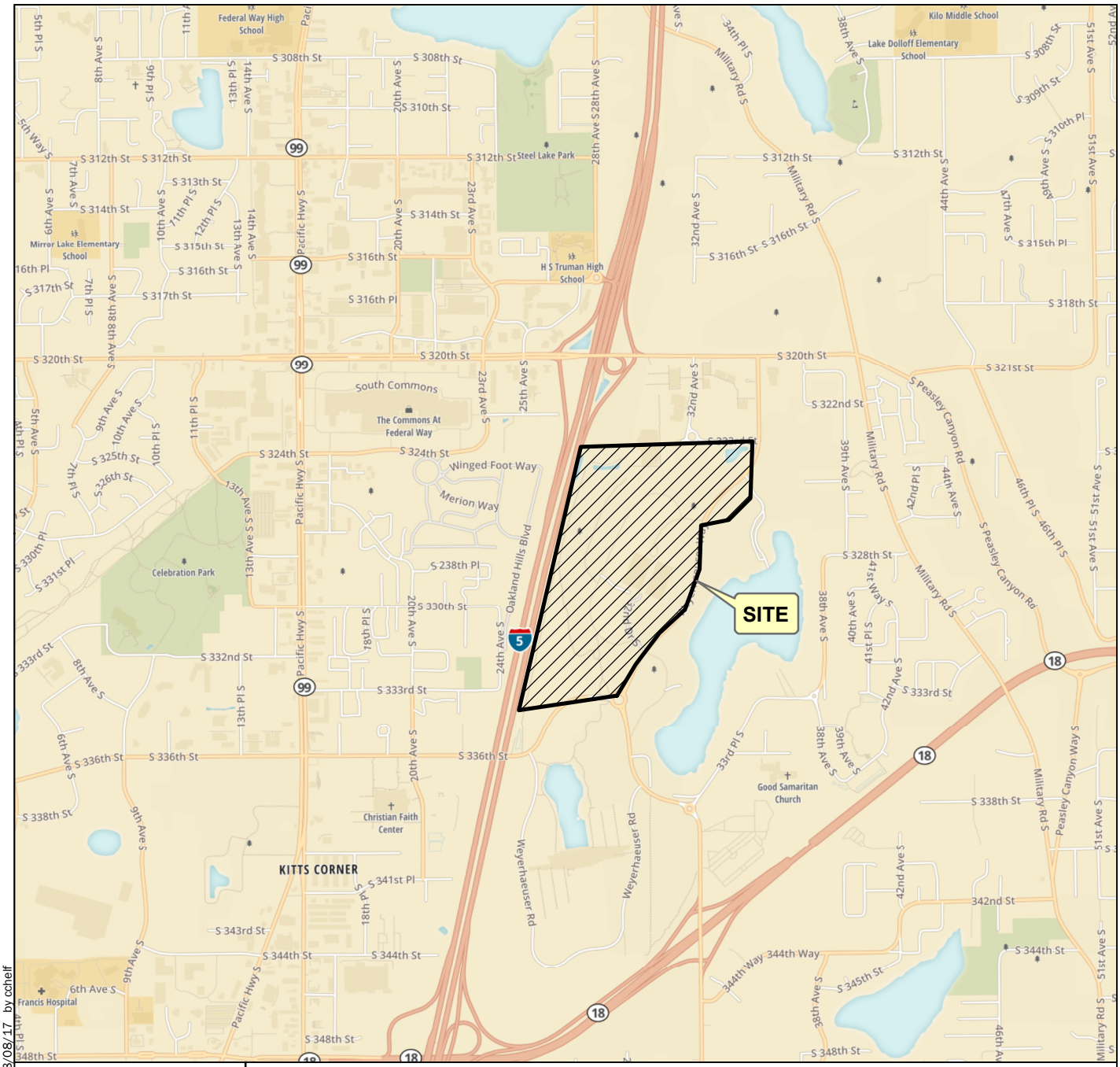
Recessional outwash was encountered in one test pit TP-5N. This pit is within the proposed pond located east of Weyerhaeuser Road, east of the northeast corner of the site. Outwash was not encountered in two other test pits completed within the proposed pond area. It is possible that some measure of stormwater infiltration within this pond is achievable. However, further study will be required to evaluate the vertical and lateral extent of the outwash material, and the permeability of the outwash.

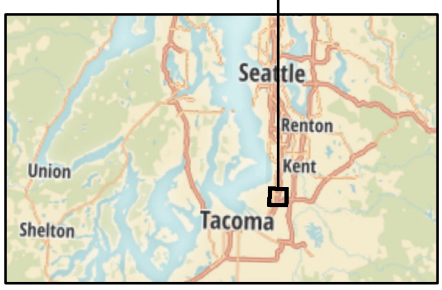
LIMITATIONS

We have prepared this geotechnical report for use by Federal Way Campus, LLC and their agents for the proposed development project described in this report. The project agents may distribute copies of this report to authorized agents and regulatory agencies as may be required for the project.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions express or implied should be understood.

Please refer to Appendix E, Report Limitations and Guidelines for Use, for additional information pertaining to use of this report.





N
W E
S

2,000 0 2,000

Feet

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2017

Projection: NAD 1983 UTM Zone 10N

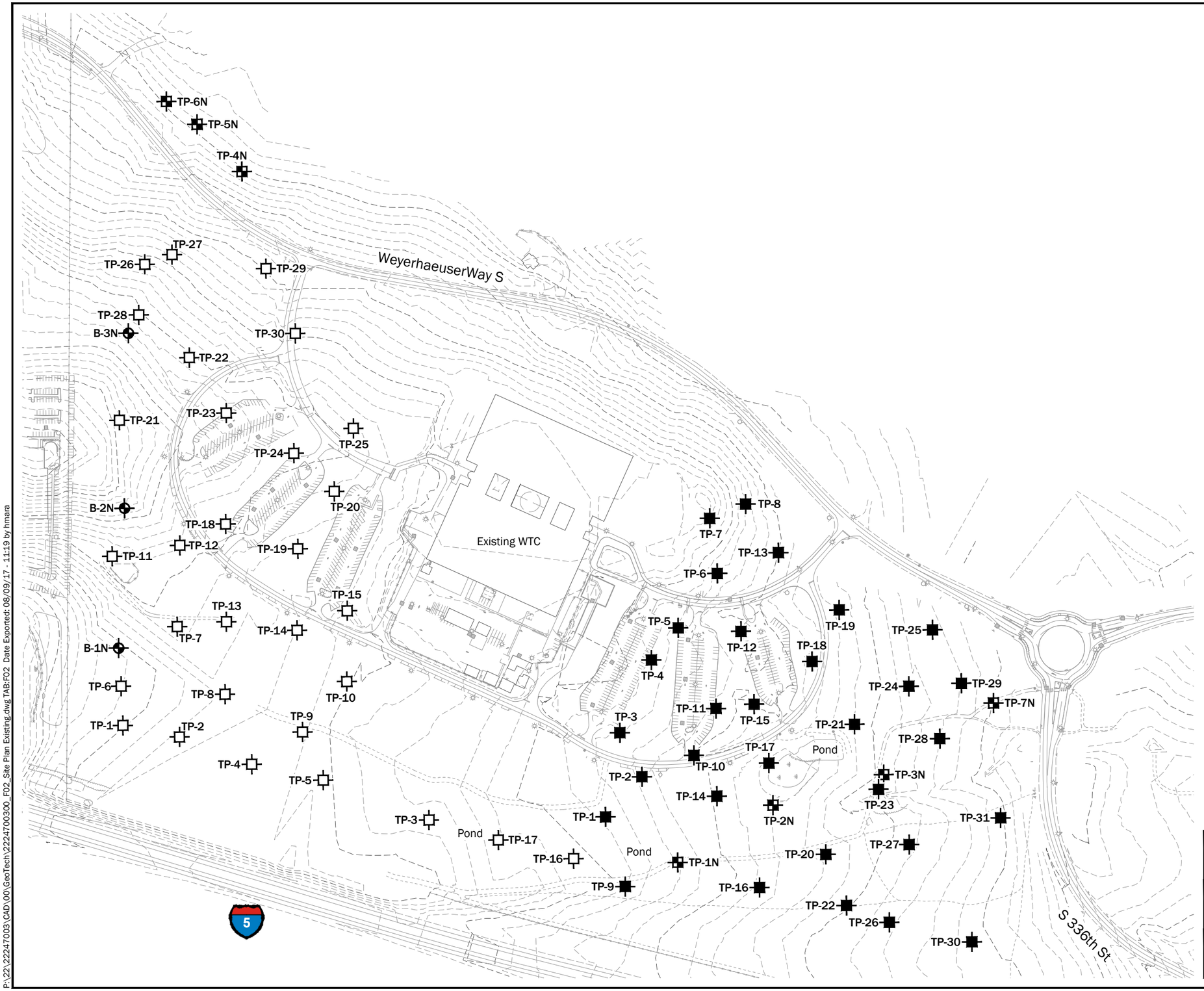
Vicinity Map

Proposed Greenline Business Park
Federal Way, Washington

GeoEngineers

Figure 1

P:\22\22247003\GIS\MXD\22247003_F01_VicinityMap.mxd Date Exported: 08/08/17 by cchelf



Legend

- TP-1N — Test Pits by GeoEngineers, 2017
- B-1N — Borings by GeoEngineers, 2017
- TP-1 — Test Pit Completed in July 2016
- TP-1 — Test Pit Completed in August 2016

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base CAD files from ESM Consulting Engineers, LLC dated 7/24/17.

Projection: NAD83 WA State Planes, North Zone, US Foot

300 0 300
Feet

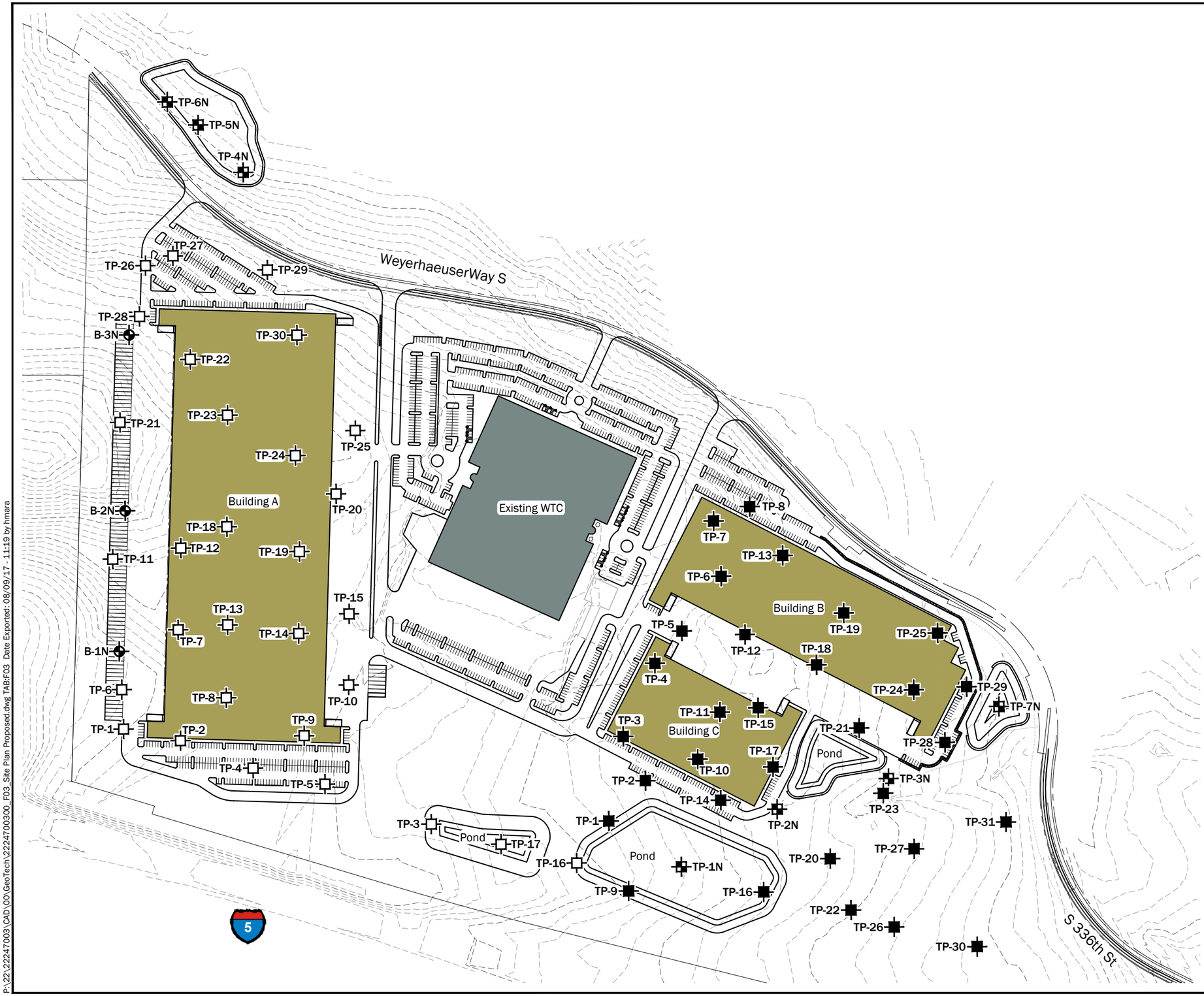
Site Plan
Existing Conditions

Proposed Greenline Business Park
Federal Way, Washington

GeoEngineers

Figure 2

P:\22\22247003\CAD\00\GeoTech\2224700300_F02_Site Plan Existing.dwg TAB:F02 Date Exported: 08/09/17 - 11:19 by hmara



Legend

- TP-1N — Test Pits by GeoEngineers, 2017
- B-1N — Borings by GeoEngineers, 2017
- TP-1 — Test Pit Completed in July 2016
- TP-1 — Test Pit Completed in August 2016

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base CAD files from ESM Consulting Engineers, LLC dated 7/24/17.

Projection: NAD83 WA State Planes, North Zone, US Foot

N E S W

300 0 300
Feet

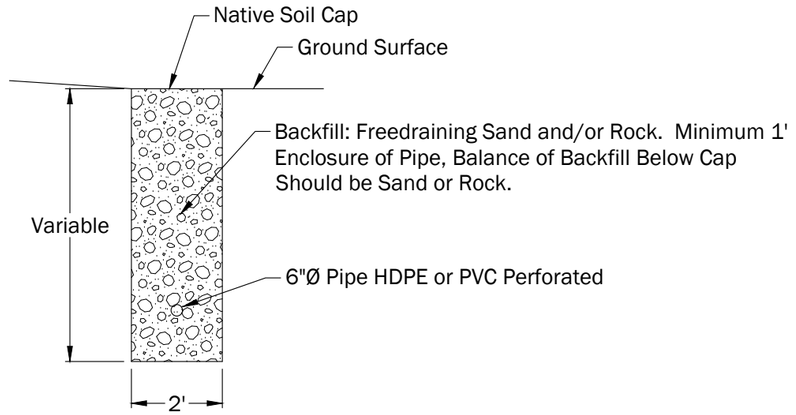
Site Plan
Proposed Conditions

Proposed Greenline Business Park
Federal Way, Washington

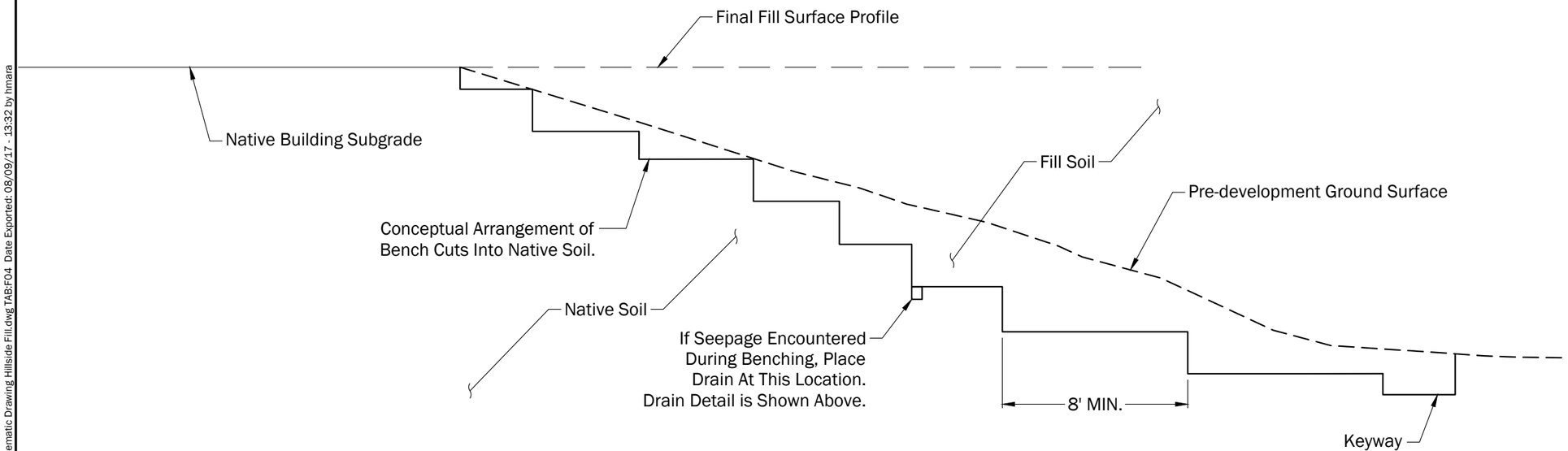
GeoEngineers

Figure 3

P:\22\22247003\CAD\00\GeoTech\22247003000_F03_Site Plan Proposed.dwg TAB:F03 Date Exported: 08/09/17 11:19 by hmara



Bench Drain
Not to Scale



Not to Scale

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source:
Drawing created from sketch provided by GeoEngineers' personnel.

Schematic Drawing Hillside Fill

Proposed Greenline Business Park
Federal Way, Washington

GeoEngineers

Figure 4

APPENDIX A
Greenline Business Park Site Plan and Cross Sections

n

SCALE: 1" = 100'

100 50 0 100 200

BUILDING "A"
605,500 SF
FF=VARIES
442.37-445.62

BUILDING "B"
282,500 SF
FF=VARIES
420.00-424.75

BUILDING "C"
147,500 SF
FF=VARIES
422.00-424.5

EXISTING
WTC
BUILDING
FF=437.00

WEYERHAEUSER WAY S.

S 336TH ST

INTERSTATE 5

POND

30' SETBACK

9' RIGHT-OF-WAY DEDICATION

3' WALL

9' WALL

10' WALL

4' TRUCK DOCK WALL

5' WALL

6' WALL

7' WALL

8' WALL

REVISIONS

NO.	DESCRIPTION/DATE	BY

ESM CONSULTING ENGINEERS, LLC
33400 8th Ave S, Suite 205
Federal Way, WA 98003
www.esmcivil.com
FEDERAL WAY (253) 838-6113
DIRECT (425) 207-2600
Civil Engineering | Land Surveying | Land Planning
Public Works | Project Management | Landscape Architecture

FEDERAL WAY CAMPUS, LLC

GREENLINE BUSINESS PARK

BASIN EXHIBIT

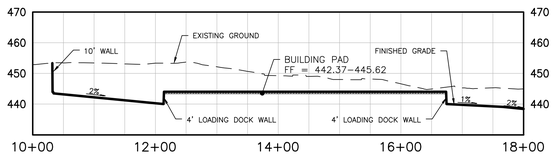
CITY OF FEDERAL WAY WASHINGTON

JOB NO.	1886-001-016
DWG. NAME	EN-02
DESIGNED BY:	LGB
DRAWN BY:	JJH
CHECKED BY:	
DATE:	06/29/2017

EN-02

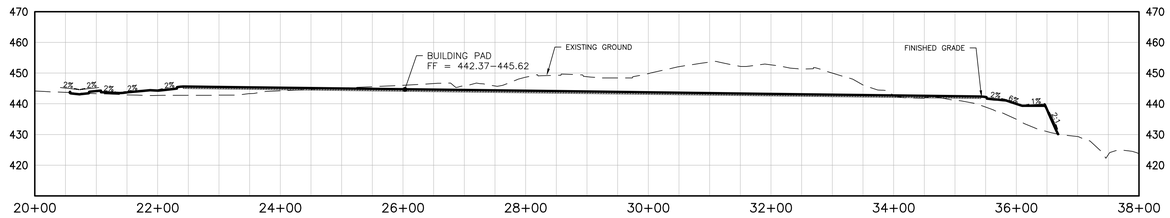
1 OF 2 SHEETS

File: \\Esm8\engr\ESM-JOBS\1880\001\016-001\exhibit\EN-02.dwg
Plotted: 6/29/2017 - 3:35 PM
Plotted By: Jeff Hiro



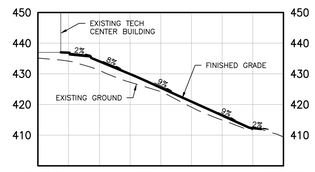
SITE CROSS SECTION A-A

SCALE: 1"=100'HORIZ. 1"=20' VERT.



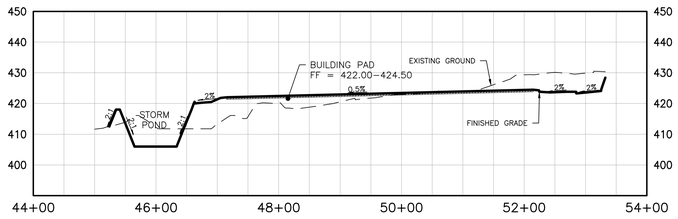
SITE CROSS SECTION B-B

SCALE: 1"=100'HORIZ. 1"=20' VERT.



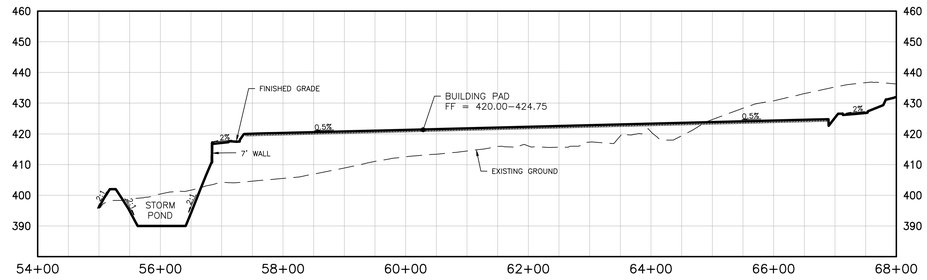
SITE CROSS SECTION C-C

SCALE: 1"=100'HORIZ. 1"=20' VERT.



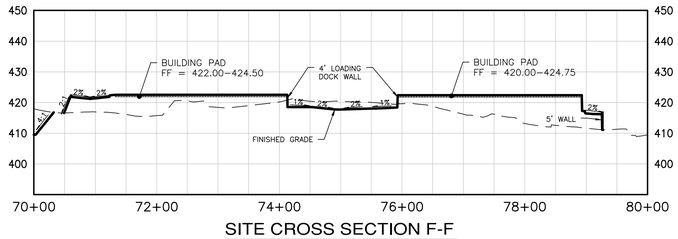
SITE CROSS SECTION D-D

SCALE: 1"=100'HORIZ. 1"=20' VERT.



SITE CROSS SECTION E-E

SCALE: 1"=100'HORIZ. 1"=20' VERT.



SITE CROSS SECTION F-F

SCALE: 1"=100'HORIZ. 1"=20' VERT.

CONSULTING ENGINEERS LLC
33400 8th Ave S, Suite 205
Federal Way, WA 98003
www.esmcivil.com
FEDERAL WAY (253) 838-6113
LOCATE (425) 207-3500
Civil Engineering
Public Works
Land Planning
Landscape Architecture
Land Surveying
Project Management

REVISIONS

NO.	DESCRIPTION/DATE	BY

FEDERAL WAY CAMPUS, LLC

GREENLINE BUSINESS PARK

SITE CROSS SECTIONS

CITY OF FEDERAL WAY

WASHINGTON

JOB NO.	1886-001-016
DWG. NAME	EN-02
DESIGNED BY:	LGB
DRAWN BY:	JJH
CHECKED BY:	
DATE:	06/29/2017

EN-02

2 OF 2 SHEETS

File: \\Esm8\proj\ESM-JOBS\1886\001\016-001\exhibits\EN-02.dwg
Plotted: 6/29/2017 3:36 PM
Plotted By: Jeff Hino

APPENDIX B
Field Explorations and Laboratory Testing

APPENDIX B
FIELD EXPLORATIONS AND LABORATORY TESTING

Field Explorations

Subsurface conditions at the site were previously explored during two phases of work. Thirty test pits were excavated in the north part of the site between July 5 and July 7, 2016. Thirty-one test pits were excavated in the middle and south parts of the site between August 15 and August 17, 2016. Supplemental explorations (seven test pits and three borings) were completed on July 19 and July 24, 2017. Borings were drilled to depths of 21 feet. Test pits were excavated to depths ranging from 4 to 9 feet bgs. Test pits were excavated using a rubber-tired backhoe provided by Kelly's Excavating of Pacific, Washington. Borings were completed using tracked drilling equipment owned and operated by Holocene Drilling of Puyallup, Washington.

The site explorations were continuously monitored by a member of GeoEngineers geotechnical staff. Our representative maintained a detailed log of the soils encountered, obtained soil samples and observed groundwater conditions. Figures 2 and 3 shows the approximate locations of the explorations. Explorations were mapped using commercial-grade GPS equipment and should be considered accurate only to the extent implied by the method used.

Soil samples were obtained from the borings using standard penetration tests (SPTs) performed in general conformance with ASTM International (ASTM) Test Method D 1586. The sampler was driven with a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler the last 12 inches or other indicated distance, into the soils is shown adjacent to the sample symbols on the boring logs. Disturbed samples were obtained from the split barrel for subsequent classification and index testing. Bulk soil samples from the test pits were collected directly from the trackhoe bucket and placed in plastic bags.

Soils encountered in the borings were classified in the field in general accordance with ASTM Standard Practice D 2488, the Standard Practice for the Classification of Soils (Visual-Manual Procedure), which is described in Figure B-1. Soil classifications and sampling intervals are shown on the exploration logs. Inclined lines at the material contacts shown on the logs indicate uncertainty as to the exact contact elevation, rather than the inclination of the contact itself. Figures B-2 through B-11 present the supplementary exploration logs. Logs from the earlier phases of work at the site are contained in Appendices C and D.

Laboratory Testing

Soil samples obtained from the explorations were brought to our laboratory and reviewed to confirm field classifications. Selected samples were tested to determine their moisture content and grain-size distribution in general accordance with applicable ASTM standards.

The moisture content of selected samples was determined in general accordance with ASTM Test Method D 2216. The test results are presented in the respective exploration logs in Appendix A. Grain-size distribution (sieve analyses) was conducted in general accordance with ASTM Test Method D 422. Atterberg Limits Tests were conducted in general accordance with ASTM Test Method D 4318.

The results of previous laboratory testing are presented in Appendices C and D. Laboratory testing of samples collected from the supplementary explorations are contained in Figures B-12 through B-14.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/ Quarry Spalls
	SOD	Sod/Forest Duff
	TS	Topsoil

Groundwater Contact

Measured groundwater level in exploration, well, or piezometer

Measured free product in well or piezometer

Graphic Log Contact

Distinct contact between soil strata

Approximate contact between soil strata

Material Description Contact

Contact between geologic units

Contact between soil of the same geologic unit

Sampler Symbol Descriptions

2.4-inch I.D. split barrel

Standard Penetration Test (SPT)

Shelby tube

Piston

Direct-Push

Bulk or grab

Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

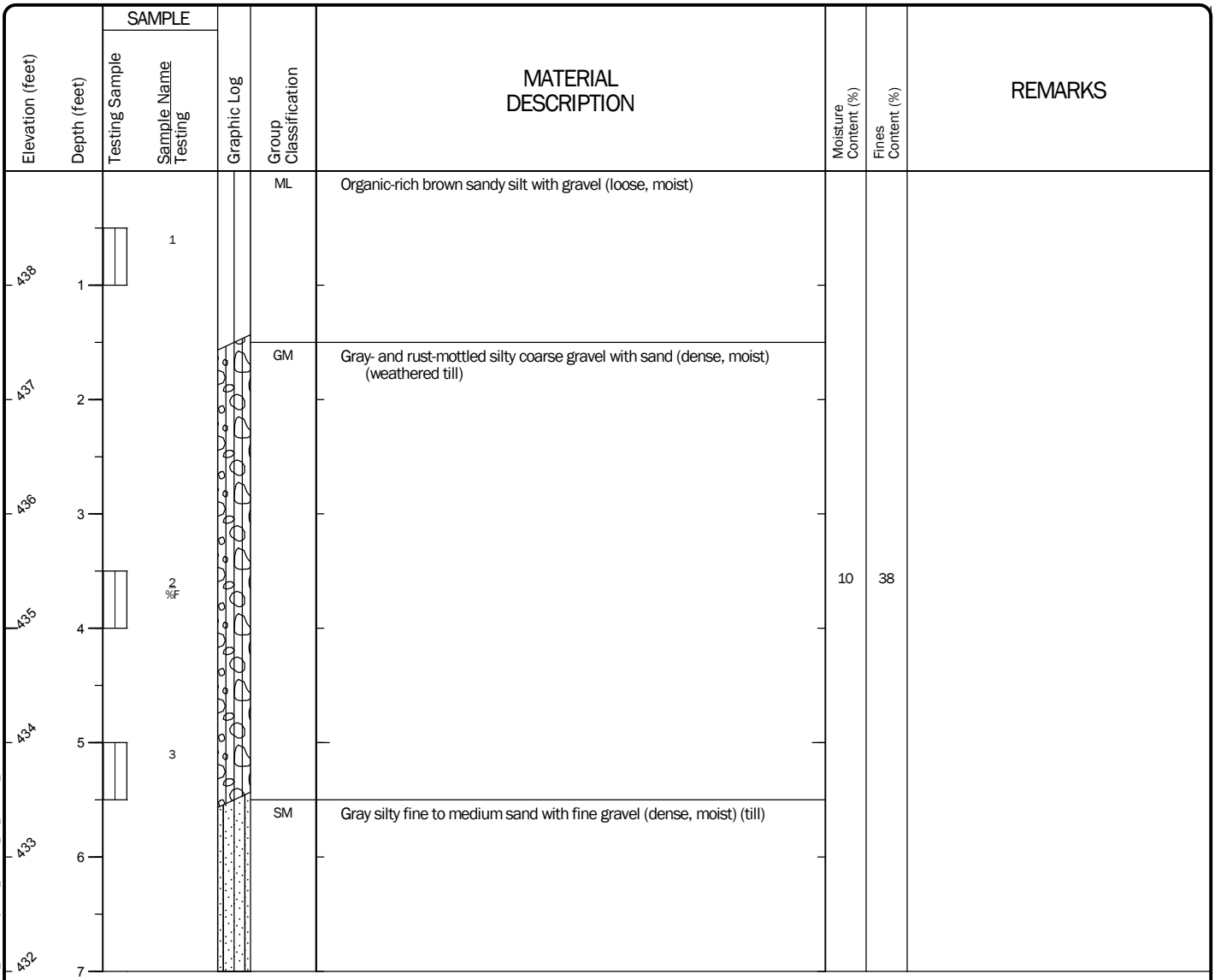
NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

Key to Exploration Logs

GeoEngineers

Figure B-1

Date Excavated	7/19/2017	Total Depth (ft)	7	Logged By CRG Checked By SWH	Excavator Kelly's Excavating Equipment Mini Trackhoe	Groundwater not observed Caving not observed
Surface Elevation (ft) Vertical Datum	439 NAVD88	Easting (X) Northing (Y)	1276740 115010	Coordinate System Horizontal Datum	WA State Plane North NAD83 (feet)	



Notes: See Figure B-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth, Vertical approximated based on DEM

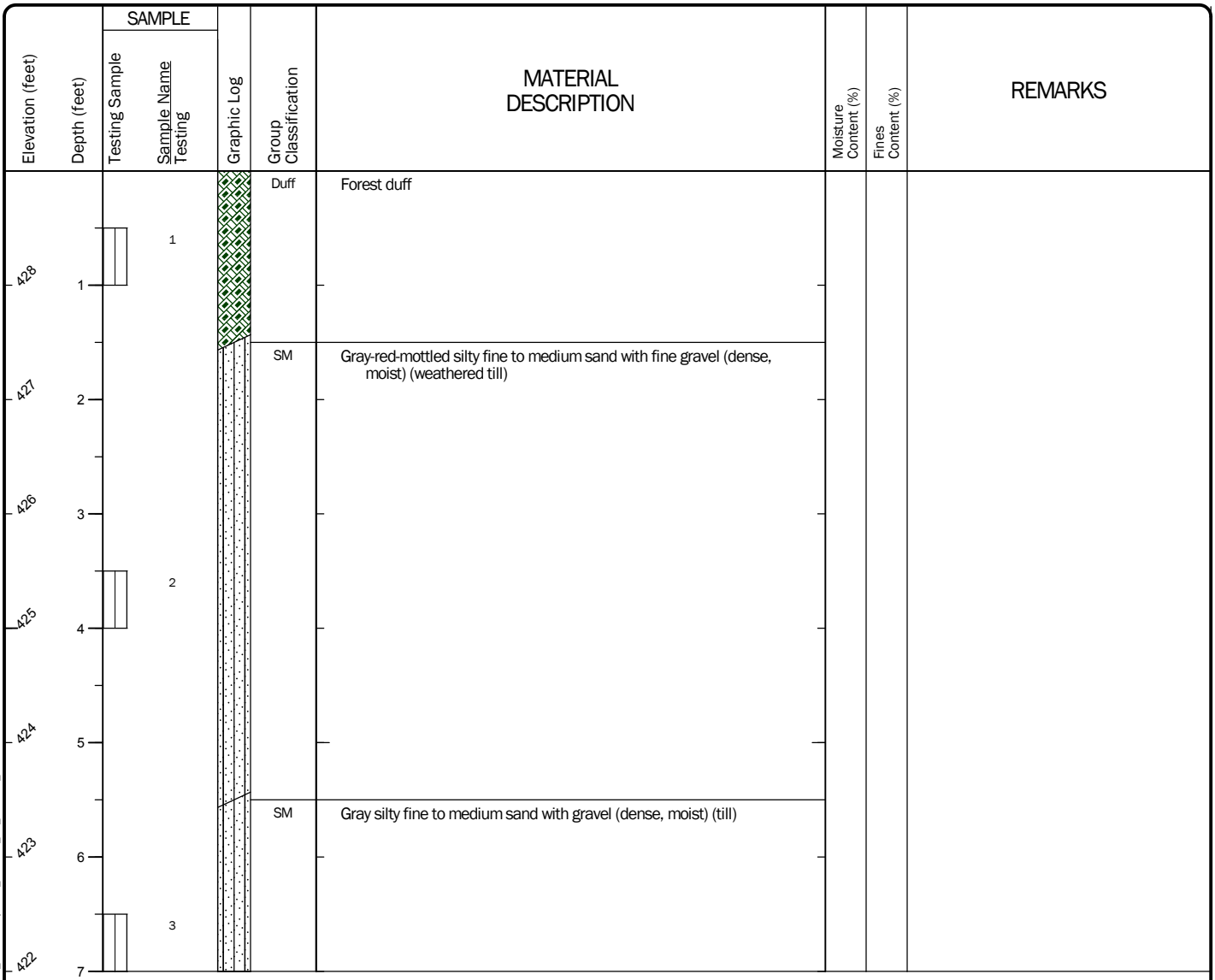
Log of Test Pit TP-1N

GeoEngineers

Project: Proposed Greenline Business Park
Project Location: Federal Way, Washington
Project Number: 22247-003-00

Figure B-2
Sheet 1 of 1

Date Excavated 7/19/2017	Total Depth (ft) 7	Logged By CRG Checked By SWH	Excavator Kelly's Excavating Equipment Mini Trackhoe	Groundwater not observed Caving not observed
Surface Elevation (ft) 429 Vertical Datum NAVD88		Easting (X) 1276910 Northing (Y) 114720	Coordinate System WA State Plane North Horizontal Datum NAD83 (feet)	



Notes: See Figure B-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth, Vertical approximated based on DEM

Log of Test Pit TP-2N

GeoEngineers

Project: Proposed Greenline Business Park
Project Location: Federal Way, Washington
Project Number: 22247-003-00

Figure B-3
Sheet 1 of 1

Date Excavated 7/19/2017	Total Depth (ft) 9	Logged By CRG Checked By SWH	Excavator Kelly's Excavating Equipment Mini Trackhoe	Groundwater not observed Caving not observed
Surface Elevation (ft) 415 Vertical Datum NAVD88		Easting (X) 1277000 Northing (Y) 114380		Coordinate System WA State Plane North Horizontal Datum NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
414	1		1		ML	Brown organic-rich silt with sand and occasional gravel (medium dense, dry)			
413	2				ML	Gray- and rust-mottled fine sandy silt with occasional organic debris and fine gravel (stiff, moist) (weathered till)			
412	3								
411	4		2 %F				24	66	
410	5								
409	6								
408	7								
407	8								
406	9		3 %F		SM	Gray silty fine to medium sand with fine to coarse gravel (very dense, moist) (till)	10	35	

Notes: See Figure B-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth, Vertical approximated based on DEM

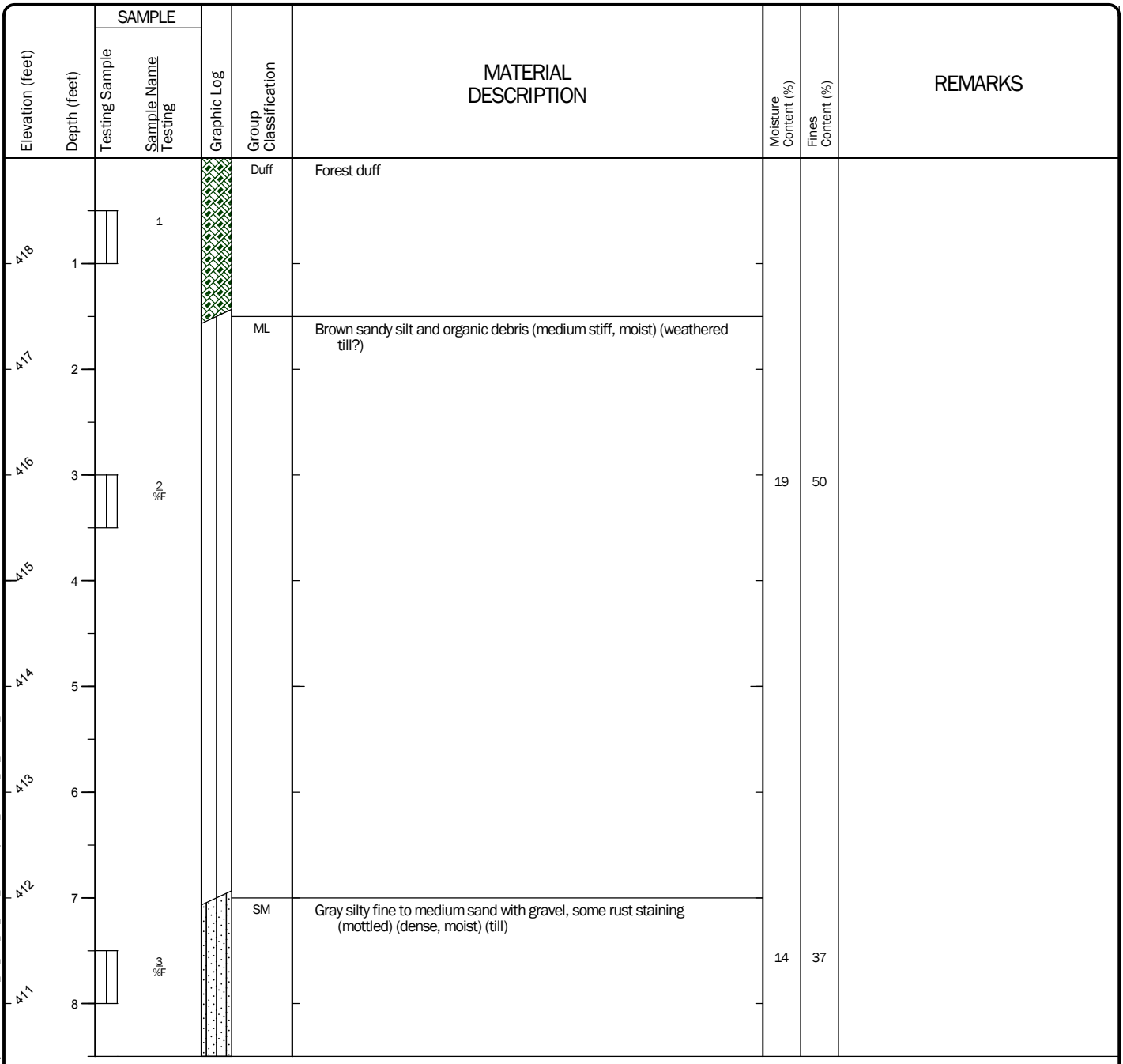
Log of Test Pit TP-3N

GeoEngineers

Project: Proposed Greenline Business Park
Project Location: Federal Way, Washington
Project Number: 22247-003-00

Figure B-4
Sheet 1 of 1

Date Excavated 7/19/2017	Total Depth (ft) 8.5	Logged By CRG Checked By SWH	Excavator Kelly's Excavating Equipment Mini Trackhoe	Groundwater not observed Caving not observed	
Surface Elevation (ft) 419 Vertical Datum NAVD88		Easting (X) 1278840 Northing (Y) 116340		Coordinate System WA State Plane North Horizontal Datum NAD83 (feet)	



Notes: See Figure B-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth, Vertical approximated based on DEM

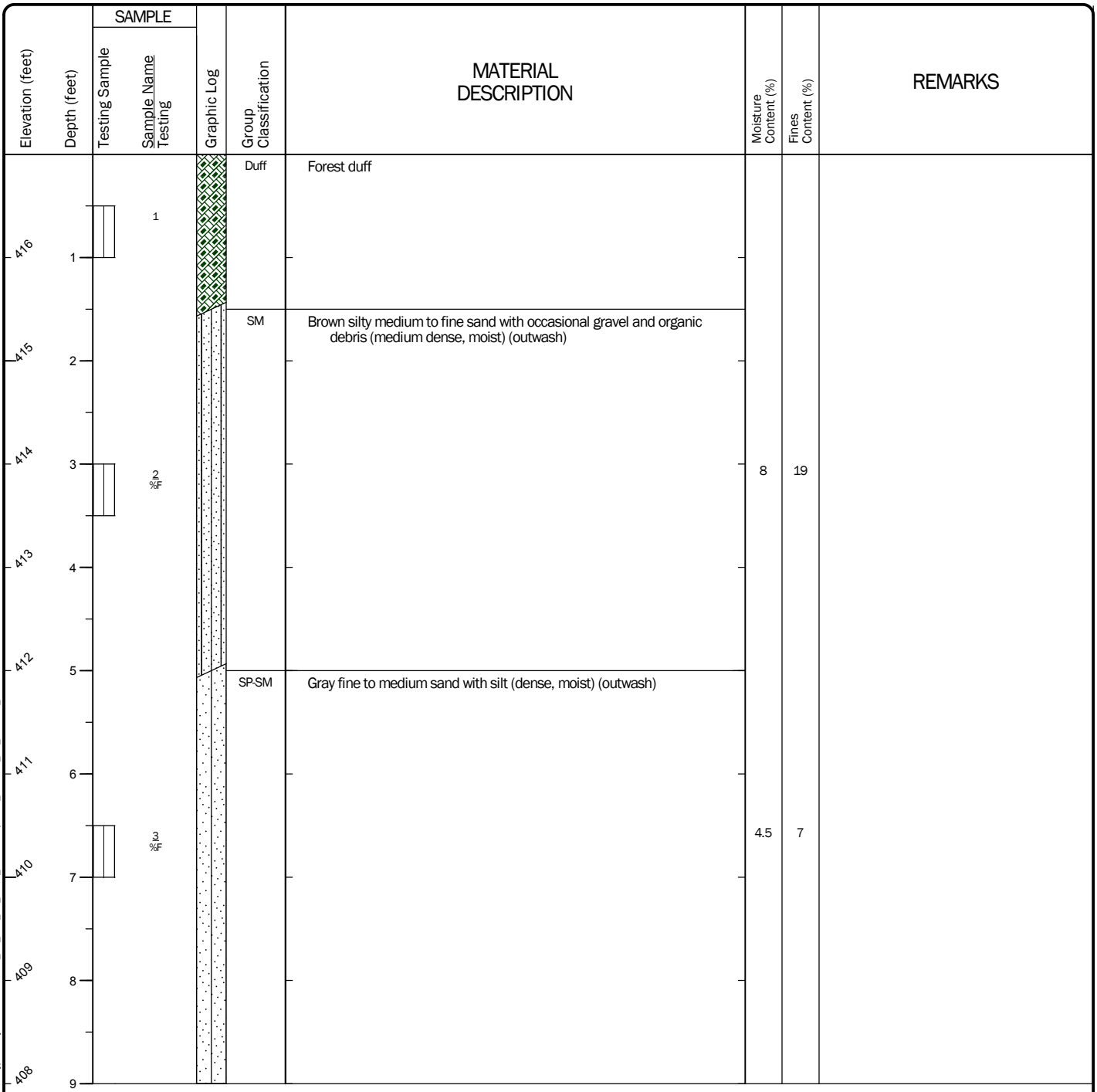
Log of Test Pit TP-4N

GeoEngineers

Project: Proposed Greenline Business Park
Project Location: Federal Way, Washington
Project Number: 22247-003-00

Figure B-5
Sheet 1 of 1

Date Excavated	7/19/2017	Total Depth (ft)	9	Logged By CRG Checked By SWH	Excavator Kelly's Excavating Equipment Mini Trackhoe	Groundwater not observed Caving not observed
Surface Elevation (ft) Vertical Datum	417 NAVD88	Easting (X) Northing (Y)	1278980 116470	Coordinate System Horizontal Datum	WA State Plane North NAD83 (feet)	



Notes: See Figure B-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth, Vertical approximated based on DEM

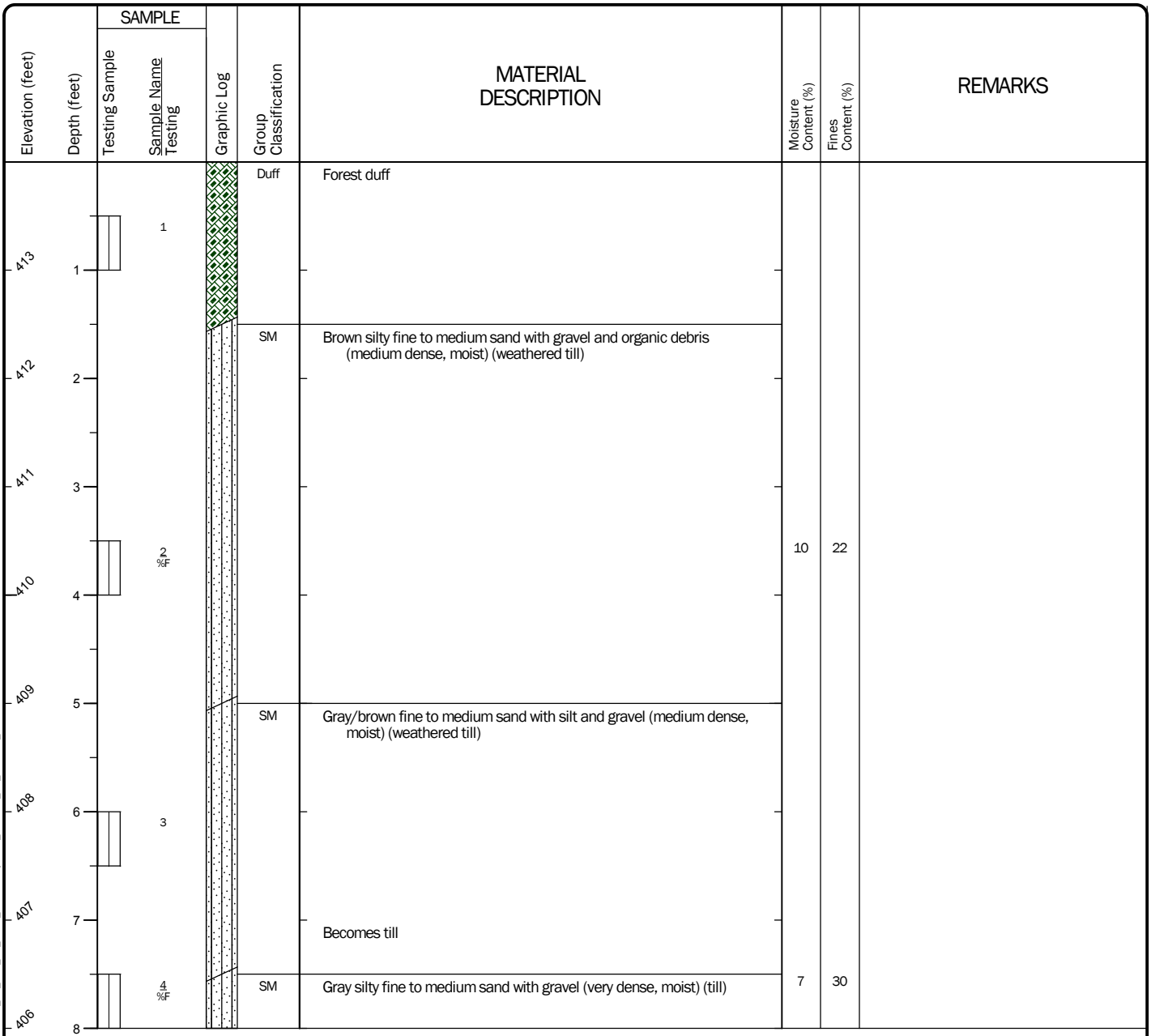
Log of Test Pit TP-5N

GeoEngineers

Project: Proposed Greenline Business Park
Project Location: Federal Way, Washington
Project Number: 22247-003-00

Figure B-6
Sheet 1 of 1

Date Excavated 7/19/2017	Total Depth (ft) 8	Logged By CRG Checked By SWH	Excavator Kelly's Excavating Equipment Mini Trackhoe	Groundwater not observed Caving not observed
Surface Elevation (ft) 414 Vertical Datum NAVD88		Easting (X) 1279050 Northing (Y) 116570		Coordinate System WA State Plane North Horizontal Datum NAD83 (feet)



Notes: See Figure B-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth, Vertical approximated based on DEM

Log of Test Pit TP-6N

GeoEngineers

Project: Proposed Greenline Business Park
Project Location: Federal Way, Washington
Project Number: 22247-003-00

Figure B-7
Sheet 1 of 1

Date Excavated	7/19/2017	Total Depth (ft)	7	Logged By CRG Checked By SWH	Excavator Kelly's Excavating Equipment Mini Trackhoe	Groundwater not observed Caving not observed
Surface Elevation (ft) Vertical Datum	404 NAVD88	Easting (X) Northing (Y)	1277220 114050	Coordinate System Horizontal Datum	WA State Plane North NAD83 (feet)	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
403	1		1		TS	Organic-rich top soil with grass roots			
402	2				ML	Tan/rust-mottled fine sandy silt with fine gravel (stiff, moist) (weathered till)			
401	3								
400	4		2 %F				20	60	
399	5								
398	6								
397	7		3		SM	Gray silty fine to medium sand with fine to coarse gravel (very dense, moist) (till)			

Notes: See Figure B-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth, Vertical approximated based on DEM

Log of Test Pit TP-7N

GeoEngineers

Project: Proposed Greenline Business Park
Project Location: Federal Way, Washington
Project Number: 22247-003-00

Figure B-8
Sheet 1 of 1

Drilled Start 7/24/2017 End 7/24/2017	Total Depth (ft) 21	Logged By CRG Checked By SWH	Driller Holocene Drilling, Inc.	Drilling Method Hollow-stem Auger
Surface Elevation (ft) 446 Vertical Datum NAVD88		Hammer Data Automatic 140 (lbs) / 30 (in) Drop		Drilling Equipment Diedrich D50 Track Rig
Easting (X) 1277390 Northing (Y) 116710		System Datum WA State Plane North NAD83 (feet)		Groundwater Date Measured: Depth to Water (ft): Yes; Elevation (ft):

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
445	0							SM	Mottled brown/gray silty fine to medium sand with gravel (very dense, moist) (till)			
		18	48		1							
440	5							SM	Gray/brown silty fine to medium sand with gravel (very dense, moist to wet) (till)			
			50/6"		2							
435	10											
		6	50/6"		3							
430	15											
		1	50/5"		4							Groundwater observed at 17½ feet at time of exploration
425	20	2	50/6"		5							

Note: See Figure B-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Google Earth, Vertical approximated based on DEM

Date:8/9/17 Path:P:\22\22247003\GINT\22247003300.GPJ DBLibrary/LibraryGEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEIB_GEOTECH_STANDARD_%F

Log of Boring B-1N

GeoEngineers

Project: Proposed Greenline Business Park
Project Location: Federal Way, Washington
Project Number: 22247-003-00

Figure B-9
Sheet 1 of 1

Drilled Start 7/24/2017 End 7/24/2017	Total Depth (ft) 21	Logged By CRG Checked By SWH	Driller Holocene Drilling, Inc.	Drilling Method Hollow-stem Auger
Surface Elevation (ft) 461 Vertical Datum NAVD88		Hammer Data Automatic 140 (lbs) / 30 (in) Drop		Drilling Equipment Diedrich D50 Track Rig
Easting (X) 1277810 Northing (Y) 116700		System Datum WA State Plane North NAD83 (feet)		Groundwater Date Measured: Yes; Depth to Water (ft); Elevation (ft)

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
460	0							SM	Brown silty fine to medium sand with gravel (medium dense, moist) (weathered till)			
		10	28		1 SA					11	44	
455	5							SM	Brown-gray silty fine to medium sand with gravel (very dense, moist to wet) (till)			
			50/3"		2 SA					8	35	
450	10								Becomes gray			
		18	90		3							
445	15											
		0	50/5"		4							Sampler bounced at 17½ feet Groundwater observed at 17½ feet at time of exploration
440	20	12	50/6"		5							

Note: See Figure B-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Google Earth, Vertical approximated based on DEM

Date:8/9/17 Path:P:\22\22247003\GINT\22247003GPJ DBLibrary/LibrarygGEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEIB_GEOTECH_STANDARD_%F

Log of Boring B-2N

GeoEngineers

Project: Proposed Greenline Business Park
Project Location: Federal Way, Washington
Project Number: 22247-003-00

Figure B-10
Sheet 1 of 1

Drilled Start 7/24/2017 End 7/24/2017	Total Depth (ft) 21.25	Logged By CRG Checked By SWH	Driller Holocene Drilling, Inc.	Drilling Method Hollow-stem Auger	
Surface Elevation (ft) 457 Vertical Datum NAVD88		Hammer Data Automatic 140 (lbs) / 30 (in) Drop		Drilling Equipment Diedrich D50 Track Rig	
Easting (X) 1278350 Northing (Y) 116680		System Datum WA State Plane North NAD83 (feet)		Groundwater Date Measured: Yes	Depth to Water (ft)	Elevation (ft)

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0							SM	Brown silty fine to coarse sand with gravel (very loose, dry)			
455		3	1		1 SA					9	32	
	5							SM	Gray silty fine to medium sand with gravel (very dense, moist to wet) (till)			Very rough drilling at 5 feet
450		14	67		2 SA					9	34	
	10											
445		15	86/11"		3							
	15											
440		15	88/11"		4							
	20		93/8"		5							Groundwater observed at 20 feet at time of exploration

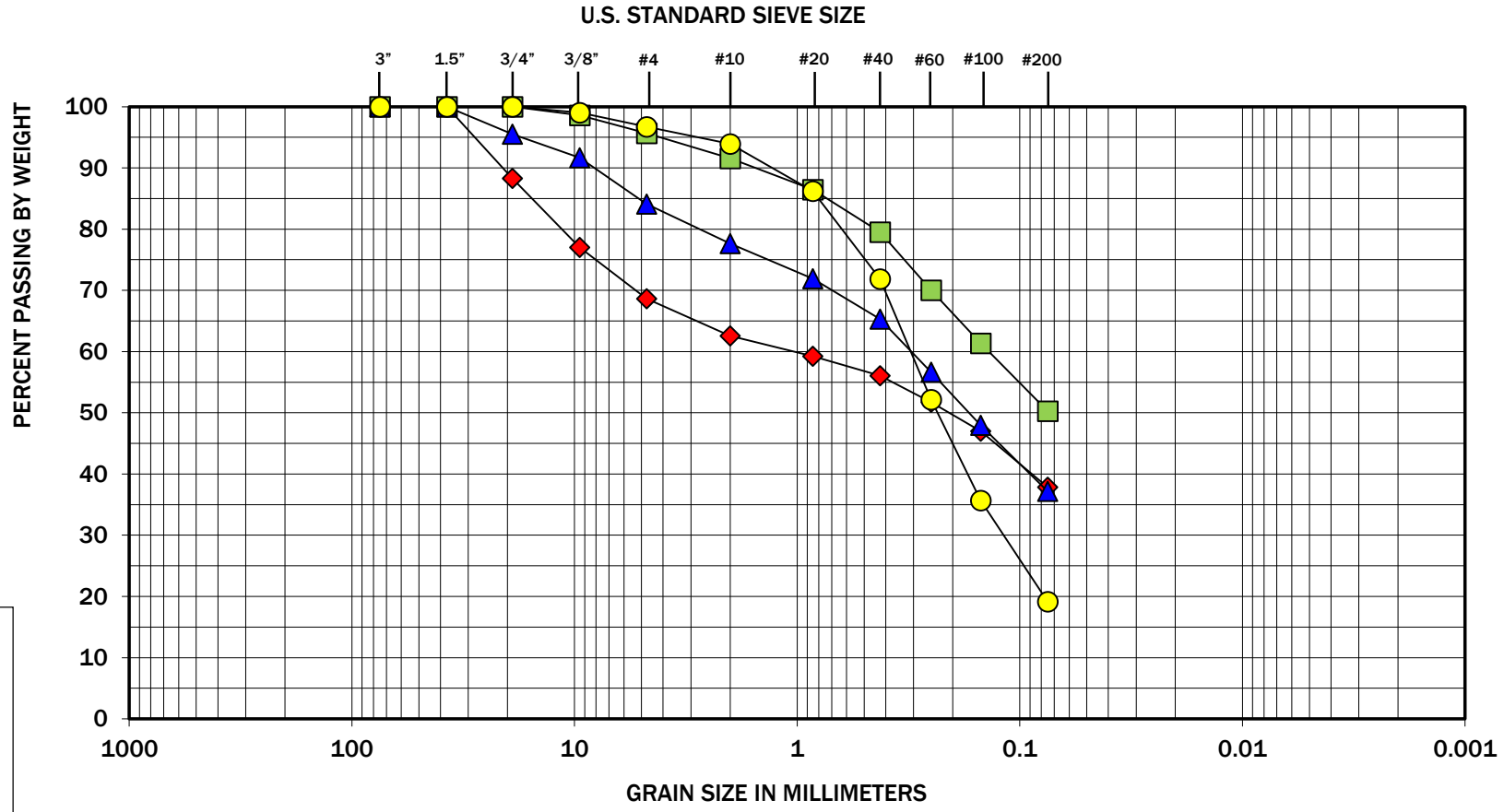
Note: See Figure B-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Google Earth, Vertical approximated based on DEM

Log of Boring B-3N

GeoEngineers

Project: Proposed Greenline Business Park
Project Location: Federal Way, Washington
Project Number: 22247-003-00

Figure B-11
Sheet 1 of 1



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Exploration Number	Depth (feet)	Moisture (%)	Soil Description
◆	TP-1N	4	10	Silty fine to coarse gravel with sand (GM)
■	TP-4N	2.5	19	Sandy silt (ML)
▲	TP-4N	8.5	14	Silty fine to medium sand with gravel (SM)
●	TP-5N	3.5	8	Silty fine to medium sand (SM)

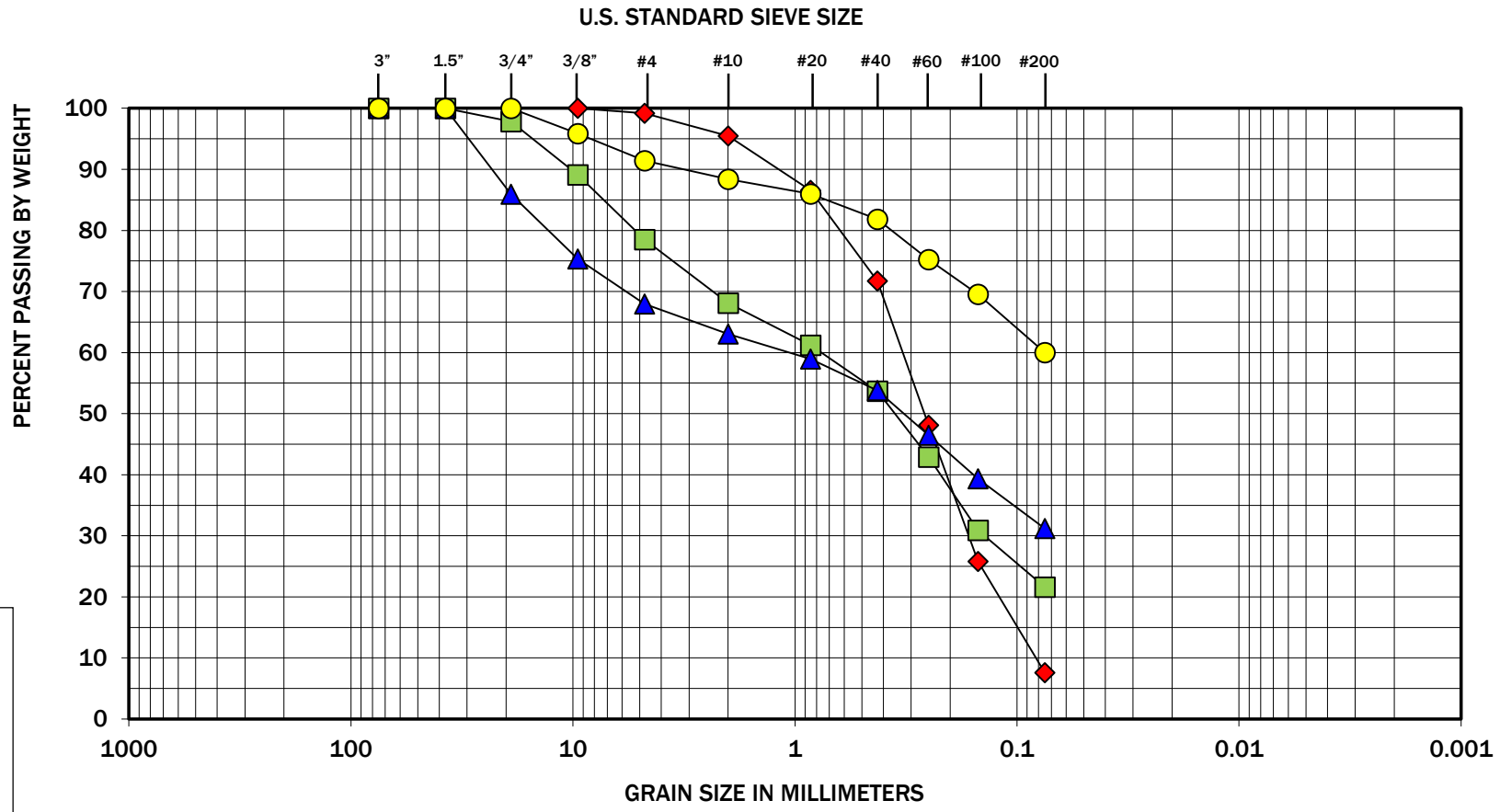
The grain size analysis results were obtained in general accordance with ASTM D 6913.

GeoEngineers

Figure B-12

Proposed Greenline Business Park
Federal Way, Washington

Sieve Analysis Results



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Exploration Number	Depth (feet)	Moisture (%)	Soil Description
◆	TP-5N	6.5	5	Fine to medium sand with silt (SP-SM)
■	TP-6N	2.5	10	Silty fine to coarse sand with gravel (SM)
▲	TP-6N	7.5	7	Silty fine sand with gravel (SM)
●	TP-7N	3.5	20	Sandy silt (ML)

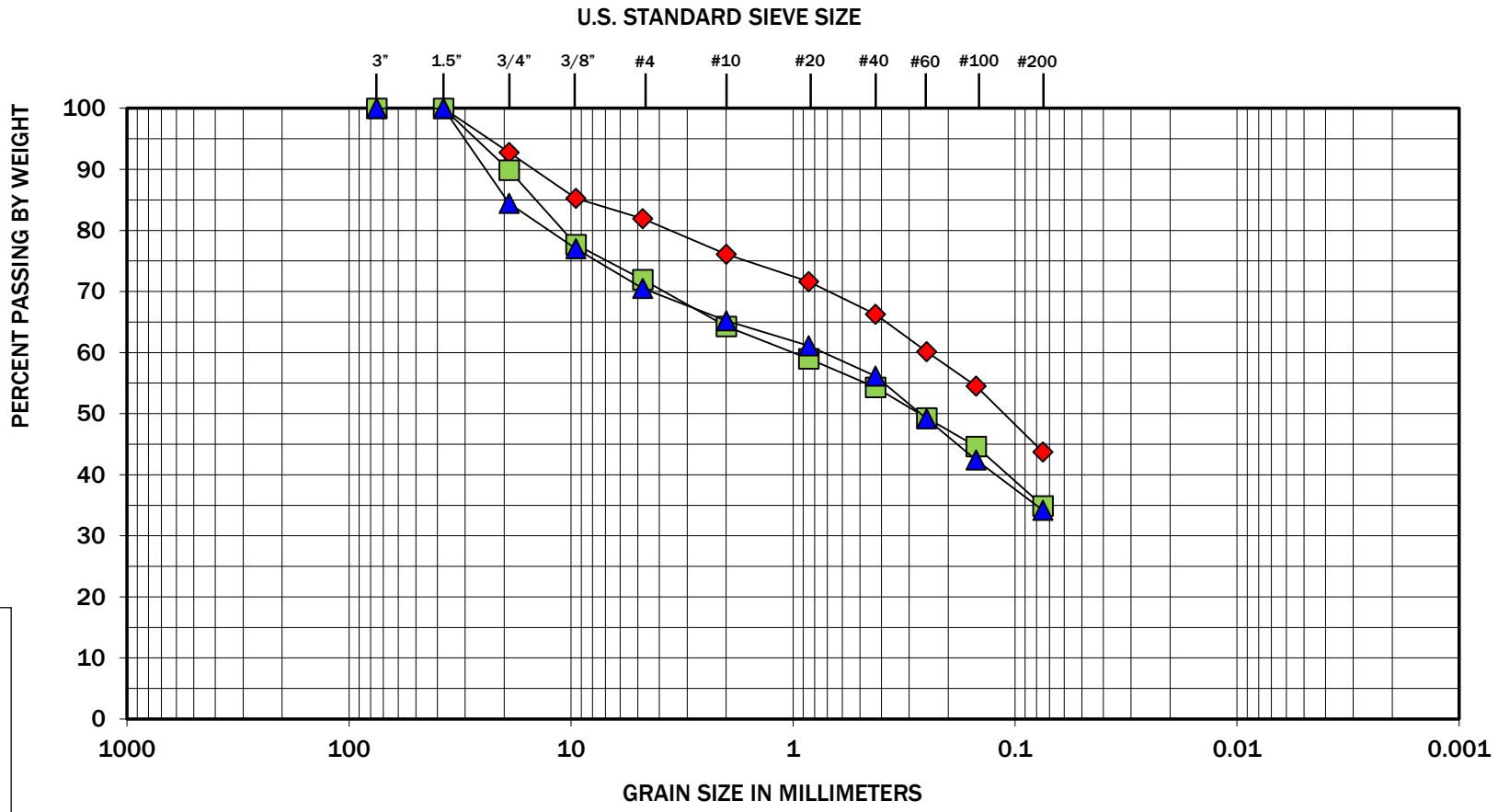
The grain size analysis results were obtained in general accordance with ASTM D 6913.

GeoEngineers

Figure B-13

Proposed Greenline Business Park
Federal Way, Washington

Sieve Analysis Results



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Exploration Number	Depth (feet)	Moisture (%)	Soil Description
◆	B-2N	2.5	11	Silty fine to medium sand with gravel (SM)
■	B-2N	7.5	8	Silty fine to medium sand with gravel (SM)
▲	B-3N	7.5	9	Silty fine sand with gravel (SM)

The grain size analysis results were obtained in general accordance with ASTM D 6913.

GeoEngineers

Figure B-14

Proposed Greenline Business Park
Federal Way, Washington

Sieve Analysis Results

APPENDIX C
Explorations and Laboratory Results – July 2016

Date Excavated	7/6/2016	Total Depth (ft)	7	Logged By / Checked By	YZ / SWH
Excavator	Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe		
Surface Elevation (ft) / Vertical Datum	520 NAVD88	Easting (X) / Northing (Y)	1194490 726100	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	6 inches forest duff			
					ML	Brown silt with sand, occasional gravel and cobbles (medium stiff, moist) (weathered till)			
519	1	X	1 SA				17	60	
518	2								
517	3	X	2		SM	Gray brown silty fine to medium sand with occasional gravel (dense, moist) (glacial till)			
516	4								
515	5								
514	6								
513	7	X	3			Grades with occasional cobbles			
						Test pit completed at 7 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-1

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-2
Sheet 1 of 1

Date Excavated 7/6/2016	Total Depth (ft) 7	Logged By YZ Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum 425 NAVD88		Easting (X) Northing (Y) 1194454 725928		System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	6-inch thick forest duff and 0.5- to 1-inch roots			
424	1				SM	Brown silty fine to medium sand with occasional gravel and cobbles (medium dense, moist) (weathered till)			
423	2								
422	3	X	1						
421	4				SM	Gray silty fine to medium sand with occasional gravel, cobbles and boulders (dense, moist) (glacial till)			
420	5								
419	6								
418	7	X	2						
						Test pit completed at 7 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-2

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-3
Sheet 1 of 1

Date Excavated 7/6/2016	Total Depth (ft) 6	Logged By DM Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum	520 NAVD88	Easting (X) Northing (Y)	1194199 725168	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	6 inches forest duff			
519	1				SM	Light brown silty fine to medium sand with gravel (loose to medium dense, moist) (fill)			
518	2	X	1						
517	3				GM	Brownish gray silty gravel with sand (dense to very dense, moist) (glacial till)			
516	4								
515	5								
514	6	X	2 SA				8	25	

Test pit completed at 6 feet
No groundwater seepage observed
No caving observed

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-3

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-4
Sheet 1 of 1

Date Excavated 7/6/2016	Total Depth (ft) 7	Logged By KM Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum 520 NAVD88		Easting (X) Northing (Y) 1194370 725708		System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
						5 inches thick forest duff, small roots			
519	1				SM	Brown silty fine to medium sand with occasional gravel and cobbles (loose to medium dense, moist) (weathered till)			
518	2	X	1						
517	3								
516	4	X	2		SM	Brown gray silty fine to medium sand with occasional gravel and cobbles (dense, moist) (glacial till)			
515	5								
514	6								
513	7	X	3			Test pit completed at 7 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-4

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-5
Sheet 1 of 1

Date Excavated	7/6/2016	Total Depth (ft)	5.5	Logged By / Checked By	YZ / SWH
Excavator	Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe		
Surface Elevation (ft) / Vertical Datum	510 NAVD88	Easting (X) / Northing (Y)	1194321 725490	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	8 inches forest duff, roots 0.5 to 2 inches thick			
509	1				SM	Grayish brown silty fine to medium sand with occasional gravel (medium dense to dense, moist) (weathered till)			
		X	1						
508	2								
507	3								
					SM	Brownish gray silty fine to medium sand with occasional gravel (dense to very dense, moist) (glacial till)			
506	4								
505	5	X	2						

Test pit completed at 5.5 feet
No groundwater seepage observed
No caving observed

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-5

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-6
Sheet 1 of 1

Date Excavated 7/6/2016	Total Depth (ft) 7	Logged By YZ Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum 530 NAVD88		Easting (X) Northing (Y) 1194610 726105		System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	6 inches forest duff, roots 0.5 to 2 inches thick			
529	1				SM	Brown gray silty fine to medium sand with occasional gravel and cobbles (medium dense, moist) (weathered till)			
528	2								
527	3	X	1		SM	Gray silty fine to medium sand with occasional gravel, cobbles, boulders (very dense, moist) (glacial till)			
526	4								
525	5								
524	6								
523	7	X	2			Test pit completed at 7 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-6

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-7
Sheet 1 of 1

Date Excavated	7/6/2016	Total Depth (ft)	7	Logged By / Checked By	YZ / SWH
Excavator	Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe		
Surface Elevation (ft) / Vertical Datum	450 NAVD88	Easting (X) / Northing (Y)	1194790 725933	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
450	0				DUF	6 inches forest duff			
					SM	Brown silty fine to medium sand with gravel, cobbles and organics (medium dense, moist) (weathered till)			
449	1								
			1						
448	2				SM	Brownish gray silty fine to medium sand with gravel, cobbles and boulder (dense to very dense, moist) (glacial till)			
447	3		2						
446	4								
445	5								
444	6								
			3						Grades to gray and very dense
443	7					Test pit completed at 7 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-7

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-8
Sheet 1 of 1

Date Excavated	7/6/2016	Total Depth (ft)	5.5	Logged By / Checked By	YZ / SWH
Excavator	Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe		
Surface Elevation (ft) Vertical Datum	465 NAVD88	Easting (X) Northing (Y)	1194584 725788	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	Sample: Testing Sample	Sample: Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	6 inches forest duff, roots 0.5 to 3 inches thick			
464	1	X	1		SM	Brown silty fine to medium sand with occasional gravel (medium dense, moist) (weathered till)			
463	2				SM	Grayish brown silty fine to medium sand with occasional gravel (dense to very dense, moist) (glacial till)			
462	3	X	2 SA				11	40	
461	4								
460	5	X	3						

Test pit completed at 5.5 feet
No groundwater seepage observed
No caving observed

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-8

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-9
Sheet 1 of 1

Date Excavated 7/6/2016	Total Depth (ft) 6	Logged By YZ Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum	475 NAVD88	Easting (X) Northing (Y)	1194468 725553	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
474	1		1		DUF	2 inches forest duff, roots			
					SM	Dark brown silty fine to medium sand with occasional gravel (medium dense, moist) (weathered till)			
473	2				SM	Grayish brown silty fine to medium sand with occasional gravel and cobbles (dense, moist) (glacial till)			
472	3		2						
471	4								
470	5					Boulder at 5 feet			
469	6		3			Test pit completed at 6 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-9

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-10
Sheet 1 of 1

Date Excavated 7/6/2016	Total Depth (ft) 6.5	Logged By YZ Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum 500 NAVD88		Easting (X) 1194621 Northing (Y) 725417		System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	6 inches forest duff			
499	1				SM	Brown silty fine to medium sand with occasional gravel and cobbles (medium dense, moist) (weathered till)			
		X	1						
498	2								
497	3				SM	Grayish brown silty fine to medium sand with gravel and cobbles (dense, moist) (glacial till)			
496	4								
495	5								
494	6	X	2						
						Test pit completed at 6.5 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-10

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-11
Sheet 1 of 1

Date Excavated	7/6/2016	Total Depth (ft)	6	Logged By / Checked By	YZ / SWH
Excavator	Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe		
Surface Elevation (ft) / Vertical Datum	450 NAVD88	Easting (X) / Northing (Y)	1195005 726133	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	6 inches forest duff			
449	1				SM	Brown silty fine to medium sand with occasional gravel and cobbles (medium dense, moist) (weathered till)			
448	2	X	1						
447	3								
446	4				SM	Gray silty fine to medium sand with occasional gravel and cobbles (dense, moist) (glacial till)			
445	5								
444	6	X	2			With occasional boulders at 6 feet			
						Test pit completed at 6 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-11

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-12
Sheet 1 of 1

Date Excavated 7/6/2016	Total Depth (ft) 6	Logged By YZ Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum 460 NAVD88		Easting (X) Northing (Y) 1195038 725924		System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	Forest duff, 6 inches, roots up to 4 inches			
					SM	Grayish brown silty fine to medium sand with occasional gravel and cobbles (dense, moist) (weathered till)			
459	1								
458	2								
457	3	X	1						
456	4				SM	Gray silty fine to medium sand with gravel and cobbles (dense, moist) (glacial till)			
455	5								
454	6	X	2						

Test pit completed at 6 feet
No groundwater seepage observed
No caving observed

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-12

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-13
Sheet 1 of 1

Date Excavated 7/6/2016	Total Depth (ft) 7	Logged By YZ Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum 445 NAVD88		Easting (X) Northing (Y) 1194805 725783		System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	6 inches forest duff			
444	1				SM	Grayish brown silty fine to medium sand with occasional gravel and cobbles (dense, moist) (weathered till)			
443	2								
442	3	X	1						
					SM	Gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (glacial till)			
441	4								
440	5								
439	6								
438	7	X	2			Test pit completed at 7 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-13

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-14
Sheet 1 of 1

Date Excavated 7/7/2016	Total Depth (ft) 6	Logged By YZ Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum 450 NAVD88		Easting (X) Northing (Y) 1194778 725568		System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
449	1				DUF	Forest duff 12 inches, roots up to 1 inch			
					SM	Brown silty fine to medium sand with occasional gravel and cobbles (medium dense, moist) (weathered till)			
448	2								
447	3		1						
446	4								
445	5				SM	Brown gray silty sand with occasional gravel (dense, moist) (glacial till)			
444	6		2						
						Test pit completed at 6 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-14

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-15
Sheet 1 of 1

Date Excavated	7/5/2016	Total Depth (ft)	5.5	Logged By / Checked By	YZ / SWH
Excavator	Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe		
Surface Elevation (ft) / Vertical Datum	475 NAVD88	Easting (X) / Northing (Y)	1194837 725415	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
474	0				DUF	Forest duff, 12 inches			
	1				SM	Grayish brown silty fine to medium sand with occasional gravel (loose to medium dense, dry to moist) (fill)			
473	2		1						
472	3								
471	4				SM	Brownish gray silty fine to medium sand with occasional gravel (dense to very dense, moist) (glacial till)			
470	5		2						
						Test pit completed at 5.5 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-15

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-16
Sheet 1 of 1

Date Excavated	7/6/2016	Total Depth (ft)	6	Logged By / Checked By	DM / SWH
Excavator	Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe		
Surface Elevation (ft) / Vertical Datum	500 NAVD88	Easting (X) / Northing (Y)	1194079 724728	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	8 inches forest duff			
499	1				SM	Light brown silty fine to medium sand with occasional gravel (loose to medium dense, moist) (fill)			
			1						
498	2				SM	Grayish brown silty fine to medium sand with occasional gravel (medium dense to dense, moist) (weathered glacial till)			
497	3								
					SM	Brownish gray silty fine to medium sand with occasional gravel (dense to very dense, moist) (glacial till)			
496	4								
495	5								
			2						
494	6					Test pit completed at 6 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-16

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-17
Sheet 1 of 1

Date Excavated	7/6/2016	Total Depth (ft)	8	Logged By / Checked By	DM / SWH
Excavator	Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe		
Surface Elevation (ft) / Vertical Datum	510 NAVD88	Easting (X) / Northing (Y)	1194137 724957	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	10 inches forest duff			
509	1				SM	Light brown silty fine to medium sand with occasional gravel (loose to medium dense, moist) (weathered glacial till)			
508	2	X	1						
507	3					Becomes grayish brown and medium dense to dense			
506	4				SM	Brownish gray silty fine to medium sand with occasional gravel (dense to very dense, moist) (glacial till)			
505	5								
504	6	X	2						
503	7								
502	8					Test pit completed at 8 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-17

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-18
Sheet 1 of 1

Date Excavated 7/5/2016	Total Depth (ft) 4	Logged By DM Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum 490 NAVD88		Easting (X) 1195102 Northing (Y) 725785		System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	6 inches forest duff			
489	1				SM	Grayish brown with slight oxidation staining silty fine to medium sand with occasional gravel (medium dense, moist) (weathered glacial till)			
488	2								
487	3								
					SM	Brownish gray silty fine to medium sand with occasional gravel (dense, moist) (glacial till)			
486	4					Test pit completed at 4 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-18

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-19
Sheet 1 of 1

Date Excavated	7/5/2016	Total Depth (ft)	6	Logged By / Checked By	DM / SWH
Excavator	Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe		
Surface Elevation (ft) / Vertical Datum	485 NAVD88	Easting (X) / Northing (Y)	1195026 725565	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	8 inches forest duff, root depth 12 inches			
484	1				SM	Grayish brown with oxidation staining silty fine to medium sand with occasional gravel (medium dense to dense, moist) (weathered glacial till)			
483	2	X	1						
482	3								
481	4				SM	Brownish gray silty fine to medium sand with occasional gravel (dense to very dense, moist) (glacial till)			
480	5								
479	6	X	2 SA				7	28	

Test pit completed at 6 feet
No groundwater seepage observed
No caving observed

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-19

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-20
Sheet 1 of 1

Date Excavated 7/5/2016	Total Depth (ft) 6	Logged By DM Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum 490 NAVD88		Easting (X) Northing (Y) 1195201 725453		System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	6 inches forest duff			
					SM	Light brown silty fine to medium sand with gravel (loose to medium dense, moist) (fill)			
489	1				DUF	6 inches buried forest duff horizon			
					SM	Grayish brown with oxidation staining silty fine to medium sand with occasional gravel (medium dense to dense, moist) (weathered glacial till)			
488	2	X	1						
487	3								
486	4								
					SM	Brownish gray silty fine to medium sand with occasional gravel (dense to very dense, moist) (glacial till)			
485	5								
484	6	X	2						

Test pit completed at 6 feet
No groundwater seepage observed
No caving observed

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-20

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-21
Sheet 1 of 1

Date Excavated	7/7/2016	Total Depth (ft)	6	Logged By / Checked By	YZ / SWH
Excavator	Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe		
Surface Elevation (ft) / Vertical Datum	575 NAVD88	Easting (X) / Northing (Y)	1195420 726107	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
574	0				DUF	Forest duff 6 inches thick, roots up to 2 inches thick			
					SM	Brown silty fine to medium sand with occasional gravel and cobbles (medium dense, moist) (weathered till)			
573	2								
572	3	X	1						
					SM	Brownish gray silty fine to medium sand with gravel and occasional cobbles (dense, moist) (glacial till)			
571	4								
570	5								
569	6	X	2			Test pit completed at 6 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-21

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-22
Sheet 1 of 1

Date Excavated 7/7/2016	Total Depth (ft) 6	Logged By YZ Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum	490 NAVD88	Easting (X) Northing (Y)	1195610 725893	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	Forest duff 3 inches thick			
					SM	Grayish brown fine to medium sand with occasional gravel and cobbles (medium dense, moist) (weathered till)			
489	1								
488	2								
487	3	X	1						
486	4				SM	Grayish brown silty fine to medium sand with gravel and cobbles (dense, moist) (glacial till)			
485	5								
484	6	X	2						
						Test pit completed at 6 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-22

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-23
Sheet 1 of 1

Date Excavated	7/5/2016	Total Depth (ft)	9	Logged By / Checked By	DM / SWH
Excavator	Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe		
Surface Elevation (ft) / Vertical Datum	480 NAVD88	Easting (X) / Northing (Y)	1195440 725781	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	1 inch forest duff, root depth 20 to 30 inches			
					SM	Light brown silty fine to medium sand with gravel and concrete debris (curb) and 2- to 3-inch tree roots (loose to medium dense, dry to moist) (fill)			
479	1	X	1 SA				9	30	
478	2								
477	3								
476	4								
475	5								
474	6								
473	7								
					SM	Brownish gray silty fine to medium sand with occasional gravel (dense to very dense, moist) (glacial till)			
472	8								
471	9	X	2						

Test pit completed at 9 feet
No groundwater seepage observed
Slight caving observed from 0 to 7 feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-23

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-24
Sheet 1 of 1

Date Excavated 7/5/2016	Total Depth (ft) 6	Logged By DM Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum 510 NAVD88		Easting (X) Northing (Y) 1195317 725576		System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	6 inches forest duff, root depth 24 to 36 inches			
					SM	Light brown silty fine to medium sand with gravel and tree roots ½ to 4 inches diameter (loose to medium dense, moist to dry) (fill)			
509	1								
508	2	X	1						
507	3								
506	4								
					SM	Brownish gray silty fine to medium sand with occasional gravel (dense to very dense, moist) (glacial till)			
505	5								
		X	2						
504	6								
						Test pit completed at 6 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-24

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-25
Sheet 1 of 1

Date Excavated 7/5/2016	Total Depth (ft) 6	Logged By DM Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum 530 NAVD88		Easting (X) 1195392 Northing (Y) 725394		System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	3 inches forest duff, 20 to 30 inches root depth			
529	1				SM	Grayish brown with oxidation staining silty fine to medium sand with occasional gravel and tree roots (medium dense to dense, moist) (weathered glacial till)			
528	2	X	1						
527	3								
526	4				SM	Brownish gray with slight oxidation staining silty fine to medium sand with occasional gravel (dense to very dense, moist) (glacial till)			
525	5								
524	6	X	2						
						Test pit completed at 6 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-25

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-26
Sheet 1 of 1

Date Excavated 7/7/2016	Total Depth (ft) 6.5	Logged By YZ Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum 510 NAVD88		Easting (X) 1195894 Northing (Y) 726028		System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	Forest duff 6 inches thick			
					SM	Gray silty fine to medium sand with occasional gravel and cobbles (medium dense, moist) (weathered till)			
509	1								
508	2								
507	3	X	1						
506	4								
					SM	Brownish gray silty fine to medium sand with occasional gravel, cobbles and boulder (very dense, moist) (glacial till)			
505	5								
504	6	X	2						
						Test pit completed at 6.5 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-26

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-27
Sheet 1 of 1

Date Excavated 7/7/2016	Total Depth (ft) 6	Logged By YZ Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum 550 NAVD88		Easting (X) 1195924 Northing (Y) 725945		System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF	Forest duff 6 inches thick			
549	1				SM	Brown silty fine to medium sand with occasional gravel and cobbles (medium dense, moist) (weathered till)			
			1						
548	2								
547	3				SM	Gray silty fine to coarse gravel with sand, cobbles and boulder (dense, moist) (glacial till)			
546	4								
545	5								
			2 SA				8	21	
544	6					Test pit completed at 6 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-27

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-28
Sheet 1 of 1

Date Excavated	7/7/2016	Total Depth (ft)	6	Logged By / Checked By	YZ / SWH
Excavator	Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe		
Surface Elevation (ft) / Vertical Datum	540 NAVD88	Easting (X) / Northing (Y)	1195740 726047	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
540	0				DUF	Forest duff 12 inches			
539	1				SM	Brown silty fine to medium sand with occasional gravel and cobbles (medium dense, moist) (weathered till)			
538	2								
537	3		1						
536	4				SM	Brownish gray silty fine to medium sand with gravel and cobbles (dense, moist) (glacial till)			
535	5								
534	6		2			Test pit completed at 6 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-28

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-29
Sheet 1 of 1

Date Excavated	7/7/2016	Total Depth (ft)	6	Logged By / Checked By	YZ / SWH
Excavator	Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe		
Surface Elevation (ft) / Vertical Datum	485 NAVD88	Easting (X) / Northing (Y)	1195880 725659	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
484	1		1		DUF	Forest duff 6 inches			
					SM	Brown silty fine to medium sand with occasional gravel and cobbles (medium dense, moist) (weathered till)			
483	2								
482	3		2						
481	4				SM	Gray silty fine to medium sand with gravel, cobbles and boulder (very dense, moist) (glacial till)			
480	5								
479	6		3			Test pit completed at 6 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-29

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-30
Sheet 1 of 1

Date Excavated 7/5/2016	Total Depth (ft) 8	Logged By YZ Checked By SWH	Excavator Kelly's Excavating	Excavation Equipment	Kumatsu WB-140 Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum	515 NAVD88	Easting (X) Northing (Y)	1195682 725570	System Datum	WA State Plane,North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
514	1				DUF	Forest duff 12 inches			
					SM	Light brown silty fine to medium sand with gravel (loose to medium dense, moist) (fill)			
513	2		1						
512	3				SM	Grayish brown silty fine to medium sand with occasional gravel (medium dense to dense, moist) (weathered glacial till)			
511	4								
510	5								
509	6				SM	Gray silty fine to medium sand with occasional gravel and sandy lenses (dense to very dense, moist) (glacial till)			
508	7								
507	8		2 SA				10	34	

Test pit completed at 8 feet
No groundwater seepage observed
No caving observed

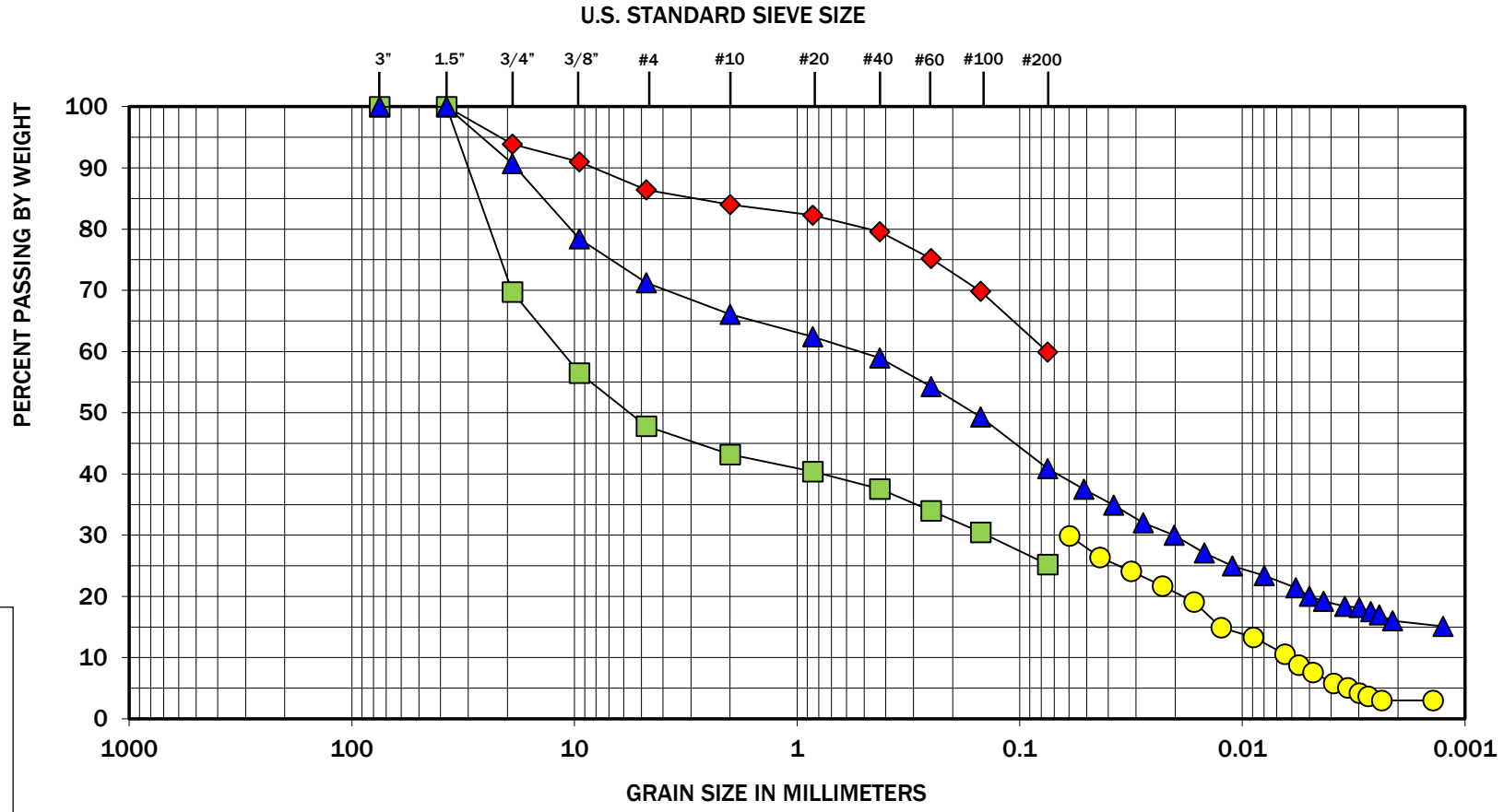
Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-30

GeoEngineers

Project: KG Investment, Building "A" Site
Project Location: Federal Way, Washington
Project Number: 9745-002-00

Figure A-31
Sheet 1 of 1



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Exploration Number	Depth (feet)	Moisture (%)	Soil Description
◆	TP-1	3.5	17.1	Sandy silt (ML)
■	TP-3	5.5	8.0	Silty gravel with sand (GM)
▲	TP-8	3.5	10.9	Silty sand with gravel (SM)
●	TP-23	1	8.8	Silty sand with gravel (SM)

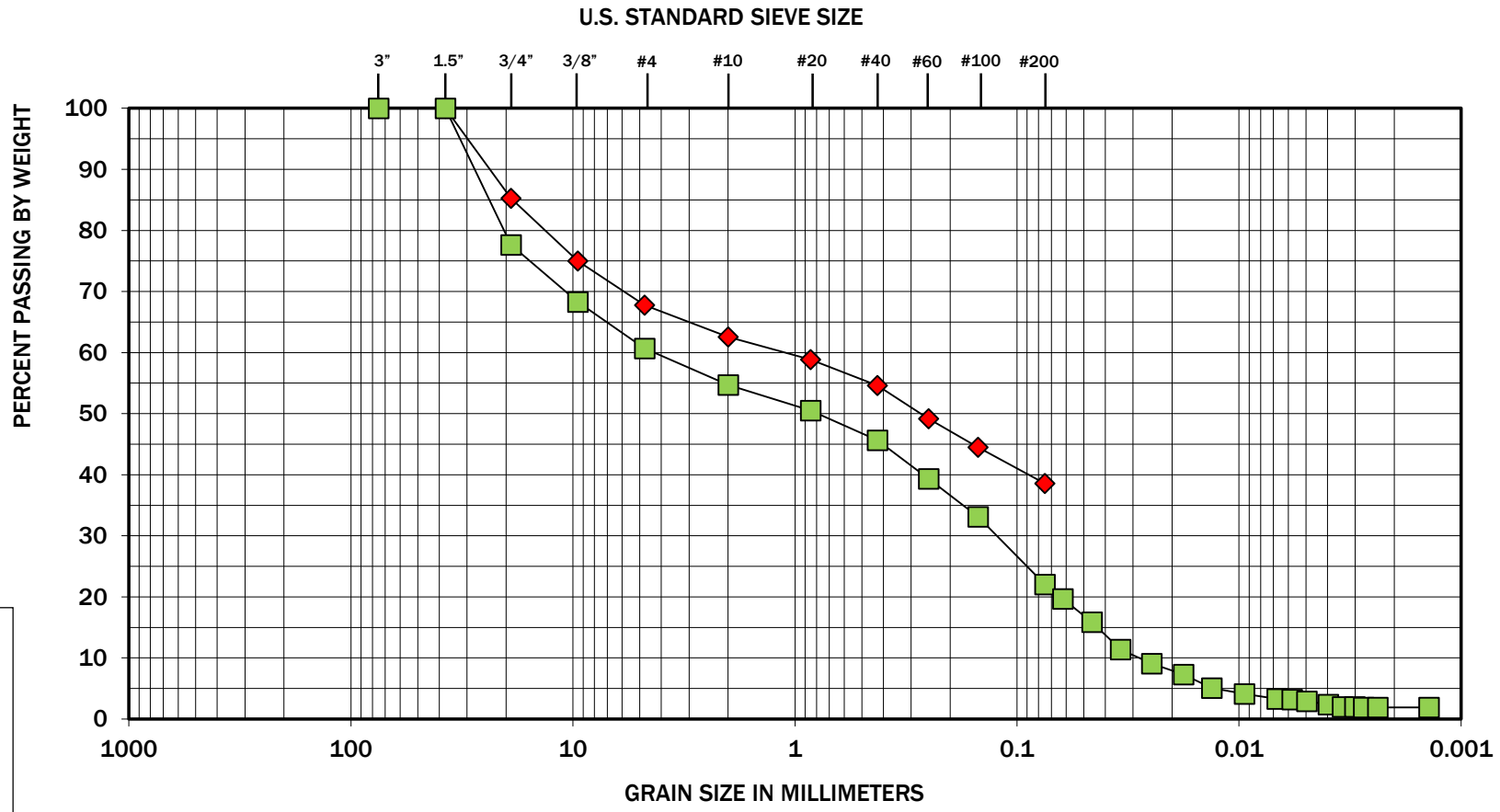
The grain size analysis results were obtained in general accordance with ASTM D 422.

GeoEngineers

Figure A-32

KG Investment, Building "A" Site
Federal Way, Washington

Sieve-Hydrometer Analysis Results



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Exploration Number	Depth (feet)	Moisture (%)	Soil Description
◆	TP-23	1	8.8	Silty gravel with sand (GM)
■	TP-27	2	8.2	Silty gravel with sand (GM)

The grain size analysis results were obtained in general accordance with ASTM D 6913.

GeoEngineers

Figure A-33

KG Investment, Building "A" Site
Federal Way, Washington

Sieve-Hydrometer Analysis Results

APPENDIX D
Explorations and Laboratory Results – August 2016

Date Excavated 8/16/2016	Total Depth (ft) 5	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1194210 Northing (Y) 724630		Coordinate System WA State Plane,South Horizontal Datum NAD83	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF		Approximately 8 inches forest duff; 14-inch root depth			Probe depth: 12 inches
2629	1				ML		Grayish brown oxidation staining sandy silt with gravel and cobbles (stiff to very stiff, moist) (weathered till)			
2628	2	X	1 SA					12	50	
2627	3									
2626	4				SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			Probe depth: less than 1 inch
2625	5	X	2							
							Test pit completed at 5 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

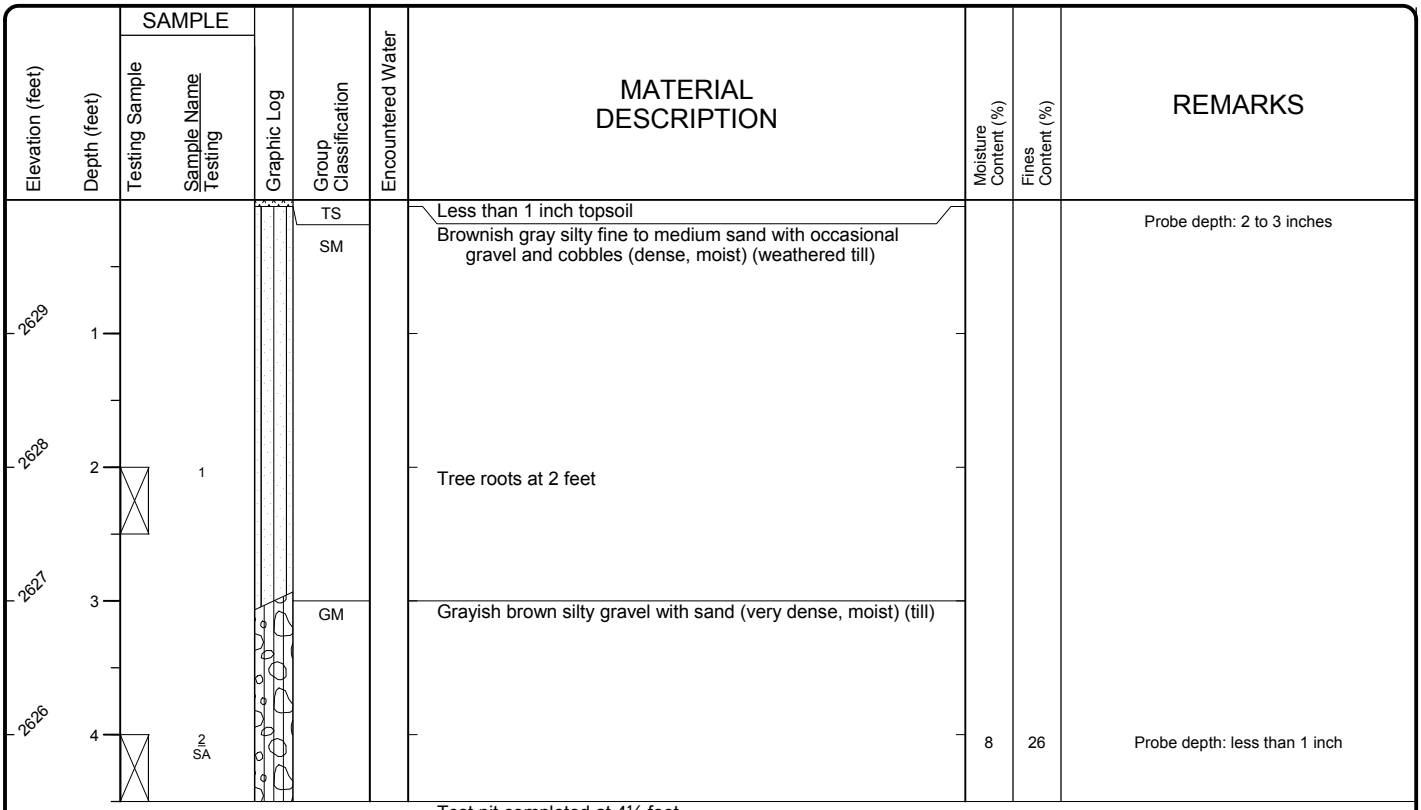
Log of Test Pit TP-1

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-2
Sheet 1 of 1

Date Excavated 8/15/2016	Total Depth (ft) 4.5	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe
Surface Elevation (ft) Vertical Datum 2630 NAVD88		Easting (X) Northing (Y) 1194330 724520		Coordinate System Horizontal Datum	WA State Plane,South NAD83



Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-2

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-3
Sheet 1 of 1

Date Excavated 8/16/2016	Total Depth (ft) 5	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1194460 Northing (Y) 724590		Coordinate System WA State Plane,South Horizontal Datum NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF		Approximately 3 inches forest duff; 8-inch root depth			Probe depth: 3 to 4 inches
					SM		Brown silty fine to medium sand with occasional gravel (medium dense, moist) (weathered till)			
2629	1									
2628	2	X	1							
2627	3				SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
2626	4	X	2							Probe depth: less than 1 inch
2625	5						Test pit completed at 5 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-3

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-4
Sheet 1 of 1

Date Excavated	8/16/2016	Total Depth (ft)	4.5	Logged By / Checked By	DTM / SWH	Excavator	Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe
Surface Elevation (ft) / Vertical Datum	2630 NAVD88	Easting (X) / Northing (Y)	1194680 724490	Coordinate System / Horizontal Datum	WA State Plane,South NAD83				

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF		Approximately 6 inches forest duff; 12-inch root depth			
2629	1				SM		Brown silty fine to medium sand with gravel (medium dense, moist) (weathered till)			
			1 SA					7	27	
2628	2									
					SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
2627	3									
2626	4		2							
							Test pit completed at 4½ feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-4

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-5
Sheet 1 of 1

Date Excavated 8/16/2016	Total Depth (ft) 5	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1194780 Northing (Y) 724410		Coordinate System WA State Plane,South Horizontal Datum NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF		Approximately 6 inches forest duff; 12-inch root depth			Probe depth: 10 to 14 inches
2629	1				SM		Brown silty fine to medium sand with occasional gravel (loose to medium dense, dry to moist) (fill?)			
2628	2	X	1							
2627	3									
					SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
2626	4									Probe depth: less than 1 inch
2625	5	X	2							

Test pit completed at 5 feet
No groundwater seepage observed
Minor caving observed from 2 to 3 feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-5

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-6
Sheet 1 of 1

Date Excavated 8/15/2016	Total Depth (ft) 4	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1194950 Northing (Y) 724290		Coordinate System WA State Plane,South Horizontal Datum NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF		Approximately 3 inches forest duff; 8-inch root depth			Probe depth: 3 to 6 inches
					SM		Grayish brown silty fine to medium sand with occasional gravel and cobbles (medium dense, moist) (fill?)			
2629	1		1							
2628	2				GM		Brownish gray silty fine to coarse gravel with sand and cobbles (very dense, moist) (till)			
2627	3									
			2 SA					7	30	Probe depth: less than 1 inch
2626	4						Test pit completed at 4 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-6

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-7
Sheet 1 of 1

Date Excavated 8/15/2016	Total Depth (ft) 6.5	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1195110 Northing (Y) 724310		Coordinate System WA State Plane,South Horizontal Datum NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					SM		Grayish brown silty fine to medium sand with gravel (medium dense, moist) (fill?)			Probe depth: 2 to 4 inches
2629	1									
		X	1							
2628	2									
2627	3				SM		Dark brown silty sand and organic matter (medium dense, moist) (fill?)			
2626	4	X	2 -200; OC					21	39	Probe depth: 6 to 8 inches 5% organics
2625	5									
					SM		Gray silty fine sand with occasional gravel and cobbles (very dense, moist) (till)			
2624	6	X	3							
							Test pit completed at 6½ feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-7

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-8
Sheet 1 of 1

Date Excavated 8/15/2016	Total Depth (ft) 4	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1195160 Northing (Y) 724200		Coordinate System WA State Plane,South Horizontal Datum NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF		Approximately 3 inches forest duff			Probe depth: 3 inches
					SM		Brownish gray with light oxidation staining silty fine to medium sand with occasional gravel and cobbles (dense, moist) (weathered till)			
2629	1		1							
2628	2				SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
2627	3									
			2							Probe depth: less than 1 inch
2626	4						Test pit completed at 4 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-8

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-9
Sheet 1 of 1

Date Excavated	8/16/2016	Total Depth (ft)	4	Logged By / Checked By	DTM / SWH	Excavator	Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe
Surface Elevation (ft) / Vertical Datum	2630 NAVD88	Easting (X) / Northing (Y)	1193990 724570	Coordinate System / Horizontal Datum	WA State Plane,South NAD83				

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					TS		Approximately 2 inches topsoil; 4-inch root depth			Probe depth: 1 to 3 inches
2629	1				SM		Grayish brown silty fine to medium sand with occasional gravel and cobbles (dense, moist) (weathered till)			
2628	2	X	1							
2627	3				SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
2626	4	X	2							Probe depth: 1 inch
							Test pit completed at 4 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-9

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-10
Sheet 1 of 1

Date Excavated	8/15/2016	Total Depth (ft)	6	Logged By / Checked By	DTM / SWH	Excavator	Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe
Surface Elevation (ft) / Vertical Datum	2630 NAVD88	Easting (X) / Northing (Y)	1194390 724360	Coordinate System / Horizontal Datum	WA State Plane,South NAD83				

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
2629	1				DUF		Approximately 6 inches forest duff; 16- to 20-inch root depth			Probe depth: 12 inches
					SM		Brown silty fine to medium sand with occasional gravel (medium dense, moist) (fill?)			
2628	2	X	1 SA					13	47	
2627	3				SM		Brownish gray silty fine to medium sand with occasional gravel, cobbles and oxidation staining (dense, moist) (weathered till)			
2626	4	X	2							Probe depth: less than 1 inch
2625	5				SM		Brownish gray silty fine to medium sand with gravel and cobbles (very dense, moist) (till)			
2624	6	X	3							
							Test pit completed at 6 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-10

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-11
Sheet 1 of 1

Date Excavated 8/15/2016	Total Depth (ft) 4.5	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1194530 Northing (Y) 724290		Coordinate System WA State Plane,South Horizontal Datum NAD83	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF		Approximately 9 inches forest duff; 16-inch root depth			Probe depth: 10 inches
2629	1				SM		Grayish brown silty fine to medium sand with occasional gravel and cobbles (dense, moist) (weathered till)			
		X	1							
2628	2									
2627	3									
					SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
2626	4	X	2 SA					10	39	Probe depth: less than 1 inch

Test pit completed at 4½ feet
No groundwater seepage observed
No caving observed

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-11

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-12
Sheet 1 of 1

Date Excavated 8/15/2016	Total Depth (ft) 4	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1194770 Northing (Y) 724220		Coordinate System WA State Plane,South Horizontal Datum NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF		Approximately 4 inches forest duff; 15- to 24-inch root depth			Probe depth: 2 to 12 inches
					SM		Brown silty fine to medium sand with gravel and roots (medium dense, moist) (fill?)			
2629	1									
			1							
2628	2									
					SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
2627	3									
			2							Probe depth: less than ½ inch
2626	4						Test pit completed at 4 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-12

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-13
Sheet 1 of 1

Date Excavated 8/15/2016	Total Depth (ft) 4.5	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1195010 Northing (Y) 724100		Coordinate System WA State Plane,South Horizontal Datum NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF		Approximately 12 inches forest duff; 16-inch root depth			Probe depth: 10 to 16 inches
2629	1				SM		Grayish brown silty fine to medium sand with occasional gravel and cobbles (dense, moist) (weathered till)			
2628	2									
		X	1 SA					6	27	
2627	3				SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
2626	4	X	2							Probe depth: less than 1 inch

Test pit completed at 4½ feet
No groundwater seepage observed
No caving observed

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-13

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-14
Sheet 1 of 1

Date Excavated	8/15/2016	Total Depth (ft)	4	Logged By / Checked By	DTM / SWH	Excavator	Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe
Surface Elevation (ft) / Vertical Datum	2630 NAVD88	Easting (X) / Northing (Y)	1194270 724290	Coordinate System / Horizontal Datum	WA State Plane,South NAD83				

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF		Approximately 6 inches forest duff; 16-inch root depth			Probe depth: 4 to 6 inches
2629	1				SM		Grayish brown silty fine to medium sand with occasional gravel and cobbles (dense, moist) (weathered till)			
2628	2	X	1							
2627	3				SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
2626	4	X	2							Probe depth: 1 inch

Test pit completed at 4 feet
No groundwater seepage observed
No caving observed

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-14

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-15
Sheet 1 of 1

Date Excavated	8/15/2016	Total Depth (ft)	5	Logged By / Checked By	DTM / SWH
Excavator	Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe		
Surface Elevation (ft) / Vertical Datum	2630 NAVD88	Easting (X) / Northing (Y)	1194550 724180	Coordinate System / Horizontal Datum	WA State Plane,South NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF		Approximately 6 inches forest duff; 3-inch root depth			Probe depth: 12 inches
					SM		Brown silty fine to medium sand with occasional gravel (medium dense, moist) (fill?)			
2629	1	X	1							
2628	2									
					SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
2627	3									
2626	4									Probe depth: less than 1 inch
2625	5	X	2				Test pit completed at 5 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-15

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-16
Sheet 1 of 1

Date Excavated	8/16/2016	Total Depth (ft)	4	Logged By / Checked By	DTM / SWH	Excavator	Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe
Surface Elevation (ft) / Vertical Datum	2630 NAVD88			Easting (X) / Northing (Y)	1193990 724160			Coordinate System / Horizontal Datum	WA State Plane,South NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
2629	1				GM		Brownish gray with oxidation staining silty fine to coarse gravel with sand and occasional cobbles (dense, moist) (weathered till); 4-inch root depth			Probe depth: 2 to 3 inches
2628	2	X	1 SA					7	34	
2627	3				SM		Gray silty fine to medium sand with occasional gravel and cobbles (dense, moist) (till)			
2626	4	X	2							Probe depth: less than 1 inch

Test pit completed at 4 feet
No groundwater seepage observed
No caving observed

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-16

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-17
Sheet 1 of 1

Date Excavated 8/16/2016	Total Depth (ft) 7	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1194370 Northing (Y) 724130		Coordinate System WA State Plane,South Horizontal Datum NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					ML		Grayish brown with oxidation staining sandy silt with occasional gravel and cobbles (stiff, moist) (weathered till); 4-inch root depth			Probe depth: 1 to 2 inches
2629	1									
2628	2	X	1 -200					14	55	
2627	3									
2626	4									Probe depth: 1 inch
2625	5									
2624	6				SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist to wet) (till)			
2623	7	X	2							

Test pit completed at 7 feet
No groundwater seepage observed
No caving observed

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-17

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-18
Sheet 1 of 1

Date Excavated	8/15/2016	Total Depth (ft)	4	Logged By / Checked By	DTM / SWH	Excavator	Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe
Surface Elevation (ft) / Vertical Datum	2630 NAVD88	Easting (X) / Northing (Y)	1194680 724000	Coordinate System / Horizontal Datum	WA State Plane,South NAD83				

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF		Approximately 3 inches forest duff; 12-inch root depth			Probe depth: 3 inches
2629	1				SM		Grayish brown silty fine to medium sand with occasional gravel and cobbles (dense, moist) (weathered till)			
2628	2	X	1							
					SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
2627	3									
2626	4	X	2							Probe depth: 1 inch

Test pit completed at 4 feet
No groundwater seepage observed
No caving observed

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-18

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-19
Sheet 1 of 1

Date Excavated 8/16/2016	Total Depth (ft) 4	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1194830 Northing (Y) 723920		Coordinate System WA State Plane,South Horizontal Datum NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF		Approximately 4 inches forest duff; 8-inch root depth			Probe depth: 6 inches
2629	1				SM		Grayish brown silty fine to medium sand with occasional gravel and cobbles (dense, moist) (weathered till)			
		X	1							
2628	2									
2627	3				SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
		X	2							Probe depth: less than 1 inch
2626	4						Test pit completed at 4 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-19

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-20
Sheet 1 of 1

Date Excavated	8/16/2016	Total Depth (ft)	6	Logged By / Checked By	DTM / SWH	Excavator	Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe
Surface Elevation (ft) / Vertical Datum	2630 NAVD88	Easting (X) / Northing (Y)	1194090 723960	Coordinate System / Horizontal Datum	WA State Plane,South NAD83				

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
2629	1				SM		Brown silty fine to medium sand with gravel and cobbles (medium dense, moist) (fill); 3- to 6-inch root depth			Probe depth: 3 to 6 inches
		X	1							
2628	2									
2627	3				ML		Grayish brown with oxidation staining sandy silt with occasional gravel and cobbles (stiff, moist) (weathered till)			
		X	2 SA					19	51	Probe depth: less than 1 inch
2626	4									
2625	5				SM		Brownish gray silty fine to medium sand with occasional gravel (very dense, moist) (till)			
		X	3							
2624	6						Test pit completed at 6 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-20

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-21
Sheet 1 of 1

Date Excavated	8/16/2016	Total Depth (ft)	4	Logged By / Checked By	DTM / SWH	Excavator	Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe
Surface Elevation (ft) / Vertical Datum	2630 NAVD88	Easting (X) / Northing (Y)	1194490 723870	Coordinate System / Horizontal Datum	WA State Plane,South NAD83				

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
2629	1				DUF		Approximately 6 inches forest duff; 12-inch root depth			Probe depth: 8 to 12 inches
					SM		Grayish brown silty fine to medium sand with occasional gravel and cobbles (dense, moist) (weathered till)			
2628	2		1							
2627	3				SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
2626	4		2							Probe depth: less than 1 inch

Test pit completed at 4 feet
No groundwater seepage observed
No caving observed

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-21

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-22
Sheet 1 of 1

Date Excavated 8/16/2016	Total Depth (ft) 4	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1193930 Northing (Y) 723900		Coordinate System WA State Plane,South Horizontal Datum NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
2629	1		1		SM		Brown silty fine to medium sand with occasional gravel and cobbles (dense, moist) (weathered till)			Probe depth: 1 to 3 inches
					SM		Gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
2628	2									
2627	3									
2626	4		2							Probe depth: less than 1 inch

Test pit completed at 4 feet
No groundwater seepage observed
No caving observed

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-22

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-23
Sheet 1 of 1

Date Excavated 8/16/2016	Total Depth (ft) 6	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1194290 Northing (Y) 723800		Coordinate System WA State Plane,South Horizontal Datum NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
2629	1				SM		Grayish brown silty fine to medium sand with occasional gravel and cobbles (dense, moist) (weathered till); 4-inch root depth			Probe depth: 3 inches
2628	2	X	1							
2627	3									
2626	4	X	2							Probe depth: less than 1 inch
2625	5				SM		Brownish gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
2624	6	X	3				Test pit completed at 6 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-23

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-24
Sheet 1 of 1

Date Excavated 8/17/2016	Total Depth (ft) 4	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1194600 Northing (Y) 723700		Coordinate System WA State Plane,South Horizontal Datum NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF		Approximately 6 inches forest duff; 48-inch root depth			Probe depth: 12 inches
2629	1				SM		Brown silty fine to coarse sand with gravel and cobbles (loose to medium dense, moist) (fill?)			
			1							
2628	2									
2627	3				SM		Gray silty fine to medium sand with gravel and occasional cobbles (very dense, moist) (till)			
			2							Probe depth: less than 1 inch
2626	4						Test pit completed at 4 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-24

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-25
Sheet 1 of 1

Date Excavated 8/17/2016	Total Depth (ft) 4	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1194770 Northing (Y) 723630		Coordinate System WA State Plane,South Horizontal Datum NAD83	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					DUF		Approximately 6 inches forest duff; 24-inch root depth			Probe depth: 10 to 14 inches
2629	1				SM		Brown silty fine to medium sand with gravel and occasional cobbles (dense, moist) (fill)			
		X	1							
2628	2				SM		Brownish gray silty fine to medium sand with gravel and cobbles (very dense, moist) (till)			
2627	3									
		X	2 -200					7	37	Probe depth: less than 1 inch
2626	4						Test pit completed at 4 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-25

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-26
Sheet 1 of 1

Date Excavated	8/17/2016	Total Depth (ft)	4	Logged By / Checked By	DTM / SWH	Excavator	Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe
Surface Elevation (ft) / Vertical Datum	2630 NAVD88	Easting (X) / Northing (Y)	1193880 723770	Coordinate System / Horizontal Datum	WA State Plane,South NAD83				

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
2629	1		1		SM		Grayish brown silty fine to medium sand with gravel and cobbles (dense, moist) (weathered till)			Probe depth: 2 to 3 inches
2628	2				SM		Brownish gray silty fine to medium sand with gravel and cobbles (very dense, moist) (till)			
2627	3									
2626	4		2				Test pit completed at 4 feet No groundwater seepage observed No caving observed			Probe depth: less than 1 inch

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-26

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-27
Sheet 1 of 1

Date Excavated 8/17/2016	Total Depth (ft) 9	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1194120 Northing (Y) 723710		Coordinate System WA State Plane,South Horizontal Datum NAD83	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
2629	1				SM		Grayish brown silty fine to medium sand with gravel, cobbles and occasional debris (medium dense to dense, moist) (fill)			Probe depth: 3 to 4 inches
		X	1							
2628	2									
2627	3									
		X	2		SM		Brown silty fine to medium sand with tree roots and occasional gravel (medium dense, moist) (fill)			Probe depth: 2 to 3 inches
2626	4									
					ML		Brownish gray oxidation staining silt with sand and occasional gravel (hard, moist) (weathered till)			
2625	5									
		X	3 -200					26	94	LL=29; PI=4
2624	6				SM		Brownish gray with oxidation staining silty sand with gravel and cobbles (very dense, moist) (till)			
2623	7									
2622	8				SM		Grayish brown silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
		X	4							
2621	9						Test pit completed at 9 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-27

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-28
Sheet 1 of 1

Date Excavated 8/17/2016	Total Depth (ft) 4	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1194440 Northing (Y) 723610		Coordinate System WA State Plane,South Horizontal Datum NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					TS		Approximately 6 inches topsoil with occasional debris; 6-inch root depth			Probe depth: 7 inches
2629	1				SM		Grayish brown with oxidation staining silty fine to medium sand with occasional gravel (dense, moist) (weathered till)			
2628	2	X	1							
2627	3				SM		Brownish gray silty fine to medium sand with occasional gravel (very dense, moist) (till)			
2626	4	X	2							Probe depth: less than 1 inch
							Test pit completed at 4 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-28

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-29
Sheet 1 of 1

Date Excavated 8/17/2016	Total Depth (ft) 4	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1194610 Northing (Y) 723540		Coordinate System WA State Plane,South Horizontal Datum NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
2629	1				SM		Brown silty fine to medium sand with occasional gravel and cobbles (medium dense, moist) (fill); 10-inch root depth			Probe depth: 6 inches
2628	2	X	1							
2627	3				SM		Gray silty fine to medium sand with occasional gravel and cobbles (very dense, moist) (till)			
2626	4	X	2							Probe depth: less than 1 inch
							Test pit completed at 4 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-29

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-30
Sheet 1 of 1

Date Excavated 8/17/2016	Total Depth (ft) 4	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1193820 Northing (Y) 723520		Coordinate System WA State Plane,South Horizontal Datum NAD83

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					SM		Grayish brown silty fine to medium sand with gravel and cobbles (dense, moist) (weathered till)			Probe depth: 2 to 4 inches
2629	1		1							
					SM		Brownish gray silty fine to medium sand with gravel and cobbles (very dense, moist) (till)			
2628	2									
2627	3									
			2 SA					8	45	Probe depth: less than 1 inch
2626	4						Test pit completed at 4 feet No groundwater seepage observed No caving observed			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-30

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-31
Sheet 1 of 1

Date Excavated 8/17/2016	Total Depth (ft) 7	Logged By DTM Checked By SWH	Excavator Kelly's Excavating, Inc.	Excavation Equipment	Rubber Tired Backhoe
Surface Elevation (ft) 2630 Vertical Datum NAVD88		Easting (X) 1194200 Northing (Y) 723430		Coordinate System WA State Plane,South Horizontal Datum NAD83	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
2629	1				SM		Grayish brown silty fine to medium sand with gravel, cobbles and occasional debris (medium dense to dense, moist) (fill)			Probe depth: 3 inches
		X	1							
2628	2									
					SM		Dark brown silty fine to medium sand with trace roots and occasional gravel (medium dense to dense, moist) (fill)			
2627	3									
		X	2							Probe depth: 1 to 4 inches
2626	4									
					SM		Grayish brown with oxidation staining silty fine to medium sand with gravel and cobbles (dense, moist) (weathered till)			
2625	5									
					SM		Gray silty fine to medium sand with gravel and occasional cobbles (very dense, moist) (till)			
2624	6									
		X	3							
2623	7						Test pit completed at 7 feet No groundwater seepage observed No caving observed			

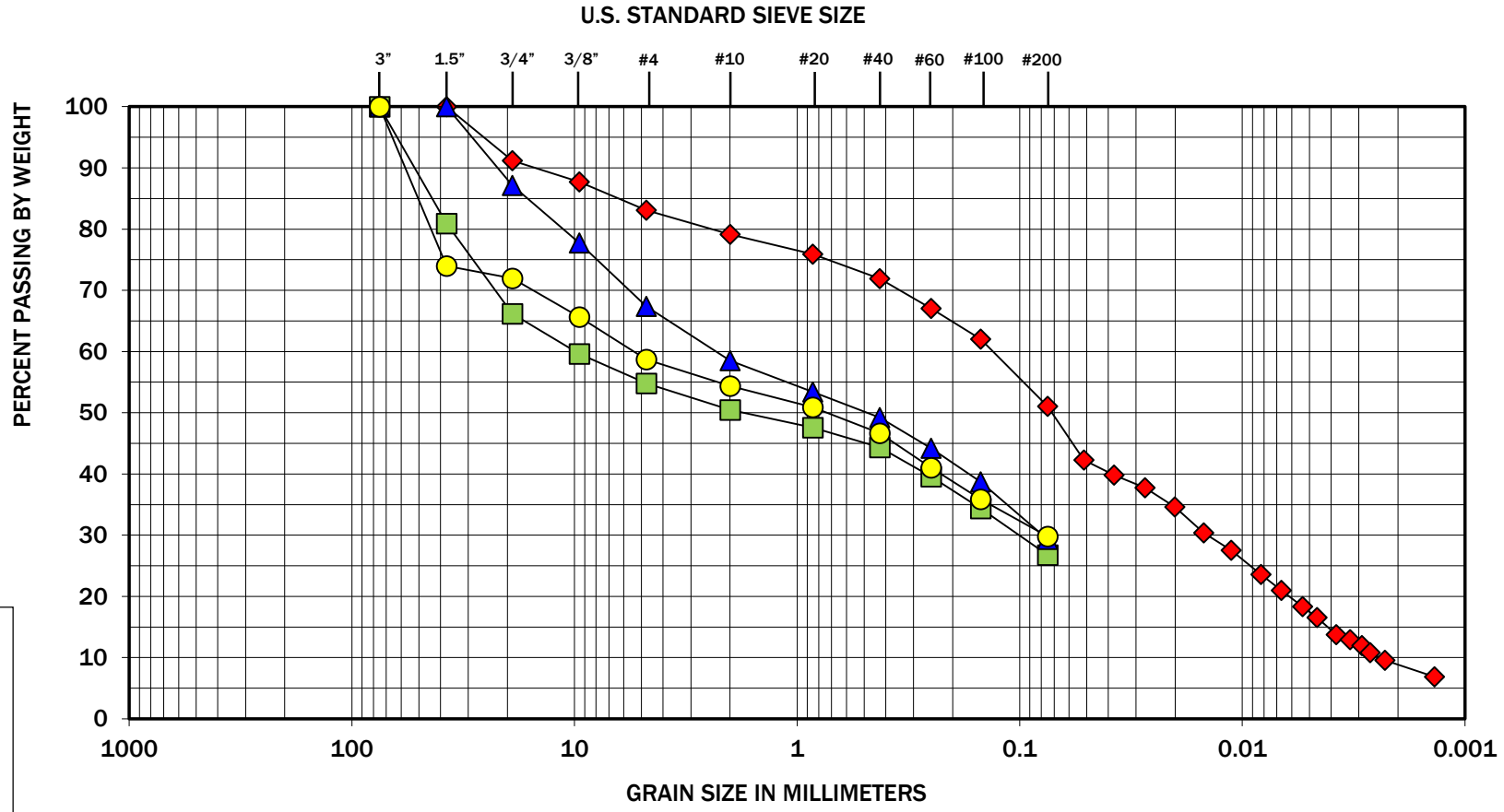
Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-31

GeoEngineers

Project: KG Investment Parcel, South Property
Project Location: Federal Way, Washington
Project Number: 9745-003-00

Figure A-32
Sheet 1 of 1



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Test Pit Number	Depth (feet)	Moisture (%)	Soil Description
◆	TP-1	2	12	Sandy silt with gravel (ML)
■	TP-2	4	8	Silty gravel with sand (GM)
▲	TP-4	1.5	7	Silty sand with gravel (SM)
●	TP-6	3.5	7	Silty gravel with sand (GM)

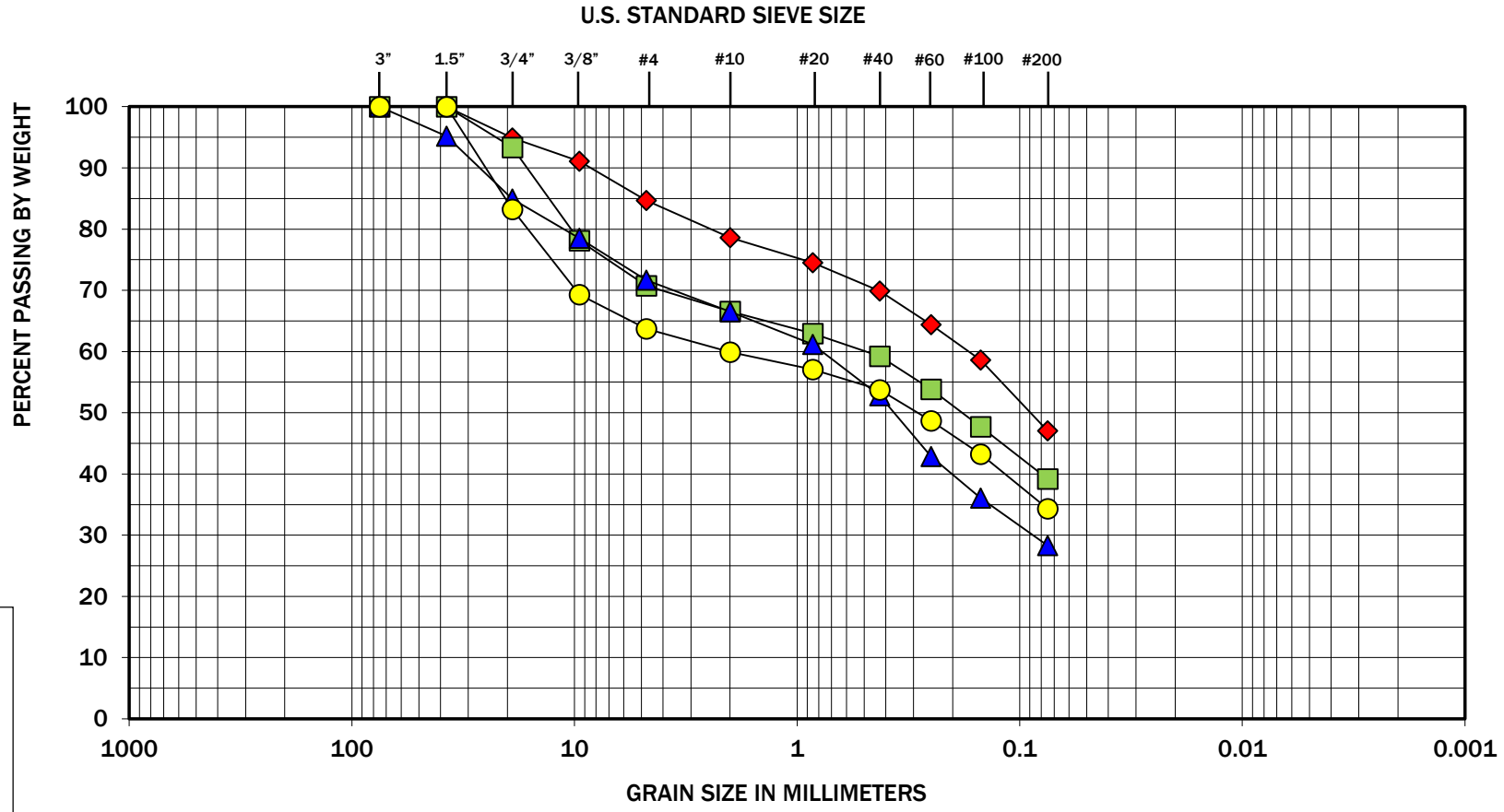
The grain size analysis results were obtained in general accordance with ASTM D 6913.

GeoEngineers

Figure A-33

KG Investment Parcel, South Property
Federal Way, Washington

Sieve and Hydrometer Analysis Results



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Test Pit Number	Depth (feet)	Moisture (%)	Soil Description
◆	TP-10	1.5	13	Silty sand with gravel (SM)
■	TP-11	4	10	Silty sand with gravel (SM)
▲	TP-13	2.5	6	Silty sand with gravel (SM)
●	TP-16	1.5	7	Silty gravel with sand (GM)

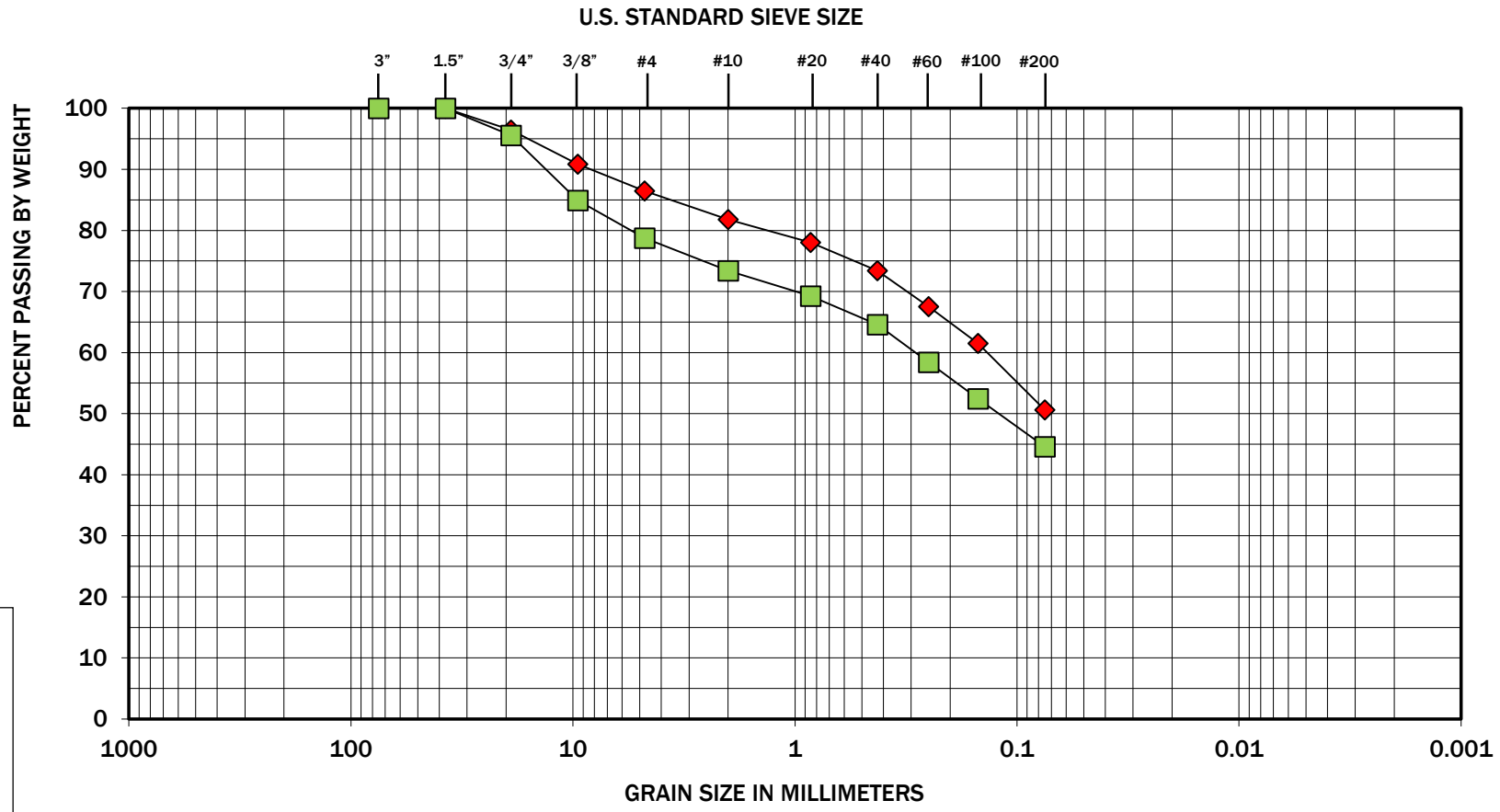
The grain size analysis results were obtained in general accordance with ASTM D 6913.

GeoEngineers

Figure A-34

KG Investment Parcel, South Property
Federal Way, Washington

Sieve Analysis Results



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Test Pit Number	Depth (feet)	Moisture (%)	Soil Description
◆	TP-20	3.5	19	Sandy silt (ML)
■	TP-30	3.5	8	Silty sand with gravel (SM)

Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.

The grain size analysis results were obtained in general accordance with ASTM D 6913.

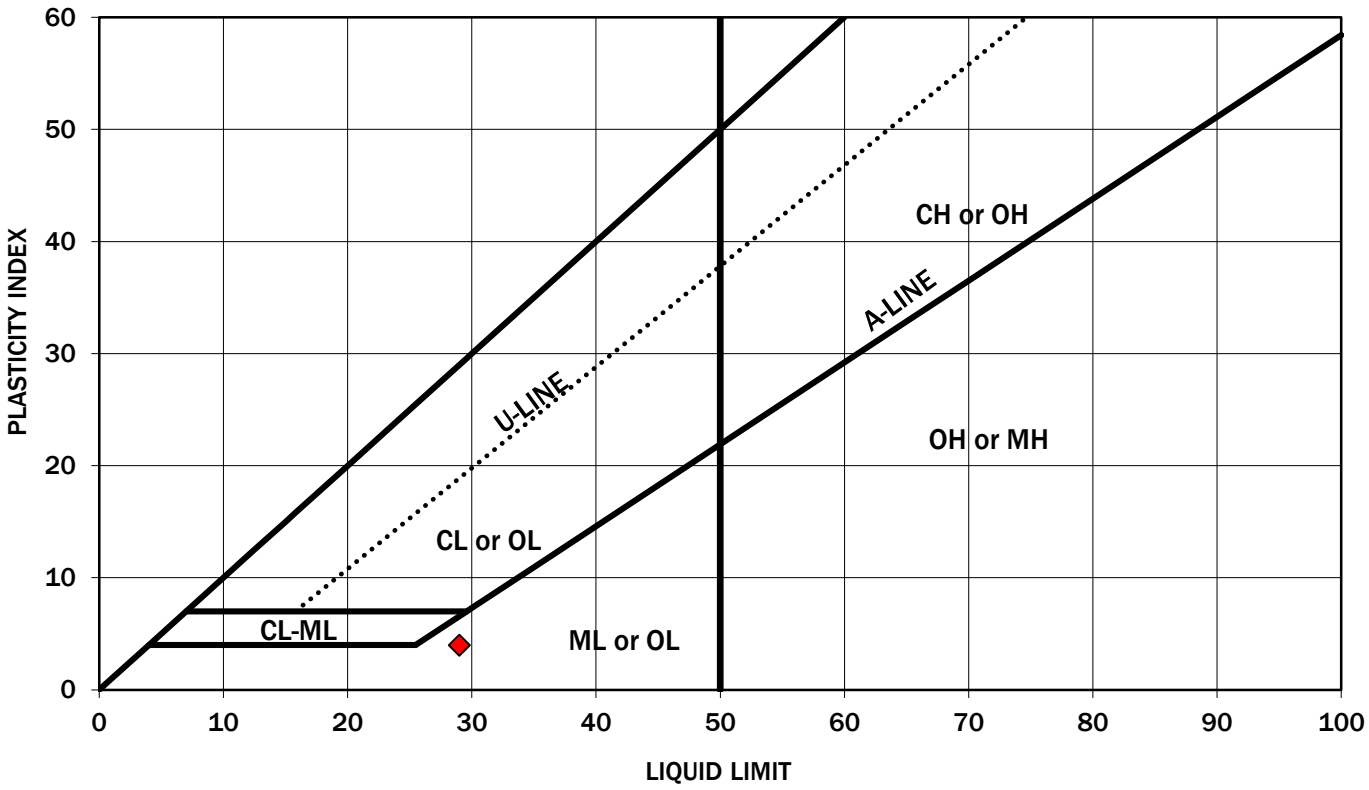
Sieve Analysis Results

KG Investment Parcel, South Property
Federal Way, Washington

GeoEngineers

Figure A-35

PLASTICITY CHART



Symbol	Test Pit Number	Depth (feet)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Soil Description
◆	TP-27	5.5	26	29	4	Silt (ML)

Atterberg Limits Test Results

KG Investment Parcel, South Property
Federal Way, Washington

GeoEngineers

Figure A-36

The liquid limit and plasticity index were obtained in general accordance with ASTM D 4318.

APPENDIX E
Report Limitations and Guidelines for Use

APPENDIX E
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Read These Provisions Closely

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory "limitations" provisions in its reports. Please confer with GeoEngineers if you need to know more how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical Services are Performed for Specific Purposes, Persons and Projects

This report has been prepared for Federal Way Campus, LLC for the project specifically identified and described in the report. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this report is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our Agreement with Federal Way Campus, LLC dated June 27, 2017 and generally accepted geotechnical practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

A Geotechnical Engineering or Geologic Report is based on a Unique Set of Project-Specific Factors

This report has been prepared for the proposed development, as described in this report, to be located in Federal Way, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, it is important not to rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structure;
- elevation, configuration, location, orientation or weight of the proposed structure;
- composition of the design team; or
- project ownership.

If changes occur after the date of this report, GeoEngineers cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

Environmental Concerns are Not Covered

Unless environmental services were specifically included in our scope of services, this report does not provide any environmental findings, conclusions, or recommendations, including but not limited to, the likelihood of encountering underground storage tanks or regulated contaminants.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Geotechnical and Geologic Findings are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies the specific subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied its professional judgment to render an informed opinion about subsurface conditions at other locations. Actual subsurface conditions may differ, sometimes significantly, from the opinions presented in this report. Our report, conclusions and interpretations are not a warranty of the actual subsurface conditions.

Geotechnical Engineering Report Recommendations are Not Final

We have developed the following recommendations based on data gathered from subsurface investigation(s). These investigations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this report are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers

cannot assume responsibility or liability for the recommendations in this report if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation

Misinterpretation of this report by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the report, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. The logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable, but separating logs from the report can create a risk of misinterpretation.

Give Contractors a Complete Report and Guidance

To help reduce the risk of problems associated with unanticipated subsurface conditions, GeoEngineers recommends giving contractors the complete geotechnical engineering or geologic report, including these "Report Limitations and Guidelines for Use." When providing the report, you should preface it with a clearly written letter of transmittal that:

- advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited; and
- encourages contractors to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer.

Contractors are Responsible for Site Safety on Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and adjacent properties.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants, and no conclusions or inferences should be drawn regarding Biological Pollutants as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field.