

August 6, 2025
Project No. 25-264

Harvey & Giselle Greisman
6511 82nd Avenue SE
Mercer Island, WA 98040

**Subject: Geotechnical Report
 Proposed Deck Replacement
 6511 82nd Avenue SE
 Mercer Island, Washington**

Dear Harvey and Giselle,

As requested, PanGEO Inc. (PanGEO) completed a geotechnical engineering evaluation to assist you and the design team for the proposed deck located at 6511 82nd Avenue SE in the City of Mercer Island, Washington. This study was performed in general accordance with our mutually agreed scope of work outlined in our proposal dated July 14, 2025, and subsequently approved on July 15, 2025. Our service scope included reviewing readily available geologic and geotechnical data, conducting a site reconnaissance, excavating two hand borings, performing engineering analysis, and developing the conclusions and recommendations presented in this report.

SITE AND PROJECT DESCRIPTION

The project site is an approximately 16,975 square foot lot located at 6531 82nd Avenue SE in the City of Mercer Island, Washington (see Figure 1, Vicinity Map). The subject property is rectangular in shape, and borders 82nd Avenue SE to the east and existing single-family residences to the other three sides (see Figure 2). The site is currently occupied by a one-story house with a daylight basement in the eastern portion of the site. Based on the review of topographic survey, the existing site grade generally slopes down from the east to the west with an average gradient of about 15 percent and a total elevation difference of about 27 feet between the east and west property lines. However, the ground surface continues to slope down toward the west on the west neighboring property with an average gradient of about 50 percent.

Based on the information provided to us, we understand that the proposed project consists of a complete remodel of the existing house. As part of the remodel, we also understand that an elevated deck will be constructed on the west side of the house. We anticipate that temporary excavations for the deck foundation will be on the order of about two feet deep if the bearing soil is present at footing subgrade

Based on review of City of Mercer Island GIS maps, the site is mapped with erosion, potential slide, and seismic geologic hazards. Additionally, an old landslide scarp is mapped near the west property line. As such, a geotechnical engineering evaluation is required as part of the building permit application. The objective of geotechnical study is to explore the near-surface soil and groundwater conditions and provide geotechnical design recommendations for the proposed deck.

The conclusions and recommendations outlined in this report are based on our understanding of the proposed development, which is in turn based on the project information provided to us. If the above project description is substantially different from your proposed improvements, or if the project scope changes, PanGEO should be consulted to review the recommendations contained in this study and make modifications, if needed.



Plate 1. Existing house and proposed deck location, looking northeast (7/14/2025).

SUBSURFACE EXPLORATIONS

CURRENT SUBSURFACE EXPLORATION

Our subsurface exploration for the current study consisted of excavating two hand borings (HB-1 and HB-2) at the site on July 16, 2024, using a hand auger. The approximate hand boring locations were taped in the field from on-site features, and are plotted on Figure 2. The hand borings were excavated to depths of about 9 feet below the existing grade.

PREVIOUS SUBSURFACE EXPLORATION

As part of our study, we reviewed readily available previous geotechnical explorations in the site vicinity. Specifically, the following previous test boring logs were reviewed:

- Hand borings 1 through 3, 6531 and 6541 82nd Avenue SE, Mercer Island (Associated Earth Sciences, Inc., 1999), located about 150 feet south of the subject site;
- Logs of test borings (EP-1 through EB-6) 6501 82nd Avenue SE, Mercer Island (Associated Earth Sciences, Inc., 2016), located adjacent to the north of the subject site;
- Logs of test borings (B-1 through B-3), 8040 SE 65th St, Mercer Island (GeoResources, 2012), located about 250 feet northwest of the subject site; and
- Logs of test borings (B-1 and B-2), 6739 and 6749 82nd Avenue SE, Mercer Island (Geotech Consultants, Inc., 1991), located about 840 feet south of the subject site.

The previous hand borings excavated at 6531 and 6541 82nd Avenue SE (AESI, 1999) generally consisted of loose, silty sand to the maximum exploration depths of about 3.5 to 5 feet below existing grades, which were interpreted as recessional outwash deposits.

The previous test borings located at 6501 82nd Avenue SE (AESI, 2016) generally encountered very loose to medium dense silty sand with pockets of silt and sand and occasional organics to depths ranging from about 9 to 15 feet below the existing grades, which were interpreted as fill and slide debris. The fill and slide debris were underlain by dense to very dense sand and silt, which was interpreted as pre-Fraser Deposits.

The previous test borings located at 8040 SE 65th St (GeoResources, 2012) were directly downslope to the west of 6501 82nd Ave SE. The soils encountered in the borings generally consisted of loose sand and very soft to soft silt from the surface to depths of about 6 to 11 feet,

which was interpreted as colluvium. The colluvium was underlain by very stiff to hard silt and dense to very dense sand.

The previous test borings located at 6739 and 6749 82nd Avenue SE (Geotech Consultants, 1991) generally encountered loose, silty sand from the surface to depths of about 6 to 10 feet below ground surface, which was interpreted as fill. The fill was underlain by hard silt and dense to very dense silty sand.

In general, the soil conditions observed in the previous explorations consisted of soft and/or loose fill, colluvium, and slide debris overlying hard and/or dense to very dense, native soil. Please refer to the previous exploration logs (Appendix B) for additional details.

SITE GEOLOGY AND SUBSURFACE CONDITIONS

The Geologic Map of Mercer Island, Washington (Troost, et al., 2006) mapped the surficial geologic unit at the subject site as Advance Outwash Deposits (Map Unit Qva). Advance Outwash Deposits (Qva) are described as well-sorted sand and gravel deposited by streams issuing from an advancing ice sheet. This unit predominantly consists of medium grained sand with silt beds common throughout. This unit is typically dense to very dense in its undisturbed state.

SOIL CONDITIONS

The soils observed in our hand borings generally consisted of about 7½ to 9 feet of loose topsoil and fill overlying medium dense to dense, native outwash sand. The following is a description of the soils encountered in the hand borings. Please refer to the summary hand boring logs (Appendix A) for additional details.

Topsoil & Fill – The hand borings encountered about 7½ to 8½ feet of loose to medium dense, orange-brown, sand to silty sand with gravel, and occasional rootlets and wood debris in PG-1 and PG-2, respectively. We interpret this unit as topsoil and fill based on loose consistency, disrupted texture, and presence of roots, organics, and wood debris.

Advance Outwash Deposits – Below the topsoil and fill, our hand borings generally encountered medium dense to dense, gray, silty sand with gravel to the bottom of each hole. This unit appears to be generally consistent with the mapped Advance Outwash Deposits.

GROUNDWATER

Minor perched groundwater was encountered at about 7½ feet below existing grade at the time of our field exploration. It should be noted that groundwater elevations and seepage rates are likely to vary depending on the season, local subsurface conditions, and other factors. Groundwater levels and seepage rates are normally highest during the winter and early spring (typically October through May).

GEOLOGY HAZARDS ASSESSMENT

POTENTIAL LANDSLIDE HAZARDS

The steep slope (40% or greater) area is located to the west of the site. The ground surface continues to slope down toward the west on the west neighboring property with an average gradient of about 50 percent. The majority of the site is mapped within a potential landslide hazard area according to the City of Mercer Island's Geologic Hazards Map. Additionally, a landslide scarp trending approximately north to south is mapped along the west property line (see plate 2 below).

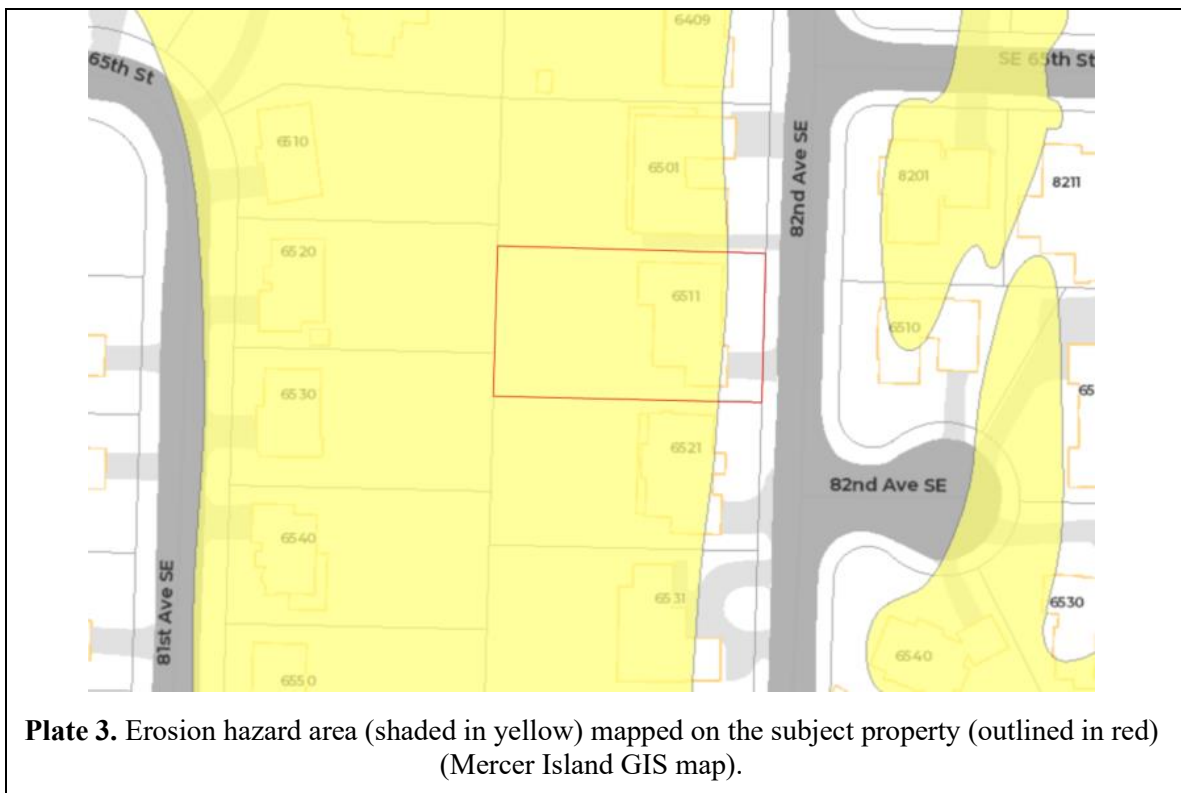


Plate 2. Steep slope area (shaded in orange), potential slide area (blue hashed area), and mapped landslide scarp (black line with tick marks) mapped on the subject property (Mercer Island GIS map).

A site reconnaissance of the subject property was conducted on July 14, 2025. According to GIS maps, the mapped landslide scarp is approximately 98 feet west of the proposed deck area. During our site reconnaissance, we did not observe the mapped landslide scarp along the top of slope on the west side of the site. The existing building foundations appear to be in relatively good condition and have performed well to date. Based on our field observations, the topography at the site and vicinity, and the subsurface conditions encountered in the hand borings, in our opinion, the subject site appears to be globally stable in its current configuration. It is our further opinion that the proposed deck as currently planned will not decrease the overall site stability or adversely affect the overall stability of the site or adjacent properties, provided the recommendations outlined herein are followed and the proposed development is properly design and constructed.

EROSION HAZARDS

The majority of the site is mapped within a potential erosion hazard area in accordance with the City of Mercer Island’s Geologic Hazards Map (see plate 3 below). Based on the results of our hand borings, the sandy site soils at the site are anticipated to exhibit moderate erosion potential. The current deck project will have very minimal ground disturbance for the deck construction outside of the existing house. In our opinion, the potential erosion hazards at the site can be



effectively mitigated with the best management practice during construction and with properly designed and implemented landscaping for permanent erosion control. During construction, the temporary erosion hazard can be effectively managed with an appropriate erosion and sediment control plan, including but not limited to installing silt fence at the construction perimeter, limiting removal of vegetation to the construction area, placing rocks or hay bales at the disturbed/traffic areas and on the downhill side of the project, covering stockpile soil or cut slopes with plastic sheets, constructing a temporary drainage pond to control surface runoff and sediment trap if needed, placing rocks at the construction entrance, etc. Permanent erosion control measures should include establishing vegetation, landscape plants, and hardscape established at the end of project.

SEISMIC HAZARDS

Based on review of the City of Mercer Island Parcel Map, the approximate western half of the site is mapped within a seismic/soil liquefaction hazard area (see Plate 4 on page 8).

Liquefaction is a process that can occur when soils lose shear strength for short periods of time during a seismic event. Ground shaking of sufficient strength and duration can result in the loss of grain-to-grain contact and an increase in pore water pressure, causing the soil to behave as a fluid. Soils with a potential for liquefaction are typically cohesionless, with a predominately silt and sand grain size, must be loose, and be below the groundwater table.

Based on our subsurface explorations and the soil conditions in the previous borings in the vicinity, the project area is predominately underlain by silty sand at shallow depths without a well-defined water table (i.e. only limited perched groundwater seepage). Based on these conditions, in our opinion, the liquefaction potential of the soils underlying the site is negligible and design considerations related to soil liquefaction are not necessary for the deck project.



Plate 4. Seismic hazard area (shaded in pink) mapped on the subject property (outlined in red) (Mercer Island GIS map).

GEOTECHNICAL DESIGN RECOMMENDATIONS

SEISMIC DESIGN PARAMETERS

We anticipate the seismic design of the structure will be accomplished in accordance with the 2021 International Building Code (IBC). Based on the site soil conditions, it is our opinion that Site Class D may be used for the seismic design of the proposed structures.

DECK FOUNDATIONS

The proposed project consists of a remodel of the existing house, including new foundations for an elevated deck on the west side of the existing house. Our hand borings encountered about 7½ to 8½ feet of loose fill overlying dense native outwash sand. Based on the soil conditions encountered, in our opinion, the new foundations for the proposed deck may be supported by a deep foundation system to reduce the potential for future deck footing settlement. Based on the site conditions and our field observations, in our opinion, pin piles are considered appropriate to support the new deck foundations. Conventional footings, although feasible, are not practical given the limited space to work and the depth of excavation required to reach competent bearing soil.

Steel Pipe Pile (Pin Pile)

Based on the site access conditions, it is our opinion that 2- or 3-inch diameter driven steel pin piles may be considered to support the new deck foundations.

Two-inch diameter pin piles may be used if site access is not available for track-mounted pile driving rig, and should consist of schedule-80 steel pipes. The piles should be driven to refusal, which is defined as less than one inch of penetration during one minute of continuous driving, with either a 90-lb jackhammer or a 140-lb pneumatic hammer. Piles driven to refusal are considered adequate for supporting an axial compression load of 3 tons per pile. We estimate that settlement is anticipated to be less than ½ inch under anticipated loading conditions for the pile supported foundations.

If access is available for the track-mounted pile driving rig, in our opinion, three-inch diameter pin piles may be used to support the new deck foundations. The number of piles required depends on the magnitude of the design load and the pile size. Table 1 below provides the allowable axial capacities in compression for pin piles with an approximate factor of safety of at least 2.0.

Penetration resistance required to achieve the capacities will be determined based on the hammer used to install the pile. The tensile and lateral capacities of pin piles should be ignored in design calculations.

Table 1 – Pin Pile Capacities

Pile Diameter (in)	Allowable Axial Capacity in Compression (tons)
2	3
3	6

Pin Pile Specifications – We recommend that the following specifications be included on the foundation plan:

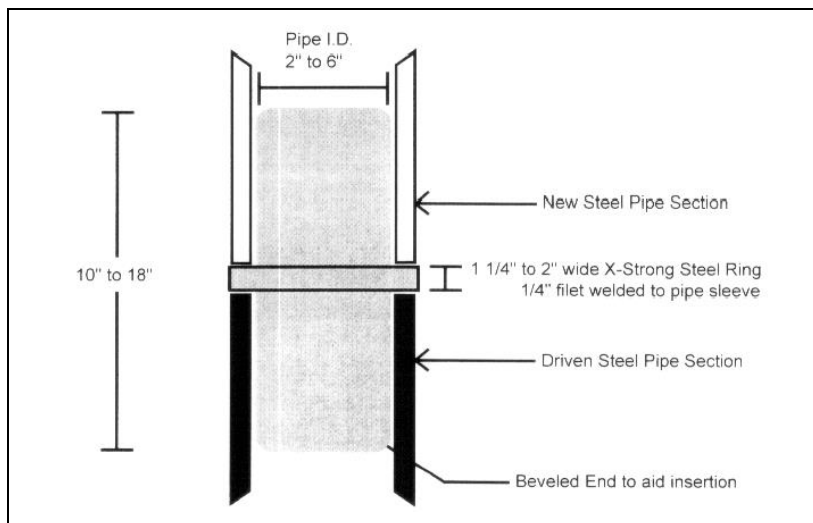
1. 3-inch diameter piles should consist of Schedule-40, ASTM A-53 pipes.
2. 3-inch piles shall be driven to refusal with a minimum 850-lb hydraulic hammer. We recommend the following refusal criteria based on the size of hammer utilized:

Table 2 – Three-inch Pin Pile Refusal Criteria

Hammer Size	Approx. Blows per Minute	Refusal Criteria (3-inch pile)
850 lbs	900	10 seconds per inch
1100 lbs	900	6 seconds per inch
2000 lbs	600	2 seconds per inch

The driving criteria recommended in the table above will be verified by a static load test program (see discussion in Item 4).

3. Piles shall be driven in nominal sections and connected with compression fitted sleeve couplers (see typical detail below). We discourage welding of pipe joints, particularly when galvanized pipe is used, as we have frequently observed welds broken during driving.
4. At least 3 percent (one minimum but no more than 5) of the 3-inch pin piles should be load tested. All load tests shall be performed in accordance with the procedure outlined in ASTM D1143. The maximum test load shall be 2 times the design load. The objective of the testing program is to verify the adequacy of the driving criteria, and the efficiency of the hammer used for the project.
5. The geotechnical engineer of record or their representative shall provide full time observation of pile installation and testing.



The number of pin piles needed, and pile layout should be determined by your structural engineer. Piles shall be driven in nominal sections and connected with compression fitted sleeve couplers (see detail below). We discourage welding of pipe joints, particularly when galvanized pipe is used, as we have frequently observed welds broken during driving.

The quality of a pin pile foundation is dependent in part on the experience and professionalism of the installation company. Therefore, a qualified contractor with pin pile driving experience of similar projects should be selected to install the piles. We also recommend that PanGEO be retained to provide full time monitoring of the pin pile installation to confirm the capacity of the piles.

Lateral Forces – The capacity of pin pipes to resist lateral loads is very limited and should not be used in design. Therefore, lateral forces should be resisted by the passive earth pressures acting against the pile caps and below-grade walls or from battered piles (batter no steeper than 3(H):12(V)).

Estimated Pile Length – The required pile length in order to develop the recommended pile capacity may vary depending on the actual subsurface and driving conditions encountered. For planning and cost estimating purposes, we estimate that pile lengths will likely be on the order of 15 to 20 feet.

Obstructions – Based on our field explorations, obstructions will be encountered during pile driving. Where possible, the obstructions should be removed to facilitate pile driving. If obstructions cannot be removed, the structural engineer of record should be notified to revise the pile layout to accommodate the adjustment.

STATEMENT OF MINIMUM RISKS

We understand that the site is mapped as a geologic hazard area. Per Mercer Island City Code Section 19.07.160.B.3, development within geologic hazard areas and critical slopes may occur if the geotechnical engineer provides a statement of risk with supporting documentation indicating that one of the following conditions can be met:

- a. The geologic hazard area will be modified, or the development has been designed so that the risk to the lot and adjacent property is eliminated or mitigated such that the site is determined to be safe; or

- b. An evaluation of site specific subsurface conditions demonstrates that the proposed development is not located in a geologic hazard area; or
- c. Development practices are proposed for the alteration that would render the development as safe as if it were not located in a geologic hazard area; or
- d. The alteration is so minor as not to pose a threat to public health, safety, and welfare.

It is our opinion that Criterion C can be met through best management practices during construction, including the proper use of silt fence, minimize earthwork activities during periods heavy precipitations, minimized exposed areas in wet season, etc. Permanent erosion control measures including landscape and hardscape installations will effectively mitigate the risk of erosion in the long term.

CONSTRUCTION CONSIDERATIONS

TEMPORARY EXCAVATIONS

As currently envisioned, the proposed deck will require excavations of about two feet below the existing grade for pin pile foundations. We anticipate the excavations to mainly encounter loose, silty sand. All temporary excavations should be performed in accordance with Part N of WAC (Washington Administrative Code) 296-155. The contractor is responsible for maintaining safe excavation slopes and/or shoring.

All temporary excavations deeper than a total of 4 feet should be sloped or shored. Based on the soil conditions at the site, for planning purposes, it is our opinion that temporary excavations for the proposed construction may be sloped 1H:1V or flatter.

The temporary excavations and cut slopes should be re-evaluated in the field during construction based on actual observed soil conditions, and may need to be flattened in the wet seasons and should be covered with plastic sheets. We also recommend that heavy construction equipment, building materials, excavated soil, and vehicular traffic should not be allowed within a distance equal to 1/3 the slope height from the top of any excavation.

MATERIAL REUSE

In the context of this report, structural fill is defined as compacted fill placed under footings, concrete stairs and landings, and slabs, or other load-bearing areas. In our opinion, the on-site soil

has high fines content and moisture sensitive. As such, on-site soil is not suitable to be used as structural fill. Structural fill, if needed, should consist of imported, well-graded, granular material, such as Seattle Type 2 aggregate, WSDOT Gravel Borrow, or approved equivalent. The on-site soil may be used as general fill in the non-structural and landscaping areas. If use of the on-site soil is planned, the excavated soil should be stockpiled and protected with plastic sheeting to prevent softening from rainfall in the wet season.

STRUCTURAL FILL PLACEMENT AND COMPACTION

Structural fill should be properly moisture conditioned, placed in loose, horizontal lifts less than 12 inches in thickness, and compacted to a dense and unyielding condition. The adequacy of compaction should be verified by a PanGEO representative. Alternatively, if density tests will be performed, the test results should indicate a minimum 95 percent relative compaction level as determined using ASTM D-1557 (Modified Proctor).

Depending on the type of compaction equipment used and depending on the type of fill material, it may be necessary to decrease the thickness of each lift in order to achieve adequate compaction. PanGEO can provide additional recommendations regarding structural fill and compaction during construction.

WET WEATHER EARTHWORK

In our opinion, the proposed site construction may be accomplished during wet weather (such as in winter) without adversely affecting the site stability. However, earthwork construction performed during the drier summer months likely will be more economical. Winter construction will require the implementation of best management erosion and sedimentation control practices to reduce the chance of off-site sediment transport. General recommendations relative to earthwork performed in wet conditions are presented below:

- The size and type of construction equipment used may have to be limited to prevent soil disturbance;
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water;
- Bales of straw and/or geotextile silt fences should be strategically located to control erosion and the movement of soil;
- Structural fill should consist of less than 5% fines; and

- Excavation slopes should be covered with plastic sheets.

SURFACE DRAINAGE AND EROSION CONSIDERATIONS

Surface runoff can be controlled during construction by careful grading practices. Typically, this includes the construction of shallow, upgrade perimeter ditches or low earthen berms in conjunction with silt fences to collect runoff and prevent water from entering excavations or to prevent runoff from the construction area from leaving the immediate work site. Temporary erosion control may require the use of hay bales on the downhill side of the project to prevent water from leaving the site and potential storm water detention to trap sand and silt before the water is discharged to a suitable outlet. All collected water should be directed under control to a positive and permanent discharge system.

Permanent control of surface water should be incorporated in the final grading design. Adequate surface gradients and drainage systems should be incorporated into the design such that surface runoff is directed away from structures. Potential problems associated with erosion may also be reduced by establishing vegetation within disturbed areas immediately following grading operations.

ADDITIONAL SERVICES

To confirm that our recommendations are properly incorporated into the design and construction of the proposed addition, PanGEO should be retained to conduct a review of the final project plans and specifications, and to monitor the construction of geotechnical elements.

Modifications to our recommendations presented in this report may be necessary, based on the actual conditions encountered during construction.

CLOSURE

We have prepared this report for Harvey and Giselle Greisman and the project design team. Recommendations contained in this report are based on a site reconnaissance, a subsurface exploration program, review of pertinent subsurface information, and our understanding of the project. The study was performed using a mutually agreed-upon scope of work.

Variations in soil conditions may exist between the locations of the explorations and the actual conditions underlying the site. The nature and extent of soil variations may not be evident until construction occurs. If any soil conditions are encountered at the site that are different from those

described in this report, we should be notified immediately to review the applicability of our recommendations. Additionally, we should also be notified to review the applicability of our recommendations if there are any changes in the project scope.

The scope of our work does not include services related to construction safety precautions. Our recommendations are not intended to direct the contractors' methods, techniques, sequences or procedures, except as specifically described in our report for consideration in design. Additionally, the scope of our work specifically excludes the assessment of environmental characteristics, particularly those involving hazardous substances. We are not mold consultants nor are our recommendations to be interpreted as being preventative of mold development. A mold specialist should be consulted for all mold-related issues.

This report has been prepared for planning and design purposes for specific application to the proposed project in accordance with the generally accepted standards of local practice at the time this report was written. No warranty, express or implied, is made.

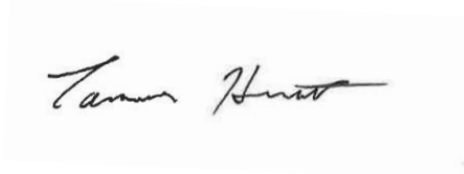
This report may be used only by the client and for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both off and on-site), or other factors including advances in our understanding of applied science, may change over time and could materially affect our findings. Therefore, this report should not be relied upon after 24 months from its issuance. PanGEO should be notified if the project is delayed by more than 24 months from the date of this report so that we may review the applicability of our conclusions considering the time lapse.

It is the client's responsibility to see that all parties to this project, including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk. Any party other than the client who wishes to use this report shall notify PanGEO of such intended use and for permission to copy this report. Based on the intended use of the report, PanGEO may require that additional work be performed and that an updated report be reissued. Noncompliance with any of these requirements will release PanGEO from any liability resulting from the use of this report.

We appreciate the opportunity to be of service.

Sincerely,

PanGEO, Inc.



Tanner N. Howitz, G.I.T.
Staff Geologist
thowitz@pangeoinc.com



08/06/2025

Chien-Lin (Johnny) Chen, P.E.
Senior Geotechnical Engineer
jchen@pangeoinc.com

Attachments:

- Figure 1 Vicinity Map
- Figure 2 Site and Exploration Map

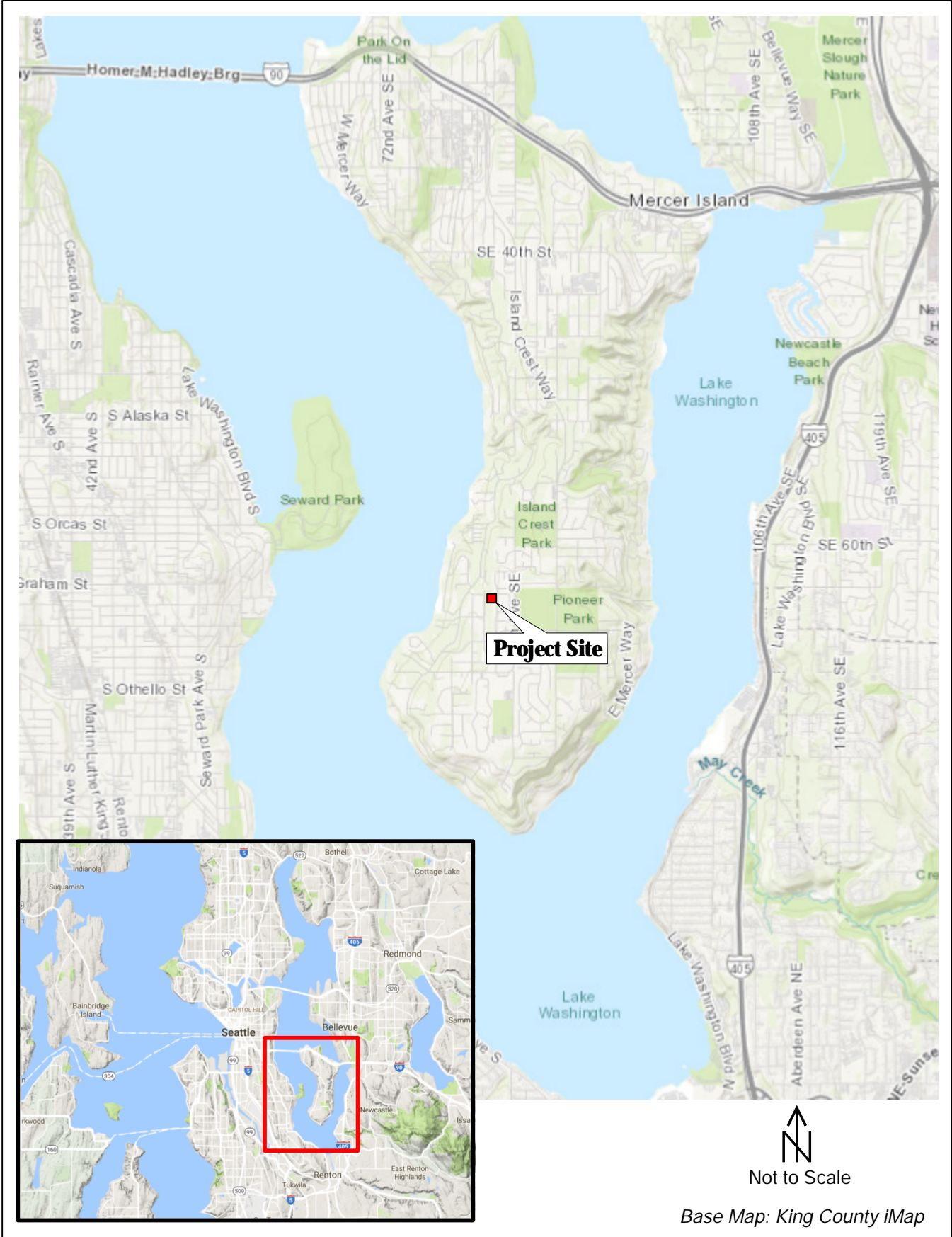
Appendix A – Summary Hand Boring Logs

- Figure A-1 Terms and Symbols for Boring and Test Pit Logs
- Figure A-2 Log of Hand Boring HB-1
- Figure A-3 Log of Hand Boring HB-2


Appendix B – Previous Exploration Logs

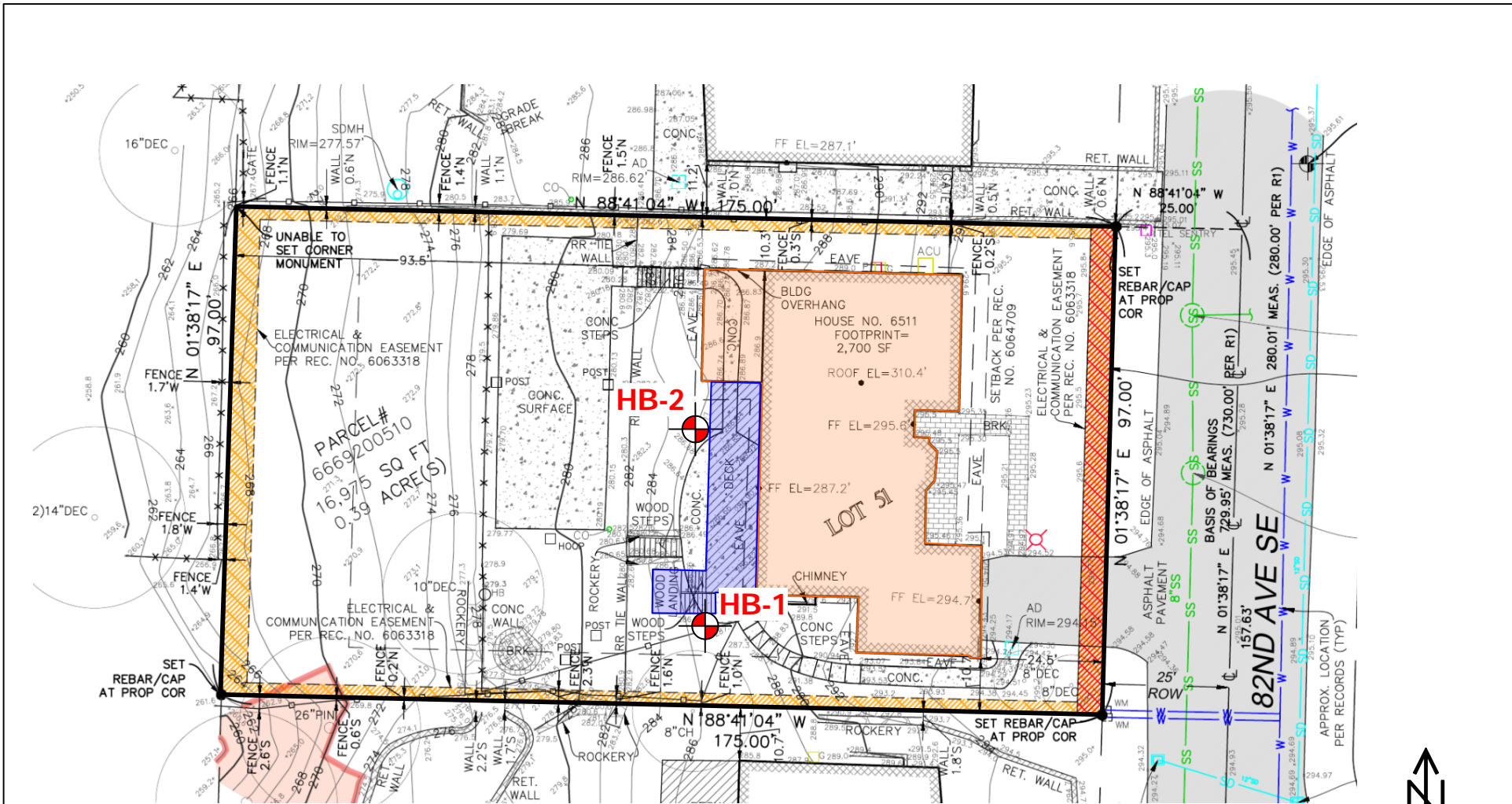
REFERENCES

- Associated Earth Sciences, Inc., 1999, *Geotechnical Issues Related to Proposed Slope Revegetation West of 6531 and 6541 82nd Avenue SE, Mercer Island, Washington.*
- Associated Earth Sciences, Inc., 2016, *Geotechnical Engineering Study, Reek Residence Retaining Wall, 6501 82nd Avenue SE, Mercer Island, Washington.*
- GeoResources, LLC, 2012, *Slope Assessment, 8040 SE 65th St, Mercer Island, Washington.*
- Geotech Consultants, 1991, *Geotechnical Engineering Study, Landslide Stabilization, West of Residences 6739 and 6749 82nd Avenue Southeast, Mercer Island, Washington.*
- International Code Council, 2021, *International Building Code.*
- Troost, K.G., Wisler, A. P., 2006, *Geologic Map of Mercer Island, scale 1:24,000.*
- WSDOT, 2025, *Standard Specifications for Road, Bridge and Municipal Construction, M 41-10, Washington State Department of Transportation.*







Base Map: King County iMap

	<p>Proposed Deck Replacement 6511 82nd Avenue SE Mercer Island, Washington</p>	<p>VICINITY MAP</p> <table border="1"> <tr> <td data-bbox="867 1965 1170 2013"> Project No. 25-264 </td> <td data-bbox="1170 1965 1479 2013"> Figure No. 1 </td> </tr> </table>		Project No. 25-264	Figure No. 1
Project No. 25-264	Figure No. 1				




Legend:

-  Site Boundaries
-  Existing House
-  Deck to be Replaced
-  Approximate Hand Boring Location



Approx. Scale
1" = 30'

Note: Base map modified from Topographic & Boundary Survey prepared by Terrane dated 2/24/25.

	Proposed Deck Replacement 6511 82nd Avenue SE Mercer Island, Washington	SITE AND EXPLORATION PLAN	
		Project No. 25-264	Figure No. 2

APPENDIX A

SUMMARY HAND BORING LOGS

RELATIVE DENSITY / CONSISTENCY

SAND / GRAVEL			SILT / CLAY		
Density	SPT N-values	Approx. Relative Density (%)	Consistency	SPT N-values	Approx. Undrained Shear Strength (psf)
Very Loose	<4	<15	Very Soft	<2	<250
Loose	4 to 10	15 - 35	Soft	2 to 4	250 - 500
Med. Dense	10 to 30	35 - 65	Med. Stiff	4 to 8	500 - 1000
Dense	30 to 50	65 - 85	Stiff	8 to 15	1000 - 2000
Very Dense	>50	85 - 100	Very Stiff	15 to 30	2000 - 4000
			Hard	>30	>4000

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		GROUP DESCRIPTIONS	
Gravel 50% or more of the coarse fraction retained on the #4 sieve. Use dual symbols (eg. GP-GM) for 5% to 12% fines.	GRAVEL (<5% fines)		GW: Well-graded GRAVEL
	GRAVEL (>12% fines)		GP: Poorly-graded GRAVEL
Sand 50% or more of the coarse fraction passing the #4 sieve. Use dual symbols (eg. SP-SM) for 5% to 12% fines.	SAND (<5% fines)		GM: Silty GRAVEL
			GC: Clayey GRAVEL
	SAND (>12% fines)		SW: Well-graded SAND
			SP: Poorly-graded SAND
Silt and Clay 50% or more passing #200 sieve	Liquid Limit < 50		SM: Silty SAND
			SC: Clayey SAND
			ML: SILT
	Liquid Limit > 50		CL: Lean CLAY
			OL: Organic SILT or CLAY
			MH: Elastic SILT
Highly Organic Soils			CH: Fat CLAY
			OH: Organic SILT or CLAY
			PT: PEAT

TEST SYMBOLS

for In Situ and Laboratory Tests listed in "Other Tests" column.

- ATT Atterberg Limit Test
- Comp Compaction Tests
- Con Consolidation
- DD Dry Density
- DS Direct Shear
- %F Fines Content
- GS Grain Size
- Perm Permeability
- PP Pocket Penetrometer
- R R-value
- SG Specific Gravity
- TV Torvane
- TXC Triaxial Compression
- UCC Unconfined Compression

SYMBOLS

Sample/In Situ test types and intervals

- 2-inch OD Split Spoon, SPT (140-lb. hammer, 30" drop)
- 3.25-inch OD Split Spoon (300-lb hammer, 30" drop)
- Non-standard penetration test (see boring log for details)
- Thin wall (Shelby) tube
- Grab
- Rock core
- Vane Shear

- Notes:**
- Soil exploration logs contain material descriptions based on visual observation and field tests using a system modified from the Uniform Soil Classification System (USCS). Where necessary laboratory tests have been conducted (as noted in the "Other Tests" column), unit descriptions may include a classification. Please refer to the discussions in the report text for a more complete description of the subsurface conditions.
 - The graphic symbols given above are not inclusive of all symbols that may appear on the borehole logs. Other symbols may be used where field observations indicated mixed soil constituents or dual constituent materials.

DESCRIPTIONS OF SOIL STRUCTURES

Layered: Units of material distinguished by color and/or composition from material units above and below	Fissured: Breaks along defined planes
Laminated: Layers of soil typically 0.05 to 1mm thick, max. 1 cm	Slickensided: Fracture planes that are polished or glossy
Lens: Layer of soil that pinches out laterally	Blocky: Angular soil lumps that resist breakdown
Interlayered: Alternating layers of differing soil material	Disrupted: Soil that is broken and mixed
Pocket: Erratic, discontinuous deposit of limited extent	Scattered: Less than one per foot
Homogeneous: Soil with uniform color and composition throughout	Numerous: More than one per foot
	BCN: Angle between bedding plane and a plane normal to core axis

COMPONENT DEFINITIONS

COMPONENT	SIZE / SIEVE RANGE	COMPONENT	SIZE / SIEVE RANGE
Boulder:	> 12 inches	Sand	
Cobbles:	3 to 12 inches	Coarse Sand:	#4 to #10 sieve (4.5 to 2.0 mm)
Gravel	3 to 3/4 inches	Medium Sand:	#10 to #40 sieve (2.0 to 0.42 mm)
		Fine Sand:	#40 to #200 sieve (0.42 to 0.074 mm)
Coarse Gravel:	3 to 3/4 inches	Silt	0.074 to 0.002 mm
Fine Gravel:	3/4 inches to #4 sieve	Clay	<0.002 mm

MONITORING WELL

- Groundwater Level at time of drilling (ATD)
- Static Groundwater Level
- Cement / Concrete Seal
- Bentonite grout / seal
- Silica sand backfill
- Slotted tip
- Slough
- Bottom of Boring

MOISTURE CONTENT

Dry	Dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water

Hand Boring Logs

Project No: 25-264
 Project Name: Proposed Deck Replacement
 Project Location: 6511 82nd Avenue Southeast, Mercer Island, WA
 Excavated: July 16, 2025

Hand Boring HB-1	
Approximate Location: Northing: 47.54465, Easting: -122.22972	
Approximate ground surface elevation: 286.6 ft	
<u>Depth (ft)</u>	<u>Material Description</u>
0 – ½	[Topsoil] Approximately 6 inches of topsoil overlain by landscaping mulch.
½ – 5	[Fill] Loose, orange-brown, fine SAND, trace organics (rootlets); moist
5 – 7 ½	Loose to medium dense, orange-brown, silty SAND, trace fine subrounded gravel, organics (rootlets and wood debris), silt content increases with depth; moist <ul style="list-style-type: none"> - Groundwater seepage encountered at 7 ½ feet below the ground surface
7½ – 8 ½	[Advance Outwash] Medium dense to dense, gray, silty SAND, few fine to coarse subrounded gravel; wet




Image of soils at about 8 ½ feet below the ground surface. HB-1 was terminated approximately 8 ½ feet below ground surface. Minor perched groundwater was encountered at about 7 ½ below the existing ground surface at the time of exploration.

Logged by: T. Howitz

Hand Boring Logs

Project No: 25-264
 Project Name: Proposed Deck Replacement
 Project Location: 6511 82nd Avenue Southeast, Mercer Island, WA
 Excavated: July 16, 2025

Hand Boring HB-2	
Approximate Location: Northing: 47.54475, Easting: -122.22973 Approximate ground surface elevation: 286.7 ft	
<u>Depth (ft)</u>	<u>Material Description</u>
0 – ½	[Topsoil] Approximately 6 inches of topsoil overlain by landscaping mulch.
½ – 8 ½	[Fill] Loose, orange-brown, silty SAND, trace fine subrounded gravel, trace organics (rootlets and wood debris); moist - Groundwater seepage encountered 7 ½ feet below the ground surface
8 ½ – 9	[Advance Outwash] Medium dense to dense, gray, silty SAND; wet - Advance outwash is inferred at this depth due to perched groundwater and appearance of gray sand
	
Image of soils from about 8 ½ feet below the ground surface. HB-1 was terminated approximately 9 feet below ground surface due to wood debris obstruction. Minor perched groundwater was encountered at about 7 ½ below the existing ground surface at the time of exploration.	
Logged by: T. Howitz	

APPENDIX B

PREVIOUS EXPLORATION LOGS



May 17, 1999
Project No. KE99205G

BAINBRIDGE ISLAND OFFICE
179 Madrone Lane North
Bainbridge Island, WA 98110
(206) 780-9370
FAX (206) 780-9438

Sherry Haba
6531 - 82nd Avenue SE
Mercer Island, Washington 98040

Subject: Geotechnical Issues Related to Proposed Slope Revegetation
West of 6531 and 6541 - 82nd Avenue SE
Mercer Island, Washington

Dear Ms. Haba:

On April 5, 1999, a representative of Associated Earth Sciences, Inc. (AESI) was on-site at the above-referenced property to discuss geotechnical issues related to your proposed slope revegetation plan and to perform shallow subsurface explorations with hand tools. Our services were verbally authorized by you on April 4, 1999. Our services have been accomplished in accordance with local engineering geology and geotechnical engineering practice at the time our work was completed. No other warranty is made.

SITE AND PROJECT DESCRIPTION

The project site is a moderately steep slope west of 6531 and 6541 - 82nd Avenue SW in Mercer Island, Washington. The slope is located between the Haba and Curfew residences on the east side, and neighboring homes to the west. We understand that most of the proposed project area is owned by the neighbors to the west.

The slope under consideration is moderately steep, with slope inclinations between 25 and 31 degrees from horizontal, as measured with a hand-held clinometer. The slope is currently covered with blackberry, fern, and other low ground cover, and numerous trees approximately 6 to 12 inches in diameter. Visually estimated dimensions of the area in question are about 150 feet north-south by 150 feet east-west, with overall vertical relief visually estimated at 40 to 60 feet. Based on a brief review of a preliminary landslide incident locator map prepared by the City of Mercer Island, and on information provided by you, we understand that previous landslide activity has occurred on similar slopes north and south of the area under review.

During our site visit we observed that you and your neighbor, Mr. Curfew, have installed surface drainage improvements near the west edge of your properties. These improvements appeared to be in good condition, and should significantly improve the slope stability performance in the

revegetation area. We recommend that you inspect the drainage systems at least annually, preferably in late fall prior to the onset of heavy seasonal rain.

We understand that you propose to replace existing larger trees on the slope with new smaller trees, for the purpose of maintaining the view from your property to the west. Your neighbor, Clyde Curfew at 6541 - 82nd Avenue NW, is also participating in the project for that portion of the slope that affects the view from his property.

REVEGETATION PLAN

When we met with you, we reviewed a plan that you had prepared that showed the locations of existing trees on the slope. We understand that the revegetation plan that you propose was developed using this plan, and with the help of a qualified arborist, or urban forestry specialist. As we understand it, you propose to remove the existing trees on the slope and replace them with trees selected for their aesthetic qualities and their growth habits, for the purpose of establishing visually pleasing vegetation that will require minimal ongoing view maintenance. We understand that when existing trees are removed, that you propose to cut the trees but leave the stumps and root mass in place to decompose naturally. No grubbing, grading, or other earthmoving of any kind is planned. We understand that new trees would be planted as existing trees are removed, and that the project would be phased over at least two growing season / winter cycles.

SUBSURFACE CONDITIONS

We observed subsurface conditions on the site by advancing three shallow explorations with hand tools. We observed a relatively thick topsoil horizon, on the order of 8 to 12 inches thick, underlain by loose silty sand to the full depth explored of 3.5 to 5 feet. This soil was interpreted to represent a glacial recessional deposit. This soil type and our interpretation do not agree with published mapping for the site, which indicates the site to be underlain by lodgement till. Lodgement till is typically dense to very dense, and is composed of an unsorted assemblage of silt, sand, gravel, cobbles, and boulders. The sediments observed in our hand explorations were not typical of lodgement till. Recessional deposits typically occur stratigraphically above the till sediments. Lodgement till typically would provide greater stability in a sloping environment than would recessional deposits, particularly when shallow ground water is present. No ground water was observed in our explorations.

CONCLUSIONS AND RECOMMENDATIONS

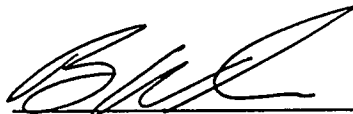
Based on our review of the City map of known landslide incidents, it is apparent that slope areas contiguous with the project area to the north and south have previously failed. Based on our site reconnaissance, shallow explorations, and on our review of published geologic mapping, it appears that the slope on the site has similar characteristics to nearby slopes which have failed in the past. We do not know if there were extenuating circumstances (i.e., broken water pipes or drains) associated with these failures. We also do not know the depth and extent of these previous movements.

One of the factors that reduces the potential of landslides is vegetation cover. Understory vegetation helps to deflect direct rainfall, and moderates surface erosion and runoff rates. Larger plants and trees can help stabilize the upper several feet of soil on the slope with their networks of roots. Therefore, removal or modification of vegetation cover can have short- and long-term impacts on slope stability. Based on our understanding of the proposed project, you do not intend to remove stumps or root masses, and therefore the stability provided by the existing root masses will gradually degrade over time as the new trees become established and replace the stability effects of the old root masses. Exposing soil on the slope by grading or grubbing would also have a negative effect on stability; however, we understand that you do not propose either of these.

Based on our understanding of the revegetation project that you propose, you have selected the lowest impact methods possible, in our opinion. While modifying the vegetation on a steep slope always carries some inherent risk of contributing to slope movement, the plan you propose minimizes those risks in our opinion. [We recommend that you verify with your arborist or urban forestry specialist, or other qualified specialist that the new trees that you propose to plant have similar root structures and canopy cover/density, and therefore will provide equivalent slope stabilization as the trees that are currently present.]

Thank you for the opportunity to have been of service. Should you have any questions regarding this letter, or other geotechnical aspects of the project, please do not hesitate to call.

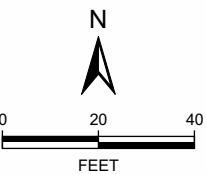
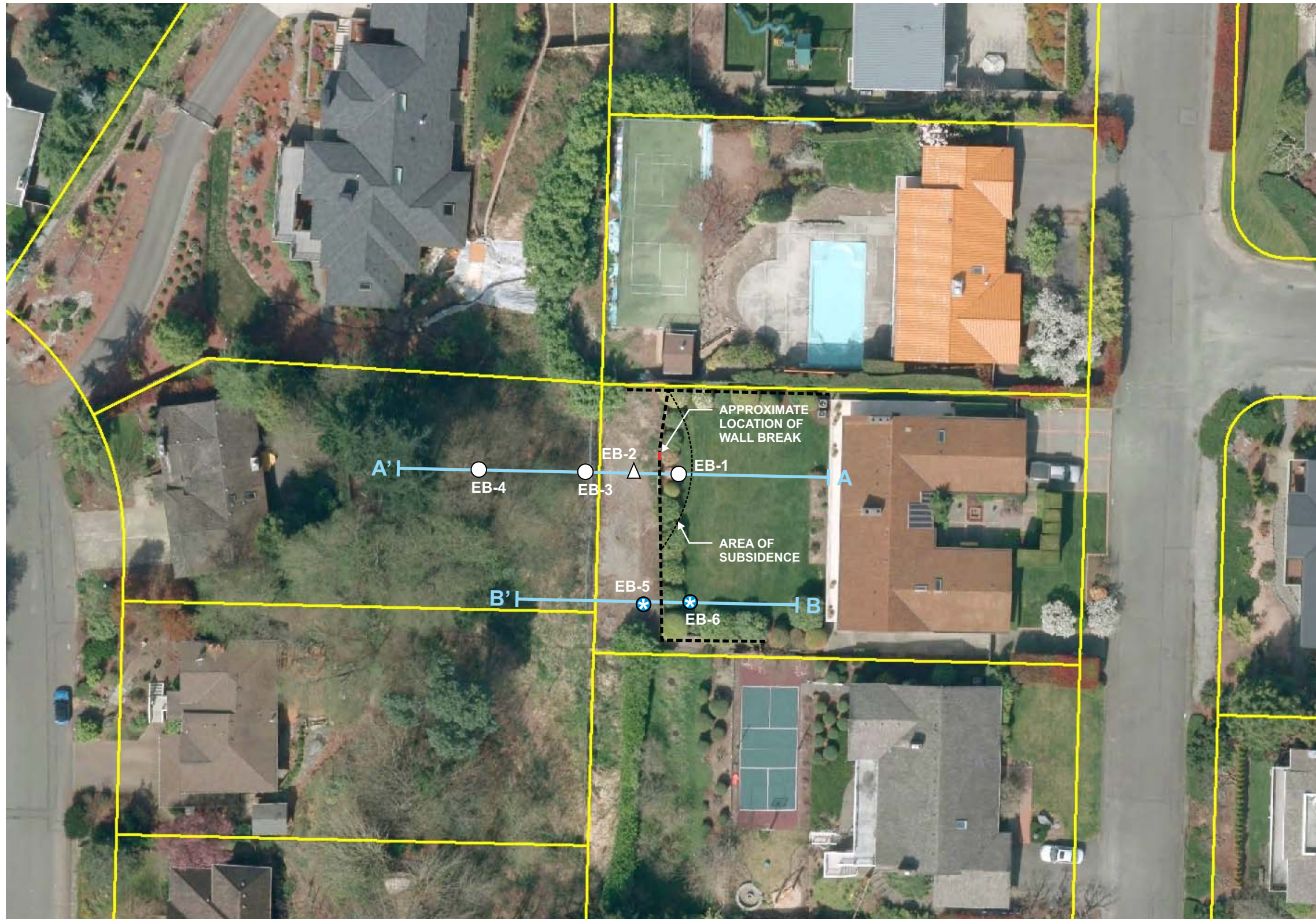
Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington



Bruce W. Guenzler
Project Geologist



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



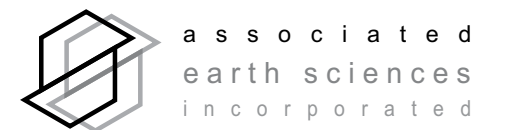
LEGEND:

- EXPLORATION BORING - 9/14
- ⊕ EXPLORATION BORING - 11/15
- △ EXPLORATION BORING WITH 1-1/4" PIEZOMETER - 9/14
- RETAINING WALL

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

REFERENCE: BING

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



SITE AND EXPLORATION PLAN

REEK RESIDENCE
MERCER ISLAND, WASHINGTON

PROJ NO.	DATE:	FIGURE:
KE140332A	12/15	2



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earth sciences
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Exploration Log

Project Number
KE140332A

Exploration Number
EB-1

Sheet
1 of 1

Project Name Reek Residence Ground Surface Elevation (ft) Unknown
 Location Mercer Island, WA Datum N/A
 Driller/Equipment CN Drilling Date Start/Finish 9/19/14, 9/19/14
 Hammer Weight/Drop 140# / 30" Hole Diameter (in) 4.5 inches

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/Foot				Other Tests	
							Blows/6"	10	20	30		40
				Sod Fill								
		S-1		Moist, tan, silty SAND, with gravel (SM). (Driller adding water - approx 1 pint.)		3 4 4	▲8					
		S-2		Becomes very moist		2 1 1	▲2					
5		S-3		Wet, gray, fine to medium SAND, few silt (SP). Wood in tip of sampler at 6.5 feet.		1/18"	▲1/18"					
		S-4		Wet, gray and brown (mixed), fine to medium SAND, with to little silt, trace organics (wood, roots) (SM).		1 2 2	▲4					
10				Pre-Fraser Nonglacial Sediments								
		S-5		Wet, mottled reddish tan and gray, fine to medium SAND, few silt; micaceous (SP).		0 6 7	▲13					
		S-6		Becomes silty and uniformly reddish tan; stratified (SM). Very moist, brownish gray, SILT; laminated (ML).		3 9 10	▲16					
15		S-7		Wet, reddish tan, silty fine SAND; micaceous (SM). Few silt (SP). (Change in drilling action at 18 feet.)		9 14 18					▲32	
20		S-8		Very moist, brownish gray, SILT; massive to weakly laminated (ML).		8 13 20					▲33	
25		S-9		Contains a lens (1-1/2 inches thick) of clean fine sand at 25.5 feet.		9 15 20					▲35	
				Bottom of exploration boring at 26.5 feet Left boring open over the weekend. Water in open boring at 4 feet (9/22/14).								

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample

- No Recovery
- Ring Sample
- Shelby Tube Sample

- M - Moisture
- Water Level (9/22/14)
- Water Level at time of drilling (ATD)

Logged by: TJP
Approved by: JNS



Geologic & Monitoring Well Construction Log

Project Number
KE140332A

Well Number
EB-2

Sheet
1 of 1

Project Name **Reek Residence**
 Elevation (Top of Well Casing) **Unknown**
 Water Level Elevation _____
 Drilling/Equipment **CN Drilling**
 Hammer Weight/Drop **140# / 30"**

Location **Mercer Island, WA**
 Surface Elevation (ft) **Unknown**
 Date Start/Finish **9/19/14, 9/19/14**
 Hole Diameter (in) **4.5 inches**

Depth (ft)	Water Level	WELL CONSTRUCTION	S T	Blows/ 6"	Graphic Symbol	DESCRIPTION
		Flush mount monument Slip cap Cement surface seal 0 to 2 feet		2 1 1		Fill Very moist, tan, fine to medium SAND, with gravel, little silt (SW/SP).
		Bentonite chips 2 to 4 feet		1/18"		Slide Debris Very moist to wet, mottled gray and reddish tan, fine to medium SAND, little silt, few to little gravel, contains roots (SP/SM).
5		10/20 silica sand 4 to 20 feet 1-1/4-inch I.D. Sch 80 PVC casing: 0 to 5 feet		2/18"		Becomes brownish gray to gray, with to little silt, with gravel (SM).
		1-1/4-inch I.D. Sch 80 PVC well screen: 0.010-inch slot width, 5 to 15 feet		1 2 3		Very moist, little gravel.
10				2/18"		Becomes wet, mottled; sand fraction becomes fine grained, little silt, trace gravel.
				1 2 3		Becomes grayish tan.
15		Threaded end cap		4 8 9		Pre-Fraser Nonglacial Sediments Wet, gray to grayish tan, fine SAND, little silt (SP/SM).
						Very moist, brownish gray, SILT; massive (ML).
						(No change in drilling action between 15 and 20 feet.)
20		Caved material 20 to 21.5 feet		5 8 12		Wet, gray, fine SAND, little silt; contains thin silt lenses (SP/SM).
		Well tag # BIS-729				Boring terminated at 21.5 feet. Well completed at 15 feet on 9/19/14.

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample

- M - Moisture
- Water Level (9/22/14)
- Water Level at time of drilling (ATD)

Logged by: TJP
 Approved by: JNS

NWELL-B_140332.GPJ BORING.GDT 12/14/15



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Exploration Log

Project Number
KE140332A

Exploration Number
EB-3

Sheet
1 of 1

Project Name Reek Residence Ground Surface Elevation (ft) Unknown
 Location Mercer Island, WA Datum N/A
 Driller/Equipment CN Drilling Date Start/Finish 9/22/14, 9/22/14
 Hammer Weight/Drop 140# / 30" Hole Diameter (in) 4.5 inches

Depth (ft)	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/Foot				Other Tests
						Blows/6"	10	20	30	
			Topsoil							
	S-1		Gravelly topsoil.		2	▲2				
			Slide Debris Wet, gray, well graded SAND, little silt (SW/SM).		1					
	S-2		Contains lenses of organic topsoil.		2/18"	▲2/18"				
5	S-3		No topsoil lenses present, trace gravel.		2/18"	▲2/18"				
	S-4		Becomes silty, few fine gravel (SM). Very moist to wet, gray, SILT, trace organics (ML).		2	▲4				
10	S-5		Wet, gray, fine to medium SAND, few to little silt; contains lenses of fine sandy silt (SP/SM). (Drilling becomes difficult at 12 feet.)		2					
			Pre-Fraser Nonglacial Sediments		4					
	S-6		Very moist, brownish gray, SILT, few to little fine sand, trace organics; massive to weakly laminated (ML).		7					
15					8					
	S-7		Becomes brownish gray, with fine sand partings.		13					
20					19					
	S-8		Contains vivianite.		9					
					12					
					17					
25	S-9		Pre-Fraser Undifferentiated Sediments Very moist, orangish tan, fine SAND, with to little silt, trace gravel (SP/SM).		13					
					18					
					22					
					12					
					21					
					29					
			Bottom of exploration boring at 29 feet							

AESIBOR 140332.GPJ December 14, 2015

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample
- M - Moisture
- Water Level ()
- Water Level at time of drilling (ATD)

Logged by: TJP
Approved by: JNS



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earth sciences
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Exploration Log

Project Number
KE140332A

Exploration Number
EB-4

Sheet
1 of 1

Project Name Reek Residence Ground Surface Elevation (ft) Unknown
 Location Mercer Island, WA Datum N/A
 Driller/Equipment CN Drilling Date Start/Finish 9/22/14,9/22/14
 Hammer Weight/Drop 140# / 30" Hole Diameter (in) 4.5 inches

Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/Foot				Other Tests
							10	20	30	40	
		S-1		Slide Debris Moist, tan, silty SAND, abundant roots (SM). (Blow counts likely overstated due to roots.)		2 7 16		▲23			
		S-2		Becomes orangish tan (inferred from cuttings). No recovery. (Driller adding water.)		8 3 2	▲5				
5		S-3		Very moist, orangish tan, sandy SILT; contains pockets of clean fine sand (ML). Large root at 6 feet. (Driller adding water - difficult drilling, likely due to roots.)		9 16 16			▲32		
10		S-4		(Drilling becomes easy at 9.5 feet.) Very moist, orangish brown, well graded SAND, with gravel, few silt (SW). (Drilling becomes more difficult at 11 feet.) Pre-Fraser Undifferentiated Sediments		0 4 11		▲15			
15		S-5		Very moist, tan, well graded SAND, with gravel, little silt (SW/SM).		20 26 25					▲51
20		S-6				25 42 46					▲88
20		S-7				50/3"					▲50/3"
25				Bottom of exploration boring at 20.25 feet Refusal - pounding on rock. Ground water not encountered.							

Sampler Type (ST):



2" OD Split Spoon Sampler (SPT)



3" OD Split Spoon Sampler (D & M)



Grab Sample



No Recovery



Ring Sample



Shelby Tube Sample

M - Moisture



Water Level ()



Water Level at time of drilling (ATD)

Logged by: TJP

Approved by: JNS

AESIBOR 140332.GPJ December 14, 2015



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Exploration Log

Project Number
KE140332A

Exploration Number
EB-5

Sheet
1 of 1

Project Name Reek Residence Ground Surface Elevation (ft) 274
 Location Mercer Island, WA Datum NAVD88
 Driller/Equipment CN Drilling / Acker Date Start/Finish 11/12/15, 11/12/15
 Hammer Weight/Drop 140# / 30" Hole Diameter (in) 5 1/2 inches

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/Foot				Other Tests	
							10	20	30	40		
		S-1		Slide Debris Very moist, brown, gravelly, silty SAND (SM).			1 1 1	▲2				
		S-2		No recovery.			1 1 2	▲3				
5		S-3		Becomes very moist to wet, gray and brown (mixed) and very silty with trace gravel; contains scatter organics.			1 3 4	▲7				
		S-4		Becomes uniformly gray.			1 3 2	▲5				
10				Pre-Fraser Non-Glacial Sediments			▼					
		S-5		Wet, mottled rust and gray, fine SAND, some silt (SP/SM).			2 5 3	▲11				
		S-6		Wet, gray, SILT, some fine sand, trace organics; contains thin lenses of silty sand; laminated (ML).			2 4 8	▲12				
15		S-7		Very moist, gray, SILT, some fine sand; contains thin lenses of silty sand (ML).			10 13 22				▲35	
20		S-8		Becomes gray to brownish gray, trace organics, silt becomes sandy.			8 19 22					▲41
				Bottom of exploration boring at 21.5 feet								
25												

AESIBOR 140332-NOV-15.GPJ November 18, 2015

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample
- M - Moisture
- Water Level ()
- Water Level at time of drilling (ATD)

Logged by: TJP
Approved by: JNS



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Exploration Log

Project Number
KE140332A

Exploration Number
EB-6

Sheet
1 of 1

Project Name Reek Residence
Location Mercer Island, WA
Driller/Equipment CN Drilling / Acker
Hammer Weight/Drop 140# / 30"

Ground Surface Elevation (ft) 282
Datum NAVD88
Date Start/Finish 11/12/15, 11/12/15
Hole Diameter (in) 5 1/2 inches

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"				Other Tests	
							10	20	30	40		
				Sod / Topsoil								
		S-1		Fill Moist, tan, gravelly SAND, some silt (SW/SM).		0 2 3	▲5					
		S-2		Becomes silty.		1 1 1	▲2					
5		S-3				1 1 3	▲4					
		S-4		Becomes gray, some gravel, trace organics. Becomes brown at tip of sampler.		1 3 5	▲8					
10		S-5		Pre-Fraser Non-Glacial Sediments		1 2 3	▲5					
		S-6		Very moist to wet, gray, silty fine to medium SAND; trace rootlets (SM).		3 9 11		▲20				
15		S-7		Wet, tan fine to medium SAND, some silt; stratified (SP/SM). Contains oxidized zones below 14 feet.		7 13 20			▲33			
		S-8		Very moist, blue gray, SILT; laminated (ML). Wet, brownish gray, silty fine SAND; scattered organics (SM).		7 15 21				▲36		
20				Bottom of exploration boring at 19 feet								
25												

AESIBOR 140332-NOV-15.GPJ November 18, 2015

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample

- No Recovery
- Ring Sample
- Shelby Tube Sample

- M - Moisture
- Water Level ()
- Water Level at time of drilling (ATD)

Logged by: TJP
Approved by: JNS



APPROXIMATE LOCATION OF BORINGS B-1●

GeoResources, LLC

5007 Pacific Highway E, Ste 16
 Fife, Washington 98424
 Phone: 253-896-1011
 Fax: 253-896-2633

Site Map

Slope Assessment
 8040 SE 65th Street
 Mercer Island, Washington

Doc: TMDW.Ngai.65th

April 2012

Figure 2

Project No: TMDW.NgaiResidence

Borehole Number: B-1

Project: Slope Assessment

Project Manager: KSS

Client: Ngai Family

Logged: RMP

Site Location: 8040 SE 65th Street

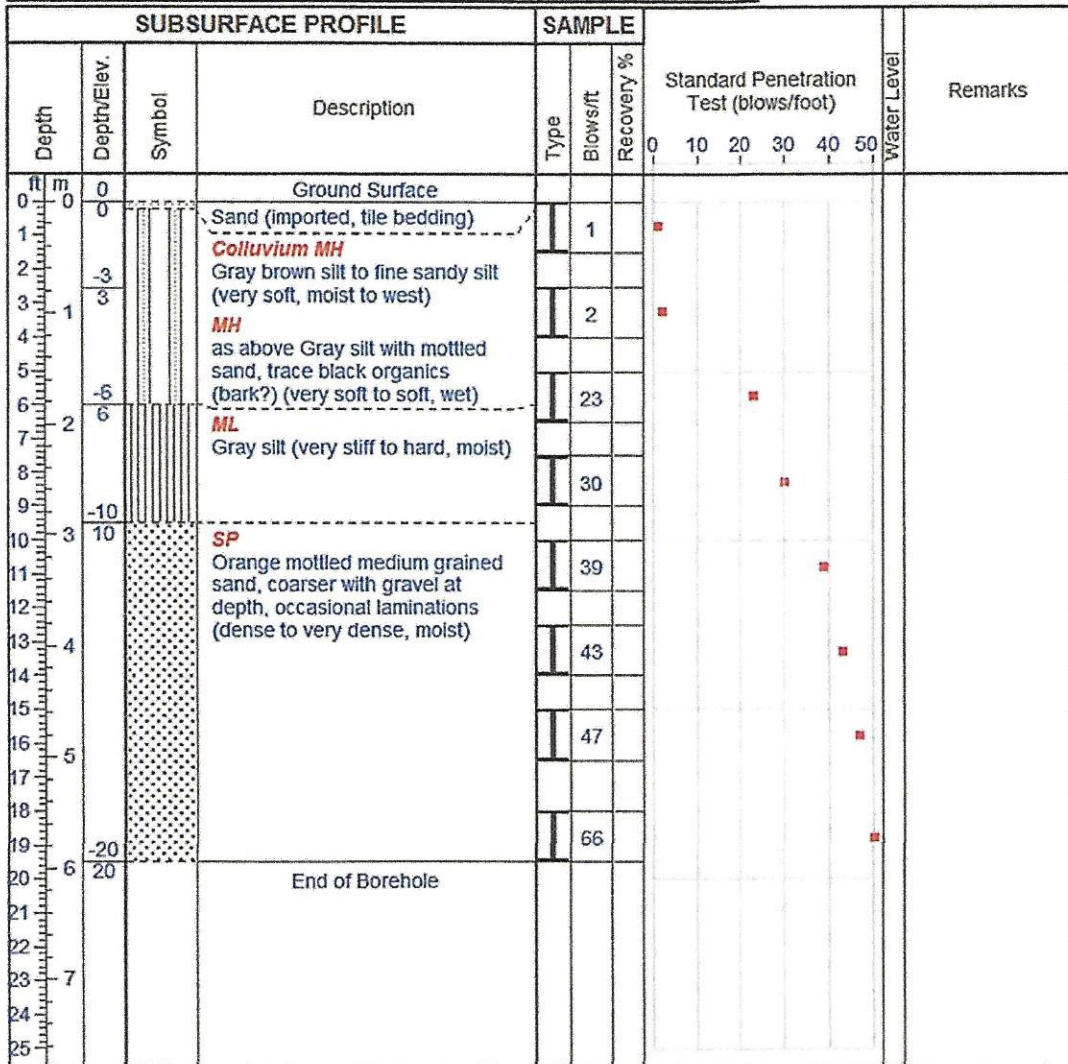
Boring Location: upper landing, near property line

GeoResources, LLC

5007 Pacific Hwy. E, Ste 16

Fife, Washington 98424

(253) 896-1011



Drilled By: CN Drilling

Datum:

Drill Method: Aker Hollow Stem Auger

Hole Size: 6 inch outer diameter

Drill Date: March 29, 2012

Sampling Method: 2 inch o.d. split spoon

Sheet: 1 of 1

Project No: TMDW.NgaiResidence

Borehole Number: B-2

Project: Slope Assessment

Project Manager: KSS

Client: Ngai Family

Logged: RMP

Site Location: 8040 SE 65th Street

Boring Location: landing above lowest block wall tier

GeoResources, LLC

5007 Pacific Hwy. E, Ste 16

Fife, Washington 98424

(253) 896-1011

SUBSURFACE PROFILE				SAMPLE		Standard Penetration Test (blows/foot)	Water Level	Remarks
Depth	Depth/Elev.	Symbol	Description	Type	Blows/ft			
0	0		Ground Surface					
1	0		Colluvium MH Gray brown mottled fine sandy silt (very soft, wet)		2			
3	-3		SP Orange mottled sand with trace black organics (loose, moist)		10			
5	-5		SP Orange mottled medium grained Sand with 2" thick brown silt lens (loose to medium dense, moist)		11			
8	-8				20			
11	-11		GM Orange silty GRAVEL (dense, moist)		29			
13	-13		SP Orange mottled medium grained sand, coarser with gravel at depth (dense to very dense, moist)		46			
16	-16				47			
19	-19				52			
21	-21		SP/GP Coarse Sand & Gravel (very dense, moist)		50			
22	-22		End of Borehole					

Drilled By: CN Drilling

Datum:

Drill Method: Aker Hollow Stem Auger

Hole Size: 6 Inch outer diameter

Drill Date: March 29, 2012

Sampling Method: 2 inch o.d. split spoon

Sheet: 1 of 1

Project No: TMDW.NgaiResidence

Borehole Number: B-3

Project: Slope Assessment

Project Manager: KSS

Client: Ngai Family

Logged: RMP

Site Location: 8040 SE 65th Street

Boring Location: north of failure, 7 feet away from existing residence

GeoResources, LLC

5007 Pacific Hwy. E, Ste 16

Fife, Washington 98424

(253) 896-1011

SUBSURFACE PROFILE				SAMPLE			Standard Penetration Test (blows/foot)	Water Level	Remarks
Depth	Depth/Elev.	Symbol	Description	Type	Blows/ft	Recovery %			
0	0		Ground Surface						
1			Colluvium Dark brown organics over light brown silt (soft, wet)		5	39			
3	1		SM Gray sand with silt, gravel at depth (loose, wet)		8	44			
6	2		SP/GP Oxidized orange sand and gravel		33	89			
7			Gray to mottled sand with small gravel (dense, moist)		33	89			
10	3		as above (wet)		34	89			
13	4		Gray silt (very stiff)		28	89			
16	5		SP Orange oxidized medium grained sand with gravel, trace cobbles (dense to very dense, moist)		41	100			
18					69	100			
19					67	80		Increased density at 19 feet	
20	6		End of Borehole						

Drilled By: CN Drilling

Datum:

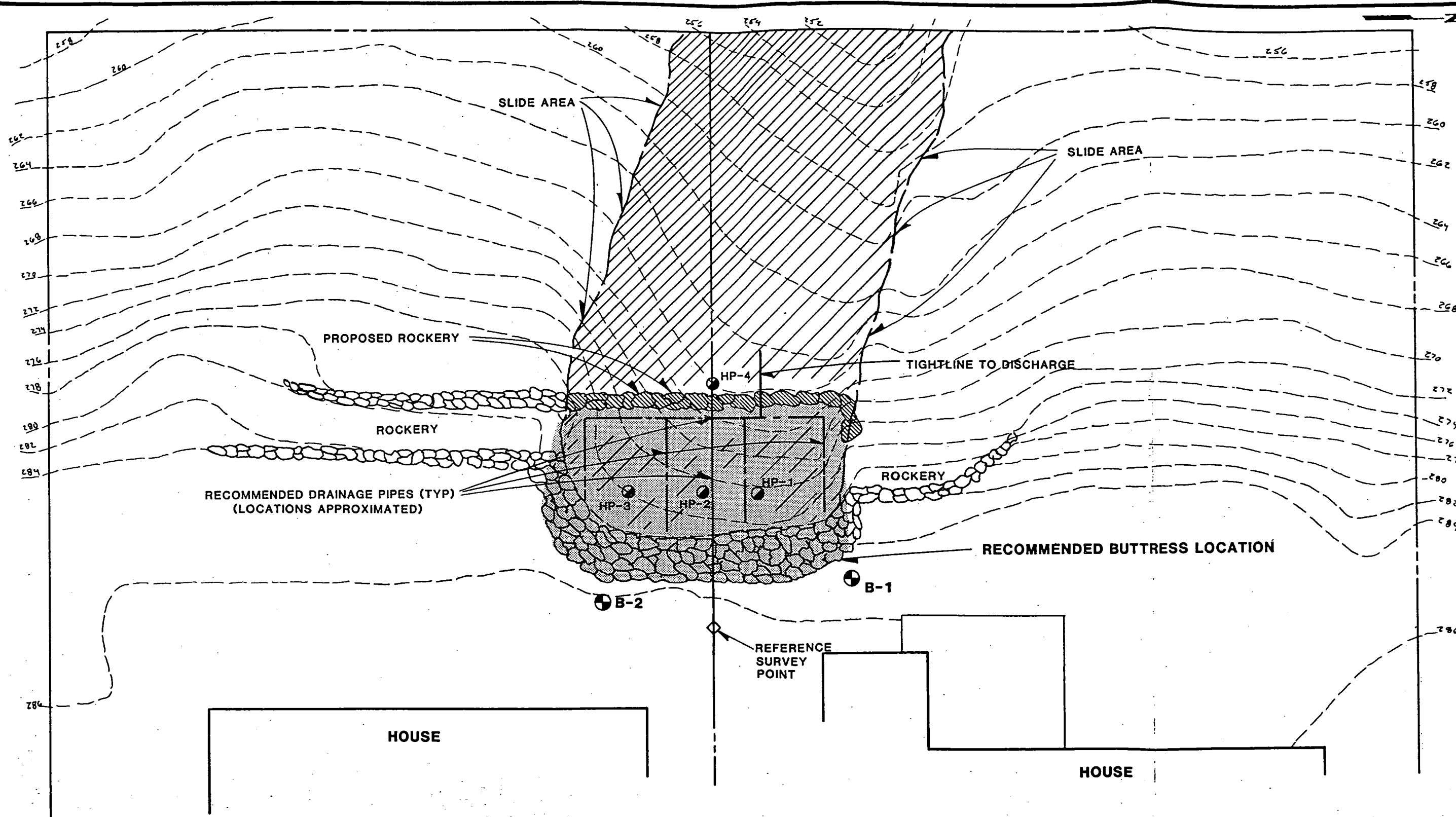
Drill Method: Aker Hollow Stem Auger

Hole Size: 6 inch outer diameter

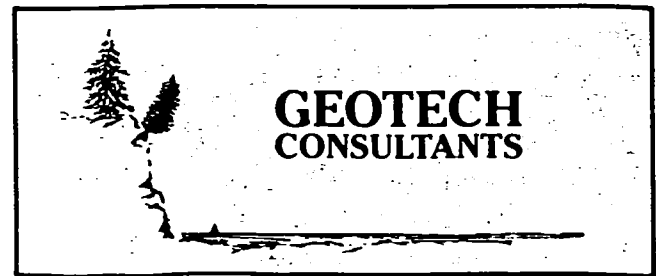
Drill Date: April 3, 2012

Sampling Method: 2 inch o.d. split spoon

Sheet: 1 of 1



- LEGEND:**
- APPROXIMATE HAND-PROBE LOCATIONS
 - ⊕ APPROXIMATE BORING LOCATIONS



**SITE EXPLORATION PLAN
LEONE & PLUTA PROPERTIES
6739 & 6749 82nd AVENUE S.E.
MERCER ISLAND, WASHINGTON**

Job No.: 91282	Date: AUG 1991	Scale:	Plate: 2
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BORING 1

Moisture Content(%)	Sample	Blows per Foot	USCS	Description
13.0	1	8		Brown, mottled, gravelly, silty fine-grained SAND, moist, loose (fill).
16.2	2	3	Fill	becomes gray, less gravelly, wet
	4	6		becomes coarse-grained, saturated, some wood encountered
	5	9	Topsoil	
	6	41	SP SM	Gray/rust, coarse-grained, slightly silty SAND with gravel, saturated, medium-dense.
29.3			ML	Rust colored, low plasticity SILT, very moist, stiff, becomes gray.
	7	38		Becomes more sandy, nonplastic, very wet

Test boring terminated at 19' below existing grade on 8-9-91.
Groundwater encountered at 7'.




GEOTECH
CONSULTANTS, INC.

TEST BORING LOG
LEONE & PLUTA PROPERTIES
6937 & 6947 82ND AVE. SE
MERCER ISLAND, WA

Job No: 91262	Date: AUG 1991	Logged by: DRW	Plate: 5
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BORING 2

Molsture Content(%)	Sample	Blows per Foot	USCS	Description
	1	3	Fill	Brown, fine-grained, silty SAND with gravel, moist, loose (fill).
23.2	2	37		Gray/rust, slightly silty, coarse grained SAND, saturated, medium-dense. becomes gravelly, dense
	3	60		
	4	86		

Test boring terminated at 14' below existing grade on 8-9-91 due to auger refusal.
 Groundwater encountered at 6.5'.



TEST BORING LOG
LEONE & PLUTA PROPERTIES
 6937 & 6947 82ND AVE. SE
 MERCER ISLAND, WA

Job No: 91262	Date: AUG 1991	Logged by: DRW	Plate: 6
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