GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists
& Environmental Specialists

May 20th 2023 G-5881

Steve Kao and Hui Hong
21722 Chinook Road
Woodway, WA, 98020

Subject: **Geotechnical Engineering Study**
Proposed Addition
5425 West Mercer Way
Mercer Island, WA

Dear Mr. Kao:

At your request, GEO Group Northwest, Inc., conducted a geotechnical engineering investigation at the above-subject location for both a proposed addition to the existing home, as well as a new ADU (accessory dwelling unit) at the above subject property on Mercer Island, Washington. The lot in question is long and thin and is located on the shoreline of the west side of the island. The existing residence is on the west side of the lot, which gently slopes west to east up the contour of the property, with a garage in the location of the proposed ADU and a large sport court and yard area on the east side of the lot. The scope of our services included a review of the geologic maps of the area, providing a characterization of the subsurface soil and groundwater conditions encountered, preparation of hand auger logs, and preparation of this geotechnical report.

SITE CONDITIONS

Site Description

The project site is located on the south-west coast of Mercer Island, Washington, as illustrated in *Plate 1 – Site Location Map*. The site is long and thin and gently slopes from west to east over an approximate 42-foot elevation change with a total lot area of 42,797 square feet. The lot is bounded by other single family residential properties to the north and south, a private road off of Bonney Street to the north, and Lake Washington to the west.

The existing house is located on the west side of the lot, close to the water at the lowest point of elevation onsite. The brick house was built in 1988, has 5,270 square feet, has one main floor with a daylight basement and a small second story. The client has not observed any settlement in the existing house. A driveway winds from the west side of the lot by the house to the east past an existing shed by the house, and a garage to the east that is proposed to be replaced with the new ADU, and up past a sport court on the east side of the lot where the driveway connects to the private drive for the neighborhood. The existing shed is approximately 50 square feet, the garage which is proposed to be replaced with the new ADU is 60 square feet, and the asphalt sports court stretches partially across the upper yard area to the east.

Description of Proposed Development

The proposed project consists of additions to the existing single-family residence as well as a new ADU in the location of the existing garage. The proposed home addition will add onto the existing first and second stories, extending the main floor from 2,390 to 4,511 square feet and the second floor 920 to 2,228 square feet. The first floor will be extended east of the existing footprint. The proposed ADU will replace the existing garage that is to the west of the sports court. The footprint of the garage will be extended slightly and the ADU will have two stories and a total 1,922 square feet of living space. Please see *Plate 2 - Site Plan.*

SITE INVESTIGATION

Geologic Overview

Based on a review of the geologic map for the area, the surficial soil in the area is mapped to overly Pre Olympia-Non-Glacial Deposits (Qpon) and Mass Wasting Deposits. Pre Olympia-Non-Glacial Deposits typically contain sand, silt (locally organic rich), gravel, and peat, discontinuously and thinly interbedded and generally, very dense and hard. These deposits can have abundant organic debris or pumiceous material indicating nonglacial origin. Mass wasting deposits are mapped to underlie the east portion of the site as well as the surrounding properties. These deposits typically contain unstratified mixtures of silt, sand and gravel. Lake Deposits (Ql) are mapped to underlie the very west edge of the property by the waterfront. The City of Mercer Island has mapped Steep Slopes and landslide hazards on the property, as well as past slides on adjacent properties.

Subsurface Investigation

On May 5th, a Staff Engineering Geologist from our firm, visited the site to perform a visual reconnaissance of the site and investigate the subsurface soil conditions. We conducted 2 soil borings in the location of both proposed additions, one close to the existing house and a second close to the existing garage and proposed ADU. Borehole locations are illustrated on *Plate 2 – Site Plan*.

Borehole 1 (BH-1) was conducted close to the footprint of the existing house. Directly below the ground surface, at approximately 2.5 feet we encountered very stiff, native silty soils. The silt transitioned from a weathered, mottled, brown silt to a blue silt at a depth of 15 feet below ground surface, no peat or organics were encountered and the soils remained very stiff throughout the terminus of the boring. We interpret these very stiff silts to be native Pre Olympia-Non-Glacial Deposits.

Borehole 2 (BH-2) was conducted close to the location of the proposed ADU, and we encountered more variety in the subsurface soils in this location. Below a grass lawn we encountered mainly medium stiff silts to a depth of approximately 20 feet below the ground surface. At 20 feet below ground surface, the soil became stiff with some interbedded sands, at 25-30 feet below the ground surface at the terminus of the boring, the silts became hard. We interpret this hard, native silt to be native Pre Olympia-Non-Glacial Deposits underlying mass wasting debris from a previous ice age.

CRITICAL AREAS

The Project site is mapped to overly a City of Mercer Island Seismic, Potential Slide and Erosion Hazard area. As part of our scope of work we evaluate the hazard with respect to the project scope of work. Please see *Plates 3, 4 and 5 – Hazardous Areas Maps.*

Landslide Hazard

Mercer Island Landslide Hazards are defined, in this case, by a combination of slopes steeper than 15%, intersecting a geologic contact of relatively permeable deposits over relatively impermeable deposits, and with springs or groundwater seepage. The site is mapped to include 15 percent slopes as well as a historic landslide deposit on the east side of project site from a previous ice age. No scarps or slide initiation points are mapped onsite. It is our professional opinion, that because of the very stiff soils found at depth onsite and because the area where the

proposed home addition will be located is primarily a flat, the project is highly unlikely to negatively impact the potential landslide area.

Erosion Hazard

According to the City of Mercer Island, Erosion hazards areas include those areas with greater than 15% slopes that are also subject to a severe risk of erosion due to wind, rain, water, slope and other natural agents. Another factor in evaluating erosion potential is infiltration potential of surficial soils. According to our subsurface investigation, the soils onsite are primarily Silts and have low infiltration potential, in our professional opinion, this indicates the chance of erosion due to soil type is low. Because of the very stiff, silty soils, lack of groundwater, and the low grade of the slopes onsite, in our professional opinion the risk of the project scope negatively impacting or being impacted by the erosion hazard area is low.

Seismic Hazard

According to the City of Mercer Island, a seismic hazard area is an area that has potential for seismically induced ground failures including settlement, cracking, lateral spreading and liquefaction due to ground shaking. The subject property is between both of the mapped Seattle faults that cross the Island and neither fault is close to the subject property. Landslide debris deposited in a previous ice age was observed to underly the east side of the site but beneath the debris we observed dense, native soils in the location of the proposed addition. In our professional opinion, because of the very stiff, silty soils observed onsite, the risk of seismically induced settlement or failure is low.

CONCLUSIONS AND RECOMMENDATIONS

The proposed project involves replacing the existing garage with a new ADU, as well as extending the first and second floors of the existing single-family residence on the west side of the parcel.

Borehole 1 was conducted in the location of the existing house, we observed stiff to hard, silty soils suitable for bearing 2.5 feet below the ground surface. We recommend the proposed addition to the house be supported on conventional concrete footing foundations that bear on dense native soils or on structural fill that is placed on a subgrade of dense native soil. Based on the findings from our investigation, bearing soils are anticipated at depth of approximately 1-2 feet below the existing ground surface. A geotechnical engineer should verify that soil conditions

in the location of all new foundations for the addition corroborate what was observed in the boring by the south-east corner of the residence.

Borehole 2 was conducted up slope of the house, by the existing garage, where the proposed ADU is to be located. In this boring, we encountered medium stiff soils to a depth of 25 feet where the silty soil became hard. Due to the medium stiff silts observed in this boring, we recommend supporting the structure on a system of small diameter 3-to-4-inch pipe piles.

Mercer Island Unified Land Development Code Geologically Hazardous Areas per Requirement 19.07.160.B

An evaluation of site-specific subsurface conditions demonstrates that the proposed development is not located in an erosion hazard, landslide hazard area or seismic hazard area and the development is so minor as not to pose a threat to the public health, safety and welfare.

Seismic Site Design Classification and Design Parameters

Based on guidance provided in the 2018 edition of the International Building Code (IBC), it is our opinion that the project site meets the criteria for seismic Site Class D for Stiff Soil. Seismic design parameters applicable for the site, based on the assigned Site Class D and design calculations per the 2018 IBC, are as follows:

S_s = 1.457 g	S_{ms} = 1.457	S_{ds} = 0.972
S_1 = 0.506 g	S_{m1} = null	S_{d1} = null

The peak ground acceleration for the site, adjusted for the assigned site class, is 0.624g based on USGS seismic hazard design mapping per the 2018 IBC

Foundations

Small-Diameter Pipe Pile System

Based on the findings from the borings drilled from this study, suitable bearing soils in the location of the proposed ADU, are expected to be present at a depth of 25-30 feet below ground surface at the project area of the site. In consideration of these conditions, it is our opinion that the proposed ADU should be supported on small-diameter steel pipe piles.

The pipe piles should be driven until the condition is reached where the resistance of the subsurface soils sufficiently retards or terminates the advancement of the pile; this condition commonly is called refusal. The depth at which refusal is achieved is dependent upon the type of pipe and driving hammer that are used, and the characteristics of the subsurface soils that the pile encounters. The following table presents design criteria for commonly-available combinations of driving hammers and pipe sizes. The following capacities include a factor of safety of 2.

Pipe Pile Design Criteria

Pipe Diameter	Pipe Wall Thickness	Hammer Weight Class	Hammer Type	Refusal Criteria*	Allowable Capacity
3 inch	Schedule 40	650 pound	TB225†	12 sec/inch	6 tons**
3 inch	Schedule 40	850 pound	TB325†	10 sec/inch	6 tons**
4 inch	Schedule 40	850 pound	TB325†	16 sec/inch	10 tons**
4 inch	Schedule 40	1100 pound	TB425†	10 sec/inch	10 tons**

* = Maximum penetration rate to be sustained through at least 3 time cycles of continuous driving.
‡ = Capacity is limited to 2 tons in City of Seattle soil liquefaction and peat settlement critical areas, and length is limited to 30 feet for projects in City of Seattle.
† = Teledyne hydraulic hammer model number, or equivalent.
** = Load testing of 3% of total number of piles (min. of 1, max. of 5 piles) required during installation in City of Seattle.

Based on findings from our subsurface investigation, we estimate that finished pile lengths can be more than 25 feet below ground surface and can be checked with a test pile. No groundwater was encountered in our subsurface explorations on the site. Therefore, we recommend that the piles consist of steel pipe. Due to the expected depths, 3-to-4-inch pile diameters should be considered.

We estimate that the maximum settlement of the pipe piles should be one-quarter (1/4) inch or less. No reduction in the pile capacities is required if the pile spacing is at least three times the pile diameter; otherwise, the capacities should be re-evaluated to account for group effects. A

one-third increase in the above allowable pile capacities can be used when considering short-term transitory wind or seismic loads.

By themselves, pipe piles do not generate lateral capacities. Lateral forces can be resisted by moment frame action between the piles and the structural beams and passive pressure against adjacent silt. To fully mobilize the passive pressure resistance, the footings or grade beams should be poured neat against competent native soil or should be backfilled with compacted structural fill. Under such conditions, the footings can be designed for an allowable passive soil pressure of 350 pcf equivalent fluid weight for lateral resistance. A coefficient of friction of 0.35 can be used between the subgrade soils and the footings or grade beams.

The performance of pipe piles is dependent on how and to what bearing stratum the piles are installed. Since a completed pile in the ground cannot be observed, it is critical that judgment and experience be used as a basis for determining the driving refusal and acceptability of a pile. Therefore, we recommend that GEO Group Northwest, Inc. be retained to monitor the pile installation operation, collect and interpret installation data, and verify suitable bearing stratum. We also suggest that the contractor's equipment and installation procedures be reviewed by us prior to pile installation to help mitigate problems which may delay the progress of the work.

Concrete Footings

In the location of the existing house, soils that are anticipated to be acceptable for building support were encountered at a depth of approximately 1-2-feet below ground surface in the location of Borehole-1, based on these findings, it is our opinion that new foundations for the project can consist of conventional concrete strip and column footings that bear directly on dense or very dense native soils or on compacted, crushed rock structural fill that has been placed on a subgrade of dense or very dense native soils. Our recommended design criteria for conventional footing foundations supported on native soils or crushed rock structural fill are provided below.

- Allowable bearing pressure, including all dead and live loads:
  - Undisturbed, dense or very dense soil = 2,000 psf
  - Structural fill placed on dense or very dense soil = 2,000 psf

- Minimum depth to base of perimeter footing below adjacent exterior grade = 18 inches
- Minimum depth to bottom of interior footings below top of floor slab = 12 inches
- Minimum width of wall footings = 16 inches

- Minimum lateral dimension of column footings = 24 inches
- Estimated post-construction settlement = ½ inch
- Estimated post-construction differential settlement across building width = ½ inch

A one-third increase in the above allowable bearing pressures can be used when considering short-term transitory wind or seismic loads. Lateral loads against the building foundations can be resisted by friction between the foundation and the supporting subgrade or by passive earth pressure acting on the buried portions of the foundations. For the latter case, the foundations must be poured "neat" against the existing undisturbed soil or be backfilled with compacted structural fill. Our recommended parameters are as follows:

- Passive Pressure (Lateral Resistance)
  350 pcf, equivalent fluid weight, for structural fill or competent undisturbed native soil
- Coefficient of Friction (Friction Factor)
  0.35 for structural fill or competent undisturbed native soil.

Slab-on-Grade Floors

For the ADU, slab-on-grade floors may be supported on a system of small-diameter pipe piles which are supported per the recommendations provided above in this report. The home addition with competent bearing soils closer to the surface may use supported floors instead of slab-on-grade. For dry storage and living space, slab-on-grade floors should be placed on a capillary break to prevent wicking of moisture through the slab. The capillary break should consist of a minimum 12-inch layer of gravel or crushed rock containing no more than 5 percent passing the No. 4 (1/4 inch) sieve and with a maximum size of ¾ inches. Clean 5/8-inch crushed chip rock with no minus fraction is an acceptable capillary break material (pea-gravel is not recommended).

Drainage

Water should not be allowed to stand in areas where footings are to be constructed. Final site grades should provide drainage away from the building structure. Wall backfill against the vertical drain mat should be compacted to a minimum of 90 percent of the material’s maximum dry density to mitigate clogging of the filter fabric. Roof drain lines should be connected to an approved discharge facility.

Grading and Earthwork

Erosion Control

Temporary erosion and sedimentation controls (TESCs), such as silt fences, should be installed down-gradient of the areas to be disturbed to prevent sediment-laden runoff from being discharged off site. Surface runoff should not be allowed to flow over the top of slopes into excavations. During wet weather, exposed soils should be covered with plastic sheeting or straw mulch. Stockpiled soils should be covered with plastic tarps. For permanent erosion control disturbed soils should be landscaped and mulched upon completion of the site work.

LIMITATIONS

The findings and recommendations stated herein are based on field observations, our experience on similar projects and our professional judgment. The recommendations presented herein are our professional opinions derived in a manner consistent with the level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area and within the project schedule and budget constraints. No warranty is expressed or implied. In the event that site conditions are found to differ from those described in this report, we should be notified so that the relevant recommendations in this report can be reevaluated and modified if appropriate.

CLOSING

We appreciate the opportunity to provide you with geotechnical engineering services for this project. Please do not hesitate to contact us if you have any questions regarding this report.

Sincerely,

GEO Group Northwest, Inc.

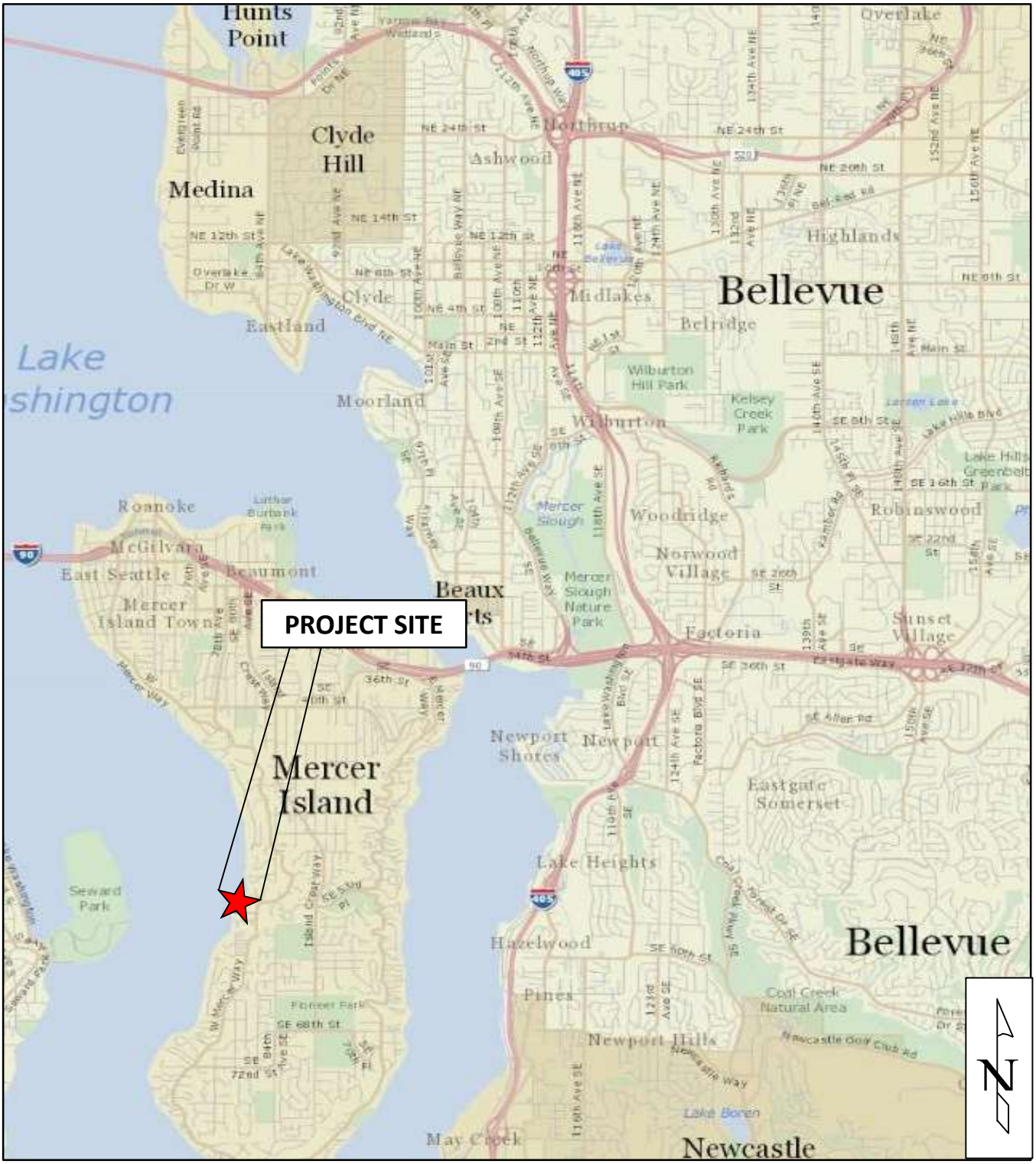
Sophie Holt, G.I.T.
Staff Engineering Geologist

William Chang, P.E.
Principal Engineer

Attachments:

Plate 1 – Site Location Map
Plate 2 – Site Plan
Plate 3 – Critical Area
Plate 4 – Critical Area
Plate 5 – Critical Area

Appendix A – USCS Soil Classification Legend & Soil Boring Logs



Source: King County iMap, 2021

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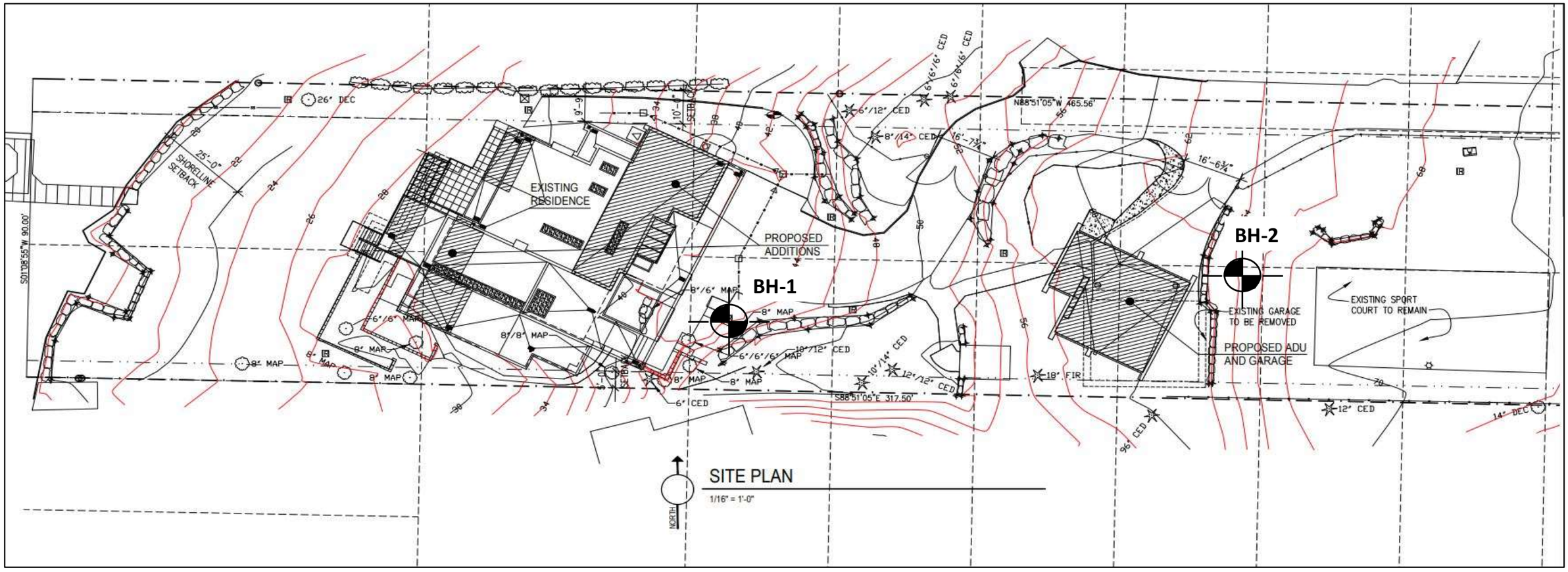
SITE LOCATION MAP

PROPOSED ADDITION
5425 WEST MERCER WAY
MERCER ISLAND, WASHINGTON

SCALE	DATE	MADE	CHKD	JOB NO.	PLATE
NONE	5/20/2023	SH	WC	G-5881	1



LEGEND

BH-1 — **BOREHOLE LOCATION**

PROPOSED ADDITION

Source: City of Kenmore GIS, Last Updated 1/17/2019

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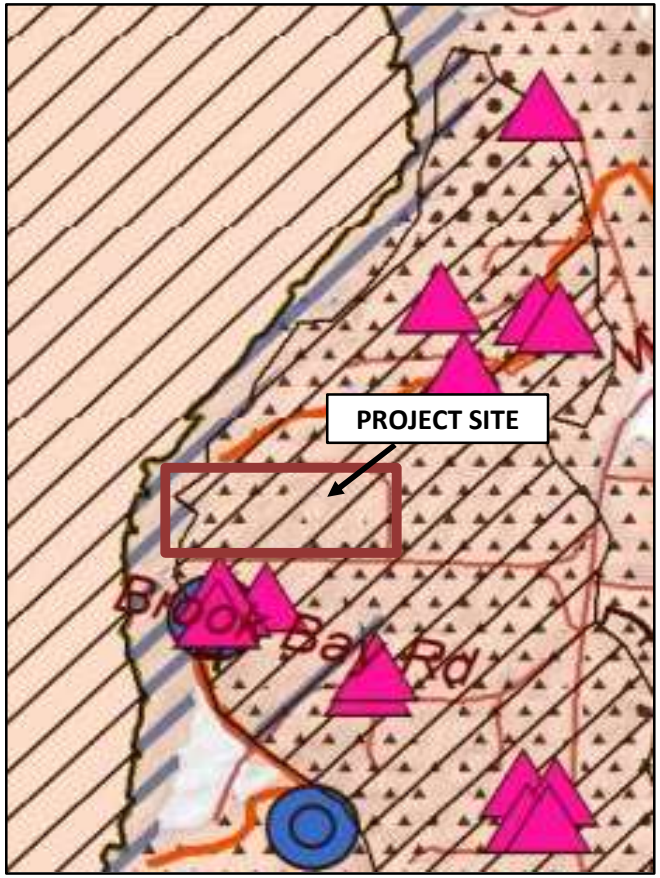
SITE PLAN

PROPOSED ADDITION
5425 WEST MERCER WAY
MERCER ISLAND, WASHINGTON

SCALE	AS SHOWN	DRAWN BY	SH	CHECKED BY	WC	DATE	5/20/2023	PROJECT NO.	G-5881	PLATE	2



Landslide hazard areas include the following mapped areas:

Landslide Hazard		Landslide Hazard Area (Known or Suspect)
		Landslide Hazard Assessment Setback

For all other areas hazard is unknown or unquantified

Supplemental Data

Known Landslides (i,iii)	▲	Identified Landslide Location
		Scarp
		Landslide and Mass Wasting Deposits; subaerial and subaqueous
Slope (v) Class (ix)		Slope 80% and higher
		Slope 40-79%
Potential Slide Area (ii)		Slope 15% and higher, and
		Geologic contact of coarse-grained deposits over fine-grained deposits where slope >= 15%, and
		Area where water less than 10 feet below ground surface based on limited data set (other areas of shallow water present), or

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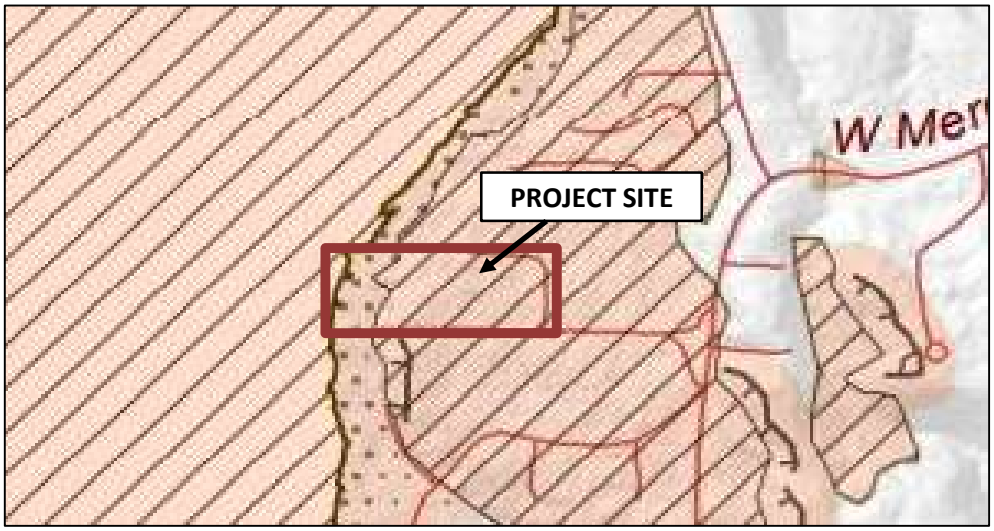
LANDSLIDE HAZARD AREA
PROPOSED ADDITION
5425 WEST MERCER WAY
MERCER ISLAND, WASHINGTON

SCALE:	NO SCALE	**DRAWN:**	SH	**CHECKED:**	WC	**DATE:**	5/20/2023	**PROJECT NO.:**	G-5881	**PLATE**	3



Seismic Hazard	Seismic Hazard Area (Known or Suspect)
For all other areas risk is unknown or limited to ground shaking	
Supplemental Data	
Seismically Hazardous Areas	Potential for seismically induced ground failures including settlement, cracking, lateral spreading, liquefaction due to ground shaking. Seismically hazardous areas include the following: High Potential for seismically induced ground failures (Poorly consolidated, see note below) Moderate Potential for seismically induced ground failures (Moderately consolidated, see note below) Scarp Landslide and Mass Wastage Deposits (subaerial & subaqueous)

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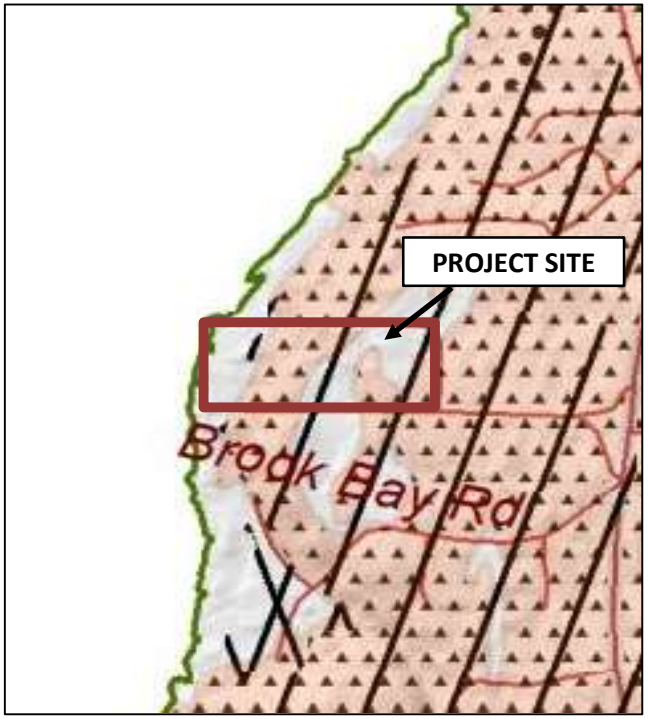
SEISMIC HAZARD AREA
PROPOSED ADDITION
5425 WEST MERCER WAY
MERCER ISLAND, WASHINGTON

SCALE:	NO SCALE	**DRAWN:**	SH	**CHECKED:**	WC	**DATE:**	5/20/2023	**PROJECT NO.:**	G-5881	**PLATE**	4



Erosion Hazard

Erosion Hazard Area (Known or Suspect)

For all other areas, hazard is unknown or unquantified

Supplemental Data

Infiltration Potential

- High - Coarse-grained deposits; e.g. gravel and clean sand
- Medium - Silty, sandy deposits
- Mixed - Interbedded or mixed fine and coarse-grained deposits

Slope Class

- Slope 80+%
- Slope 40-79%
- Slope 15-39%

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EROSION HAZARD AREA

PROPOSED ADDITION
5425 WEST MERCER WAY
MERCER ISLAND, WASHINGTON

SCALE:	NO SCALE	DRAWN:	SH	CHECKED:	WC	DATE:	5/20/2023	PROJECT NO.:	G-5881	PLATE	5

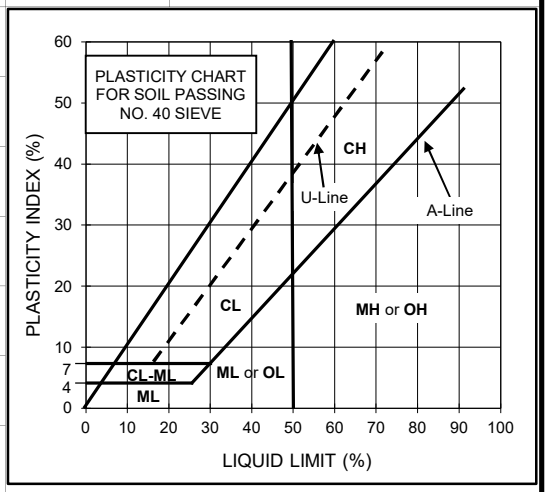
APPENDIX A

USCS Soil Classification Legend & Soil Boring Logs

SOIL CLASSIFICATION & PENETRATION TEST DATA EXPLANATION

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISION			GROUP SYMBOL	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA	
COARSE-GRAINED SOILS	GRAVELS (More Than Half Coarse Fraction is Larger Than No. 4 Sieve)	CLEAN GRAVELS (little or no fines)	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURE, LITTLE OR NO FINES	CONTENT OF FINES BELOW 5%	Cu = (D60 / D10) greater than 4 Cc = $(D30)^2$ / (D10 * D60) between 1 and 3
			GP	POORLY GRADED GRAVELS, AND GRAVEL-SAND MIXTURES LITTLE OR NO FINES		CLEAN GRAVELS NOT MEETING ABOVE REQUIREMENTS
		DIRTY GRAVELS (with some fines)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12%	GM: ATTERBERG LIMITS BELOW "A" LINE. or P.I. LESS THAN 4
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES		GC: ATTERBERG LIMITS ABOVE "A" LINE. or P.I. MORE THAN 7
More Than Half by Weight Larger Than No. 200 Sieve	SANDS (More Than Half Coarse Fraction is Smaller Than No. 4 Sieve)	CLEAN SANDS (little or no fines)	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	CONTENT OF FINES BELOW 5%	Cu = (D60 / D10) greater than 6 Cc = $(D30)^2$ / (D10 * D60) between 1 and 3
			SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES		CLEAN SANDS NOT MEETING ABOVE REQUIREMENTS
		DIRTY SANDS (with some fines)	SM	SILTY SANDS, SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12%	ATTERBERG LIMITS BELOW "A" LINE with P.I. LESS THAN 4
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES		ATTERBERG LIMITS ABOVE "A" LINE with P.I. MORE THAN 7
FINE-GRAINED SOILS	SILTS (Below A-Line on Plasticity Chart, Negligible Organics)	Liquid Limit < 50%	ML	INORGANIC SILTS, ROCK FLOUR, SANDY SILTS OF SLIGHT PLASTICITY		
		Liquid Limit > 50%	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOIL		
	CLAYS (Above A-Line on Plasticity Chart, Negligible Organics)	Liquid Limit < 50%	CL	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAYS, LEAN CLAYS		
		Liquid Limit > 50%	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS		
Less Than Half by Weight Larger Than No. 200 Sieve (i.e., fines)	ORGANIC SILTS & CLAYS (Below A-Line on Plasticity Chart)	Liquid Limit < 50%	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY		
		Liquid Limit > 50%	OH	ORGANIC CLAYS OF HIGH PLASTICITY		
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS		



SOIL PARTICLE SIZE

FRACTION	U.S. STANDARD SIEVE			
	Passing		Retained	
	Sieve	Size (mm)	Sieve	Size (mm)
SILT / CLAY	#200	0.075		
SAND				
FINE	#40	0.425	#200	0.075
MEDIUM	#10	2.00	#40	0.425
COARSE	#4	4.75	#10	2.00
GRAVEL				
FINE	0.75"	19	#4	4.75
COARSE	3"	76	0.75"	19
COBBLES	76 mm to 203 mm			
BOULDERS	> 203 mm			
ROCK FRAGMENTS	> 76 mm			
ROCK	>0.76 cubic meter in volume			

GENERAL GUIDANCE FOR ENGINEERING PROPERTIES OF SOILS, BASED ON STANDARD PENETRATION TEST (SPT) DATA

SANDY SOILS				SILTY & CLAYEY SOILS		
Blow Counts N	Relative Density, %	Friction Angle ϕ, degrees	Description	Blow Counts N	Unconfined Strength q_u, tsf	Description
0 - 4	0 -15		Very Loose	< 2	< 0.25	Very soft
4 - 10	15 - 35	26 - 30	Loose	2 - 4	0.25 - 0.50	Soft
10 - 30	35 - 65	28 - 35	Medium Dense	4 - 8	0.50 - 1.00	Medium Stiff
30 - 50	65 - 85	35 - 42	Dense	8 - 15	1.00 - 2.00	Stiff
> 50	85 - 100	38 - 46	Very Dense	15 - 30	2.00 - 4.00	Very Stiff
				> 30	> 4.00	Hard

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13705 Bel-Red Road Bellevue, WA 98005
Phone (425) 649-8757 E-mail: info@geogrourpnw.com

PLATE A1

BORING NO. B - 1

Logged By: SH Date Drilled: 5/5/2023 Surface Elev. 40

Drilled By: Geologic Drill

Depth ft.	Elevation	USCS Code	Description	Sample Loc.	Sample No.	SPT Blow Counts	Corrected Blow Counts	Moisture Content
1		ML	Brown SILT, very stiff, damp, blocky bedding structure, stained, mottled, depositional features		1	6,10,14 (N=24)		22%
5		ML	Same, very stiff, increasing staining with depth		2	8,11,12 (N=23)		32%
		ML	Same		3	7,10,13 (N=23)		33%
10		ML	Same		4	7,9,14 (N=23)		34%
15		ML	Blue-Grey SILT, very stiff, damp to moist, no staining or color variations observed		5	10,10,14 (N=24)		30%
20		ML	Same, very stiff, increasing moisture with depth		6	9,12,14 (N=26)		27%
25								

LEGEND: 2" O.D. SPT Sampler; 3" O.D. California Sampler; Water Level noted during drilling; Water Level measured at later time, as noted

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BORING LOG

PROPOSED ADDITION
5425 W MERCER WAY
MERCER ISLAND

JOB NO. G-5881 **DATE** 5/12/2023 **PLATE** A2

BORING NO. B - 1

Logged By: SH Date Drilled: 5/5/2023 Surface Elev. 40
Drilled By: Geologic Drill

Depth ft.	Elevation	USCS Code	Description	Sample Loc.	Sample No.	SPT Blow Counts	Water Content %	Other Tests/ Comments
25		ML	Same, very stiff, fine sand obserevd with silt		7	11,13,16 (N=29)		29%
			Depth of boring: 26.5 feet. Drilling Method: Hollow-stem auger. Sampling Method: 2"-O.D. standard penetration test Sampler driven with 140 lb. hammer and cathead. Groundwater not encountered					
30								
35								
40								
45								
50								

LEGEND: 2" O.D. SPT Sampler; 3" O.D. California Sampler; Water Level noted during drilling; Water Level measured at later time, as noted

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

BORING LOG

PROPOSED ADDITION
5425 W MERCER WAY
MERCER ISLAND

JOB NO. G-5881 **DATE** 5/12/2024 **PLATE** A3

BORING NO. B - 2

Logged By: SH Date Drilled: 5/5/2023 Surface Elev. 64

Drilled By: Geologic Drill

Depth ft.	Elevation	USCS Code	Description	Sample Loc.	Sample No.	SPT Blow Counts	Corrected Blow Counts	Moisture Content
1		SM	Dark Brown SILTY SAND, loose, damp, roots, staining, mottling and discoloration		1	1,2,3 (N=5)		34%
5		ML	Light brown SILT, medium stiff, roots, staining, mottling and interbedded layers of discoloration		2	1,4,4 (N=8)		30%
		ML	Light brown-grey SILT, medium stiff, roots, Increasing moisture with depth, less staining with depth		3	3,3,5 (N=8)		30%
10		ML	Same		4	3,3,3 (N=6)		30%
15		ML	Same		5	2,3,4 (N=7)		30%
20		ML	Brown SILT, with some interbedded fine sands, stiff, moist, mottled		6	5,6,7 (N=13)		25%
25								

LEGEND: 2" O.D. SPT Sampler; 3" O.D. California Sampler; Water Level noted during drilling; Water Level measured at later time, as noted

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

BORING LOG

PROPOSED ADDITION
5425 W MERCER WAY
MERCER ISLAND

JOB NO. G-5881 **DATE** 5/12/2023 **PLATE** A4

BORING NO. B - 2

Logged By: SH Date Drilled: 5/5/2023 Surface Elev. 64

Drilled By: Geologic Drill

Depth ft.	Elevation	USCS Code	Description	Sample Loc.	Sample No.	SPT Blow Counts	Water Content %	Other Tests/ Comments
25		ML	Brown SILT, with some interbedded fine sands, hard, damp, mottled		7	12,16,24 (N=40)		38%
30		ML	Blue-Grey SILT, hard, damp			11,17,14 (N=32)		26%
			Depth of boring: 01.5 feet. Drilling Method: Hollow-stem auger. Sampling Method: 2"-O.D. standard penetration test Sampler driven with 140 lb. hammer and cathead. Groundwater not encountered					
35								
40								
45								
50								

LEGEND: 2" O.D. SPT Sampler; 3" O.D. California Sampler; Water Level noted during drilling; Water Level measured at later time, as noted

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

BORING LOG

PROPOSED ADDITION
5425 W MERCER WAY
MERCER ISLAND

JOB NO. G-5881 **DATE** 5/12/2023 **PLATE** A5