Cobalt Geosciences, LLC
P.O. Box 1792
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April 24, 2025
Updated May 18, 2025

Lana Fauser
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RE: Geotechnical Evaluation
Proposed Additions
9640 SE 61st Place
Mercer Island, Washington

In accordance with your authorization, Cobalt Geosciences, LLC has prepared this report to discuss the results of our geotechnical evaluation at the referenced site.

The purpose of our evaluation was to provide recommendations for foundation design, grading, and earthwork.

Site & Project Description

The site is located at 9640 SE 61st Place in Mercer Island, Washington. The site consists of one irregularly shaped parcel (No. 4260000060) with a total area of 14,275 square feet.

The central portion of the property is developed with a residence with a daylight basement and driveway. The remainder of the property is vegetated with grasses, bushes, and sparse trees. According to City of Mercer Island Maps the site contains potential landslide and erosion hazard areas.

The site generally slopes downward from east to west at variable magnitudes ranging from about 5 to 50 percent and relief of about 55 feet. Most areas have been graded and faced with modular block or basement walls. Block walls are locally terraced with heights of 4 feet or less for individual walls.

The site is bordered to the east by Lake Washington and a residential property, to the south by a shared private road, and to the west and north by residential properties.

The proposed development includes a second story addition and a new deck. Site grading may include cuts and fills of 3 feet or less and foundation loads for the deck are expected to be light.

We should be provided with the final plans to verify that our recommendations remain valid and do not require updating.

Area Geology

The Geologic Map of Mercer Island, indicates that the site is near the contacts between Pre-Olympia glacial till, Pre-Olympia coarse-grained glacial deposits, and Pre-Olympia coarse-grained nonglacial deposits.

These deposits typically consist of coarse grained trace to silty-fine sand with gravel and cobble. These materials are typically dense to very dense below a weathered zone.

Soil & Groundwater Conditions

As part of our evaluation, we drilled two hollow stem auger borings where accessible.

Disturbed soil samples were obtained during drilling by using the Standard Penetration Test (SPT) as described in ASTM D-1586. The Standard Penetration Test and sampling method consists of driving a standard 2-inch outside-diameter, split barrel sampler into the subsoil with a 140-pound hammer free falling a vertical distance of 30 inches. The summation of hammer-blows required to drive the sampler the final 12-inches of an 18-inch sample interval is defined as the Standard Penetration Resistance, or N-value. The blow count is presented graphically on the boring logs in this appendix. The resistance, or "N" value, provides a measure of the relative density of granular soils or of the relative consistency of cohesive soils.

The soils encountered were logged in the field and are described in accordance with the Unified Soil Classification System (USCS).

The borings encountered approximately 6 inches of topsoil underlain by approximately 3 to 4 feet of loose to medium dense, silty-fine to medium grained sand trace gravel (Possible Fill over Weathered Glacial Till). These materials were underlain by dense to very dense, silty-fine to medium grained sand with gravel (Glacial Till), which continued to the termination depths of the explorations.

Groundwater was not observed or encountered in the borings. Based on our observations and nearby historic explorations to the east, groundwater can become perched on the denser till during the wet season with more persistent groundwater at or near the elevation of the adjacent Lake Washington.

Water table elevations often fluctuate over time. The groundwater level will depend on a variety of factors that may include seasonal precipitation, irrigation, land use, climatic conditions and soil permeability. Water levels at the time of the field investigation may be different from those encountered during the construction phase of the project. It would be necessary to install a piezometer to determine groundwater depths over a typical year.

City of Mercer Island GIS Mapped Hazards

The City of Mercer Island GIS maps indicate that the site contains a potential slide and erosion hazard area. These designations are likely present due to the mapped geologic units, which can exhibit pre-historic landslide features in some areas.

Based on our explorations and explorations from adjacent properties, this area is underlain by dense till-like soils and not landslide or mass wastage deposits. The risk of soil movements in this area is very low. Mitigation is not warranted.

Environmentally Critical Area Assessment

As part of our report preparation, we assessed the site for potential critical areas utilizing the City of Mercer Island geologic hazard map available on-line. As noted above, there is minimal to no risk associated with the mapped hazards. Discussion of code information is as follows:

The City of Mercer Island municipal code requires the following for a critical areas study:

Disclosure of the presence of critical areas, including a delineation and type or category of critical area, on the development proposal site and any mapped or identifiable critical areas on or off site within the distance equal to the largest potential required buffer applicable to the development proposal area on the applicant's property;

The subject site is described as possessing an erosion hazard and potential slide hazards. Potential slide hazards may be based on geologic mapping which shows potential mass wastage deposits in this area.

Low magnitude slopes within and near the site appear to be associated with past legal grading activities, where slopes in the overall neighborhood were flattened and terraced into lots and buildable areas. The area has low magnitude slopes overall with retaining walls.

Erosion hazards are present likely based on magnitudes of more than 15 percent and soil type (mapped type).

A topographic and boundary survey;

We have provided a site plan with topographic information and topographic survey.

A statement specifying the accuracy of the report and all assumptions made and relied upon;

This report can be relied upon for design of the proposed additions in our professional opinion. The report was authored with site-specific information obtained through subsurface explorations and site reconnaissance.

A description of the methodologies used to conduct the critical area study, including references;

Cobalt representatives were on-site in March and April 2025 to obtain subsurface data through drilling and observation of surrounding the existing residential structure. We also reviewed the geologic maps for the region (Geologic Map of Mercer Island), and the NRCS Soil Survey.

A scale map of the development proposal site;

We have provided a site plan.

Photographic records of the site before the proposed alteration occurs;

We have included photographs with this report.

An assessment of the probable effects to critical areas and associated buffers, including impacts caused by the development proposal and associated alterations to the subject property and impacts to other properties and any critical areas or buffers located on them resulting from the development of the site and the proposed development;

We have analyzed the proposed site development from a slope stability hazard standpoint and with respect to mapped erosion hazards. The additions/construction will not increase instability on and around the subject site. Additionally, the distance from slope hazard areas/slopes on the subject site will remain similar to what is currently present and will not result in any alteration in the stability characteristics of the slopes on and off-site. Erosion hazards are very low based on soil density and low magnitude topography and do not require mitigation.

A description of mitigation sequencing implementation described in section 19.07.100 including steps taken to avoid and minimize critical areas impacts to the greatest extent feasible;

In our opinion, provided best management practices (BMPs) are utilized during and after construction for stormwater management and erosion control measures, there will be no impacts to the critical areas on the site.

Detailed studies, as required by this chapter, for individual critical area types in order to ensure critical area protection;

We have evaluated the slopes on the subject site and based on our observations, the slopes are stable in their current condition and configuration. The primary basis for this opinion is the lack of indications of prior instability, dense soil conditions without evidence of mass wastage materials, and the fact that there are no planned alterations for the slopes dictated as possessing an erosion and landslide hazard.

There will be no net-gain in surcharge conditions on the subject slopes. Erosion hazard risks are currently very low based on a lack of topography and will not be affected by the development.

Assessment of potential impacts that may occur on adjacent sites, such as sedimentation or erosion, where applicable; and

We have evaluated the currently available plan, and there will be no change in the sedimentation or erosion risks on adjacent sites given BMPs are employed during and after construction.

The mapped landslide and erosion hazards will not be affected by the development as these risks are very low and grading will be minimal. No mitigation is required.

A post-design memorandum prepared by a qualified professional confirming that the proposed improvements comply with the design recommendations.

We can provide this letter upon request and once the project is complete.

Statement of Risk

Per Section 19.07.160B2 of the Mercer Island City Code, development within geologic hazard areas require that a Geotechnical Engineer licensed within the State of Washington provide 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 the public health, safety and welfare.

The project meets the criteria of b from above. The soil conditions are not consistent with potential landslide hazard areas or erosion hazard areas. The dense till-like soils at shallow depths are resistant to instability as well as erosion due to high shear strength and fines content.

Erosion Hazard

The Natural Resources Conservation Services (NRCS) maps for King County indicate that the site is underlain by Kitsap silt loam (15 to 30 percent slopes). Based on our experience, the site soils would have a slight to moderate erosion potential in a disturbed state depending on the slope magnitude.

It is our opinion that soil erosion potential at this project site can be reduced through landscaping and surface water runoff control. Typically, erosion of exposed soils will be most noticeable during periods of rainfall and may be controlled by the use of normal temporary erosion control measures, such as silt fences, hay bales, mulching, control ditches and diversion trenches. The typical wet weather season, with regard to site grading, is from October 31st to April 1st. Erosion control measures should be in place before the onset of wet weather.

Seismic Hazard

The overall subsurface profile corresponds to a Site Class *D* as defined by Table 1613.5.2 of the International Building Code (IBC). A Site Class *D* applies to an overall profile consisting of medium dense to very dense soils within the upper 100 feet.

We referenced the U.S. Geological Survey (USGS) Earthquake Hazards Program Website to obtain values for S_S, S_1, F_a, and F_v. The USGS website includes the most updated published data on seismic conditions. The following tables provide seismic parameters from the USGS web site with referenced parameters from ASCE 7-16 and ASCE 7-22.

Seismic Design Parameters (ASCE 7-16)

Site Class	Spectral Acceleration at 0.2 sec. (g)	Spectral Acceleration at 1.0 sec. (g)	Site Coefficients		Design Spectral Response Parameters		Design PGA
			F_a	F_v	S_{DS}	S_{D1}	
D	1.448	0.502	1.0	Null	0.966	Null	0.62

Seismic Design Parameters (ASCE 7-22)

Site Class	Spectral Acceleration at 0.2 sec. (g)	Spectral Acceleration at 1.0 sec. (g)	Site Coefficients		Design Spectral Response Parameters		Design PGA_M
			F_a	F_v	S_{DS}	S_{D1}	
D	1.61	0.63	Null	Null	1.14	Null	0.73

Additional seismic considerations include liquefaction potential and amplification of ground motions by soft/loose soil deposits. The liquefaction potential is highest for loose sand with a high groundwater table. The site has a low likelihood of liquefaction. For items listed as "Null" see Section 11.4.8 of the ASCE.

Conclusions and Recommendations

General

The site is underlain by glacial till which becomes denser with depth. Dense soils are generally present within a few feet of the ground surface in this area (other than areas underlain by wall backfill).

The proposed deck may be supported on a shallow foundation system bearing on medium dense or firmer native soils or on structural fill placed on the native soils. Local overexcavation of loose weathered native soils may be necessary depending on the proposed elevations and locations of the new footings.

Footings should be embedded an adequate depth to avoid surcharging any walls. A 1H:1V envelope should be maintained from the base of new footings to the back of any walls at their base.

Foundation Design

The proposed deck may be supported on a shallow spread footing foundation system bearing on undisturbed medium dense or firmer native soils or on properly compacted structural fill placed on the suitable native soils. Any undocumented fill and/or loose native soils should be removed and replaced with structural fill below foundation elements.

Structural fill below footings should consist of clean angular rock 5/8 to 4 inches in size. We should verify soil conditions during foundation excavation work.

For shallow foundation support, we recommend widths of at least 16 and 24 inches, respectively, for continuous wall and isolated column footings supporting the proposed deck. Provided that the footings are supported as recommended above, a net allowable bearing pressure of 2,000 pounds per square foot (psf) may be used for design.

A 1/3 increase in the above value may be used for short duration loads, such as those imposed by wind and seismic events. Structural fill placed on bearing, native subgrade should be compacted to at least 95 percent of the maximum dry density based on ASTM Test Method D1557. Footing excavations should be inspected to verify that the foundations will bear on suitable material.

Exterior footings should have a minimum depth of 18 inches below pad subgrade (soil grade) or adjacent exterior grade, whichever is lower. Interior footings should have a minimum depth of 12 inches below pad subgrade (soil grade) or adjacent exterior grade, whichever is lower.

If constructed as recommended, the total foundation settlement is not expected to exceed 1 inch. Differential settlement, along a 25-foot exterior wall footing, or between adjoining column footings, should be less than ½ inch. This translates to an angular distortion of 0.002. Most settlement is expected to occur during construction, as the loads are applied. However, additional post-construction settlement may occur if the foundation soils are flooded or saturated. All footing excavations should be observed by a qualified geotechnical consultant.

Resistance to lateral footing displacement can be determined using an allowable friction factor of 0.40 acting between the base of foundations and the supporting subgrades. Lateral resistance for footings can also be developed using an allowable equivalent fluid passive pressure of 250 pounds per cubic foot (pcf) acting against the appropriate vertical footing faces (neglect the upper 12 inches below grade in exterior areas). The frictional and passive resistance of the soil may be combined without reduction in determining the total lateral resistance.

Care should be taken to prevent wetting or drying of the bearing materials during construction. Any extremely wet or dry materials, or any loose or disturbed materials at the bottom of the footing excavations, should be removed prior to placing concrete. The potential for wetting or drying of the bearing materials can be reduced by pouring concrete as soon as possible after completing the footing excavation and evaluating the bearing surface by the geotechnical engineer or his representative.

Erosion and Sediment Control

Erosion and sediment control (ESC) is used to reduce the transportation of eroded sediment to wetlands, streams, lakes, drainage systems, and adjacent properties. Erosion and sediment control measures should be implemented, and these measures should be in general accordance with local regulations. At a minimum, the following basic recommendations should be incorporated into the design of the erosion and sediment control features for the site:

- Schedule the soil, foundation, utility, and other work requiring excavation or the disturbance of the site soils, to take place during the dry season (generally May through September). However, provided precautions are taken using Best Management Practices (BMP's), grading activities can be completed during the wet season (generally October through April).
- All site work should be completed and stabilized as quickly as possible.
- Additional perimeter erosion and sediment control features may be required to reduce the possibility of sediment entering the surface water. This may include additional silt fences, silt fences with a higher Apparent Opening Size (AOS), construction of a berm, or other filtration systems.
- Any runoff generated by dewatering discharge should be treated through construction of a sediment trap if there is sufficient space. If space is limited other filtration methods will need to be incorporated.

CLOSURE

This report was prepared for the exclusive use of Lana Fauser and her appointed consultants. Any use of this report or the material contained herein by third parties, or for other than the intended purpose, should first be approved in writing by Cobalt Geosciences, LLC.

The recommendations contained in this report are based on assumed continuity of soils with those of our test holes and assumed structural loads. Cobalt Geosciences should be provided with final architectural and civil drawings when they become available in order that we may review our design recommendations and advise of any revisions, if necessary.

Use of this report is subject to the Statement of General Conditions provided in Appendix A. It is the responsibility of Lana Fauser who is identified as "the Client" within the Statement of General Conditions, and its agents to review the conditions and to notify Cobalt Geosciences should any of these not be satisfied.

Sincerely,

Cobalt Geosciences, LLC

5/18/2025
Phil Haberman, PE, LG, LEG
Principal

Statement of General Conditions

USE OF THIS REPORT: This report has been prepared for the sole benefit of the Client or its agent and may not be used by any third party without the express written consent of Cobalt Geosciences and the Client. Any use which a third party makes of this report is the responsibility of such third party.

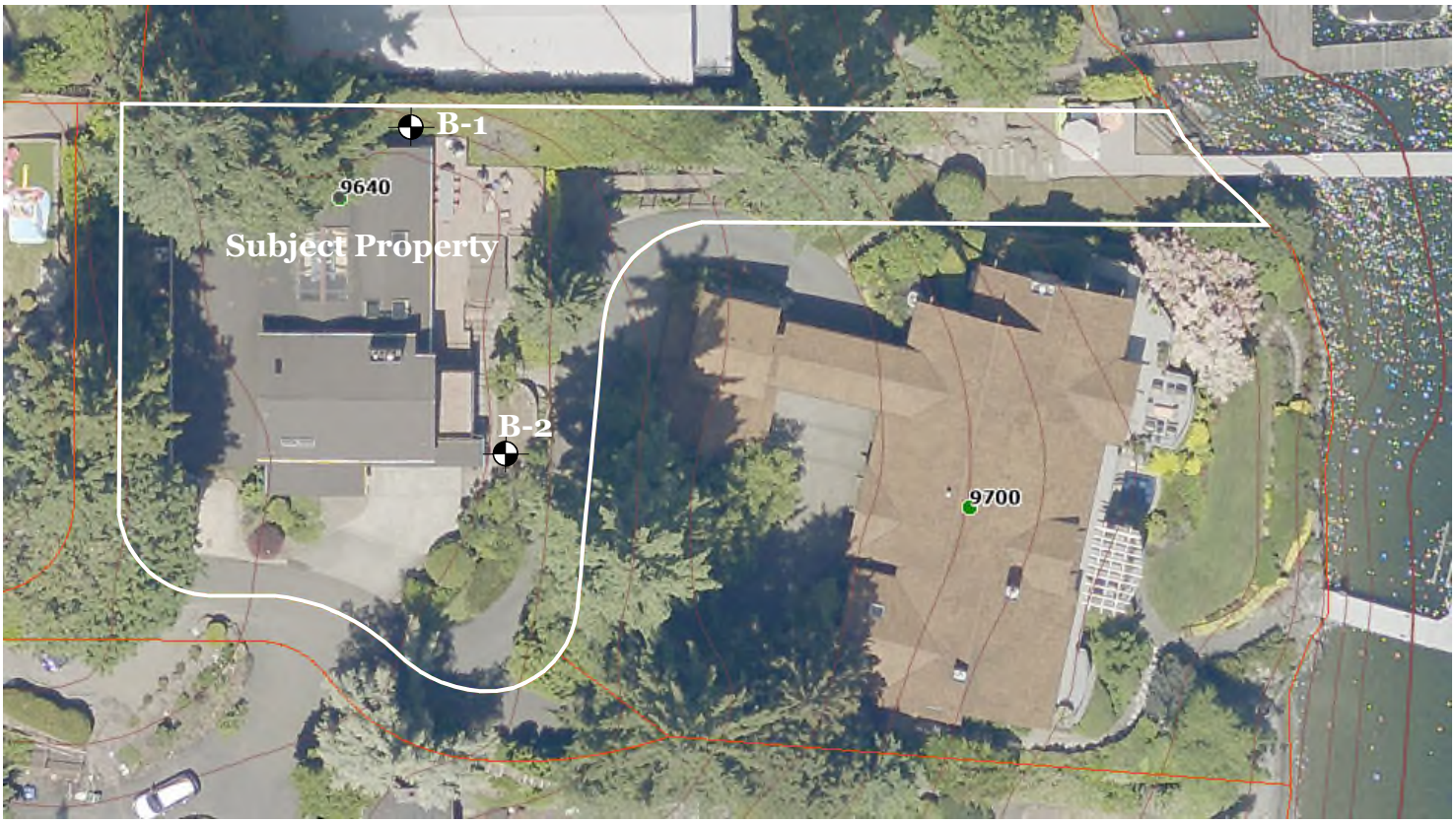
BASIS OF THE REPORT: The information, opinions, and/or recommendations made in this report are in accordance with Cobalt Geosciences present understanding of the site specific project as described by the Client. The applicability of these is restricted to the site conditions encountered at the time of the investigation or study. If the proposed site specific project differs or is modified from what is described in this report or if the site conditions are altered, this report is no longer valid unless Cobalt Geosciences is requested by the Client to review and revise the report to reflect the differing or modified project specifics and/or the altered site conditions.

STANDARD OF CARE: Preparation of this report, and all associated work, was carried out in accordance with the normally accepted standard of care in the state of execution for the specific professional service provided to the Client. No other warranty is made.

INTERPRETATION OF SITE CONDITIONS: Soil, rock, or other material descriptions, and statements regarding their condition, made in this report are based on site conditions encountered by Cobalt Geosciences at the time of the work and at the specific testing and/or sampling locations. Classifications and statements of condition have been made in accordance with normally accepted practices which are judgmental in nature; no specific description should be considered exact, but rather reflective of the anticipated material behavior. Extrapolation of in situ conditions can only be made to some limited extent beyond the sampling or test points. The extent depends on variability of the soil, rock and groundwater conditions as influenced by geological processes, construction activity, and site use.

VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Cobalt Geosciences must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments of the report conclusions or recommendations are required. Cobalt Geosciences will not be responsible to any party for damages incurred as a result of failing to notify Cobalt Geosciences that differing site or sub-surface conditions are present upon becoming aware of such conditions.

PLANNING, DESIGN, OR CONSTRUCTION: Development or design plans and specifications should be reviewed by Cobalt Geosciences, sufficiently ahead of initiating the next project stage (property acquisition, tender, construction, etc), to confirm that this report completely addresses the elaborated project specifics and that the contents of this report have been properly interpreted. Specialty quality assurance services (field observations and testing) during construction are a necessary part of the evaluation of sub-subsurface conditions and site preparation works. Site work relating to the recommendations included in this report should only be carried out in the presence of a qualified geotechnical engineer; Cobalt Geosciences cannot be responsible for site work carried out without being present.



Approximate Boring Location

B-1

King County imap Image

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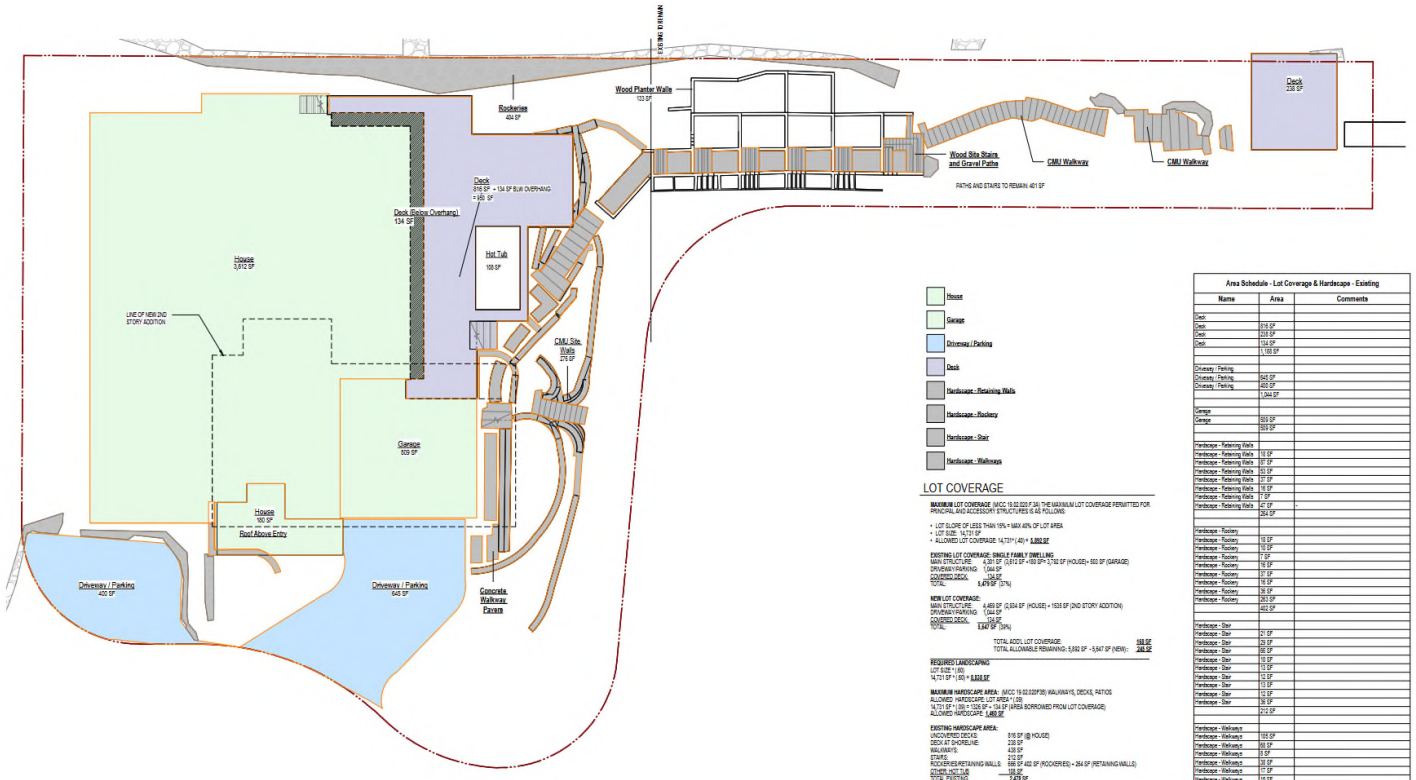
COBALT GEOSCIENCES	Proposed Additions 9640 SE 61st Place Mercer Island, Washington	**Site Image** **Figure 1**	Cobalt Geosciences, LLC P.O. Box 82243 Kenmore, WA 98028 (206) 331-1097 www.cobaltgeo.com cobaltgeo@gmail.com



Existing conditions

1 EXISTING LOT COVERAGE & HARDSCAPE
1/8" = 1'-0"

House
Garage
Driveway / Parking
Deck
Hardscape - Retaining Walls
Hardscape - Rockery
Hardscape - Stair
Hardscape - Walkways

LOT COVERAGE

MAXIMUM LOT COVERAGE (MCC 19.02.020.F.3A) THE MAXIMUM LOT COVERAGE PERMITTED FOR PRINCIPAL AND ACCESSORY STRUCTURES IS AS FOLLOWS:

- LOT SLOPE OF LESS THAN 15% + MAX 40% OF LOT AREA
- LOT SIZE: 14,731 SF
- ALLOWED LOT COVERAGE: 14,731* (.40) + 2,282 SF

EXISTING LOT COVERAGE: SINGLE FAMILY DWELLING
MAIN STRUCTURE: 4,391 SF (3,812 SF + 169 SF+ 3,782 SF (HOUSE)+ 609 SF (GARAGE)
DRIVEWAY/PARKING: 1,044 SF
COVERED DECK: 238 SF
TOTAL: 5,479 SF (37%)

NEW LOT COVERAGE:
MAIN STRUCTURE: 4,469 SF (2,934 SF (HOUSE) + 1535 SF (2ND STORY ADDITION)
DRIVEWAY/PARKING: 1,044 SF
COVERED DECK: 158 SF
TOTAL: 5,647 SF (38%)

TOTAL ADDL LOT COVERAGE: 168 SF
TOTAL ALLOWABLE REMAINING: 5,682 SF - 5,647 SF (NEW): 240 SF

REQUIRED LANDSCAPING
LOT SIZE * (.65)
14,731 SF * (.65) = 9,574 SF

MAXIMUM HARDSCAPE AREA: (MCC 19.02.020F(3B) WALKWAYS, DECKS, PATIOS
ALLOWED: HARDSCAPE LOT AREA * (.05)
14,731 SF * (.05) = 1536 SF + 134 SF (AREA BORROWED FROM LOT COVERAGE)
ALLOWED HARDSCAPE: 1,670 SF

EXISTING HARDSCAPE AREA:
UNCOVERED DECKS: 816 SF (@ HOUSE)
DECK AT SHORELINE: 238 SF
WALKWAYS: 438 SF
STAIRS: 212 SF
ROCKERIES/RETAINING WALLS: 668 SF 402 SF (ROCKERIES) + 264 SF (RETAINING WALLS)
COVER, HOT TUB: 105 SF
TOTAL EXISTING: 2,478 SF

TOTAL OVER ALLOWED: 1016 SF (72%)

HARDSCAPE AREA REMOVED:
(EXISTING HARDSCAPE: 2,478 SF
HARDSCAPE AREA REMAINING: -819 SF
EXISTING DECK REMOVED: -160 SF
EXISTING INCT SUB REMOVED: -168 SF
1,573 SF HARDSCAPE REMAINING

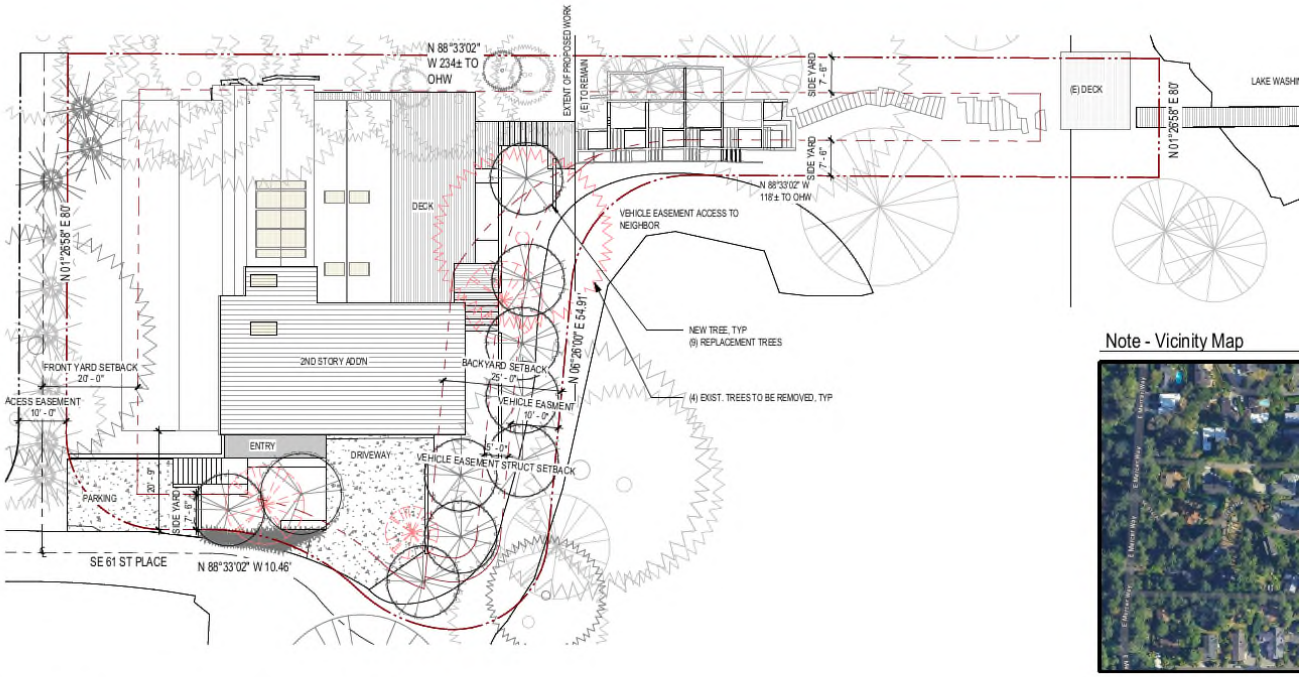
NEW HARDSCAPE:
REMAINING HARDSCAPE: 1573 SF
NEW UNCOVERED DECK: 772 SF
NEW WALKWAYS: 391 SF
NEW STAIRS: 171 SF
NEW RETAINING WALLS: 194 SF
MEDICINE BENCHES: 73 SF
TOTAL NEW: 3,163 SF

TOTAL OVER ALLOWED: 1,723 SF (118 %)

MCC 19.01.060 F(3B) WHERE MAX. HARDSCAPE IS EXCEEDED, TWO SQUARE FEET OF LEGALLY EXISTING HARDSCAPE REMOVED FOR EVERY ONE SQUARE FOOT OF NEW HARDSCAPE

Area Schedule - Lot Coverage & Hardscape - Existing

Name	Area	Comments
Deck		
Deck	816 SF	
Deck	238 SF	
Deck	134 SF	
	1,188 SF	
Driveway / Parking		
Driveway / Parking	645 SF	
Driveway / Parking	400 SF	
	1,044 SF	
Garage		
Garage	609 SF	
	609 SF	
Hardscape - Retaining Walls		
Hardscape - Retaining Walls	18 SF	
Hardscape - Retaining Walls	187 SF	
Hardscape - Retaining Walls	63 SF	
Hardscape - Retaining Walls	37 SF	
Hardscape - Retaining Walls	116 SF	
Hardscape - Retaining Walls	7 SF	
Hardscape - Retaining Walls	67 SF	
	264 SF	
Hardscape - Rockery		
Hardscape - Rockery	18 SF	
Hardscape - Rockery	10 SF	
Hardscape - Rockery	7 SF	
Hardscape - Rockery	18 SF	
Hardscape - Rockery	37 SF	
Hardscape - Rockery	18 SF	
Hardscape - Rockery	36 SF	
Hardscape - Rockery	261 SF	
	402 SF	
Hardscape - Stair		
Hardscape - Stair	21 SF	
Hardscape - Stair	29 SF	
Hardscape - Stair	66 SF	
Hardscape - Stair	10 SF	
Hardscape - Stair	13 SF	
Hardscape - Stair	12 SF	
Hardscape - Stair	13 SF	
Hardscape - Stair	12 SF	
Hardscape - Stair	36 SF	
	212 SF	
Hardscape - Walkways		
Hardscape - Walkways	105 SF	
Hardscape - Walkways	66 SF	
Hardscape - Walkways	8 SF	
Hardscape - Walkways	36 SF	
Hardscape - Walkways	17 SF	
Hardscape - Walkways	17 SF	
Hardscape - Walkways	18 SF	
Hardscape - Walkways	16 SF	
Hardscape - Walkways	13 SF	
Hardscape - Walkways	9 SF	
Hardscape - Walkways	21 SF	
Hardscape - Walkways	80 SF	
Hardscape - Walkways	9 SF	
Hardscape - Walkways	18 SF	
Hardscape - Walkways	15 SF	
Hardscape - Walkways	14 SF	
Hardscape - Walkways	18 SF	
	439 SF	
House		
House	3,812 SF	
House	169 SF	
	3,782 SF	
Grand total: 48	7,949 SF	



Note - Vicinity Map

Site Plan
1/16" = 1'-0"
4" 8' 16' 32'

Provided Site Plan
Approximate Scale 1"=40'

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COBALT GEOSCIENCES

Proposed Additions
9640 SE 61st Place
Mercer Island, Washington

Site Plan

Figure 2

Cobalt Geosciences, LLC
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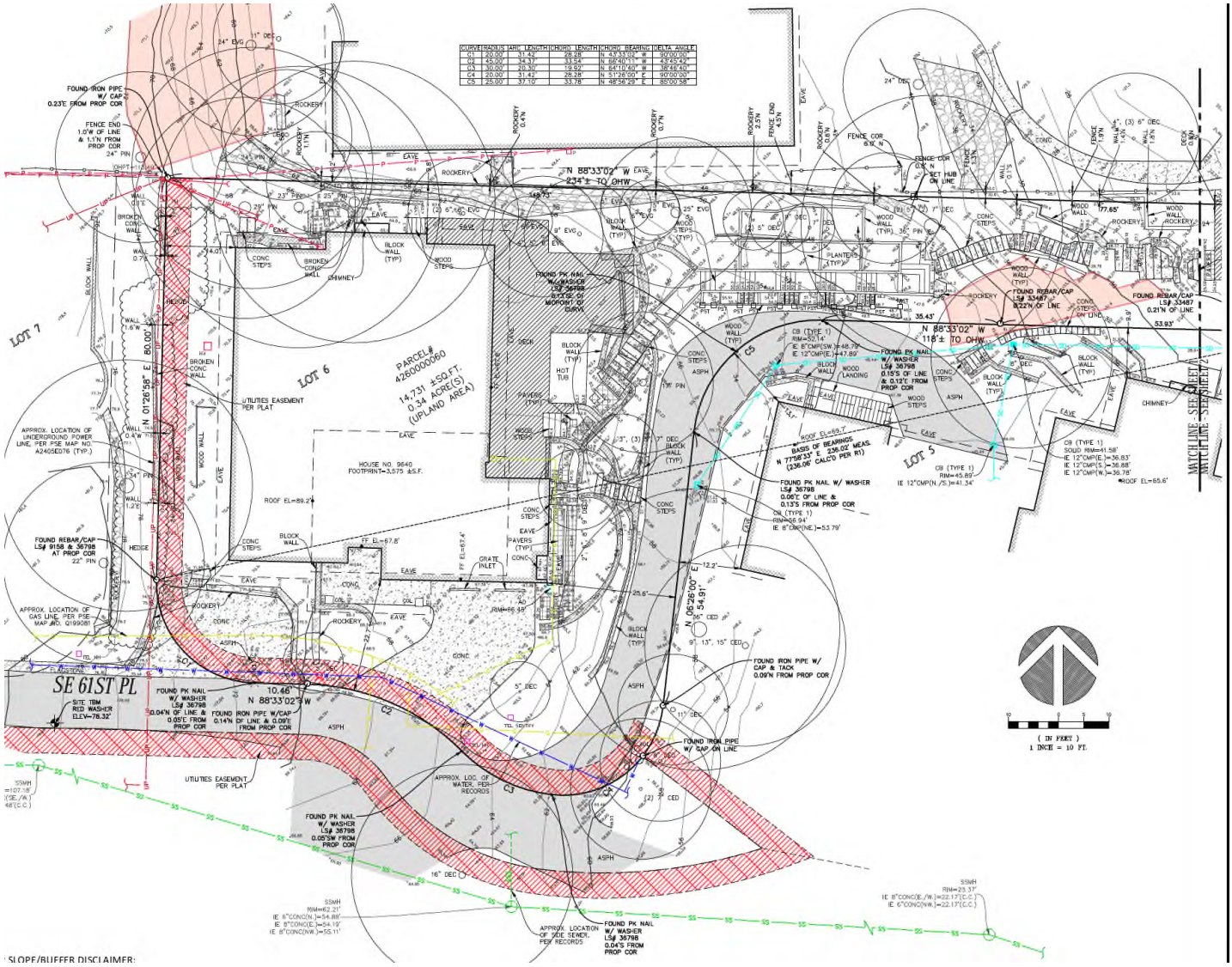

Provided topographic survey

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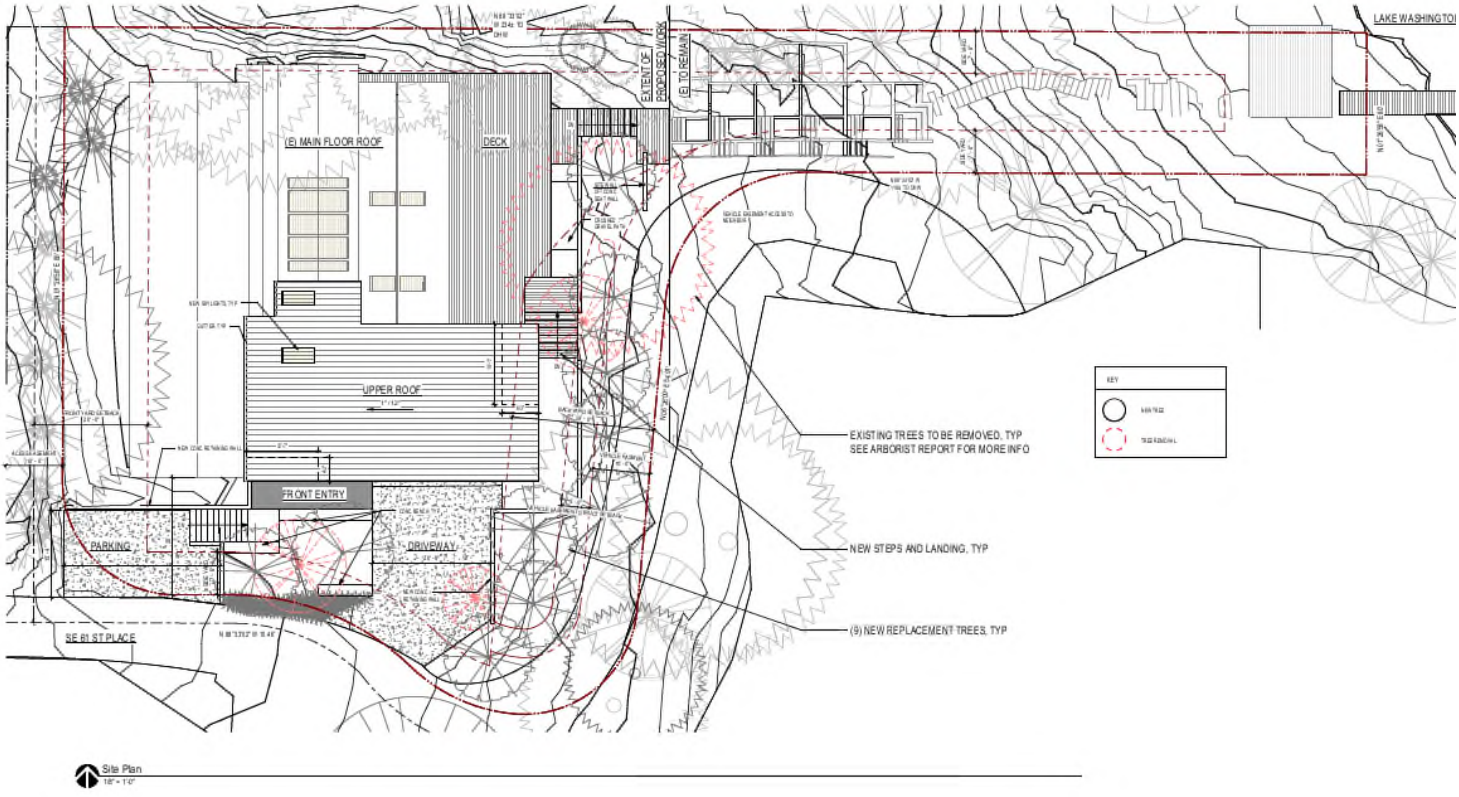
COBALT GEOSCIENCES	Proposed Additions 9640 SE 61st Place Mercer Island, Washington	**Site Plan** **Figure 3**	Cobalt Geosciences, LLC P.O. Box 82243 Kenmore, WA 98028 (206) 331-1097 www.cobaltgeo.com cobaltgeo@gmail.com



Additional site plan

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COBALT GEOSCIENCES	Proposed Additions 9640 SE 61st Place Mercer Island, Washington	**Site Plan** **Figure 4**	Cobalt Geosciences, LLC P.O. Box 82243 Kenmore, WA 98028 (206) 331-1097 www.cobaltgeo.com cobaltgeo@gmail.com

Eastern portion of residence

Looking east and northeast from residence

Looking north into property

Property on right

COBALT GEOSCIENCES

Proposed Additions
9640 SE 61st Place
Mercer Island, Washington

Site Photos

Cobalt Geosciences, LLC
P.O. Box 82243
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Unified Soil Classification System (USCS)

MAJOR DIVISIONS			SYMBOL	TYPICAL DESCRIPTION
COARSE GRAINED SOILS (more than 50% retained on No. 200 sieve)	Gravels (more than 50% of coarse fraction retained on No. 4 sieve)	Clean Gravels (less than 5% fines)	GW	Well-graded gravels, gravels, gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines
		Gravels with Fines (more than 12% fines)	GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	Sands (50% or more of coarse fraction passes the No. 4 sieve)	Clean Sands (less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
			SP	Poorly graded sand, gravelly sands, little or no fines
		Sands with Fines (more than 12% fines)	SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures
FINE GRAINED SOILS (50% or more passes the No. 200 sieve)	Silts and Clays (liquid limit less than 50)	Inorganic	ML	Inorganic silts of low to medium plasticity, sandy silts, gravelly silts, or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays silty clays, lean clays
		Organic	OL	Organic silts and organic silty clays of low plasticity
	Silts and Clays (liquid limit 50 or more)	Inorganic	MH	Inorganic silts, micaceous or diatomaceous fine sands or silty soils, elastic silt
			CH	Inorganic clays of medium to high plasticity, sandy fat clay, or gravelly fat clay
		Organic	OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor		PT	Peat, humus, swamp soils with high organic content (ASTM D4427)

Classification of Soil Constituents

MAJOR constituents compose more than 50 percent, by weight, of the soil. Major constituents are capitalized (i.e., SAND).

Minor constituents compose 12 to 50 percent of the soil and precede the major constituents (i.e., silty SAND). Minor constituents preceded by "slightly" compose 5 to 12 percent of the soil (i.e., slightly silty SAND).

Trace constituents compose 0 to 5 percent of the soil (i.e., slightly silty SAND, trace gravel).

Grain Size Definitions

Description	Sieve Number and/or Size
Fines	<#200 (0.08 mm)
Sand	
-Fine	#200 to #40 (0.08 to 0.4 mm)
-Medium	#40 to #10 (0.4 to 2 mm)
-Coarse	#10 to #4 (2 to 5 mm)
Gravel	
-Fine	#4 to 3/4 inch (5 to 19 mm)
-Coarse	3/4 to 3 inches (19 to 76 mm)
Cobbles	3 to 12 inches (75 to 305 mm)
Boulders	>12 inches (305 mm)

Relative Density (Coarse Grained Soils)

N, SPT, Blows/FT	Relative Density
0 - 4	Very loose
4 - 10	Loose
10 - 30	Medium dense
30 - 50	Dense
Over 50	Very dense

Consistency (Fine Grained Soils)

N, SPT, Blows/FT	Relative Consistency
Under 2	Very soft
2 - 4	Soft
4 - 8	Medium stiff
8 - 15	Stiff
15 - 30	Very stiff
Over 30	Hard

Moisture Content Definitions

Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, from below water table

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Soil Classification Chart

Figure C1

Log of Boring B-1

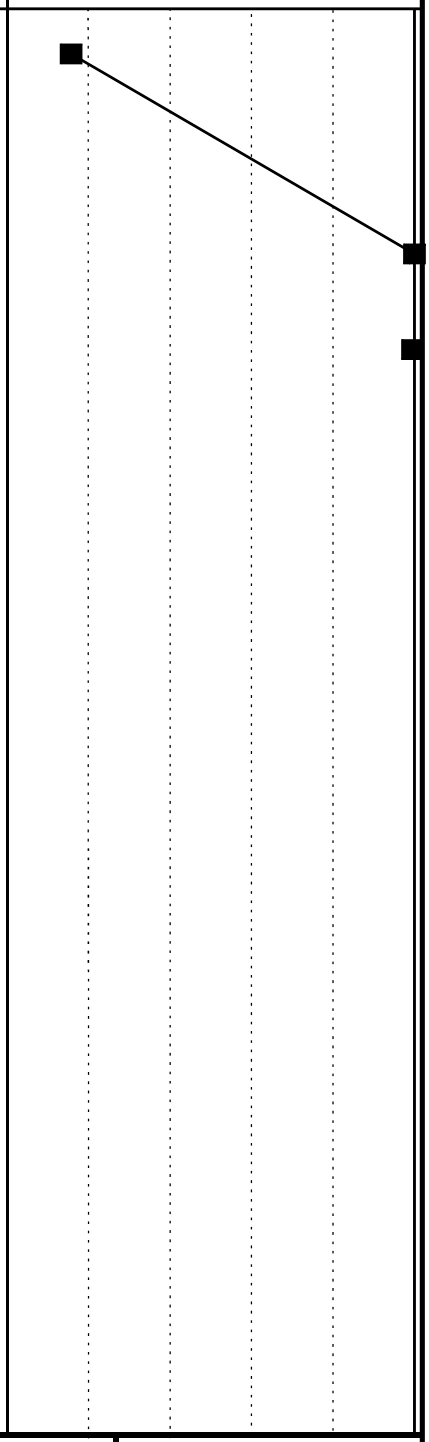
Date: April 2025	Depth: 9'	Initial Groundwater: None
Contractor: Geo	Elevation:	Sample Type: Split Spoon
Method: Hollow Stem Auger	Logged By: PH Checked By: PH	Final Groundwater: None

Depth (Feet)	Interval	% Recovery	Blows/6"	Graphic Log	USCS Symbol	Material Description
			3			Vegetation/Topsoil
2			4 5		SM	Loose to medium dense, silty-fine to medium grained sand trace to with gravel, mottled yellowish brown to grayish brown, moist. (Possible Fill over Weathered Glacial Till)
4					SM	Dense to very dense, silty-fine to medium grained sand trace to with gravel, grayish brown, moist. (Glacial Till)
6			18 25 35			
8			35 42 50			
10						End of Boring 9' Refusal
12						
14						
16						
18						
20						
22						
24						
26						
28						
30						
32						
34						

Groundwater

Moisture Content (%)
Plastic Limit — Liquid Limit

SPT N-Value
0 10 20 30 40 50



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Boring Log

Log of Boring B-2

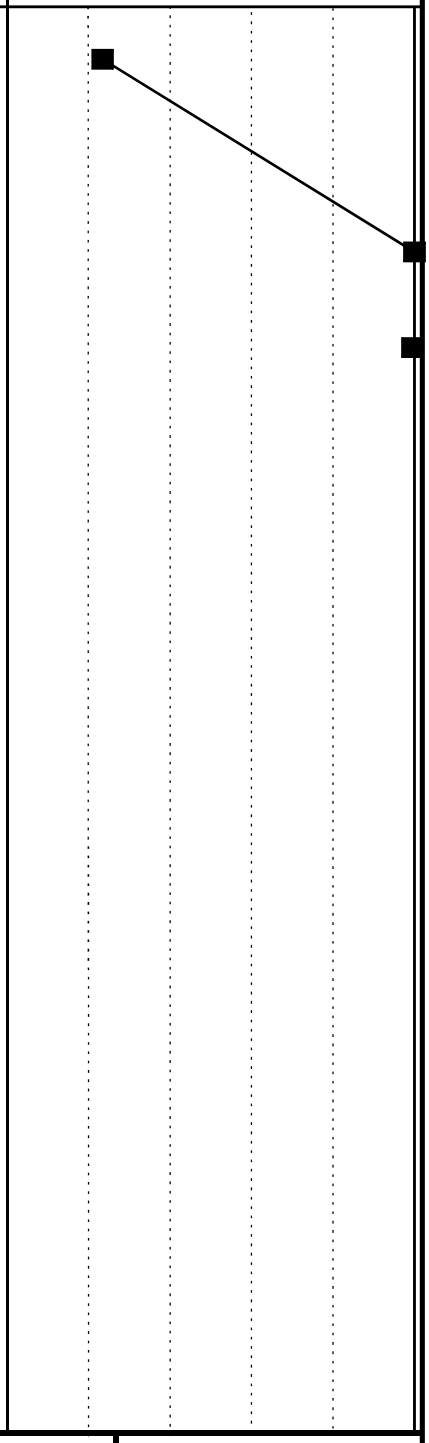
Date: April 2025	Depth: 9'	Initial Groundwater: None
Contractor: Geo	Elevation:	Sample Type: Split Spoon
Method: Hollow Stem Auger	Logged By: PH Checked By: PH	Final Groundwater: None

Depth (Feet)	Interval	% Recovery	Blows/6"	Graphic Log	USCS Symbol	Material Description
			3			Vegetation/Topsoil
2			4 7		SM	Loose to medium dense, silty-fine to medium grained sand trace to with gravel, mottled yellowish brown to grayish brown, moist. (Possible Fill over Weathered Glacial Till)
4						
6			21 28 28		SM	Dense to very dense, silty-fine to medium grained sand trace to with gravel, grayish brown, moist. (Glacial Till)
8			30 45 50			
10						End of Boring 9' Refusal
12						
14						
16						
18						
20						
22						
24						
26						
28						
30						
32						
34						

Groundwater

Moisture Content (%)
Plastic Limit — Liquid Limit

SPT N-Value
0 10 20 30 40 50



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Boring Log