GEOTECHNICAL REPORT

80th Avenue Expansion
6743 – 80th Avenue Southeast
Mercer Island, Washington

Project No. T-9253

Terra Associates, Inc.

Prepared for:

Ankita Aras and Sahil Patel
Mercer Island, Washington

November 11, 2025

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Ankita Aras and Sahil Patel
6743 – 80th Avenue Southeast
Mercer Island, Washington 98040

Subject: Geotechnical Report
80th Avenue Expansion
6743 – 80th Avenue Southeast
Mercer Island, Washington

Dear Ankita and Sahil:

As requested, we have conducted a geotechnical engineering study for the subject project. The attached report presents our findings and recommendations for the geotechnical aspects of project design and construction.

Our field exploration indicates the site is underlain by approximately two to five inches of organic topsoil overlying approximately three to four- and one-half feet of medium dense to dense silty sand with gravel, silty sand, and sandy silt (weathered glacial till) over dense to very dense cemented silty sand with gravel to sandy silt with gravel (unweathered glacial till) to the termination of the test pits. No groundwater seepage was observed during the excavation of the Test Pits.

In our opinion, the native soils on the site will be suitable for support of the proposed development, provided the recommendations presented in this report are incorporated into project design and construction.

We trust the information presented in this report is sufficient for your current needs. If you have any questions or require additional information, please call.

Sincerely yours,
TERRA ASSOCIATES, INC.

CAROLYN S. DECKER
STATE OF WASHINGTON
47016
REGISTERED
PROFESSIONAL ENGINEER

11-11-2025

Carolyn S. Decker, P.E.
President

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1.0 PROJECT DESCRIPTION

The project consists of demolishing existing sheds and constructing a DADU along with pool resurfacing, deck replacement, and updated landscaping. Grading and development plans were not available at the time of this report. Based on existing topography, we would expect grading to be minor, with cuts and fills between one and five feet.

We would expect that the residential structure will be two- to- three-story, wood-frame building with the main floor constructed at grade. Foundation loads are expected to be relatively light, in the range of 2 to 3 kips per foot for bearing walls and 50 to 75 kips for isolated columns.

The recommendations in the following sections of this report are based on our understanding of the preceding design features. We should review design drawings as they become available to verify our recommendations have been properly interpreted and to supplement them, if required.

2.0 SCOPE OF WORK

Our work was completed in accordance with our authorized proposal dated October 3, 2025. Accordingly, on October 21, 2025, we observed soil and groundwater conditions at two soil test pits excavated with a mini track-mounted excavator to a maximum depth of approximately five feet below existing grades. Using the information obtained from the subsurface exploration, we performed analyses to develop geotechnical recommendations for project design and construction.

Specifically, this report addresses the following:

- Soil and groundwater conditions.
- Geologic Hazards per City of Mercer Island Municipal Code.
- Seismic design parameters per the 2021 International Building Code (IBC.)
- Site preparation and grading.
- Excavations.
- Foundations.
- Slab-on-grade floors.

- Lateral earth pressures for wall design.
- Infiltration feasibility.
- Drainage.
- Utilities.
- Pavements.

It should be noted, recommendations outlined in this report regarding drainage are associated with soil strength, design earth pressures, erosion, and stability. Design and performance issues with respect to moisture as it relates to the structure environment are beyond Terra Associates, Inc.'s purview. A building envelope specialist or contactor should be consulted to address these issues, as needed.

3.0 SITE CONDITIONS

3.1 Surface

The project site consists of a single tax parcel totaling approximately 0.46 acres located at 6743 – 80th Avenue Southwest in Mercer Island, Washington. The approximate site location is shown on Figure 1.

The site is currently developed with a single-family residence, attached garage, pool, sheds, decking and associated access and landscaping. Site topography consists of a relatively flat area where the residence is located, and then transitions to a slope that descends from the east to the west, with an overall relief of approximately 15 feet.

3.2 Subsurface

In general, the soil conditions at the site consist of approximately two to five inches of organic topsoil overlying approximately three to four and one half feet of medium dense silty sand with gravel, silty sand, and sandy silt (weathered glacial till) over dense to very dense cemented silty sand with gravel to sandy silt with gravel (unweathered glacial till) to the termination of the test pits.

The *Geologic Map of Mercer Island, Washington* by K.G. Troost and A.P. Wisher (2006) maps the site as being underlain by Vashon Till (Qvt). The soils we observed in our test pits are generally consistent with this regional geology mapping.

The preceding discussion is intended to be a general review of the soil conditions encountered. For more detailed descriptions, please refer to the Test Pit Logs in Appendix A. The approximate location of the test pits are shown on Figure 2.

3.3 Groundwater

Groundwater seepage was not observed in any of our test pits. Some mottling was observed within the weathered portion of the soil formation observed in all of the test pits. Mottling is typically an indication that shallow groundwater seepage develops within this mottled zone. We would expect that shallow groundwater seepage will likely develop during the normally wet winter and spring months along the contact between the upper weathered portion of the soil formation and the underlying unweathered glacial till. This occurs as a result of rainfall that infiltrates through the upper weathered soil zone and becomes perched on the underlying dense till. The till has a relatively low permeability that impedes the continued downward migration of the infiltrated rainfall. As a result, groundwater seepage will develop and tend to flow laterally along the contact.

Groundwater seepage levels will fluctuate seasonally with the highest levels occurring during the normally wet winter to late spring months (November to May).

3.4 GEOLOGIC HAZARDS

The City of Mercer Island Municipal Code defines geologic hazards as "lands that are susceptible to erosion, landslides, seismic events, or other factors as identified by WAC 365-190-120. These areas may not be suited for development activities because they may pose a threat to public health and safety. Areas susceptible to one or more of the following types of hazards shall be designated as geologically hazardous areas: landslide hazard areas, seismic hazard areas, and erosion hazard areas." We evaluated site conditions for the presence of geologic hazards including erosion hazard areas, landslide hazard areas, and seismic hazard areas.

3.4.1 Erosion Hazard Areas

Section 19.16.010 of the Mercer Island Municipal Code (MIMC) defines an erosion hazard as "areas greater than 15 percent slope and subject to a severe risk of erosion due to wind, rain, water, slope, and other natural agents including those soil types and/or areas identified by the U.S. Department of Agriculture's Natural Resources Conservation Service as having a "severe" or "very severe" rill and inter-rill erosion hazard."

The soils observed onsite are classified as *AmC, Arents, Alderwood Material, 6 to 15 percent slopes* by the United States Department of Agriculture Natural Resources Conservation Service (NRCS), formerly the Soil Conservation Service. With the existing slope gradients, these soils will have a moderate potential for erosion when exposed. The southwestern portion of the site has a slope gradient greater than 15 percent and therefore the site would be considered an erosion hazard area by the City of Mercer Island.

Implementation of temporary and permanent Best Management Practices (BMPs) for preventing and controlling erosion will be required and will mitigate the erosion hazard. As a minimum, we recommend implementing the following erosion and sediment control BMPs prior to, during, and immediately following construction activities at the site.

Prevention

- Limit site clearing and grading activities to the relatively dry months (typically May through September).
- Limit disturbance to areas where construction is imminent.
- Locate temporary stockpiles of excavated soils no closer than ten feet from the crest of the slope.
- Provide temporary cover for cut slopes and soil stockpiles during periods of inactivity. Temporary cover may consist of durable plastic sheeting that is securely anchored to the ground surface or straw mulch.
- Establish permanent cover over exposed areas that will not be disturbed for a period of 30 days or more by seeding, in conjunction with a mulch cover or appropriate hydroseeding.

Containment

- Install a silt fence along site margins and downslope of areas that will be disturbed. The silt fence should be in place before clearing and grading is initiated.
- Intercept surface water flow and route the flow away from the slope to a stabilized discharge point. Surface water must not discharge at the top or onto the face of the steep slope.
- Provide onsite sediment retention for collected runoff.

The contractor should perform daily review and maintenance of all erosion and sedimentation control measures at the site.

In accordance with Section 19.07.160.E of the MICI "Development standards—Erosion hazard areas.

> 1. All development proposals shall demonstrate compliance with chapter 15.09, storm water management program.
>
> 2. No development or activity within an erosion hazard area may create a net increase in geological instability on or off site".

The project proposes to comply with the storm water management program outlined in Chapter 15.09 of the MICI. Based on our understanding of the proposed project, it is our opinion that the proposed construction will not create a net increase in geological instability on or off site. Terra Associates, Inc. should review the final grading plans when they are available.

3.4.2 Landslide Hazard Areas

Section 19.16.010 of the MIMC defines a landslide hazard as "areas subject to landslides based on a combination of geologic, topographic, and hydrologic factors, including:

> 1. Areas of historic failures.
>
> 2. Areas with all three of the following characteristics:

a. Slopes steeper than 15 percent.

b. Hillsides intersecting geologic contacts with relatively permeable sediment overlying a relatively impermeable sediment or bedrock.

c. Springs or groundwater seepage.

3. Areas that have shown evidence of past movement or that are underlain or covered by mass wastage debris from past movements.

4. Areas potentially unstable because of rapid stream incision and stream bank erosion.

5. Steep Slope. Any slope of 40 percent or greater calculated by measuring the vertical rise over any 30-foot horizontal run."

None of the above conditions exist on the site and the site is not mapped as a 'Landslide Hazard Area' on *Mercer Island Landslide Hazard Assessment* Map dated April 2009. Therefore, in our opinion, the site is not a landslide hazard as defined by the MIMC.

3.4.3 Seismic Hazard Areas

Section 19.16.010 of the MIMC defines a seismic hazard area as "areas subject to severe risk of damage as a result of earthquake induced ground shaking, slope failure, settlement, soil liquefaction or surface faulting."

Liquefaction is a phenomenon where there is a reduction or complete loss of soil strength due to an increase in water pressure induced by vibrations. Liquefaction mainly affects geologically recent deposits of fine-grained sand below the groundwater table. Soils of this nature derive their strength from intergranular friction. The generated water pressure or pore pressure essentially separates the soil grains and eliminates this intergranular friction; thus, eliminating the soil's strength.

A review of a map titled "*Mercer Island Seismic Hazards Assessment Map*," dated April 2009 by K.G. Troost and A.P. Wisher, shows that the subject site is not mapped within a "Seismic Hazard Area".

Based on the site topography, the presence of glacially consolidated soils, and the lack of significant groundwater, it is our opinion that the risk for damage resulting from earthquake-induced slope failure, settlement, lateral spreading, surface failure, or soil liquefaction is negligible. Therefore, in our opinion, unusual seismic hazard areas do not exist at the site, and design in accordance with local building codes for determining seismic forces would adequately mitigate impacts associated with ground shaking.

3.5 Seismic Site Class

Based on soil conditions observed in the test pits, and our knowledge of the area geology, per Chapter 16 of the 2021 International Building Code (IBC), Site Class "C" should be used in structural design.

3.6 City of Mercer Island Critical Area Requirement

Per Section 19.07.160.B.3, "An evaluation of site-specific subsurface conditions demonstrates that the proposed development is not located in a landslide hazard area or seismic hazard area".

Based on the site topography and soil explorations, the site is not within a landslide hazard area or seismic hazard area. Therefore, it is our opinion that the proposed project can be constructed as designed without negatively impacting the project site, adjacent body of water, or adjacent properties.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 General

Based on our study, there are no geotechnical considerations that would preclude development of the site, as currently planned. The residential building can be supported on conventional spread footings bearing on competent inorganic native soils observed below the organic surface horizon or on structural fill placed and compacted above the native soils. Pavement and floor slabs can be similarly supported.

Most of the native soils encountered at the site contain a sufficient amount of soil fines that will make them difficult to compact as structural fill when too wet. The ability to use native soil from site excavations as structural fill will depend upon its moisture content and the prevailing weather conditions at the time of construction. If grading activities take place during winter, the owner should be prepared to import clean granular material for use as structural fill and backfill.

The following sections provide detailed recommendations regarding the preceding issues and other geotechnical design considerations. These recommendations should be incorporated into the final design drawings and construction specifications.

4.2 Site Preparation and Grading

To prepare the site for construction, all vegetation, organic surface soils, and other deleterious material should be stripped and removed from the site. Surface stripping depths of approximately two to five inches should be expected to remove the organic surface soils and vegetation. In the developed portion of the site, demolition of existing structures should include complete removal of foundations, floor slabs, pavements, and hardscape surfaces from areas of new construction. Existing buried utilities that will be abandoned should be excavated and removed or sealed to prevent intrusion of groundwater seepage and soil. Abandoned utilities beneath new foundations should be removed. Organic surficial soils will not be suitable for use as structural fill but may be used for limited depths in nonstructural areas.

Once clearing and stripping operations are complete, cut and fill operations can be initiated to establish desired building grades. Prior to placing fill, all exposed bearing surfaces should be observed by a representative of Terra Associates, Inc. to verify soil conditions are as expected and suitable for support of new fill or building elements.

Our representative may request a proofroll using heavy rubber-tired equipment to determine if any isolated soft and yielding areas are present. If excessively yielding areas are observed and they cannot be stabilized in place by compaction, the affected soils should be excavated and removed to firm bearing and grade restored with new structural fill. If the depth of excavation to remove unstable soils is excessive, the use of geotextile fabrics, such as Mirafi 500X or an equivalent fabric can be used in conjunction with clean granular structural fill. Our experience has shown, in general, a minimum of 18 inches of a clean, granular structural fill placed and compacted over the geotextile fabric should establish a stable bearing surface.

The native soils encountered at the site contain a sufficient amount of soil fines that will make them difficult to compact as structural fill when too wet or too dry. The ability to use native soils from site excavations as structural fill will depend upon its moisture content and the prevailing weather conditions at the time of construction. If wet soils are encountered, the contractor will need to dry the soils by aeration during dry weather conditions. Alternatively, the use of an additive, such as Portland cement, cement kiln dust (CKD), or lime to stabilize the soil moisture can be considered. If the soil is amended, additional Best Management Practices (BMPs) addressing the potential for elevated pH levels will need to be included in the Storm Water Pollution Prevention Program (SWPPP) prepared with the Temporary Erosion and Sedimentation Control (TESC) plan.

If grading activities are planned during the wet winter months, or if they are initiated during the summer and extend into fall and winter, the owner should be prepared to import wet-weather structural fill. For this purpose, we recommend importing a granular soil that meets the following grading requirements:

U.S. Sieve Size	Percent Passing
6 inches	100
No. 4	75 maximum
No. 200	5 maximum*

* Based on the 3/4-inch fraction.

Prior to use, Terra Associates, Inc. should examine and test all materials imported to the site for use as structural fill.

Structural fill should be placed in uniform loose layers not exceeding 12 inches and compacted to a minimum of 95 percent of the soil's maximum dry density, as determined by American Society for Testing and Materials (ASTM) Test Designation D-1557 (Modified Proctor). The moisture content of the soil at the time of compaction should be within two percent of its optimum, as determined by this ASTM standard. In nonstructural areas, the degree of compaction can be reduced to 90 percent.

4.3 Excavations

All excavations at the site associated with confined spaces, such as utility trenches, must be completed in accordance with local, state, and federal requirements. Based on regulations outlined in the Washington Industrial Safety and Health Act (WISHA), the upper, weathered glacial till soils would be classified as Type C soil. The lower, dense to very dense unweathered glacial till soils observed at depth would be classified as Type A soil.

Accordingly, temporary excavations in Type C soils should have their slopes laid back at an inclination of 1.5:1 (Horizontal: Vertical) or flatter, from the toe to the crest of the slope. Side slopes in Type A soils can be laid back at a slope inclination of 0.75:1 or flatter. For temporary excavation slopes less than 8 feet in height in Type A soils, the lower 3.5 feet can be cut to a vertical condition, with a 0.75:1 slope graded above. For temporary excavation slopes greater than 8 feet in height up to a maximum height of 12 feet, the slope above the 3.5-foot vertical portion will need to be laid back at a minimum slope inclination of 1:1. No vertical cut with a backslope immediately above is allowed for excavation depths that exceed 12 feet. In this case, a four-foot vertical cut with an equivalent horizontal bench to the cut slope toe is required. All exposed temporary slope faces that will remain open for an extended period of time should be covered with a durable reinforced plastic membrane during construction to prevent slope raveling and rutting during periods of precipitation.

The above information is provided solely for the benefit of the owner and other design consultants and should not be construed to imply that Terra Associates, Inc. assumes responsibility for job site safety. It is understood that job site safety is the sole responsibility of the project general contractor.

4.4 Foundation Support

The residential building may be supported on conventional spread footing foundations bearing on competent inorganic native soils or on structural fill placed above competent inorganic native soils. Foundation subgrade should be prepared as recommended in Section 4.2 of this report. Perimeter foundations exposed to the weather should bear a minimum depth of 1.5 feet below final exterior grades for frost protection. Interior foundations can be constructed at any convenient depth below the floor slab.

The native soils that will be exposed at the expected foundation elevations are moisture sensitive and will be easily disturbed by normal construction activity when wet. As a measure to protect the soils from disturbance during construction, consideration should be given to placing a four-inch layer of clean crushed rock or lean mix concrete over the foundation subgrade to serve as a working surface.

Foundations bearing on competent soils can be dimensioned for a net allowable bearing capacity of 2,500 pounds per square foot (psf). For short-term loads, such as wind and seismic, a one-third increase in this allowable capacity can be used. With structural loading as anticipated and this bearing stress applied, estimated total settlements are less than one inch.

For designing foundations to resist lateral loads, a base friction coefficient of 0.35 can be used. Passive earth pressures acting on the side of the footing and buried portion of the foundation stem wall can also be considered. We recommend calculating this lateral resistance using an equivalent fluid weight of 350 pcf. We recommend not including the upper 12 inches of soil in this computation because they can be affected by weather or disturbed by future grading activity. This value assumes the foundation will be constructed neat against competent existing fill, native soil, or backfilled with structural fill as described in Section 4.2 of this report. The values recommended include a safety factor of 1.5.

4.5 Slab-on-Grade Floors

Slab-on-grade floors may be supported on subgrade prepared as recommended in Section 4.2 of this report. Immediately below the floor slab, we recommend placing a four-inch-thick capillary break layer composed of clean, coarse sand or fine gravel that has less than five percent passing the No. 200 sieve. This material will reduce the potential for upward capillary movement of water through the underlying soil and subsequent wetting of the floor slab.

The capillary break layer will not prevent moisture intrusion through the slab caused by water vapor transmission. Where moisture by vapor transmission is undesirable, such as covered floor areas, a common practice is to place a durable plastic membrane on the capillary break layer and then cover the membrane with a layer of clean sand or fine gravel to protect it from damage during construction and to aid in uniform curing of the concrete slab. It should be noted, if the sand or gravel layer overlying the membrane is saturated prior to pouring the slab, it will not be effective in assisting uniform curing of the slab and can actually serve as a water supply for moisture bleeding through the slab, potentially affecting floor coverings. Therefore, in our opinion, covering the membrane with a layer of sand or gravel should be avoided if floor slab construction occurs during the wet winter months and the layer cannot be effectively drained. We recommend floor designers and contractors refer to the current American Concrete Institute (ACI) Manual of Concrete Practice for further information regarding vapor barrier installation below slab-on-grade floors.

4.6 Lateral Earth Pressures for Wall Design

The magnitude of earth pressure development on engineered retaining walls will partly depend on the quality of the wall backfill. We recommend placing and compacting wall backfill as structural fill as described in Section 4.2 of this report. To guard against the build-up of hydrostatic pressure, wall drainage must also be installed. A typical wall drainage detail is provided as Figure 3. All drains should be routed to an approved point of discharge.

With backfill placed and compacted as recommended and drainage properly installed, we recommend designing restrained (not free to deflect) retaining walls for an at-rest earth pressure equivalent to a fluid weighing 50 pcf. A value of 35 pcf may be used for the case where the wall is unrestrained. To account for seismic loading an additional lateral load equivalent to 8H psf where H is the below-grade height of the wall should be applied. These values do not include other surcharge loading such as from fill backslopes, adjacent footings, or traffic surcharge loading that may act on the wall. If such conditions exist, then the imposed loading must be included in wall design. Values of friction at the base of wall foundations and passive earth pressure that are used in design to resist lateral loads are provided in Section 4.4 of this report.

4.7 Infiltration Feasibility

Based on our observations and laboratory data, silty sand with gravel to sandy silt with gravel glacial till soils are present in all of the test pits near the ground surface. These glacial till soils characteristically exhibit low permeability and would not be a suitable receptor soil for discharge of development stormwater using infiltration/retention facilities.

Additionally, mottling was observed within the weathered glacial till soils near the surface which indicate that relatively shallow seasonal groundwater levels develop at the site. The glacial till soils and shallow groundwater levels that likely develop at the site, would impede any downward migration of site stormwater causing groundwater mounding and potentially result in flooding of adjacent properties. Based on our study, it is our opinion that the glacial till soils and site groundwater conditions will preclude using infiltration facilities including low impact development (LID) techniques for management of development stormwater.

4.8 Drainage

Surface

Final exterior grades should promote free and positive drainage away from the site at all times. Water must not be allowed to pond or collect adjacent to foundations or within the immediate building areas. We recommend providing a positive drainage gradient away from the building perimeter. If this gradient cannot be provided, surface water should be collected adjacent to the structures and directed to appropriate storm facilities. In addition, we recommend providing a positive drainage gradient away from the crest of the steep slope to prevent runoff along the face of the slope.

Subsurface

We recommend installing perimeter foundation drains adjacent to shallow foundations. The drains can be laid to grade at an invert elevation equivalent to the bottom of footing grade. The drains can consist of four-inch diameter perforated PVC pipe enveloped in washed pea gravel-sized drainage aggregate. The aggregate should extend six inches above and to the sides of the pipe. Roof and foundation drains should be tightlined separately to the storm drains. All drains should be provided with cleanouts at easily accessible locations.

4.9 Utilities

Utility pipes should be bedded and backfilled in accordance with American Public Works Association (APWA) or the local jurisdictional specifications. At a minimum, trench backfill should be placed and compacted as structural fill as described in Section 4.2 of this report. As noted, most native soils excavated on the site should be suitable for use as backfill material during dry weather conditions. However, if utility construction takes place during the wet winter months, it will likely be necessary to import suitable wet weather fill for utility trench backfilling.

4.10 Pavements

Pavement subgrades should be prepared as described in Section 4.2 of this report. Regardless of the degree of relative compaction achieved, the subgrade must be firm and relatively unyielding before paving. The subgrade should be proofrolled with heavy rubber-tired construction equipment such as a loaded 10-yard dump truck to verify this condition.

The pavement design section is dependent upon the supporting capability of the subgrade soils and the traffic conditions to which it will be subjected. For residential access, we expect traffic will consist mainly of cars and light trucks, with occasional heavy traffic in the form of moving trucks and trash/recycle vehicles. With a stable subgrade prepared as recommended, we recommend the following pavement sections:

Light Traffic and Parking:

- Two inches of hot mix asphalt (HMA) over four inches of crushed rock base (CRB)
- Three and one-half inches of full depth HMA

The paving materials used should conform to the current Washington State Department of Transportation (WSDOT) specifications for one-half-inch hot mix asphalt HMA and CRB.

Long-term pavement performance will depend on surface drainage. A poorly drained pavement section will be subject to premature failure as a result of surface water infiltrating into the subgrade soils and reducing their supporting capability. For optimum pavement performance, we recommend surface drainage gradients of at least two percent. Some degree of longitudinal and transverse cracking of the pavement surface should be expected over time. Regular maintenance should be planned to seal cracks when they occur.

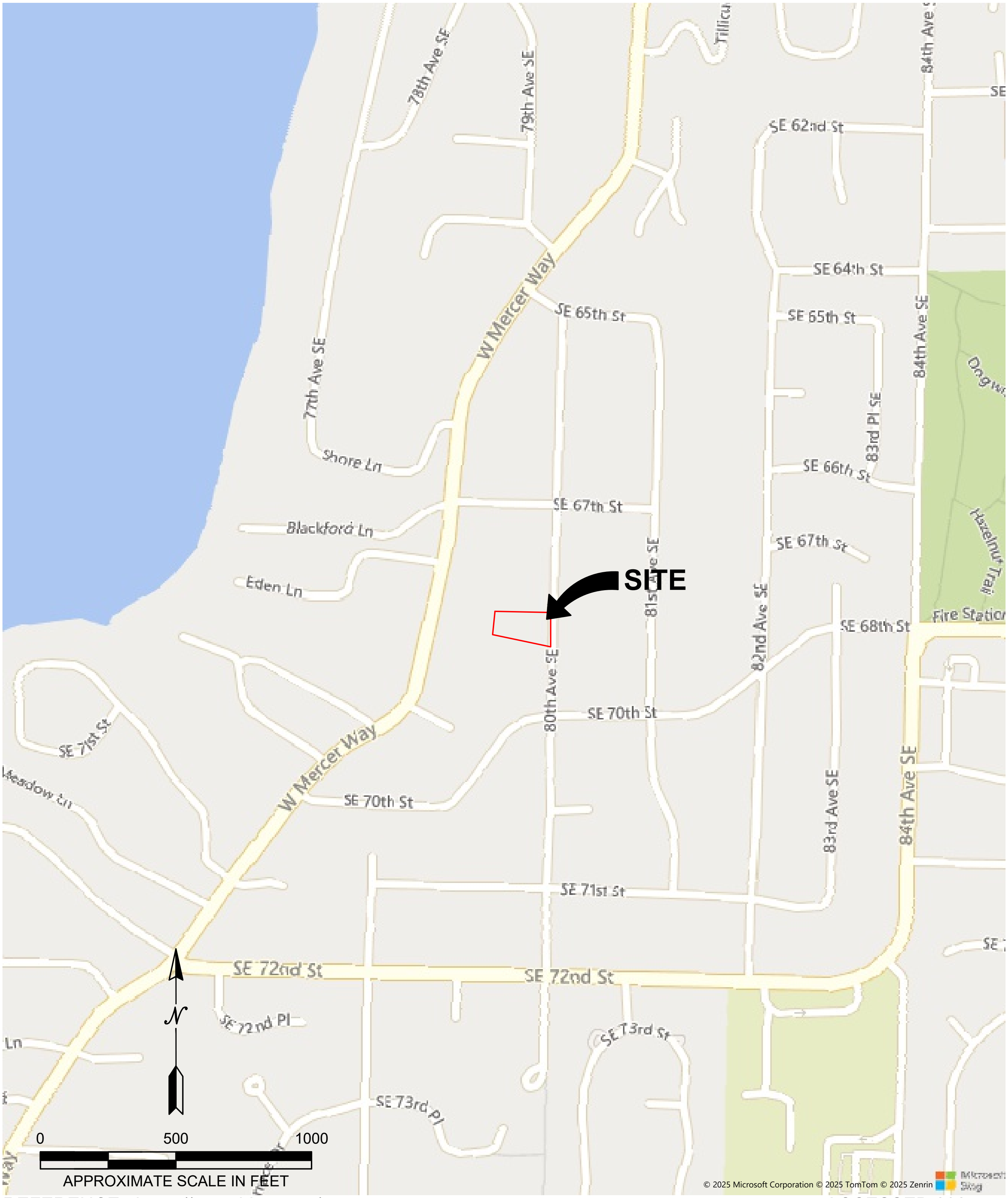
5.0 ADDITIONAL SERVICES

Terra Associates, Inc. should review the final design drawings and specifications in order to verify earthwork and foundation recommendations have been properly interpreted and implemented in project design. We should also provide geotechnical service during construction to observe compliance with our design concepts, specifications, and recommendations. This will allow for design changes if subsurface conditions differ from those anticipated prior to the start of construction.

6.0 LIMITATIONS

We prepared this report in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made. This report is the copyrighted property of Terra Associates, Inc. and is intended for specific application to the 80th Avenue Expansion project in Mercer Island, Washington. This report is for the exclusive use of Ankita Aras, Sahil Patel, and their authorized representatives.

The analyses and recommendations presented in this report are based on data obtained from the subsurface explorations completed onsite. Variations in soil conditions can occur, the nature and extent of which may not become evident until construction. If variations appear evident, Terra Associates, Inc. should be requested to reevaluate the recommendations in this report prior to proceeding with construction.

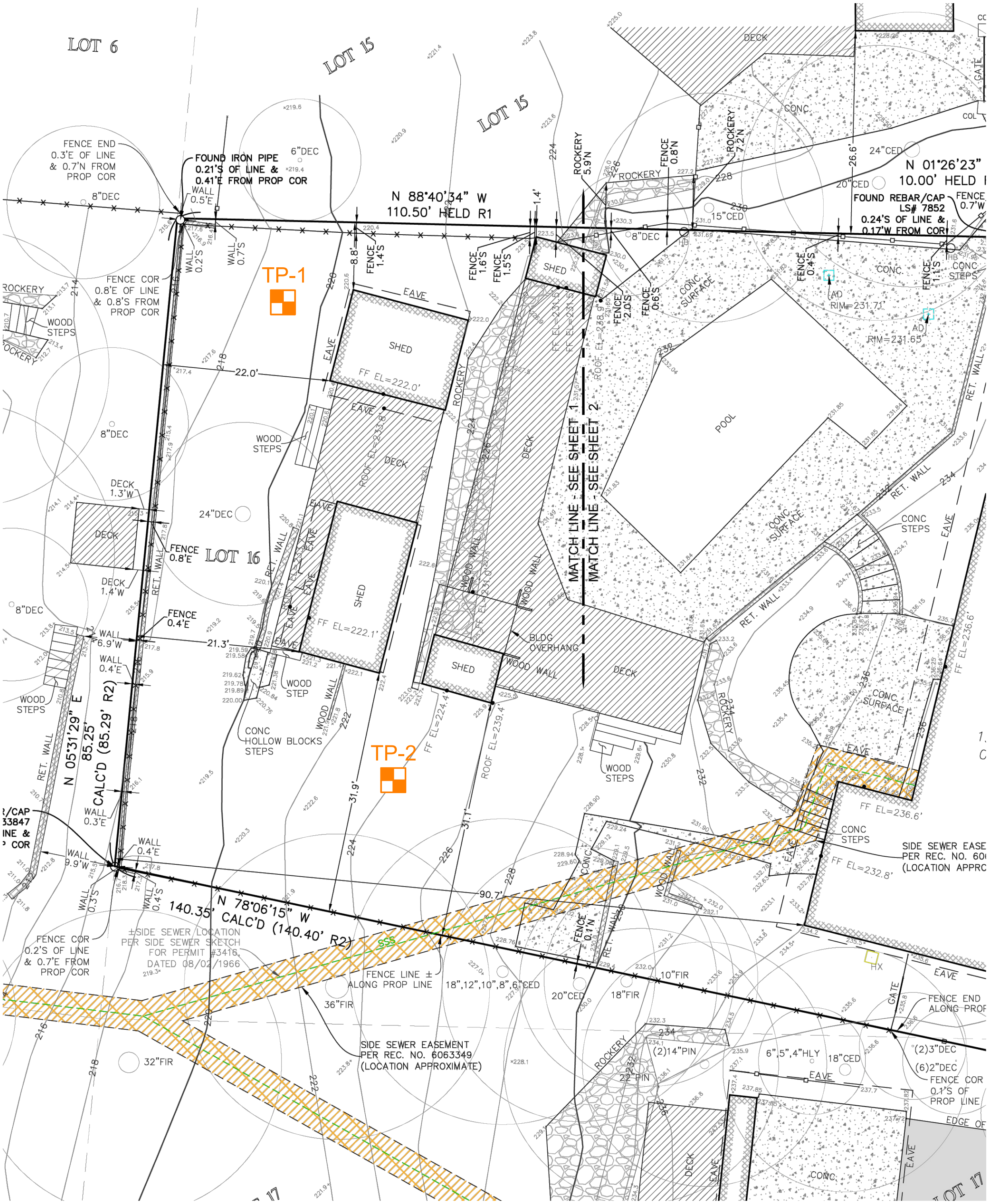


REFERENCE: https://www.bing.com/maps ACCESSED 2025

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

VICINITY MAP
80TH AVE EXPANSION
MERCER ISLAND, WASHINGTON

Proj.No. T-9253	Date: NOV 2025	Figure 1



NOTE:

THIS SITE PLAN IS SCHEMATIC. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. IT IS INTENDED FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR DESIGN OR CONSTRUCTION PURPOSES.

REFERENCE: SITE PLAN PROVIDED BY CLIENT.

LEGEND:

APPROXIMATE TEST PIT LOCATION

0 50 100

APPROXIMATE SCALE IN FEET

N

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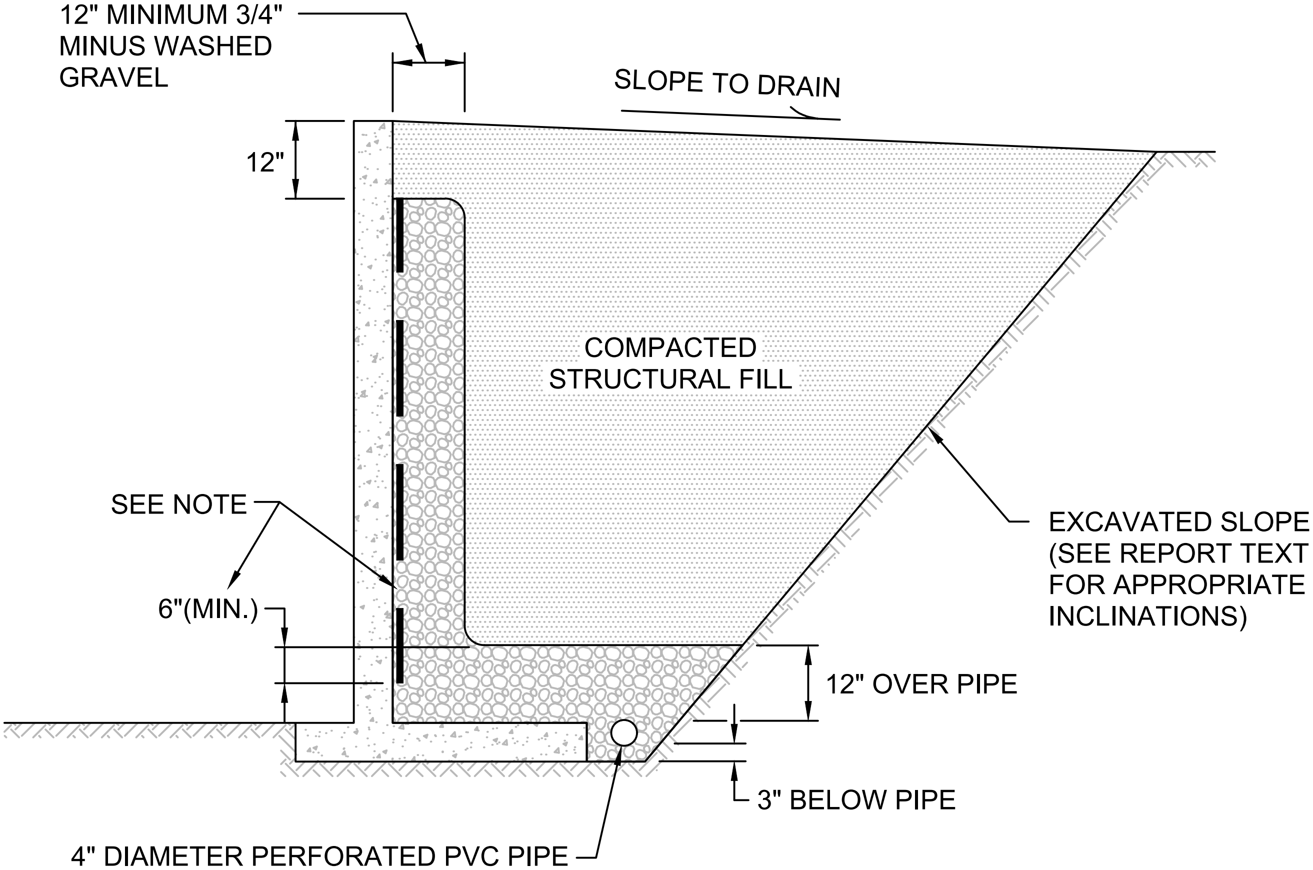
EXPLORATION LOCATION PLAN
80TH AVE EXPANSION
MERCER ISLAND, WASHINGTON

Proj.No. T-9253	Date: NOV 2025	Figure 2



NOT TO SCALE

NOTE:

MIRADRAIN G100N PREFABRICATED DRAINAGE PANELS OR SIMILAR PRODUCT CAN BE SUBSTITUTED FOR THE 12-INCH WIDE GRAVEL DRAIN BEHIND WALL. DRAINAGE PANELS SHOULD EXTEND A MINIMUM OF SIX INCHES INTO 12-INCH THICK DRAINAGE GRAVEL LAYER OVER PERFORATED DRAIN PIPE.

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TYPICAL WALL DRAINAGE DETAIL 80TH AVE EXPANSION MERCER ISLAND, WASHINGTON		
Proj.No. T-9253	Date: NOV 2025	Figure 3

APPENDIX A
FIELD EXPLORATION AND LABORATORY TESTING

80th Avenue Expansion
Mercer Island, Washington

On October 21, 2025, we completed our site exploration by observing soil conditions at two test pits. The test pits were excavated using a mini track-mounted excavator to a maximum depth of approximately five feet below existing site grades. Test pit locations were approximately determined in the field by pacing and sighting from existing site features. The approximate location of the test pits is shown on the attached Exploration Location Plan, Figure 2. Test Pit Logs are presented on Figures A-2 and A-3.

A geotechnical engineer from our office conducted the field exploration. Our representative classified the soil conditions encountered, maintained a log of each test pit, obtained representative soil samples, and recorded water levels observed during excavation. All soil samples were visually classified in accordance with the Unified Soil Classification System (USCS) described on Figure A-1.

Representative soil samples obtained from the test pits were placed in sealed plastic bags and taken to our laboratory for further examination and testing. The moisture content of selected samples was measured and is reported on the corresponding Test Pit Logs. Grain size analyses were also performed on select samples. The results are shown on Figure A-4.

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTION
COARSE GRAINED SOILS More than 50% material larger than No. 200 sieve size	**GRAVELS** More than 50% of coarse fraction is larger than No. 4 sieve	Clean Gravels (less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines.
		Gravels with fines	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS More than 50% of coarse fraction is smaller than No. 4 sieve	Clean Sands (less than 5% fines)	SW	Well-graded sands, sands with gravel, little or no fines.
			SP	Poorly-graded sands, sands with gravel, little or no fines.
		Sands with fines	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS More than 50% material smaller than No. 200 sieve size	**SILTS AND CLAYS** Liquid Limit is less than 50%		ML	Inorganic silts, rock flour, clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity. (Lean clay)
			OL	Organic silts and organic clays of low plasticity.
	SILTS AND CLAYS Liquid Limit is greater than 50%		MH	Inorganic silts, elastic.
			CH	Inorganic clays of high plasticity. (Fat clay)
			OH	Organic clays of high plasticity.
HIGHLY ORGANIC SOILS			PT	Peat.

DEFINITION OF TERMS AND SYMBOLS

COHESIONLESS

Density	Standard Penetration Resistance in Blows/Foot
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	>50

COHESIVE

Consistancy	Standard Penetration Resistance in Blows/Foot
Very Soft	0-2
Soft	2-4
Medium Stiff	4-8
Stiff	8-16
Very Stiff	16-32
Hard	>32

Symbol	Definition
I	2" OUTSIDE DIAMETER SPILT SPOON SAMPLER
II	2.4" INSIDE DIAMETER RING SAMPLER OR SHELBY TUBE SAMPLER
▼	WATER LEVEL (Date)
Tr	TORVANE READINGS, tsf
Pp	PENETROMETER READING, tsf
DD	DRY DENSITY, pounds per cubic foot
LL	LIQUID LIMIT, percent
PI	PLASTIC INDEX
N	STANDARD PENETRATION, blows per foot

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UNIFIED SOIL CLASSIFICATION SYSTEM
80TH AVE EXPANSION
MERCER ISLAND, WASHINGTON

Proj.No. T-9253	Date: NOV 2025	Figure A-1

LOG OF TEST PIT NO. TP-1

FIGURE A-2

PROJECT NAME: 80th Ave Expansion **PROJ. NO:** T-9253 **LOGGED BY:** CSD

LOCATION: Mercer Island, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** N/A

DATE LOGGED: October 21, 2025 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(5-inches organic TOPSOIL) Red-Brown to Brown silty SAND with gravel to sandy SILT with gravel, fine to medium sand, fine to medium gravel, moist, roots, rootlets, some charcoal, (SM/ML)	Medium Dense to Dense	
1	1			13.7
	2	Light gray silty SAND with gravel to sandy SILT with gravel, fine to medium sand, fine to medium gravel, moist, mottled, minor cementation. (SM/ML)		8.5
2				
	3			8..8
3		Gray silty SAND with gravel, fine to medium sand, fine to medium gravel, moist, cemented at approximately 5 feet. (SM)	Dense to Very Dense	
	4			11.8
4				
5	5	Test pit terminated at approximately 5 feet. No groundwater seepage observed.		12.6
6				
7				

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

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LOG OF TEST PIT NO. TP-2

FIGURE A-3

PROJECT NAME: 80th Ave Expansion **PROJ. NO:** T-9253 **LOGGED BY:** CSD

LOCATION: Mercer Island, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** N/A

DATE LOGGED: October 21, 2025 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(2 inches organic TOPSOIL)		
	1	Brown silty SAND with gravel, fine to medium sand, fine to medium gravel, moist, numerous roots. (SM)		9.8
1			Medium Dense	
2	2	Light gray silty SAND with gravel to sandy SILT with gravel, fine to medium sand, fine to medium gravel, moist, mottled. (SM/ML)		7.2
	3			7.0
3			Medium Dense to Dense	
4				
		Dark gray silty SAND with gravel, fine to medium sand, fine to medium gravel, moist, cemented. (SM)	Very Dense	
5	4	Test pit terminated at approximately 5 feet. No groundwater seepage observed.		12.3
6				
7				

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

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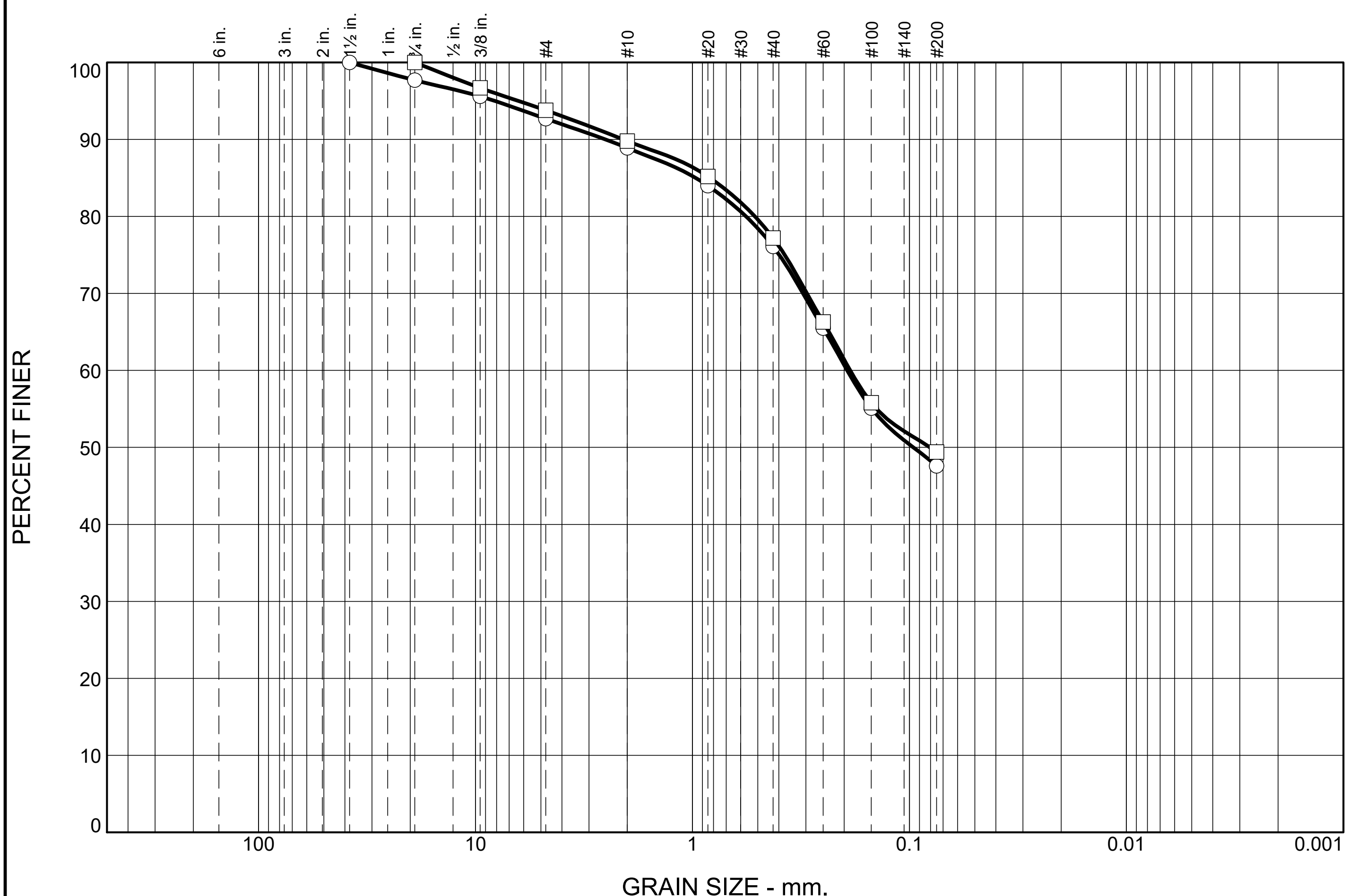
Particle Size Distribution Report

ASTM D422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	2.3	5.0	3.8	12.8	28.5	47.6	
□	0.0	0.0	6.2	4.0	12.6	27.8	49.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.9652	0.1936	0.0960					
□			0.8303	0.1876	0.0803					

Material Description	Test Date	USCS	NM
○ Silty SAND	10/24/2025	SM	
□ Silty SAND	10/24/2025	SM	

Project No. T-9253 **Client:** Ankita Aras and Sahil Patel

Project: 80th Avenue Expansion

Mercer Island, Washington

○ **Location:** Test Pit TP-1 **Depth:** -2.5 feet **Sample Number:** 2

□ **Location:** Test Pit TP-1 **Depth:** -3.5 feet **Sample Number:** 3

Remarks:

Terra Associates, Inc.

Kirkland, WA

Figure A-4

Tested By: ZA