Earth Solutions NW LLC
Geotechnical Engineering, Construction Observation/Testing and Environmental Services

September 12, 2018
ES-6182

Pacwest Construction, LLC
4118 – 96th Avenue Southeast
Mercer Island, Washington 98040

Attention: Mr. Vann Lanz

Subject: Geotechnical Evaluation
Proposed Single-Family Residence
3440 – 97th Avenue Southeast
Mercer Island, Washington

Reference: Kathy G. Troost and Aaron P. Wisher
Geologic Map of Mercer Island, Washington, October 2006
Mercer Island Landslide Hazard Assessment Map, April 2009
Mercer Island Erosion Hazard Assessment Map, April 2009
Mercer Island Seismic Hazard Assessment Map, April 2009

Herrera Environmental Consultants, Inc.
Low-Impact Development Infiltration Feasibility Map

King County Flood Control District
Liquefaction Susceptibility for King County, May 2010

United States Department of Agriculture (USDA)
Natural Resources Conservation Service (NRCS)
Online Web Soil Survey (WSS) Resource

Mercer Island City Code, Title 19.07.060

Dear Mr. Lanz:

As requested, Earth Solutions NW, LLC (ESNW) has prepared this letter for the proposed single-family residence to be constructed at the subject address. This evaluation was prepared in general accordance with our proposal dated June 15, 2018 and authorized by you on June 19, 2018. A summary of our subsurface exploration and preliminary geotechnical recommendations are provided in this letter.

Project Description

The subject site is located approximately 300 feet south of the intersection between Southeast 34th Street and 97th Avenue Southeast, in Mercer Island, Washington. The approximate project location is illustrated on the attached Vicinity Map (Plate 1). The site consists of one tax parcel (King County Parcel No. 072405-9012) totaling approximately 8,800 square feet. The attached Test Pit Location Plan (Plate 2) illustrates the approximate site limits.

We understand the subject site will be developed with a single-family residence and associated improvements. At the time of this evaluation, specific grading and building load plans were not available for review; however, based on our experience with similar projects, the proposed residence will likely be two to three stories in height and constructed using relatively lightly loaded wood framing supported on a conventional foundation. Perimeter footing loads will likely be about 2 to 3 kips per lineal foot, with slab-on-grade loading anticipated to be approximately 150 pounds per square foot (psf). Grade cuts and/or fills of about five feet are anticipated to achieve design elevations.

If the above design assumptions are incorrect or change, ESNW should be contacted to review the recommendations provided in this letter, which has been prepared for the exclusive use of Pacwest Construction, LLC and their representatives. No warranty, expressed or implied, is made. This letter was prepared in a manner consistent with the level of care and skill that is typical of other members in the profession currently practicing under similar conditions in this area. Variations in soil and groundwater conditions observed at the test pit locations may exist and may not become evident until construction. ESNW should reevaluate the conclusions provided in this evaluation if variations are encountered.

Surface Conditions

The subject site is bordered to the north and west by single-family residences, to the east by undeveloped land, and to the south by Interstate 90. The site is currently undeveloped and covered with dense brush growth. Site topography maintains a generally northeast-trending declination, with approximately 10 to 12 feet of elevation change occurring within the confines of the property.

Subsurface Conditions

ESNW observed, logged, and sampled three test pits within accessible locations of the site, for the purpose of evaluating soil and groundwater conditions. The test pits were excavated to a maximum exploration depth of about nine feet below the existing ground surface (bgs). The following is a general description of the soil and groundwater conditions encountered at the test pit locations. Please refer to the attached test pit logs for a more detailed description of subsurface conditions. Representative soil samples collected at the test pit locations were analyzed in general accordance with Unified Soil Classification System (USCS) and USDA schemes.

Topsoil and Fill

Where encountered, topsoil was present in about the upper six inches of existing grades. The topsoil was characterized by dark brown color, the presence of fine organic material, and small root intrusions. Silty sand and sandy silt fill was encountered at each test pit location, extending to approximate depths of one to four feet bgs. The fill was characterized as loose to medium dense and encountered primarily in a moist condition. Various construction-like and deleterious debris was encountered at each test pit location and observed at surficial grades across the site. An approximate depiction of observed areas containing fill is provided on Plate 2. Fill material may also be encountered in proximity to existing site features.

Native Soil

Underlying topsoil and fill, native soils were encountered as silt with varying sand amounts (USCS: ML), in a dense to very dense a moist condition. The native soils were observed primarily in a moist condition, extending to the maximum exploration depth of approximately nine feet bgs.

Geologic Setting

The referenced geologic map resource identifies recessional lacustrine deposits (Qvrl) as underlying the site and surrounding areas. The recessional lacustrine deposits are characterized as laminated silt and clay with local sand layers, peat, and other organic sediments. However, based on the encountered soil conditions, it is our opinion that native soils are more representative of glacial till (Qvt) deposits, which are mapped directly east of the site. The till is characterized as a compact diamict of silt, sand, and subrounded to well-rounded gravel.

The referenced WSS resource identifies soils of the Kitsap silt loam series (Map Unit Symbol: KpB) as underlying the site and surrounding area. The Kitsap loam in commonly found in terrace landforms, derived from lacustrine deposits. Based on our field observations, it is our opinion the native soils be considered representative of glacial till deposits.

Groundwater

During our July 2018 fieldwork, groundwater seepage was not encountered at the test pit locations. Groundwater seepage is common within glacial deposits, with rates and elevation fluctuations depending on many factors, including precipitation duration and intensity, the time of year, and soil conditions. In general, groundwater elevations and flow rates are higher during the winter, spring, and early summer months. In this regard, the contractor should be prepared to respond to and manage areas of perched groundwater seepage during construction activities.

Geologically Hazardous Areas

As part of our evaluation, we reviewed the referenced City of Mercer Island (City) hazard maps to identify the presence of geologically hazardous areas on, or immediately off, site. Our review indicates that a seismic hazard has been preliminarily identified within the property bounds by the City. Landslide and erosion hazard areas are not apparently mapped within the confines of the site, but appear to be present directly east of the property. For completeness, a review and assessment of each of the above hazard areas are provided below.

Landslide Hazard

As defined in the Mercer Island City Code (MICC), a landslide hazard area is any area subject to landslide based on a combination of geologic, topographic, and hydrologic factors. The landslide hazard criteria (italicized), as defined in MICC 19.16.010, as well as our classification to the presence of each criteria is presented below:

1. *Areas of historic failures;*

   No obvious indications of historic failures were observed at surficial grades or within the explored depths of our pits.

2. *Areas with all three of the following characteristics:*

   a. *Slopes steeper than 15 percent; and*

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

   c. *Springs or ground water seepage;*

   Overall site gradients are generally under 11 percent, with total site elevation change of less than 15 feet. However, gradients immediately west of the site increase to approximately 32 percent, with an elevation change of about 20 feet. Native soils consist primarily of medium dense to dense silt (with varying degrees of sand) to the terminus of the exploration locations. Groundwater seepage was not encountered within the explored depths of the test pits.

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

   Neither obvious indications of previous movement nor mass wastage deposits were encountered or observed during our July 2018 exploration and reconnaissance. Heavy brush and bramble growth covered the majority of the site during our exploration. The slope directly west of the site was vegetated with low-lying brush and sparse tree growth.

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

Based on our review, the site is not located within a geographical location that is considered susceptible to stream incision or stream bank erosion.

5. Steep slope, defined as any slope of 40 percent or greater calculated by measuring the vertical rise over any 30-foot horizontal run.

Delineated slope gradients are below 40 percent both on and immediately off site.

Based on our review, the site and immediately adjacent areas do not meet MICC criteria to be considered a landslide hazard area. In our opinion, restrictions relating to landslide hazards are not necessary for the proposed development.

Erosion Hazard

Defined in MICC 19.16.010, an erosion hazard area is any area 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 USDA NRCS as having a "severe" or "very severe" rill and inter-rill erosion hazard.

As discussed within the *Geologic Setting* section of this letter, site soils have been characterized as the Kitsap silt loam per the WSS. In our opinion, these soils have a moderate to severe erosion potential. However, provided adequate temporary erosion control BMPs (silt fencing, sediment barriers, covering of exposed soils and/or stockpiles, etc.) are implemented and adequately maintained during construction, surface water is managed, and permanent erosion control measures are installed after construction, it is our opinion the potential erosion hazard can be adequately mitigated.

Seismic Hazard

Defined in MICC 19.16.010, a seismic hazard area is any area subject to severe risk of damage as a result of earthquake-induced ground shaking, slope failure, settlement, soil liquefaction, or surface faulting.

Native site soils were primarily encountered as medium dense to dense silt with varying degrees of sand. Groundwater seepage was not encountered within the test pit locations during our July 2018 exploration. In our opinion, the dense in-situ nature of the native soils, appreciable fines contents, and absence of a uniformly established groundwater table are generally not conducive for liquefaction or slope failure resulting from a seismic event. In these regards, it is our opinion the site not be considered a seismic hazard. As such, restrictions relating to seismic hazards are not necessary for the proposed development.

Site Preparation and Earthwork

Initial site preparation activities will consist of installing temporary erosion control measures, establishing grading limits, and performing clearing and site stripping. Subsequent earthwork activities will involve minor grading activities and related residential infrastructure improvements.

Temporary Erosion Control

A temporary construction entrance, consisting of at least six inches of quarry spalls, should be considered to both minimize off-site soil tracking and provide a stable entrance surface. A woven geotextile fabric may be placed beneath the quarry spalls to provide greater stability of the temporary construction entrance. Erosion control measures should include silt fencing placed around the site perimeter. Soil stockpiles should be covered or otherwise protected to reduce soil erosion. Temporary approaches for controlling surface water runoff should be established prior to beginning earthwork activities. Additional Best Management Practices (BMPs), as specified by the project civil engineer and indicated on the plans, should be incorporated into construction activities. As needed, erosion control BMPs may be modified during construction, as approved by the site erosion control lead.

In-situ and Imported Soils

On-site soils are considered moisture sensitive, with successful use as structural fill being largely dictated by the moisture content of the soil at the time of placement and compaction. If site soils cannot be successfully compacted, the use of an imported soil may be necessary. In our opinion, a contingency should be provided in the project budget for export of soil that cannot be successfully compacted as structural fill. Soils with fines contents greater than 5 percent typically degrade rapidly when exposed to periods of rainfall.

Imported soil intended for use as structural fill should consist of a well-graded, granular soil with a moisture content that is at (or slightly above) the optimum level. During wet weather conditions, imported soil intended for use as structural fill should consist of a well-graded, granular soil with a fines content of 5 percent or less (where the fines content is defined as the percent passing the Number 200 sieve, based on the minus three-quarter-inch fraction).

Due to the extent of deleterious debris encountered during our fieldwork, existing fill is generally considered unsuitable for use as structural fill. If existing fill soil is pursued for use as structural fill, it must be approved by ESNW prior to placement and compaction.

Excavations and Slopes

Excavation activities are likely to expose both existing fill and dense native soils. Based on the soil conditions observed at the test pit locations, the following allowable temporary slope inclinations, as a function of horizontal to vertical (H:V) inclination, may be used for temporary excavations greater than four feet in height. The applicable Federal Occupation Safety and Health Administration (OSHA) and Washington Industrial Safety and Health Act (WISHA) soil classifications are also provided:

- Fill, regardless of in-situ density — 1.5H:1V (Type C)
- Areas containing groundwater seepage — 1.5H:1V (Type C)
- Loose to medium dense soil — 1.5H:1V (Type C)
- Medium dense to dense native soil — 1H:1V (Type B)

Steeper temporary slope inclinations within undisturbed, very dense glacial till may be feasible based on the soil and groundwater conditions exposed within the excavations. If pursued, steeper temporary slope inclinations must be approved and designed by ESNW either prior to or at the time of excavation.

Permanent slopes should be planted with vegetation to enhance stability and to minimize erosion and should maintain a gradient of 2H:1V or flatter. The presence of perched groundwater may cause localized sloughing of temporary slopes due to excess seepage forces. A representative of ESNW should observe temporary and permanent slopes to confirm the slope inclinations are suitable for the exposed soil conditions and to provide additional excavation and slope recommendations, as necessary. If the recommended temporary slope inclinations cannot be achieved, temporary shoring may be necessary to support excavations.

Structural Fill

Structural fill is defined as compacted soil placed in foundation, slab-on-grade, and roadway areas. Fill placed to construct permanent slopes and throughout retaining wall and utility trench backfill areas is considered structural fill as well. Soils placed in structural areas should be placed in loose lifts of 12 inches or less and compacted to a relative compaction of 95 percent, based on the laboratory maximum dry density as determined by the Modified Proctor Method (ASTM D1557). For soil placed in utility trenches underlying structural areas, compaction requirements are dictated by the local city, county, or utility district, and are typically specified to a relative compaction of at least 95 percent of the Modified Proctor value.

Foundations

The proposed single-family residence can be constructed on a conventional continuous and spread footing foundation bearing on competent native soil, recompacted native soil, or new structural fill placed directly on competent native soils. Due to the extent of deleterious debris encountered within the existing fill, it is our opinion foundation elements should only be placed on competent native soil or new structural fill placed directly on competent native soil. In this respect, it may be necessary to overexcavate foundation subgrade areas that do not extend through existing fill. In general, where loose or unsuitable soil conditions are exposed at foundation subgrade elevations, compaction of soils to the specifications of structural fill, or overexcavation and replacement with suitable structural fill, will be necessary.

Provided the structure will be supported as described above, the following parameters can be used for design of the new foundation:

- Allowable soil bearing capacity 2,500 psf
- Passive earth pressure 300 pcf (equivalent fluid)
- Coefficient of friction 0.40

A one-third increase in the allowable soil bearing capacity may be assumed for short-term wind and seismic loading conditions. With structural loading as expected, total settlement in the range of one inch and differential settlement of about one-half inch is anticipated. The majority of the settlements should occur during construction, as dead loads are applied.

Seismic Design

The 2015 International Building Code recognizes the American Society of Civil Engineers (ASCE) for seismic site class definitions. In accordance with Table 20.3-1 of the ASCE Minimum Design Loads for Buildings and Other Structures manual, Site Class D should be used for design.

The referenced liquefaction susceptibility map indicates the site and surrounding areas maintain very low liquefaction susceptibility. Liquefaction is a phenomenon where saturated and loose sandy soils suddenly lose internal strength and behave as a fluid. This behavior is in response to increased pore water pressures resulting from an earthquake or other intense ground shaking. In our opinion, site susceptibility to liquefaction may be considered negligible. The relatively high in-situ density, appreciable fines contents of the native soils, and the absence of a uniformly established, shallow groundwater table were the primary bases for this opinion.

Retaining Walls

Retaining walls should be designed to resist lateral earth pressures and applicable surcharge loads. The following parameters may be used for retaining wall design:

• Active earth pressure (yielding condition)	35 pcf (equivalent fluid)
• At-rest earth pressure (restrained condition)	55 pcf
• Traffic surcharge (passenger vehicles)	70 psf (rectangular distribution)*
• Passive earth pressure	300 pcf (equivalent fluid)
• Coefficient of friction	0.40
• Seismic surcharge	6H psf**

* *Where applicable*
** *Where H equals the retained height (in feet)*

The above design parameters are based on a level backfill condition and level grade at the wall toe. Revised design values will be necessary if sloping grades are to be used above or below retaining walls. Additional surcharge loading from adjacent foundations, sloped backfill, or other relevant loads should be included in the retaining wall design.

Retaining walls should be backfilled with free-draining material that extends along the height of the wall and a distance of at least 18 inches behind the wall. The upper 12 inches of the wall backfill may consist of a less permeable soil, if desired. A perforated drainpipe should be placed along the base of the wall and connected to an approved discharge location. A typical retaining wall drainage detail is provided on Plate 3. If drainage is not provided, hydrostatic pressures should be included in the wall design.

Drainage

Groundwater seepage was not encountered at the test pit locations during our July 2018 fieldwork. However, zones of perched groundwater seepage may be anticipated in site excavations depending on the time of year grading operations take place. Temporary measures to control surface water runoff and groundwater during construction would likely involve interceptor trenches and sumps. ESNW should be consulted during preliminary grading to identify areas of seepage and to provide recommendations to reduce the potential for instability related to seepage effects.

Finish grades must be designed to direct surface drain water away from structures and slopes to the extent feasible. Water must not be allowed to pond adjacent to structures or slopes. In our opinion, foundation drains should be installed along building perimeter footings. A typical foundation drain detail is provided on Plate 4.

Infiltration Feasibility

As indicated in the *Subsurface* section of this letter, native soils encountered during our fieldwork were characterized as silt with varying degrees of sand. Based upon the results of USDA textural analyses performed on representative soil samples, native soils may also be classified as slightly gravelly loam. Irrespective of gravel content, fines contents within the native loam were about 70 to 94 percent.

Review of the City infiltration feasibility map indicates the site has been designated by the City as infeasible for Low-Impact Development (LID) facilities. Additionally, the high in-situ density and appreciable fines contents of the native loam will severely restrict the performance of any infiltration facility. In our opinion, infiltration is not feasible from a geotechnical standpoint.

Additional Services

ESNW should have an opportunity to review final site designs with respect to the geotechnical recommendations provided in this letter. ESNW should also be retained to provide earthwork observation, testing, and supplementary consultation services (as needed) during development and construction.

We trust this letter meets your current needs. Should you have questions regarding the content herein, or require additional information, please call.

Sincerely,

EARTH SOLUTIONS NW, LLC

KEVEN D. HOFFMANN
STATE OF WASHINGTON
53734
REGISTERED PROFESSIONAL ENGINEER
09/12/2018

Chase G. Halsen
Staff Geologist

Keven D. Hoffmann, P.E.
Senior Project Engineer

Attachments: Plate 1 – Vicinity Map
Plate 2 – Test Pit Location Plan
Plate 3 – Retaining Wall Drainage Detail
Plate 4 – Footing Drain Detail
Test Pit Logs
Grain Size Distribution

Reference:
King County, Washington
Map 596
By The Thomas Guide
Rand McNally
32nd Edition

NORTH

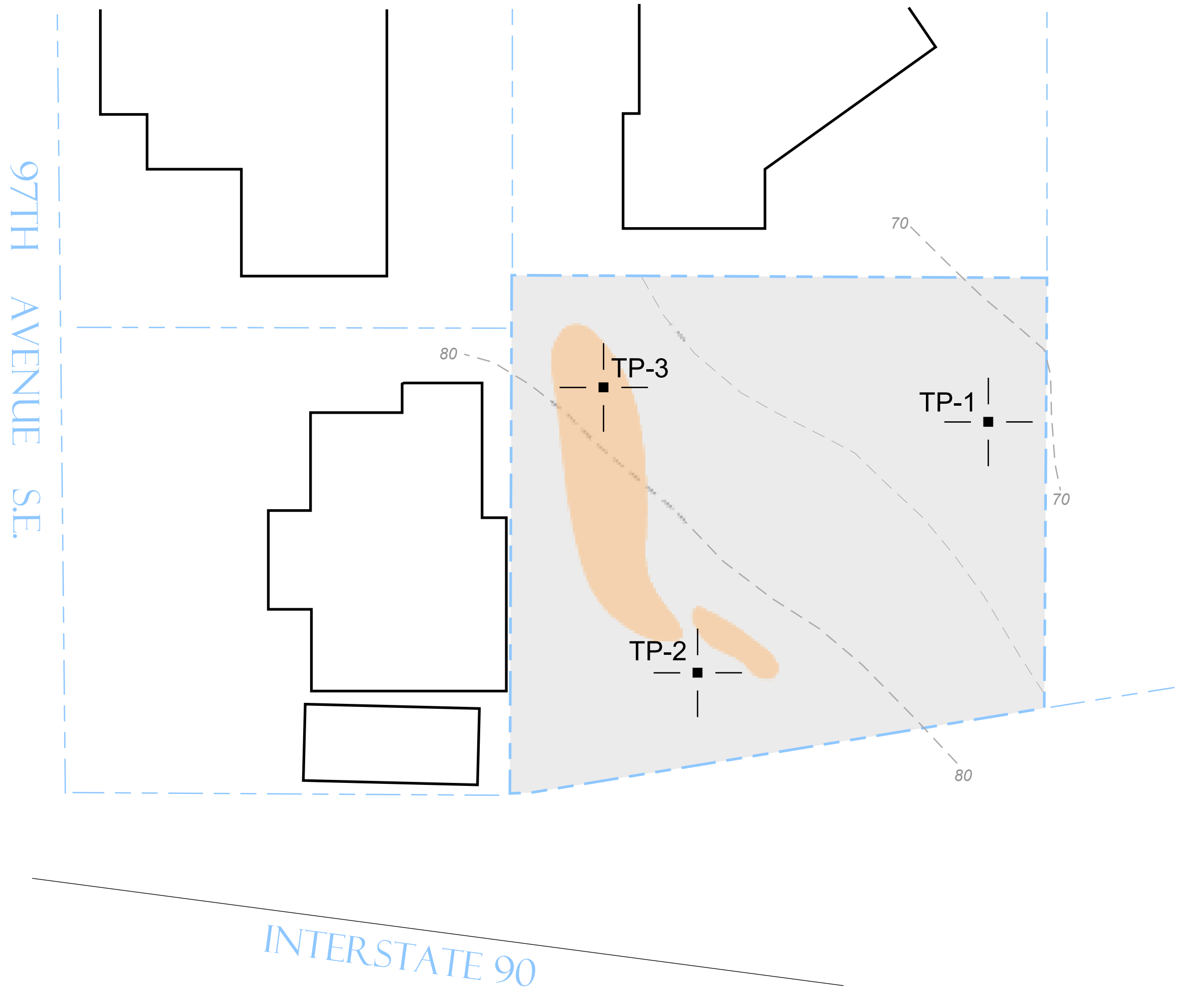
Earth Solutions NW LLC

Geotechnical Engineering, Construction Observation/Testing and Environmental Services

Vicinity Map
97th Avenue SFR
Mercer Island, Washington

Drwn. MRS	Date 08/08/2018	Proj. No. 6182
Checked CGH	Date Aug. 2018	Plate 1

NOTE: This plate may contain areas of color. ESNW cannot be responsible for any subsequent misinterpretation of the information resulting from black & white reproductions of this plate.



LEGEND

TP-1 — Approximate Location of ESNW Test Pit, Proj. No. ES-6182, July 2018

Subject Site

Existing Building

Anticipated Areas of Fill

NORTH

NOT - TO - SCALE

NOTE: The graphics shown on this plate are not intended for design purposes or precise scale measurements, but only to illustrate the approximate test locations relative to the approximate locations of existing and / or proposed site features. The information illustrated is largely based on data provided by the client at the time of our study. ESNW cannot be responsible for subsequent design changes or interpretation of the data by others.

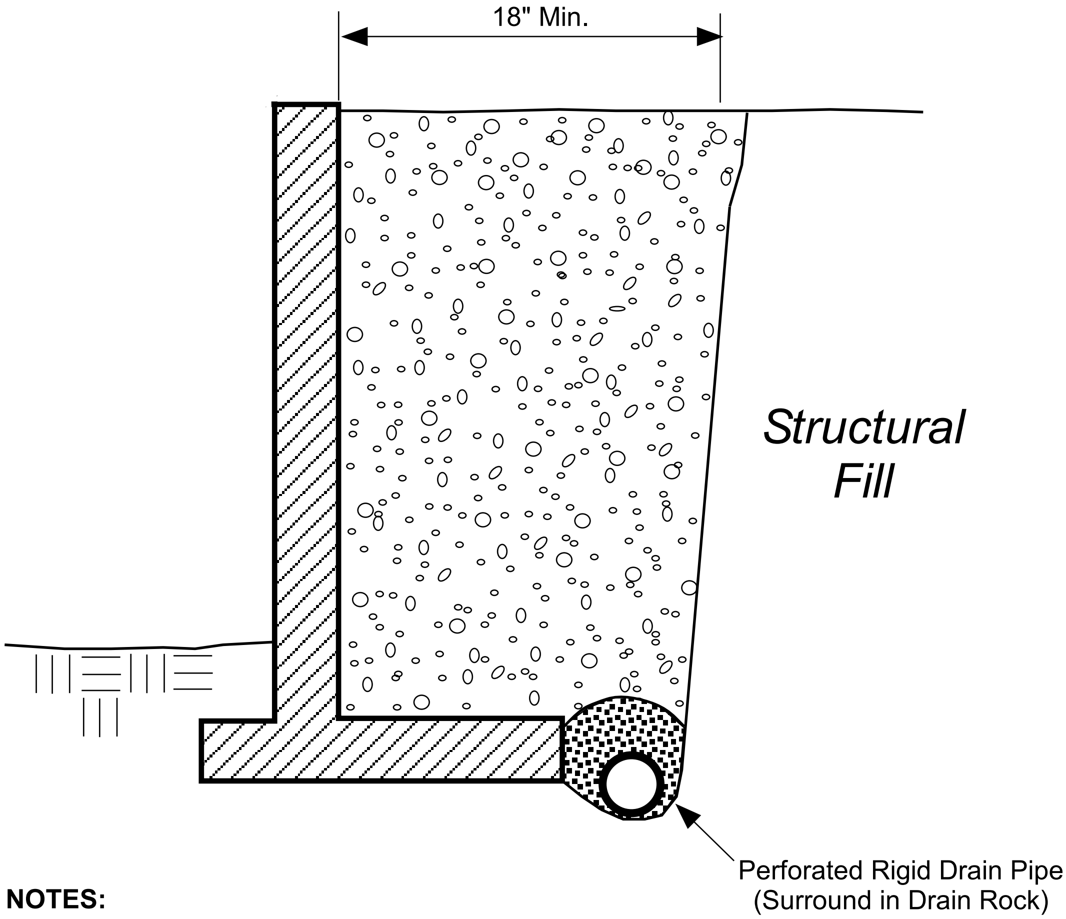
NOTE: This plate may contain areas of color. ESNW cannot be responsible for any subsequent misinterpretation of the information resulting from black & white reproductions of this plate.

Earth Solutions NW LLC

Geotechnical Engineering, Construction Observation/Testing and Environmental Services

Test Pit Location Plan
97th Avenue SFR
Mercer Island, Washington

Drwn. MRS	Date 08/08/2018	Proj. No. 6182
Checked CGH	Date Aug. 2018	Plate 2



NOTES:

- Free-draining Backfill should consist of soil having less than 5 percent fines. Percent passing No. 4 sieve should be 25 to 75 percent.
- Sheet Drain may be feasible in lieu of Free-draining Backfill, per ESNW recommendations.
- Drain Pipe should consist of perforated, rigid PVC Pipe surrounded with 1-inch Drain Rock.

SCHEMATIC ONLY - NOT TO SCALE
NOT A CONSTRUCTION DRAWING

LEGEND:

Free-draining Structural Backfill

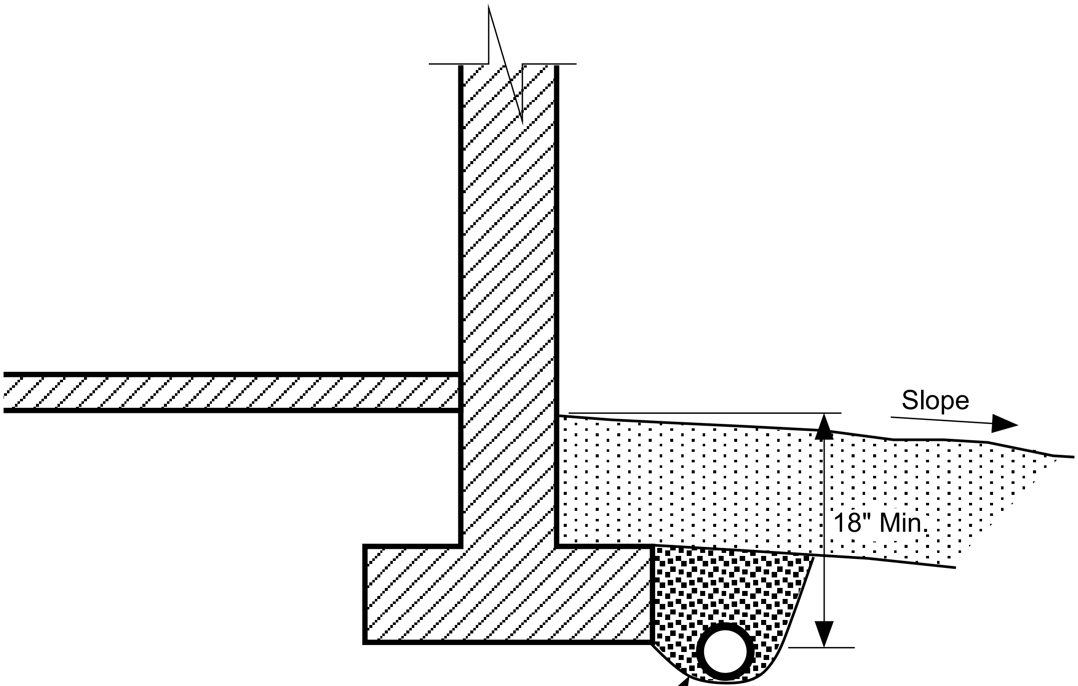
1-inch Drain Rock

Earth Solutions NW LLC

Earth Solutions NWLLC
Geotechnical Engineering Construction
Observation/Testing and Environmental Services

Retaining Wall Drainage Detail
97th Avenue SFR
Mercer Island, Washington

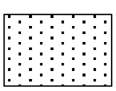
Drwn. MRS	Date 08/08/2018	Proj. No. 6182
Checked CGH	Date Aug. 2018	Plate 3



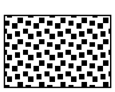
NOTES:

- Do NOT tie roof downspouts to Footing Drain.
- Surface Seal to consist of 12" of less permeable, suitable soil. Slope away from building.

LEGEND:



Surface Seal: native soil or other low-permeability material.



1-inch Drain Rock

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NOT A CONSTRUCTION DRAWING

Earth Solutions NWLLC
Geotechnical Engineering, Construction Observation/Testing and Environmental Services

Footing Drain Detail
97th Avenue SFR
Mercer Island, Washington

Drwn. MRS	Date 08/08/2018	Proj. No. 6182
Checked CGH	Date Aug. 2018	Plate 4

Earth Solutions NW LLC

SOIL CLASSIFICATION CHART

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

DUAL SYMBOLS are used to indicate borderline soil classifications.

The discussion in the text of this report is necessary for a proper understanding of the nature of the material presented in the attached logs.

Earth Solutions NW
1805 - 136th Place N.E., Suite 201
Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-1

PROJECT NUMBER ES-6182 | **PROJECT NAME** 97th Avenue SFR

DATE STARTED 7/10/18 | **COMPLETED** 7/10/18 | **GROUND ELEVATION** 72 ft | **TEST PIT SIZE**

EXCAVATION CONTRACTOR NW Excavating | **GROUND WATER LEVELS:**

EXCAVATION METHOD | **AT TIME OF EXCAVATION** ---

LOGGED BY CGH | **CHECKED BY** SSR | **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 6": brush | **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION	
0			TPSL		0.5	Dark brown TOPSOIL, root intrusions to 2'	71.5
			SM		1.5	Brown silty SAND, loose, moist (Fill) -light plastic debris	70.5
		MC = 19.20%				Gray sandy SILT, medium dense, moist	
5		MC = 23.40% Fines = 90.70%	ML			-becomes silt, dense -minor iron oxide staining [USDA Classification: slightly gravelly LOAM]	
		MC = 29.50%					
		MC = 20.70%			9.0		63.0

Test pit terminated at 9.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

Bottom of test pit at 9.0 feet.

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Bellevue, Washington 98005
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TEST PIT NUMBER TP-2

PROJECT NUMBER ES-6182 **PROJECT NAME** 97th Avenue SFR

DATE STARTED 7/10/18 **COMPLETED** 7/10/18 **GROUND ELEVATION** 82 ft **TEST PIT SIZE**

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** SSR **AT END OF EXCAVATION** ---

NOTES Surface Conditions: brush/grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0 – 1.0			SM		Brown silty SAND, loose, moist (Fill) -minor plastic debris, root intrusions to 4'	81.0
1.0 – 6.0		MC = 11.60% Fines = 68.80% MC = 34.00%	ML		Gray sandy SILT, very dense, moist -moderate iron oxide staining [USDA Classification: slightly gravelly LOAM] -becomes silt	76.0

Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

Bottom of test pit at 6.0 feet.

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TEST PIT NUMBER TP-3

PROJECT NUMBER ES-6182 **PROJECT NAME** 97th Avenue SFR

DATE STARTED 7/10/18 **COMPLETED** 7/10/18 **GROUND ELEVATION** 78 ft **TEST PIT SIZE**

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** SSR **AT END OF EXCAVATION** ---

NOTES Surface Conditions: brush **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0		MC = 18.40% Fines = 62.70%	ML		Brown sandy SILT, loose to medium dense, moist (Fill) -root intrusions to 4' -plastic debris -brick debris [USDA Classification: slightly gravelly LOAM]	
		MC = 18.00%		4.0		74.0
5		MC = 23.10%	ML		Brown sandy SILT, medium dense, moist -light iron oxide staining -becomes gray silt, dense	
		MC = 24.70%		8.0		70.0
					Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation. No caving observed. Bottom of test pit at 8.0 feet.	

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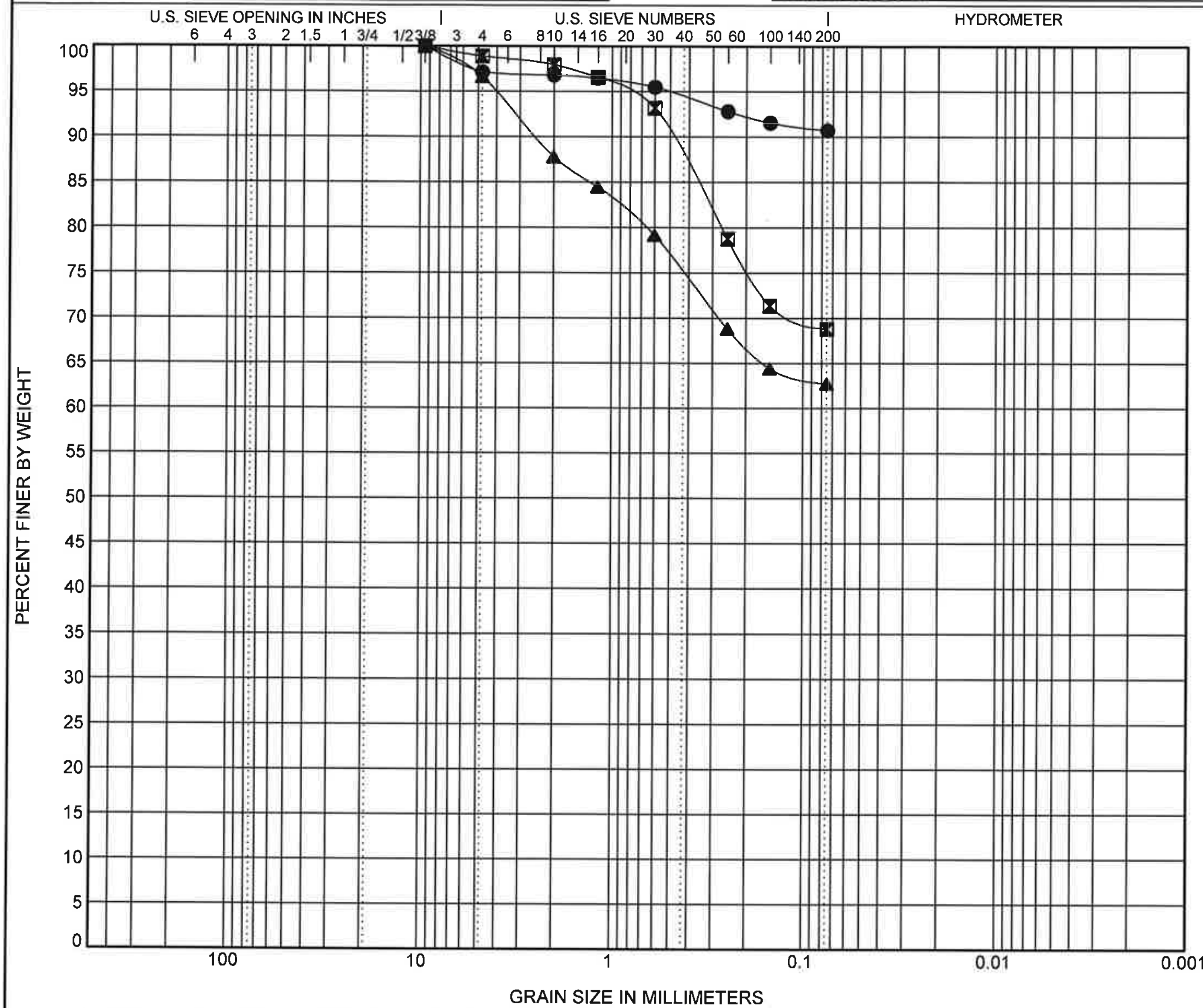
GRAIN SIZE DISTRIBUTION

PROJECT NUMBER ES-6182 **PROJECT NAME** 97th Avenue SFR



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	Cc	Cu
● TP-01	5.00ft.	**USDA: Gray Slightly Gravelly Loam. USCS: ML.**		
⊠ TP-02	2.00ft.	**USDA: Gray Slightly Gravelly Loam. USCS: Sandy ML.**		
▲ TP-03	2.00ft.	**USDA: Gray Slightly Gravelly Loam. USCS: Sandy ML.**		

Specimen Identification		D100	D60	D30	D10	LL	PL	PI	%Silt	%Clay
● TP-01	5.0ft.	9.5							90.7	
⊠ TP-02	2.0ft.	9.5							68.8	
▲ TP-03	2.0ft.	9.5							62.7	