

February 6, 2025

JN 25038

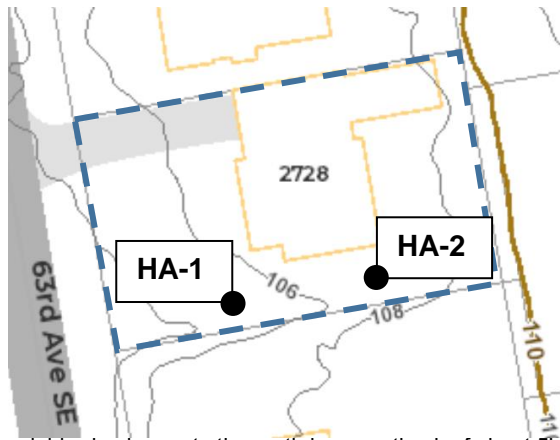
Frank Imani
PO Box 655, Mercer Island, WA 98040

Subject: Excavation Concerns - Proposed Residence
2728 - 63rd Avenue Southeast, Mercer Island, Washington

Dear Mr. Imani:

via email

At your request, we visited the subject site on January 31, 2025 to observe the site conditions and complete hand auger holes at the site as shown in the sketch below.



HA-1

0.0-1.5' Sod and Topsoil
1.5-3.0' Tan sandy SILT, v. moist, medium stiff [ML]
3.0-4.5' Brown sandy SILY with wet SAND lenses, wet, stiff [SM/ML]
Bottom at 3.0 feet – refusal on Gravel. Groundwater at 3.5'.

HA-2

0.0-1.5' Sod and Topsoil
1.5-3.0' Tan sandy SILT, v. moist, medium stiff [ML]
3.0-4.5' Brown sandy SILT with wet SAND lenses, wet, stiff [SM/ML]
4.5-7.0' Gray-brown slightly silty SAND to SAND, wet, dense. [SP/SM]
Bottom at 7.0 feet. Groundwater at 3.5'.

The hand augers revealed a silt profile overlying dense sands that were wet. This is a typical of outwash soil profile in Mercer Island. The neighboring house to the north has a setback of about 5' and the southern neighboring house is over 20 feet from the property line, so no surcharges exist.

We understand the proposed structure will have setbacks of 10 and 8 feet from the north and south property lines, respectively, and will require excavations of up to about 3-4 feet on the north and about 10' below existing grades on the south.

Excavation slopes should not exceed the limits specified in local, state, and national government safety regulations. Temporary cuts to a depth of about 4 feet may be attempted vertically in unsaturated soil, if there are no indications of slope instability. However, vertical cuts should not be made near property boundaries, or existing utilities and structures. Based upon Washington Administrative Code (WAC) 296, Part N, the unsaturated, dense native soil at the subject site would generally be classified as Type B. Therefore, temporary cut slopes greater than 4 feet in height cannot be excavated at an inclination steeper than 1:1 (Horizontal:Vertical), extending continuously between the top and the bottom of a cut. Groundwater exiting cuts can rapidly destabilize an excavation and cause caving or sloughing. If wet soils or groundwater are encountered in the excavation, the excavation should be backfilled immediately above the line of seepage and the project geotechnical engineer contacted for additional recommendations such as dewatering, armoring, reduced cut slope inclinations, and/or excavation shoring as necessary to maintain site stability.

The above recommended temporary slope inclination is based on the conditions exposed in our explorations, and on what has been successful at other sites with similar soil conditions. It is possible that variations in soil and groundwater conditions will require modifications to the inclination at which temporary slopes can stand. Temporary cuts are those that will remain unsupported for a relatively short duration to allow for the construction of foundations, retaining walls, or utilities. Temporary cut slopes should be protected with plastic sheeting during wet weather. It is also important that surface water be directed away from temporary slope cuts. The cut slopes should also be backfilled or retained as soon as possible to reduce the potential for instability. Please note that sand and/or loose soil can cave suddenly and without warning. Excavation, foundation, and utility contractors should be made especially aware of this potential danger.

Cuts of up to a 7-foot vertical exposed height (with no surcharge) may be temporarily supported by ultra-block shoring. An ultra block is a precast 2.5-foot-square concrete block with lengths of 5 feet. The blocks can be stacked using an integral ridge along the top of the block that fits a like indentation in the bottom of the blocks above. The blocks should be stacked in a staggered brickwork pattern such that each block above interlocks with two blocks below. This may require the use of half-width blocks. The blocks should be stacked with a 1:6 (Horizontal: Vertical) batter in this application. The base of the block wall should rest on dense soils and the base block should be buried at least 6 inches below the bottom of excavation grade. The annular space behind the blocks should be filled with clean crushed rock (i.e. Type 22 or 2-inch ballast) for drainage. The excavation at the face of the base of the blocks (backfill of the embedded 'key' below the bottom of excavation) should be backfilled with compacted native gravel or crushed rock. Temporary near-vertical cuts will be necessary to install the blocks. We recommend that all of the materials for constructing the wall (blocks and rock) be onsite prior to the excavation for the wall. The wall should be constructed in segments (on the order of 10 feet long) with the blocks being stacked and backfilled immediately after excavation is complete. No excavated sections should be left open overnight. This "build as you go" technique will minimize the exposure of the adjacent soils to sloughing. A 1:1 (H:V) slope above the block may be established with the backfill rock. A typical block wall detail is attached as **Plate A – Temporary Ultra Block Shoring**. Block wall calcs at right.

Block Wall Design			
Active	30 pcf	Active Pressure	844 lbs
Passive	450 pcf	Surcharge pressure	338 lbs
Wall Height	7.5 ft	Passive Pressure	103 lbs
Cut Slope Ht (1:1)	3 ft	Active Moment	3375 ft-lbs
Block size (2' or 2.5	2.5 ft	Passive Moment	17 ft-lbs
		Gravity Res Moment	5273
Friction Factor	0.5	Friction	1641 lbs
Block Wall Weight	2812.5 lbs		
Batter 1:	6	Sliding FOS	1.5
Block Embed	0.5 ft	Overturning FOS	1.6

Geotech Consultants, Inc. should be retained to provide geotechnical consultation, testing, and observation services during construction. This is to confirm that subsurface conditions are consistent with those indicated by our exploration, to evaluate whether earthwork and foundation construction activities comply with the general intent of the recommendations presented in this report, and to provide suggestions for design changes in the event subsurface conditions differ from those anticipated prior to the start of construction. However, our work would not include the supervision or direction of the actual work of the contractor and its employees or agents. Also, job and site safety, and dimensional measurements, will be the responsibility of the contractor.

During the construction phase, we will provide geotechnical observation and testing services when requested by you or your representatives. Please be aware that we can only document site work we actually observe. It is still the responsibility of your contractor or on-site construction team to verify that our recommendations are being followed, whether we are present at the site or not.

The analyses, conclusions, and recommendations contained in this report are based on site conditions, as they existed at the time of our site visit. If the subsurface conditions encountered during construction are significantly different from those anticipated, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary. Unanticipated soil conditions are commonly encountered on construction sites. Such unexpected conditions frequently require making additional expenditures to attain a properly constructed project.

This report has been prepared for the exclusive use of Frank Imani, and his representatives for specific application to this project and site. Our recommendations and conclusions are based on the site materials observed and on previous experience with sites that have similar observed conditions. The conclusions and recommendations are professional opinions derived in accordance with current standards of practice within the limited scope of our services. No warranty is expressed or implied.

We trust that this report meets your immediate needs for the proposed development. Please contact us if we can be of further service.

Respectfully submitted,

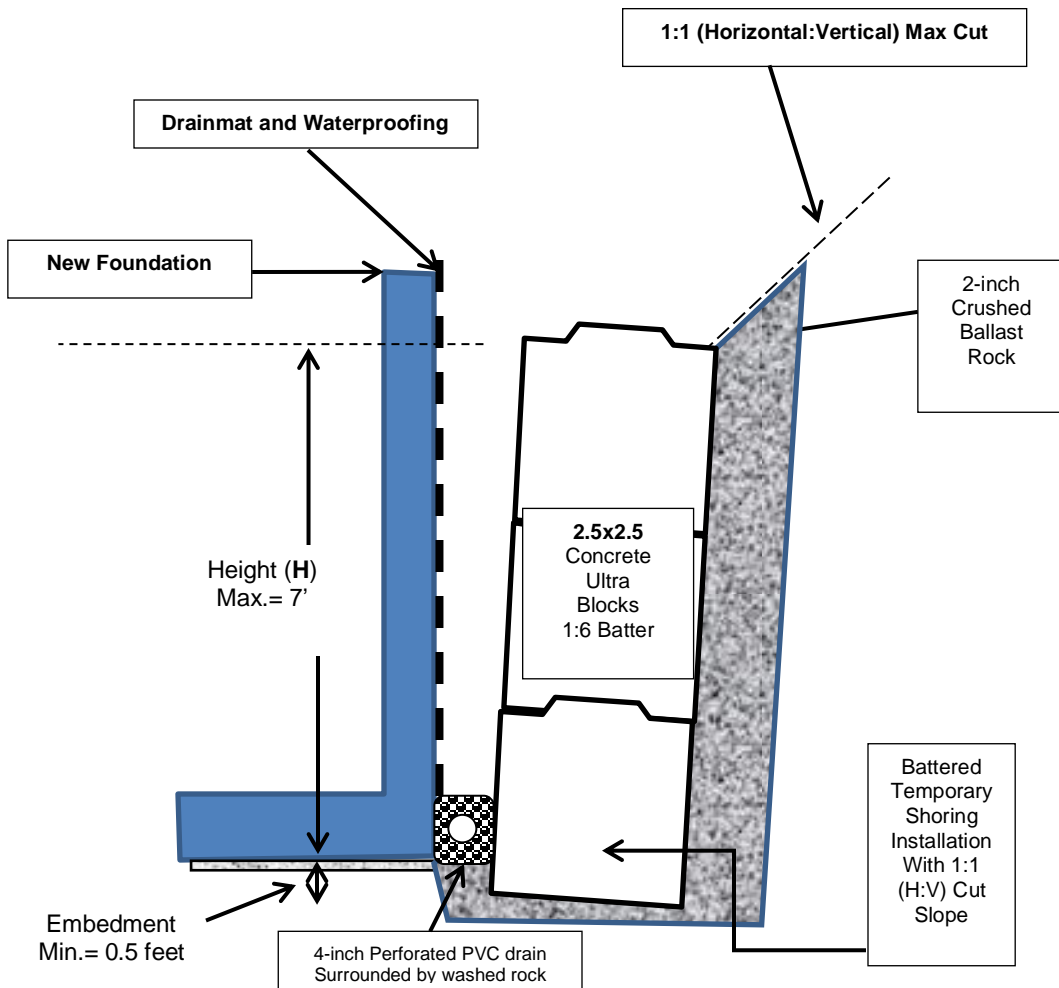
GEOTECH CONSULTANTS, INC.



James H. Strange, Jr., P.E.
Associate

2.6.25

JHS: jhs



General Notes

- 1) Each block shall bear on two blocks in the tier below to interlock the blocks.
- 2) The materials for the wall construction (blocks and rock) shall be onsite prior to excavation for the wall such that the wall can be constructed continuously (in 10-foot sections) as the excavation is made in a "build as you go" fashion.
- 3) Block wall construction (excavation, block stacking, backfill) shall be observed by Geotech.



GEOTECH
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Temp Ultra-Block Wall Detail

2728 – 63rd Avenue Southeast
Mercer Island, Washington

Job 25038	Date: Feb 2025	Scale: Not to Scale	Plate: A
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