GEOTECH
CONSULTANTS, INC.

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October 29, 2025

JN 25324

John Ford
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Mercer Island, Washington 98040
via email: *johndford1965@outlook.com*

Subject: **Foundation and Critical Area Considerations**
Proposed House Addition and Deck Expansion
6805 S.E. 32nd Street
Mercer Island, Washington

Greetings:

This report presents our geotechnical engineering report related to the planned work associated with remodeling the existing residence. The scope of our services consisted of assessing the site surface and subsurface conditions, and then developing this summary report.

Based on the information provided by Sturman Architects, a small addition will be constructed off the southeastern corner of the house. This addition will require the construction of new foundations. The existing main floor deck located along the south side of the house will be expanded along the west side of residence. The excavations for the planned work will be limited in extent. The grades within the development areas will be maintained; no fill placement or retaining walls are planned.

SITE CONDITIONS

The subject property is located on the south side of S.E. 32nd Street. A residence underlain by a daylight basement level occupies the southern portion of the lot. A detached garage with one floor of living space above it is located in the northeast corner of the site. The driveway extends off S.E. 32nd Street into a paved motorcourt that occupies the central portion of the lot. The area around the existing structures is covered with mature trees and landscaping.

The ground surface on the lot and surrounding properties generally slopes downward toward the west. Along the western property line is a short (4- to 5-foot-tall) rockery that was likely constructed when the house was built. This rockery retains fill placed to create a narrow level area along the west side of the house. Below this rockery is the gently-sloped yard of the neighboring property.

The City of Mercer Island GIS maps the entire lot, as well as all of the surrounding neighborhood, as lying within a Potential Landslide Hazard and Erosion Hazard Area. There are no steep slopes mapped on, or around, your property. Our review of *the Mercer Island Landslide Hazard Assessment* (Troost and Wisher, 2009) shows no documented landslides on, or near, the subject property.

We visited the subject property on October 22, 2025 to observe the existing site conditions and to evaluate subsurface conditions in test holes conducted in the area of the southeastern addition and

the western deck expansion. We saw no indications of recent slope movement on, or around, the site.

The explorations were conducted at the approximate locations shown on the attached Site Exploration Plan. Logs of the test holes are also attached. Test Hole 1 was conducted in the footprint of the proposed southeastern addition. At this location, the grade has been lowered a few feet from the original condition as a result of excavation for landscaping. This exploration found a thin layer of mulch and loose, silty sand overlying slightly gravelly, silty sand that became dense and cemented at a depth of approximately 1.5 feet. The dense soil is glacially-compressed. Test Hole 2 was completed in the area of the proposed western deck expansion. Loose, silty sand fill was encountered extending to a depth of approximately 3.5 feet. Beneath this fill was slightly gravelly, silty sand similar in composition to what was found in Test Hole 1. At a depth of 4.5 feet, this native sand was dense and cemented. We previously encountered similar soil conditions for a residential development located two lots to the east, and upslope, of the subject site. No groundwater seepage was encountered in the test holes.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

THIS SECTION CONTAINS A SUMMARY OF OUR STUDY AND FINDINGS FOR THE PURPOSES OF A GENERAL OVERVIEW ONLY. MORE SPECIFIC RECOMMENDATIONS AND CONCLUSIONS ARE CONTAINED IN THE REMAINDER OF THIS REPORT. ANY PARTY RELYING ON THIS REPORT SHOULD READ THE ENTIRE DOCUMENT.

Based on our observations, the foundations for the proposed southeastern addition can be completed using conventional shallow footings. These foundations will likely have to be excavated by hand. It will be important that all footings be excavated to the dense, native soil. The footing subgrades should also be thoroughly cleaned of any loosened or disturbed soil, in order to minimize post-construction settlement.

Considering the depth of the fill and loose soils on the west side of the house, and the desire to avoid disturbing the existing rockery, we recommend that the western deck expansion be supported on driven pipe piles. These piles can be driven to refusal in the dense soils using portable equipment. The use of the pipe piles limits the amount of excavation that will be necessary. All isolated deck columns should be supported on two piles.

The glacially-compressed soils beneath the site that will support the planned deck are not susceptible to seismic liquefaction.

Potential Landslide Hazard Areas: The site lies within an area mapped as a Potential Landslide Hazard area. No recent large-scale movement has been documented in the vicinity of the site. Our explorations confirm that glacially-compressed soil lies close to the ground surface. This competent soil has a negligible potential for instability on the gentle to moderate site slopes.

It is our opinion that no buffers or setbacks are required for the planned construction, provided the recommendations presented in this report are followed. The recommendations presented in the report are intended to prevent adverse impacts to the stability of the site

and the neighboring properties, and to avoid the planned new deck from being damaged by any potential shallow movement of the fill along the west side of the house.

Erosion Hazard Areas: The site meets the City of Mercer Island's criteria for an Erosion Hazard Area. The temporary erosion control measures needed during the site development will depend heavily on the weather conditions that are encountered during the site work. One of the most important considerations, particularly during wet weather, is to immediately cover any bare soil areas to prevent accumulated water or runoff from the work area from becoming silty in the first place. If work occurs during the wet season, a straw wattle or wire-backed silt fence should be erected as close as possible to the planned work area, and the existing vegetation around the work area should be left in place. Soil stockpiles should be minimized. Following rough grading, it may be necessary to mulch or hydroseed bare areas that will not be immediately covered with landscaping or an impervious surface.

The dense, glacially-compressed soil is essentially impervious. Also, in addition to the short filled rockery along the downslope side of the site, there are developed properties downgradient of the site. Considering these issues, it is our professional opinion that on-site infiltration or dispersion of runoff from impervious surfaces is infeasible.

We provide the following "statement of risk" to satisfy City of Mercer Island conditions:

"It is our professional opinion that the development practices proposed in this report for the new development would render the alteration as safe as if it were not located in a geologic hazard area."

We recommend including this report, in its entirety, in the project contract documents. This report should also be provided to any future property owners so they will be aware of our findings and recommendations.

SEISMIC CONSIDERATIONS

In accordance with the International Building Code (IBC), the site class within 100 feet of the ground surface is best represented by Site Class Type D (Stiff Soil).

The IBC and ASCE 7 require that the potential for liquefaction (soil strength loss) during an earthquake be evaluated for the peak ground acceleration of the Maximum Considered Earthquake (MCE), which has a probability of occurring once in 2,475 years (2 percent probability of occurring in a 50-year period). The dense soils beneath the site that will support the pipe piles are not susceptible to seismic liquefaction under the ground motions of the MCE because of their compact nature and high internal strength.

CONVENTIONAL FOUNDATIONS

The footings for the southeastern addition should bear directly on dense, native soil. Any existing fill or loose soils should be removed with the foundation extents.

An allowable bearing pressure of 2,000 pounds per square foot (psf) is appropriate for footings supported on competent native soil. A one-third increase in this design bearing pressure can be used when considering short-term wind or seismic loads. For the above design criteria, it is

anticipated that the total post-construction settlement of footings founded on competent native soil, will be less than one inch, with differential settlements on the order of one-quarter-inch in a distance of 25 feet along a continuous footing with a uniform load.

Lateral loads due to wind or seismic forces may be resisted by friction between the foundation and the bearing soil, or by passive earth pressure acting on the vertical, embedded portions of the foundation. For the latter condition, the foundation must be either poured directly against relatively level, undisturbed soil or be surrounded by level, well-compacted fill. We recommend using the following ultimate values for the foundation's resistance to lateral loading:

PARAMETER	ULTIMATE VALUE
Coefficient of Friction	0.40
Passive Earth Pressure	300 pcf

Where: pcf is Pounds per Cubic Foot, and Passive Earth Pressure is computed using the Equivalent Fluid Density.

If the ground in front of a foundation is loose or sloping, the passive earth pressure given above will not be appropriate. The above ultimate values for passive earth pressure and coefficient of friction do not include a safety factor.

PIPE PILES

A 2-inch-diameter pipe pile driven with a minimum 90-pound jackhammer or a 140-pound Rhino hammer to a final penetration rate of 1-inch or less for one minute of continuous driving may be assigned an allowable compressive load of 3 tons. Load tests are not required to verify this allowable capacity.

Extra-strong steel pipe should be used. The site soils are not highly organic, and are not located near salt water. As a result, they do not have an elevated corrosion potential. Considering this, it is our opinion that standard “black” pipe can be used, and corrosion protection, such as galvanizing, is not necessary for the pipe piles. Subsequent pipe sections should be connected together using threaded or slip couplers, or by welding. If slip couplers are used, they must fit snugly into the ends of the pipes. This can require that shims or beads of welding flux be applied to the couplers.

Pile caps and grade beams should be used to transmit loads to the piles. In general, a minimum of two piles should be used in isolated pile caps, in order to prevent eccentric loading on individual piles.

LIMITATIONS

This report has been prepared for the exclusive use of John Ford and his representatives, for specific application to this project and site. Our conclusions and recommendations are professional opinions derived in accordance with our understanding of current local standards of practice, and within the scope of our services. No warranty is expressed or implied. The scope of our services does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in our report for consideration in design.

ADDITIONAL SERVICES

In addition to reviewing the final plans, 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.

We appreciate the opportunity to be of service on this project. Please contact us if you have any questions, or if we can be of further assistance.

Respectfully submitted,

GEOTECH CONSULTANTS, INC.

10/29/2025

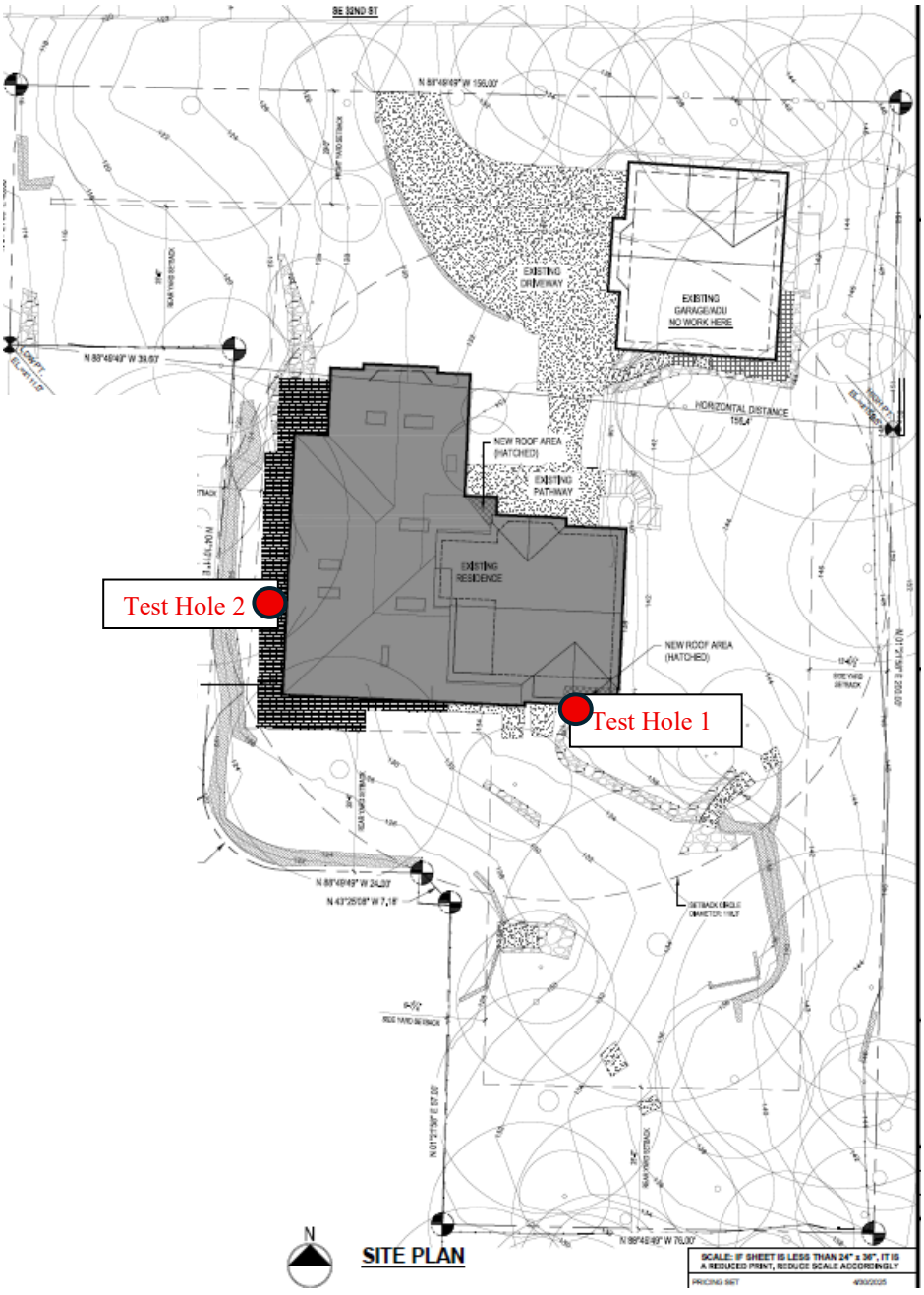
Marc R. McGinnis, P.E.
Principal

Attachments:

- Site Exploration Plan
- Test Hole Logs

cc: **Sturman Architects** – John Magcawas
via email: john@sturmanarchitects.com

MRM:kg


Test Hole 2
Test Hole 1
EXISTING RESIDENCE
EXISTING GARAGE/ADU NO WORK HERE
EXISTING DRIVEWAY
EXISTING PATHWAY
NEW ROOF AREA (HATCHED)
HORIZONTAL DISTANCE 156.4'
N
SITE PLAN
SCALE: IF SHEET IS LESS THAN 24" x 36", IT IS A REDUCED PRINT, REDUCE SCALE ACCORDINGLY

TEST HOLE 1

Depth (feet)	Soil Description
0 – 1.0	4” of Mulch over Brown, silty SAND with roots, fine-grained, moist, loose
1.0 – 1.5	Grayish-brown, slightly gravelly, silty SAND, fine-grained, damp, loose -becomes dense and cemented at 1.5 feet

Test Hole was terminated at a depth of 1.5 feet on October 22, 2025.
No groundwater seepage was observed.

TEST HOLE 2

Depth (feet)	Soil Description
0 – 0.5	Mulch and Gravel
0.5 – 3.5	Brown, slightly gravelly, silty SAND, fine-grained, moist, loose (FILL)
3.5 – 4.5	Grayish-brown, slightly gravelly, silty SAND, fine-grained, damp, loose -becomes dense and cemented at 4.5 feet

Test Hole was terminated at a depth of 4.5 feet on October 22, 2025.
No groundwater seepage was observed.