GEOTECH
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JN 26008

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via email: toddbutson@gmail.com

Subject: **Geotechnical and Critical Area Report**
Repair and Expansion of Existing Decks
8602 North Mercer Way
Mercer Island, Washington

Greetings:

This report presents our geotechnical engineering report related to the planned work associated with the remodel of your existing home. The scope of our services consisted of assessing the site surface and subsurface conditions, and then developing this summary report. On January 8, 2026, the undersigned principal engineer met with your contractor (Showpiece Construction) at your property to evaluate the existing conditions.

A narrow, lower level deck extends along the western two-thirds of the north side of your home, below an overhanging portion of the main floor. The south edge of this deck is carried on the continuous foundation of the house, while the north edge spans between the five isolated pad footings that support the overhanging portion of the house. During replacement of the deck boards, it was discovered that some of the framing for the deck itself needed replacement, which has required a permit from the City of Mercer Island. Accessory to this reconstruction of the existing deck, it will be enlarged toward the west and east to connect with exterior stairs that extend up to the main floor level. A new main level deck will be built off the east side of the house. These deck expansions will require the construction of some new foundations. All work associated with the reconstruction and expansion of the deck will occur within no more than approximately 7 to 11 feet of the existing house's footprint. Much of the work will occur in areas previously disturbed by the construction of the existing deck, an on-grade patio, and a foot path.

The City of Mercer Island GIS maps your entire lot to lie within a Potential Landslide Hazard, Seismic Hazard, and Erosion Hazard areas. There are no steep slopes mapped on, or around, your property.

SITE CONDITIONS

Your property is situated on the north end of Mercer Island, a few lots removed from the shore of Lake Washington. It is accessed by a driveway extending from North Mercer Way, which is located along the south border of the property.

Your residence consists of a main floor overlying a north-facing daylight basement. As discussed above, the main floor extends approximately 7 feet beyond the north foundation of the basement over the western approximately two-thirds of the house. The five timber columns that carry the north side of this overhanging portion are supported on large concrete pad footings.

The ground surface on the property generally slopes downward toward the north at a gentle to moderate inclination. There are no steep slopes on, or near, the site. On the north portion of the property, approximately 15 feet north of the house, the ground surface becomes relatively flat. This low, generally-flat grade extends onto the neighboring northwestern (#8452) and northeastern (#8478) lots and continues north to the shore of Lake Washington. Based on our observations, this low, relatively-flat area was originally below the surface of Lake Washington before the lake's level was dropped in 1916 by the completion of the Montlake Cut.

During our visit to the site, we conducted explorations in the areas of the proposed new foundations outside the area of the previously-existing deck. These hand-excavated test holes encountered a varying thickness of fill and loose, highly-weathered silty sand overlying silty sand that becomes denser and less weathered with depth. In our previous exploration for a project two lots to the west (#8456) we found similar native soil conditions. By reviewing Mercer Island's GIS, we were able to find logs of explorations completed for the houses constructed on all of the adjoining lots. These explorations found similar medium-dense to dense, glacially-compressed soils on the properties located west and east of the site, above the historic level of Lake Washington. The lots to the northwest and northeast, within the previous limits of Lake Washington, are underlain by varying amounts of old lake deposits, beneath which are dense, glacially-compressed soils.

Seepage or wet soil conditions were not encountered to the maximum 5-foot depth of the onsite 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.

The test holes conducted around the planned work area encountered varying amounts of fill and loose soil underlain by competent, glacially-compressed sands. Due to the lack of access for excavation equipment, we recommend that driven, small-diameter pipe piles be used to support all of the new deck footings. This will ensure that the expanded portions of the deck are supported on glacially-compressed soils and will undergo negligible post-construction settlement. This will also minimize site disturbance.

The portion of the existing deck that will be reconstructed will not be larger or substantially heavier than the old deck. As a result, rebuilding the deck will not cause additional settlement of the existing house foundations that will be reused to support it. An allowable bearing capacity of 2,000 pounds per square foot (psf) can be assumed for the soil beneath the existing house footings. If it is necessary to add any new footings to the rebuilt portion of the deck, they should be supported on pipe piles.

Seismic Hazard: The glacially-compressed soils beneath the development area are not susceptible to seismic liquefaction. The foundations for new construction will also bear on these non-liquefiable soils. No additional mitigation is required to address the mapped Seismic Hazard.

Potential Landslide Hazard: The existing residence and planned new deck construction are not close to any steep or tall slopes. The dense to very dense, glacially-compressed soils that underlie the site, and which will support the deck, are not susceptible to instability, even during a strong earthquake. The stability of the gently- to moderately-inclined ground on, and around, the site will not be adversely affected by the shallow excavations needed for the new development. No buffer or other mitigation measures are required to address the Potential Landslide Hazard mapping of the site.

The deck expansion will not increase the potential for instability on the site or the neighboring properties.

Erosion Hazard: The site disturbance for the proposed development will be limited, and will occur primarily on gently-sloped ground. The mapped Erosion Hazard can be mitigated by implementing proper temporary erosion control measures that will depend heavily on the weather conditions that are encountered. Existing ground cover and landscaping should be left in place wherever possible to minimize the amount of exposed soil. Small soil stockpiles should be covered with plastic during wet weather. Soil and mud should not be tracked onto the adjoining streets, and silty water must be prevented from traveling off the site. It should be possible to complete the planned remodel/expansion during the wet season without adverse impacts to the site and neighboring lots. As with any construction project, it can be necessary to periodically maintain or modify temporary erosion control measures to address specific site and weather conditions.

Once we have reviewed the final plans for the development incorporating the recommendations of this report, we can provide a “statement of risk” to satisfy City of Mercer Island conditions.

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 are not susceptible to seismic liquefaction under the ground motions of the MCE.

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 Todd Butson, 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. Our services also do not include assessing or minimizing the potential for biological hazards, such as mold, bacteria, mildew and fungi in either the existing or proposed site development.

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.

1/19/2026
Marc R. McGinnis, P.E.
Principal

cc: **Showpiece Construction** – Clayton Showalter
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