

March 11, 2025

JN 25040

Andrew and Courtney Ackley
9603 S.E. 61st Place
Mercer Island, WA 98040
via email: andrew@stritmatter.com

Subject: **Geotechnical and Critical Area Study**
Proposed Additions to Existing Residence
9603 S.E. 61st Place
Mercer Island, Washington

Greetings:

This report presents our geotechnical engineering report related to additions that will be constructed in association with the planned 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.

Based on the preliminary plans prepared by Brandt Design Group, we understand that your existing residence will undergo a remodel. As a part of this work, two additions/expansions of the structure will be included. On the northeastern end of the house, the existing upper floor will be expanded approximately 7 feet to fully cover the footprint of the basement garage. The loads from this upper floor addition will be carried on the existing foundations. At the western end of the house, a two-story addition will extend approximately 7 feet beyond the existing footprint. This addition will be supported on new foundations. An upper floor addition will also be constructed over the triangular-shaped, one-story portion of the house located at the northwestern corner. This upper floor addition will be supported on the existing foundations. The excavation necessary for the new foundations at the western end of the house is expected to be the only substantial site disturbance outside the existing house's footprint.

SITE CONDITIONS

We visited the subject property on February 29, 2025 to observe the existing conditions and to complete subsurface explorations in the areas of the proposed work. The subject lot is situated between East Mercer Way and Lake Washington on the south side of a curved section of S.E. 61st Place.

The existing residence sits on the southwestern portion of the lot. The garage, which occupies the eastern, basement portion of the house, is accessed by a driveway extending southward from S.E. 61st Place near the mid-line of the property. A paver-covered autocourt extends eastward from the face of the garage. The northeastern portion of the property contains an eastward-trending watercourse, with the area around the watercourse having been landscaped and terraced in the past with short rockeries.

The eastern portion of the existing residence is underlain by a basement, which contains the garage. Most of the basement, except for the eastern approximately 7 feet, has two stories of living space above it. The very northeast corner of the house, which is outside the footprint of the garage,

but at the same elevation as the garage slab, is a small, one-story entry. This small one-story portion of the structure will not be changed as a part of the remodel. The western portion of the house to the west of the basement is underlain by a crawl space. Much of this portion of the house is two stories in height, but the northwestern corner is only one story.

The ground surface on the site and the neighboring properties generally slopes downward toward the east. There are no steep slopes on, or near, the site.

We saw no indications of recent slope movement on the site. The closest mapped landslide on the *Mercer Island Landslide Hazard Assessment* (Troost and Wisher) is approximately 500 feet to the south of the site.

The City of Mercer Island GIS maps your entire lot to lie within Potential Landslide Hazard and Erosion Hazard areas, and the south half of the lot is mapped as an Erosion Hazard area. There are no steep slopes mapped on, or around, your property.

During our visit to the site, our firm completed explorations at the locations indicated on the attached Site Exploration Plan. Logs for the test holes are also attached. All four of the test holes were excavated alongside existing foundations that are expected to provide support for the new upper floor additions. Loose, silty sand backfill was observed extending to the bottom of the footings in all of the test holes. Test Holes 1 and 2 found the bottom of the existing footing at the east face of the garage at a depth of one foot below the surface of the paver-covered autocourt. The existing continuous perimeter footing encountered in Test Holes 3 and 4 is bottomed at a depth of 2 feet below the existing grade. In all four of the test holes, the existing footings were found to bear on medium-dense, slightly silty to silty sand with some gravel. This native soil generally became dense within 12 inches of the bottom of the footings. No groundwater or wet soil conditions were observed 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.

The test holes conducted around the existing house confirm that its foundation bear on competent native soils that are suitable to support the loads associated with the new additions. The medium-dense to dense, native sands found in Test Holes 3 and 4 are also acceptable to support new foundations for the planned western addition.

Excavation to reach bearing soils for the western addition should only be a few feet in depth. These temporary cuts can be made at a near-vertical inclination, and will not be close to the property lines. These temporary cuts will not undermine the neighboring properties.

If the loose fill is removed within the footprint of the western addition, its floor could be constructed as a slab-on-grade. Well-compacted granular fill would need to be placed under this slab. Alternatively, the floor could be constructed as framed over a crawl space. Where crawl spaces are used, footing drains should be installed along the outside of the foundation wall. These footing

drains should be constructed in general accordance with the attached detail, and the pipes must be set below the level of the crawl space.

CRITICAL AREA STUDY

Potential Landslide Hazard: The existing residence and planned new construction are not close to any steep or tall slopes. The glacially-compressed soils that underlie the site and which will support the new additions 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. The stability of the surrounding properties will not be adversely affected by the planned development. No buffer or other mitigation measures are required to address the Potential Landslide Hazard mapping of the site.

Erosion Hazard: The site disturbance for the proposed development will be limited, and will occur primarily on the relatively flat ground on the west side of the house. 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. We recommend that a silt fence or straw wattle be installed around the downslope sides of any work areas. 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.

Buffers and Mitigation: As noted above, the entire site lies within a mapped Potential Landslide Hazard Area, and the prescriptive buffer would extend far beyond the boundaries of the property and the planned development area. No Steep Slope buffer would apply to this project, and no buffer is required by the MICC for an Erosion Hazard Area.

We recognize that the planned development will occur within the designated critical areas. The recommendations presented in this geotechnical report are intended to allow the project to be constructed in the proposed configuration without adverse impacts to critical areas on the site or the neighboring properties. The geotechnical recommendations presented in this report will mitigate any potential hazards to critical areas on the site.

Statement of Risk: In order to satisfy the City of Mercer Island's requirements, a statement of risk is needed. As such, we make the following statement:

The construction practices proposed in this report for the alteration would render the development as safe as if it were not located in a geologically hazardous area and do not adversely impact adjacent properties.

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 glacially-compressed soils beneath the site are not susceptible to seismic liquefaction under the ground motions of the MCE because of the absence of near-surface groundwater.

CONVENTIONAL FOUNDATIONS

An allowable bearing pressure of 2,500 pounds per square foot (psf) is appropriate for existing and new footings supported on dense, native sands. 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.

LIMITATIONS

This report has been prepared for the exclusive use of the Ackleys and their 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.



3/11/2025

Marc R. McGinnis, P.E.
Principal

Attachments:

- Vicinity Map
- Site Exploration Plan
- Test Hole Logs
- Footing Drain Detail

cc: **Brandt Design Group** – Kate Miller
via email: kate@brandtdesigninc.com



GEOTECH
CONSULTANTS, INC.

VICINITY MAP

9603 S.E. 61st Place
Mercer Island, Washington

Job No:

25040

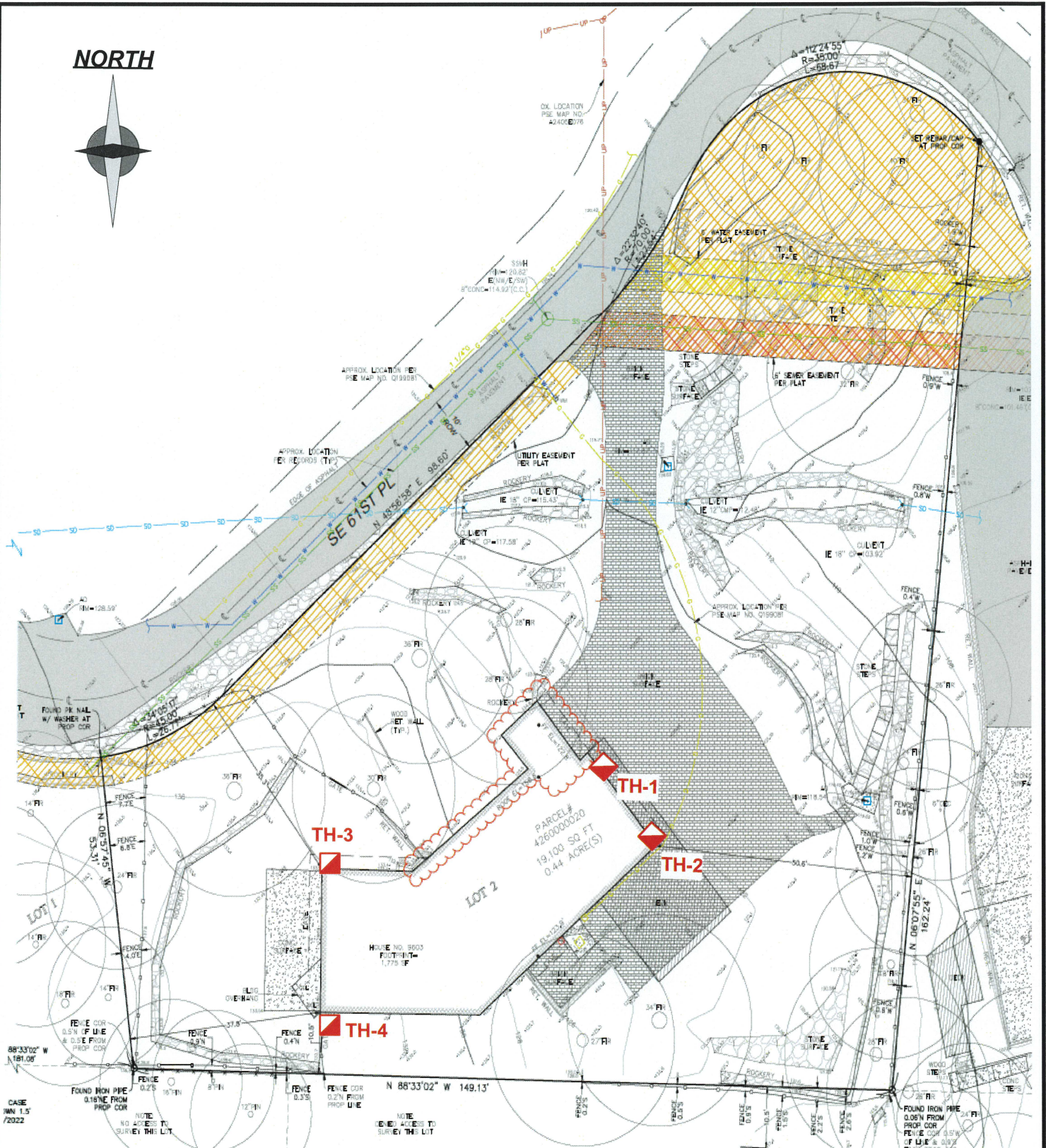
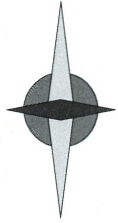
Date:

March 2025

Plate:

1

NORTH



Legend:

Test Hole Location



**GEOTECH
CONSULTANTS, INC.**

SITE EXPLORATION PLAN

9603 S.E. 61st Place
Mercer Island, Washington

Job No:	Date:	No Scale	Plate:
25040	March 2025		2

TEST HOLE 1

Depth (feet)	Soil Description
0 – 1.0	Pavers over brown, silty SAND, loose (FILL)
1.0 – 2.0	-Bottom of existing footing at 1.0 feet Brown to gray, silty SAND, fine-grained, very moist, medium-dense
2.0 – 2.5	Brown, gravelly, slightly silty SAND, fine-grained, moist, dense

Test Hole was conducted on February 29, 2025.

No groundwater seepage was observed.

TEST HOLE 2

Depth (feet)	Soil Description
0 – 1.0	Pavers over brown, silty SAND, loose (FILL)
1.0 – 2.0	-Bottom of existing footing at 1.0 feet Brown to gray, silty SAND, fine-grained, very moist, medium-dense
2.0 – 3.0	Brown, gravelly, silty SAND, fine-grained, moist, dense

Test Hole was conducted on February 29, 2025.

No groundwater seepage was observed.

TEST HOLE 3

Depth (feet)	Soil Description
0 – 2.0	Brown to gray, gravelly, silty SAND, loose (FILL)
2.0 – 3.0	-Bottom of existing footing at 2.0 feet Brown, gravelly, silty SAND, fine-grained, moist, dense

Test Hole was conducted on February 29, 2025.

No groundwater seepage was observed.

TEST HOLE 4

Depth (feet)	Soil Description
0 – 2.0	Brown to gray, gravelly, silty SAND, loose (FILL)
2.0 – 3.0	-Bottom of existing footing at 2.0 feet Brown, gravelly, silty SAND, fine-grained, moist, dense

Test Hole was conducted on February 29, 2025.

No groundwater seepage was observed.



TEST HOLE LOGS			
9603 S.E. 61st Place			
Mercer Island, Washington			
Job No:	Date:		Plate:
25040	March 2025		3