

February 15, 2021

JN 21018

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Attention: Greg Andrews
via email: tutgreg@msn.com

Subject: **Geotechnical Engineering Considerations**
Proposed Residence Addition Project
8140 West Mercer Way
Mercer Island, Washington

Greetings:

We are pleased to present this geotechnical engineering report for the proposed deck/landscape project on Mercer Island. The scope of our services consisted of exploring site surface and subsurface conditions in the project area, and then developing this report to provide recommendations/conclusions for design and existing slope considerations.

Based on information provided to us by Tutmarc Associates, we understand that a deck addition is proposed at southeastern corner of the existing residence. The deck will extend over an existing slope, with its western side connected to the existing residence foundation and the eastern side supported by a new structure. This new structure will include a stair (that will provide access to the deck) and also a fountain.

If the scope of the project changes from what we have described above, we should be provided with revised plans in order to determine if modifications to the recommendations and conclusions of this report are warranted.

SITE CONDITIONS

The site is located in the southwestern portion of Mercer Island. It is situated upslope of West Mercer Way, on the northern side of an existing driveway that provides access to multiple residences to West Mercer Way. The existing residence is located in the central portion of the site. Overall, the site slopes downward to the southwest with a moderate inclination of approximately 25 percent. The area of the proposed deck is at the southeastern portion of the residence. There is an approximate 10-foot steep slope, inclined at approximately 50 percent, located above the residence. An onsite driveway is located at the top of the slope. This slope is landscaped and includes some small rockeries.

We excavated a test hole with hand equipment at the top of the slope in the approximate location of where the stairway and fountain are proposed. A small amount of loose fill soil was revealed at the ground surface overlying relatively loose, native sand. At a depth of approximately 3 feet, the sand became medium-dense to dense. Our firm observed the excavation of test pits in the past on an

adjacent residential property that is just south (8146 West Mercer Way). The competent native sand was revealed a relatively shallow depths similar to the sand revealed at 3 feet in the onsite test hole. We have attached the logs of the nearby test pits with this report.

CONCLUSIONS AND RECOMMENDATIONS

As noted earlier, the test hole excavated in the area at the eastern side of the proposed structure revealed competent, native sand soil a depth of approximately 3 feet. The eastern side of the structure can be founded on a conventional footing foundation provided it bears on the competent soil. An allowable bearing pressure of 2,000 pounds per square foot (psf) is appropriate for the design of the footing foundation; a one-third increase in this design bearing pressure may be used when considering short-term wind or seismic loads. In addition, an ultimate coefficient of friction of 0.5 can be used for foundation's lateral resistance.

Because the loads for this deck project will be on either the existing residence foundation or the new footing, the slope that exists between the residence and driveway will not be affected by the project.

In order to satisfy the City of Mercer Island's requirements because of the steep slope east of the residence, which is technically considered a Geologic Hazard Area, a statement of risk is needed. As such, we make the following statement:

Provided the recommendations in this report are followed, it is our professional opinion that the development has been designed so that the risk to the lot and adjacent property is eliminated or mitigated such that the site is determined to be safe.

The drainage and/or waterproofing recommendations presented in this report are intended only to prevent active seepage from flowing through concrete walls or slabs. Even in the absence of active seepage into and beneath structures, water vapor can migrate through walls, slabs, and floors from the surrounding soil, and can even be transmitted from slabs and foundation walls due to the concrete curing process. Water vapor also results from occupant uses, such as cooking, cleaning, and bathing. Excessive water vapor trapped within structures can result in a variety of undesirable conditions, including, but not limited to, moisture problems with flooring systems, excessively moist air within occupied areas, and the growth of molds, fungi, and other biological organisms that may be harmful to the health of the occupants. The designer or architect must consider the potential vapor sources and likely occupant uses, and provide sufficient ventilation, either passive or mechanical, to prevent a build up of excessive water vapor within the planned structure.

Geotech Consultants, Inc. should be allowed to review the final development plans to verify that the recommendations presented in this report are adequately addressed in the design. Such a plan review would be additional work beyond the current scope of work for this study, and it may include revisions to our recommendations to accommodate site, development, and geotechnical constraints that become more evident during the review process.

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.

LIMITATIONS

The conclusions and recommendations contained in this report are based on site conditions as they existed at the time of our explorations and assume that the soil and groundwater conditions encountered in the explorations are representative of subsurface conditions on the site. If the subsurface conditions encountered during construction are significantly different from those observed in our explorations, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary. Unanticipated conditions are commonly encountered on construction sites and cannot be fully anticipated by merely taking samples in borings. Subsurface conditions can also vary between exploration locations. Such unexpected conditions frequently require making additional expenditures to attain a properly constructed project. It is recommended that the owner consider providing a contingency fund to accommodate such potential extra costs and risks. This is a standard recommendation for all projects.

This report has been prepared for the exclusive use of Tutmarc Associates, the property owners, 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.



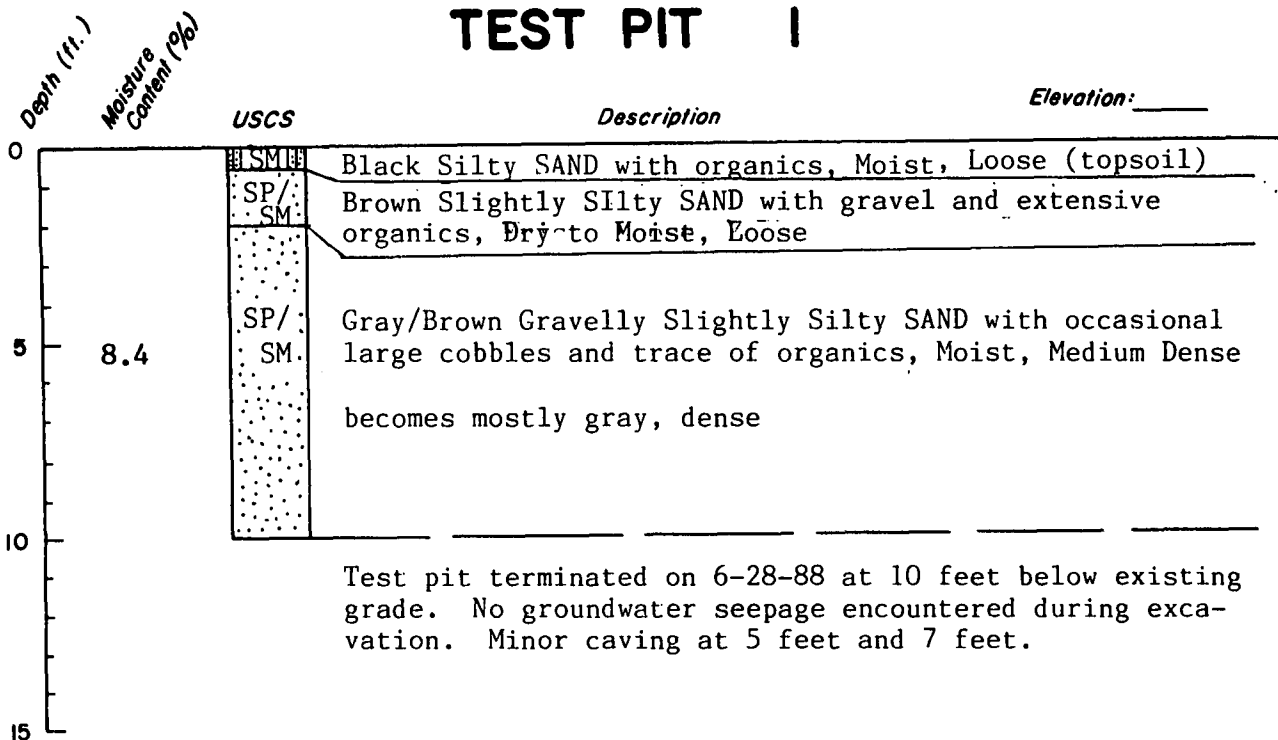
02/15/21

D. Robert Ward, P.E.
Principal

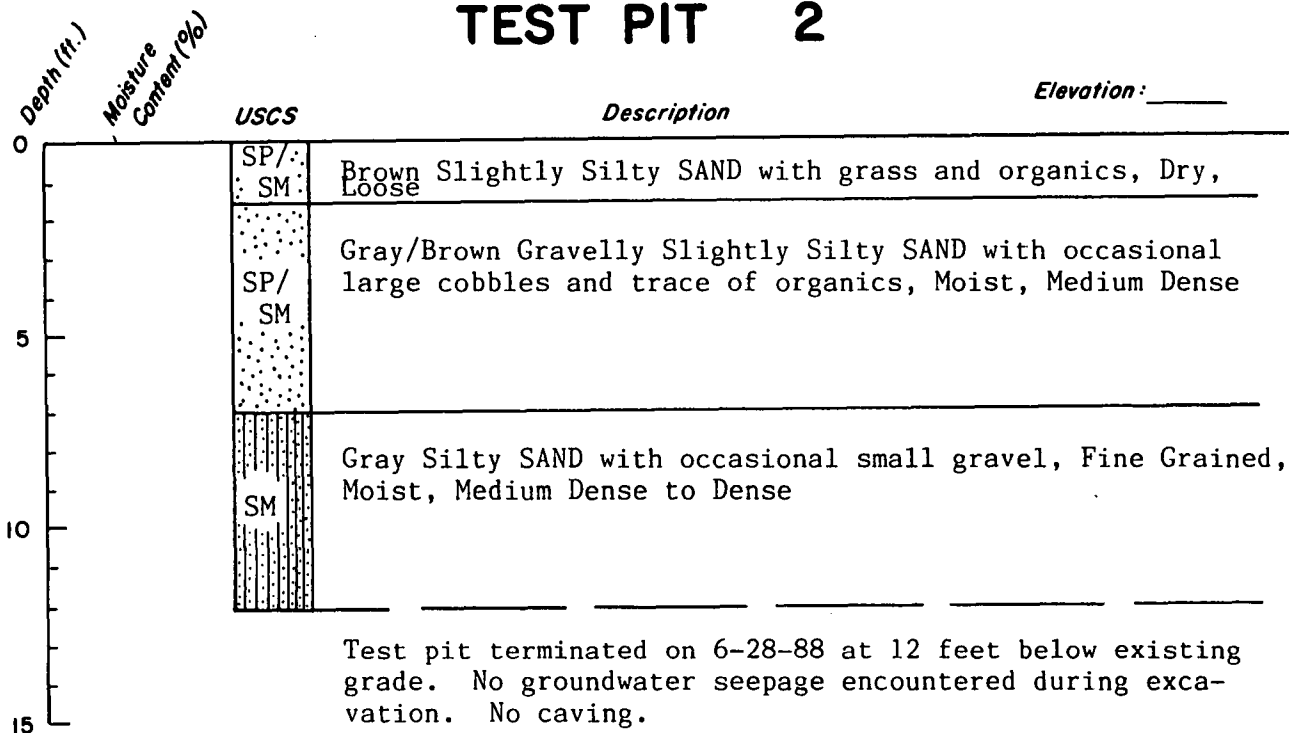
Attachment: Logs of Nearby Test Pits

DRW:kg

TEST PIT 1



TEST PIT 2



TEST PIT LOGS
 HIGGINS RESIDENCE
 MERCER ISLAND, WASHINGTON

Job No.: 88236	Date: JULY 1988	Logged By: DRW	Plate: 3
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