

July 14, 2020

JN 16162

Rahul Shinde
via email: shinde.rahul@gmail.com

Subject: Review of Structural and Civil Drawings
Proposed Ne Shinde Residence
4207 West Mercer Way
Mercer Island, Washington

Reference: *Geotechnical Engineering Study*, Geotech Consultants; May 11, 2016.

Since preparing our 2016 *Study* the scope of your project has changed to a total reconstruction of the existing residence. From a geotechnical standpoint, this has the significant benefit of completing a structure that will be supported entirely on a modern foundation system intended to prevent post-construction settlement and to provide foundation and slope stability considerations for the western portion of the structure. The eastern half of the foundation for the structure was addressed in previous structural designs.

For our review, we were provided with sheets S0.1, S2.1, and S5.1-S5.3 (Studio Ectypos) dated May 22, 2020 and sheets C1-C5 (WR Consulting) dated May 21, 2020. These plans show that the eastern half of the house, which is located in an area of old fill and a previous skin slide, will be supported on drilled stabilization piles, with pipe piles supporting the upper, northern foundation. This is consistent with our recommendations. This is consistent with the design that we previously reviewed. A large crane-mounted drill will be needed to reach out over the slope to install the drilled stabilization piles. The western half of the house will be constructed on the natural knob of ground having better soil conditions. This portion of the structure will be set back further from the steep slope than the existing structure. Also, pipe piles will be used to support this portion of the new house. The western portion will therefore also be protected from any future shallow movement on the steep slope, and will prevent adverse impacts to the slope's stability. The closely-spaced drilled piles are not needed for the western half of the new house.

A large detention tank must be installed between the new house and the north property line. It would not be appropriate to install the detention tank closer to the steep slope, as the detention tanks have been known to leak and this would present a risk to the slope. The HDPE outlet for the detention tank will be a flow spreader located at the base of the slope, alongside the watercourse. This is an appropriate discharge point, as the surface runoff from the site currently flows to this point.

The plans that we reviewed conform to our geotechnical recommendations. We provide the following "statement of risk" to satisfy City of Mercer Island conditions:

"It is our professional opinion that the development practices indicated in the reviewed plans should render the development as safe as if it were not located in a geologic hazard area."

We have been asked about the need to remove the old birch trees located in the right-of-way to the north of the planned new residence. These birch trees present definite safety and access issues if they were to remain in place. The large equipment needed for demolition and excavation, as well

as drilling of the eastern piles, needs to be kept back from the crest of the steep slope for safety and stability purposes. The birch trees, if they were to remain, makes that difficult to impossible to accomplish. They also would present a hazard to swinging of the crane needed to install the drilled piles. There are, unfortunately, no other appropriate options to install the piles for the eastern half of the structure. Additionally, leaving the trees in place would preclude making a sloped excavation for the installation of the storm detention system, and the excavation for this installation may cut through the tree roots anyway. From a geotechnical standpoint, slope stability and erosion protection for the site and right-of-way would be improved by removing these sickly deciduous trees and replacing them with healthy evergreen trees and vegetation. The precipitation interception afforded by evergreen vegetation during the fall and winter months reduces the amount of precipitation that can reach the ground surface. Deciduous trees do not provide this benefit.

Please contact us if there are any questions regarding this letter.

Respectfully submitted,

GEOTECH CONSULTANTS, INC.



07/14/20

Marc R. McGinnis, P.E.
Principal

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