



June 25, 2021  
ES-8009

## Earth Solutions NW LLC

Geotechnical Engineering, Construction  
Observation/Testing and Environmental Services

Design Built Homes  
11400 Southeast 8<sup>th</sup> Street, Suite 415  
Bellevue, Washington 98004

Attention: Mr. Todd Sherman

**Subject: Geotechnical Consultation  
Preliminary Slope Assessment  
Lorenzini Short Plat  
4719 – 86<sup>th</sup> Avenue Southeast  
Mercer Island, Washington**

Dear Mr. Sherman:

Earth Solutions NW, LLC (ESNW) has prepared this letter for the proposed residential development located at 4719 – 86<sup>th</sup> Avenue Southeast in Mercer Island, Washington. The purpose of this letter was to provide an opinion regarding slope stability, and geotechnical recommendations for slope setbacks based on observation of several shallow test pits excavated with hand tools, review of the geologic maps for the area, and review of LiDAR imagery for the area.

### **Project Description**

The subject site is located on the west side of 86<sup>th</sup> Avenue Southeast, south of the intersection with Southeast 47<sup>th</sup> Street in Mercer Island, Washington. The site is currently developed with a single-family residential structure, driveway, and general landscape areas. The site sits atop a slope which descends towards the south and neighboring properties. The slope is inclined at 35 percent, based on our review of the available topographic survey for the site. The site is surrounded by developed parcels occupied by residences, and associated improvements.

Re-development plans include removal of the existing structure, and construction of two single-family residences and associated improvements.

## **Surface Conditions**

Native trees are present on and around the slope, and the slope is heavily vegetated with underbrush and blackberries. During our site visit a representative of ESNW observed the areas on and around the top-of-slope. No signs of instability in the form of highly pistol-butted tree trunks, surface seeps, slide scarps, or down-sets were observed within accessible portions of the upper slope.

We reviewed the LiDAR imagery for the slope and site, and observed no signs of past or present instability in the form of crescent-shaped morphology in the slope, downsets, or hummocks. However, fidelity of the LiDAR is limited and somewhat difficult to ascertain as to the presence of past small-scale landslides and scarp formation.

## **Geologic Setting**

The referenced geologic map resource identifies Vashon subglacial till (Qvt) deposits across the site and surrounding areas. The referenced SCS soil survey identifies Arents Alderwood series soils (AmC) across the majority of the site, with Kitsap silt loam 2 to 8 percent slopes (KpB) mapped for the west side of the site, and Kitsap silt loam 15 to 30 percent slopes (KpD) mapped for the area to the south of the existing residence. Arents Alderwood series soils are typified by glacial till, whereas Kitsap series soils are typified by lacustrine depositional environments.

The soil conditions observed at the test pit locations, excavated around the top-of-slope, are generally consistent with glacial till deposits. In our opinion, the site lies in an area underlain by glacial till based on our review and limited subsurface exploration.

## **Subsurface**

We reviewed test pit logs by others as part of the preparation of this report. The test pits were located to the southwest of the subject site, and were described as being excavated within glacial till soil as reviewed on the DNR geology portal which is available on-line.

The soil conditions at the test locations ESNW excavated using hand tools to a depth of two feet were observed to be silty sand (Unified Soil Classification, SM) and sandy silt (ML). The soil density was observed to transition from medium dense to dense at depths of about one and one-half feet.

## **Groundwater**

Groundwater seepage was not observed in the test pits that were excavated June 23, 2021.

## **Geological Hazard Areas**

A slope meeting the criteria for a landslide hazard area is present off the southern and western sides of the property. The slope descends from the site elevation towards the south and southwest.

The City of Mercer Island landslide hazard map describes slopes inclined at 15 percent and higher for the slope under concern. Based on our review of the available topographic survey, the slope is inclined at about 35 percent starting at elevation 290 and descending to elevation 244. Additionally, the map identifies a scarp to the southwest of the subject site, located above the roadway located at the toe-of-slope offsite.

We observed no signs of instability during our site visit in June of 2021. Indicators of slope instability are described above in the Surface Conditions section of this letter.

## **Recommendations**

Based on our review of the city code (19.07.160) in relation to geologically hazardous areas, we have determined (based on our limited site exploration and analysis) that landslide hazards areas are not present on the site based on the inclination of the slope, and the presumed subsurface conditions at-depth within the slope regions on the subject site. Meaning that we do not anticipate a permeable soil type underlain by a less permeable soil type.

In our opinion, a 10-foot separation should be maintained between the face-of-slope and edge-of-foundation.

It is our understanding, and the client's, that a more in-depth analysis may be required to determine the global stability characteristics within the slopes on/around the subject site, as this report is cursory in nature and intended for feasibility reasons. ESNW can provide a more thorough slope stability study upon request.

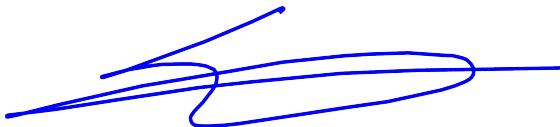
## **Limitations**

The recommendations and conclusions provided in this geotechnical engineering study are professional opinions consistent with the level of care and skill that is typical of other members in the profession currently practicing under similar conditions in this area. A warranty is not expressed or implied. Variations in the soil and groundwater conditions encountered at the test sites may exist, and may not become evident until construction. ESNW should reevaluate the conclusions in this letter if variations are encountered.

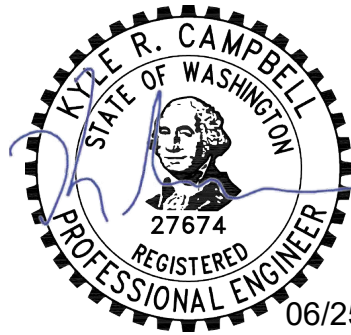
We trust this geotechnical assessment meets your current needs. If you have any questions, or if additional information is required, please call.

Sincerely,

**EARTH SOLUTIONS NW, LLC**



Stephen H. Avril  
Senior Project Geologist



06/25/2021

Kyle R. Campbell, P.E.  
Principal Engineer