



December 18, 2019  
Project No. 20180264E001

Land Resources NW, LLC  
19711 88<sup>th</sup> Avenue NE  
Bothell, Washington 98011

Attention: Mr. Craig Pierce

Subject: Proposed East-West Road Connector  
Wyndham Highlands  
13018 and 13104 Sultan Basin Road  
Sultan, Washington

References: *Subsurface Exploration, Geologic Hazard, and Geotechnical Engineering Report, Wyndham Highlands*, prepared for Land Resources NW, LLC by Associated Earth Sciences, Inc. (AESI), dated July 12, 2018.

*Geotechnical Report Addendum, Wyndham Highlands*, prepared for Land Resources NW, LLC by AESI, dated August 2, 2018.

Dear Mr. Pierce:

It is our understanding that construction of an east-west connector road is being considered for the Wyndham Highlands project. Specifically, the conceptual plan consists of extending a road down the steep slope located in the western portion of the subject site to provide a connection between Sultan Basin Road and Trout Farm Road.

The steep slope in the western portion of the subject site classifies as a Landslide Hazard Area under the *Sultan Municipal Code (SMC)* due to the following characteristics:

- The slope is in an area of historic landslide activity;
- The slope exhibits inclinations of 40 percent or more over a height in excess of 10 feet;
- Portions of the slope below 5 feet in depth are underlain by sediments exhibiting blow counts less than 10 blows per foot as measured using the Standard Penetration Test (ASTM D-1586-11); and,
- The inclination of the slope exceeds 15 percent and exhibits emergent seepage (spring activity).

An analysis of the stability of the slope was completed as part of our previous work at the site. Minimum factors of safety of 1.55 and 0.81 were calculated for the slope under static and seismic conditions, respectively. Section 17.10.310(E) of the SMC specifies that minimum factors of safety of 1.5 and 1.15 are required to demonstrate mitigation of landslide hazard risk under static and seismic conditions, respectively. The minimum factor of safety of 0.81 calculated for the subject slope under seismic conditions falls below this standard and indicates that the slope would fail under the design seismic event. Under seismic conditions, theoretical failure surfaces associated with factors of safety less than codified minimum of 1.15 were found to extend up to 69 feet beyond the top of the steep (>40 percent) slope.

Detailed discussions of the subsurface conditions underlying the subject site, the topography of the slope, geomorphic indications of historic landslide activity, and the methodology and findings of our slope stability analysis were provided in our July and August 2018 geotechnical reports.

Alteration of geologically hazardous areas and their buffers is prohibited under the SMC, except as expressly allowed in Chapter 17 of the code. Section 17.10.325(F)(3) of the code states that *“Access roads and utilities may be permitted within the geologically hazardous area and associated buffers if the director determines based on an approved critical area report and mitigation plan that the road will not increase the risk to adjacent sites and that no other feasible alternative exists”*. Section 17.10.310(E) of the code states that *“...permits shall not be issued for any site where a substantial risk of earth subsidence and landslide hazard exists unless all the following apply:*

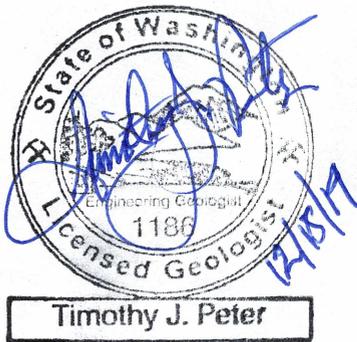
1. *The risks can be defined with reasonable scientific certainty according to the standards of the geotechnical engineering profession and found to be within the minimum factor of safety for the static and seismic conditions of at least 1.5 and 1.15, respectively.*
2. *Any hazard associated with the site is scientifically ascertained and fully disclosed through the permit process.”*

The stability analysis completed for the subject slope indicates that factors of safety on the slope under seismic conditions do not meet the minimum performance standard specified

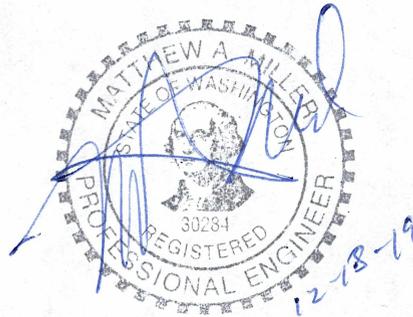
under SMC Section 17.10.310(E). For this reason, construction of a connector road down the steep slope is not recommended and would not be allowed under the SMC.

We appreciate this opportunity to have been of service to you with your project. Should you have any questions, or require additional information, please do not hesitate to call.

Sincerely,  
**ASSOCIATED EARTH SCIENCES, INC.**  
**Kirkland, Washington**



Timothy J. Peter, L.E.G., L.Hg.  
Senior Engineering Geologist



Matthew A. Miller, P.E.  
Principal Geotechnical Engineer