



## Technical Memorandum

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Date:	July 13, 2021	Project Manager:	Matt Miller <i>MDM</i>
To:	Basel Capital	Principal in Charge:	Matt Miller <i>MDM</i>
Attn:	Lucy Chen Maria Hui	Project Name:	Basel Harbour Place
Address:		Project No:	20190008E001
Subject:	Comment Response - 9900 Harbour Place Permit # DA-2019-002, BSP-2019-01		

### Reference Documents:

1. *Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report, Dated February 8, 2019, AESI*
2. *AESI Supplemental letter titled Additional Subsurface Explorations, Basel Mukilteo Townhomes dated March 22, 2019*
3. *AESI Memorandum Additional Information Request - 9900 Harbour Place Permit # DA-2019-002, BSP-2019-01 dated March 25, 2020*

This memo is on response to comments from each reviewer of the City of Mukilteo. Our responses are in regard to the geotechnical portions of the project

### Planning Comment: Linda Ritter

#### *Geotechnical Report #2*

1. *The Public Works Director is requiring a 30 foot setback from the top of the slope on the west side of the property per the geotechnical report dated March 22, 2019. Revise the site plan to show the 30 foot setback.*

### Reviewers Engineering: Jake Kronberg Senior Engineering Technician

### Stormwater: Brian Wirt Stormwater Technician

4. *The Geotechnical Report dated March 22, 2019, on page 5 under Recommendations states the setback on the west property line for all structures shall be 30-feet from top of slope.*

*The geotechnical report addendum, dated March 25, 2020, modified the top of slope setback recommendation to 25' from top of slope provided the foundation is located at a depth where the loading would result in an "effective" setback of 30' (measured horizontally from the foundation depth to the face of slope). The Binding Site Plan and Civil Plan Sets shall show a setback line for all structures measured from top of slope. The City will not accept top of slope setback requirements that are contingent on a particular type or depth of foundation. Based on the recommendations in the March 22, 2019 Geotechnical Report, the site plan and Binding Site Plan shall be updated to reflect the required 30-foot setback recommendation. In addition, Building #13 shall be adjusted to meet the required 30-foot setback.*

In response to the proceeding comments from both of the reviewers of the City of Mukilteo, the project team was granted a meeting with the City reviewers regarding the slope setback issues. Our meeting was intended to provide clarity of the project intentions and the recommendations for slope setbacks given by the geotechnical engineer. The setbacks from the top of the slope along the perimeter of the proposed development were provided in the original geotechnical report and a follow-up memorandum.

In Reference #1, the original geotechnical report provided preliminary recommendations based upon exploration pits and on-site observations. As a result of the site analysis, it was acknowledged that the slopes along the west and south sides of the project area were classified as steep slopes. Mukilteo City code 17.08.020 defines "Steep slopes" as naturally occurring slopes that rise ten feet or more for every twenty-five feet horizontal (i.e., forty percent or greater, also represented as a twenty-two degree angle). A slope is delineated by establishing its toe and top. Existing slopes modified with engineering oversight or in accordance with standard construction industry techniques are not considered steep slopes. From this definition the top of the slope was defined on the site plan, and we concluded that in order to mitigate landslide hazards, the proposed townhomes should be set back at least 25 feet from the top of steep slopes along the western and southern property boundaries. This conclusion was based upon the shallow explorations performed and the presence of dense to very dense glacial till for the support of the foundations.

In order to further substantiate the original recommendations and obtain the needed information for a slope stability analysis, additional explorations were performed near the top of the steep slopes. This resulted in a supplemental letter describing the slope stability analysis performed and follow-up recommendations for setbacks from the top of the slope. As a result of the slope stability analysis a setback was determined for shallow foundations to be 30 feet. However, it was also stated that a reduced setback to the code minimum of 25 feet could also be achieved if the foundations of the structures are deepened. By deepening the foundation, the risk of instability will not increase for a reduced setback.

*Mukilteo City Code 17.52A.050 Development in geologic sensitive areas.*

*A. "Applicants proposing development on undeveloped lots within a geologic sensitive area shall comply with the building setback and buffer recommendation presented in the geotechnical analysis. In no case shall the critical slope setback be less than twenty-five feet from a steep slope."*

The proposed development is complying with the building setback presented in the geotechnical report. The geotechnical report indicates that a setback less than 30 feet may be used if the foundations are extended to a depth where the bearing elevation is at least 30 feet from the face of the slope. This was an alternative given in the original report, Reference #1, and illustrated in Reference #3.

*Mukilteo City Code Development Standards 17.52A.080.A states "The proposed development shall provide a safety factor of 1.5 for static conditions and 1.2 for dynamic conditions for seismic occurrences. Analysis of dynamic conditions shall be based on a minimum horizontal acceleration as established by the current adopted version of the International Building Code."*

The recommendation for setbacks was supported by slope stability analysis that meets the criteria for site development standards. Deepening the foundation near the top of a steep slope is a common site development practice.

In addition, the project is also complying with the development code by establishing a setback of no less than 25 feet.

Based upon the analysis performed, it is our opinion that a setback of 25 feet from the top of the steep slopes is suitable provided the recommendations made for foundation depths are followed.

*Geotechnical Reports*

- 8. Provide geotechnical confirmation and/or addendum that shows the slope stability analysis related to the stormwater vault provided in the geotechnical letter report dated March 22, 2019 includes the effects of proposed retaining wall and associated fill in the vicinity of the vault.*

According to the revised plans dated 6-25-21, the stormwater vault has been relocated away from the top of the slope. The vault is now located northeast of the original location with the southern end of the vault in the play area. This location is farther away from the top of the slope and at a depth of about 22 feet below existing grade. Fill was encountered for the full depth of the exploration (EP-8) near this location to a depth of 10.5 feet. Other locations nearby the fill is underlain by dense to very dense glacial till. The glacial till will provide a bearing capacity that meets or exceeds 3,000 psf for design of the stormwater vault.

The slope stability analysis performed in the preparation of the letter report dated March 22, 2019, was done for a pre- and post-developed condition that included the vault. Both scenarios resulted in adequate factors of safety that includes the current configuration.

If there are any further questions, please call 425-827-7701.

