



ELEMENT
solutions

June 19, 2023

Client: Ann C. Jones Family LP
807 Chuckanut Shore Road
Bellingham, WA 98229

Cc: City of Bellingham Planning & Community Development
Ali Taysi ; AVT Consulting, LLC

Project: **Jones Edgemoor Estate – Proposed 38-Lot Plat**
352 Viewcrest Road, Bellingham, WA

Subject: **Memorandum #1 – Response to COB Application Review RFI (Issued 12/21/2022)**

Dear Ms. Jones,

At the request of the Jones family and project team, Element Solutions (ES) has reviewed a revised lot layout and considered review comments returned by the City of Bellingham (COB) in order to compose a response intending to address portions of the most recent RFI (12/21/2022) pertaining to Geohazards. Our summary understanding of the COB requests is as follows:

- Address in greater detail or provide clarifications on relation of prescriptive 60' x 60' building envelopes to mapped geohazard slopes and standard minimum 10-foot buffers.
- Address building areas with respect to other specific geohazard setbacks on certain lots / features as provided in the geotechnical report.
- Provide discussion / demonstration of proposed setback reduction satisfying the criteria in BMC 16.55.460(A)(1)(b).

This Memorandum relies wholly on data collected previously and presented in the *Geotechnical Investigation & Geohazard Report - Proposed 38-Lot Plat Development, Jones Edgemoor Estate* (ES, October 6, 2022). No additional field work or analysis has been completed at this time. The findings and recommendations of the original work are not superseded by the new information below. This correspondence is intended to clarify and supplement original report recommendations, and to address layout revisions and code compliance.

Key Changes to Layout

We have reviewed the most recent Site Plan (PSE ; 6-9-2023), incorporated by reference. These key items summarize changes of significance with respect to critical area geohazard considerations:

- Building envelope for “Lot 7” (top of NW ridge) was removed, and land area was combined with adjacent “Lot 8”. The “Lot 8” building envelope was slightly adjusted to maximize distance from the mapped GHA. This is now Lot 7; all subsequent Lot numbers were adjusted.
 - This change eliminates the building area from a challenging location in proximity to two large slope features (to NW and SE). Minor adjustment of the remaining building envelope to southwest has resulted in a configuration that meets standard buffer criteria as well as specific setback recommendations by ES (see below).
- Lot 38 building envelope was relocated to northwest, next to lot entry.
 - This change moves the building zone outside of the standard 50-foot buffer from the suspected relict landslide feature in the NE corner of the project area.
- A lot was added to the southwest row of lots (replacing removed “Lot 7”). Other lots in southwest row were adjusted in width to compensate.
 - No significant changes to layout or relation to GHAs as a function of width adjustments.
- The shared driveway access extending to the southwest from the East Road cul-de-sac has been shifted a varying distance to the southeast on the order of 20 to 30 feet.
 - The alignment that was formerly along the top and upper part of a moderate slope is now traversing the majority of the slope feature. The road is aligned roughly in parallel with the slope trend. Road development will use a combination of grading and retaining walls as needed to construct the traveled way.
- Other small adjustments were made to lot lines and building envelopes which have optimized the setbacks from GHAs in order to meet code standards on a per-lot basis.

Review of Setbacks

Setbacks under consideration for preliminary building envelopes include three categories: 1) Special setbacks from large slope/bluff features outside of the development area , 2) Setbacks from specific local features within the development area based on geohazard assessment, and 3) Minimum setbacks from geohazard slopes (10-foot, with justification). Setbacks were discussed in Section 4.4.2 of the geotechnical report.

Special Setbacks

We previously recommended a 150-foot setback from the southeast coastal bluff slope crest. All proposed development is further inland and well outside of this primary setback. A minimum 50-foot setback was also prescribed for the suspected relict landslide feature in the NE corner of the site. The building envelope for Lot 38 has been relocated and is now over 100 feet away from the mapped LHA. No further review for this category of setbacks is necessary.

Local Geohazard Setbacks

These are addressed in order as discussed in the Geotechnical Report, Section 4.4.2.

- Lot 7 (formerly 7 & 8): Original Lot 7 was eliminated, and no building envelope is depicted above the area recommended for a 30-foot rock cliff setback. The current Lot 7 building envelope meets or exceeds the recommended 20-foot setback from the underlying cliff exposure (and minimum 10-foot setback from top of delineated GHA).
- Lot 12 (formerly 13): Building envelope was adjusted to northwest. Now meets recommended 15-foot setback from underlying steep rock exposure to southeast (and minimum 10-foot setback from top of delineated GHA).
- Lot 18 – 19 outcrop (formerly 19 - 20): A localized steep outcrop feature straddles the boundaries of several lots with building envelopes arranged around its perimeter sides and upslope area. All proposed building sites meet or exceed the recommended 10-foot minimum setback, both above and below the mapped GHA boundary surrounding this feature.
- Lots 19 – 20 (formerly 20 – 21): A recommendation was given for rock fall protection to either use a setback of 15 feet from the base of the exposed rock face, or to incorporate a catchment wall type of feature. The Lot 20 building envelope appears to be over 15 feet from the steep exposure on the uphill slope aspect, and 10 feet from the GHA boundary along its uphill side. Lot 19 has a building envelope well away from this feature.

Standard Minimum Setback

Various adjustments were made to site layout and depicted building envelopes with intent to meet or exceed a standard 10-foot minimum delineated GHA setback. Typically, this was done using a 60' x 60' footprint. In some cases, due to space and orientation limits, a 10%-reduced building envelope was employed by PSE.

We reviewed the updated layout and building envelopes. Mapped lots generally appear to meet or exceed 10-foot setbacks from nearby GHAs which were delineated using GIS analysis. *With exception of the following special circumstance and Lot 6*, we are not aware of lots in this revised layout that do not meet or exceed the minimum setback standard from GHA slope areas.

For the realigned southwest access driveway, the moderate bank along the length of the road will be redeveloped as a roadway. Thus, it will no longer be a natural slope, either above or below the road. It is accepted that appropriate engineering and construction techniques will be used to secure the road and surrounding topography along this alignment. A number of lots to be served by this road will be closely tied to the frontage due to other downhill or uphill constraints on the buildable areas. Associated locations include Lots 24 to 29 on the downhill side, and Lots 20 & 21 on the uphill side. A minimum setback buffer is not applied to these building envelopes from slopes on the road side which will no longer be a slope upon access road development.

Lot 6 along Viewcrest Road has space restrictions which do not allow for a full minimum 10-foot buffer from the mapped toe of the GHA slope when applying a standard square building envelope. The easements on the north and east margins of the lot constrain the building envelope. The lot width is sufficient to accommodate east/west extension of the building area, but the north/south dimension is limited. As is shown on the current layout map, the square envelope is able to be fit with elimination of a buffer from the toe of the slope without encroaching into the mapped GHA. It is our opinion, from a geotechnical and geohazard standpoint, that buffer elimination in this localized case is suitable based on the slope conditions observed in the field and underlying geologic conditions. Furthermore, it is reasonable to expect that the Lot 6 residence can be designed and constructed among the available lowland space with appropriate respect to avoidance and protection of the critical area slope conditions and slope stability. A minimum 10-foot buffer from the toe of the slope could be adopted in design of Lot 6 without restricting reasonable site use.

Justification of Standard Buffer Reduction

The RFI requested that ES address code item BMC 16.55.460(A)(1)(b), which states:

Buffer Reduction. The buffer may be reduced to a minimum of 10 feet when a qualified professional demonstrates to the director's satisfaction that the reduction will adequately protect the proposed development, adjacent developments, and uses and the subject critical area.

It is our opinion that the standard buffer reduction from GHAs to building envelopes to a minimum of 10 feet is suitable for this site and proposed development. This interpretation is based on work previously completed and reported in the Geotechnical Report (10-6-2022), and the discussions therein.

In summary, the following conditions and aspects inform our interpretation:

- Where determined to be necessary, based on review of site-specific features of concern and topography, greater setbacks have been recommended and applied (as discussed above).
- The prevailing underlying geological condition among the more sloping areas of the site is sandstone bedrock. Bedrock was typically encountered within a few feet of the surface, and is exposed locally along steep outcrop faces.
- Sandstone bedrock is highly favorable for global slope stability. At this site, the bedrock is oriented with primary bedding planes dipping into the hillside (moderately to northwest). Thus, there are not bedding-controlled dip-slope features.
- Residences can typically be constructed in close proximity to, or upon, moderate slopes with foundations placed on bedrock. This is a common building practice in our region. The generally shallow nature of the bedrock (within 5 feet of surface) allows for such construction without significant difficulty and using typical practices, in our experience.
- Runoff from buildings and roads will be controlled so that new stormwater does not present a risk of excess erosion or slope failure on steep grades. It is our understanding that most stormwater

will be collected and routed off site into an existing stormwater conveyance utility along Sea Pines Road. Stormwater from northwest lots may be directed northward to the frontage.

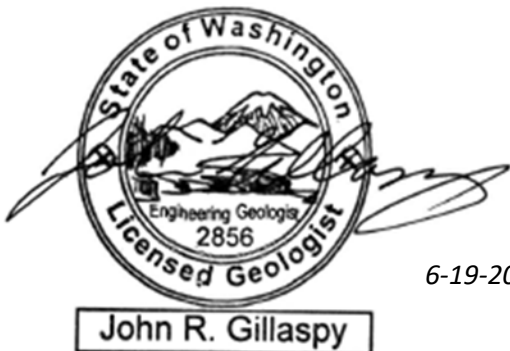
- By use of proper design and construction practices, and adequately controlling stormwater runoff, the development will not pose an increased risk of slope instability to undeveloped portions of the property or to adjacent developments/off-site areas.
- As overviewed above, building envelopes have been arranged as such to avoid direct impacts to delineated GHAs (excepting southwest access driveway corridor). We anticipate that construction can be completed while avoiding impacts to nearby slopes if an appropriate level of care is used for the environment of construction.
- The proposed layout and expected construction approach appears to be consistent with surrounding residential developments in the vicinity of the project site and subject to similar surficial and geological conditions.

Closing

Thank you for the opportunity to contribute our expertise to your project. Please feel free to contact us at (360) 671-9172 if you have any questions or comments regarding this correspondence.

Sincerely,

ELEMENT SOLUTIONS



6-19-2023

John Gillaspy, LEG

Environmental Services Manager

Incorporated by Reference:

The Woods at Viewcrest – Proposed Lots, Buildings & Roads & Existing Conditions
(Pacific Surveying & Engineering, Inc.; 6-9-2023)

Statement of Limitations

This document has been prepared by Element Solutions for the exclusive use and benefit of the client. No other party is entitled to rely on any of the conclusions, data, opinions, or any other information contained in this document. This document represents Element Solution's best professional judgment based on the information available at the time of its completion and as appropriate for the project scope of work. Services performed in developing the content of this document have been conducted in a manner consistent with that level and skill ordinarily exercised by members of the geologic engineering profession currently practicing under similar conditions. No warranty, expressed or implied, is made.