

Memo dated May 9, 2018

To: Ryan Countryman and Paul MacCready

From: Randolph R Sleight PE, PLS

Chief Engineering Officer PDS

Landslide Hazard Area Deviation Request dated April 24, 2018

The applicant's geotechnical engineer, Hart Crowser, submitted a letter requesting deviation from the landslide hazard areas requirements enumerated in 30.62B.340. The letter only partially addresses the requirements for granting a deviation. Although granting a deviation for the second access road may be possible if the requisite data is provided, a deviation for the remainder of the buildings located within the landslide hazard area or within its setback is not approvable.

The applicant vested to the critical areas regulations in effect in 2011. The relevant provisions here are SCC 30.62B.320 and .340. Those provisions are set forth in full below. The general rule is that development is not allowed within a landslide hazard area or its setback. Deviations from this rule are permitted when certain criteria are met.

- (2)(b) Deviations from setbacks may be allowed when the applicant demonstrates that the following conditions are met:
 - (i) there is no alternate location for the structure on the subject property; and
 - (ii) a geotechnical report demonstrates that:
 - (A) the alternative setbacks provide protection which is equal to that provided by the standard minimum setbacks; and
 - (B) the proposal meets the requirements of SCC 30.62B.320.

This provision is typically used when a property owner wishes to make use of their land and is unable to locate a structure, such as a single family home, on their property due to the existence of a landslide hazard area and its setback. I have not reviewed a deviation request for a project of this scale and for so many structures.

Hart Crowser's letter appears to request a deviation for two segments of the proposed project. The first segment is for a secondary access road, to be constructed in Phase 1. The second segment is for Phase 2, the Urban Plaza Tower Plan.

Secondary Access Road

1. No alternate location (SCC.30.62B.340(2)(b)(i))

The Hart Crowser letter states only that "construction of the secondary access road required by PDS can only be located in a landslide area, and the location shown on Plan A-051 and in the geotechnical report (Figure 10 Hart Crowser 2018a) encounters the least amount of geologic

critical areas, especially landslide hazard area.” This statement is conclusory, and does not explain whether other options for locating the secondary access road were considered and eliminated.

2. Geotechnical report demonstrates alternative setbacks provide protection equal to that provided by standard setbacks (SCC 30.62B.340(2)(b)(ii)(A))

Based on my preliminary review of the Hart Crower letter and geotechnical report, the report does not demonstrate alternative setbacks provide protection equal to that provided by standard setbacks. This is primarily for two reasons. First, the report identifies the need to construct a significant retaining wall system (created to retain a soil height of 60 feet) and to resist lateral sliding from both a deep seated slide and a shallow slide event both for static and seismic conditions. But the report does not show its work to demonstrate how this is feasible. There are no preliminary designs, schematics, or calculations for the wall. The wall appears to be freestanding with no anchoring shown, but generally described to require tierods, mechanically stabilized earth, counterfort or other means to resist lateral earth movement. It will be built on a hillside that is dominated by low-cohesive soils (sand and silty sand; Lawton Clay; glacial outwash), yet the report claims the wall itself will have a cohesion factor of 10000 psf (see Figures 18-25 Hart Crowser 2018a). There is no data for me to confirm a 10000 psf cohesion in the existing almost cohesionless soils behind the proposed wall. Similarly, I was unable to confirm whether the 78000 pound per foot loading of the wall as proposed would resist slope movement, if the site is excavated to elevation 6 west of the railroad tracts.

Second, the point of contact with water is located 100-300 feet east from where a landslide is predicted to occur (see Figures 18-25 Hart Crowser 2018a). Groundwater will need to be intercepted or collected to stabilize the hillside. This will need to be accomplished beyond the limits of the applicant’s ownership interests. The report does not provide any indication where or how this dewatering will occur. On page 21, at the bottom of the page, it indicates all measurements were based on HC-1, which is 400-600 feet from where the seeps or springs occur on the slope face, where potential failure is likely.

In sum, there is no demonstration in the report the wall is feasible to resist a significant landslide with potential slope run-outs described on page 24 or that it will provide the protection it claims.

Urban Plaza Tower, Phase 2

1. No alternate location (SCC.30.62B.340(2)(b)(i))

The Hart Crowser letter does not mention this criterion or how it is met. While the secondary access road is required to meet a code requirement, these buildings are not required by code, nor must they be located within a landslide hazard area and its setback.

2. Geotechnical report demonstrates alternative setbacks provide protection equal to that provided by standard setbacks (SCC 30.62B.340(2)(b)(ii)(A))

Same comments as above.

Additional Issues

Portions of these landslide hazard areas adjoining the common property line to properties to the south show grading on adjoining properties. The LHA code requirements would normally require the use of retaining walls that allow for the maintenance of the natural slope areas rather than grading onto adjoining properties to the south. This is a requirement of 30.62B.340 (2)(d) that was not addressed.

Conclusion

Based on the current design of the project and the information submitted by the applicant, including the Hart Crowser letter and report, I do not find the criteria in SCC 30.62B.340(2) for a deviation are met. Because of this, I find the proposed project results “in increased risk of property damage, death or injury,” in substantial conflict with SCC 30.62B.320(1)(b)(i).

Applicable Code Provisions

30.62B.320 General standards and requirements for erosion and landslide hazard areas.

(1) Any development activity, action requiring a project permit or clearing occurring in an erosion or landslide hazard area:

(a) Shall be designed to:

(i) Comply with the requirements in an approved geotechnical report when required pursuant to SCC 30.62B.140;

(ii) Utilize best management practices (BMPs) adopted by the department pursuant to chapter 30.63A SCC and all known and available reasonable technology (AKART) appropriate for compliance with this chapter;

(iii) Prevent collection, concentration or discharge of stormwater or groundwater within an erosion or landslide hazard area, except as otherwise provided in this chapter; SCC Title 30 Page 544

(iv) Minimize impervious surfaces and retain vegetation to minimize risk of erosion or landslide hazards; and

(b) Shall not:

(i) result in increased risk of property damage, death or injury;

(ii) cause or increase erosion or landslide hazard risk;

(iii) increase surface water discharge, sedimentation, slope instability, erosion or landslide potential to adjacent or downstream and down-drift properties beyond pre-development conditions; or

(iv) adversely impact wetlands, fish and wildlife habitat conservation areas or their buffers.

(2) For shoreline and bank stabilization and flood protection measures proposed in erosion or landslide hazard areas, the project proponent shall make all reasonable efforts to avoid and minimize impacts to wetlands and fish and wildlife habitat conservation areas and their buffers pursuant to the requirements of chapter 30.62A SCC, in the following sequential order of preference:

(a) Utilize setbacks sufficient to ensure that shoreline stabilization or flood hazard reduction measures will not be necessary to protect development for its projected design life, or;

(b) When sufficient setbacks are not possible, utilize other non-structural measures unless the applicant demonstrates through a geotechnical report required pursuant to SCC 30.62B.120 that new or enlarged structural stabilization or flood protection is necessary to protect:

(i) existing primary structures, utilities, roads and bridges;

(ii) new utilities or public bridges and transportation structures allowed pursuant to 30.62B.330(3);

(iii) agricultural land; or

(iv) projects where the sole purpose is to protect or restore wetlands, fish and wildlife habitat conservation areas or their buffers.

30.62B.340 Landslide hazard areas.

(1) Development activities, actions requiring project permits and clearing shall not be allowed in landslide hazard areas or their required setbacks unless there is no alternate location on the subject property.

(2) Structures shall be setback from landslide hazard areas unless the department approves a deviation as provided below.

(a) Setbacks shall be established as follows:

(i) the minimum top of slope setback shall be equal to the height of the slope divided by three, or 50 feet, whichever is greater;

(ii) the minimum toe of slope setback shall be 50 feet or the height divided by two whichever is greater; and SCC Title 30 Page 546

(iii) slope setbacks shall be no less than the minimum necessary to ensure that structural shoreline stabilization measures will not be necessary to protect the development.

(b) Deviations from setbacks may be allowed when the applicant demonstrates that the following conditions are met:

(i) there is no alternate location for the structure on the subject property; and

(ii) a geotechnical report demonstrates that:

(A) the alternative setbacks provide protection which is equal to that provided by the standard minimum setbacks; and

(B) the proposal meets the requirements of SCC 30.62B.320.

(3) In addition to the requirements in SCC 30.62B.320 the following standards and requirements apply to development activities, actions requiring project permits and clearing in landslide hazard areas:

(a) Vegetation shall not be removed from a landslide hazard area, except for hazardous trees based on review by a qualified arborist or as otherwise provided for in a vegetation management and restoration plan;

(b) The factor of safety for landslide occurrences shall not be decreased below the limits of 1.5 for static conditions or 1.1 for dynamic conditions. Analysis of dynamic conditions shall be

based on horizontal acceleration as established by the current version of the International Building Code;

(c) Tiered piles or piers shall be used for structural foundations where possible to conform to existing topography;

(d) Retaining walls that allow for the maintenance of existing natural slope area shall be used wherever possible instead of graded artificial slopes;

(e) Provided there is no practical alternative, utility lines and pipes may be constructed in landslide hazard areas under the following conditions:

(i) the line or pipe shall be located above ground and properly anchored or designed so that it will continue to function in the event of an underlying slide; and

(ii) stormwater conveyance systems shall be designed with high-density polyethylene pipe with fuse-welded joints, or similar product that is technically equivalent; or

(iii) alternatively, utilities may be bored below landslide hazard areas provided they are located beneath the depth of potential slope failure.

(f) Point source discharge of stormwater may be allowed in landslide hazard areas under the following conditions:

(i) the stormwater is conveyed via continuous storm pipe downslope to a point where it does not increase risk to landslide hazard areas or other properties downstream from the discharge;

(ii) the stormwater is discharged at flow durations matching predeveloped conditions with adequate energy dissipation into existing channels; or

(iii) discharge upslope of the landslide hazard area may only occur if:

(A) it is dispersed onto a low-gradient undisturbed setback adequate to infiltrate all surface and stormwater runoff; and

(B) the discharge will not decrease the stability of the slope.