August 18, 202 Project No. 2266-SZ69-B36

Sean Sesanto, Associate Planner
City of Capitola
420 Capitola Avenue
Capitola, CA 95010

Subject: **Geotechnical Peer Review – Slope Stability**
1410 Prospect Avenue
Capitola, California

References: 1) **Dees and Associates, Inc.,** Geotechnical Investigation for Proposed Single-Family Residence, 1410 Prospect Avenue APN 034-046-19, dated July 28, 2021

2) **Revised Plan Set, Johnson Residence,** 1410 Prospect Ave., prepared by Derek Van Alstine and dated February 8, 2022.

Dear Mr. Sesanto,

INTRODUCTION AND PROPOSED CONSTRUCTION

As requested, we have performed a peer review of the geotechnical aspects of References 1 and selected sheets from Reference 2. Based on our conversations with yourself it is our understanding that the City of Capitola is requesting a geotechnical peer review that focuses on how adequately the consultant (Dees and Associates) has addressed the impact of the proposed project on the stability of an adjacent slope. The subject property is located adjacent to the railroad right-of-way, and slope stability concerns due to the proposed construction are being raised by the Santa Cruz County Regional Transportation Commission.

A new 2-story house with a full basement and a detached garage is proposed for the subject property. The proposed structures will be located in approximately the same location as an existing residence and garage but will be located approximately 1-foot closer to the street (and further from the slope to the east) than the existing improvements. The one exception is that the basement "light wells" on the proposed structure will extend about 4-feet closer to the east, towards the slope in question. The existing residence and garage were constructed at pad grade and do not include a basement.

CONSULTANT INFORMATION

The geotechnical investigation report prepared by Dees and Associates (Reference 1) describes the site and adjacent slope as "a gently sloping terrace above a moderate to steep coastal bluff that has been terraced to accommodate a railroad track and roadway. The slope immediately below the parcel descends about 20 feet to the railroad tracks at a slope gradient of 45 to 50 degrees. The slope continues on the other side of the railroad tracks down to Cliff Drive…".

Two borings were drilled at the site, extending to 28.5 and 1.5 feet below ground surface.

Landsliding hazards were addressed qualitatively by recommending that "the proposed residence should be setback behind a 1.5:1 (horizontal to vertical) line drawn upwards from the base of the slope", and the report concludes that "there is a low potential for landslides to affect the proposed residence as long as it is setback as recommended".

In the "Site Drainage" section of the report Dees and Associates specify that "Runoff from improvements should not be allowed to flow over the steep slope…..retention structures should be located at least 50 feet from the top edge of the rear slope".

BACKGROUND DATA AND SITE RECONNAISSANCE

Based on our review of regional geologic maps the site is underlain by Coastal Terrace deposits and Purisima bedrock. Local experience with similar site conditions has shown that the contact between these two materials is relatively flat.

A Geotechnical Engineer from Pacific Crest Engineering visited the site on July 11, 2022. The subject slope between the site and the railway was measured at about a 42-degree inclination and 20 feet in height. Except for surficial gopher holes and minor shallow slumping, we did not see any evidence of significant slope failure or movement in the immediate area. Our understanding is that the rail line in this area was constructed over 100 years ago and it appears that the associated grading has remained essentially the same in this immediate area since that time.

PEER REVIEW COMMENTS

Based on our peer review and experience with residential coastal projects in Santa Cruz County, we offer the following comments:

<u>QUALITATIVE AND QUANTITATIVE SLOPE STABILITY ANALYSES</u>

A *qualitative* slope stability analysis or "screening analysis" as it is referred to in CGS Special Publication 117A, is one that evaluates the severity of the hazard and the risk it poses to adjacent improvements. *Qualitative* slope stability analyses typically are based on evaluating evidence for the presence of landslides, the susceptibility of the geologic formation to landsliding, and other factors indicative of slope stability (e.g. shallow groundwater etc.). If the hazard is determined to be low based on a *qualitative* analysis then a *quantitative* analysis is typically not required. A quantitative analysis is one that includes a more detailed field and subsurface investigation, site specific laboratory shear strength testing, and computer modeling to determine the factor of safety against failure for a slope.

In our opinion the *qualitative* assessment of slope stability submitted in the geotechnical investigation report by Dees and Associates (Reference 1) meets the local, generally accepted standard of care in the area. The recommended setback based on a 1.5:1 inclination measured from the base of the slope provides a roughly 20-foot horizontal setback from the top of slope, which is in accordance with CBC slope setback parameters, as well as generally accepted geotechnical engineering principles and local practice. The proposed house and garage are located behind this setback line. Additionally, the basement foundation will transmit building loads to the underlying soil at an elevation about 10-feet below ground surface. This configuration has less probability of impacting hypothetical slope failure surfaces than the current structure that transmits building loads closer to the ground surface.

SUMMARY

In summary, the *qualitative* assessment of slope stability provided by the consultant adequately addresses landsliding hazards at the site. Further *quantitative* stability analysis should not be required for the proposed development.

CLOSING

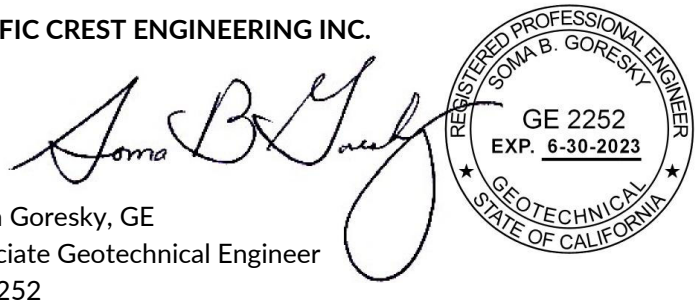
Our review of the above reports has been limited to the geotechnical consultant's determination of the slope stability at the site and the influence the proposed development has on the existing slope. We have not reviewed their findings, conclusions, or recommendations pertaining to the other aspects of the project and have no opinion regarding them.

Our services have consisted of peer review services only. We have based our opinions on the documents provided to us, information collected from discussions with the City of Capitola, and our own literature research and experience. We have not generated subsurface information of our own nor have we provided design or construction recommendations. In no way is Pacific Crest Engineering Inc. acting as the Geotechnical Engineer of Record for this project, nor are we responsible for the adequacy or completeness of any portion of the geotechnical design or construction.

We appreciate the opportunity provide the City of Capitola with these services. Please feel free to contact us at your convenience, we can be reached at 831-722-9446.

Sincerely,

PACIFIC CREST ENGINEERING INC.



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