



Project No. 06847-42-05
March 7, 2022

Tri Pointe Homes
13400 Sabre Springs Parkway, Suite 200
San Diego, California 92128

Attention: Ms. April Tornillo

Subject: RESPONSE TO CITY REVIEW COMMENTS
SOUTHWEST VILLAGE
SAN DIEGO, CALIFORNIA

- References:
1. *City of San Diego LDR-Geology, Southwest Village SP, Project No. 614791*, prepared by Mr. Patrick Thomas, dated May 8, 2019.
 2. *Update to Geotechnical Investigation and Slope Stability Analysis for Beyer Boulevard, Southwest Village, Vesting Tentative Map, San Diego, California*, prepared by Geocon Incorporated, dated February 16, 2022 (Project No. 06847-42-05).
 3. *Supplemental Geotechnical Investigation and Slope Stability Analysis, Southwest Village VTM-1, San Diego, California*, prepared by Geocon Incorporated, dated June 25, 2021 (Project No. 06847-42-04).
 4. *Preliminary Geotechnical Investigation, Southwest Village, Vesting Tentative Map, San Diego, California*, prepared by Geocon Incorporated, dated March 28, 2019 (Project No. 06847-42-03).
 5. *The Otay Mesa Lateral Spread, A Late Tertiary Mega-Landslide in Metropolitan San Diego County, CA*, Environmental & Engineering Geoscience, Vol. XVII, No. 3, August 2011.
 6. *When Landslides Are Misinterpreted as Faults: Case Studies from The Western United States*, Environmental & Engineering Geoscience, Vol. XVIII, No. 4, November 2012.

Dear Ms. Tornillo:

We have prepared this letter to respond to City of San Diego review comments (Reference 1) for the subject project. The City review comments with respect to geotechnical issues followed by our responses are provided hereafter.

Issue No. 4: *The analysis of slope stability presented in the referenced report is apparently based largely on assumptions, which are poorly constrained by subsurface data that is projected over significant distances.*

Response: We have performed additional geotechnical studies for the Beyer Boulevard extension into the project and Vesting Tentative Map 1 (VTM-1). We have also performed a preliminary study for Vesting Tentative Map 2 (VTM-2). Reference 2 contains boring logs, laboratory testing and slope stability analysis specific to the proposed Beyer Boulevard alignment along the west end of the project. This investigation included eleven large-diameter borings and five continuous core borings. Reference 3 contains boring logs, laboratory testing and slope stability analyses specific to potential impacts of the San Ysidro landslide complex on project development along the southeastern side of proposed south village. For this study we performed three continuous core borings ranging in depth from 218.5 feet to 397 feet below the ground surface. In our opinion we have sufficiently characterized the geologic conditions and material strengths used in our analysis.

Issue No. 5: *The geotechnical consultant recommends that additional geotechnical studies be performed to better define depths and limits of remedial grading and to provide more soil and geologic information specific to the proposed development.*

Response: The recommended studies have been performed and are presented in References 2 and 3.

Issue No. 6: *Submit an addendum geotechnical investigation report that addresses the plans currently under environmental review. Refer to the City's "Guidelines for Geotechnical Reports" for the scope of the requested report. The geotechnical investigation report should also address and include the following:*

Response: References 2 and 3 are update geotechnical studies to our preliminary geotechnical investigation (Reference 4). The reports are specific to the current plans being proposed.

Issue No. 7: *Regional geologic mapping described by Vanderhurst, et al. (2011) (Locality 5) indicates the entire area is underlain by the "Otay Lateral Spread" that slid on a bentonitic clay bed. Clarify if the Otay Formation (Tob) shown on the geotechnical consultants' geologic map and cross sections represents the base of the "Otay Lateral Spread."*

Response: A literal interpretation of Figure 1 in Reference No. 5 indicates that the subdivision and roadway is underlain by the Otay Lateral Spread (OLS) and Terrace deposits. The figure shows areas to the northwest, north and east that also expose the OLS. The extent of the OLS appears to be coincident with published mapped outcrops of the Otay Formation. Since the base of the OLS is not shown on Figure 1, we have no opinion regarding the relationship between the base of the OLS and the published limits of the Otay Formation which was the basis for the geologic nomenclature in our report.

Issue No. 8: *Clarify if cross section K-K' and the slope stability analysis presented in Figures 20 & 21 represent the worst-case scenario with respect to degree of dip, piezometric surface, geologic structure and stratigraphy of the bentonite beds and landslide slip surface. Per the City's Guidelines for Geotechnical Reports, where direct observation is not possible, the geotechnical consultant*

should apply appropriately conservative shear strength parameters and assume worst-case geologic conditions.

Response: The slope stability analysis presented in References 2 and 3 are based on new information and update the geologic interpretation and geotechnical analysis presented in Reference 4; therefore, the use of “worst-case” geologic conditions and overly conservative shear strength parameters is not warranted.

Issue No. 9: *For example, the project’s geotechnical consultant could consider using bentonite shear strengths along bedding in the range of observed westerly dips (e.g., 0-6 degrees) and conservative across bedding strengths to model shear strength parameters and worst-case geologic conditions in the slope stability analysis where the geologic model is not constrained by direct observation and sampling.*

Response: See response to Issue No. 8.

Issue No. 10: *Clarify if the reported regional dip data is based on site specific investigation.*

Response: Bedding orientation information is presented in References 2 and 3 and is based on site specific information measured from our borings, or correlation between borings.

Issue No. 11: *The geotechnical consultant has indicated groundwater was not reported within any of the borings or test pits excavated at the site. However, the consultant has not characterized groundwater levels or conditions beneath the site. Describe the groundwater conditions and describe the worst-case groundwater conditions constrained by the data.*

Response: As noted, we did not encounter groundwater in exploratory borings and trenches performed on the mesa top and within the proposed Beyer Boulevard alignment. In addition, groundwater is not expected to impact development on the mesa top. As indicated in Reference 4, we expect seasonal surface water flow in Moody Canyon and tributary drainages during the rainy season.

With respect to the San Ysidro landslide, perched groundwater was encountered in borings performed during our supplemental study (Reference 3). The perched groundwater elevations from the borings were used in our stability analyses.

Dukek & Associates is performing a groundwater study utilizing seven groundwater monitoring wells installed last year within the San Ysidro Landslide and on the mesa top. The monitoring wells will be used to improve modeling of the phreatic surface within the slide mass and adjacent areas. The study will also record seasonal variations over the last rainy season. We expect the groundwater study to be complete in the next several couple months.

Issue No. 12: *Give the potential for inclined aquicludes (i.e., bentonite beds) in Otay Formation, the consultant should address the potential for confined (artesian) conditions.*

Response: Since the internal structure of the Otay Formation can be randomly oriented (i.e. discontinuous clay seams, flame structures, lateral spread features, etc.) it would be difficult to accurately predict “the potential for inclined aquicludes” during the investigation phase of study. As is the case with all projects, excavations within the on-site geologic units during grading will be observed by an engineering geologist and, based on the observations, recommendations will be provided in the event that potential seepage paths or confining layers are noted.

Issue No. 13: *Demonstrate that the proposed development and increased irrigation will not increase the potential for activation of the San Ysidro landslide.*

Response: Dudek & Associates concluded that the post-development vertical infiltration of storm water into the substrate would be less than the existing condition which is already relatively low as evidenced by permeability testing, a review of existing soil survey maps and the presence of vernal pools on the mesa (see Reference 3). This opinion is supported by the fact that the development will result in a net increase in impervious surface area due to the construction of structures, pavements, etc., and the collection and conveyance of storm water into the project storm drain system that would normally soak into the exposed soils on the mesa.

Issue No. 14: *Provide the large diameter boring logs by Geotechnics (06/08/1988 and 05/04/2004). If Geocon, Inc. is relying on the data from those borings logs, Geocon Inc. must indicate they agree with that data.*

Response: The requested boring logs are provided in Appendix B of Reference 4. However, for our supplemental study and update report (References 2 and 3), we are not relying on data from previous studies. Analyses for our recent studies are based on information obtained from borings, cores, and laboratory testing performed specific for these studies.

Issue No. 15: *Vanderhurst, et al. (2011) report residual direct shear tests of bentonite gouge yield average angles of internal friction of 8 degrees with a cohesion intercept of 0 psf. The project’s geotechnical consultant should consider this strength in the range of values used in the parametric analysis.*

Response: Stability analysis in Reference 2 for Beyer Boulevard utilized an internal friction of 8 degrees and a cohesion of 0 psf for the basal slide surface and weak clay beds. Stability analysis in Reference 3 utilized an internal friction of 8 degrees and 50 psf. These parameters are less than the shear strength values determined from laboratory testing performed for our study, and are therefore considered conservative.

Issue No. 16: *Cross Section A-A’ indicates Otay Formation exposed at the surface within Qls1/Qls2 inconsistent with the geologic map. Please revise as necessary.*

Response: Updated/corrected cross sections based on a refined geologic interpretation and the proposed new alignment of Beyer Boulevard are provided in Reference 2.

Issue No. 17: *Cross Section C-C’ indicates Otay Formation exposed at the surface within Qls1 inconsistent with the geologic map. Please revise as necessary.*

- Response:** Updated/corrected cross sections are provided in Reference 2.
- Issue No. 18:** *Cross Section D-D' indicates alluvium buried by Qls2 inconsistent with the Geologic Map. In addition, the cross section indicates the alluvium is approximately 10 feet thick but the log for Boring LB-1A indicates about 2 feet of alluvium. Also, the log for Boring LB-9A indicates a major bedding plane shear at 48 feet. Could this bedding plane shear be the slip plane for Qls1? Please clarify and revise as necessary.*
- Response:** Updated/corrected cross sections based on the new geotechnical information and roadway alignment of Beyer Boulevard are provided in Reference 2.
- Issue No. 19:** Cross Section H-H' indicates Otay Formation exposed at the surface inconsistent with the Geologic Map. In addition, the buried outcrop pattern of the bentonite (Tob) abruptly truncates on the geologic map. Please clarify and revise as necessary.
- Response:** Updated/corrected cross sections based on the new geotechnical information and roadway alignment of the proposed new alignment of Beyer Boulevard are provided in Reference 2.
- Issue No. 20:** Cross Section I-I' indicates Otay Formation exposed at the surface inconsistent with the Geologic Map. Also, the log for Boring LB-10A indicates remolded bedding plane shears at about 58 feet. Could this bedding plane shear be the slip plane for Qls2? Please clarify and revise as necessary.
- Response:** Updated/corrected cross sections based on the new geotechnical information and roadway alignment the proposed new alignment of Beyer Boulevard are provided in Reference 2.
- Issue No. 21:** Cross Section J-J' indicates Otay Formation exposed at the surface inconsistent with the Geologic Map. Also, the log for Boring LB-10A indicates remolded bedding plane shears at about 58 feet. Could this bedding plane shear be the slip plane for Qls2? Please clarify and revises as necessary.
- Response:** Updated/corrected cross sections based on the new geotechnical information and roadway alignment the proposed new alignment of Beyer Boulevard are provided in Reference 2.
- Issue No. 22:** Cross Section M-M' indicates Qtg exposed at the surface inconsistent with the Geologic Map. Please clarify and revise as necessary.
- Response:** Updated/corrected cross sections based on the new geotechnical information and roadway alignment of Beyer Boulevard are provided in Reference 2.
- Issue No. 23:** *The geotechnical consultant should consider providing additional explorations, cross sections and slope stability analysis through Qls2 at approximate Beyer Boulevard Stations 12+50 and 18+50. Provide a cross section parallel to cross section C-C' on the north side of Beyer Boulevard to demonstrate the geologic conditions and internal consistency of the geologic model. Indicate if remedial grading is required to provide landslide mitigation.*

Response: Additional exploration has been performed for the area identified. Cross sections and stability analysis based on the proposed alignment of Beyer Boulevard are provided in Reference 2. Landside and bedrock shear zone mitigation recommendations are provided in Reference 2 and shown on the cross sections.

Issue No. 24: *The project's geotechnical consultant should consider presenting a quantitative evaluation of earthquake induced landslide potential.*

Response: Seismic slope stability analyses are provided in References 2 and 3.

Issue No. 25: *The geotechnical consultant must indicate if the site is suitable for the proposed subdivision and extension of Beyer Boulevard with respect to geologic and geotechnical site conditions. (New Issue)*

Response: Based on our investigations and analyses, it is our opinion that the site is suitable for the proposed subdivision and extension of Beyer Boulevard with respect to geologic and geotechnical site conditions.

Issue No. 26: *The consultant should provide a concluding statement indicating whether or not the slopes within or adjacent to the proposed development site will have a factor of safety of 1.5 or greater with respect to gross and surficial slope stability following completion of the proposed development.*

Response: It is our opinion that the slopes within or directly adjacent to the proposed development site that would effect post-grading conditions will have an acceptable factor of safety with respect to gross and surficial slope stability.

Issue No. 27: *Regional geologic mapping by Kennedy and Tan (1977, 2008) shows northwest trending faults crossing the area of proposed subdivision and the Beyer Boulevard alignment. Clarify if, based on the site-specific evaluation by the project's geotechnical consultant, faults cross the area of the proposed subdivision and address surface fault-rupture hazard of the area of the proposed subdivision.*

Response: Based on a site-specific evaluation of geomorphic features, it is our opinion that the liniments previously mapped across the area of the proposed subdivision and Beyer Boulevard are landslide related and not faults. This opinion is corroborated by information contained in Reference No. 4 and the City of San Diego Seismic Safety Study.

Issue No. 28: *Show the location of the State mapped faults on the geologic map.*

Response: The location of a mapped fault crossing the Beyer Boulevard alignment is shown on Figure 1 of Reference 2. We are proposing to perform additional fault trenches once access to the County of San Diego property can be attained. We will provide an geologic map showing faults in an updated report.

Issue No. 29: *Clarify the rationale used to establish the 50-foot Landslide Head Scarp Setback.*

Response: The 50-foot setback is intended to provide a buffer zone in the event that surficial sloughages occur on the headscarp. Surficial sloughages, if they occur, are expected to be limited to the outer 5 to 10 feet of the slope face. The 50-foot setback should provide a sufficient distance so that the development is not impacted from surficial failures.

Issue No. 30: *Address if the proposed project will destabilize or result in settlement of the City's Right of Way or adjacent properties.*

Response: In our opinion, provided the recommendations of our report are followed, that the project will not destabilize or result in settlement of the City's Right of Way or adjacent properties.

Issue No. 31: *Show the limits of recommended remedial grading on the geologic/geotechnical map and referenced Tentative Map and Preliminary Grading plan.*

Response: The recommended buttress shear key limits are shown on the geologic map and cross sections in Reference 2.

Issue No. 32: *Indicate the 50-foot Landslide Head Scarp Setback on the referenced Tentative Map and Preliminary Grading Plan.*

Response: The Civil Engineer will provide this information.

Issue No. 33: *Indicate the 50-foot Landslide Head Scarp Setback on the referenced Tentative Map and Preliminary Grading Plan.*

Response: The Civil Engineer will provide this information.

Should you have any questions regarding this letter, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED



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