GeoSoils, Inc.

Geotechnical • Geologic • Coastal • Environmental

5741 Palmer Way • Carlsbad, California 92010 • (760) 438-3155 • FAX (760) 931-0915 • www.geosoilsinc.com

Revised August 24, 2022

W.O. 8358-A-SC

Heritage Bridge, LLC, Falcon Cove, LLC
481 E. Sun Spring Place
Oro Valley, Arizona 85755

Subject: Infiltration Feasibility Condition Letter, Proposed Residential Development ("Cove House"), Lots 2 and 17 of Block 46, La Jolla, San Diego County, California 92037, Assessor's Parcel Numbers (APNs) 350-131-02-00 and -29-00

References:

1. "Geotechnical Evaluation, Proposed Residential Development ('Cove House'), Lots 2 and 17 of Block 46, La Jolla, San Diego County, California 92037, Assessor's Parcel Numbers (APNs) 350-131-02-00 and -29-00," W.O. 8358-A-SC, dated August 23, 2022, by GeoSoils, Inc.

2. "The City of San Diego Storm Water Standards," updated May 2021, by D-Max Engineering, Inc.

3. "Limited Supplemental Geotechnical Investigation for Foundation Design, 1590 Coast Walk, APN 350-141-15-00, La Jolla, San Diego County, California," W.O. 6918-A-SC, dated July 21, 2015, by GeoSoils, Inc.

Dear Sir or Madame:

In accordance with the request of Island Architects (Project Architectural Consultant), GeoSoils, Inc. (GSI) is providing this letter discussing the feasibility of storm water infiltration into the earth materials present within the subject parcels. This letter was prepared in general accordance with the requirements outlined in Section C.1.1 of Appendix "C" of Reference 2 (see References). The scope of our services has included a review of the References, analysis of data, and the preparation of this summary letter.

INFILTRATION FEASIBILITY CONDITION

Items associated with Section C.1.1 of Appendix "C" of Reference 2 are included in *italics*, followed by our response.

- *The phase of the project in which the geotechnical engineer first analyzed the site for infiltration feasibility.*

GSI Response

Planning phase.

- *Results of previous geotechnical analyses conducted in the project area.*

GSI Response

The results of previous geotechnical analyses GSI recently performed at the subject site are summarized in Reference 1. A brief synopsis of the geological, soils, and groundwater conditions within the subject parcels is provided below.

Based on our field mapping and subsurface exploration, the parcels are largely mantled by a Quaternary-age residual soil consisting of silty sand that is on the order of 1 foot to 2 feet thick. Undocumented artificial may occur at the surface near the northwestern property corner of APN 350-131-02-00 (Lot 2), and likely consists of a mixture of silty sand, clayey sand, sand, and clay with rounded gravels derived from the near-surface geologic units in the surrounding area.

Quaternary-age old paralic deposits were encountered in the exploratory borings at depths of approximately 1 foot to 2 feet below the existing grades. The old paralic deposits consisted of interbedded clayey sand, sand, and clay.

Cretaceous-age sedimentary bedrock, belonging to the Point Loma Formation, underlies the old paralic deposits within the subject parcels, and generally occurs below elevations ranging between approximately 62 and 71 feet above mean sea level (MSL). However, we infer that it may be within a couple of feet of the ground surface near the southeastern property boundary of APN 350-131-29-00 (Lot 17), coincident with a relict coastal bluff associated with a higher sea level stand during the Pleistocene. Although not directly encountered in the exploratory borings advanced with the subject parcels, based on subsurface findings from our previous work within a nearby property on Coast Walk (Reference 3), the Point Loma Formation generally consisted of interbedded sandy claystone and sandstone with trace concretions.

According to the United States Department of Agriculture's/Natural Resources Conservation Service's (USDA's/NRCS's) "Web Soil Survey" website (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm), the onsite soils consist of urban land. Due to land disturbance from development, the attributes of this soil unit are not identified by the USDA/NRCS.

Perched groundwater seepage was encountered in Boring B-2, advanced in preparation of Reference 1, at an approximate depth of 19 feet below the existing grade or approximately 65 feet above MSL. In addition, during previous subsurface exploration within a nearby Coast Walk property, performed in preparation of Reference 3, GSI

encountered groundwater seepage while down-hole logging a large-diameter boring. The groundwater seepage was occurring between depths of approximately 56 and 58 feet below the former ground surface (or roughly at elevations 59 to 61 feet above MSL). The elevations at which groundwater seepage was observed are near the elevation of the geologic contact between the old paralic deposits and the Point Loma Formation. The seepage is likely the result of groundwater accumulating near the geologic contact between the old paralic deposits and the Point Loma Formation, owing to the contrasting permeabilities of these geologic units.

- *The development status of the site prior to the project application (i.e., new development with raw ungraded land, or redevelopment with existing graded conditions).*

GSI Response

Currently, APN 350-131-02-00 (Lot 2) consists of undeveloped land. Whereas, APN 350-131-29-00 (Lot 17) currently contains an existing tennis court shared with the adjacent parcel to the northeast. Thus, the development status of APN 350-131-02-00 (Lot 2) may be characterized as new development with raw ungraded land. The development status of APN 350-131-29-00 (Lot 17) may be described as redevelopment.

- *The history of design discussions for the project footprint, resulting in the final design determination.*

GSI Response

The project footprint was determined by the project architectural consultant.

Based on our understanding of the onsite geological conditions, GSI concludes that the infiltration of storm water into the site earth materials for permanent post-construction storm water best management practices (BMPs) has a high potential to accumulate along sand and clay beds within the old paralic deposits, and along the geologic contact between the old paralic deposits and the Point Loma Formation, resulting in perched groundwater (groundwater mounding). Perched groundwater would likely migrate laterally and enter the adjacent properties, and seep from the nearby coastal bluff, owing to the seaward-dipping geologic contact between the old paralic deposits and the Point Loma Formation. The lateral migration of perched groundwater could induce swelling of expansive soils and fill settlement within the subject parcels and the adjacent properties. Perched groundwater exiting the bluff face would also contribute to spring sapping and reduced bluff stability. Lastly, the proposed project includes numerous retaining walls and it appears that retaining walls are present on the adjacent property to the southwest. Lateral migration of perched groundwater could increase moisture transmission through these walls. Given these factors, it is our opinion that the infiltration of storm water into the onsite earth materials for storm water management and treatment is not sound engineering

practice, since it could adversely affect the proposed onsite improvements and the existing development on the adjacent properties. Therefore, owing to potentially grave consequences, the infiltration of storm water into the onsite earth materials to meet permanent, post-construction storm water BMP objectives is regarded as infeasible and is not recommended from a geotechnical standpoint. Changes to the project footprint would not mitigate the aforementioned hazards.

- *Full/partial infiltration BMP standard setbacks to underground utilities, structures, retaining walls, fill slopes, and natural slopes applicable to the DMA that prevent full/partial infiltration.*

GSI Response

Plans showing the tentative locations of permanent post-construction storm water BMPs have not been provided for GSI review. Regardless, infiltration of storm water into the onsite earth materials for storm water management and treatment is not sound engineering practice, since it could adversely affect the proposed onsite improvements and the existing development on the adjacent properties for the reasons described in our previous response. Therefore, it is regarded as infeasible and not recommended from a geotechnical standpoint. In summary, GSI respectfully concludes that the determination of standard setbacks between BMPs, improvements, and slopes is immaterial.

- *The physical impairments (i.e., fire road egress, public safety considerations, etc.) that prevent full/partial infiltration.*

GSI Response

Storm water infiltration into the onsite earth materials is considered infeasible since it could adversely affect the proposed onsite improvements and the existing development on the adjacent properties for the reasons described in a previous response herein. Thus, GSI respectfully concludes that physical impairments have no bearing on the viability of storm water BMPs that rely on full or partial infiltration into the onsite earth materials.

- *The consideration of site design alternatives to achieve partial/full infiltration within the DMA.*

GSI Response

GSI is unaware of any reasonable and practical site design alternatives to achieve partial/full infiltration within the DMA without increasing the risk of adverse impacts to the proposed onsite improvements and the existing development on the adjacent properties.

- *The extent site design BMPs requirements were included in the overall design.*

GSI Response

The evaluation of site design BMP requirements falls under the purview of the Civil Engineer-of-Record. Regardless, site design BMPs are also considered infeasible since infiltrating storm water in any volume at the subject site would increase the risk of adverse impacts to the proposed onsite improvements and the existing development on the adjacent properties for the reasons described in a previous response herein.

- *Conclusion or recommendation from the geotechnical engineer regarding the DMA's infiltration condition.*

GSI Response

As indicated previously, infiltrating storm water in any volume at the subject site increases the potential for perched groundwater to accumulate along sand and clay beds within the old paralic deposits, and along the geologic contact between the old paralic deposits and the Point Loma Formation. The perched groundwater would likely migrate laterally and enter the adjacent properties, and seep from the nearby coastal bluff, owing to the seaward-dipping geologic contact between the old paralic deposits and the Point Loma Formation. The lateral migration of perched groundwater could induce swelling of expansive soils and fill settlement within the subject parcels and the adjacent properties. Perched groundwater exiting the bluff face would also contribute to spring sapping and reduced bluff stability. Lastly, the proposed project includes numerous retaining walls and it appears that retaining walls occur on the adjacent property to the southwest. Lateral migration of perched groundwater could increase moisture transmission through these walls. These factors would substantially increase the risk of adverse impacts to the proposed onsite improvements and the existing development on the adjacent properties. Thus, we conclude that storm water infiltration into the onsite earth materials to meet permanent, post-construction storm water BMP objectives is infeasible (i.e., "no infiltration condition") and is not recommended from a geotechnical perspective. Geotechnical recommendations for onsite storm water management are provided in Reference 1.

- *An Exhibit for all applicable DMAs that clearly labels:*
  - *Proposed development areas and development type.*
  - *All applicable features and setbacks that prevent partial or full infiltration, including underground utilities, structures, retaining walls, fill slopes, natural slopes, and existing fill materials greater than 5 feet.*
  - *Potential locations for structural BMPs.*
  - *Areas where full/partial infiltration BMPs cannot be proposed.*

GSI Response

Since GSI does not recommend infiltration of storm water into the onsite earth materials for storm water management and treatment, it is our opinion that the preparation of the exhibit serves no geotechnical purpose nor benefit.

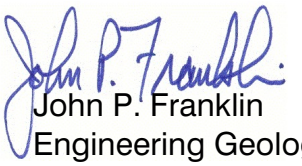
LIMITATIONS

The conclusions and recommendations are professional opinions. These opinions have been derived in accordance with current standards of practice, and no warranty, either express or implied, is given. Standards of practice are subject to change with time. GSI assumes no responsibility or liability for work or testing performed by others, or their inaction; or work performed when GSI is not requested to be onsite, to evaluate if our recommendations have been properly implemented. Use of this report constitutes an agreement and consent by the user to all the limitations outlined above, notwithstanding any other agreements that may be in place. In addition, this report may be subject to review by the controlling authorities. Thus, this report brings to completion our scope of services for this portion of the project.

The opportunity to be of service is sincerely appreciated. If you should have any questions, please do not hesitate to contact our office.

Respectfully submitted,

GeoSoils, Inc.



John P. Franklin
Engineering Geologist, CEG 1340

Stephen J. Coover
Geotechnical Engineer, GE 2057

Ryan B. Boehmer
Staff Geologist

RBB/JPF/SJC/sh

Distribution: (1) Addressee (PDF via email)
(1) Island Architects, Attention: Mr. Patrick Vercio (PDF via email)