

Alex Reizman, PE
501 Herondo Street
Hermosa Beach, CA 90254

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City Council Members
City of Hermosa Beach
1315 Valley Drive
Hermosa Beach, California 90254

Subject: Greenbelt Infiltration Project between Herondo and 2nd Street – Adjacent Building Structure Liquefaction and Settlement Concerns

References:

- 1) Geosyntec Letter, Subject: Infiltration Testing and Preliminary Geotechnical Investigation Hermosa Greenbelt Project, Hermosa Beach California, April 7, 2017
- 2) City of Los Angeles “Planning and Land Development Handbook for Low Impact Development (LID)”
- 3) County of Los Angeles Department of Public Works, Geotechnical and Materials Engineering Division, Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration, Document GS200.2, 6/30/2017
- 4) Los Angeles Department of Building and Safety (LADBS) document “Guidelines for Storm Water Infiltration,”

Dear City Council Members:

My wife and I are residents at the Moorings, a housing complex adjacent to the proposed Greenbelt Infiltration Project. We are writing to you in opposition to the proposed infiltration project location on the basis of increased public safety risk posed to the residential housing both to the west and east of the project. Specifically, infiltration systems pose an increased risk to seismic liquefaction and settlement of adjacent buildings, a safety risk that has not been adequately considered by the City of Hermosa Beach. An alternative location of the infiltration project, not in such proximity to existing buildings, must be considered.

A geotechnical investigation of the proposed Greenbelt site has been performed in Reference 1. Within the report the following conclusions are made:

Based on site-specific preliminary screening level liquefaction-triggering analysis, potential

liquefaction is predicted to occur in two of the six boreholes. Additional detail are presented in Appendix E. Potential liquefaction was predicted to occur in Borehole B-3 at a depth of approximately 25 ft bgs and in Borehole B-5 at depths of approximately 30 and 40 ft bgs...Therefore, a large continuous zone of liquefaction is not expected for this site, but further advanced liquefaction analysis is recommended during the design phase of the project.
(Section 6.2 of the letter)

Based on the results of the preliminary screen level liquefaction analysis, an additional detailed evaluation of potential liquefaction may be warranted. Based on LADBS [2017], infiltration features may not be applicable for sites where seismically induced settlements are greater than 1.5 inches. Based on the results presented in Table 6 above, seismically induced settlements at Borehole B-3 and B-5 are greater than 1.5 inches. However, the depths at which the settlements were calculated are not expected to influence the infiltration features that are proposed.
(Section 8.0 of the letter)

Summarizing the Reference 1 letter findings are that liquefaction and settlement hazards are specifically present, and additional detailed evaluation is warranted. Interestingly, the conclusions are focused on the “infiltration features that are proposed”. In other words, at the specific project site. No conclusions on the increased liquefaction or settlement hazard of adjacent residential buildings is rendered. As shown in Figure 4 of the Reference 1 letter, there is a liquefaction hazard directly on the west side of the proposed project location. No soil borings were performed at that location (see Figure 2 of Reference 1).

Liquefaction and settlement potential was evaluated and identified at the proposed project site, however adjacent site vulnerability was not evaluated or addressed in the Reference 1 letter. City and County regulatory documents require the evaluation of infiltration project impact on both the site and adjacent structures. The reason for this is that a temporary “mound” of water is created under the Infiltration facility during the water absorption process. The mound size could be quite substantial, and could raise the ground water level under adjacent structures. Infiltration project screening criteria and guidelines are discussed in References 2, 3 and 4. Specifically, Reference 2, Table 4.1 screening guidelines are as follows:

Potentially Feasible: Geotechnical hazards such as liquefaction are a potential near the site

Infeasible: Geotechnical hazards such as liquefaction, collapsible soils, or expansive soils exist

Reference 3 site requirements are:

Item 6. Stormwater infiltration shall not increase the potential for static settlement of structures on or adjacent to the site. Laboratory testing should be performed to evaluate the anticipated settlement and hydrocollapse potential of soils 10 feet below the proposed invert of infiltration.

Item 7. Stormwater infiltration shall not increase the potential for seismic settlement of structures on or adjacent to the site. Liquefaction potential shall be evaluated considering the design volume of stormwater infiltration.

Reference 4 requirements are:

Item 3. Storm water infiltration is not allowed on any site where the water may saturate soils that are subject to liquefaction, and the total and differential settlement (static and seismic) is greater than 1.5 inches and 0.75 inches, respectively.

Comparing the above requirements to the Reference 1 letter, it is clear that project site adjacent building vulnerabilities to liquefaction and settlement were not adequately addressed in the Reference 1 report.

According to The Los Angeles Department of Building and Safety (Ref. 4) the suitability of a stormwater infiltration site must be evaluated in a geotechnical soils report. The report must address the requirements listed in Section V.A.1 and 2. All the requirements have not be addressed or resolved in the Reference 1 letter. In fact as discussed previously, the conclusion that the adjacent structures are not at an increased potential for settlement or liquefaction, has not be made. Further, it appears that the requirements of the Reference 4 document were not followed when evaluating site liquefaction and settlement potential. Specifically, Reference 1 states: “Existing groundwater elevations were used for the preliminary screening level liquefaction triggering analysis.” (Section 6.2)

The Reference 4 requirement states: ”On a site where the water may saturate soils that are subject to liquefaction, a liquefaction analysis assuming the design ground water at the level of infiltration. (Section V.A.1.g)

As discussed in Section 5.3 of Reference 1, the historic high ground water elevation is 10 ft below ground surface (bgs). Section 6.2 of Reference 1 implies that groundwater of 24.5 to 27 ft bgs was used in the liquefaction analyses. The use of a “design ground water” will likely show a potential for liquefaction and settlement to be even greater.

In conclusion, placing a high impact infiltration project in such close proximity to a densely populated area requires significant safety and consequence analyses. Even the City of Hermosa Beach own commissioned study is not able to conclusively rule out liquefaction and soil settlement concerns. Extensive studies are required to prove that water “mound” created by the Infiltration facility does not increase the potential for seismic and static settlement of adjacent building structures. Because project safety has not been demonstrated to Los Angeles regulatory standards, I recommend that an alternate location for the infiltration project be evaluated.

Respectfully,

A handwritten signature in black ink, appearing to read "A. Reizman", with a long, sweeping horizontal line extending to the right.

Alex Reizman, PE