

# Terminal One Development LLC

---

Rafael Montes, P.P.  
Senior Engineer  
San Francisco Bay Conservation and Development Commission  
455 Golden Gate Avenue, Suite 10600  
San Francisco, CA 94102-7019

October 17, 2017

Re: Latitude Project, City of Richmond, Contra Costa County, California

Dear Rafael,

At meetings held on May 24, 2017 and August 8, 2017, the Bay Conservation and Development Commission's Engineering Criteria Review Board ("ECRB" or the "Board") reviewed the engineering criteria employed in analyzing the structural integrity of the Terminal One Wharf, in assessing the adequacy of the Latitude Project's shoreline protection, and in evaluating the resiliency of the Project relative to sea level rise. The Board concluded its August 8<sup>th</sup> review of the Latitude Project by adopting a motion conditionally approving the Latitude Project with the Board's approval conditioned on the submission by Applicant of adequate written responses to comments raised by the Board at its August 8<sup>th</sup> meeting – with Applicant's responses to be reviewed by the Board at its November 1, 2017 meeting.

On August 31, 2017, we were provided a draft copy of the meeting minutes from the August 8, 2017 ECRB meeting to assist us in preparing a Responses to Comments document. We carefully reviewed the draft minutes and prepared a list of Board comments to serve as the framework for our responses. Because most of the comments related to the geotechnical analysis, we asked ENGEО, our geotechnical engineering consultant, to prepare our initial Responses to Comments document based on a list of Board comments gleaned from the August 8<sup>th</sup> meeting minutes.

Staff has subsequently provided Applicant a list of Board comments based in part on Staff's review of the audio from the August 8, 2017 ECRB meeting (and perhaps reflecting clarification from individual Board members regarding their comments). See the attached annotated "List of ECRB Comments from August 8, 2017 Meeting."

ENGEО has revised their initial Responses to Comments document entitled "Technical Memorandum No. 1" to address the Board concerns as reflected in Staff's most recent List of ECRB Comments. I have provided Staff with a copy of ENGEО's revised Technical Memorandum No. 1 by separate email. I have also attached to this email correspondence a copy of Staff's List of ECRB Comments that has been annotated by ENGEО, BKF, and SGH:

- to explain the revisions that have been made to ENGEО's Technical Memorandum No. 1 to address the Board's concerns as reflected in Staff's List of ECRB Comments;

- to cross-reference Staff's numbered list of comments with the responses provided in ENGEO's Technical Memorandum No. 1; and
- to address points raised in Staff's List of ECRB Comments that warrant further explanation or clarification.

In particular, we would call the Board's attention to:

- BKF's annotated response to Board Comment Number 7;
- SGH's annotated response to Board Comment Number 10; and
- ENGEO's annotated explanations addressing Board Comments Numbers 5, 6, 7, 8, 9, 11, and 12.

I would very much appreciate it if you could provide a copy of this correspondence with the attached annotated List of ECRB Comments from August 8, 2017 Meeting, as well as ENGEO's revised Technical Memorandum No. 1 to the Board for their consideration at their November 1, 2017 meeting.

Sincerely,

J. Cleve Livingston  
Terminal One Development LLC

## ATTACHMENT 1

### LIST OF ECRB COMMENTS FROM AUGUST 8, 2017 MEETING

(As Prepared by Staff with Annotations by Applicant)

October 16, 2017

1. Look at the amount of information gathered on the western part of the site to see if additional work and exploration is warranted to better characterize the materials below the Bay mud.

**ENGEO Annotation** – This comment is addressed in our Technical Memorandum in Response to ECRB Comment #1.

2. Questions were raised regarding the strength parameters used in evaluating the stability of the sand and clayey sand using Phi (friction angle) of 31 and an undrained strength of 780 psf.

**ENGEO Annotation** -- This comment is addressed in our Technical Memorandum in Response to ECRB Comment #2.

3. Reexamine the deflections for the piles during an event and the configuration and depth of the DSM buttress.

**ENGEO Annotation** – This comment is addressed in our Technical Memorandum in Response to ECRB Comment #3.

4. Given that liquefaction is expected, justify why the soil profile at the site was classified as E and not F. The classification ranges from A to F from hard rock to very weak soils, respectively.

**ENGEO Annotation** -- This comment is addressed in our Technical Memorandum in Response to ECRB Comment #4.

5. Provide information gathered regarding subsurface profiles in other parts of the site, and provide a longitudinal profile (along the wharf-front).

**ENGEO Annotation** – This comment is addressed in our Technical Memorandum in Response to ECRB Comment #5. We provided additional cross-sections as well as Young Bay Mud elevation contours for reference.

6. Include a narrative describing the processes and time histories used in developing the ground response analysis. The Board asked if the seismic hazard had been disaggregated and how time/history records were chosen (e.g., should there be a mix of Hayward- and

San Andreas-type sources?). And should the target spectrum be natural shaped as developed from a hazard analysis, rather than flat-topped? He noted that most hazard in this area is Strike Slip, but the chart in Slide 19, site response, includes one Reverse and one Normal fault type, which is surprising, but does not include the San Andreas fault. He suggested taking the average from at least seven sources instead of the five shown on the slide.

**ENGEO Annotation** -- This comment is addressed in our Technical Memorandum Response to ECRB Comment #6. We compare the use of a mapped, code-type spectra to a site-specific spectra, and show in the period of interest, there is no difference in the target spectra. We discuss the need for pulse-like ground motions due to proximity to the fault of interest which results in using the time histories included. The use of 5 time histories strictly conforms to ASCE 7-10.

7. A revised Base Flood Elevation for the site is 12 feet NAVD88. Would the new information impact the flood readiness of the wharf and more specifically the area of the western access? Check whether old data is based on MSL (e.g., NGVD29) or MLLW (e.g., NAVD88), and compare with more recent data.

**BKF Annotation** – The current (released September 30, 2015) FEMA Flood Insurance Rate Map (FIRM) shows the bulk of the Terminal One Site is not located within a 100-year flood zone. A narrow band of shoreline underlying the existing Terminal One Wharf and extending to the east is situated in coastal Zone VE (EL 11), with a Base Flood Elevation (BFE) of 11 feet. We suspect that the Base Flood Elevation of 12 feet NAVD88 referenced in Comment No. 7 occurs in Zone VE (EL 12) which applies to an area of the Bay located adjacent to the Terminal One site's western shoreline. Neither the Terminal One Wharf nor "the area of western access" is situated in Zone VE (EL 12). Nevertheless, both the segment of the Bay Trail loop which runs along the landside of the site's western shoreline and the programmed areas of the Wharf will have a minimum top elevation of 15 feet, providing 3 feet of freeboard to address the potential for up to 3 feet of future sea level rise even assuming a BFE of 12 feet.

**ENGEO Annotation** – In response to this comment, the boring logs and cross-sections were matched and the datums were corrected to be consistent in our work. In addition, the datums have been added to the boring logs and cross-sections attached in our Technical Memorandum.

8. It was not clear whether the cross-section drawings agreed with the elevation of boring logs. Please confirm that elevation references have been reconciled between these two and perform a check on the stability analysis.

**ENGEO Annotation** – The datums have been added to the boring logs and cross-sections shown in our Technical Memorandum.

9. The board commented on long-term resilience and public access to the Bay. Since the project is based on performance-criteria, which may not be designed for access or egress in the event of an earthquake, would there be provisions incorporated in the project, outside code, to enable passage.

**ENGEO Annotation** -- The project is designed in accordance with the criteria established for the project which is consistent with appropriate codes. The structure performance at the code-level event is anticipated to provide safe egress from the structure. We anticipate that reuse of the wharf by the public would be pending appropriate evaluation of the structure after the event (consistent with building reuse after a major earthquake).

10. The board had questions regarding the inspection program to monitor piles that become classified Severe, how the program would work and what measures would be in place to repair after the public park is built.

**Simpson Gumphertz & Heger (SGH) Annotation** – The Project Applicant will work with the City of Richmond and SGH to develop an on-going wharf inspection and maintenance/repair program which will include both periodic monitoring of the condition of the piles supporting the wharf and repair of those piles that become classified as subject to “Severe” deterioration. Implementation of the monitoring and maintenance program will ensure public safety and compliance with the California Building Code. The financing mechanism for funding the long term inspection/maintenance/repair program has not yet been determined but may involve the formation of a Mello Roos Community Facilities District for maintenance or a Lighting and Landscape District.

11. In the slope stability analyses results, show the constraints on the search for the critical slip surface.

**ENGEO Annotation** – The information requested by this comment has been added to the Slope Stability Analyses that was performed in response to ECRB Comment #2 included in our Technical Memorandum.

12. Because of the complexity of the Soil-Structure-Interaction problem of slope deformation, where piles are providing strength but may themselves also degrade, consider whether it might be more appropriate to use a finite element or finite difference numerical modeling approach for the final analyses.

**ENGEO Annotation** -- The use of various analysis methods is not dictated by any code or other publication and the selection of the appropriate method is subject to the design professional’s professional judgement. It is our normal practice to always start an analysis of this type using conventionally used, simplified limit equilibrium methods. When the Latitude Project was analyzed using this conventional methodology, the

results indicated the Terminal One site and wharf would perform within an acceptable range of tolerance. In our professional judgment, the additional complexity, rigor, and expense of numerical modeling is not warranted unless our analysis using the conservative simplifying assumptions does not support a finding that the performance of the site and the wharf will be acceptable. We have had a similar project (Brooklyn Basin) peer reviewed by a third-party consultant who recommended an identical analysis procedure be implemented for that other project (which was also reviewed by ECRB).