

# San Francisco Bay Conservation and Development Commission

375 Beale Street, Suite 510, San Francisco, California 94105 tel 415 352 3600 fax 888 348 5190  
State of California | Gavin Newsom – Governor | info@bcdc.ca.gov | www.bcdc.ca.gov

July 30, 2020

**TO:** All Engineering Criteria Review Board Members

**FROM:** Lawrence J. Goldzband, Executive Director (415/352-3653; larry.goldzband@bcdc.ca.gov)  
Rafael Montes, Senior Staff Engineer (415/352-3670; Rafael.montes@bcdc.ca.gov)

**SUBJECT: Draft Minutes of July 25, 2019 Engineering Criteria Review Board Meeting**

1. **Call to Order.** The meeting was called to order by the Chair, Professor Roger Borchardt, at 1:06 p.m. in the Monterey Conference Room at 455 Golden Gate Avenue, San Francisco, California.

The following ECRB members were present: Roger Borchardt, PhD, Board Chair; Robert “Bob” Battalio, PE; Professor Mary Catherine Comerio; James B. French, PE, GE; Lou M. Gilpin, PhD, CEG; Professor Jack P. Moehle.

The following ECRB members were not present: Richard B. Dornhelm, PE; William T. Holmes, SE; Frank L. Rollo, PE, GE.

The following BCDC staff members were present: Coastal Program Analyst Walt Deppe, Regulatory Director Brad McCrea, Senior (staff) Engineer and Board Secretary Rafael Montes and General Counsel Marc Zeppetello.

Present for the Alameda Marina Project were: Jim Falaschi of Alameda Marina LLC; Angelo Obertello of Carlson, Barbee & Gibson (CBG); Charles Olson and Carolyn Lee of Lubin Olson & Niewiadomski LLP (Lubin Olson); Logan Medeiros and Clayton Proto of Rockridge Geotechnical; Gayle Johnson and Sam Yao of Simpson Gumpertz & Heger (SGH); Steve Bittman of Stellar Environmental; Clay Fry of Studio FCF.

Also present were Rod Iwashita and Kari Kilstrom of the Port of San Francisco.

2. **Approval of Draft Minutes for the May 8, 2019 Engineering Criteria Review Board Meeting.** Chair Borchardt asked for a motion and a second to adopt the minutes of May 8, 2019.

**MOTION:** Board member Battalio moved approval of the Minutes, seconded by Board member French.

Board member Battalio stated that on page 13, the phrase “hydrodynamics of non-sediment” should be changed to “hydrodynamics for sediment transport.”



**ECRB MINUTES  
JULY 25, 2019**

**VOTE:** The motion carried with a vote of 6-0-0 with Chair Borchardt, Mr. Battalio, Prof. Comerio, Mr. French, Dr. Gilpin and Prof. Moehle voting “YES”, no “NO” votes, and no abstentions.

3. **Public Announcements.** Mr. Montes reported on the following.

With the Board’s help, BCDC has a nominee for the ECRB: Mr. Rod Iwashita, who will be appointed by the Commission next week at the regular meeting.

The second announcement was that BCDC is going to move to 375 Beale Street this month, so the next meeting will be at that location. One requirement of the building staff is that we submit potential meeting dates and times for next year. Mr. Montes will be sending Committee members a survey of their availability.

At Chair Borchardt’s request, the audience members introduced themselves.

4. **Alameda Marina Mixed-Use Redevelopment.** Coastal Program Analyst Walt Deppe introduced the project.

Pacific Shops, Inc. (PSI) and the City of Alameda are proposing to redevelop a 44-acre site located at the Alameda marina waterfront. The project consists of a mix of uses including maritime marina, commercial/retail, residential, and open space.

Proposed structural improvements include new seawalls, a new boat hoist structure, wharf retrofit and repairs, repairs to the graving dock, and ground improvement work including deep soil mixing.

The current proposal was accepted by BCDC’s Design Review Board on September 7, 2018. The Alameda Marina Project has a pending application with BCDC.

Questions for staff address the following items regarding engineering criteria of the proposed project.

- a. Whether groundwater rise onshore is sufficiently considered for the proposed ground improvements, and whether strategies to secure the shoreline are adequate, meet life-safety standards criteria, and last for the life of the project.
- b. Whether the designs of the seawalls are adequate and would be able to support the additional fill required to raise the shoreline for sea level rise adaptation in the future.
- c. Whether there are any potential structural or life-safety risks associated with the historic wharf decks and their future adaptation.
- d. Whether DSM criteria for the project is adequate.
- e. For the graving dock, whether the two tie rod investigations are representative of the overall condition of the structure.
- f. Whether the proposed repairs are sufficient to ensure its future durability.

(Chair Borchardt noted an additional correction for the previous meeting’s minutes: Prof. Moehle was erroneously listed as present.)

Mr. Charles Olson of Lubin Olson added detail to Mr. Deppe's presentation.

- Originally Alameda Marina was primarily a shipyard, and during WWII it became significant.
- In the 1950's and 60's the shipyard infrastructure was taken out and replaced by a marina.
- Today approximately 80% of the site is an asphalt parking lot.
- 27 acres of the site are owned in fee by Pacific Shops; 17 acres including most of the marina are deeded to the City of Alameda by the State as public trust tidelands.
- Mr. Olson gave the timeline of the project.
- He showed a diagram of the master plan which includes retention of the maritime commercial core, up to 760 new residential units, 250,000 square feet of maritime commercial core and industrial space, and about 3.6 acres of open space within BCDC's jurisdiction.
- One of the main purposes of the master plan is to open up the site to the Bay.
- The project will be developed in four phases.
- Factors driving the \$20 million in repairs to the shoreline are sea level rise and the condition of the existing shoreline.

Chair Borchardt asked about the current design stage of the project. Sam Yao of SGH replied that the engineering analysis is at about 40-45%.

Mr. Angelo Obertello of CBG spoke about existing conditions regarding elevation along the shoreline as well as the plan for raising grades.

- He gave existing site elevations with variations around the site.
- He gave sea level rise criteria that the current designs are planning for. He included proposed building and public access wharf elevations.

Board member Battalio asked how they selected 13.5' as the proposed elevation of the trail and how sea level rise is accommodated. Mr. Obertello replied that at the 2100 projected sea level rise, they wanted to have a low level of potential for frequent flooding. He confirmed that the operational water level threshold was a king tide of two-year extreme tide.

- Along the shoreline, everything they have planned has the optic of having adaptive capacity – elevated pathway, elevated flood wall, or elevated promenade.
- Mr. Obertello showed a rendering of the planned Bay Trail along the revetment and along the seawall, and the planned elevation and adaptive capacity.
- He showed a schematic rendering of the elevated adaptive promenade relative to the existing structure.

Chair Borchardt asked the source of the material to raise the grade level by 4 feet. Mr. Logan Medeiros of Rockridge Geotechnical answered that it would be select fill brought in to the site. Chair Borchardt asked if the fill could influence compaction and lateral resistance along the seawalls. Mr. Medeiros confirmed and said that there is a compaction spec in the geotechnical report for the engineered fill beneath the Bay Trail at the west slope, and they have also specified it being reinforced with geogrid.

Mr. Clayton Proto of Rockridge Geotechnical continued.

- He laid out the regional setting for the Alameda marina starting with a map from 1859, showing the portions that were marsh and sand dunes. A current outline of the city shows much reclaimed land offshore.

- The current shoreline of Alameda shows a favorable position because of a sand dune – the location of the site – coming up to the shoreline.

Board member French asked the relative densities of the dune sands. Mr. Proto answered that they are 40 and up, slightly cemented.

- Mr. Proto showed ground failures from the 1906 and 1989 earthquakes. They were concentrated on reclaimed land and development on marsh. There were no ground failures on Alameda Marina or the immediate vicinity.

- He showed a map of the proposed development plan.

- He showed a map from 1876 of the shoreline, then a map from 1917 showing development – the shoreline pushed out into the mudflats and the beginning of dredging offshore.

- A map from 1946 showed activity at the site for WWII shipbuilding. The shoreline was cut back about 300 feet to develop piers and docks.

Board member Battalio asked if they also dredged it for berthing depths. Mr. Proto confirmed. A hole was dredged in the middle of the marina for a floating dry dock.

- A map from 1965 showed the footprint of today, with some fill going on and construction of the graving dock.

- Mr. Proto showed the three zones across the site: historic fill in the tidal zone, historic fill on marsh deposit, and thinner fill closer to Clement Avenue on dune sand.

- Mr. Proto gave the results of the preliminary investigation in 2012 with 15 Cone Penetration Tests (CPTs) and the supplemental investigation in 2019 with 31 additional CPTs. In 2019 they also did five rotary wash borings on the western portion of the site, geophysical testing (seismic refraction testing and electromagnetic conductivity scans), and dynamic penetration tests to confirm the depth to competent material beneath the mudline.

In answer to a question from Board member French about test publications, Mr. Proto stated that the geophysical testing specific to the seismic refraction testing of Multi-channel Analysis of Surface Waves (MASW) was completed and published in the Appendices, while the report about the electromagnetic surveys is still outstanding.

Chair Borchardt asked if the MSAW is based on surface wave analysis rather than seismic refraction. Mr. Proto affirmed.

- Mr. Proto broke out typical subsurface conditions for CPT-20 from the geotechnical investigation.

Chair Borchardt asked about the material that is down about 40 feet: doesn't the log suggest that it is relatively soft material? Mr. Proto answered that in different locations at 44-49 feet they saw a 5-foot thick layer of lower shear strength of estimated 2,000 psf.

Chair Borchardt noted that the stiff material in the center, around 30 feet, is thicker than the logs show. Many of the logs also show that the material below 40 feet is somewhat similar in cone penetration to the material above. Mr. Proto answered that clays have lower tip resistance by an order of magnitude than sands. However, the clay is not weak; visually, the tip resistance alone does not tell enough.

Chair Borchardt asked about the shear wave velocity. Mr. Proto looked through the results. In the meantime, Mr. Medeiros stated that for the site-specific at a slope 2 at the Promenade Wharf they had a  $V_{s30}$  of 232 meters per second. The majority of the site is fairly solid or Type D soil with the exception of the northwest corner at the west slope. Chair Borchardt pointed out that when you get down into shear wave velocities that low, you basically get into soils that have quite a potential amplification capability, especially when they are next to something fairly stiff.

Chair Borchardt stated that he had some difficulty in deciphering the way Mr. Proto had presented the information. He suggested coming up with a map based on the CPT information as well as the thickness of the underlying material that is softer clay, and a map showing bedrock depth across the site. He suggested using the shake program to come up with some estimated site response fracture, especially at the places where they are putting in seawalls. He tried to infer that from the estimates of ground motion and found that they are not computed at a very high resolution and period.

- Mr. Proto continued that across most of the site there is a relatively thin layer of five feet or less of young bay mud, with the exceptions of the northwest corner and below the graving dock.

- The Merritt sand thickness is fairly uniform across the site at 15-20 feet thick, tapering out at the northwest corner and the northeast corner.

- Mr. Medeiros gave an overview of the geotechnical analysis for the proposed shoreline improvements.

- It consisted of a site-specific seismic evaluation for slope 2 at the wharf structure, liquefaction analyses, lateral earth pressure diagrams, and slope stability analyses.

Board member Battalio asked if they had considered the sea level rise adaptation measures in terms of the fill and other loadings. Mr. Medeiros replied that they considered a potential differential water condition for each seawall – the five-foot difference between mean high water and mean low water, with an extra increment of water pressure on each wall. They also looked at liquefaction analysis using water at the ground surface; it had a minimal effect on the estimated liquefaction settlements. They looked at the resultant forces of the design pressure diagrams for the seawalls using ground water levels 6½ feet higher and found that the resultant forces on the seawalls went down. The current design pressures are more conservative than the case where there is higher ground water.

- Mr. Medeiros gave details of the site-specific seismic evaluation for the Promenade Wharf (SW-2), done in accordance with ASCE 7-10.

- Board member French asked how they did their PSHA (Probabilistic seismic hazard analysis.) Mr. Medeiros answered that they used the computer model EZ-FRISK.

- He showed a liquefaction analysis example using CPT-20. They determined that the materials were too plastic to liquefy. Mr. Medeiros and Mr. Proto answered questions about the graphs for Board member French. The potentially liquefiable layers are generally less than one foot thick, which is true for much of the site. Looking at all the CPTs within the shoreline band, the majority have less than ¾ inches of liquefaction-induced settlement. The exception is the CPTs behind the existing graving dock, where the material was found to be highly liquefiable.

- Mr. Medeiros showed diagrams of the design lateral earth pressures evaluation, with cantilevered sheetpile for Seawall #1 as the example.

Board member French asked if the clay model or the sandy model was liquefied for the Sitar model. Mr. Medeiros answered that for the pre-liquefaction case using the Sitar model, they had used the sand model. He and Board member French discussed seismic increments of liquefied soil and things that are retaining water.

- Mr. Medeiros explained an example of the Generalized Limit Equilibrium (GLE) check for Seawall #1.

Board member French asked if there was much difference between the Sitar approach and the GLE methodology. Mr. Medeiros answered that some were very close, while in the example of Seawall #1, the Sitar was substantially higher and appears more conservative. They are taking the higher of the two.

- For each seawall they also performed global stability checks. Under static conditions using drained soil parameters they have a factor of safety of 2 for Seawall #1. They generally looked for at least a safety factor (SF) of 1.5 under static conditions.

- They looked at pseudo static global stability using a horizontal seismic coefficient of  $\frac{1}{2}$  the MCE level PGA.
- Mr. Medeiros explained design lateral earth pressures for Seawall #5 which is anchored with tie rod and deadman anchors.
- In locations where they do not have new seawalls proposed, they looked at slope stability. In the analysis they neglected the presence of the wharf piles and of the planned king piles. Mr. Medeiros explained where they recommended deep soil mixing (DSM).
- The west slope does not have dense sand; it has roughly 30 feet of softer bay and estuary deposits. The slope is marginally stable, and they were introducing a zone of ground improvement in their model, similar to Slope 2 and the Promenade Wharf.

Board member Battalio noted that with future sea level rise, they would raise the site grades further. Did they analyze the factor of safety with that – how is the adaptation accomplished? Mr. Medeiros answered that they ran their models for a proposed ground level of 13.5. Mr. Obertello stated that in this specific area, they would be elevating the floodwall because of the constraints relative to some of the upland improvements nearby.

Board member Battalio asked if they felt they would be able to accommodate that wall. Mr. Medeiros felt that with a block of DSM, they could easily accommodate additional fill. They are designing for currently anticipated sea level rise, and the slope stabilization measures meet the requirements for life-safety.

Board member French felt that the amounts for the drain strength of Clays 2 and 3 looked very high. You need to define the strength as a result of the CPT analysis – it is not related to the overburdened strength per se. Mr. Proto responded that this is a relatively thin layer; he wanted to get weaker offshore, and by using the overburden function he was not saying more than he should. Board member French expressed concern with the analytical method used with the overburden. He suggested subdividing Clays 2 and 3 with offshore being lower strength.

- They looked at potential seismic slope deformations using the screening analysis recommended in the SCEC guidelines. They found that significant slope deformations were not likely for the first two slopes, but for the West Slope the yield acceleration was only about 0.1, indicating that it is likely to experience some deformation during a major earthquake. They concluded that these relatively minor deformations did not pose a threat to life-safety. The proposed buildings are to be located about 250 feet back from this slope. Because they are going to be placing four feet of engineered fill anyway, they are going to reinforce it with geogrid using granular fill.

- Mr. Medeiros presented the conclusions.

Chair Borchardt stated that the shear wave velocity profiles show travel times for the different arrivals. It would be best to have this interpreted from the point of view of interval shear wave velocities down at those depths.

Chair Borchardt was interested to see, when you put the profiles together and try to compute the ground response from rock and depth clear to the surface, the overall response of a typical site. You might have situations with more amplification or with less. There are a lot of structures planned across the site, so it would be good early on in the project to have an idea of the site response.

Mr. Medeiros mentioned that a portion of the west slope is Site Class D, and a portion is Site Class E. For their deformation analysis they used the increased Site Class D PGA.

Mr. Medeiros felt that it was not clear that a site response analysis was warranted following the provisions of ASCE 7-10. Chair Borchardt said he was thinking more about the whole project, and seeking to proceed with additional understanding right from the beginning.

Mr. Medeiros asked if Chair Borchardt felt that a boring down to bedrock is necessary for this site. Chair Borchardt responded that it would be nice, including having the interval velocities measured all the way down.

Board member French asked if the elevations are designed to be post-consolidation elevations so that post-50-year settlement will still be at the 14-foot level. Mr. Medeiros answered that they have not had those conversations yet. In the location of the Bay Trail where they have the thickest fill – about four feet in the northwest slope – they have mitigated the settlement with the introduction of DSM through the bay mud.

Board member French suggested adding plots of shear wave velocity versus depth. Maybe on the same set of plots, plot shear wave velocity versus depth.

Board member French mentioned that after looking at some of these plots, having more site response might be appropriate.

He commented that rather than half-PGA or even with SLAMMER, they might consider looking at a fairly simple analysis with Bray and Travarasrou where they put in the deformations given by different accelerations. Mr. Medeiros responded that they had considered Bray and Travarasrou but liked the way SLAMMER addresses it.

Mr. Yao continued the presentation, speaking on four subjects: the seawalls and graving dock, wharves, the new boat hoist, and seismic instrumentation.

- The general approach of SGH to the shoreline improvements was conservative. Cost is always a concern.
- Mr. Yao indicated the locations of the improvements.
- There will be four seawalls and a graving dock. For general design criteria, SGH designs per the California Building Code, ASCE 7-10, ASCE 61-14, and NCHRP 611.
- Seismic load combinations are designed per ASCE 7-10.
- The seismic criteria for the seawall and the graving dock meets the Life-Safety Requirements in Maximum Considered Earthquake (MCE), which exceeds the Building Code.
- Mr. Yao showed the concept for Seawall 1, then the analysis.

- He showed the design for Seawall 4.

Prof. Moehle noted that the strengths seem high; how about the deflections? Mr. Yao replied that the static deformation is low while the seismic deformation is in inches, but we are talking about MCE. Even with the Building Code requirement of Life Safety there is no yielding. Deflection is a consideration, but not for MCE.

- Mr. Yao listed the design summary of Seawalls 4, 5, and 6. They are all conservatively designed.

- He pointed out that with the existing seawalls, 95% of deterioration comes from the corrosion in the marine environment. They will use multiple measures for corrosion protection: corrosion-resistant steel ASTM A690, using coating where necessary, and cathodic protection using sacrificial anodes.

- Mr. Yao gave a summary of the design. All seawalls are designed to support new fills in the back in anticipation of sea level rise. Conservatism was the approach regarding the old design of the existing seawall. New seawall design criteria satisfies Life-Safety requirements in MCE, have elastic design, and have adequate factors of safety for tie rods and high passive resistance for deadman anchors.

Board member French raised the point that if the fill needs to be designed for target elevations in 50 years, the end of construction will have to be several inches to half a foot higher. The design needs to be ready for those end-of-construction fill surfaces.

Prof. Comerio asked what the level of the fill will be relative to the existing buildings. Mr. Olson responded that 11 existing buildings are to be retained. The harbormaster's office (Buildings 25 and 26) are at a lower elevation and they are working on how to build around that, possibly by lifting the buildings up, moving them, lifting the soil level to that higher level, and putting the buildings back.

- Mr. Yao spoke about the graving dock, constructed in the 1960s. He showed a cross-section. It is now filled with about 35 feet of sediment. The developer investigated the graving dock and recorded it in videos and photos. Mr. Yao reviewed the seismic analysis. The design exceeded the Building Code because they used the MCE.

- In summary, the graving dock has historically been subjected to much higher lateral loads than what the service loads we anticipate in the future. The field investigation of the tie-rods is statistically significant – they are pristine. Needing repair are the laggings between concrete piles and some of the tie-rod heads; these repairs are not major.

- There are five wharves on the project; for retrofit the plan is to replace deteriorated girders and joists as well as piles.

- The Promenade Wharf will eventually be used as a public assembly place. Mr. Yao emphasized that there is a lot of redundancy in the wharf – the joists and beams are oversized.

Board member French asked what caused one pile to corrode and not another. Mr. Yao replied that way under the mudline there is no rotting, but where the cement back went bad the timber pile rotted away.

- Mr. Yao explained the retrofit plan with a diagram of the 37 rotted piles and five girders.
- He gave the design criteria which uses ASCE 7-10.

Prof. Moehle asked if there is any special requirement for a place of public assembly. Mr. Yao stated that for public assembly, the Building Code essentially increases the live loads. They also have to meet the ADA requirements and they want to make it high-heel safe (i.e., the gap between the boards is much closer). There are no special structural requirements. The importance factor is 2.

- They will retrofit all the wharves the same way. Mr. Yao stated that the DCR ratios of 0 to 0.75 and 0.75 to 0.9 are structurally acceptable.
- He summarized that they evaluated all the wharves using site-specific spectra for Design Earthquake. The retrofit is to replace deteriorated beams, install new piles, and reduce the R factor to use elastic design. They will include 25% reduction on structural strength beyond code-defined values (knowledge factor = 0.75). They will ignore structural redundancy in the wharves.
- Mr. Yao addressed sea level rise. Currently the wharf is at elevation 12. He described the steps for the future if the owner should decide to raise the wharf deck to 13.5.
- Mr. Yao described the new boat hoist location and gave the design criteria.

Chair Borchardt asked if there is going to be a maintenance yard there as well. Mr. Yao answered that it is not in this location. Mr. Olson stated that it would be in the maritime commercial core area. They are working with the City and have put out an RFQ for boatyard operators. The intent is to have a maintenance yard on the site.

- Mr. Yao presented the seismic instrumentation. There is quite a bit of instrumentation in this area already, but they proposed to install three three-dimensional accelerometer clusters – two on the concrete structure, one on the big wharf, and one on the land side for free ground motion collection.

Chair Borchardt noted that the landward instrumentation would be out of BCDC's jurisdictional zone. The one on the loading dock will not give much information on the ground motion. He suggested having one instrument near the west seawall – the mud is thicker there. He suggested having one behind some of the other seawalls, back from the seawall on the ground surface. He also suggested considering one on Slope 3. Mr. Yao said he would discuss these suggestions with the developer, and felt that they could be accommodated. Chair Borchardt felt that if sites are picked carefully, they can be easily maintained and last a long time. Sensors should be put on the landward side where they are not exposed to salt water.

For the Promenade Wharf, Slope 2, and the west slope, Mr. Medeiros asked if Chair Borcherdt was more interested in the motions on the soil or over the DSM. Chair Borcherdt answered that one would be good on the DSM, with the rest on the soil to give an idea of the general site response. He summarized his recommendations for instrumentation sites as CPT 17, CPT 23, the one on the Promenade near CPT 30, somewhere near CPT 34, CPT 45, and CPT 36 (Sea Wall 4).

Mr. Yao asked the Board if there is any need for seismic instrumentation on the wharf. Chair Borcherdt stated that from an engineering point of view it would be interesting. Clay Fry of Studio FCF said there are some structures on the wharf but not specifically on the large promenade. They are building some benching against the Bay Trail. The group discussed installing sensors in housings. Chair Borcherdt noted that you can easily link them into a warning system. Mr. Yao commented that there is a lot of redundancy in the vertical loads.

Chair Borcherdt referred to a document concerning chemicals of concern (COCs). Marine maintenance has been done at this site, and the paints on the bottom of boats, which contain lead and chromium, are extremely toxic to the environment. Quite a few measurements have been made and it would be beneficial to see a distribution of these across the site. The solution for contaminated soil concentrations would be to remove them. For residential areas, clean fill should be provided.

Steve Bittman of Stellar Environmental Solutions responded that they were expecting to find more lead than they did. Regarding distribution, there are only two areas where they found over the 1,000 mg/kg threshold which is classified as hazardous waste. Those areas are to the west side of the graving dock and near the main entrance to the facility; Stellar is planning on removing them. Regarding the fill, bringing in three feet on the top isolates it from any other development to be placed nearby. The residential areas are generally not going to be involved. Most of the lead that is hazardous is going to be removed, and any lead levels that are over the environmental screening levels for residential areas will be covered.

Mr. Olson stated that there is contamination around Building 12, and the plan is to remove the building and take out whatever is there. There may be a possibility of moving clean fill from the east side to the west.

Mr. Bittman stated that generally chromium is not involved there. Lead is not particularly soluble in water, so they are not expecting an issue with rising groundwater levels.

Mr. Bittman continued that two underground storage tanks still need to be investigated – hydrocarbons are a concern.

Mr. Johnson stated that given the large size and spread-out occupancy of the assembly area, it may not fall under the code definition. SGH will clarify that.

Mr. Montes advised that if there are criteria the Board would like to have modified, the applicant would need to come back.

Chair Borcherdt stated that additional information would be useful in the areas of plots of shear wave velocity versus depth and strength analysis of potential for lateral movement if

fill is added in a few of the areas. Board member French had mentioned acceleration levels versus deformation, and Chair Borchardt had thought that a site-specific spectrum developed based on the complete soil profile for bedrock up would be important. Chair Borchardt felt the effort to look into the COCs was beneficial. The Board's comments on the instrumentation had been fully appreciated by the applicant.

Board member French confirmed with the applicants that the fill may have to be a little higher initially to account for the future consolidation settlement. They will also be checking the depth versus shear wave/depth versus SU to see whether site response analysis may be appropriate. Board member French also mentioned a question that came from the BCDC Design Review Board regarding the DSM criteria; his response was that it is an adequate approach.

Mr. Montes asked if the Board members felt that all six questions on page 12 of the July 11, 2019 memo from Executive Director Goldzband had been resolved.

Prof. Moehle proposed going through each of the items. The rest of the Board agreed.

(1) Because of future rising sea levels, staff have concerns regarding ground water rise onshore of the ground improvements and any physical hazards arising from it. Further, the staff wants your opinion on whether the strategies to secure the shoreline are adequate, meet life-safety criteria and last for the life of the project.

(2) The staff would like your assessment on the SLR adaptation measures being proposed on whether the seawalls would be able to support the additional fill (berm/levees) required to raise the shoreline.

Board member Battalio spoke regarding #1 and 2; he stated that his comments could be addressed by following up with staff, and not necessarily coming back to the ECRB. Regarding future sea levels, he would like to have the criteria clarified. The operational criterion for the trail elevation was above the king tide, which is about a two-year occurrence. The 13.5 provides about six feet of sea level rise accommodation. Board member Battalio felt that was a reasonable approach for a trail; it would be helpful if this were confirmed or otherwise corrected.

Board member Battalio discerned from this that there is about three feet of sea level rise accommodated with the 100-year flood elevation according to FEMA. That is reasonable to consider for design, but there is a need for some certainty about a higher sea level of perhaps three or four more feet. Mr. Montes felt BCDC could handle that question in terms of the permitting process. Board member Battalio said that he would appreciate a statement on feasibility, whatever analysis is needed.

He stated that the groundwater has not been addressed; the perimeter would be at 13.5 but it seems like some places on the site would be left low. The idea is that we are only looking at surface water inundation. If the Bay water levels rise with sea level as we expect they will, we expect the ground water to rise. Drainage may be impeded with high groundwater. Board member Battalio would like to see an analysis of dry side flooding due to high groundwater in combination with groundwater runoff.

He commented that with the base flood elevation of about 10 feet, there is also a statement that wave run-up is expected to be less than three feet. He deduced that it is unlikely to have three feet of wave run-up during the 100-year stillwater level, and the stillwater level governs. It would be helpful to have some sort of clarification of the vertical and lateral extended wave run-up and how that relates to the trail.

Board member Battalio noticed some buildings within the 100-foot shoreline band (although not in BCDC purview); he was interested in the accommodation for those buildings.

Mr. Olson clarified that the base level of the entire site will be 13.5 – there will not be any areas lower than that. The base level for any livable space will be at least 14, as will all the streets and everything else.

Board member Battalio noted that in general we are repeatedly seeing a walling off and raising along the existing bay perimeter. We are not really providing space for ecology. Mr. Montes commented that some of BCDC's policies mention mitigation in areas adjacent to seawalls. Board member Battalio felt that it is important to start thinking about not just protecting built assets and fostering economic development, but also about protecting natural assets and integrating them into design.

(3) The historic wharves decks will be elevated above future SLR by additional installation of the pile caps. Are there any potential physical risks that could render these structurally obsolete and/or result in issues of life-safety?

Prof. Moehle responded that if done properly, there were no such risks.

(4) Are the DSM criteria adequate for the project?

The Board agreed that they were.

(5) Graving Dock – Is it your assessment that two tie rod investigations are representative of the overall condition of the structure? Are the proposed repairs sufficient to ensure its future durability?

Prof. Moehle felt that they were designed and constructed properly, demonstrated by the two exposed rods. The repairs for the corroded anchors also seem fine.

(6) Are there any uncertainties about the life safety aspect of the overall repair strategies?

The Board agreed that there always are, but none beyond the ordinary – none that cannot be addressed.

Prof. Moehle stated that he would still like to have SGH respond to the Design Review Board about the occupancy issue. Mr. Johnson stated that Mr. Yao had used an R of 1 rather than 1.25, even though it is risk category 3.

Brad McCrea, BCDC Regulatory Director, asked for clarity on whether the project is coming back or not. He also requested for the applicants to be able to respond to any items they deemed necessary.

Chair Borchardt stated that the Board has identified several issues where additional information would be useful. He suggested a Motion for the project to move forward with the understanding that the applicant address these issues, but not necessarily have to come back to the Board.

Mr. Montes agreed with this approach. His sense from the ECRB was that the criteria are adequate.

Chair Borchardt stated that the critical issue is the seawalls, which have a lot of conservatism being built in. He also felt some concern with the COCs, which are being addressed. Mr. Olson responded that they will be working with the Regional Water Control Board.

Prof. Moehle said that only if the design team reaches some impasse in responding to these questions would they have to come back.

Mr. Montes stated that the applicant will have to amend some of the wording in their reports for clarification, based on the Board's comments.

**MOTION:** Mr. French moved to recommend that the project move forward with the understanding that the issues discussed be addressed to the satisfaction of BCDC staff; seconded by Prof. Moehle.

**VOTE:** The Motion carried with a vote of 6-0-0 with Chair Borchardt, Mr. Battalio, Prof. Comerio, Mr. French, Dr. Gilpin and Prof. Moehle voting "YES", no "NO" votes, and no abstentions.

**5. Follow-up Questions and Answers of Presentation on ECRB Role and Duties with BCDC Legal Staff.** Mr. Montes stated that many questions had been raised during the previous meeting's presentation on the goals and duties of the ECRB. Chief Counsel Marc Zeppetello was present to answer any questions on legal matters from the Board.

Mr. Zeppetello read an excerpt from the Bagley-Keene Open Meeting Act stating its purpose. The Act applies to advisory bodies, i.e., the full Commission and the ECRB.

Serial meetings happen by phone or email communications where two or more members of a body have communication and discuss the merits of a matter, exchanging views in an attempt to come to a recommendation or decision.

A question had been raised over whether board members can communicate prior to a meeting, by email or telephone, regarding the merits of a matter coming before them. It is not prohibited technically for just two members to have a conversation, but they might reach out to other members for more discussions, and that is prohibited. The prohibition is that a quorum cannot have discussions or communications, all at one time or in sequence, on the merits of a matter to exchange views or come to a decision.

Board member French asked about a situation in which he would discuss something with the other geotech about some issue of concern. This would not snowball into a quorum; is this discouraged? Mr. Zeppetello answered that the law does not prohibit two Board members from speaking, but you need to be careful.

Mr. Zeppetello spoke regarding two Board members communicating in a sidebar during a meeting. This is totally contrary to the spirit of the Act. The point of the law is to collaborate in public.

Regarding conflict of interest, Mr. Zeppetello referred to the Form 700. If a firm you are working with is designing a project that is coming before the ECRB, you should disclose that and probably recuse yourself from the discussion. Conflicts can also arise in ways that do not have an economic interest. You could be affiliated with a group opposed to or in favor of a project, and a conflict may be perceived because of your affiliation.

The Public Records Act states that the public records of an agency are subject to disclosure on request by the public. Mr. Montes may send communications to transmit materials which is fine, but email communications about projects are discouraged. It is a possibility that email communications about a project may become part of a legal search and would have to be disclosed.

Prof. Comerio asked about BCDC jurisdiction and Board jurisdiction: has engineering criteria always been only fill, or was it once broader? Mr. McCrea read the applicable regulation which referred to “the safety of fills and of structures on fills.”

He explained that the only reason the Commission can deny a permit for a project in the shoreline band is if the project fails to provide maximum feasible public access. We do not have any land use authority in the shoreline band; it is all about the adequacy of the public access.

Mr. McCrea stated that the Bay jurisdiction as defined by the McAteer-Petris Act is limited to filled areas after Sept. 17, 1965. This includes a driven pile in the Bay.

Board member Battalio asked why the ECRB had not commented on the proposed buildings in today’s project that were within the 100-foot shoreline band. Mr. McCrea replied that the purview of the ECRB is to look at the safety of fills in the Bay. The buildings were in the shoreline band rather than the Bay, so they are in the purview of the Design Review Board. If there is a structure that is tied to land, and something happens on land that affects the safety of the wharf or pier, Mr. McCrea felt that the Board has purview over the slope stability on land as it pertains to the wharf or pier. There is a need to look at what is happening on the shoreline as it pertains to the marine structure.

Prof. Moehle spoke of a hypothetical project in which native land that is seen to be inundated within 100 years by sea level rise, has five feet of fill placed and houses built upon it. Is that within ECRB jurisdiction? Mr. Zeppetello thought not because the fill was placed on native land.

Kari Kilstrom of the Port of San Francisco posed the question of whether they are looking at flooding issues just for public access or for fill.

Mr. McCrea stated that at BCDC there are two different Bay jurisdictional lines. Where there is no marsh vegetation present (the typical riprap shoreline), the Bay jurisdiction is mean high tide. Where marsh plants are present, the Bay jurisdiction is five feet above mean sea level. Instead of mean high water, you go down to mean sea level and go up to five feet above that. If fill is being placed in an unfilled area which could potentially cause a slope stability issue that would rotate into the Bay, that is ECRB purview.

Prof. Comerio asked to receive clarification from staff on the kind of questions the ECRB can ask developers. Mr. McCrea agreed.

Board member Battalio asked if, years ago, the jurisdictional line had been higher than high tide. Mr. McCrea confirmed that it had been.

Prof. Comerio asked if there is anything that justifies the change of BCDC jurisdiction with sea level rise. Mr. Zeppetello answered that it has not yet been addressed by the California Supreme Court, but the federal cases are clear that tidelands and public trust move with the tide. BCDC staff takes the position that as sea level rises, our jurisdiction is moving inland.

Mr. McCrea added that the definition of the Bay uses the words "tidal action:" the Bay is wherever there is tidal action. In the future if there is tidal action inland, the Bay per se moves with it.

6. **Adjournment.** Chair Borchardt adjourned the meeting at 5:07 p.m.