

San Francisco Bay Conservation and Development Commission

455 Golden Gate Avenue, Suite 10600, San Francisco, California 94102 tel 415 352 3600 fax 415 352 3606

April 24, 2019

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 January 24, 2019 BCDC Engineering Criteria Review Board Meeting

1. **Call to Order.** The meeting was called to order by the Chair, Dr. Roger Borchardt, at 1:03 p.m. in the Monterey Conference Room at 455 Golden Gate Avenue, San Francisco, California.

The following ECRB members were present: Dr. Roger Borchardt, Board Chair; Robert “Bob” Battalio, PE; Professor Mary Catherine Comerio; James “Jim” French, PE, GE; Dr. Lou Gilpin; William Holmes, SE; and Professor Jack Moehle.

The following ECRB members were not present: Richard B. Dornhelm, PE; Professor Martin Fischer; and Frank Rollo, PE, GE.

2. **Approval of Draft Minutes for November 13, 2018 Engineering Criteria Review Board Meeting.**

MOTION: Mr. Moehle moved approval of the Minutes, seconded by Mr. French. The motion carried with a vote of 7-0-0 with Chair Borchardt, Mr. Battalio, Ms. Comerio, Mr. French, Mr. Gilpin, Mr. Holmes, and Mr. Moehle voting “YES”, no “NO” votes, and no abstentions.

Chair Borchardt requested the audience members to introduce themselves.

Audience members interested in the Encinal Terminals Project included the following: Mike O’Hara and James Mee, Tim Lewis Communities; Brad Porter, Dilip Trivedi, and Sam Tooley, Moffat & Nichol; Uri Eliahu, Jeff Fippin, Bahareh Heidarzadeh, and David Teague, ENGEO; Angelo Obertello, Carlson, Barbee & Gibson.

3. **Public Announcements.** Megan Hall, BCDC Coastal Scientist, stated that in addition to the Environmental Justice and Social Equity Bay Plan Amendment which the attendees were to hear about today, another amendment process is underway: the Fill for Habitat Bay Plan Amendment. It will reassess the amount of bay fill allowed for habitat restoration projects in the bay, in an effort to make these projects more resilient to sea level rise.

For the benefit of the applicants, Chair Borchardt reviewed the Bay Plan Policy set forth by BCDC for the ECRB.

info@bcdc.ca.gov | www.bcdc.ca.gov
State of California | Gavin Newsom – Governor



ECRB MINUTES
April 24, 2019

Encinal Terminals Project (Pre-Application and Second Review). Rafael Montes, BCDC Senior Staff Engineer, stated that BCDC staff member Sam Stewart would present the issues, concerns, and desired information submitted by the ECRB. Sam Stewart, BCDC Permit Analyst, began.

Structural improvement for seismic safety is only proposed for the southern part of the wall. The majority of the proposed public access would be located on the walls. Is the design criteria approach adequate for the southern wharf area? Are engineering analyses and safety considerations for the project appropriate? Do the Board believe that the walls should be formed as intended?

According to the information submitted, the DSM would prevent the collapse of the walls in a large seismic event, although it may not ensure its future use. Therefore, do the Board agree that the DSM as proposed would effectively ensure the safety of the walls in a large seismic event?

Would the threat of sea level rise and future flooding become a safety concern of the expected life of the walls? Examples include groundwater impacts and effects and how groundwater rise from sea level rise would impact the DSM. Would the DSM still be effective as a structural buttress against a large earthquake if submerged in groundwater?

The Encinal Terminal peninsula has three waterfront sides to the estuary. Due to property-owned shipping, two of these sides were beside the DSM for the project. Does the Board have any concerns if actual seismic displacement were to occur on the east end (i.e., the Portman marina side) peninsula were no DSM beside it?

Staff believe that to ensure a longer-lived wharf, the Commission should require routine structural inspections over the life of the wharf. Can the Board advise on the best strategy for wharf maintenance and inspection?

Chair Borchardt asked if the list of points was summarized in the memo. Mr. Stewart confirmed.

Chair Borchardt requested to start with a summary of the project, as it is in the very early planning stage (5%).

Mike O'Hara gave a presentation on the developments of the past year, as follows.

- Mr. O'Hara reviewed the location, which has water on three sides. The site is predominantly land with a long wharf structure on the west side.
- The project is 32 acres, of which 23 are Upland; 17 are owned by Tim Lewis Communities; 6 are owned by the City of Alameda; and 9 are submerged.
- The Alameda City Planning Board approved the plan in July, and the City Council approved it in September and October. North Waterfront Cove, LLC has a lease for the next 11 years on the 6 acres owned by the City; they will be working with the City to define what happens in that area.
- Mr. O'Hara identified and explained the concept pieces of the project. He pointed out that the City had wanted the Bay Trail to be on the western edge of the wharf.
- An assumption in the conceptual illustration Mr. O'Hara was showing was that approximately 1 acre of the existing timber wharf would be removed; all of the waterfront

amenity area will then be useable. This area will require some structural retrofit, repair and replacement of piers, rebuilding, and possible demolition and removal of portions of the wharf. The final size and configuration may be modified.

- The bottom line is that they moved and created a 41-foot corridor inland of the wharf to provide permanent public access. It will be on land at all times. Mr. O’Hara gave the details. All the wharf-top improvements will be done in the “opportunity area.”
- The applicant does not believe that there is a feasible solution for a portion of the wharf because of the depth of the bay mud, etc. They will isolate that portion from the one that is retrofitted with seismic joints.
- Mr. O’Hara continued to explain the conceptual illustrations.
- In terms of phasing, he pointed out that wharftop improvements would get done in conjunction with the adjacent buildings.

Jeff Fippin of ENGEO gave the geotech presentation, as follows.

- ENGEO has done borings and CPTs on the site and has a grasp of the geotechnical constraints and strengths of the site.
- They have created numerous cross-sections perpendicular and parallel to the water’s edge, presented in the report entitled Slope Stability Analysis.
- Mr. Fippin showed two of the cross-sections. All of the land is reclaimed so there is fill across the whole development site. It is generally non-engineered: sand, clay, gravel, and some bay mud. Below that is young bay mud, stiffer inland than out in the water. Below that are other marine deposits, old bay clay, and alluvium.
- Mr. Fippin reviewed the criteria used to evaluate the site using a map illustration. Because of soft soils present, ENGEO did a site response analysis.
- There are building sites, but no buildings are sized or placed yet. ENGEO has supplied a geotechnical report for what is likely to be built there. They are going to mitigate the liquefaction of the non-engineered fill, probably through some manner of vibratory compaction. ENGEO has presented options for mitigating the compressible soil.
- The buildings will be designed in accordance with the building code and CGS SP117A (California Geological Survey Special Publication 117A/Guidelines for Evaluating Seismic Hazards in California.) ENGEO is trying to restrain deformations within the development area to 2-6 inches, consistent with SP117A.
- The wharf, in order to be consistent with other similar projects nearby, will use ASCE61 (Seismic Design of Piers and Wharves standards.) For public access, ENGEO is mixing in a higher level of seismicity in accordance with ASCE 41-13 (Seismic Evaluation and Retrofit of Existing Buildings standards.)

Board Member French asked what the applicable code will be for the final design. Mr. Fippin answered that the requirements of 41-13 are identical to 41-17.

- For the wharf, ENGEO will look at the lateral deformations of the soft soils – how they may push kinematically on the structure – and provide that to Moffatt & Nichol for their analysis.

- Bahareh Heidarzadeh of ENGEO provided the ground response analysis, as follows.

- ENGEO looked at seismic hazard for two levels: BSE-1 (Basic Level Earthquake-1) and BSE-2. They developed a PSHA (Probabilistic Seismic Hazard Analysis) BSE-2E (Basic Level Earthquake-Level 2 “E” for existing or “N” for new structures) based on a 975-year return period, compared that with PSHA BSE-2N taken as the ground shaking based on MCE_r or risk-targeted Maximum Considered Earthquake, and picked the minimum; BSE-2E was higher, so they used the MCE_r for that hazard level.

- They also performed PSHA analysis for a 225-year return period, compared it with the new BSE-1E from the new building code, and picked the minimum which was BSE-1.

Board Member French asked where the general response spectrum falls. Ms. Heidarzadeh answered that these were probabilistically governed for most cases.

- In order to select the appropriate ground motions, ENGEO performed de-aggregation for the hazard levels. In most cases the San Andreas and Hayward faults were controlling. More weight was given to the Hayward fault in the ground motion selection. Ms. Heidarzadeh showed a table with the 10 ground motions selected.

Board Member French noted that previously the ECRB had asked for a de-aggregation of the hazard. Ms. Heidarzadeh explained that the table showed the de-aggregation with a contribution of approximately 10% from the San Andreas, and the rest of the contribution coming from the Hayward.

- They ran the site response analysis for three different models to represent three different thicknesses of young bay mud. The code used was ASCE 710. The design will be permitted under 710. ENGEO compared the spectral acceleration – the average of the 10 – for three different models with 80% of the map code spectrum for both the BSE-2E and the MCE_r level, and basically picked the maximum of the two.

- Ms. Heidarzadeh showed the results at the surface for three different models. In most cases, because of the presence of the soft soil they got amplification in the longer period and some damping at the lower period, but they are capped by 80% of the code. She indicated the BSE-2 level spectrum and the final recommended BSE-1 spectrum for the three models.

Board Member French asked about the soil response. Ms. Heidarzadeh answered that you can see the contribution from all the layers, but there is a lot of damping from the soft material; there is also some amplification due to the same soft material at the longer periods. The input motions are site class D because the bedrock is very deep.

Board Member French noted that there will be a contribution in the soil response if you look at it from the point of view of input motions at the base of the rock. Ms. Heidarzadeh agreed – you are not ignoring that, but you are basically bringing some uncertainties and some conservatism in your analysis because the ground motion models are based on a global database.

Board Member French asked if there had been a lot of response coming up through fairly thick old bay clay. Mr. Fippin answered that they had input the ground motion based on geologic maps below the depth of the old bay clay within the underlying older San Antonio formations. They took the time histories and spectrally matched them to site class D to try to capture that amplification that happens with the soil above the bedrock.

Chair Borchardt stated that the thicker sections will contribute to the longer periods, and that is of interest with respect to this project: because of the extent of the wharf, some of these longer periods are going to come into play. Ms. Heidarzadeh agreed and said that they had included all the thickness of old bay clay in their model to give assurance that they were capturing the longer period amplification.

Board Member French asked about site class F – is that post-mitigation? Ms. Heidarzadeh answered they had run the site response because it is site class F, but they check their responses spectrum at the surface with site class E. For the fill, they are considering improving it for the future.

Board Member Gilpin asked if going from Section 4 to 3 to 2 shows the likely feasible and infeasible design criteria. Mr. Fippin indicated the geotechnical cross-sections on the map with background colors based on zones that show the potential use of the wharf.

Board Member Gilpin commented that the likely feasible area is rather poorly defined but is critical in the final designs. That, as well as looking at the distribution of subsurface information in some of the cross-sections, made him wonder if there is enough information to go to final design. In particular, the shoreline outline is kind of squiggly, not corresponding with some of the sections. He asked if ENGEO could shore up some of the details. Mr. Fippin pointed out a line of borings and CPTs running north/south essentially behind the end of the wharf. They are confident that they can see where the young bay mud drops off. He agreed that it does not align with the historic shoreline, but they are comfortable that they have enough information to know where cross-section 3 stops, which is where they will put the seismic joint.

Board Member Gilpin asked if they have thought about doing a contour map. Mr. Fippin replied that they have one they are using internally; they would be happy to provide it. Board Member French felt it would be valuable to have it published.

Board Member French asked if they have done a time-history structural analysis. Sam Tooley of Moffat & Nichol replied that they have not at this point; they have done a non-linear static analysis. Board Member French was interested in compatibility between responses of different ends of the wharf, for instance.

Board Member French asked the response during Loma Prieta; was there liquefaction? Mr. Fippin answered that it was a privately-owned facility, and there were no records. He felt that there were not a lot of places on Alameda that are similar to this site. Regarding damage to the wharf, Mr. Porter stated that there were no broken batter piles or shear up at the caps, only minor hairline cracks.

- Mr. Fippin continued. For the first step of the analysis looking at how the land underneath the buildings was going to perform, they did a typical slope stability screening analysis. They used NCHRP 611 and did a pseudostatic analysis to look at where there might be issues with slope stability. They came up with a pseudostatic coefficient consistent with the level of seismicity for the building design, and looked at areas where they are not going to get a factor of safety greater than 1. The only place that passes that check is on the eastern side of the site; there the deformations meet their criteria. Along the western and northern ends the deformations are too big.

- The water area on the western side of the site, Alaska Basin, has an old wall so a lot of it is dredged out as you move back to the south. Along the southern end there is about 300 feet of a steel bulkhead wall that is tied back. In that area, corrosion is happening in the splash zone but there is still an acceptable amount of structural steel for the static loads on the structure.

- They did a pseudostatic analysis on the wall at the MCE level because there is liquefiable soil behind the wall. They figured out the force to stabilize it and found that a retrofit must be done.

- The solution along both the northern shoreline and the western shoreline behind the bulkhead is to do deep soil mixing. The concept is to do enough to reduce the displacements into the development area such that they meet the criteria of 2-6 inches of lateral deformation and do deformation behind the bulkhead sheet pile wall so that they are reducing loads on that wall from seismic. The added benefit is to make the failure surfaces below the wharf shorter.

- They intend to dig a trench behind the wall (which is bowed out) that goes below where the corrosion is happening, pull all the sheet piles to line them up, and fill the trench with concrete. If corrosion keeps happening at that splash zone, soil won't fall out. Moffat & Nichol will evaluate the structure.

Board Member French asked about the toe. Mr. Fippin replied that it goes into dense merit sand. The depth of the mixing is about 30 feet from existing grade.

- They used a limit equilibrium method to validate the DSM: establishing that the block of improved soil is wide enough and deep enough, and that they have an appropriate replacement ratio based on composite shear strength. They did a series of failure surfaces that go under the DSM and through the DSM. They checked and idealized the dimensions based on a limit equilibrium method. Mr. Fippin showed a map of the areas of DSM with different widths (distance from the water back) and depths below the water surface.

- ENGEO views the DSM as a design-build approach. Until they retain a contractor, they can't do a final design; they have received solicitations from six different contractors.

Board Member French asked the strength they are looking for in the DSM. Mr. Fippin thought it was 200 psi x 30% replacement ratio.

Chair Borchardt asked about maintenance of the sheet piles to achieve minimal confinement of the corrosive environment. Mr. Fippin explained that they would rely on the sheet piles if they have the longevity once these improvements are made, but if ENGEO determines that the sheet piles cannot withstand the corrosive environment for the duration of the design lifespan, then they will have to come up with a system for providing some manner of confinement at the front.

Chair Borchardt asked if the vibratory settlement work will be done before they put in the DSM. Mr. Fippin answered that the current order of work is to do the DSM first, then the impact. With the DSM, a lot of the existing fill is going to become treated soil. They are not planning to do deep soil mixing at the location where they do the mixing, but in between and behind the columns. They will make sure to control that.

Board Member French gave his view of the process of densifying and liquefying while being surrounded by stable soil, so that it goes downward rather than lateral.

David Teague of ENGEO presented the PLAXIS two-dimensional modeling, as follows.

- In addition to the site response analysis, ENGEO also did dynamic numerical analysis of the same three sections. They modeled the effects of the piles and the DSM, with the same 10 time histories used for the site response analyses in deep soil. They applied those time histories in both the positive and negative directions in order to understand any directional effects.

- They calibrated the PLAXIS model to the deep soil model, basically calibrating the parameters in their deep soil model such that they were able to get similar response spectra in the free field away from the piles and the slope. They came up with a very good match.

- Brad Porter of Moffat & Nichol did the field investigations and the condition assessment of the wharf. He described the structure:

- The original structure (C1) was built in 1927 along with the timber portion on the northwest side. In 1962 the C-2 concrete structure (C2) was built. The timber part is fairly well shot and will be demolished. They have no drawings for the C2 construction, but it has the typical wharf construction of batter piles on each bent, a two-foot thick concrete deck, and a large king pile in the middle to take the lateral forces.

- On the shore side the wharf has a small retaining wall that holds the soil back and a small sea wall. The retaining wall is in relatively good condition given its age.

- They cut into one of the vertical piles to get the strand size and the spacing to discern the capacities.

Mr. Tooley stated that they have updated their criteria to consider the ASCE 41-13 criteria for existing Risk Category II buildings.

- They are going to look at two different earthquake levels: the recommended BSE-2N and the MCE, and two thirds of the design earthquake; and they are going to be targeting achievement of life safety and collapse prevention acceptance criteria.

- The methods they are using to evaluate the feasibility of the structure are the nonlinear pushover analysis including the nonlinear soil parameters provided from ENGE0's PLAXIS analysis, and use of the substitute structure demand to calculate the demand displacement.

- They have been using the limiting strains in the nonlinear concrete elements or the retrofit steel elements. They have been considering the timber capacity as linear.

- Regarding the model, they have been accounting for the plumb piles and for the C1 structure and the C2 structure independently. Preliminary analysis shows that the C2 structure is compliant. For the C1 structure, while they are evaluating the retrofit feasibility, they have been using the ASCE 61 life safety values. To achieve the collapse prevention of MCE, they are looking at life safety at the MCE. They have been evaluating the timber with the current NDS linear methods.

- Regarding seismic shaking demands, they have finished their preliminary study and then looked a little further. They have the spectral shaking demand and the kinematic soil movement under the wharf.

- Under the MCE_r demand, the displacement capacity of the C1 structure is around 3-4 inches. Under the kinematic motion when fully applied, the deck displacement is around 20 inches. However, none of the timber pile sections are overstressed.

- For combining the kinematic and inertial demands, they have been working through evaluating the appropriate combination. They have considered that the velocities of the different demands are probably quite different, so they have been looking at filtering them using some sort of viscous damping device. Mr. Tooley described new stiff elements to provide support for the C1 structure.

Board Member French asked if the dampers are qualified for this kind of exposure. Mr. Tooley confirmed: they are qualified for the marine environment.

Angelo Obertello of Carlson, Barbee & Gibson described the strategy for sea level rise, as follows.

- He showed current existing conditions with potential inundation areas with sea level rise.

- The proposed strategy is to elevate ground elevations to a minimum of 13.5. The existing wharf has top elevation of approximately 13. There will be a topping slab and a number of other enhancements.

- Regarding adaptive measures, they have updated the plan to incorporate the 41 feet. This has been their opportunity to introduce reserve space for adaptive measures as well. These include potential flood walls and elevated berms.

- The eastern shoreline has reserved space between the project and the property line to allow adaptive measures.

Chair Borcherdt asked the status of the design stage. Mr. O'Hara gave a 5-10% design level, given that they haven't determined exactly where the retrofit will occur. The design schedule will be fairly accelerated over the next three months to get to a level of 30-50%.

Chair Borcherdt asked if they have an agreement with the city that this project is going to take on responsibility for placing the DSM around the entire project; have they committed to the city to provide seismic resistance for more of the island than just their property? Mr. O'Hara responded that they have an approved master plan with the city that includes all of their methods for the project. They have not gone through a plan check yet for the DSM; they will be doing that very early this year.

Chair Borcherdt noted that the DSM will be located along the landward side of the wharf. Mr. O'Hara confirmed that there is DSM that will be placed within city-owned parcels; as part of the company's lease, they are allowed to do that.

Chair Borcherdt commented that liquefaction could still take place beneath the wharf, and the DSM would minimize any lateral movement associated with liquefaction on the landward side. Mr. Fippin confirmed that the purpose of DSM is to reduce lateral displacement within the building areas to acceptable levels for structures that are going to be inhabited. Mr. Eliahu stated that it is important to remember that the soil that is liquefiable is the fill. The DSM is going out to the edge of the fill. They would not expect any liquefaction on the water side of the DSM. They have lateral displacement issues outboard of the edge, but it is not a liquefaction mechanism.

Board Member Gilpin said that given that a certain amount of the northern end of the wharf cannot be retrofitted, if there is an earthquake, and since we are responsible for bay fill, what happens to it? Mr. O'Hara responded that a seismic joint will be placed between that portion and the improved wharf. The determination of what happens to that wharf happens in the future. All of the wharf will be in private ownership (with public access). We will be forming a geologic hazard abatement district (GHAD), an HOA, and a community facilities district. The first two will be set up to make that decision in the future.

Board Member Gilpin asked if BCDC has entertained a GHAD district before. Mr. Montes stated that it was done with Treasure Island.

Board Member Comerio asked if there is an estimation for how much useable public space along the area's edges will be left following an earthquake. Mr. O'Hara answered that there will always be the 41 foot area landward of the wharf. In addition, wherever the line of feasibility may be, the concept would be that everything south of it would be left; it would be retrofitted and therefore useable. The city had told them not to plan for something that hasn't happened yet. The city wants to use the whole area for as long as they can; they want the wharftop improvements.

Board Member Battalio asked about the sea level rise adaptation measures at the edge of the 41 feet. If the public access to the old wharf is upgraded and sustained, and ends up underwater, would you then implement adaptation strategies around this perimeter so that it is more useable? Mr. O'Hara responded that they have only focused on the landward side, because of the feasibility of putting in a sea wall. Out on the edge, the issue arises of what happens underneath if you hold the water back.

Board Member Battalio commented that from BCDC's perspective of public access, it sounds like there could be a significant change in the amount available. Mr. O'Hara responded that looking at the end of the century, the projections show that at year 2100 the mean high water is at 12.1 feet. Board Member Battalio made the point that inundation at mean high water may not actually be acceptable access to the public. The BCDC staff needs to look at that. The adaptation measures are only for the 41 foot strip, which is much smaller than the public access on the whole wharf.

Board Member Battalio asked why they used a low emission scenario for the year 2100 sea level rise projection of 5.7 feet whereas the high emission scenario is 6.9 feet. Mr. Obertello replied that they had used the medium to high risk scenario of 6.9 feet. He added that there is a 1% chance that the wharf would be inundated at the end of the century.

Board Member Battalio noted that the adaptation sketches have a wall whose top is at 5.7 feet but no freeboard. Mr. Obertello responded that there would be freeboard.

Board Member Battalio asked if there were any possibility of backsides flooding. Mr. Obertello answered that there is the potential – the inundation figures show lower elevations to the south and east. The City of Alameda is currently evaluating the Arbor Street Pump Station for improvement to handle sea level rise. Those inundation figures would improve once the city goes forward with that project. In addition the city is working through a Climate Action Plan in which they will identify their strategies to deal with regional sea level rise.

Board Member Battalio asked about the danger of people slipping on the steps on the northern shore. Mr. O'Hara stated that the city wants to have access where people can actually touch the water; that detail needs to be worked out with them.

Board Member French asked about surcharge and time rates, and drainage water from the surcharge. Mr. Fippin answered that surcharge is an option for the development. Other options include deep foundations for the buildings. Using surcharge would involve wick drains (the bay mud is as thick as 60 feet at the northern end). They would use strip drains to collect the water, bring it over to the side, and handle it as appropriate.

Board Member French asked about the joint between C1 and C2: does it tie them together or let them move separately? Mr. Tooley replied that it lets them move separately to accommodate the kinematic displacement.

Board Member French asked about the wedge in front of the wall that would potentially still be moving. What about the wedge of thinning out fill that would still be liquefiable in front of the wall; does the PLAXIS study allow for pressure generation and liquefaction? Mr. Fippin

replied that they had assumed that it was already liquefied in the model. For next time, Board Member French asked them to consider what could happen when some of the fill is not liquefied and is sitting on top of the liquefied material. Mr. Eliahu explained a change in location of the wedge on the schematic.

Brad McCrea, BCDC Regulatory Director, stated that usually the ECRB gives a stamp of approval when a project design is around 25-30%. With this project design at 5%, it seems reasonable for the applicant to return to the ECRB. Board Member Battalio felt that the sea level rise piece should be looked at again.

He stated that a main question the ECRB had with staff concerned one section being retrofitted and the other not; the DSM is meant to protect both structures from collapsing, but one of the structures will not be viable after a large earthquake.

Board Member Holmes had a question about the non-retrofitted portion: is it dangerous after an earthquake? Mr. Montes stated that they would have to remove it after a large earthquake. Board Member Holmes said that typically, we want public access to be life-safe. If that portion is non-retrofitted, theoretically it doesn't have adequate performance, although it has public access.

Mr. McCrea stated that the Commission would take up the decision on the amount of public access available and whether it would be viable for the length of the project. On the question of whether existing public access is safe, the ECRB's purview is the safety of fills. Mr. McCrea suggested moving the discussion toward the safety of the retrofitted and filled structures.

Board Member French asked what it would physically look like if it fails in an earthquake; why is it no longer useable? Mr. O'Hara replied that they don't know – that is part of the issue. The structure survived Loma Prieta and other seismic events during the last 90 years. The building official would have to make the determination of whether it is habitable. Board Member French felt that the companies involved in the development need to decide that it maintains life safety and non-collapse during a big earthquake.

Chair Borchardt stated that this situation is very unusual to the ECRB in that we are discussing an unpredictable response. He wondered about another solution: if you are putting DSM all the way around the structure, is it not possible to ensure safety of the public access associated with the DSM? Mr. O'Hara responded that the 41 feet of permanent public access is safe. Chair Borchardt stated that the other zone needs to be identified as somewhat unstable.

Board Member French stated that even if you are not building anything new north and west on the wharf, you are still opening gates and letting people walk out there, whereas before there was no access and no statement. Board Member Comerio commented that it is a policy but also a question; the BCDC makes a determination about the policy, but her question is whether people are going to be hurt standing on the wharf during an earthquake.

Board Member French felt the need for a description of what happens in a design-level earthquake. Board Member Holmes commented that this is why we have standards. Are we allowing access on something that is normally not acceptable?

Board Member Gilpin emphasized that there are no borings on the most vulnerable northwest corner of the wharf. Mr. Fippin responded that the CPT explains the top and the bottom of the young bay mud. The most important factors are the thickness of the young bay

mud and knowing where the bottom is. Board Member Gilpin requested to see a contour map. Board Member French agreed that it would be good to make sure that the stratigraphy makes sense geomorphologically.

Mr. Fippin stated that they calibrate a CPT to a boring when they do this kind of study. CPTs are actually much more precise in identifying changes in stratigraphy.

Chair Borcherdt spoke regarding the big picture from the point of view of the ECRB: their role is to comment on the engineering criteria. This does not include the areas of the wharf that are not being retrofitted. The ECRB can only determine if they have not met certain standards.

Mr. McCrea agreed. He suggested asking the applicants to analyze the unretrofitted portion for a higher probability earthquake. The ECRB's purview is for new fills in the bay, but here there is an old fill – however, the BCDC is going to be curious about whether it is safe or not.

Chair Borcherdt suggested separating the retrofitted part that's being engineered from the part that is not being retrofitted.

Mr. Montes expressed the hope that the Motion will include issues that staff have such as groundwater rise from sea level rise and the peninsula.

Board Member Holmes asked about the retrofit feasibility criteria: "retrofittable," "may be retrofittable," and "not retrofittable." Mr. O'Hara explained that it is a cost/benefit analysis. Chair Borcherdt asked about any other potential resources for getting the questionable areas made safer, such as the City of Alameda.

Board Member Holmes commented that when increasing the use of a structure, most cities would say you have to make it meet the standards.

Mr. Tooley used the example of Pier 27, the cruise ship terminal. As part of that project, it was determined that replacing the entire pier was infeasible; but as an existing waterfront amenity there was net public benefit by providing public access. Mr. Montes pointed out that BCDC did not have bay jurisdiction on those old piers. Pier 27 was a grandfathered structure that could not be brought to the ECRB.

Mr. McCrea recommended for the ECRB to take a look at the retrofitted fill and notify BCDC on whether it is going to be safe. With regard to the other piece, the ECRB has the option to commenting on it or suggesting what may seem reasonable. It is an odd situation because part of it is being retrofitted and part of it is not. For instance, along the San Francisco waterfront maybe none of it is; however, the Port deems it is safe enough to invite people onto it. But this one we are doing half of it but not the other half and talking about whether it is safe.

In the BCDC public access policy, public access has to be safe. We will be having this conversation with the applicant in the context of taking it to the Commission of whether all of the public access is safe. But to the extent that this body can advise us on both, it would be great; and if you only feel you can advise us on part of it but not the other then please do.

Board Member French stated he was geotechnically satisfied with the criteria that the applicant used and presented so far. It has also responded to previous ECRB questions. He suggested having the applicant give a presentation addressing the life safety issues for the non-retrofitted portions, and to address Committee Member Gilpin's question with a geomorphologically defensible explanation with additional contour maps.

Chair Borchardt suggested two separate Motions for today.

In regards to the first Motion, Chair Borchardt wondered whether the ECRB needed to identify the various parts of the project that were included.

Mr. French suggested everything within the perimeter that the applicant defined as retrofittable and to be retrofitted, although recognizing that is a moving line. Wherever that line moves to, we are okay with that.

Chair Borchardt wanted to make clear it does include the DSM along the western side and on the northern side.

He added that ECRB has a responsibility to say something about instrumentation. This seems like with the sheet piles and the excavating that is going to go on behind them this would be an ideal opportunity to put in some instrumentation in a cost-effective way that the applicant could use then to monitor the situation as time moved forward. He requested the applicant come back with an instrumentation plan that would consider a couple of key areas around the DSM because it is a crucial part of this project and it is important to see how it responds over time. Mr. Fippin inquired whether something similar to the Alameda Landing project be suitable with respect to the DSM and the sheetpiles. The chair agreed with that suggestion.

Chair Borchardt stated he would entertain a motion in terms of the engineering portion as to whether the ECRB considers the criteria adequate with a couple of provisos: Requesting a contour map with thicknesses and elevations, make sure that site responses down to 500 feet are taken into account plus the other geotechnical logs with respect to the northwest corner previously articulated.

Mr. Battalio added that the public access criteria for the wharf need to be clarified for the staff and Commission because the performance of the wharf, the amount of acceptable inundation of the wharf is not clear. It sounds like the wharf will be inundated in the future and whether what remains is adequate public access is unclear. What level and frequency of inundation is acceptable for public access?

Chair Borchardt noted that if the Motion passes, it would not be necessary for the applicant to come back before the ECRB with respect to that portion.

MOTION: Mr. French moved approval of the criteria, with provisions to provide a geotechnical contour map with thicknesses and elevations, to ensure that site responses down to 500 feet are taken into account, and to clarify for staff the public access criteria for the wharf; seconded by Mr. Moehle. The motion carried with a vote of 7-0-0 with Chair Borchardt, Mr. Battalio, Ms. Comerio, Mr. French, Mr. Gilpin, Mr. Holmes, and Mr. Moehle voting “YES”, no “NO” votes, and no abstentions.

The Board deliberated what the second Motion should be as it related to the unretrofitted part of the wharf; therefore, Chair Borchardt asked the members for any comments. Mr. Holmes opined that “no comment” indicated approval/acceptance; therefore, the board ought to comment. Mr. Battalio asked if the ECRB could indicate concern that there may be a life safety risk. Mr. French suggested that the applicant needed to indicate what the concerns were and what the performances of this section would be. Mr. Battalio stated he was concerned whether the project would collapse or not under the new design. Professor Moehle indicated that for started it did not meet the criteria for life-safety. Mr. Battalio asked whether the project met the life safety criteria for that section of the wharf.

Professor Moehle suggested the chair that the board should state that acceptance of the retrofitted portion should be contingent on acceptance for the unretrofitted portion.

Mr. O’Hara stated if the applicant had not come forward with any retrofit the ECRB would not have reviewed the project. He felt there is a question as to what the ECRB’s obligation is in regard to that and that is why the applicant’s focus on the criteria was the geotechnical and the criteria for the retrofit itself.

Mr. Holmes stated if there had been no retrofit the ECRB still would have asked what the performance would be of this whole area that has public access.

Mr. O’Hara requested the applicant be able to work with staff on performance for the whole unretrofitted portion.

Mr. Battalio asked what public access exists currently.

Mr. O’Hara stated there is none, it is gated off.

Board Member Comerio stated that as a member of this Board, she was uncomfortable suggesting that public access be allowed on the wharf as it exists – that the engineering criteria be that this could fail and have life safety hazards. She did not want to stand behind the accepted criteria of one part of the project; therefore, the staff or the Commission has determined the issue was not in the board’s purview or they have to determine what policies apply. She reiterated her discomfort on the approach being proposed by the project sponsor as it stood due to the confusion of purview.

Mr. Montes suggested the idea of removal the entire northern portion. Mr. McCrea agreed with the idea.

Chair Borchardt stated that because of the public access issue, the first Motion needs to be contingent on the fact that the issue needs to be satisfactorily resolved.

Mr. McCrea proposed getting the analysis as Mr. Montes suggested. He also agreed with Mr. O’Hara’s proposal to bring the analysis to staff and staff could decide how to proceed.

Mr. French asked if a motion was still needed based on the applicant's offer.

Mr. McCrea stated the motion could be for the ECRB to concur with the applicant's offer.

Chair Borchardt stated that because of the public access issue the first Motion needs to be contingent on the fact that the issue needs to be satisfactorily resolved.

The ECRB members discussed the wording of the motion.

Mr. O'Hara stated if there is a retrofitted portion and it stops at some point, the ECRB has reviewed the criteria for the retrofitted area. If the ECRB is approving access to that point within the retrofitted area, that it be contingent upon resolution to another point. He hoped the first motion would say the wharf has been retrofitted in a safe way and therefore it is a safe build.

Chair Borchardt stated the unretrofitted portion is locked now. But once the gate gets opened for access to the retrofitted part of the project you are also allowing access to the unsafe portions. Unless the portion is fenced off the ECRB feels they need to be careful of approval of the other criteria and not saying something about access to those other parts.

Mr. O'Hara stated they are proposing the entirety of the wharf be opened, asking whether the Commission makes the ultimate determination based on the input from the Design Review Board, the ECRB and from staff.

Mr. McCrea again proposed getting the analysis as Mr. O'Hara suggested and letting the staff determine whether to bring it back to the Board. He suggested staff continue to work with the applicant to determine if the criteria they were using is safe.

Chair Borchardt asked if staff felt what the ECRB had provided was satisfactory and okay, as long as what they approved does not get misinterpreted.

Mr. French stated with or without a motion the dialogue was captured in the minutes and their concerns were clear.

Board Member Moehle felt that the ECRB was being directed in a way that made him feel dissatisfied with the original Motion. Professor Comerio reiterated again that she now did not feel comfortable with the previous motion unless it was contingent on the whole aspect of the public access wharf.

The Board discussed how to proceed. Board Members Moehle and Comerio expressed concern about unanswered questions.

MOTION: Mr. Moehle moved that the applicant further evaluate the portions that have been deemed infeasible to retrofit, to work with staff to develop some opinions, to work with the Design Review Board to consider some policy aspects of this, and to bring the matter back before the ECRB with respect to life safety criteria; seconded by Ms. Comerio. The Motion carried with a vote of 7-0-0 with Chair Borchardt, Mr. Battalio, Ms. Comerio, Mr. French, Mr. Gilpin, Mr. Holmes, and Mr. Moehle voting "YES", no "NO" votes, and no abstentions.

Briefing on Environmental Justice and Social Equity Bay Plan Amendment. Clesi Bennett, BCDC Planner, spoke about the process to date, its timeline, and the findings.

Three main processes led BCDC to decide to amend the Bay Plan regarding environmental justice:

a. The Rising Sea Level Working Group, an informal Commissioner working group convened in 2013. They saw the need to make the entire Bay Area more resilient in a just and fair manner.

b. The Policies for a Rising Bay project, developed to evaluate BCDC policies around sea level rise.

c. A series of public workshops initiated by BCDC in 2016-17 to increase its efforts to adjust to rising sea levels.

(1) BCDC decided to undertake several policy updates, including the Social Equity and Environmental Justice Bay Plan amendment.

(2) A Commissioner working group on environmental justice guided BCDC. A workshop with the public was held on January 17 with more workshops or focus groups to come. They will then draft policy changes.

(3) They intend to release the staff planning report in mid-May. After the first public hearing on July 18 during the Commission meeting, the 60-day comment period will begin. A vote could take place in September.

(4) Ms. Bennett described the scoping and organizing phase which involved meeting and presenting to various groups and agencies throughout the state and region.

(5) She described the background research.

(6) At the Commissioner Workshop on Environmental Justice, the bulk of the time was spent in small group discussions where people were brainstormed solutions.

(7) When BCDC was originally created in 1965, excess fill was threatening the bay and policies were written to safeguard against that problem. Climate change and sea level rise have been game changers, however, and we are now revising our policies to address this threat.

(8) Ms. Bennett gave the formal project goal: “Amend the San Francisco Bay Plan to incorporate principles of environmental justice and social equity into the planning, design, and permitting of shoreline projects in and along the San Francisco Bay.”

(9) In 2017 the Commission first voted to initiate this Bay Plan Amendment and identified three sections and a possible fourth:

- Public Access
- Shoreline Protection
- Mitigation
- A potential new section on environmental justice and social equity

(10) Ms. Bennett gave details for those sections. All intersect with environmental justice.

(11) She described further issues to be explored.

Ms. Bennett asked if the Board Members saw any connection between issues of environmental justice or social equity, and their role as the ECRB or as engineers.

Chair Borchardt asked what staff envisions the ECRB's role to be. Ms. Bennett replied that many development projects are designed and construction projects begun without communities knowing about them or having the chance to give input. One role would be finding how to make projects more inclusive of the public. Chair Borchardt stated that the ECRB's role is primarily to review the engineering criteria and provide comments to the Commission.

Board Member Gilpin recalled a project in which oil refineries were putting in a new pipeline or cleaning station, and there was never any environmental discussion.

Board Member Moehle commented that rising sea levels are causing harmful materials in our soils to get into the water.

Board Member Battalio posed the flood plain management question of whether raising and filling one area increases the flood potential in another area. People and agencies with money and a mission may not recognize the effects on poorer people. We also do not talk about poorer communities in flood-prone areas; with sea level rise this is going to worsen. The question is how to handle this situation.

Board Member Comerio felt that we cannot overstress the issue of the policies on public access. That is a huge portion of what BCDC is about. In a number of projects the ECRB has looked at, there has been a certain amount of shoulder-shrugging on the part of developers that in the event of an earthquake public access won't work anymore. Engineering criteria are a huge way to help engage the public in understanding risk. She mentioned the case of a small railroad bridge in the East Bay that had been designed only to a minimum standard; the economic and social impacts of the bridge being out of use were huge but were not being considered. Strengthening these issues within BCDC policy would give the ECRB more teeth.

Board Member Gilpin noted that most of the properties we deal with are high-rent districts – valuable, of limited access, expensive to develop. He looked to the BCDC to let the ECRB know of unintended consequences of some of these projects for which we are rendering engineering responses.

Board Member French commented that the human values, environmental values, and policies for which the ECRB offers technical support are mostly decided by others beforehand.

Board Member Battalio noted that from a flooding perspective, there are a lot of risks that are not incorporated with fill of the bay. It is more of a flood plain management question. There is much that the ECRB is not looking at.

Board Member French raised the question of the Board being compensated.

Board Member French noted that there is a lot of habitat frustration in the salt flats that we have not heard anything about from the Commission.

Board Member Battalio considered the public access issue – which the ECRB gets to look at on the waterfront – to be a social justice issue in general.

Board Member French noted that sea level rise is going to start impacting many areas, for example Highway 80 through Berkeley.

4. **Presentation on Roles and Duties of the Engineering Criteria Review Board.** Mr. McCrea distributed the handouts to the Board members for them to look at in preparation for the next meeting.

Board Member Moehle saw a conflict between BCDC's interest in social justice and the ECRB's instructions to look at only the structure being retrofitted at any given time.

Mr. Montes viewed engineering criteria as safety criteria: you are basically advocating for the public by making the structures safe. For the refinery project involving the mile-long pipeline, the ECRB's involvement and review resulted in the project taking a long time to determine the permitting.

Board Member Gilpin emphasized that for the ECRB, it is important to see a broad spectrum of data.

5. **Adjournment.** The meeting was adjourned at 4:44 p.m.