DATE: May 03, 2018 **STAFF REPORT** AGENDA ITEM NO. 8.1

TO:	FOSTER CITY PLANNING COMMISSION
PREPARED BY:	MARLENE SUBHASHINI, PLANNING MANAGER
PROJECT:	FOSTER CITY LEVEE PROTECTION PLANNING AND IMPROVEMENTS PROJECT – CIP 301-657
OWNER:	CITY OF FOSTER CITY
PROJECT LOCATION:	CITYWIDE

REQUESTED ACTION/PURPOSE

The purpose of this meeting is for the Planning Commission to review and discuss design options for the levee wall treatments and landscaping for the Foster City Levee Protection Planning and Improvements Project (CIP 301-657). Comments from the Planning Commission would be forwarded to the City Council for consideration at a future meeting date.

RECOMMENDATION

Apart from providing flood protection, the levee is an important amenity to the Community. The levee is part of the Regional Bay Trail that provides both recreational opportunities and bike/pedestrian travel routes. Given the options discussed below, Staff recommends the following wall treatments:

- Painted Sheet Pile Wall with Concrete Cap on the Bay/Slough side of the wall. Note that the Sheet Pile wall will be painted on the Bay Side of the Bay Trail only.
- Sheet Pile Wall with Concrete Cap covered with either Precast Concrete Panel Fascia or Cast-in-Place Concrete Fascia. The Concrete Fascia can be smooth, colored, textured or stamped.

The above options are not only aesthetically pleasing but are within the estimated budget costs for the project. If project bids turn out to be high, then the Precast or Cast-In-Place Concrete Panel Fascia would be applied at certain desirable locations (e.g. access points) and a painted Steel Sheet Pile Wall with a Concrete Cap would be used in other locations.

BACKGROUND

The purpose of this meeting is to review and discuss design options for the levee wall treatments and landscaping as part of the Levee Protection Planning and Improvements Project (CIP 301-657). The project site is generally located within the footprint of the approximately 34,300 lineal feet (6.5 miles) of existing levee system. The levee alignment has a slight deviation from the existing levee system footprint.

The purpose of the proposed levee project is to improve the City's existing levee system to provide flood protection in accordance with updated Federal Emergency Management Agency

(FEMA) guidelines, retain FEMA accreditation for the levee, and protect against future sea level rise. The Planning Commission had previously reviewed the project for environmental impacts in accordance with the California Environmental Quality Act (CEQA) requirements.

The environmental analysis studied two project scenarios at an equal level, which would have different ranges of levee elevations/floodwall heights as needed to meet FEMA freeboard requirements and protect against future Sea Level Rise (SLR). Based on the estimated future SLR projections, the current recommended SLR planning scenarios for Foster City in the year 2050 and 2100 are 1.9 feet (23 inches) and 4.4 feet (53 inches), respectively. Including this additional height beyond the FEMA freeboard requirement in both scenarios provides a means for the City to adapt to future SLR due to climate change and would prolong the life of the project. The two scenarios are:

1. FEMA Freeboard with Sea Level Rise for the Year 2050 (1.9 feet or 23 inches of SLR)
2. FEMA Freeboard with Sea Level Rise for the Year 2100 (4.4 feet or 53 inches of SLR)

The consultant, Schaaf & Wheeler, was tasked with performing the preliminary engineering design work for the project, which included analyzing various levee design elevation strategies within the scope of the two project scenarios studied by the EIR that both meet the guidelines of regulatory permitting agencies and retain the levee certification from FEMA.

At the regular meeting on October 17, 2016, the City Council adopted Minute Order No. 1476, accepting the Basis of Design Overview report. The Basis of Design Overview Report outlined designated sub-reaches along the levee and elevation deficiencies, preliminary geotechnical conditions and design constraints, design alternative analyses and improvement types, preliminary structural design considerations, sea level rise adaptation measures, and preliminary cost estimates for basic flood protection and Bay Trail restoration.

Based on preliminary evaluations and City Council direction, the project would utilize a combination of three different levee improvement types (Sheet Pile Floodwall, Earthen Levee, and Conventional Floodwall), depending on the location along the existing levee and the adjacent site constraints. This hybrid approach of combining the three improvement types would provide the most flexibility to meet current FEMA standards, retain FEMA accreditation, and achieve the project objectives.

On May 8, 2017, the City Council took the following actions based on the Planning Commission's Recommendation:

1. Certified the Final Environmental Impact Report (EIR);
2. Adopted the California Environmental Quality Act (CEQA) Findings, Statement of Overriding Considerations, and Mitigation Monitoring and Reporting Program (MMRP) for the Project; and
3. Approved the 2050 SLR project scenario; directing staff to further develop and analyze the Option 4 2050 SLR and Future Adaptation Strategy design variation; and directing staff to proceed with the 30-year General Obligation Bond financing alternative.

The 2050 SLR and Future Adaptation would build the levee to the 2050 SLR scenario now and use offshore solutions in the future where applicable to dissipate wave energy in front of the wall. The estimated cost for the project is $90 million. In the future, adaptation to 2100 SLR is estimated at an additional cost of $100 million.

On March 5, 2018 the City Council approved to place a $90 million bond measure to locally fund levee improvements on the June 5, 2018 ballot. In order to pass, the bond measure needs to be approved by 66.7% of voters.

PUBLIC NOTICING

The public was advised of the May 3, 2018 Public Hearing in the following ways:

- ¼ page ad in the *Foster City Islander* – April 18, 2018
- Electronic mailing to the project applicants, owners, and persons who expressed interest in receiving project updates – April 12, 2018
- Information page on Foster City Website: www.fostercity.org – April 12, 2018
- Electronic Marquee Sign in Leo Ryan Park – April 20, 2018 – May 3, 2018
- Foster City TV Channel 27 – April 16, 2018 – May 3, 2018
- Public Posting Places – April 16, 2018
- Social Media – Nextdoor – April 20, 2018

ANALYSIS

A. Levee Improvement Types

As noted previously, the project would utilize a combination of three different levee improvement types, depending on the location along the existing levee and the adjacent site constraints. See attached Project Narrative and Plans prepared by the consultants. The three levee improvement types identified are:

1. Sheet Pile Floodwall

   The Sheet Pile Floodwall improvement type uses Sheet Pile Floodwall sections as a permanent flood protection structure. This improvement type is planned where there is insufficient right-of-way width or where encroachment may occur into wetland areas with an alternative design (earthen levee or conventional floodwall) improvement type. The sheet pile floodwall design would be composed of a vertical wall (likely made of steel or possibly vinyl sheet pile in certain applicable locations) that varies in height from 1 – 8 feet above the grade of the existing earthen levee and is generally 12 inches wide. The earthen levee would then be raised with additional fill in locations where the finished floodwall elevation is no higher than 3.5 feet above the trail, except for the access ramp at Swordfish Street where the trail slopes down to street level.

2. Earthen Levee

   The Earthen Levee improvement type is planned where there is enough right-of-way width to raise and expand the levee using fill only. The earthen type levee is planned to be utilized within sub-reaches where there is sufficient land for an expansion of the levee base, and where such a design would help maintain views along the Bay Trail, provide public access to the shoreline, and/or provide unobstructed access corridors for wildlife to adjacent areas on the landward side of the levee during flood events. For earthen levees, the top of the existing levee would be excavated and conditioned to accept new fill (either conventional or lightweight fill). The top width of the earthen levee would range from 15 – 18 feet and 13.5 – 16.5 feet in elevation (on the NAVD datum) at the top elevation.

3. Conventional Floodwall

   Due to limited space and limited vertical clearance (and inability to drive piles) under the San Mateo Bridge/SR 92 and limited space along the O'Neill Slough Remnant Channel from

west of Port Royal Park to the end of the levee for installing Sheet Pile Floodwalls, a Conventional Floodwall would be used instead at these locations.

Note that earthen fill is added to increase the elevation of the trail and reduce the relative height of the wall to preserve views of San Francisco Bay and ensure that the maximum wall height does not exceed 3.5 feet from the grade adjacent to the Bay Trail (except near the San Mateo Bridge/SR 92 where the height would be up to 7 feet and at the ramp adjacent to Swordfish Street where the height would be up to 12.5 feet.

B. <u>Levee Sections and Improvement Types (Sheets 3-5)</u>

Sheet 3 of the attached plans show the various sections along the levee that would utilize one of the improvement types mentioned above. These typical sections are consistent with the levee types shown in the EIR and were chosen based on site constraints such as the location of wetland areas and available rights-of-way.

The majority of the levee will be constructed using the Sheet Pile Wall method with an AC (Asphalt Concrete) path. The Sheet Pile Wall will be constructed on the Bay/Slough side with a DG (Decomposed Granite) shoulder on either side of the asphalt path. Where space is limited along the levee, a secondary retaining wall would be installed on the landward side of the levee creating a "Double Wall." It would require less right-of-way width than a single sheet pile wall because the fill is confined to the levee crest between the two walls. A safety rail would also be placed on the secondary wall.

The typical Earthen Levee has an asphalt path with DG shoulder on either side of the pathway.

The Conventional Floodwall as explained above would be composed of a vertical wall that varies in height from 2 – 7 feet above the finish grade at the Bay Trail and is 8 – 12 inches wide. Higher wall heights are limited to transition areas at the San Mateo Bridge (only on the land side of the trail) and at the Swordfish Street ramp.

The existing width of the trail is 10 feet wide. The proposed width of the asphalt path with the improvements varies between 10 feet to 12 feet plus DG shoulders on either side of the pathway. The first stretch of the levee improvements (about a quarter mile long) is a 10 feet wide asphalt path that matches the existing paved width with a 4-foot shoulder on either side, for a total trail width of 18 feet. The shoulder was added to keep the trail consistent with the recommendations of the Bay Trail Design Guidelines as well as for future sea level rise adaptation plan. The second stretch of the trail along the Mariners Point Golf Course would have no improvements as there is existing high ground along this stretch of the trail. The third stretch (majority of the trail) has a 12 feet wide asphalt path with 8 feet designated for a two-way bike lane and 4 feet reserved as a dedicated two-way pedestrian path and a 3-foot shoulder on either side for a total trail width of 18 feet. The last stretch of the trail along the O'Neill Slough Remnant Channel will have a trail width of 15 feet (12 feet wide AC path with a 3-foot DG shoulder) just on the Bay/Slough side because there is not enough room within the levee right-of-way to have a 3-foot wide shoulder on both sides. The entire stretch of the improved trail will follow the San Francisco Bay Trail Design Guidelines and Toolkit published by California Coastal Conservancy.

C. <u>Potential Sheet Pile Wall Treatment Options (Sheet 6)</u>

Sheet 6 shows some wall treatment options that could be applied within limited reaches or for the entire wall length.

1. Painted Steel Sheet Pile Wall and Steel Cap (Approx. $3 million)

   The wall would be constructed using steel that is epoxy coated for corrosion protection and the top of the wall would have a manufactured steel cap that is coated to match. Leaving the Sheet Pile Wall uncoated with no cap is not considered a viable option due to potential safety concerns and it may not be visually appealing.

2. Painted Steel Sheet Pile Wall and Concrete Cap (Approx. $3.5 million)

   This option would utilize a concrete cap on top of the steel wall. This option may be aesthetically more pleasing compared to the steel cap.

3. Bay side of Wall

   Two options are considered for the Bay Side of the Sheet Pile Wall: leaving the epoxy coating (corrosion resistance) exposed to sunlight or painting the epoxy-coated sheet pile with a topcoat for ultra-violet exposure resistance. Additional wall treatment options are not considered because of the additional cost and the coverings would not be of visual benefit to Bay Trail users.

   - Leave Epoxy Coating Exposed: Leaving the epoxy coating exposed is the least expensive option for the bay side of the wall. There is no additional cost on top of the material required. Over time, UV exposure will cause the epoxy coating to chalk and it may become unsightly.

   - Paint Steel Sheet Pile with Topcoat: Top-coating the steel sheet pile is considered as the upgraded option from leaving the epoxy coating exposed. A urethane topcoat will provide UV protection and help extend the life of the underlying epoxy coating, which provides a measure of corrosion resistance.

4. Trail Side of Wall

   Three options are considered for this exposure of the wall: painted steel sheet pile, a poured in-place concrete fascia, and a precast concrete panel fascia. Leaving the sheet pile exposed to naturally weather over time is not considered a viable option due to the concern for graffiti removal and maintenance.

   - Painted Steel Sheet Pile Wall: Painting the sheet pile wall for is considered as the least expensive option for the land side of the Sheet Pile Wall.

   - Cast-In-Place Concrete Fascia (Approx. $5 million): Another option is to fill the sheet pile wall corrugations with cast-in-place concrete, probably using the shotcrete process. The concrete would act as a smooth fascia, and while it may stiffen the sheet pile wall somewhat, is not considered to have any particular structural benefit. If this option is selected, a concrete cap is required to complete the installation; a steel cap would not be recommended.

   - Precast Concrete Panel Fascia (Approx. $5 million): A precast concrete panel fascia is considered as an alternate upgraded option from the painted sheet pile wall. If this option is selected, a concrete cap is required to complete the installation; a steel cap would not be recommended.

D. Description of Views from some Sections along the Trail (Sheets 7-10)

1. Typical View between Mariner's Point and San Mateo Bridge (Sheet 7)

   This view shows the view of the levee trail from E. 3rd Avenue. The levee improvement section at this is a sheet pile all on the bay side of the trail and a Mechanically Stabilized Earth (MSE) block wall on the land side. The wall is used on the land side in this location due to the location of wetland areas and available right-of-way. The MSE walls are less expensive than a concrete wall. There will be a hand rail mounted on top of the MSE wall to conform to ADA requirements.

2. Levee Access at Beach Park Boulevard and Swordfish Street (Sheet 7)

   This view shows the access point at Beach Park Boulevard and Swordfish Street. The Bay Trail comes down to street level at Beach Park Boulevard for vehicular access to the Bay Trail. Pedestrian access will be maintained to the existing cross walk across Beach Park Boulevard. Behind the trail will be a concrete bench seating area with the covered sheet pile wall behind. The option shown is a precast panel-covered feature wall where the wall is the tallest with a cast-in-place concrete covering the sheet pile wall for the length of the slope down to the access point on both the north and south side of Swordfish Street. This design was chosen due to right-of-way constraints along the existing trail alignment.

3. Transition at Floodbreak adjacent to San Mateo Bridge (Sheet 8)

   This rendering shows the transition from a sheet pile wall on the bay side of the levee and an MSE wall on the land side of the levee. At the transition to the trail under the San Mateo Bridge, a Floodbreak flood gate will be placed at top of the improved Bay Trail to provide continuous flood protection. The Floodbreak Floodgate is a permanent, passive flood control system that will activate automatically when water levels rise. The majority of the time the floodgate remains at-grade to allow accessibility and pops up when needed for protection. The trail will then slope down to existing grade, where a concrete wall on the land side of the levee will tie into the San Mateo Bridge. The sheet pile wall will follow the trail down to retain the fill on the slope down and will end once the trail ties into the existing grade. The wall on the back side of the levee will be approximately 5.5 feet tall where it ties into the San Mateo Bridge.

4. Typical View of Access along Beach Park Boulevard (Sheet 9)

   This view shows an access along Beach Park Boulevard where there is enough room for a wheelchair ramp and access stairs. Per the suggestion of a Foster City resident, we have incorporated strategically placed glass walls to serve as viewing areas of San Francisco Bay for those who remain seated or cannot look out across the top of the floodwall. The two options shown are for the sheet pile wall to be painted or covered with cast-in-place concrete. There is spaced designated at this access point for an ADA accessible bench, trash and recycling, an information kiosk and a new cross walk will be added across Beach Park Boulevard. There will be fill placed to bring the Bay Trail height to no more than 3.5 feet lower than the top of wall.

5. View from Port Royal Park (Sheet 10)

   This rendering shows the concrete floodwall along the bay side between Port Royal Park and Belmont Slough. The proximity to homes and the lack of adequate space for pile driving equipment necessitated the use of a concrete floodwall in this location. The wall height will be approximately 2 feet higher than existing grade and minimal fill will be placed to widen the Bay Trail.

E. Landscaping (Sheets 11-12)

The conceptual approach to planting over six miles of trail edge and berm at the Foster City Levee Improvement Project is driven by a combination of environmental, aesthetic, and practical considerations. Environmental aspects include the protection of existing ecologically sensitive areas from invasive plant species and adaptability of native plant species to the specific coastal conditions along this trail. Aesthetic aspects include the visibility of different areas to residential homes and frequently used roads. Practical aspects include the logistics and costs of planting miles of trail, and maintaining these areas including associated irrigation into the future with limited resources and budgets.

1. Environmental

Two areas with ecological sensitivity exist north of the San Mateo Bridge along East 3rd Avenue and one just south of the bridge. The levee slopes adjacent to these areas will be planted with a combination of perennials, grasses, and annuals, all of them California natives, and most of them native to the Bay Area ecotype. To partially screen the vertical levee wall, larger native woody shrubs and large groundcovers will be planted along its base. These areas will change appearance over the seasons as do California native landscapes, and several proposed species support birds and butterflies.

2. Aesthetics

The stretch of trail along Beach Park Boulevard from the bridge to just south of Foster City Boulevard is the portion with the highest visibility to community residents. Historically the slopes along the trail have been planted with ice plant, a plant imported to the state by Caltrans to stabilize road and railroad slopes in the early 20th century. It is an extremely robust groundcover, requiring minimal maintenance and no watering leading to low long term maintenance costs. Flowering in the spring, it also has aesthetic acceptability to the residents of the City – similar to the famous ice plant covered slopes along Pacific Grove on the Monterey Peninsula. Ice plant is known to spread to adjacent natural areas, but can also be contained if surrounded by hardscape and roads which is the case here. The planting approach therefore proposes to replant ice plant along sections of the trail in between the trail access points.

3. Practical

The access points to the trail, with steps and ramps including about twenty feet on either side, will be planted with flowering perennials, all California / Bay Area natives. This planting approach will highlight the access points and provide seasonal color where it's most visible. Included in these areas will be a planting buffer of robust and dense native woody groundcovers adjacent to ice plant areas that will remain. The buffer, with a narrow concrete mow band along its outer edge will allow maintenance staff to monitor the edges of the ice plant and contain it when needed.

South of Beach Park Boulevard will be minor areas of trail edge restoration with the exception of the J-site adjacent to the Sea Cloud Park, whose extents will be modified by the new trail alignment. Both the slough side and inland side of these areas will be replanted with California / Bay Area native grasses and perennials. The slough side which will be partially inundated on a regular basis will be specifically planted with the same species of the local ecotype that currently exists in this area.

F. Access Points and Amenities (Sheets 13-19)

Sheets 13 through 19 shows proposed general layouts for the amenities to be provided on the trail, which are located on subsequent drawings. The amenities may include:

- Information kiosk
- Bench with room for wheelchair access
- Pet litter station
- Trash bin and recycling bin
- Bike rack with room for 2 bikes
- Square post informational signs
- Pole-mounted informational signs

Location map showing the amenities provided at each access point is shown. There will be a total of 49 access points, with nine access points from the Bay Trail to the Bay and 40 access points from the street or adjacent properties to the Bay Trail. The signage and amenities proposed are based on those already provided at existing trail access points, space available to add amenities, and the relative positioning of amenities along the entire levee/trail reach within Foster City. All public access points will have an ADA access ramp, a stairway with hand rails, or both a stairway and an access ramp. These determinations have been made based on the space available to provide a ramp or stairway, and if the access point is located within public right-of-way. The project will maintain access points to private property; however not every access point to private property will be ADA accessible due to the space available for construction within the public right-of-way.

NEXT STEPS

Comments from the Planning Commission will be forwarded to the City Council for their consideration at a future meeting date.

ATTACHMENTS

Attachment 1: Project Narrative
Attachment 2: Project Plans

INDIVDUALS, ORGANIZATIONS AND DOCUMENTS CONSULTED

EIR for the Foster City Levee Protection Planning and Improvements Project
Chuck Anderson, Alexandra Oran & Erin Slezak – Schaaf & Wheeler
Jeff Moneda – Public Works Director
Adit Pal & Hiral Sheth – BFS Landscape Architects