

**San Francisco  
Bay Conservation and Development Commission**

**Major Permit Application**

**For the**

**San Francisco – Oakland Bay Bridge  
East Span Seismic Safety Project**

**September 2001**

Submitted by:

**California Department of Transportation  
District 4  
111 Grand Avenue  
Oakland, California 94611**

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# Box 1

## Applicant Information

**a. PROPERTY OWNER:**

Name: California Department of Transportation  
Address: 111 Grand Avenue, P.O. Box 23660  
City, State, Zip: Oakland, CA 94623-0660  
Telephone: \_\_\_\_\_ Fax: /

**b. OWNER'S REPRESENTATIVE:**  None

Name: H.P. Hensley  
Address: 111 Grand Avenue, P.O. Box 23660  
City, State, Zip: Oakland, CA 94623-0660  
Telephone: 510/286-6250 Fax: 510/286-6447

Affiliation to Applicant: Deputy Director/  
Program Manager, Toll Bridge Program

I hereby authorize MARA MELANDRY  
to act as my representative and bind me in all matters concerning this application.

H.P. Hensley  
Signature of Owner

9/12/01  
Date

**c. APPLICANT:**

Name: California Department of Transportation  
Address: 111 Grand Avenue, P.O. Box 23660  
City, State, Zip: Oakland, CA 94623-0660  
Telephone: \_\_\_\_\_ Fax: /

**d. APPLICANT'S REPRESENTATIVE:**  None

Name: Mara Melandry  
Address: 111 Grand Avenue, P.O. Box 23660  
City, State, Zip: Oakland, CA 94623-0660  
Telephone: 510/622-5582 Fax: 510/286-6374

Affiliation to Applicant: SFOBB Environmental Manager

I hereby authorize MARA MELANDRY  
to act as my representative and bind me in all matters concerning this application.

H.P. Hensley  
Signature of Applicant

9/12/01  
Date

**e. CO-APPLICANT:**  None

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City, State, Zip: \_\_\_\_\_  
Telephone: / Fax: /

**f. CO-APPLICANT'S REPRESENTATIVE:**  None

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City, State, Zip: \_\_\_\_\_  
Telephone: / Fax: /

Affiliation to Applicant: \_\_\_\_\_

I hereby authorize \_\_\_\_\_  
to act as my representative and bind me in all matters concerning this application.

\_\_\_\_\_  
Signature of Co-Applicant

\_\_\_\_\_  
Date

## Box 2

# Certification of Accuracy of Information

*I hereby certify under penalty of perjury that to the best of my knowledge the information in this application and all attached exhibits is full, complete, and correct, and I understand that any misstatement or omission of the requested information or of any information subsequently requested shall be grounds for denying the permit, for suspending or revoking a permit issued on the basis of these or subsequent representations, or for the seeking of such other and further relief as may seem proper to the Commission.*

\_\_\_\_\_  
Signature of Owner or Owner's Representative

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Applicant or Applicant's Representative

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Co-applicant or Co-applicant's Representative

\_\_\_\_\_  
Date

# Box 3

## Project Information

- a. Project Name: San Francisco-Oakland Bay Bridge East Span Seismic Safety Project
- b. Project Description: Please See Attachment 3
- 
- c. Date work is expected to begin: January 2002 Date Work is expected to be completed: April 2009
- d. Does the project involve development within the primary management area of the Suisun Marsh ?  
No. The project is not located within the Suisun Marsh.
- e. Does the project involve the placement of fill of any type in San Francisco Bay or within the primary management area of the Suisun Marsh, a salt pond, a managed wetland, or a certain waterway ?  
Yes. Please see Box 5 and Attachment 5.
- f. Does the project involve development within the 100-foot shoreline band around San Francisco Bay?  
Yes. Please see Box 6 and Attachment 6.
- g. Does the project involve the dredging or the disposal of dredged material in San Francisco Bay or within the primary management area of the Suisun Marsh, a salt pond, a managed wetland, or a certain waterway?  
Yes. Please see Box 8 and Attachment 8.
- h. Total Project Cost: \$2.6 Billion
- i. Processing Fee: \$10,000.00

## Item b.

### **PROJECT DESCRIPTION**

The California Department of Transportation (Caltrans) proposes to replace the East Span of the San Francisco-Oakland Bay Bridge (East Span Project). The project would be located on Interstate 80 between the cities of San Francisco and Oakland (see Figure 1). The western project limit is the eastern portal of the Yerba Buena Island (YBI) tunnel located in San Francisco; however, project related traffic controls may extend to the western portal of the YBI tunnel and project signage may extend to the western approach of the West Span in San Francisco. The eastern project limit is located approximately 1,312 feet (400 meters) west of the Bay Bridge Toll Plaza on a spit of land referred to as the Oakland Touchdown area in the City of Oakland (See Figure 2). The project site also includes the waters of San Francisco Bay adjacent to the bridge and on the north and east sides of YBI and the Oakland Touchdown area.

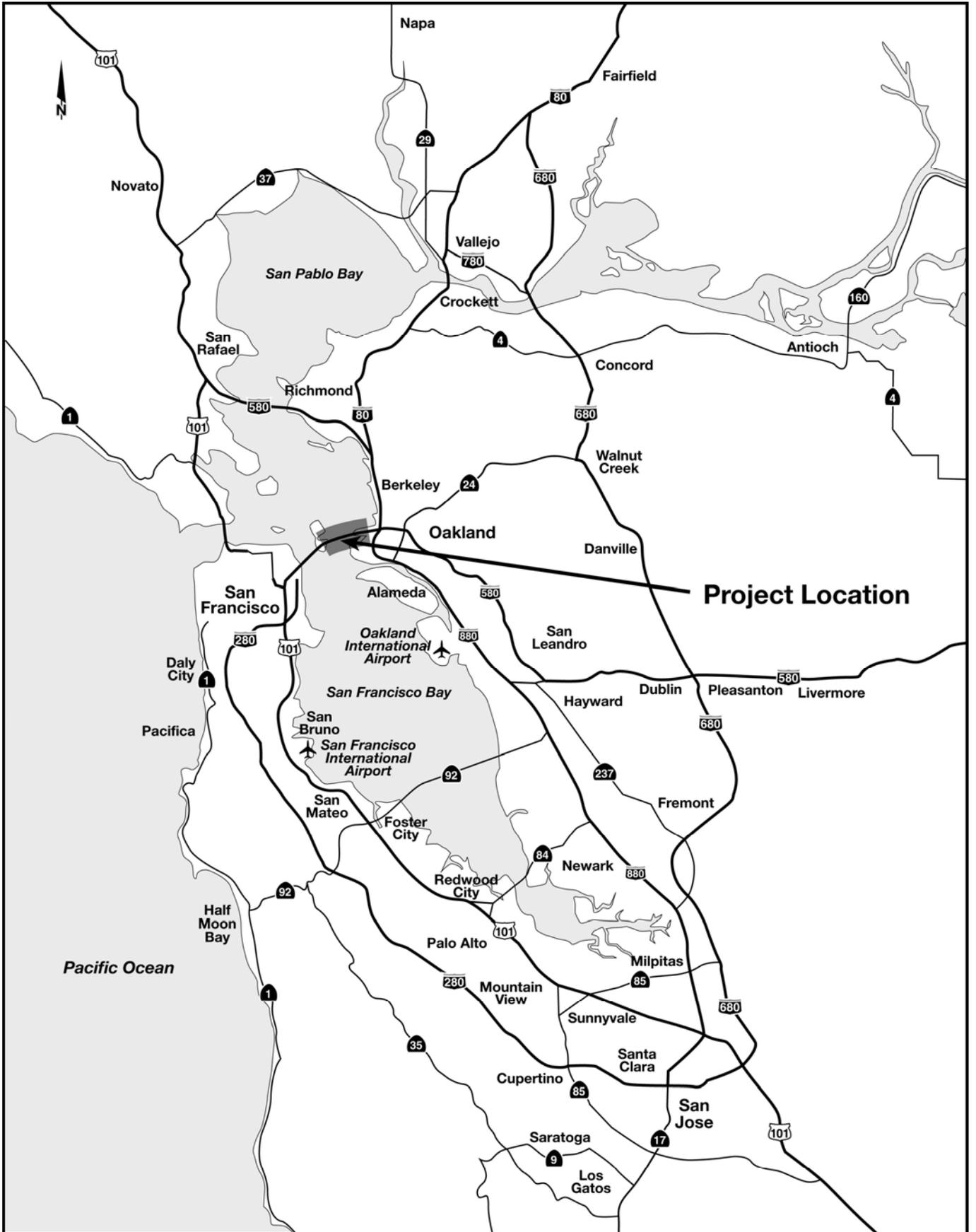
The new bridge would be constructed north of the existing East Span and would be approximately 2.18 miles long (3.5 kilometers long) and approximately 230 feet wide (70 meters wide), including a 50-foot (15.3-meter) minimum space between the east and westbound bridge decks (see Figure 3). The bridge decks would be side-by-side, except for the double deck portion between the existing YBI tunnel and the transition structures where the double deck structure becomes two parallel structures. Each deck would consist of five traffic lanes and inside and outside shoulders. The traffic lanes would be 12 feet wide (3.6 meters wide) with 10-foot-wide (3.0-meter-wide) shoulders. A bicycle/pedestrian path would be constructed on the south side of the eastbound structure and would be 15.5 feet wide (4.7 meters wide). The bicycle/pedestrian path would be located 1 foot (0.3 meters) above the roadway grade and would be separated from traffic by the roadway shoulder, a safety barrier and a railing. The distance between the edge of the bridge deck and the path would vary from approximately 17 inches (43 centimeters) to 10 feet (3 meters) depending on the bridge segment. The bicycle/pedestrian path would extend from the eastern approach in Oakland to the western terminus of the East Span on YBI in San Francisco.

The East Span Project would also replace the eastbound on-ramp on YBI. The existing ramp needs to be dismantled to construct the new bridge. The ramp would be rebuilt and would meet current design and safety standards.

### **NEW BRIDGE CONSTRUCTION**

The East Span Project would take seven years to complete, including two years to remove the existing East Span. However, seismic safety and lifeline criteria would be achieved for westbound traffic four years after the start of construction and, for eastbound traffic, five years after the start of construction. Construction is scheduled to begin in early 2002 and targeted for completion in early 2009.

The new structures and roadway consist of a viaduct from the YBI tunnel to a self-anchored suspension span (SAS), the SAS or main span, a skyway from the SAS to the Oakland approach, and a geotechnical approach embankment and roadway at the Oakland Touchdown (see Figure 4). The structures would be supported by 25 piers over water and 19 bents set on YBI and the Oakland Touchdown area. Construction of the new bridge would be divided among four separate contracts including the SAS/YBI Contract (which includes YBI transition structures and the main span), the Skyway Contract, the Oakland Approach Structures Contract, and the Geofill Contract at the Oakland Touchdown. In addition, there would be a demolition contract to remove the existing bridge. A construction schedule by contract is included as Appendix C. The schedule; however, is for planning purposes only. The actual schedule would be determined after contract award by the selected construction contractors.

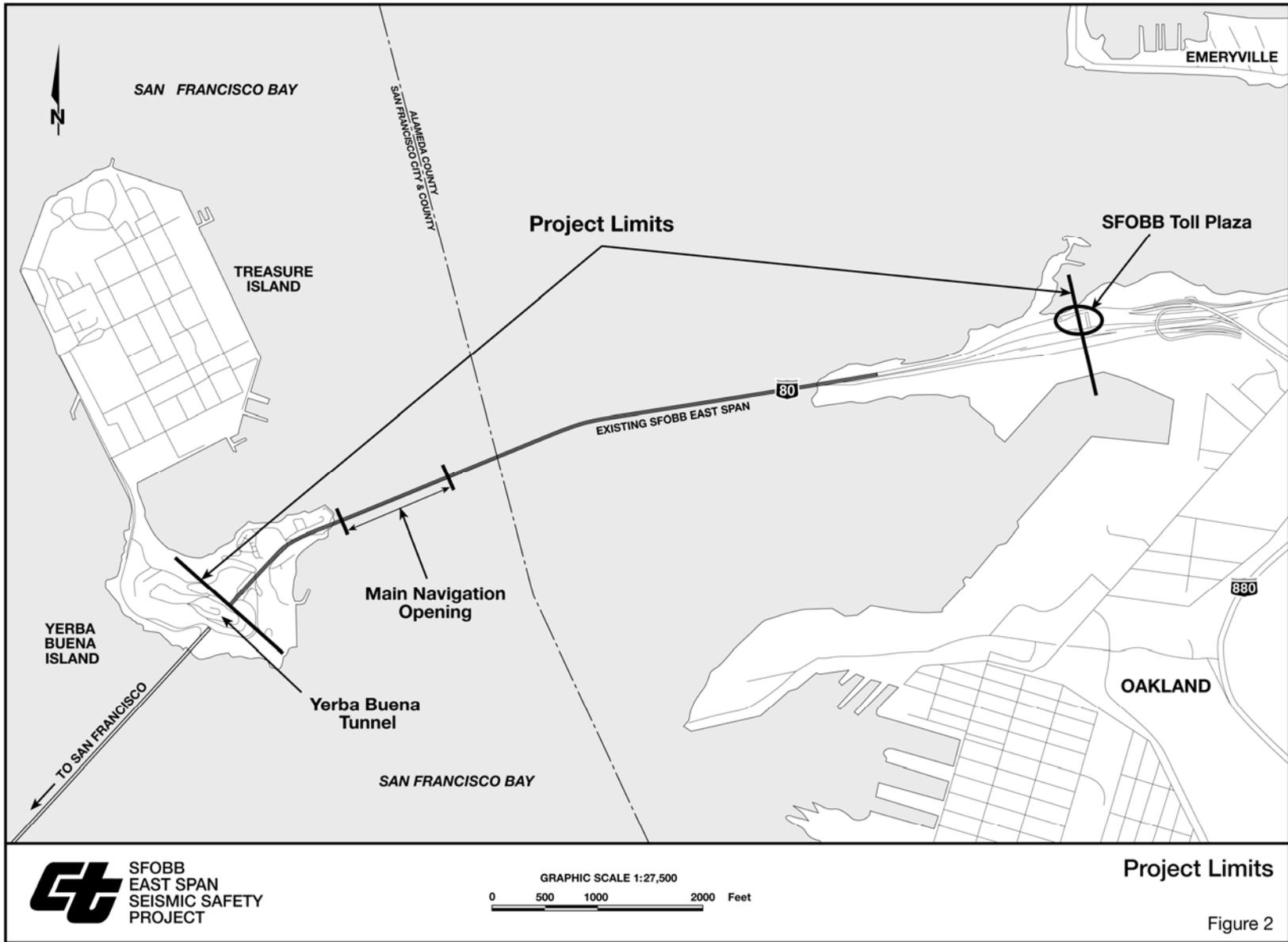


SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT



Project Location

Figure 1

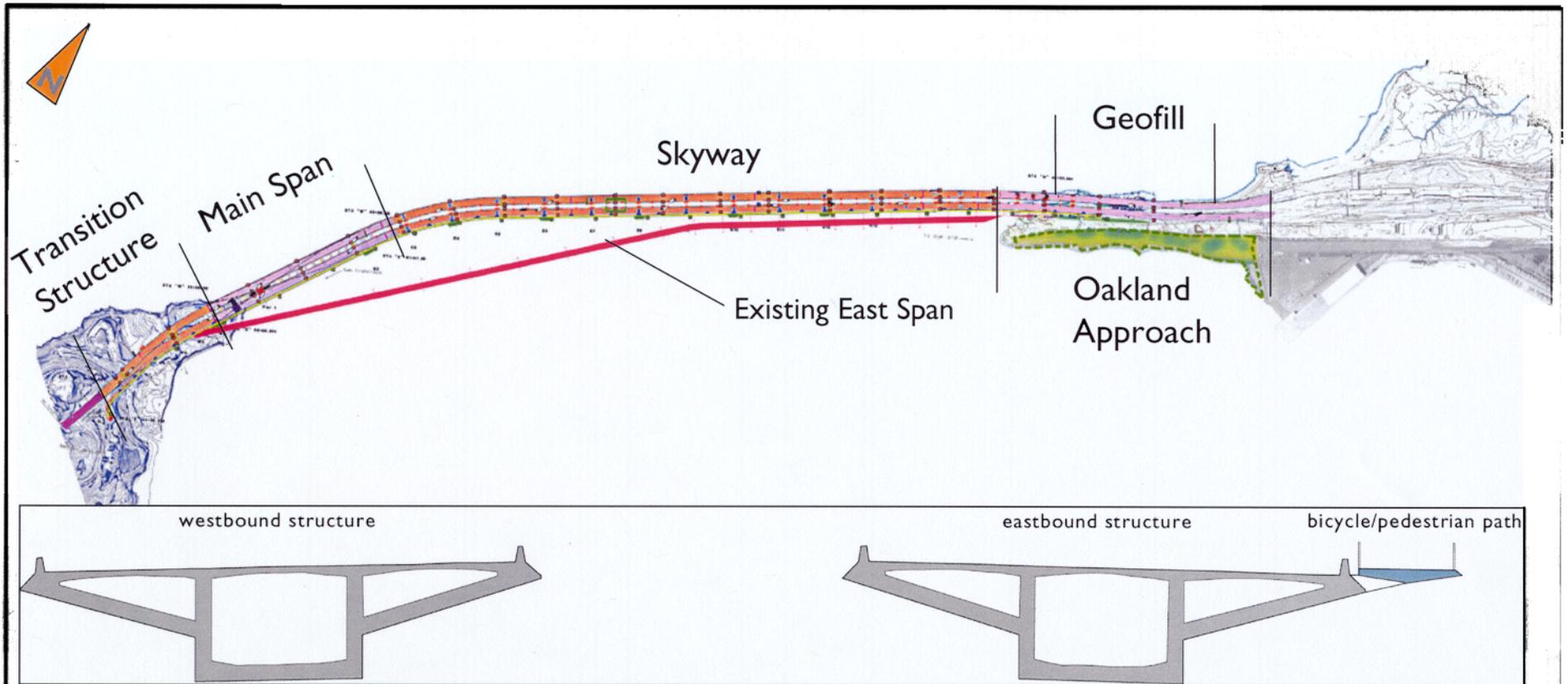




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Proposed East Span

Figure 3



- Located on an alignment north of the existing bridge
- Bridge contracts include YBI Transition Structure / Main Span, Skyway, Oakland Approach Structure and the Geofill
- Approximately 2.2 miles long, with 2% grade
- Two side-by-side structures
- Unified design from end-to-end
- Bicycle and pedestrian path located on south side of bridge on eastbound deck

Skyway Cross-Section



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PROJECT

Not to Scale

Project Overview

Figure 4

### **Attachment 3: Project Information**

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Project site plans for permanent and temporary improvements are presented on a smaller scale in Figures 5-10 and on a larger scale in Appendix D.

The project would require the use of large-scale equipment and involve labor-intensive activities. Materials and equipment would arrive to the site by land (truck) and by water (boat and barge). Depending on the location, timing, and size of the deliverables, they could be moved into position by land and/or barge mounted cranes. Work crews would arrive by vehicle and by boat depending on location. Temporary access trestles, which may be built on or in close proximity to YBI and the Oakland Touchdown area, would also be used for delivery of materials. These structures would likely have timber, steel, or concrete driven foundations and timber, steel, or concrete decks, depending on their exact use and the materials selected by the contractor. The access trestles would be designed by the contractor.

For land-based support structures (bents), pre-mixed concrete could be delivered by truck and dumped or pumped into place, or mixed on-site at batch plants, transported by truck and dumped or pumped into place. For in-Bay structures (piers), concrete would be delivered to docked barges, placed on barges for batching and transport, and then dumped or pumped into place.

Excavators, backhoes, haulers, graders, and other large-scale earth moving and construction equipment would be used to clear and excavate portions of the site on YBI and the Oakland Touchdown. Excavated material would be stockpiled for reuse or removed from the site by truck or barge for disposal.

Dredging in-Bay near the Oakland Touchdown area would also be required for the project. Dredging would provide adequate clearance for barge access during construction of the new bridge and dismantling of the existing bridge. Dredging would also be required to excavate and remove sediment at individual pier locations for construction of the new bridge. Dredging equipment (e.g., clamshells, dredges and backhoes) would be used to remove sediments and the material would be transported from the site by barges for disposal or reuse. See Attachment 8 for dredging and disposal details.

#### **Temporary Detours at YBI**

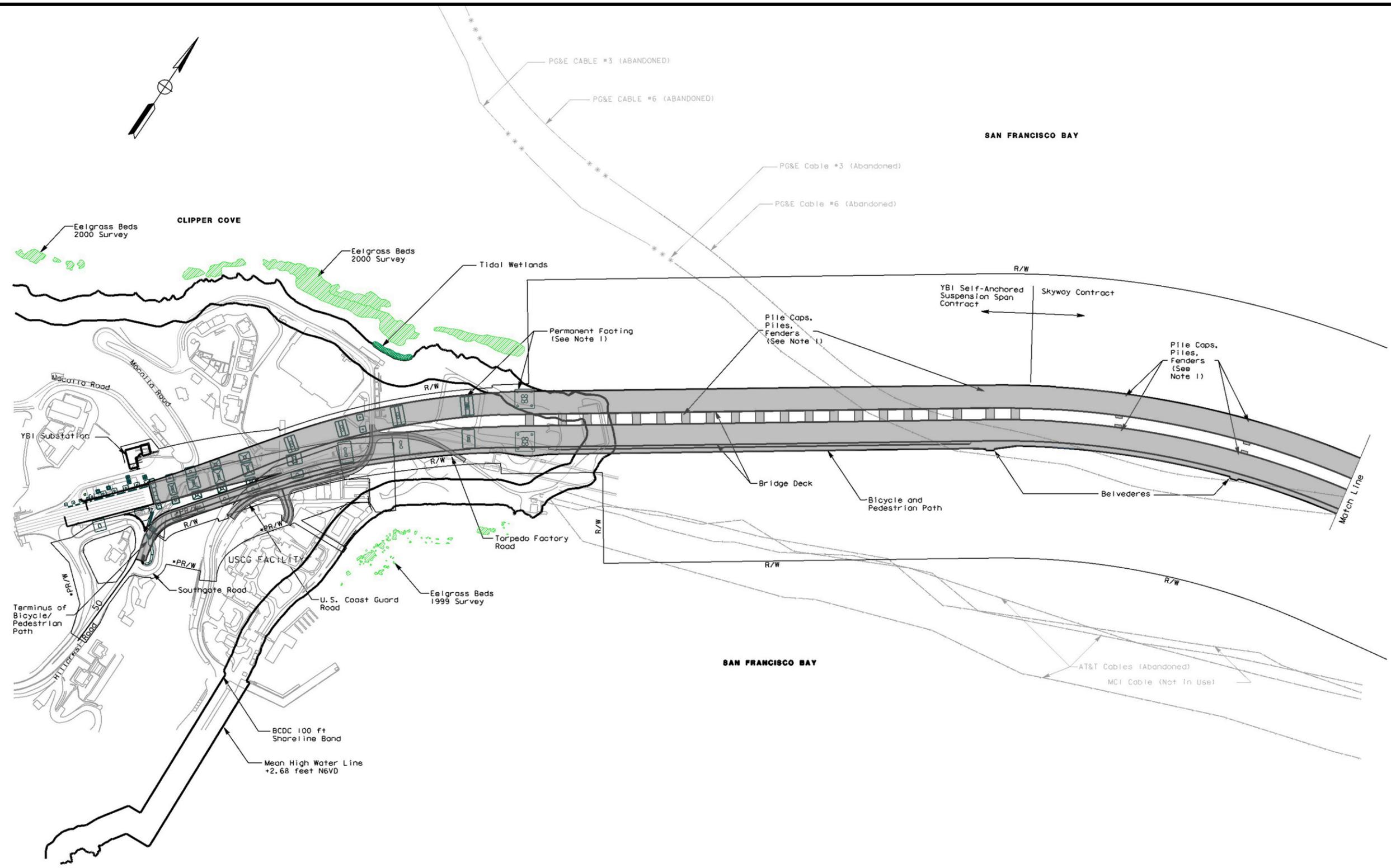
Except for delivery of materials and personnel, the main span and skyway would be constructed without interrupting traffic on the existing East Span. However, temporary detours would be required on YBI to route traffic around work areas (see Figure 8).

The temporary westbound detour would be 1,607 feet long (490 meters long) and constructed north of the existing East Span, while the temporary eastbound detour would be 1,574 feet long (480 meters long) and constructed south of the existing East Span. Both west and eastbound detour structures would be approximately 56-foot wide (17 meters wide) with five 11-foot-wide (3.4-meter-wide) lanes in each direction. The temporary detours would be operational for approximately two years; however, it would be approximately four years between the beginning of construction and the dismantling of the temporary detours. The temporary detours could be removed as soon as they are no longer needed to carry traffic or as one of the last steps of bridge construction, depending on whether the contractor chooses to use them as platforms from which to construct other portions of the bridge.

#### **Substructure Construction**

Creating access to construct footings would require grading the area surrounding the temporary detours and excavating up-slope near the tunnel portal on YBI. Sheet pile, soldier piles, tie backs, and/or other temporary shoring may be used to stabilize excavated slopes.

For construction of the bents, piles would be driven into bearing soil strata to achieve required capacity on YBI, forms would be built for pile caps or spread footings; the forms would be filled with reinforcing steel and concrete and removed after the concrete has cured. The towers and bent caps would then be erected using cranes to lift and fit manufactured sections together. Temporary supports may be used during construction to keep the bent towers in a vertical position.



**General Notes:**

1. See Contract Drawings for Construction Details.
2. This plan is not to scale. See Contract Plans for scaled drawings.

**Legend:**

- R/W - Permanent Right of Way
- \*PR/W - Pending Right of Way. See Property Interest Map for Right of Way Status

07 September 2001

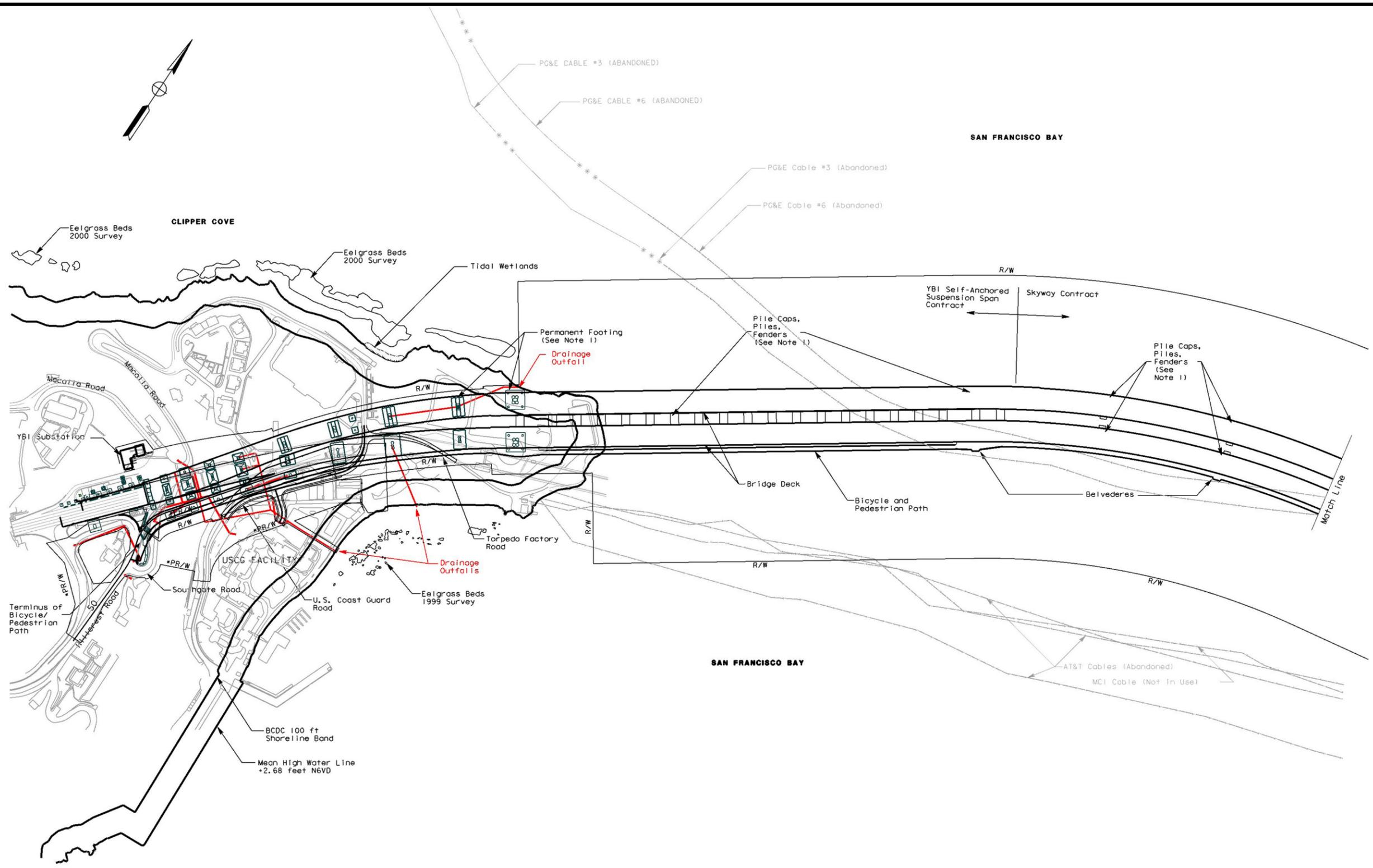


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Proposed Permanent Improvements  
YBI/Self-Anchored Suspension Span Contract

Not to Scale

Figure 5



**General Notes:**

1. See Contract Drawings for Construction Details.
2. This plan is not to scale. See Contract Plans for scaled drawings.
3. Drainage Facilities are subject to change.

**Legend:**

- R/W - Permanent Right of Way
- \*PR/W - Pending Right of Way. See Property Interest Map for Right of Way Status

07 September 2001

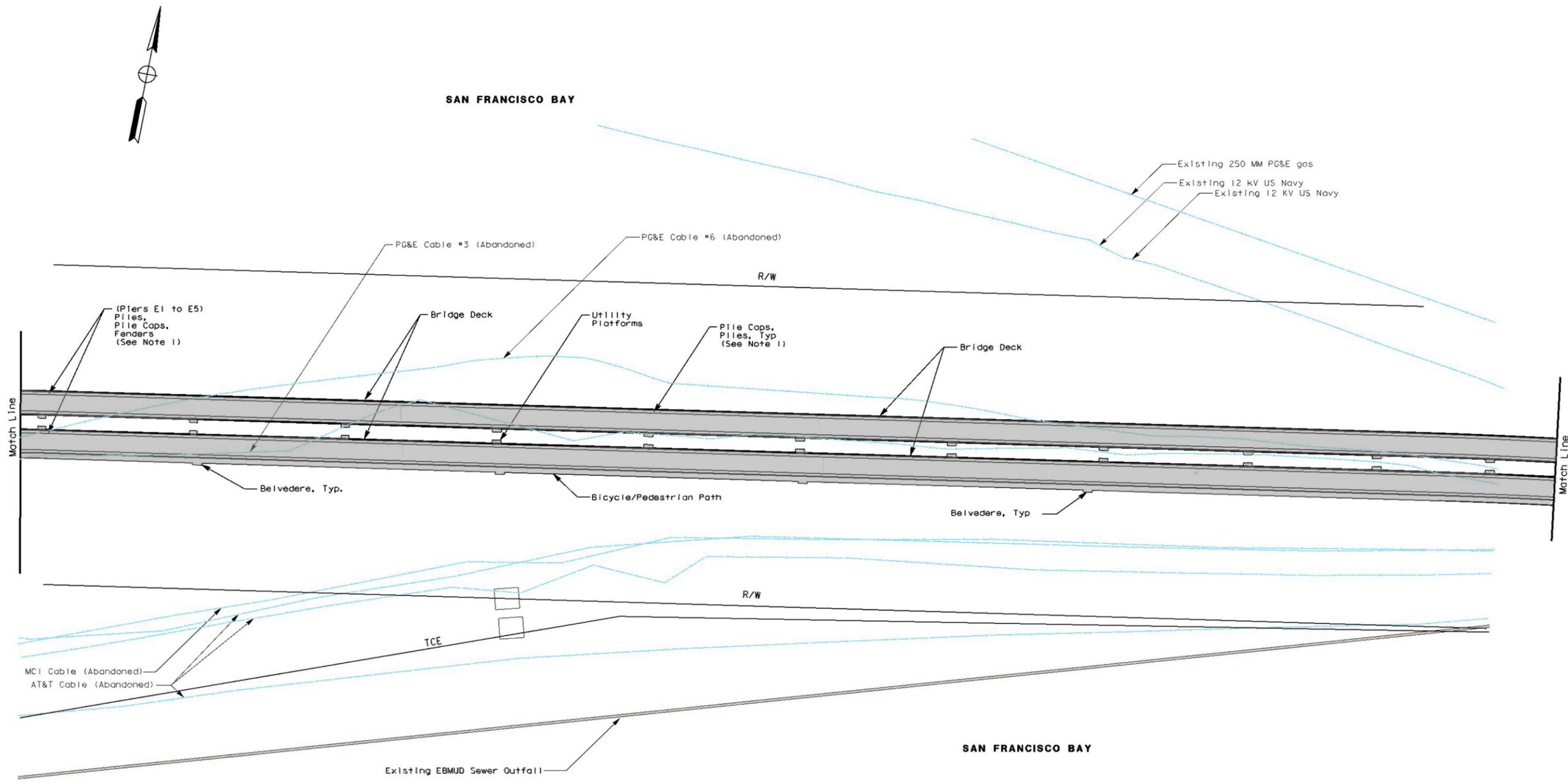


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PROJECT

Proposed Drainage Improvements  
YBI/Self-Anchored Suspension Span Contract

Not to Scale

Figure 5A



**General Notes:**

1. See Contract Drawings for Construction Details.
2. This plan is not to scale. See Contract Plans for scaled drawings.

**Legend:**

- R/W - Permanent Right of Way
- TCE - Temporary Construction Easement

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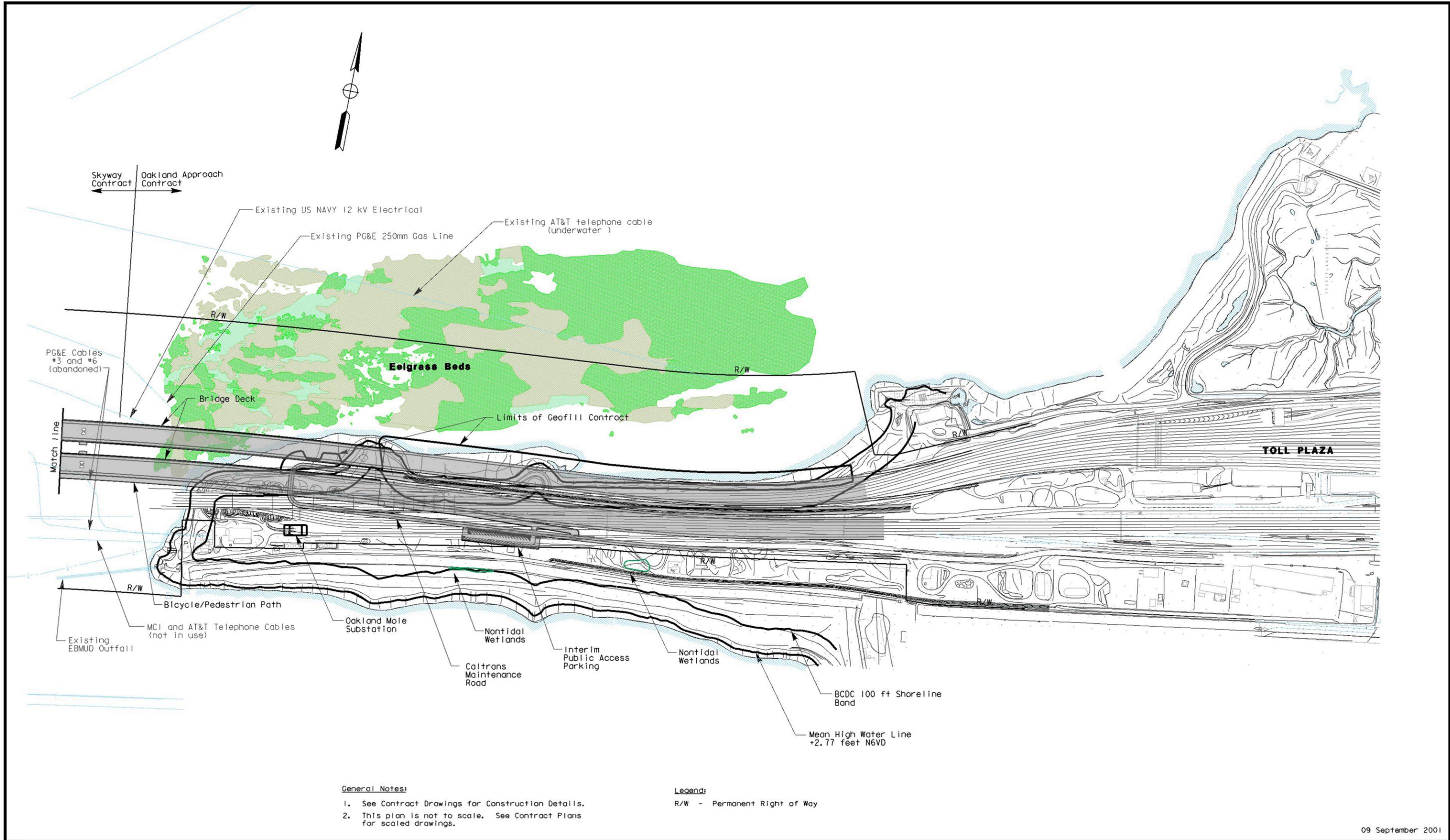


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Proposed Permanent Improvements  
Skyway Contract

Not to Scale

Figure 6



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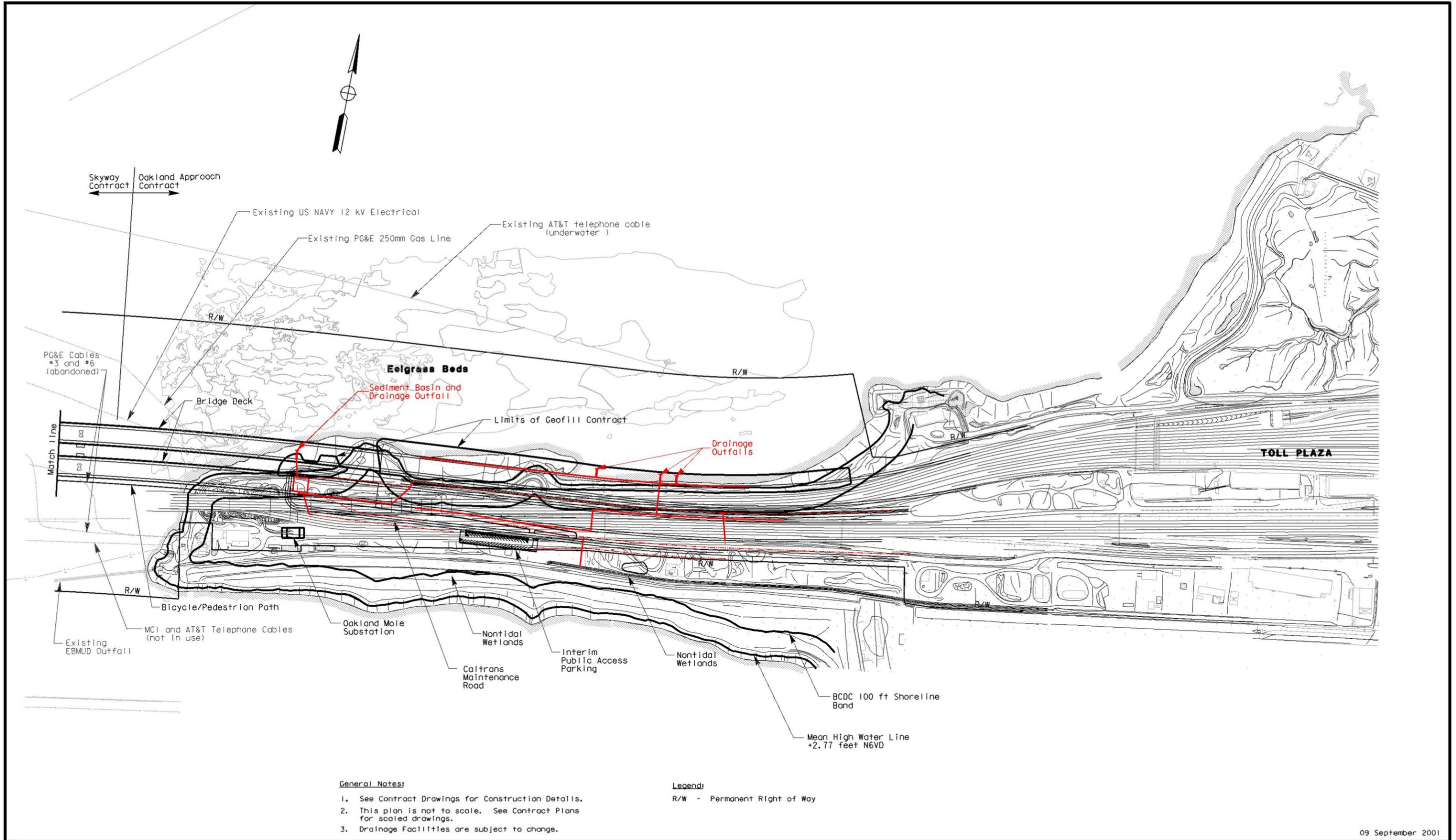


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PROJECT

Proposed Permanent Improvements  
Oakland Approach and Geofill Contracts

Not to Scale

Figure 7



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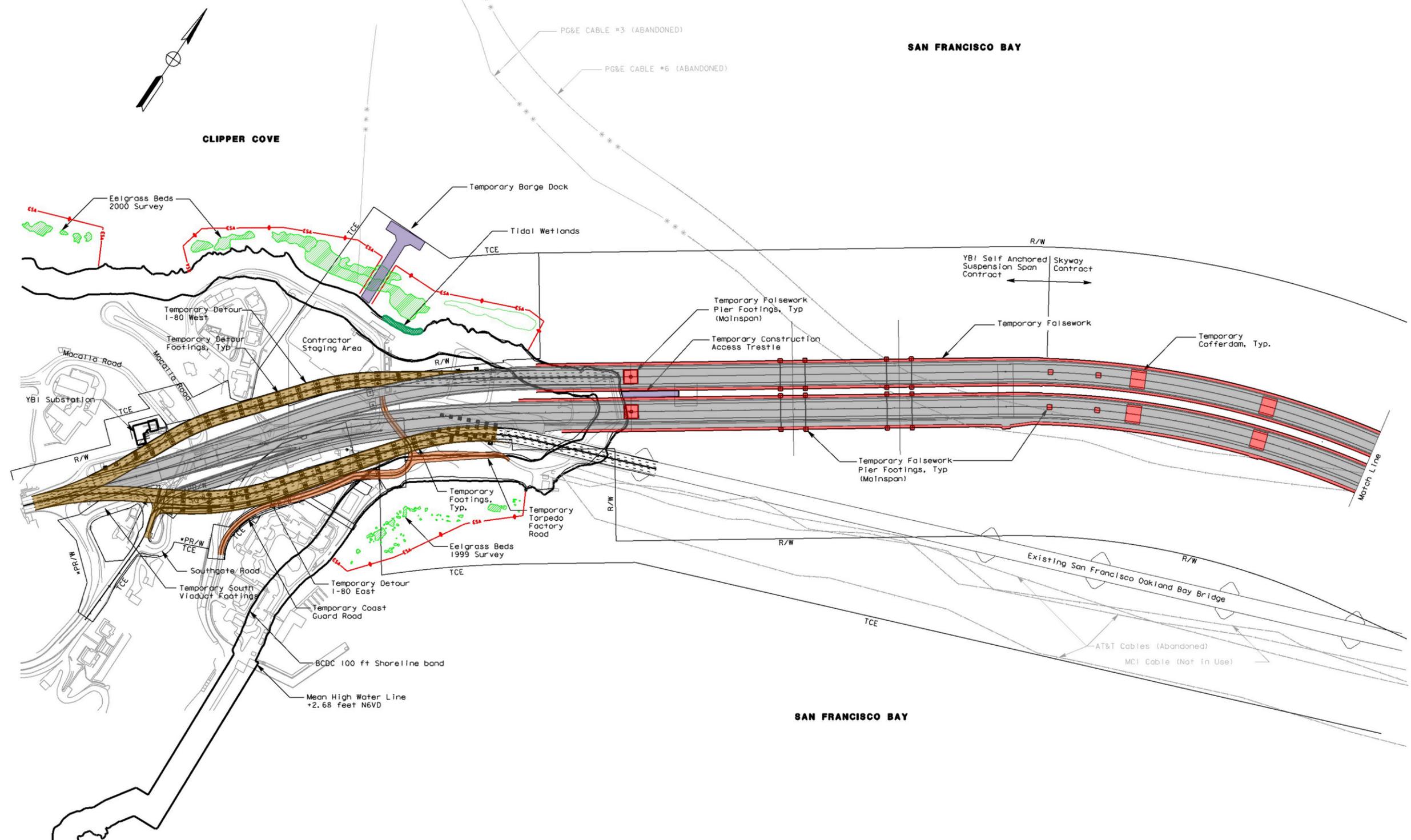


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SEISMIC SAFETY  
PROJECT

Proposed Drainage Improvements  
Oakland Approach and Geofill Contracts

Not to Scale

Figure 7A



**General Notes:**

1. See Contract Drawings for Construction Details.
2. This plan is not to scale. See Contract Plans for scaled drawings.

**Legends:**

- R/W - Permanent Right of Way
- TCE - Temporary Construction Easement
- ESA - Environmentally Sensitive Area
- \*PR/W - Pending Right of Way. See Property Interest Map for Right of Way Status

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EAST SPAN  
SEISMIC SAFETY  
PROJECT

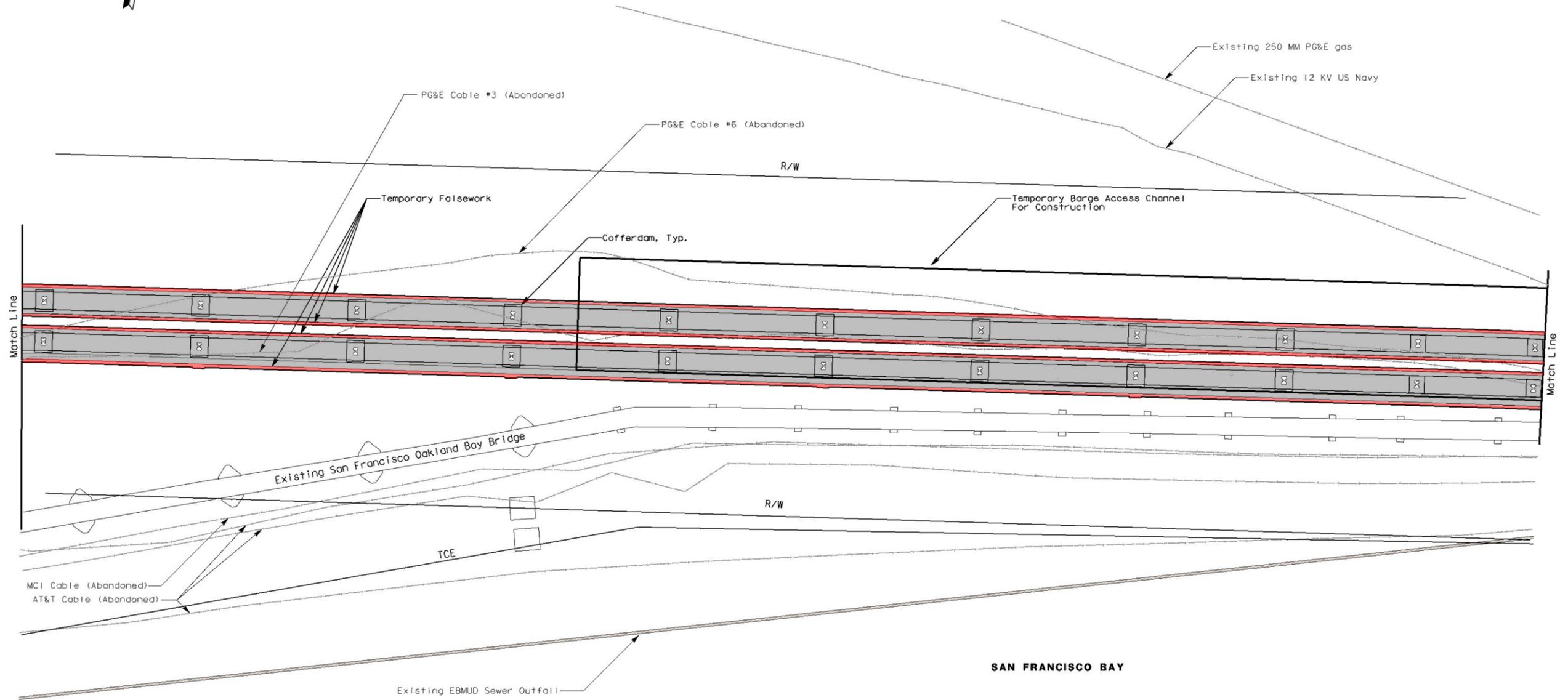
Proposed Temporary Improvements  
YBI/ Mainspan Contract

Not to Scale

Figure 8



SAN FRANCISCO BAY

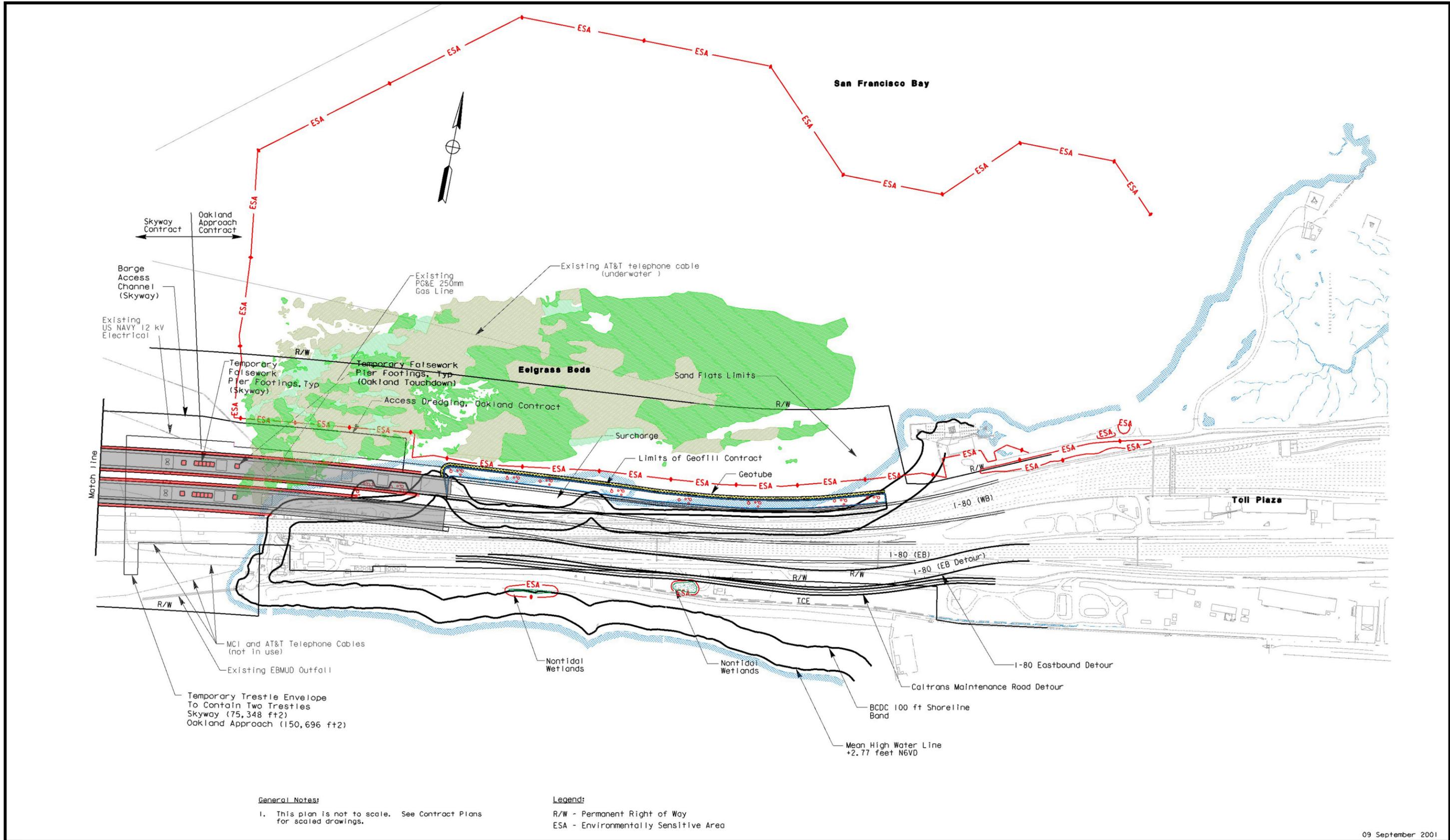


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PROJECT

Proposed Temporary Improvements  
Skyway Contract

Not to Scale

Figure 9



**General Notes:**

1. This plan is not to scale. See Contract Plans for scaled drawings.

**Legend:**

- R/W - Permanent Right of Way
- ESA - Environmentally Sensitive Area

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PROJECT

Proposed Temporary Improvements  
Oakland Approach and Geofill Contracts

Not to Scale

Figure 10

## **Attachment 3: Project Information**

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### ***Superstructure Construction***

Steel girders would be raised by crane, forms would be built for laying the deck, reinforcing steel and concrete would be placed in the forms, and the forms would be removed after the concrete has cured. Construction of the roadway barriers would follow the same sequence and be followed by the installation of signage.

### **Temporary Detours at the Oakland Touchdown Area**

At the Oakland Touchdown area, an eastbound temporary detour would be built at-grade, south of the existing eastbound lanes, requiring relocation of the existing Caltrans maintenance road (see Figure 10). The detour and maintenance road relocation would require a temporary construction easement from the City of Oakland. Following construction of the eastbound approach and structure, eastbound traffic would shift from the temporary detour onto the new structure, and the Caltrans maintenance road would be realigned. Temporary detours would not be required for construction of the westbound approach and structure.

### **Transition Structures at YBI**

At Bent 48 on YBI, the new bridge would begin with transition structures that would move from the double-decked structure into two parallel structures (see Figures 8 and 11). The structures would be prestressed, concrete box-girders.

### ***Substructure Construction***

Creating access for footings, driving piles to bearing strata, and construction of the pile caps would require the same construction methods as the temporary detours (see above).

To construct the piers, forms would be constructed, reinforcing steel would be placed in the forms, concrete would be cast into the forms, and the forms would be removed after the concrete has cured.

### ***Superstructure Construction***

Deck forms would be built, reinforcing steel would be placed in the forms, concrete would be cast into the forms, and the forms would be removed after the concrete has cured and the prestressing placed. Construction of the roadway barriers would follow the same sequence as that of the deck forms and then signage, utilities and pre-stressing cables would be installed.

### **Main Span**

The main span, located between Pier W2 on YBI and Pier E2 on the eastern side of the main navigation opening, would be a steel deck, self-anchored suspension bridge design (see Figure 5).

### ***Main Tower Construction***

The main tower would be set offshore from YBI. Bay bottom sediments would be removed, holes would be drilled into bedrock, hollow steel pipe piles would be driven or socketed into the holes, and a pre-fabricated steel box (with concrete cover) pile cap would be floated into position and sunk onto the piles, sealed around them, and pumped dry. The piles would be filled with concrete and welded to the pile cap, which would be filled with reinforcing steel and concrete, and covered with a top slab. Precast concrete fenders would be brought to the site and attached to the pile cap. The slab would provide the surface on which four pre-fabricated steel tower legs would be erected. The legs would be raised by cranes and bolted together. Steel link beams would be bolted between the legs along their length. Temporary support piers may be placed in the Bay and on either side of the permanent main tower during its construction. Depending on methods selected by the contractor, cofferdams may be used during construction of the main tower foundation; however, it is unlikely due to water depths at this location.

All removed sediment would be placed on a barge for transport and disposed of per DMMO recommendations.



Photo Simulation of the Transition Structure Looking East

Note: View Prior to Re-landscaping

## Attachment 3: Project Information

---

**Pier E2 Construction.** Hollow steel pipe piles would be driven into Young Bay Mud and a pre-fabricated steel box (with concrete cover) pile cap would be floated into position and sunk onto the piles, sealed around them, and pumped dry. The piles would be filled halfway with concrete and welded to the pile cap, which would be filled with reinforcing steel and concrete, and covered with a top slab. All sediments within the piles resulting from pile driving would be removed, placed on a barge for transport, and disposed. See Attachment 8 for dredging and disposal details.

**Pier W2 Construction.** Rock on YBI would be removed mechanically, and the rock faces stabilized or retained. The pile holes would be drilled deeper into the rock. The holes may have to be dewatered. A concrete reinforcing cage would be placed in the pile holes, and the hole filled with concrete. The pile cap would be formed, a reinforcing cage would be placed, then the forms filled with concrete. The forms would be removed after the concrete cures.

Construction of both piers above the pile caps would include constructing forms, placing reinforcing steel and concrete in the forms, and removing the forms once the concrete has cured. The process would be the same for the pier caps; however, the pier caps would be prestressed. Tie-down cables would be placed between the pile cap and pier cap to anchor the pier.

### ***Superstructure Construction***

Temporary falsework on piles would be constructed between Pier W2 and the main tower. Two temporary towers would be constructed between the main tower and Pier E2. There would be falsework on the island as well to support the superstructure while it is being constructed. Pre-fabricated steel segments of the superstructure would be delivered to the site by barge and lifted onto the falsework and the temporary towers. Each segment would then be connected to the adjacent segments. Completed portions of the deck could be used as working platforms for other construction activities including delivery of materials and equipment and lifting and positioning of structural components.

Suspension cables would then be lifted and placed between the top of the main tower and each side of the bridge. Cable suspenders would then be hung from the suspension cable and connected to the deck. After the suspension cables and suspenders are stressed and positioned, the falsework and temporary towers would be removed, the barriers and riding surface overlay would be placed, and utilities, lighting and signs would be installed.

### **Skyway**

The skyway would be a prestressed, concrete box-girder (see Figure 6).

A temporary access trestle may be utilized to build portions of the skyway and allow for the delivery of materials, equipment, and work crews. It is expected that the trestle would be used in conjunction with the barges in areas of shallow water. The trestle for the skyway would be approximately 75,350 square feet (7,000 square meters). Barges may support the heavier equipment.

### ***Substructure Construction***

Construction of the piles and the pile caps would be similar to construction of Pier E2. All sediments within the piles resulting from pile driving would be removed, placed on a barge for transport, and disposed. See Attachment 8 for dredging and disposal details. Depending on methods selected by the contractor, cofferdams may be used.

Near the Oakland approach, cofferdams may be required. The cofferdam would be placed, sediment excavated, and the cofferdam dewatered. The steel pipe piles would be driven to the Alameda formation. A steel box pile cap would be lowered onto the piles and welded to them. If necessary, the piles would be emptied of Bay sediments then the piles and pile caps would be filled with reinforced concrete.

The pier forms would be placed, filled with reinforcing steel and concrete, then removed once the concrete is cured. The pier caps would be constructed similarly. Once the pier is complete, the cofferdams would be removed either fully or to at least 1.5 feet (0.46 meter) below the mudline.

## **Attachment 3: Project Information**

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Where the new structure is in close proximity to the existing East Span, the contractor would have to ensure the existing structure foundations remain stable. This may require placing a stabilizing system (such as sheet piling) in the Bay. When the pile cap construction is complete, the stabilizing system would be removed either fully or to at least 1.5 feet (0.46 meter) below the mudline.

### ***Precast Superstructure Construction***

All sections of the deck would be cast off-site, delivered to the site by barge, lifted by cranes, placed on alternating sides of the pier for balance, and attached to the previous segment with prestressing cable. When the sections meet in the mid-span, they would be jacked together and either joined with prestressed concrete or a mechanical expansion hinge. The barriers and the riding surface overlay would be constructed in a sequence similar to that of the main span, after which utilities, lighting, and signage would be installed.

### ***Cast-in-place Superstructure Construction***

A form traveler would be lifted and secured to the pier table. Steel reinforcing would be placed inside the form. Concrete would be delivered and poured. After the concrete cures, the prestressing cable would be placed, then the form traveler would be moved out over the new section to form the next section. When the sections meet in mid-span, they would be jacked together and either joined with prestressed concrete or a mechanical expansion hinge.

### ***Temporary Towers***

Pile-supported temporary towers would be placed by the skyway contractor where the skyway joins the main span and Oakland approach. These towers would support the skyway until the adjoining structures are complete. Once the main span and Oakland approach are complete and all structures are joined, the temporary towers would be removed.

## **Oakland Approach Structures**

The Oakland approach structures (see Figure 7) would include a cast-in-place, prestressed, concrete box-girder supported by a cast-in-place, reinforced, concrete substructure. A temporary access trestle would be utilized to facilitate construction and would be approximately 150,700 square feet (14,000 square meters).

### ***Substructure Construction***

Construction in-Bay would include dredging for barge access, building a temporary access trestle, driving piles, and placing cofferdams in areas of shallow water near the Oakland Touchdown. The cofferdam method would involve driving sheet piles into Young Bay Mud to isolate a working area that would be dredged and dewatered to create access for construction of footings. All sediments resulting from pile driving and dredging would be removed, placed on a barge for transport, and disposed. See Attachment 8 for dredging and disposal details.

Construction on land would include excavation at footings and driving piles. The sequence to construct the pile caps and the piers and bents above the pile caps would be similar to the sequence followed to construct the pile caps and the bents of the transition structures (see above).

Where the new structure is in close proximity to the existing East Span, the contractor would have to ensure the existing structure foundations remain stable. This may require placing a stabilizing system (such as sheet piling) in the Bay. When the pile cap construction is complete, the stabilizing system would be removed either fully or to at least 1.5 feet (0.46 meter) below the mudline.

### ***Superstructure Construction***

The construction sequence to build the bridge decks of the skyway would be the same as for the transition structure (see above). Construction of the roadway barriers would be in the same sequence and be followed by the installation of signage, utilities, and prestressing cables after the concrete has cured (see above).

## **Attachment 3: Project Information**

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### **Additional Oakland Touchdown Area Activities**

At the Oakland Touchdown area, a portion of the new westbound roadway and the relocated maintenance road would encroach into the Bay, requiring use of engineered fill and surcharge in the Bay and upland areas.

For construction of the westbound roadway, a geotube would be placed in tidal areas north of the Oakland Touchdown area, along a distance of approximately 1,970 feet (600 meters), to temporarily protect the work area from tidal and wave action and to facilitate installation of wick drains and the placement of fill. A geotube is a large diameter tube of permeable geotextile fabric into which Bay sand and water would be pumped. When the geotube is filled, it would act as a tidal barrier to protect the work area (see Figure 12).

Within the area protected by the geotube the existing soils would be excavated to an elevation of approximately -2.6 feet (-0.8 meters). Wick drains and vertical drains would be installed and evenly distributed throughout the excavated area to facilitate consolidation of underlying bay mud and prevent liquefaction of overlying sand. The drains would be covered with a layer of gravel upon which clean fill material would be placed. The fill is referred to as "surcharge material." The weight of the surcharge material on the underlying bay mud would force the pore water in the substrate up through the wick drains. The wick drains reduce the distance the pore water has to travel to reach a more permeable flow path, which reduces the time required to consolidate the bay mud. The vertical drains would also convey some pore water during the surcharge period. However, they are primarily to provide a drainage path for pore water during a seismic event. The water that drains from the substrate through the wick drains and vertical drains would flow through the gravel blanket to the Bay.

Runoff from the surface of the fill would drain to existing and temporary drainage features and would be subject to Storm Water Pollution Prevention requirements and standards. Best management practices (BMPs) that would be used include, but are not limited to temporary slope drains, erosion control blankets, and fiber rolls. When the substrate has been drained and compacted by the weight of the surcharge material, a portion of the surcharge would be removed and the road surface would be constructed upon the remaining fill. The excess surcharge material would be removed to an upland site for reuse.

### **DISMANTLING OF THE EXISTING BRIDGE**

Dismantling activities would consist of seven major stages, which represent major components of the existing bridge and construction-related structures, including:

- YBI viaduct;
- YBI 288-foot (88-meter) steel truss approach spans;
- Oakland approach structures;
- YBI temporary detours;
- Cantilever truss spans;
- 504-foot (154-meter) steel truss spans; and
- 288-foot (88-meter) steel truss spans.

The YBI viaduct, the YBI steel truss approach spans, the Oakland approach structures, and the YBI temporary detours would be dismantled during construction of the replacement bridge because of construction staging. The temporary detours could be removed as soon as they are no longer needed to carry traffic or as one of the last steps of bridge construction, depending on whether the contractor chooses to use them as platforms from which to construct other portions of the bridge. The three remaining sections would be dismantled under separate contracts.



SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

Typical Geotube

Figure 12

## **Attachment 3: Project Information**

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### **Dredging**

Some areas near the Oakland Touchdown are too shallow to accommodate barges to dismantle the existing bridge; thus, a barge access channel would need to be dredged. The suitability of sediments in the barge access channel for dismantling the existing bridge would be evaluated prior to disposal per the Dredged Material Management Office's (DMMO) recommendation. See Attachment 8 for dredging and disposal information.

After dismantling the superstructure, the bridge foundations would be removed to an elevation of at least 1.5 feet (0.46 meter) below the mudline. This would require the removal of sediments around the footings through the use of cofferdams. Techniques such as reverse circulation drilling, jetting, and air lifting may be used by the contractors to remove the material around the footings. These methods would involve creating a slurry of material within the cofferdam and lifting or pumping it into the drilling vessel or barge. The concrete from the dismantled footings would be removed and transported by barge or truck to a predetermined site for reuse, recycling, or disposal. Existing piles would be cut off to an elevation at least 1.5 feet (0.46 meter) below the mudline. Once the cofferdams are removed, natural sedimentation would fill the area surrounding the cut-off-piles.

### **Superstructure**

Removal of decks could be performed by cutting them into pieces or by disassembling them panel-by-panel. Truss spans near the Oakland shore may be removed by conventional barge and crane methods due to the shallow water and low clearance under the deck. Options include constructing temporary supports under the span and disassembling the truss segment by segment, dredging for barge clearance, constructing temporary embankments of engineered fill within the Bay for access, or using special shallow-draft barges or rigging devices for lowering sections onto barges from the bridge deck. Protective measures would be taken to prevent materials or debris from falling into the Bay. Depending on location, materials could be removed by barge or truck to a predetermined site for reuse, recycling, or disposal.

### **Substructure**

Substructure elements could be lifted from their bases in one piece or piece by piece. Dismantling of concrete foundations would require reducing the reinforced concrete to pieces small enough to be hauled away, which could be done by mechanical means such as saw cutting, flame cutting, mechanical splitting, or pulverizing and hydro-cutting. The hollow interiors of the piles remaining below the mudline could also be used as receptacles for pieces of concrete as the pier above is dismantled. This method would substantially reduce the quantity of material requiring transport and disposal and would lower dismantling costs. The piles remaining below the mudline could be capped or would gradually fill in through siltation. Any reinforcing steel would be cut off to be flush with the face of the concrete that remains below the mudline.

Removal of the piles to 1.5 feet (0.46 meter) below the mudline could be completed by an underwater dismantling method or by constructing cofferdams at each pier. The use of cofferdams at YBI would depend on methods selected by the contractor, however their use is assumed for purposes of estimating dredged quantities generated by existing bridge removal.

### **CONTAMINATED SOIL**

Some areas within the project limits have been identified as having contamination due to underground storage tank leaks, lead-based paint removal, landfilling operations, and other industrial activities. Investigation of soil that would be excavated for the project is being finalized and soils would be characterized for disposal at appropriate upland disposal sites.

### **TEMPORARY DEWATERING**

### **Attachment 3: Project Information**

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During construction of the foundation structures, dewatering may be required from cofferdams, pile shafts, and upland excavations. Water removed from cofferdams and marine-based piles would be filtered to remove suspended solids and the receiving water would be monitored for turbidity and discoloration. Discharges would not be allowed to increase the turbidity of the receiving water by more than ten percent.

In some cases the foundation construction may occur within areas of petroleum-contaminated ground water resulting mainly from diesel fuel leaks. If ground water is encountered during the foundation construction and dewatering is required in these locations, the water would be contained, analyzed, and treated, if necessary, prior to discharge. Treatment would include removing settleable solids in a holding tank and removing petroleum compounds by filtration through granulated activated carbon. The water would be treated to conform to State standards before being discharged back into the Bay. In addition, excavations would be sealed to minimize further contaminant transport due to drawdown.

During the time the geotube is in place, there may be instances when water accumulating behind the geotube would need to be pumped over the barrier to the Bay. The discharge would include groundwater from the wick drains and vertical drains, bay water infiltrating from below and through the geotube, and storm water. Analysis of groundwater samples from both the shallow and deep water-bearing zones within the influence of the wick drains and vertical drains did not detect contaminants at concentrations that could adversely impact beneficial uses or exceed any water quality objective or standard. Water quality characteristics of concern would be settleable material, suspended material, turbidity, and color. During any discharge, BMPs, such as a filtration device or settling tank, would be implemented to remove settleable material from the effluent. In addition, the turbidity and color of the receiving water would be monitored. The BMPs would be described in the project's Storm Water Pollution Prevention Plan (SWPPP).

#### **TEMPORARY AND PERMANENT DRAINAGE**

The East Span Project includes modification and enhancement of existing drainage facilities including the outfalls at the Oakland Touchdown and at YBI. Currently, the westbound roadway at the Oakland Touchdown is drained by sheet flow that is filtered by a vegetated strip. Some portions of the eastbound roadway drain to an existing drainage system, which leads to an open channel that drains south to the Bay. The existing drainage channel is part of the City of Oakland drainage system. The remaining eastbound roadway portions drain north to the Bay via four existing outfalls.

Three existing outfalls that drain to the north of the existing bridge would be modified to accommodate the new fill and new roadway features. All three outfalls would be extended. In addition, four new 1.5-foot-diameter (0.46-meter-diameter) outfalls would be required to drain the roadway surface runoff to the Bay. The outfalls would drain to the north shore of the Oakland Touchdown. Runoff from the relocated maintenance road would drain south to the Bay through the open channel.

During construction of the East Span Project, four additional 1.5-foot-diameter (0.46-meter-diameter) outfalls, which would drain temporarily to the northern shore of the Oakland Touchdown, would be required to accommodate the runoff from the surcharge material placed adjacent to the geotube. The drains would be removed when the surcharge is removed.

Within the project area, drainage at YBI would use existing outfalls and drainage features as well as new ones. Currently the system collects the bridge and surface runoff from YBI and conveys it to the Bay via a number of existing outfalls. The new drainage system would separate the Caltrans runoff from the rest of the YBI drainage and carry it through a number of new drainage systems to the Bay.

The new drainage system would discharge into the Bay via four outfalls; two outfalls would be in new locations, one outfall would utilize an existing outfall location, and one of the outfalls would be an unmodified existing outfall where a new system would connect.

The first new outfall would be located on the northeast side of YBI just north of Pier W2 of the westbound structure. It would carry some of the runoff from the new bridge deck and the surface runoff of the portion of Caltrans right-of-way located north of the new structure.

### **Attachment 3: Project Information**

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The second new outfall would be located east of the U.S. Coast Guard (USCG) facility, south of the new bridge, on a small beach area. At this location two new pipes would be placed adjacent to the existing pipe, one for local drainage and one for Caltrans drainage.

The modified outfall would be located at the USCG facility between Building 27 and the tennis court. A new outfall pipe would be placed at this location, adjacent to the existing outfall pipe to carry Caltrans drainage. A portion of new local roadway runoff would be tied to the existing outfall pipe.

At the unmodified outfall location, part of the new YBI drainage system would tie into a portion of the existing system which would carry water to the Bay via an existing outfall pipe located north of Building 22 on the USCG facility. Although the existing pipe would not be replaced with a different diameter pipe, the amount of flow could change, mostly likely reduced.

# Box 4

## Total Project and Site Information

- a. Project Street Address: N/A
- b. City, County, State, Zip: N/A
- c. Assessor's Parcel Numbers): See Appendix E for a copy of the property map.
- d. ID number(s) of previous BCDC permit(s) issued for work on this site: M66-33, M68-7, M71-6, 11-71, M79-81, M87-42, M89-35, 11-93, M93-63, and M00-2.
- e. Length of shoreline on the project site: 6,315 feet / 1,925 meters
- f. Length of shoreline of any adjacent property owned by the owner of the project site: N/A
- g. Approximate total size of project site (including areas outside BCDC's jurisdiction): 369.4 acres / 149.7 hectares
- h. Area reserved for non-public access uses: 370 acres / 150 hectares
- i. Area reserved for public access: 5.6 acres / 2.3 hectares
- j. Total size of underwater and tidal areas of the project site: 329 acres / 133 hectares

**k. INFORMATION ABOUT THE TOTAL PROJECT AND SITE TO BE PROVIDED IN AN ATTACHMENT:**

The information requested below is included in Attachment 4.

1. Please describe the existing condition of the site, including the present elevations, current vegetation (not covered), existing structures and use of the site.
2. Please describe the area, in square feet, within the total project site that will be used each for: (1) structures, roads, and parking; (2) landscaping; and (3) left undeveloped.
3. Please indicate whether the project will involve the release of pollutants or have the potential for accidental pollutant discharge into the Bay.
4. Please identify any suspected or known sites of toxic contamination on or in proximity to the project site, and provide the following information: (a) identify the types of pollutants present; (b) show the location of the pollutants on the site plan; (c) describe the extent to which the pollutants are accessible to humans, fish, wildlife or vegetation, or are moving offsite; and (d) steps being taken (including government actions) to control or clean up the pollutants.

**Item k-1. Please describe the existing condition of the site, including the present elevations, current vegetation, existing structures and use of the site.**

## **YERBA BUENA ISLAND AND TREASURE ISLAND (TI)**

Most of YBI and TI are owned by the federal government. YBI is currently under the jurisdiction and ownership of the USCG and the Department of the Navy (Navy) with the exception of portions of the right-of-way for the East Span Project, which were transferred to Caltrans under a Federal Land Transfer in October 2000. These federal agencies must approve any activity on their property. In general, the Navy owns the property north of the existing East Span, as well as the ramps to and from the bridge; the USCG owns most of the property south of the bridge (see Figure 13). The Navy also owns TI and the causeway connecting YBI and TI.

YBI is a 147-acre (59-hectare) natural island. The USCG facility consists of 41 acres (17 hectares) and is located south of the existing SFOBB East Span. The area on YBI owned by the Navy is 86 acres (34 hectares). The existing East Span connects to the West Span at the YBI tunnel, which runs through the middle of YBI. Caltrans' permanent right-of-way on YBI is 20 acres (8 hectares).

TI is a 403-acre (163-hectare) man-made island created by placement of fill in the Bay. A man-made causeway located northwest of YBI connects the two islands.

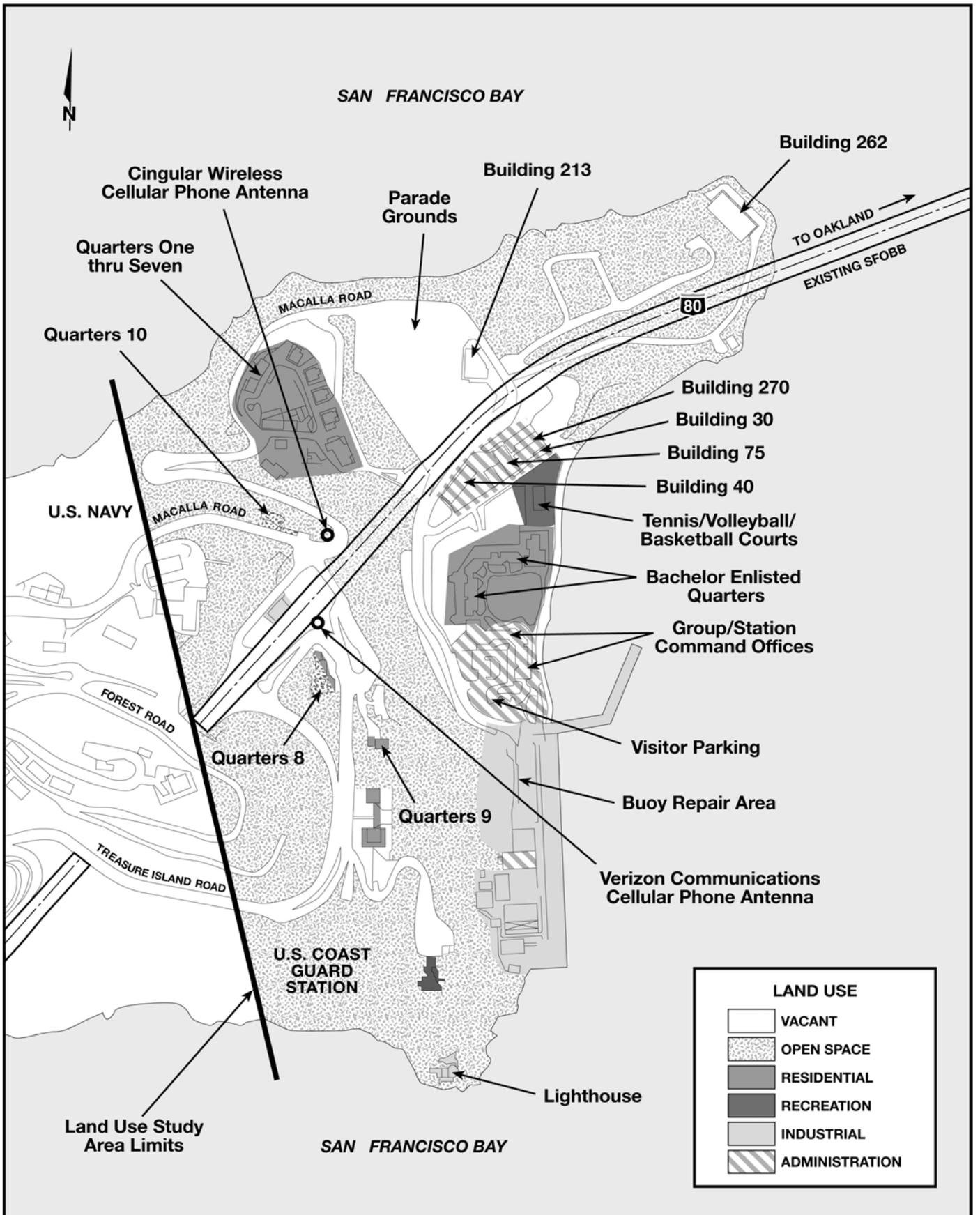
## **U.S. Navy**

The Naval Station Treasure Island (NSTI), which comprises the Navy property on YBI and TI, encompasses 489 acres (197 hectares) of land. The NSTI was operational from the 1940s until 1997, when it was decommissioned. Within Navy jurisdiction on YBI, there are about 10 buildings previously used by the military primarily for storage, communications, fire safety, and administrative purposes. In addition, there are 105 housing units, 10 of which are large single-family residences originally built for officers; the remainder are 2, 3, and 4-unit buildings, generally single-story. About 95 of these housing units, located on the western and central parts of YBI, are currently occupied as market-rate civilian housing.

Land uses on the eastern side of YBI within the vicinity of the existing East Span include Quarters 1-7 (see Figure 13). Quarters 1-7 were built in the early 1900s as senior officers' quarters and comprise a Historic District eligible for listing on the National Register of Historic Places. Quarters 1-7 are currently undergoing renovation and will eventually be leased out by the CCSF as locations for events and meetings. Two other buildings (Buildings 213 and 262) are located on the eastern side of YBI. Building 213 is currently vacant; however, a fire truck owned by the CCSF is stored inside. Building 262, known as the Torpedo Building, was constructed in 1891 and is eligible for the National Register of Historic Places. This building is also vacant.

The 403 acres (163 hectares) on TI support 150 military buildings and 904 housing units. The military buildings served a broad range of functions, including medical/dental offices, a fire training facility, prison, administrative offices, a conference center, restaurants, and barracks, as well as storage for equipment and other miscellaneous items for a total of 2.5 million square feet (0.23 million square meters).

The Navy is seeking to dispose of its property on YBI and TI under the Defense Base Closure and Realignment Act of 1990, as amended. Through this process, jurisdictional authority will pass from Navy control, and the property within the former naval station will be available for reuse.



## **Attachment 4: Total Project and Site Information**

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The laws and regulations guiding the base closure process require the Navy to consult with the Local Redevelopment Authority (LRA) and consider the LRA's plans as it decides how to dispose of NSTI. The CCSF is the LRA recognized by the Department of Defense as the agency responsible for planning the redevelopment of former NSTI. Accordingly, the Navy is working with the CCSF to coordinate base closure activities.

Notwithstanding the CCSF's status as the LRA in the base closure process, the Navy has not yet completed its analysis for the disposal and reuse of NSTI pursuant to the National Environmental Policy Act (NEPA). Although the Navy must consider the CCSF's plans for NSTI, the Navy has discretion to evaluate and decide among competing requests for the excess land. Pursuant to NEPA, the Navy must consider all reasonable disposal alternatives, including a "no action" alternative. The Navy has not disclosed what other alternatives are being considered; these will be publicly disclosed when the Navy circulates its Draft Environmental Impact Statement (DEIS) for the disposal and reuse of NSTI.

### **U.S. Coast Guard**

The property on YBI owned by the USCG encompasses approximately 41 acres (17 hectares). The focus of USCG operations is a narrow half-mile strip of land at the eastern edge of YBI. From this location, the USCG performs a variety of functions, including 24-hour search and rescue, law enforcement, and buoy repair and maintenance. Vessel traffic service is performed from a large communications tower at the top of YBI. Because of its search and rescue and law enforcement responsibilities, it is essential that the USCG be located at a waterfront site where boats can quickly accelerate to full speed. It is also very important for the unit to be centrally located to maintain adequate response times to emergency calls in the central and southern Bay.<sup>1</sup>

USCG facilities on YBI include several administrative buildings as well as residential units (see Figure 13). Residential facilities are provided for about 78 USCG personnel or USCG dependents who live on-site. The Bachelor Enlisted Quarters (BEQ) provides 51 rooms for approximately 68 residents in a group of four buildings. There are also five single-family homes on the island for the families of officers housing approximately ten residents. Recreational facilities on YBI consist of outdoor tennis, basketball, volleyball courts, and a barbecue pit located next to Building 75.

Industrial buildings are located at the southern end of YBI. Maintenance, repair, and painting of buoys for the entire Bay Area are done at these industrial buildings.

### **California Department of Transportation**

On October 25, 2000, the Federal Highway Administration (FHWA) executed a Federal Land Transfer of some land on YBI formerly owned by the United States. FHWA transferred this land to Caltrans to give the State adequate right-of-way and access for construction of the East Span Project. Any transferred right-of-way not required for the East Span Project would revert to the United States after project completion. The area now owned by Caltrans starts approximately 500 feet (152 meters) west of the western tunnel portal and runs through the tunnel and ends at about 840 feet (256 meters) east of the eastern tunnel portal for a total length of approximately 1,875 feet (571 meters). The width of the Caltrans property varies on the north side up to 145 feet (44 meters) from the centerline of the existing bridge and up to 125 feet (38 meters) from centerline on the south side.

### **Vegetation**

Most of the terrestrial vegetation on YBI and TI consist of non-native plant species. Typical landscaped species found include Tasmanian blue gum (*Eucalyptus globulus*), German ivy (*Senecio mikanioides*), and Monterey cypress (*Cupressus macrocarpa*). Patches of native vegetation occur on YBI and include coast live oak woodland and northern coastal scrub.

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<sup>1</sup>United States Coast Guard, Draft Group San Francisco Master Plan, 1995.

## **Attachment 4: Total Project and Site Information**

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A small, narrow band of northern coastal salt marsh occurs on the north side of YBI adjacent to Clipper Cove. Dominant plant species found in northern coastal salt marshes include pickleweed (*Salicornia virginica*) and saltgrass (*Distichlis spicata*). Sand flats occur adjacent to the USCG facility. Eelgrass beds occur in some of the shallow intertidal waters at Clipper Cove and the Coast Guard facility.

### **OAKLAND TOUCHDOWN AREA**

The San Francisco-Oakland Bay Bridge (SFOBB) touches down in the City of Oakland on a spit of land north of Port of Oakland (Port) facilities and west of the I-80/I-880/I-580 Interchange (distribution structure). The land in this area is owned by a number of public agencies, including the City of Oakland, the Port, the State of California, and the U.S. Army.

The State of California has a permanent easement for the right-of-way where the current I-80/SFOBB alignment is located. This property extends approximately 164 feet (50 meters) from the outer boundaries of the westbound and eastbound I-80 alignments and includes a median area between the two directions of travel.

The SFOBB Toll Plaza is located approximately 655 feet (200 meters) west of the distribution structure and extends across the westbound I-80 lanes (see Figure 14). SFOBB Toll Plaza administrative facilities, maintenance buildings, tow-truck operations base, and the SFOBB Traffic Operations Center are located south of the SFOBB Toll Plaza within the median area. SFOBB Toll Plaza workers also park in this area.

The Caltrans maintenance road extends the length of the project area within the Oakland Touchdown area on the south side of I-80. The roadway continues under the SFOBB and provides access to the north side of the bridge. Burma Road is also located on the south side of the Oakland Touchdown. It extends from Maritime Street to the west end of the touchdown and is roughly parallel to the maintenance road. Burma Road was constructed by the U.S. Army and is now used by the Port under a lease agreement. This roadway is blocked to public vehicular access about 1 mile (1.6 kilometers) from the west end of the touchdown. At this point, traffic is diverted onto the Caltrans maintenance road.

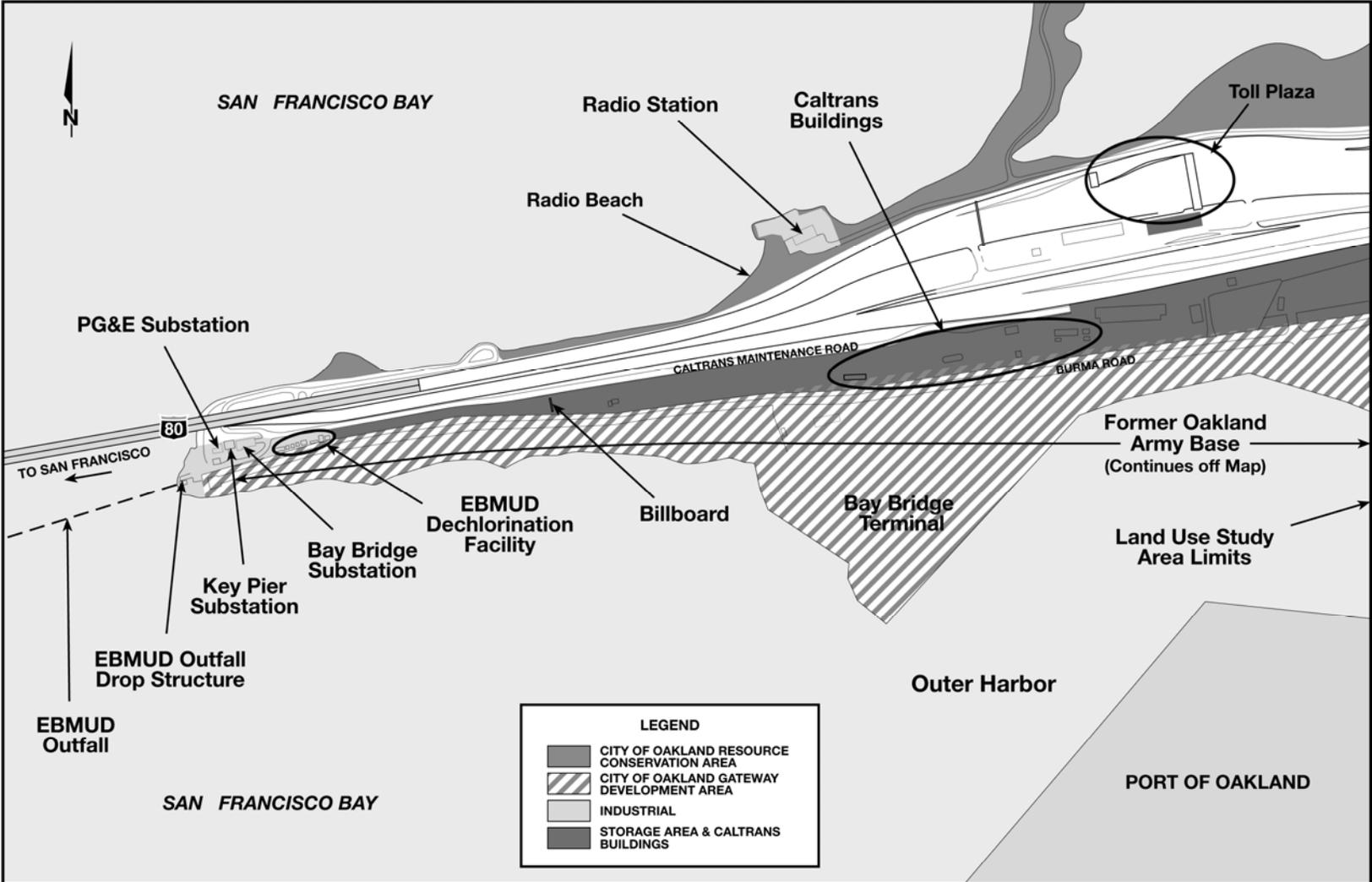
Various Caltrans storage, repair, and maintenance facilities are located between the maintenance road and Burma Road, at the west end of the Oakland Touchdown area. Caltrans' Bay Bridge Substation and the Key Pier Substation, which were used during the era when the bridge carried trains, are also located in this area and are currently used for Caltrans maintenance activities. An East Bay Municipal Utility District (EBMUD) final dechlorination treatment station and outfall are also located in this area. The sewer outfall is 8 feet (2.4 meters) in diameter, 3.1 miles (5 kilometers) long, and extends 1 mile (1.6 kilometers) into the Bay.

A storage area for Caltrans construction materials and maintenance activities extends for about 1 mile (1.6 kilometers) between the maintenance road and Burma Road. This property is owned by the City of Oakland. A billboard owned by the Port is also located within this area. It is designated for community non-profit organizations and Oakland Airport-related media.

Four additional Caltrans buildings are located south of the SFOBB Toll Plaza and the maintenance road (see Figure 14). The buildings are used for storage, maintenance, and repair materials associated with general maintenance of the bridge.

### **South Side of the Oakland Touchdown Area**

The Port property extends from the south side of the Oakland Touchdown area and continues south along the San Francisco Bay shoreline to the Inner Harbor between the cities of Oakland and Alameda. The Port is a highly developed area of industrial, maritime, transportation, and commercial uses. Its deep-water berths and container cranes are supported by a network of warehouses, roadways connecting to freeways, and intermodal railyards. The Port also operates numerous non-maritime-related activities along its 19 miles (30 kilometers) of shoreline, including commercial real estate, two airports, recreational parks, wildlife refuges, and industrial facilities.



## Attachment 4: Total Project and Site Information

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The U.S. Army owns and controls the property on the south side of the Oakland Touchdown area, including Burma Road. Army property extends from near the end of the touchdown eastward and includes land on the east side of Maritime Street. The Oakland Army Base (OARB) Military Traffic Management Command Center operated from this property until the Oakland Army Base was decommissioned in September 1999. The Oakland Army Base Reuse Authority (OBRA) together with the U.S. Army, the City of Oakland, and the Port, recently adopted the Oakland Army Base Reuse Plan through the Base Realignment and Closure (BRAC) process. Within this property, the Port operates the Bay Bridge public terminal on the shoreline south of the SFOBB Toll Plaza. The terminal currently handles break bulk (non-containerized) cargo. The Port plans to operate the terminal in the near term.

A container freight storage area is located between Burma Road and the maintenance road, south of the SFOBB Toll Plaza. AMNAV, a private shipping company, is located on the south side of Burma Road and uses Pier 8 (adjacent to the Bay Bridge public terminal) for tug services. Burma Road continues eastward where it intersects with Maritime Street, which then intersects with West Grand Avenue. West Grand Avenue provides access to and from I-80. A large shipping container storage area is located on property west of this intersection.

### North Side of the Oakland Touchdown Area

The strip of land on the north side of the East Span is designated as a Resource Conservation Area in the City of Oakland General Plan.<sup>2</sup> Caltrans has a permanent easement on the western-most 164 feet (50 meters) of land to the north of the bridge; beyond this boundary, the land is owned by the Port. The Resource Conservation Area continues nearly 2 miles (3.2 kilometers) eastward from the touchdown before turning northward towards Emeryville.

The 1-mile (1.6-kilometer) stretch of shoreline in Emeryville, known as the Emeryville Crescent, provides sensitive habitat for a variety of wildlife and special status species. The project area for the East Span Project ends at Radio Beach, roughly 3,300 feet (1,000 meters) from the western end of the touchdown and approximately 1.5 miles (2.4 kilometers) from the Emeryville Crescent (see Figure 2).

### Vegetation

Ruderal vegetation occurs at the Oakland Touchdown area on the former Oakland Army Base property and at scattered sites along the north side of the existing roadway. The vegetation on the former Oakland Army Base provides winter roosting habitat for shorebird species during high tides, including the western sandpiper (*Calidris mauri*), semipalmated plover (*Charadrius semipalmatus*), and dunlin (*Calidris alpina*).<sup>3</sup> Small patches of northern foredune and landscaped vegetation occur along the north side of the Oakland Touchdown area. Ornamental landscape species at the Oakland Touchdown include iceplant (*Carpobrotus edulis*), Monterey pine (*Pinus radiata*), and acacia (*Acacia spp.*).

A narrow strip of northern coastal salt marsh occurs along the north side of Radio Beach. Sand flats also occur on the north shore of the Oakland Touchdown between Radio Beach and the eastern bridge abutment. During low tide, sand flats provide foraging and roosting areas for shorebirds that utilize the Bay during spring and fall migration. However, the habitat value of the sand flats in the project area is diminished by the abrupt transition with adjacent uplands and the lack of adjacent wetland habitats. The existing shoreline adjacent to the sand flats at the Oakland Touchdown is protected with rock riprap and the uplands are landscaped with non-native vegetation. Eelgrass beds occur in the intertidal areas just north of the bridge approach at the Oakland Touchdown.

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<sup>2</sup> City of Oakland General Plan, March 1998.

<sup>3</sup> Caltrans, Memorandum regarding Wintering Bird Surveys Along the Cypress Reconstruction Mitigation Bike Path, August 1995.

## **Attachment 4: Total Project and Site Information**

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**Item k-2. Please describe the area, in square feet, within the total project site that will be used for: (1) structures, roads, and parking; (2) landscaping; and (3) left undeveloped.**

Refer to Table 4-1 for the total area required for structures, roads, parking, and undeveloped area.

**Item k-3. Please indicate whether the project will involve the release of pollutants or have the potential for accidental pollutant discharge into the Bay.**

Construction of the East Span Project could accidentally discharge pollutants into the Bay such as:

- Sediment from areas that have been cleared, graded, excavated, or disturbed by stockpiling;
- Construction debris;
- Contaminated ground water from excavations;
- Fuel and lubricants for equipment stored on barges; and
- Dredging and dredged material disposal.

Caltrans manages all storm and non-storm water discharges associated with construction activities in accordance with the requirements of Order No. 99-06-DWQ issued by the State Water Resources Control Board. The order requires that a SWPPP be prepared for the East Span Project. The SWPPP is prepared prior to construction and details the structural and procedural control measures that would be implemented by the contractor during construction activities to address soil stabilization, sediment control, sediment tracking control, wind erosion control, non-storm water discharge management, and waste management and disposal control practices. The SWPPP would specify soil and material storage locations and the control measures to be implemented at those locations to prevent conveyance of material into water bodies.

The SWPPP would also outline measures and BMPs that would be implemented to control and prevent, to the maximum extent practicable, non-storm water discharge of pollutants to surface and ground waters. In addition, the SWPPP would have a plan for responding to and managing accidental spills during construction, and a plan for managing and disposing of pumped ground water. The SWPPP would address overall management of the construction project such as designating areas for material storage, equipment fueling, concrete washouts, and stockpiles.

Caltrans will obtain a Clean Water Act Section 401 Water Quality Certification from the Regional Water Quality Control Board (RWQCB) for dredging and disposal of dredged material in the Bay.

**Item k-4. Please identify any suspected or known sites of toxic contamination on or in proximity to the project site, and provide the following information: (a) identify the types of pollutants present; (b) show the location of the pollutants on a site plan; (c) describe the extent to which the pollutants are accessible to humans, fish, wildlife or vegetation, or are moving offsite; and (d) steps being taken (including governmental actions) to control or clean up the pollutants.**

The following sites with suspected or known toxic contamination have been identified on or in proximity to the project site (see Figures 15 and 16):

### **NAVAL STATION TREASURE ISLAND (NSTI)**

NSTI is implementing closure activities under a BRAC Cleanup Plan as mandated by federal policy. In preparation for closure, remedial investigations have been performed at the NSTI. Contaminants found during the investigation include petroleum hydrocarbons and heavy metals. These contaminants have

**Table 4-1  
Project Element Quantities - Permanent Structures**

Project Element	Area Within Shoreline Band		Area Within Bay		Area Outside BCDC Jurisdiction		Total Project Area	
	Square Feet	Square Meters	Square Feet	Square Meters	Square Feet	Square Meters	Square Feet	Square Meters
<b>YBI Transition/Suspension Span</b>								
Bridge Deck	44,122	4,099	348,807	32,405	270,015	25,085	662,944	61,589
Bike/Pedestrian Path and Belvederes	4,359	405	28,169	2,617	47,243	4,389	79,772	7,411
Support Piers/Piles and Pile Caps	452	42	17,384	1,615	3,143	292	20,979	1,949
Fenders	0	0	10,310	958	0	0	10,310	958
USCG Road (net)	0	0	0	0	8,654	804	8,654	804
Southgate Road (net)	0	0	0	0	1,163	108	1,163	108
Macalla Road (net)	0	0	0	0	5,877	546	5,877	546
Torpedo Factory Road (net)	0	0	0	0	4,801	446	4,801	446
Landscaping <sup>a</sup>	TBD	TBD	0	0	TBD	TBD	TBD	TBD
Grading	0	0	0	0	46,016	4,275	46,016	4,275
<b>Skyway</b>								
Bridge Deck	0	0	1,191,708	110,712	0	0	1,191,708	110,712
Bike/Pedestrian Path and Belvederes	0	0	129,371	12,019	0	0	129,371	12,019
Support Piers/Piles/Pile Caps	0	0	77,565	7,206	0	0	77,565	7,206
Fenders	0	0	13,976	1,298	0	0	13,976	1,298
<b>Oakland Touchdown Structure and Approaches</b>								
Bridge Deck	57,178	5,312	121,483	11,286	8,138	756	186,799	17,354
Bike/Pedestrian Path and Belvederes	8,364	777	6,598	613	16,275	1,512	31,237	2,902
Support Piers/Piles/Pile Caps	334	31	11,862	1,102	0	0	12,196	1,133
At-grade W I-80 (Pavement)	107,059	9,946	55,941	5,197	65,973	6,129	228,972	21,272
At-grade E I-80 (Pavement)	26,533	2,465	0	0	155,131	14,412	181,664	16,877
Realign Caltrans Maintenance Road (Pavement)	36,630	3,403	2,982	277	96,919	9,004	136,531	12,684
Shoreline Protection Westbound Road <sup>b</sup>	0	0	0	0	0	0	0	0
Shoreline Protection Caltrans Maint. Road <sup>b</sup>	0	0	0	0	0	0	0	0
Public Access Parking/Staging	0	0	0	0	15,888	1,476	15,888	1,476
Landscaping	0	0	0	0	0	0	0	0
Oakland Mole Substation	0	0	0	0	3,810	354	3,810	354
<b>Geofill/Surcharge Material</b>								
Engineered Fill Westbound Road	64,713	6,012	144,324	13,408	0	0	209,037	19,420
Engineered Fill Caltrans Maintenance Road	6,297	585	12,658	1,176	0	0	18,955	1,761

Notes:

<sup>a</sup>Caltrans would prepare a landscape plan for those areas on YBI that are disturbed during construction. The area of landscaping is not known at this time.

<sup>b</sup>Shoreline protection is included in the fill footprint of the Westbound Roadway and the Caltrans Maintenance Road under the Geofill Contract.

<sup>c</sup>Caltrans is seeking to obtain two staging areas at or near the Oakland Touchdown the size of which is dependent upon negotiations with the property owners.

**Table 4-1 (Continued)**  
**Project Element Quantities - Temporary Structures**

Project Element	Area Within Shoreline Band		Area Within Bay		Area Outside BCDC Jurisdiction		Total Project Area	
	Square Feet	Square Meters	Square Feet	Square Meters	Square Feet	Square Meters	Square Feet	Square Meters
<b>YBI Transition/Suspension Span</b>								
Barge Dock A - near Clipper Cove	0	0	17,459	1,622	0	0	17,459	1,622
Construction Access Trestle	65	6	5,587	519	0	0	5,651	525
Falsework	5,866	545	69,858	6,490	4,532	421	80,256	7,456
Falsework Piers	420	39	9,225	857	0	0	9,645	896
Cofferdams	248	23	4,316	401	0	0	4,564	424
Construction Staging Area	3,875	360	0	0	73,626	6,840	77,501	7,200
Temporary Detours - I 80 East	0	0	0	0	96,306	8,947	96,306	8,947
Temporary Detours - I 80 West	0	0	0	0	73,443	6,823	73,443	6,823
Temporary Detours - Ramps	0	0	0	0	14,574	1,354	14,574	1,354
Temporary USCG Road	6,889	640	0	0	21,001	1,951	27,890	2,591
Temporary Macalla	0	0	0	0	12,971	1,205	12,971	1,205
Temporary Torpedo Factory Road	6,329	588	0	0	2,626	244	8,956	832
<b>Skyway</b>								
Construction Access Trestle Region	0	0	75,348	7,000	0	0	75,348	7,000
Falsework	0	0	268,928	24,984	0	0	268,928	24,984
Falsework Piers	0	0	78,642	7,306	0	0	78,642	7,306
Cofferdams	0	0	33,670	3,128	0	0	33,670	3,128
<b>Oakland Touchdown Structure and Approaches</b>								
Caltrans Maintenance Road Detour	0	0	0	0	55,327	5,140	55,327	5,140
Construction Access Trestle Region	0	0	150,696	14,000	0	0	150,696	14,000
Falsework	0	0	21,140	1,964	0	0	21,140	1,964
Falsework Piers	6,781	630	11,883	1,104	646	60	19,311	1,794
Cofferdams	344	32	4,219	392	0	0	4,564	424
Construction Staging Areas <sup>c</sup>	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
EB Detour	0	0	0	0	177,423	16,483	177,423	16,483
<b>Geofill/Surcharge Material</b>								
Geotube Westbound Road	527	49	28,309	2,630	0	0	28,837	2,679
Geotube Caltrans Maintenance Road	0	0	4,306	400	0	0	4,306	400

Notes:

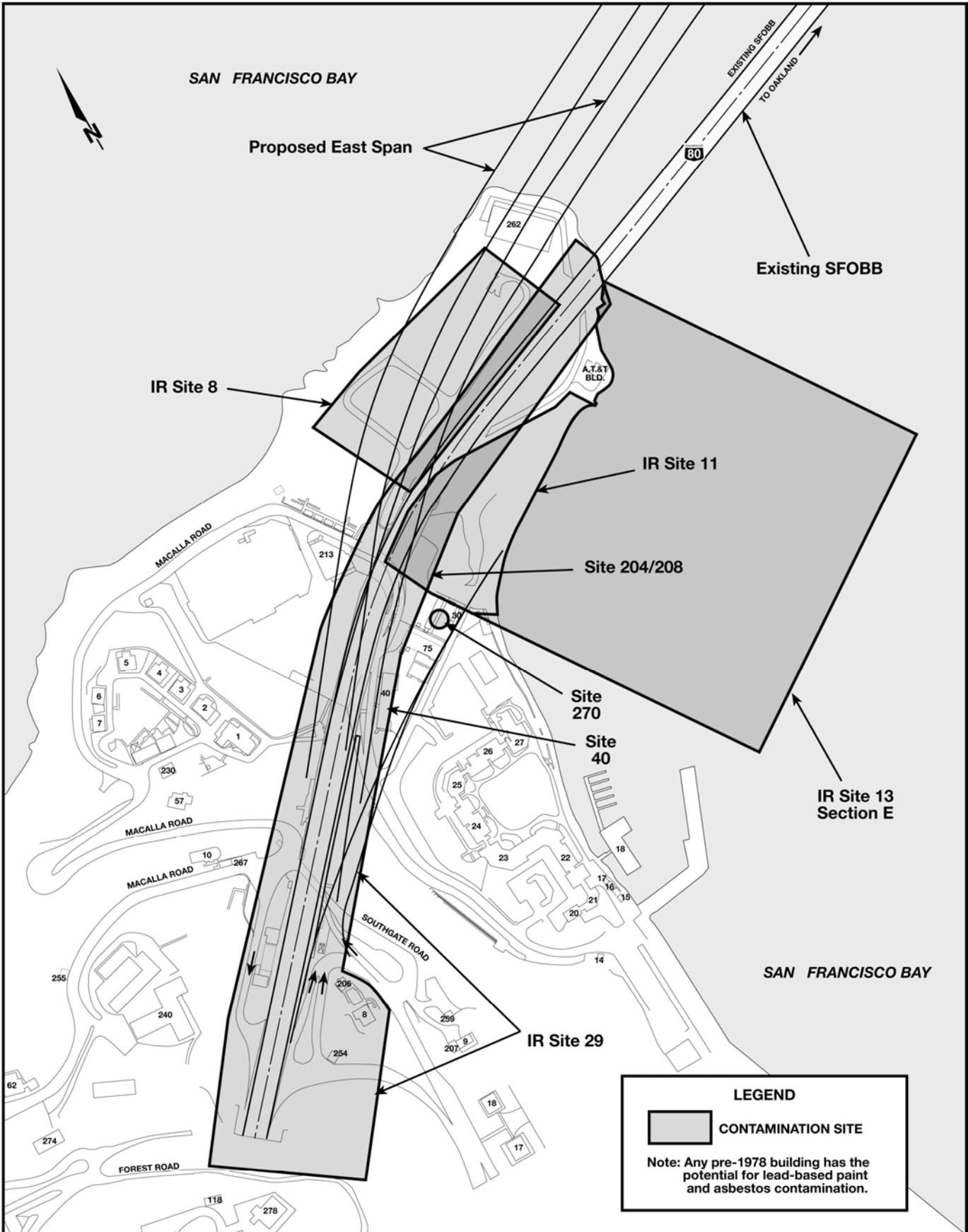
<sup>a</sup>Caltrans would prepare a landscape plan for those areas on YBI that are disturbed during construction. The area of landscaping is not known at this time.

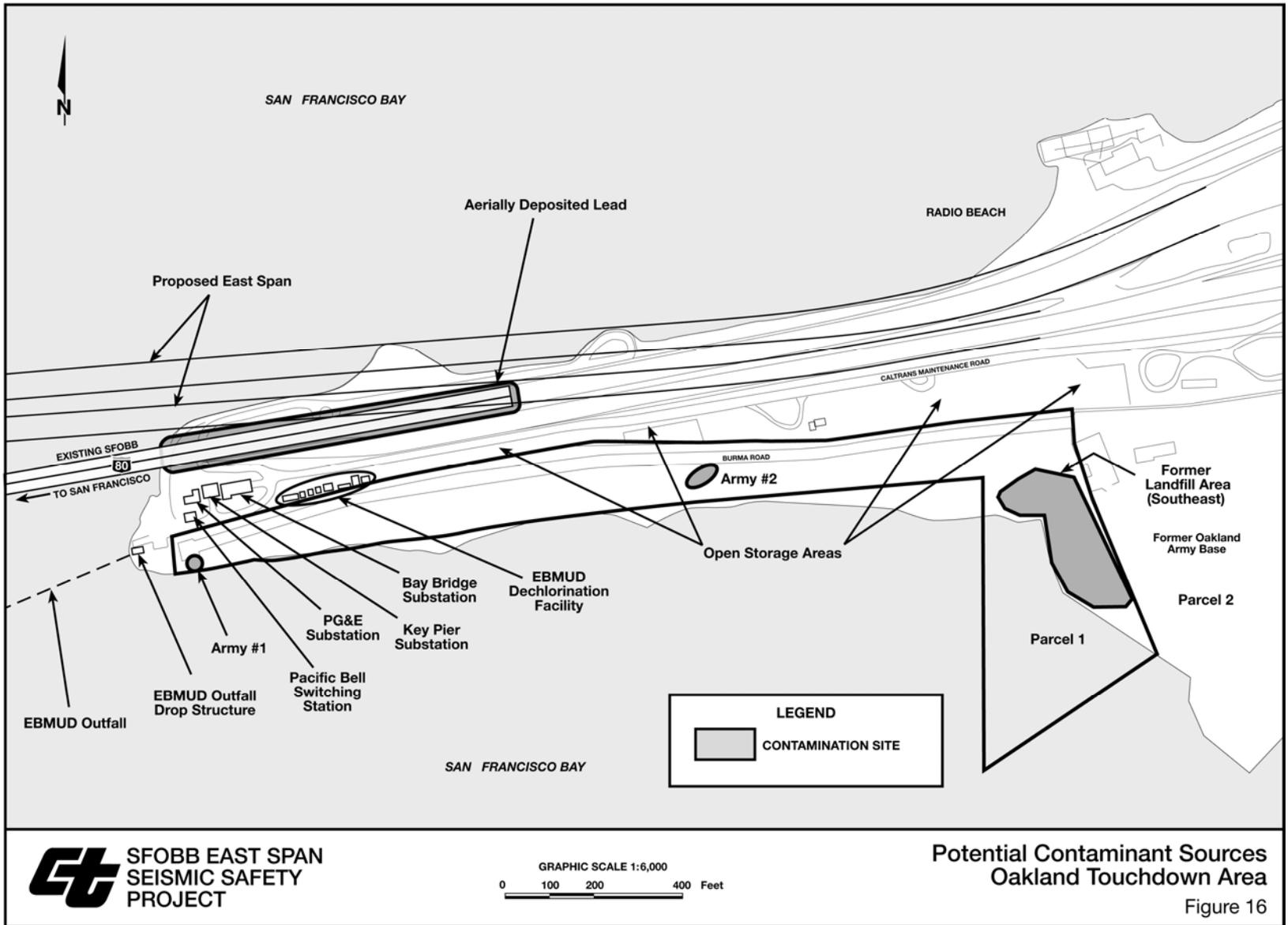
<sup>b</sup>Shoreline protection is included in the fill footprint of the Westbound Roadway and the Caltrans Maintenance Road under the Geofill Contract.

<sup>c</sup>Caltrans is seeking to obtain two staging areas at or near the Oakland Touchdown the size of which is dependent upon negotiations with the property owners.

Calvin Lee  
16-May-01  
Parsons Brinckerhoff  
Quantity Estimate

Item	Existing Area (sq. m.)	Proposed Area (sq. m.)	Net Area (sq. m.)
Bridge	13944	30815	16871
Ramp	832	750	-82
Macalla Road	1150	1371	221
SG Road	1267	1447	180
CG Road	1606	2495	889
Torpedo Road	371	772	401





## **Attachment 4: Total Project and Site Information**

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been attributed to underground transmission and storage of fuel, placement of soil and debris as fill, and deposition of lead-based paint from maintenance of the existing bridge.

The primary disturbances to these contaminants from the East Span Project would be excavation of contaminated soil, discharges of ground water removed from excavations, and migration of contaminants due to pile driving. Caltrans would take the following measures to mitigate these impacts only as they relate to project construction for the East Span Project:

- Contaminated soil would be removed and disposed outside BCDC's jurisdiction, in accordance with applicable federal, state, and local regulations and the BRAC Clean Up Plan;
- Contaminated ground water would be treated on-site prior to discharge or transported to a permitted off-site treatment facility outside BCDC's jurisdiction; and
- Pile excavations would be isolated from surrounding contaminant plumes to prevent contaminant migration.

In addition, contractors on the project would be given information regarding the contaminants so that procedures can be developed to minimize potential health hazards due to exposure.

### **OAKLAND ARMY BASE (OARB)**

The OARB is located south of the project site at the Oakland Touchdown area. The OARB is also operating base closure activities under a BRAC Cleanup Plan. While the area is still under investigation, contaminants identified at the OARB include petroleum hydrocarbons and heavy metals. There is no known off-site migration of contaminants and the East Span Project does not directly impact this site.

### **CALTRANS' RIGHT-OF-WAY AND MAINTENANCE FACILITY**

The areas beneath and adjacent to the existing SFOBB structure and east approach roadway contain contaminants resulting from bridge maintenance and vehicle operation. The identified contaminants include petroleum hydrocarbons and heavy metals such as lead. The primary impacts and mitigation methods are the same as those for the NSTI site.

### **EAST BAY MUNICIPAL UTILITY DISTRICT DECHLORINATION FACILITY**

This facility is located south of the project site at the Oakland Touchdown area. There is a potential for sodium bisulfide in soils on the site. There is no known or suspected off-site migration of contaminants and the East Span Project does not directly impact this site.

# Box 5

## Bay Fill Information

("Fill" means earth or any other substance or material, including pilings or structures placed on pilings, and structures floating at some or all times and moored for extended periods, such as houseboats and floating docks.)

- a. Total volume of solid fill to be placed in water or marsh areas:  
Permanent fill: 103,253 cubic yards/78,942 cubic meters  
Temporary fill: 62,910 cubic yards/48,098 cubic meters
- b. Area to be covered with solid fill: (See Tables 5-1 and 5-2 for items b. – e.)
- c. Area to be covered with floating fill:
- d. Area to be covered with pile-supported fill:
- e. Area to be covered with cantilevered fill:
- f. Total area to be filled:  
Permanent fill: 45.52 acres/18.42 hectares  
Temporary fill: 14.15 acres/5.72 hectares
- g. Of the total area specified in "f", (See Tables 5-1 and 5-2 for item g.) open water area to be filled:  
Permanent fill:  
Temporary fill:
- h. Tidal marsh or wetland area to be filled: (See Figures 35 and 36)  
Permanent fill: 3.03 acres/1.23 hectares  
Temporary fill: 0.80 acres/0.32 hectares
- i. Salt pond area to be filled: N/A
- j. Managed wetland area in the primary management area of the Suisun Marsh to be filled: N/A
- k. Other managed wetland area to be filled: N/A
- l. Area on new fill to be reserved for private, commercial, or other uses: 41.75 acres/16.90 hectares
- m. Area on new fill to be reserved for public access: 3.77 acres/ 1.52 hectares
- n. What is the basic purpose of the new fill in the Bay, salt pond, managed wetland, or certain waterway?  
See Attachment 5
- o. **INFORMATION REGARDING FILL TO BE PROVIDED IN AN ATTACHMENT:**
1. Please specify the area of fill, in square feet, proposed to be covered by structures; used for roads; used for parking; used for pathways and sidewalks; covered with landscaping; used for piers, docks, and other maritime-related purposes; placed for shoreline protection; and used for other purposes (specify uses).  
See Table 4-1 in Attachment 4.
  2. Please provide dimensions of portions of all structures to be built on new fill, including length, width, area, height and number of stories.  
See Table 4-1 in Attachment 4.
  3. Please provide one or more photographs of existing shoreline conditions.  
See Figures 17-30 in Attachment 5.

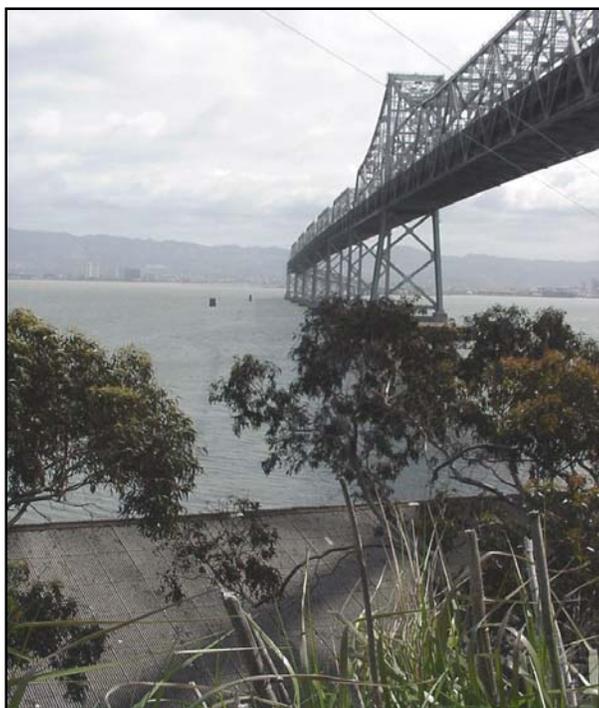
(Box 5, Bay Fill Information, continued)

**p. PROVIDE THE FOLLOWING INFORMATION TO JUSTIFY THE PROPOSED FILL:**

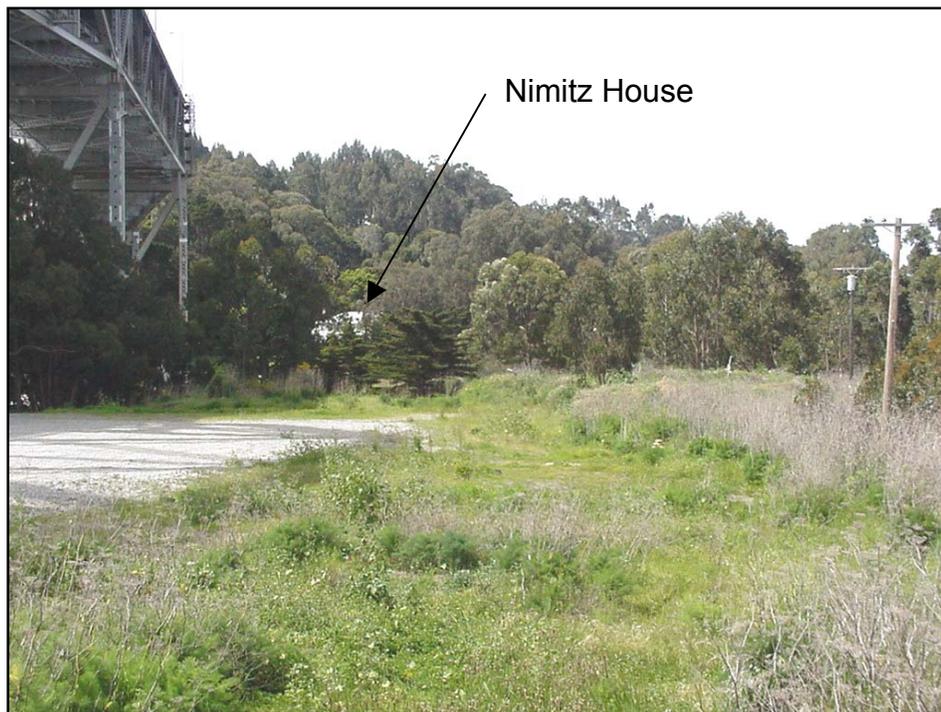
The information requested below is provided in Attachment 5.

1. The Commission can approve new fill for only five purposes: (1) accommodating a water-oriented use; (2) improving shoreline appearance; (3) providing new public access to the Bay; (4) accommodating a project that is necessary to the health, safety, or welfare of the public in the entire Bay Area; and (5) accommodating a project that is consistent with either: (1) the Suisun Marsh Preservation Act and the Suisun Marsh Protection Plan; or (2) the Suisun Marsh Local Protection Program. Please explain how the project is consistent with one or more of these purposes.
2. Please explain (a) why the fill proposed is the minimum amount necessary; and (b) why there is no alternative upland location for the project that would avoid the need for Bay fill.
3. If the fill is to be used for improving shoreline appearance or providing new public access to the Bay, please explain why it is physically impossible or economically infeasible to accomplish these goals without filling the Bay.
4. Please explain how the fill will result in a stable and permanent shoreline.
5. Please explain the steps that will be taken to assure that the project will provide reasonable protection to persons and property against hazards of unstable geologic or soil conditions or of flood or storm waters.
6. Please provide the names, addresses, and telephone numbers of any licensed geologists, engineers, or architects involved in the project design who can provide technical information and certify to the safety of the project.
7. Please describe in detail the anticipated impacts of the fill on the tidal environment, describe how these impacts will be addressed or mitigated, and explain how the public benefits of the project would exceed the public detriment from the loss of water area or marshlands.
8. For marina projects, please indicate how many berths, if any, are to be made available for live-aboard boats and explain how these live-aboard boats will contribute to public trust purposes.
9. Please identify any other specific policies of the McAteer-Petris Act (California Government Code Title 7.2, especially Section 66605), the Suisun Marsh Preservation Act (California Public Resources Code Sections 29000-29612), the San Francisco Bay Plan and the Suisun Marsh Preservation Plan, and the Commission's regulations regarding minor fill for improving public access and shoreline appearance, that are relevant to and offer support for the project and explain how the project is consistent with these policies.

Fig 17



View of proposed project area looking over the roof of Building 262



View of existing bridge looking west towards the Nimitz House





View of existing bridge looking west toward Nimitz House



View of existing bridge looking west in the vicinity of the YBI portal



**SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT**

YBI Views

Figure 18



View looking west along Macalla Road (YBI) showing the proposed barge dock location and location of eelgrass beds



View of existing bridge footing on the east shore of YBI near Building 262



**SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT**

**YBI Views**

Figure 19



View of existing vegetation and proposed location of temporary detour to be located south of the existing structure on YBI



View of Radio Beach looking east towards Emeryville and Berkeley



**SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT**

**YBI and Oakland  
Touchdown Views**

Figure 20



View of wetland vegetation at Radio Beach



Sand flat habitat located along the northern shore of Oakland Touchdown area



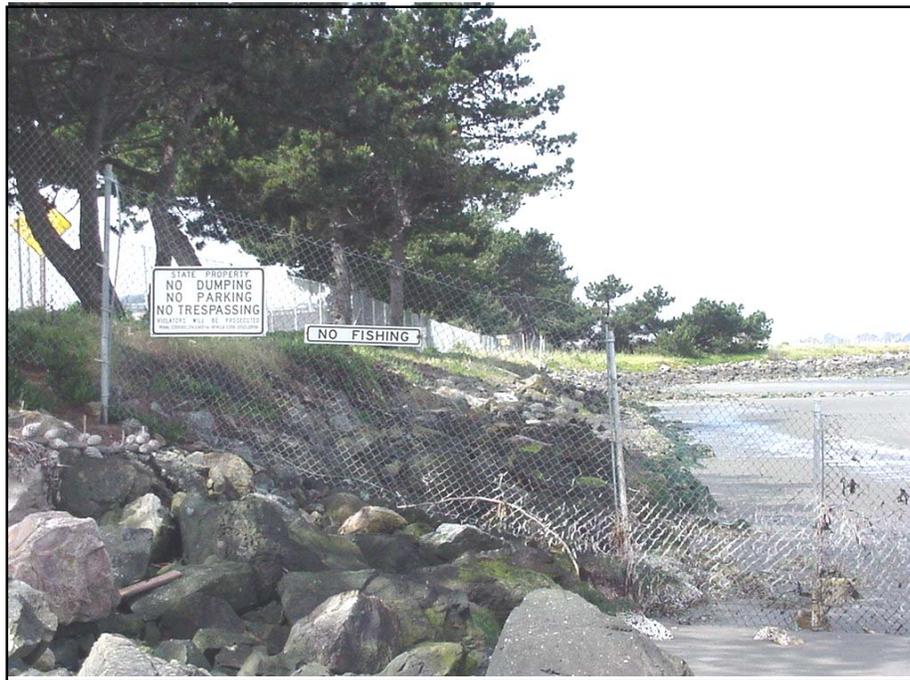
**SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT**

Oakland Touchdown Views

Figure 21



View of existing rock slope protection and sand flats located on the northern shore of the Oakland Touchdown area



View of existing rock slope protection located along the northern slope of the Oakland Touchdown area



**SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT**

Oakland Touchdown Views

Figure 22



Existing rock slope protection and sand flat habitat located along the northern slope of the Oakland Touchdown



View of the proposed project area looking west at the Oakland Touchdown area



**SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT**

Oakland Touchdown Views

Figure 23



View of the existing Caltrans maintenance road located along the southern side of the bridge approach at the Oakland Touchdown area



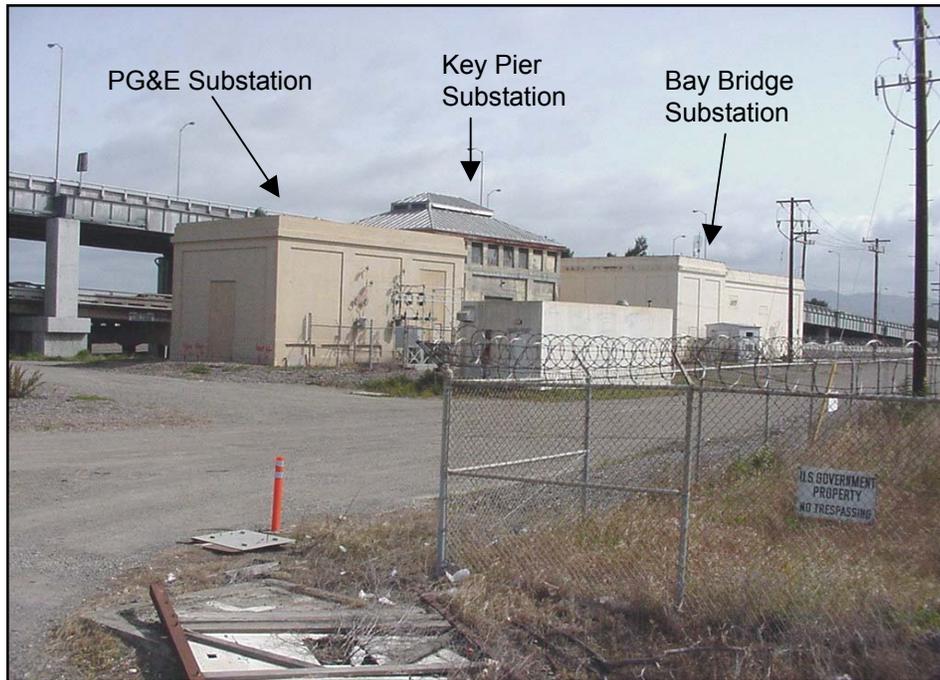
View of existing Caltrans maintenance road located along the north side of the existing bridge at the Oakland Touchdown area



**SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT**

Oakland Touchdown Views

Figure 24



View looking north at the Oakland Touchdown area towards the PG&E Substation



View looking east at the Oakland Touchdown area across the proposed EBRPD Gateway Park



**SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT**

Oakland Touchdown Views

Figure 25



**SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT**

View of Yerba Buena Island Touchdown – Looking South



**SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT**

View of Yerba Buena Island Tunnel - Looking West

Figure 27



**SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT**

View of Yerba Buena Island Touchdown – Looking North



**SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT**

View of the Oakland Touchdown – Looking West



SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

View of the Oakland Touchdown – Looking East

Items p 1-8.

### MCATEER-PETRIS ACT

Section 66605 of the McAteer-Petris Act states that fill should be authorized only when; (a) public benefits from fill clearly exceed public detriment from the loss of the water areas and should be limited to water-oriented uses, such as bridges; (b) that there is no alternative upland location; (c) that the fill is the minimum necessary to achieve the project purpose; (d) the nature, location and extent of any fill minimizes the harmful effects to the bay; (f) the fill establishes a permanent shoreline; and (g) the applicant has valid title to the properties in question.

### PROPOSED BAY FILL

The proposed project would place approximately 103,253 cubic yards (78,942 cubic meters) of permanent fill covering approximately 45.52 acres (18.42 hectares) of Bay surface area (see Table 5-1 for a detailed breakdown of permanent Bay fill). This includes approximately 41.93 acres (16.96 hectares) of high-level suspended fill represented by the side-by-side bridge decks and the bicycle and pedestrian path from which there would be few impacts to Bay-related resources.

Proposed permanent fill includes:

- Submerged fill for piles and pile caps to support the bridge piers at the main span, the skyway and the Oakland approach;
- Submerged fill for fenders to protect the bridge from ship collisions at the main span and the skyway;
- High-level suspended and pile-supported fill for the bridge deck and the bicycle and pedestrian path;
- Solid engineered fill (geotechnical) for the westbound roadway and shoreline protection at the Oakland Touchdown area; and
- Solid engineered fill (geotechnical) to relocate the Caltrans maintenance road and provide shoreline protection at the Oakland Touchdown area.

In addition to the permanent fill, the proposed project would place approximately 62,910 cubic yards (48,098 cubic meters) of temporary fill covering approximately 14.15 acres (5.72 hectares) of Bay surface area (see Table 5-2 for a detailed break down of temporary Bay fill). This includes approximately 7.77 acres (3.15 hectares) of high-level suspended and pile-supported fill for falsework from which there would be few impacts to Bay-related resources. All temporary fill would be removed at the completion of the project.

Proposed temporary fill includes:

- Pile-supported fill for a barge dock at YBI to facilitate the movement of construction supplies, equipment and personnel;
- Pile-supported fill for construction access trestles at the main span, the skyway and the Oakland approach;
- High-level suspended and pile-supported fill for falsework and falsework piers at the main span, the skyway and the Oakland approach to erect various portions of the new bridge;

**Table 5-1  
Permanent Fill In BCDC Jurisdiction**

Project Element	Fill Type	BCDC BAY FILL AREA				BCDC BAY FILL VOLUME	
		Square Feet	Square Meters	Acres	Hectares	Cubic Yards	Cubic Meters
<b>YBI Transition/Suspension Span</b>							
Piles/Pile Caps (2 piles/pile caps) <sup>a</sup>	Submerged	0	0	0.00	0.00	16,786	12,834
Fenders (2 fenders) <sup>a</sup>	Submerged	0	0	0.00	0.00	2502	1,913
Bridge Deck <sup>b</sup>	High-Level	348,807	32,405	8.01	3.24	0	0
Bicycle/Pedestrian Path and Belvederes	High-Level	28,169	2,617	0.65	0.26	0	0
<b>Skyway</b>							
Piles/Pile Caps (28 piles/pile caps) <sup>a</sup>	Submerged	0	0	0.00	0.00	32,819	25092
Fenders (6 fenders) <sup>a</sup>	Submerged	0	0	0.00	0.00	4,210	3219
Bridge Deck <sup>b</sup>	High-Level	1,191,704	110,712	27.36	11.07	0	0
Bicycle/Pedestrian Path and Belvederes	High-Level	129,373	12,019	2.97	1.20	0	0
<b>Oakland Touchdown Structures and Approaches</b>							
Piles/Pile Caps (9 piles/pile caps) <sup>a</sup>	Submerged	0	0	0.00	0.00	1,354	1,035
Bridge Deck <sup>b</sup>	High-Level	121,483	11,286	2.79	1.13	10	7
Bicycle/Pedestrian Path and Belvederes	High-Level	6,598	613	0.15	0.06	0	0
<b>Geofill/Surcharge Material</b>							
Engineered Fill Westbound Road	Solid/Earthen	144,324	13,408	3.31	1.34	44,272	33,848
Shoreline Protection Westbound Road <sup>c</sup>	Solid	0	0	0.00	0.00	0	0
Engineered Fill Maintenance Road	Solid/Earthen	12,658	1,176	0.29	0.12	1,300	994
Shoreline Protection Maintenance Road <sup>c</sup>	Solid	0	0	0.00	0.00	0	0
<b>TOTAL FILL</b>		<b>1,983,116</b>	<b>184,236</b>	<b>45.52</b>	<b>18</b>	<b>103,253</b>	<b>78,942</b>
<b>Existing Structure/Dredging</b>							
Piers (21 piles) <sup>a</sup>	Submerged	0	0	0.00	0.00	-74,144	-56,687
Fenders (4 fenders) <sup>a</sup>	Submerged	0	0	0.00	0.00	-4,685	-3,582
Bridge Deck	High-Level	-544,389	-50,575	-12.50	-5.06	0	0
Net Removal of Sediment (dredging)	Earthen	0	0	0.00	0.00	-364,910	-278,994
<b>TOTAL NET FILL</b>		<b>1,438,727</b>	<b>133,661</b>	<b>33.03</b>	<b>13.37</b>	<b>-340486</b>	<b>-260321</b>

Notes:

<sup>a</sup>Piers, piles, pile caps and fenders all fall within the footprint (area) of the bridge deck and therefore do not contribute to the overall area of permanent fill.

<sup>b</sup>The bridge deck includes the maintenance platforms.

<sup>c</sup>Shoreline protection falls within the footprint of the westbound road or the maintenance road and therefore does not contribute to the overall area of permanent fill.

Fill quantities based on BCDC MHTL of +2.68 feet (NGVD).

**Table 5-2  
Temporary Fill In BCDC Jurisdiction**

Project Element	Fill Type	BCDC BAY FILL AREA				BCDC BAY FILL VOLUME	
		Square Feet	Square Meters	Acres	Hectares	Cubic Yards	Cubic Meters
<b>YBI Transition/Suspension Span</b>							
Barge Dock- near Clipper Cove	Pile-Supported	17,459	1,622	0.40	0.16	81	62
Construction Access Trestle	Pile-Supported	5,587	519	0.13	0.05	60	46
Falsework	Pile-Supported	69,858	6,490	1.60	0.65	0	0
Falsework Piers (2 footings, 4 piers) <sup>a</sup>	Submerged	0	0	0.00	0.00	2,776	2,122
Cofferdams (2 cofferdams) <sup>a</sup>	Submerged	0	0	0.00	0.00	12,072	9,230
<b>Skyway</b>							
Construction Access Trestle	Pile-Supported	75,348	7,000	1.73	0.70	199	152
Falsework	Pile-Supported	268,928	24,984	6.17	2.50	0	0
Falsework Piers (6 footings) <sup>a</sup>	Submerged	0	0	0.00	0.00	592	452
Cofferdams (28 cofferdams) <sup>a</sup>	Submerged	0	0	0.00	0.00	26,928	20,588
<b>Oakland Touchdown Structures And Approaches</b>							
Construction Access Trestle	Pile-Supported	150,696	14,000	3.46	1.40	508	389
Falsework <sup>b</sup>	Pile-Supported	0	0	0.00	0.00	0	0
Falsework Piers (4 footings) <sup>a</sup>	Submerged	0	0	0.00	0.00	695	531
Cofferdams (7 cofferdams) <sup>a</sup>	Submerged	0	0	0.00	0.00	1,500	1,147
<b>Geofill/Surcharge Material</b>							
Tidal Berm (Geotube) Westbound Road	Solid	28,309	2,630	0.65	0.26	16,667	12,743
Tidal Berm (Geotube) Maintenance Road <sup>c</sup>	Solid	0	0	0.00	0.00	833	637
<b>TOTAL FILL</b>		<b>616,185</b>	<b>57,245</b>	<b>14.15</b>	<b>5.72</b>	<b>62,910</b>	<b>48,098</b>

Notes:

<sup>a</sup>Falsework piers and cofferdams fall within the footprint (area) of the falsework and therefore do not contribute to the overall area of temporary fill.

<sup>b</sup>Falsework at the Oakland Touchdown falls within the footprint of the temporary access trestles and therefore does not contribute to the overall area of temporary fill.

<sup>c</sup>The temporary tidal berm falls within the area of the maintenance road and the shadow of the elevated eastbound road, both of which are accounted for as permanent impacts.

Fill quantities based on BCDC MHTL of +2.68 feet (NGVD).

## **Attachment 5: Bay Fill Information**

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- Submerged fill for cofferdams at the main span, the skyway and the Oakland approach segments to install the piles and pile caps; and
- Solid fill for a geotube at the Oakland Touchdown area to act as a tidal berm when constructing the westbound roadway.

### **PROJECT PURPOSE AND PUBLIC BENEFITS OF FILL**

The purpose of the East Span Project is to provide a seismically upgraded vehicular crossing for current and future users between YBI and Oakland. This would provide substantial public benefits by improving public safety and minimizing economic disruptions from a maximum credible earthquake (MCE)<sup>4</sup>. An MCE on either the San Andreas or Hayward faults is expected to inflict far greater damage to the SFOBB than it experienced from the 1989 Loma Prieta earthquake. On the existing East Span, an MCE could cause a multi-span collapse, potentially resulting in numerous casualties and requiring months to reopen the bridge or years to build a replacement. A replacement bridge is being designed not only to withstand an MCE, but to also achieve a lifeline performance level between YBI and Oakland. Lifeline refers to infrastructure that is constructed to a higher standard to provide necessary post-disaster functionality and assist in emergency response efforts. A lifeline connection would provide post-earthquake access to link major population centers, emergency relief routes, emergency supply and staging centers and intermodal links with major distribution centers. Additionally, the bridge would be upgraded to meet current operation and safety standards to the maximum extent feasible.

In addition to establishing a lifeline performance level and upgrading the replacement bridge to meet current operation and safety standards, the East Span Project would provide other significant public benefits including: (1) providing approximately 6,900 total person years of employment in the local, state, and national economy; (2) providing approximately 5.6 acres (2.3 hectares) of new public access and Bay Trail connections including a bicycle and pedestrian path from the Oakland shore to YBI and a staging area with parking at the Oakland Touchdown area; and (3) providing \$8 million to the U.S. Fish and Wildlife Service (USFWS) to preserve and restore approximately 3,000 acres (1,214 hectares) of diked historic baylands at Skaggs Island in southern Sonoma County.

### **WATER-ORIENTED USE**

The permanent and temporary fill is necessary to construct a replacement bridge. The McAteer-Petris Act specifically identifies bridges as a water-oriented use. Caltrans recognizes that it proposes to place permanent, solid fill at the Oakland Touchdown area for the westbound roadway (bridge approach) and to relocate its maintenance road. While BCDC has historically viewed the placement of solid fill for roadways as being inconsistent with the McAteer-Petris and the public trust, the solid fill is necessary to provide a seismically upgraded bridge approach that can be quickly and easily repaired in the event of an MCE, to provide necessary emergency access to respond to accidents on the bridge, and to ensure safe and efficient access for maintenance personnel. The bridge approach is fundamentally linked to the bridge and provides an essential transition from land to water. The Caltrans maintenance road provides essential access to properly maintain and service the bridge. Therefore, both the approach and the maintenance road should fundamentally be considered part of the bridge and a water-oriented use under

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<sup>4</sup> An MCE is the largest earthquake reasonably capable of occurring, based on current geological knowledge. Caltrans has projected the MCE for the East Span as an earthquake of magnitude 8 (Richter scale) on the San Andreas Fault or magnitude 7-1/4 on the Hayward fault. However, while earthquakes are often described in terms of their magnitude, they can also be described in terms of their return period, which is the approximate time interval expected between two earthquakes of comparable intensity. Designers of major engineering structures design for an earthquake with a long return period of approximately 1,000 to 2,000 years, called a Safety Evaluation Event (SEE). Designers for the East Span Project are using an SEE with a 1,500-year return period in their design criteria for a replacement bridge. This SEE is an earthquake that would generate the largest rock motions expected to occur at the bridge site an average of once every 1,500 years, or ten times the projected 150-year life span of the replacement bridge. The Seismic Safety Peer Review Panel and the ground motion subcommittee of MTC's Engineering and Design Advisory Panel (EDAP) considered it appropriate to design the bridge for these ground motions.

## **Attachment 5: Bay Fill Information**

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the McAteer-Petris Act. The listing of water-oriented uses in the McAteer-Petris Act is only exemplary and BCDC has the discretion, on a case-by-case basis, to determine whether the bridge approach and the maintenance road constitute water-oriented uses.

### **FILL FOR HEALTH, SAFETY AND WELFARE**

Pursuant to Section 66632(f) of the McAteer-Petris Act, the fill for the westbound roadway and the Caltrans maintenance road is necessary to the health, safety and welfare of the entire Bay Area. Under BCDC Permit No. 11-71, BCDC approved solid fill in the Bay along the San Francisco-Oakland Bay Bridge Toll Plaza as necessary to the health, safety and welfare of the entire Bay Area. In approving BCDC Permit No 11-71 in 1971, BCDC specifically found that “the project is (1) so essential to public safety as to justify approval even if it were not consistent with the provisions of the San Francisco Bay Plan, in that the project would greatly improve public safety of thousands of travelers on the approaches of Interstate Highway 80 to the Bay Bridge, and (2) of such a scale as to be of importance to the public of the entire Bay Area because of the volume of traffic on the lanes to be affected by this project, which traffic derives from all parts of the Bay Area and beyond.” Since 1971, the Bay Bridge has become even more vital to the entire Bay Area for the movement of goods and people and is the primary vehicular link between the East Bay, San Francisco, and the peninsula. The Bay Bridge now carries far higher volumes of traffic than it did in 1971. In fact, the Bay Bridge has the highest average daily traffic volumes (272,000 vehicles per day) of any toll bridge in the world. Its importance to the Bay Area is further reflected in its designation as a lifeline connection to provide post-earthquake access to link major population centers, emergency relief routes, emergency supply and staging centers, and intermodal links with major distribution centers.

### **NO ALTERNATIVE UPLAND LOCATION**

There is no alternative upland location for the replacement bridge itself including the bridge piles, pile caps, fenders and bridge deck, which must connect the Oakland Touchdown area and YBI. By its very nature a bridge at this location must be sited over water.

There is no alternative upland location for the permanent solid fill for the westbound roadway (bridge approach) and the Caltrans maintenance road. During construction of the replacement bridge, existing traffic must be maintained with few or no disruptions during peak travel periods. There is limited land at the Oakland Touchdown area in which to maintain the existing westbound and eastbound roadways, and the existing maintenance road, construct temporary detours, site the new approach and relocate the maintenance road. Caltrans cannot site the westbound roadway entirely on upland because it would compromise the geometrics and safety of the eastbound roadway and affect access to the Caltrans maintenance road, which is necessary for emergency response.

There is no alternative upland location for the temporary structures associated with bridge construction. Barge access is necessary at YBI to facilitate the transport of construction materials, equipment and personnel to the construction site. Access on YBI is limited by the narrow and winding roadways. Transporting large construction equipment and materials would be extremely difficult using land-based access. The siting of the barge dock would take advantage of the large, flat, Parade Grounds that may be used as a contractor staging and laydown area (see Figure 8). By its very nature, a dock must be located over water and provides an essential transition from land to water.

Temporary access trestles, falsework, falsework piers, and cofferdams are needed to facilitate construction of the Oakland approach structures, the skyway and the main span. Because much of the replacement bridge would be built over water, there is no alternative upland location from which to work. Construction of the Oakland approach structures and the skyway are not feasible from land. Using large cranes and other construction equipment in shallow water areas underlain by Young Bay Mud poses a significant safety problem. Heavy construction equipment, particularly cranes and pile drivers, would likely sink into the Bay mud and tip over, causing a potential loss of life and equipment resulting in increased delays and costs. Stable working platforms are necessary to install temporary cofferdams, drive piles and install pile caps for the Oakland approach structures and the skyway. For the main span, a temporary pile-supported trestle is needed for access from the east end of YBI to the main span tower. The trestle would be used to dock small boats, access the main pier, and to lay-down materials to be lifted into place

## Attachment 5: Bay Fill Information

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by cranes on the main pier tower legs. This would be safer and more efficient than lifting the materials from a barge or boat. In addition, the trestles may be used to facilitate construction of the falsework necessary for those portions of the bridge deck that would be cast-in-place for the main span, the skyway and the Oakland approach. Falsework and falsework piers would also be used to erect various segments of the replacement bridge.

### MINIMUM FILL NECESSARY

The proposed Bay fill is the minimum necessary to achieve the project purpose. The new bridge incorporates state-of-the-art design with respect to seismic safety. The bridge piles, pile caps and piers, which represent submerged fill, are designed to withstand an MCE. Further reducing the diameter of these structural components would compromise seismic safety. The bridge deck, which represents high-level suspended and pile-supported fill, would have a side-by-side deck configuration with the westbound and eastbound roadways adjacent to each other. While a stacked deck configuration would further minimize the amount of high-level suspended fill, it was eliminated as a design option because it would not perform as well as a side-by-side configuration in a seismic event. Additionally, the side-by-side configuration also provides enhanced visual access to the Bay for motorists. The roadway cross-section includes two 10-foot-wide (3-meter-wide) shoulders, five 12-foot-wide (3.6-meter-wide) travel lanes. A 15.5-foot-wide (4.7-meter-wide) bicycle and pedestrian path for public access would be located on the south side of the eastbound roadway. The cross-section of the bridge decks cannot be further reduced without compromising public safety and American Association of State Highway and Transportation Officials (AASHTO) standards or by eliminating the public access.

Caltrans has analyzed whether it could further minimize fill in the Bay for the westbound roadway at the Oakland Touchdown area by utilizing a slab-on-pile construction technique as opposed to solid fill (geotechnical option). Caltrans also evaluated whether the 1V:3H/1V:2H slope for the westbound roadway fill could be replaced with a retaining wall, near-vertical lightweight fill, a mechanically stabilized embankment (MSE) wall or vertical armoring. Although the slab-on-pile construction technique could further minimize fill in the Bay, it is seismically inferior to the geotechnical option and would not provide a transitional upland habitat area. MTC's EDAP also evaluated the slab-on-pile option and recommended the geotechnical solution for economic, aesthetic, and functional reasons. Caltrans' advanced planning analysis found that:

- **Seismic Performance.** The slab-on-pile has poor seismic performance with possible failure and/or irreparable damage during an MCE. The solid fill option may incur lateral displacement and settlement with minor to moderate pavement distress;
- **Time to Re-open After Seismic Event.** The slab-on-pile option could be open to emergency traffic within hours after an MCE. However, it would require months to construct temporary detours for public use. The solid fill option could be open to emergency traffic within hours after an MCE and to full traffic within several days;
- **Repairs.** The slab-on-pile option would require replacing the entire structure in-kind or replacing it with solid fill and detouring five lanes of westbound traffic during construction. A detour would likely be on temporary structures located in the Bay further impacting sand flats and eelgrass beds. Repair of the solid fill option would involve new asphalt concrete overlay, which could be completed in days and avoids the need for most traffic detouring;
- **Repair Costs.** Permanent repair or replacement of the slab-on-pile option would cost approximately \$5,000,000. Repair of the solid fill option would cost approximately \$100,000 to \$500,000;
- **Initial Construction Costs.** The slab-on-pile option would cost approximately \$6,530,000 due to in-water construction and the need for deep pile foundations. The solid fill option would cost approximately \$4,990,000;
- **Maintenance Issues.** The slab-on-pile option would be costlier to maintain than the solid fill option due to its in-water location; and

## Attachment 5: Bay Fill Information

- Environmental Considerations.** The slab-on-pile option would create an abrupt shoreline transition with inlets that would be susceptible to trapping debris and garbage. The solid fill option could be designed with a 1V:3H/1V:2H slope to provide a transitional upland habitat area for shorebirds feeding on the adjacent sand flats and could be planted with native plants to provide the appearance of a more natural shoreline as compared to the existing shoreline. Moreover, this slope design would minimize potential erosion of eelgrass beds by limiting the return of wave energy near the toe of the slope.

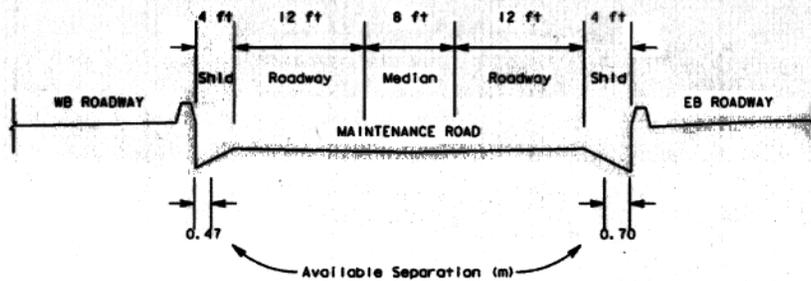
Caltrans has also analyzed whether it could further minimize fill in the Bay for the westbound roadway at the Oakland Touchdown area by realigning the roadway further south. Shifting the westbound roadway south of the proposed alignment is not feasible for a number of reasons:

- Maintenance Road Access.** The maintenance road would be located between the westbound and eastbound roadways and is critical for emergency and service vehicle access. The maintenance road would serve as the primary access route for emergency vehicles responding to accidents on the bridge as well as the primary circulation road for accessing the median toll facility from the current maintenance facility to the south of eastbound I-80 in the future;
- AASHTO Standards.** Reducing the width of the maintenance road and its median and shoulders would conflict with the minimum criteria specified by AASHTO's *Policy on Geometric Design of Highways and Streets* (AASHTO, 1990, Table V-16, p. 461) for a road of its intended use. (See Figures 31 and 32; the AASHTO reference is presented in Appendix F). The following table summarizes the design section widths and the rationale for their use:

Section Component	Recommended Width	Rationale/Reference
Roadway	11.8 feet (3.6 meters) per lane	Caltrans Highway Design Manual AASHTO, 1990, Table V-16, p.461
Median	8.2 feet (2.5 meters)	Minimum size to accommodate drainage facilities and landscaping serving the maintenance road.
Shoulder	3.9 feet (1.2 meters)	AASHTO, 1990. Table V-16, P. 461

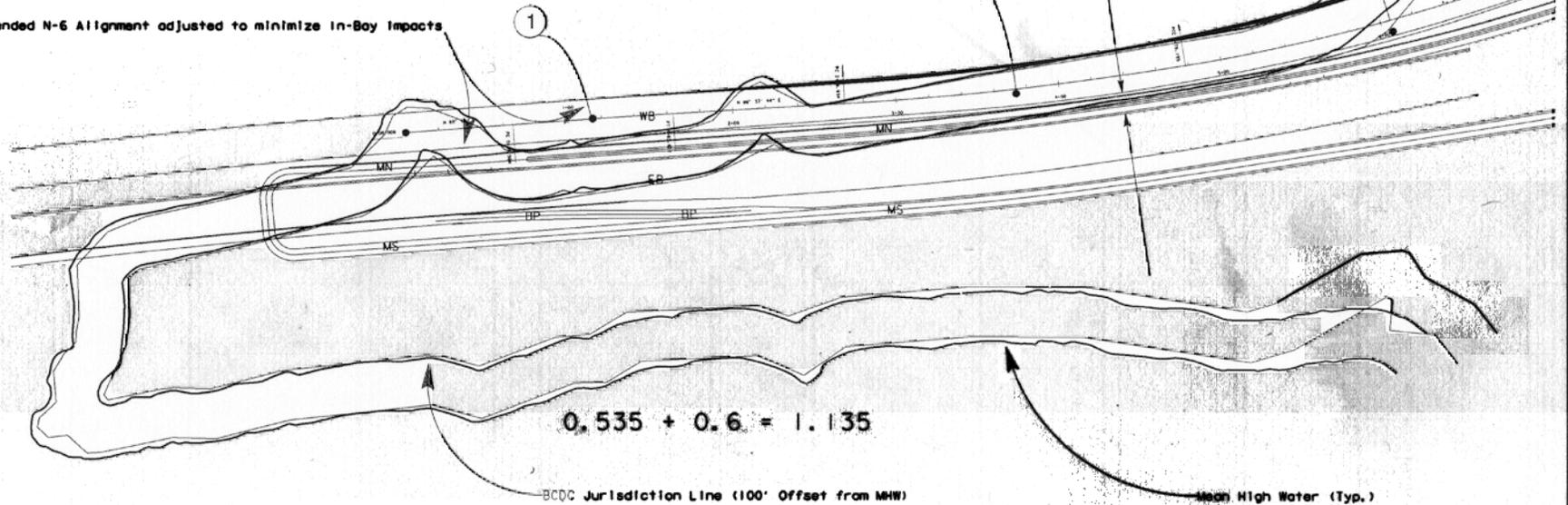
AASHTO design criteria are guidelines that are typically less restrictive with regard to driver comfort and safety than Caltrans' design guidelines as embodied in the Highway Design Manual. The design section widths specified above would provide the minimum space for the operation of emergency service vehicles while also providing sufficient room for passing disabled vehicles. This is an important design feature as the response time of emergency vehicles is key to realizing the intended use of the maintenance road and ensuring public safety;

- Minimum Separation.** The roadway alignments have been placed such that the combined width of the maintenance road, median, and shoulders equals the minimum separation of 39.7 feet (12.1 meters) between the westbound and eastbound alignments. The minimum separation is the limiting factor, because any realignment must be essentially parallel to the currently proposed alignment, tying into the same control points at the end of the structure and at the existing roadway; and
- Reversing Curves.** Given the restrictive geometric configuration at the westbound alignment where the minimum separation is present, reversing curves would be required



Minimum Separation ③  
40 ft

MTC Recommended N-6 Alignment adjusted to minimize In-Bay Impacts



$$\text{Width of maintenance road} = \text{median width} + (2 \times \text{lane width}) + (2 \times \text{shoulder width})$$

$$8 \text{ ft} + (2 \times 12 \text{ ft}) + (2 \times 4 \text{ ft})$$

$$40 \text{ ft}$$

$$\text{Minimum separation available} = \text{Minimum separation between WB and EB} - \text{Width of maintenance road}$$

$$40 \text{ ft} - 40 \text{ ft}$$

$$0 \text{ ft}$$

**Note:** Reducing the width of the maintenance road and its median and shoulder would conflict with the minimum criteria specified by AASHTO.

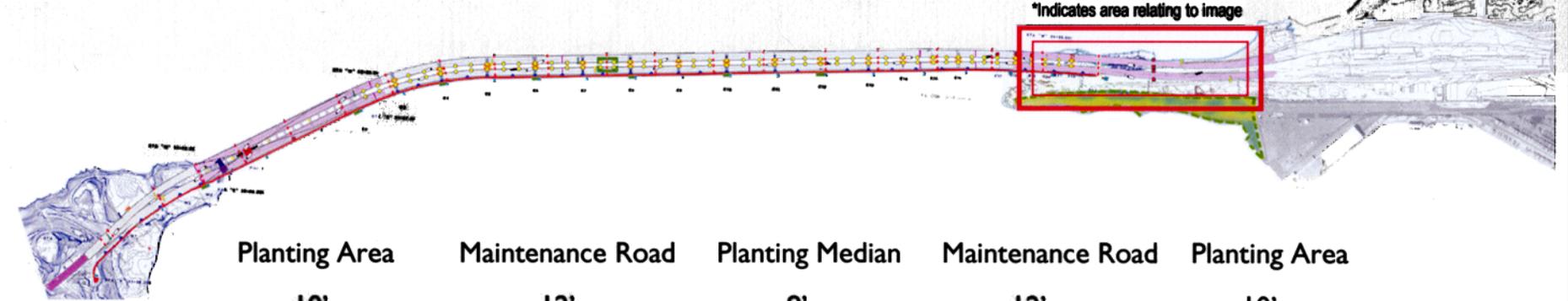


SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

### Potential Minimum Available Separation Between WB and EB Alignments

Not to Scale

Figure 31

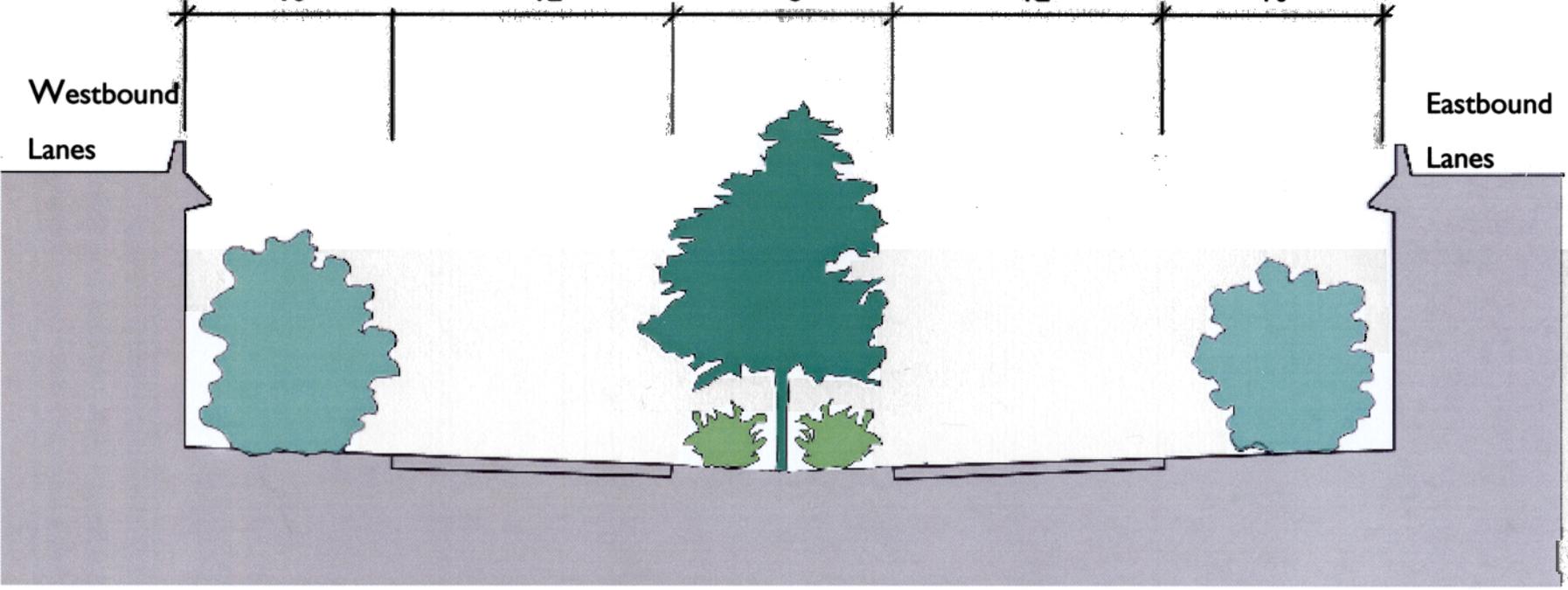


Planting Area      Maintenance Road      Planting Median      Maintenance Road      Planting Area

10'                      12'                      8'                      12'                      10'

Westbound  
Lanes

Eastbound  
Lanes



SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

Caltrans Maintenance Road (Cross-Section)

Not to Scale

Figure 32

## Attachment 5: Bay Fill Information

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to bring the westbound alignment closer to the maintenance road and eastbound alignment. Because reversing curves are required, the entire remaining length of the westbound roadway segment under consideration for realignment cannot be shifted by a uniform distance. Due to the short distance within which the reversing curves would occur, an alternative alignment would not be able to meet minimum requirements for curve lengths and central angles (see Caltrans Highway Design Manual design criteria Index 203.4 in Appendix F).

Realignment of the westbound roadway to further minimize Bay fill would require either a reduction in the widths of the design section for the maintenance road or the use of reversing horizontal curves that would not meet Caltrans' design criteria. Either option creates a less desirable roadway alignment that could compromise public safety. For a new facility, Caltrans adheres to the minimum requirements of the Highway Design Manual.

With respect to temporary fill, Caltrans has identified a likely construction scenario that the contractor may implement to construct the new bridge. This includes the use of a temporary barge dock at YBI and construction access trestles for the main span, the skyway, and the Oakland approach.<sup>5</sup> These structures would be designed using the minimum fill necessary that would allow for construction access, transportation and the use of large construction equipment, such as cranes and pile drivers, and safe working platforms for personnel. It is possible that the contractor may choose to utilize a different size, configuration and/or siting of docks and access trestles. If this proves to be the case, Caltrans and/or the contractor would seek to have the changes approved through BCDC's post-permit plan review or a permit amendment. If any changes are made, environmentally sensitive areas (ESAs) would still be respected.

The size of the falsework, falsework piers and cofferdams are a function of the bridge size itself. The temporary fill associated with these structures cannot be further minimized unless the diameter of the piles and pile caps and the cross-section of the bridge deck are also reduced.

### **MINIMIZE HARMFUL EFFECTS TO THE BAY**

While there would be unavoidable impacts to Bay resources, such as the temporary and permanent filling of open water areas, sand flats and eelgrass beds, Caltrans would implement all feasible measures to minimize harmful effects to the Bay including:

- **Environmentally Sensitive Areas (ESAs).** Caltrans would identify environmentally sensitive areas in the field to limit the location of construction activities and prevent encroachment or placement of fill into eelgrass beds and tidal marsh habitat that are located outside the construction zone. ESAs (as shown in Figures 8 and 10) would be identified by buoys or other highly visible markings;
- **Turbidity Control Program.** Caltrans would implement a turbidity control program. The program would include measuring turbidity and light attenuation at the project boundary to compare with ambient conditions within the eelgrass beds. These measurements would be used to monitor additional sediment transport caused by dredging and other construction activities within the project boundaries. If necessary, turbidity control measures would be implemented;
- **Geotube.** Rather than placing earthen fill in the Bay to serve as a tidal berm when constructing the westbound roadway, Caltrans would use a geotube. A geotube is a high strength polyester or polypropylene geotextile tube that is hydraulically filled with a dredge or a pump (see Figure 12). To minimize impacts to sand flats at the Oakland Touchdown area from the weight of the geotube, Caltrans would place geotextile fabric onto the sand flats before installing the geotube. This would minimize or reduce the potential for mud

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<sup>5</sup> At the Oakland Touchdown, two access trestles may be constructed: a 75,350-square feet (7,000-square meter) trestle for the skyway and a 150,700-square feet (14,000-square meter) trestle for the Oakland approach structures. These trestles would be located within a specific construction envelope. The design of the two access trestles would be left up to the contractor.

## **Attachment 5: Bay Fill Information**

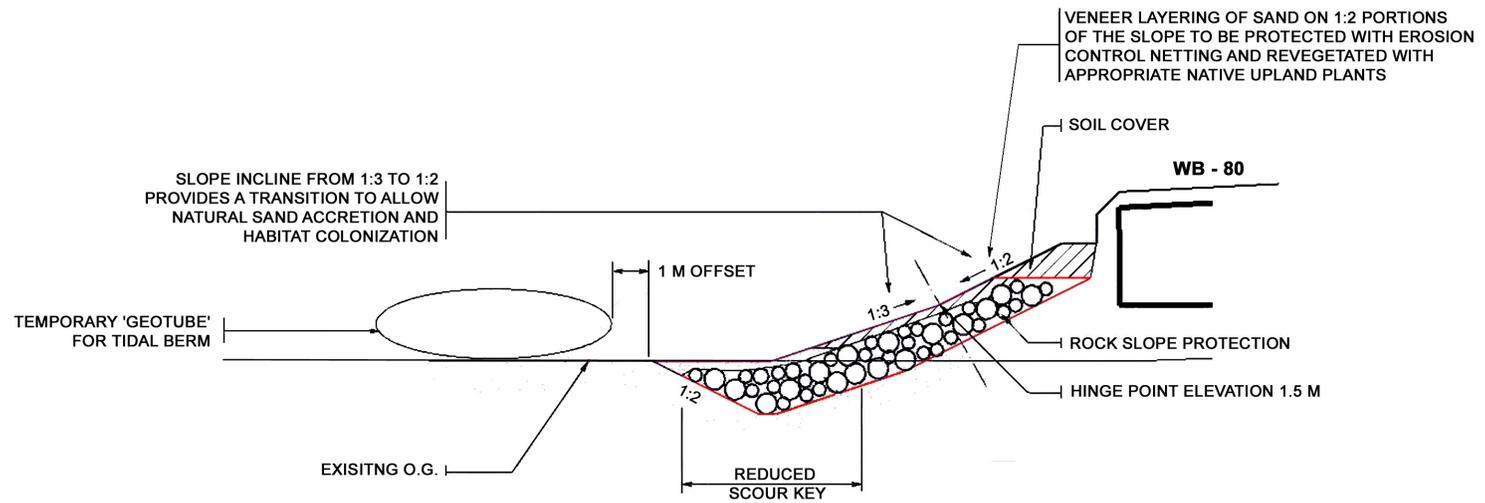
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boils. That portion of the sand flats temporarily impacted by the placement of the geotube and mud boils would be restored to pre-existing elevations following construction;

- **SWPPP.** To minimize impacts to water quality, Caltrans would prepare a SWPPP. Statewide National Pollutant Discharge Elimination System (NPDES) Permit Nos. CAS000003 and CAS000002 apply to the project facilities during construction. The NPDES permit requires that a SWPPP be prepared for any construction project that disturbs an area greater than five acres (2 hectares) or for any project that is located within or near a water-related sensitive environment. The purpose of the SWPPP would be to identify pollutant sources that may affect the quality of the discharges of storm water associated with the construction activities of the project, including the placement of Bay fill, and to identify, construct and implement storm water pollution control measures and best management practices to reduce pollutants in storm water discharges from the project site during and after construction;
- **Harbor Seal, California Sea Lion, and Gray Whale.** Methods, such as a sound attenuation system and/or monitoring, would be used to avoid or minimize impacts to marine mammals. Caltrans is continuing to evaluate sound attenuation devices for pile driving and a decision as to what measures to implement will be made in consultation with the NMFS;
- **Fisheries.** In its letter concluding Section 7 consultation for special status fish species, NMFS proposed the use of sound attenuation during salmonid outmigration as a method to avoid pile driving impacts. FHWA and Caltrans agreed to implement such measures. Since release of the FEIS, FHWA and Caltrans have continued coordinating with NMFS regarding potential impacts to special status fish species as a result of pile driving. Through this coordination, it was recognized that sound attenuation may reduce but not fully avoid impacts to special status fish species and that accurate assessment of pile driving impacts to special status fish species might not be possible. As a result of this recent coordination, FHWA, Caltrans, and NMFS are considering appropriate minimization and conservation measures. The decision as to what measures to implement will be made in consultation with NMFS. FHWA and Caltrans are working with NMFS to update the biological opinion and will request an incidental take statement for endangered fish;
- **Double-crested Cormorant.** Caltrans would monitor the double-crested cormorant colony during breeding season and prevent the birds from nesting on the existing bridge where potential impacts of construction activities could occur. The protocol to prevent double-crested cormorants from nesting would follow the methods implemented for maintenance activities on the existing bridge. This protocol involves washing partially constructed nests off the bridge with water when the nests are not actively occupied. Construction of the East Span Project would include dismantling the existing East Span, which would result in the permanent removal of existing nesting sites for the double-crested cormorant. Lightweight, transparent material would be constructed on the inside of the new bridge to provide new nesting habitat; and
- **Shorebirds.** The East Span Project would not result in a direct impact to shorebird species; however, it would result in the temporary and permanent removal of supporting roosting and feeding habitat. The portion of the mudflats temporarily impacted by the placement of the geotube and mud boils would be restored to pre-existing elevations following construction.

### **ESTABLISHMENT OF A PERMANENT SHORELINE**

The placement of solid fill to construct the westbound roadway and to relocate the Caltrans maintenance road establishes a new, permanent shoreline further bayward of the existing shoreline (see Figure 33). Caltrans has designed the westbound roadway and the Caltrans maintenance road to create a permanent and stable shoreline. The proposed fill for the westbound roadway is designed for stability under both static and dynamic conditions. Due to the presence of soft to medium stiff natural Young Bay Mud soils which are relatively weak and compressible, the design includes installation of wick drains with staged fill placement to accelerate soil strength gain and settlements. This would allow for stable



**PROPOSED SLOPE TREATMENT**



## **Attachment 5: Bay Fill Information**

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construction and prevent excessive long-term maintenance due to settlements. Relative to dynamic or seismic stability, the presence of existing, liquefiable sand fill necessitated ground improvement with vertical pipe drains. This technique would densify the existing sand and provide enhanced drainage to mitigate liquefaction under the project seismic conditions. The toe of the proposed embankment, which would be located along the new permanent shoreline, is also protected against erosion by wave action with rock slope protection underlain by a geotextile fabric.

The engineered fill for the westbound road would provide for five travel lanes, shoulders, a small upland bench and rock slope protection that is designed to provide an upland transition from the sand flats. Caltrans does not anticipate further widening the approach for additional traffic lanes in the future. The width of the approach is constrained by the number of lanes on the bridge. To generate greater capacity, the bridge itself and the YBI tunnel would have to be widened. In addition, the area of Bay beyond the toe of the new slope is owned and controlled by the Port. Caltrans would have to acquire additional right-of-way to further widen the approach. Thus, the current design establishes a permanent shoreline.

### **DEMONSTRATION OF ADEQUATE TITLE**

Caltrans has not yet formally acquired the necessary rights-of-way for all areas in which permanent fill would be placed in the Bay for the new bridge. However, Caltrans has reached agreement with the Port of Oakland that the necessary lands would be transferred to State control. Some temporary construction easements, mainly needed for construction access, (see Figure 34 and Appendix E) are yet to be acquired. Caltrans would continue to negotiate with the appropriate federal and local entities to acquire the minor amounts of property easements to construct the bridge. Caltrans cannot begin construction under a particular contract until it has certified the right-of-way for that contract. Caltrans has the power of eminent domain (except over land owned by the USCG) and would proceed with formal condemnation, if necessary, to secure adequate property rights.

Caltrans proposes that the Executive Director exercise his authority to waive the filing requirement for proof of property interest. Caltrans would then provide evidence of such property interest for each particular portion of the project prior to commencing construction of that portion.

### **MARSHES AND MUDFLATS**

#### **Bay Plan Policies**

In part, BCDC's Bay Plan policies on marshes and mudflats state that marshes and mudflats should be maintained to the fullest extent possible to conserve fish and wildlife and to abate air and water pollution. Filling and diking that eliminate marshes and mudflats should therefore be allowed only for purposes providing substantial public benefits and only if there is no reasonable alternatives.

#### **Potential Impacts**

The East Span Project would temporarily and permanently fill special aquatic sites within the project site including sand flats and eelgrass beds (see Figures 35 and 36 and Table 5-3). Based on a survey of eelgrass beds completed in October of 2000, the East Span Project would:

- Permanently impact approximately 3.24 acres (1.31 hectares) of eelgrass beds;
- Temporarily impact approximately 0.36 acres (0.14 hectares) of eelgrass beds
- Permanently impact approximately 4.19 acres (1.70 hectares) of sand flats; and
- Temporarily impact approximately 0.80 acres (0.32 hectares) of sand flats.

The majority of the impacts to special aquatic sites would occur in the intertidal areas just to the north of the Oakland Touchdown as a result of dredging for a barge access channel and the placement of solid fill to construct the westbound roadway (bridge approach) and relocate the Caltrans maintenance road.

DATE	REVISIONS	REV CK									

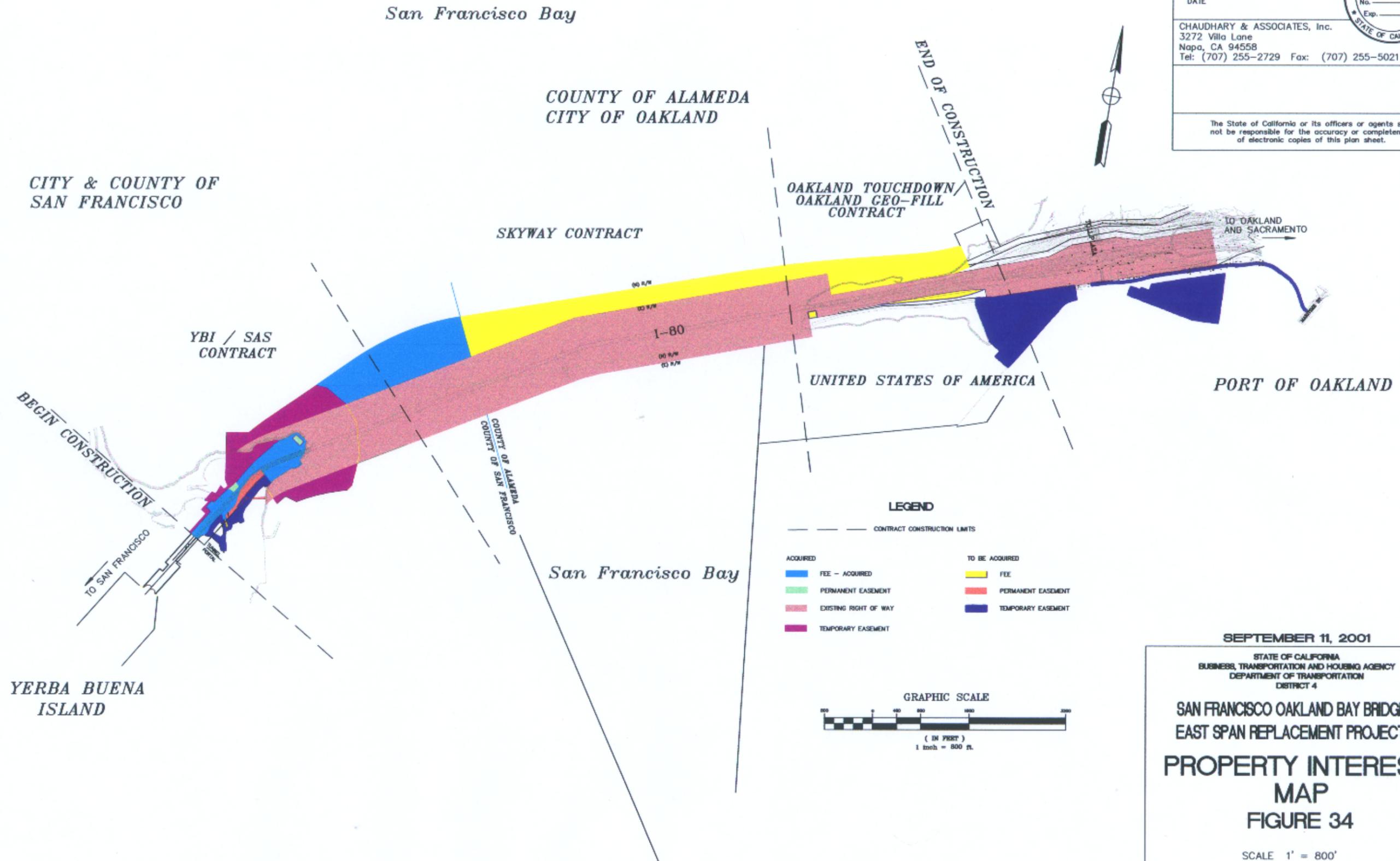
DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	ALA/SF	80	SF 12.6/14.2 ALA 00.0/2.7	0	

LICENSED LAND SURVEYOR

DATE

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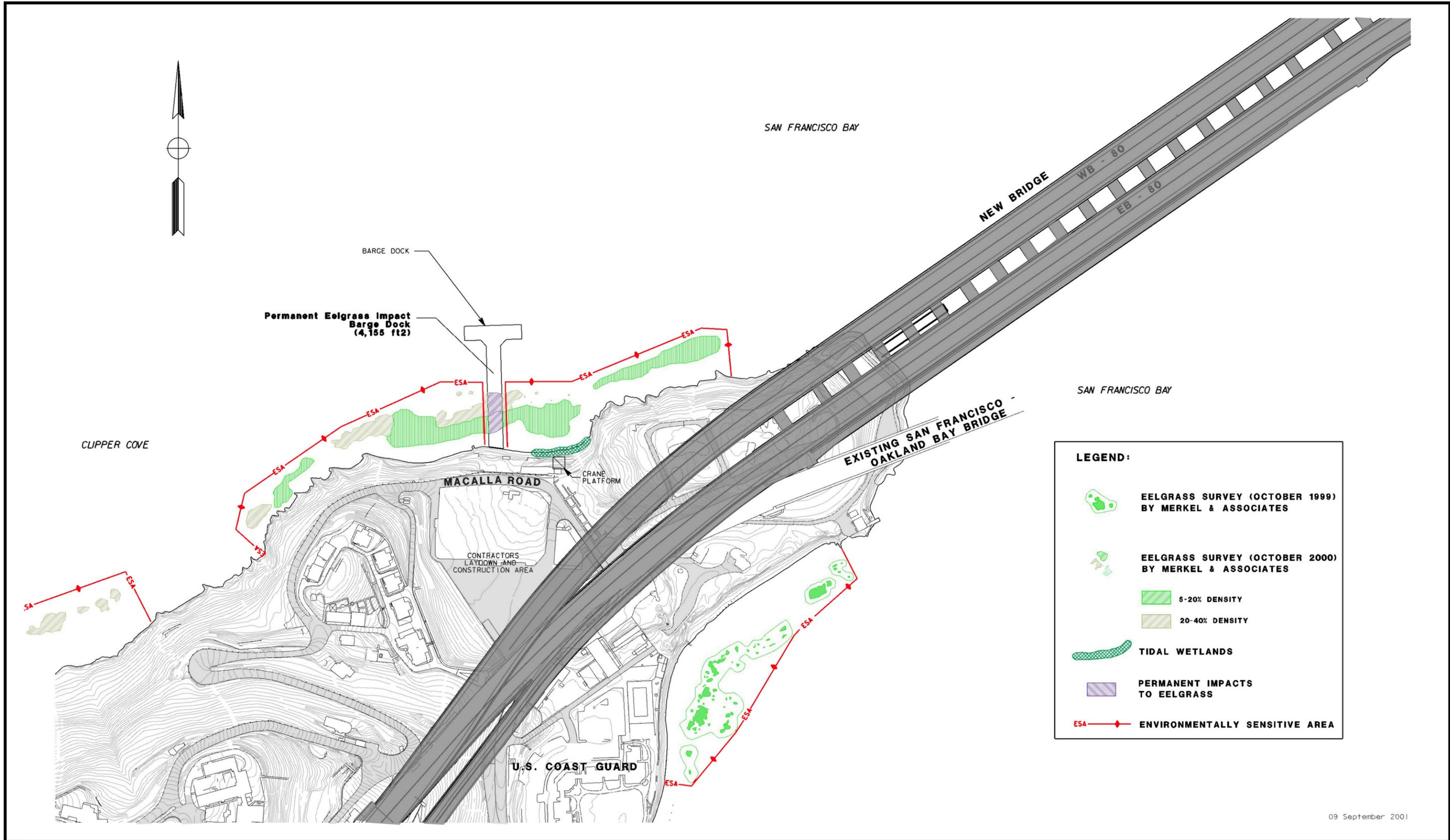
SEPTEMBER 11, 2001

STATE OF CALIFORNIA  
BUSINESS, TRANSPORTATION AND HOUSING AGENCY  
DEPARTMENT OF TRANSPORTATION  
DISTRICT 4

**SAN FRANCISCO OAKLAND BAY BRIDGE  
EAST SPAN REPLACEMENT PROJECT**

**PROPERTY INTEREST  
MAP  
FIGURE 34**

SCALE 1" = 800'

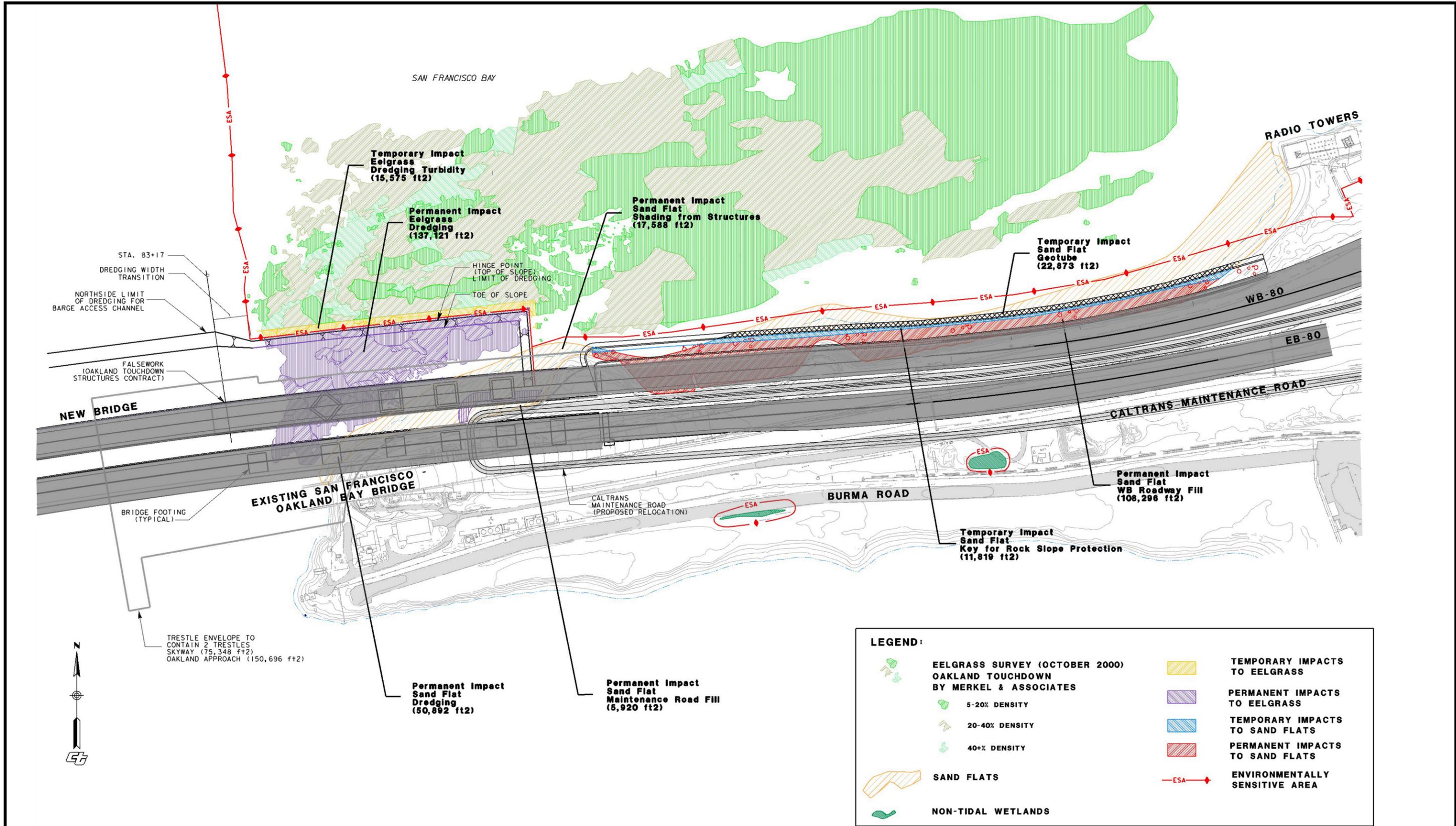


SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

Not to Scale

Impacts Analysis Special Aquatic Sites  
Yerba Buena Island

Figure 35



09 September 2001



SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

Impacts Analysis Special Aquatic Sites  
Oakland Approach

Not to Scale

Figure 36

**Table 5-3  
Impacts to Special Aquatic Sites<sup>a</sup>**

Project Element	Impact	Sand Flats				Eelgrass			
		(square ft)	(square m)	(acres)	(hectares)	(square ft)	(square m)	(acres)	(hectares)
<b>YBI Transition/Suspension Span</b>									
Clipper Cove Barge Dock	Permanent	0	0	0.00	0.00	4,155	386	0.10	0.04
Construction Access Trestle	None	0	0	0.00	0.00	0	0	0.00	0.00
<b>Skyway</b>									
Construction Access Trestle <sup>b</sup>	None	0	0	0.00	0.00	0	0	0.00	0.00
Falsework <sup>b</sup>	None	0	0	0.00	0.00	0	0	0.00	0.00
Falsework Piers <sup>b</sup>	None	0	0	0.00	0.00	0	0	0.00	0.00
Cofferdams <sup>b</sup>	None	0	0	0.00	0.00	0	0	0.00	0.00
<b>Oakland Touchdown Area</b>									
Barge Access Channel (Dredging)	Permanent	50,892	4,728	1.17	0.47	137,121	12,739	3.15	1.27
Turbidity (Dredging/Mud Boils/Prop Wash)	Temporary	0	0	0.00	0.00	15,575	1,447	0.36	0.14
Construction Access Trestles <sup>b</sup>	None	0	0	0.00	0.00	0	0	0.00	0.00
Piles/Pile Caps (9 piles/pile caps <sup>b</sup> )	None	0	0	0.00	0.00	0	0	0.00	0.00
Bridge Deck/Maintenance Road (Shading)	Permanent	17,588	1,634	0.40	0.16	0	0	0.00	0.00
<b>Geofill/Surcharge Material</b>									
Tidal Berm (Geotube) Westbound Road	Temporary	22,873	2,125	0.53	0.21	0	0	0.00	0.00
Shoreline Protection Westbound Roac <sup>c</sup>	Permanent	0	0	0.00	0.00	0	0	0.00	0.00
Key for Shoreline Protection WB Road	Temporary	11,819	1,098	0.27	0.11	0	0	0.00	0.00
Engineered Fill Westbound Road	Permanent	108,296	10,061	2.49	1.01	0	0	0.00	0.00
Tidal Berm Maintenance Roac <sup>c</sup>	Permanent	0	0	0.00	0.00	0	0	0.00	0.00
Shoreline Protection Maintenance Roac <sup>c</sup>	Permanent	0	0	0.00	0.00	0	0	0.00	0.00
Engineered Fill Maintenance Road	Permanent	5,920	550	0.14	0.06	0	0	0.00	0.00
<b>TOTALS</b>		217,388	20,196	4.99	2.02	156,852	14,572	3.60	1.46

Type of Impact	(square ft)	(square m)	(acres)	(hectares)	(square ft)	(square m)	(acres)	(hectares)
<b>Temporary</b>	34,692	3,223	0.80	0.32	15,575	1,447	0.36	0.14
<b>Permanent</b>	182,696	16,973	4.19	1.70	141,276	13,125	3.24	1.31

Notes:

<sup>a</sup> The East Span Project would not impact tidal or non-tidal wetlands. As well, the skyway portion of the project would not impact any special aquatic habitat.

<sup>b</sup> Included within the footprint of dredging impacts. No other impacts to special aquatic sites would result from the construction of these temporary project elements.

<sup>c</sup> Included within footprint of engineered fill for the westbound road or the maintenance road.

## **Attachment 5: Bay Fill Information**

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There would be relatively minor impacts to eelgrass beds at Clipper Cove from the construction of a temporary barge dock.

The purpose of the East Span Project is to provide a seismically upgraded vehicular crossing for current and future users between YBI and Oakland. This would provide substantial public benefits by improving public safety and minimizing economic disruptions from a maximum credible earthquake. An MCE on either the San Andreas or Hayward faults would be expected to inflict far greater damage to the SFOBB than it experienced from the 1989 Loma Prieta earthquake. On the existing East Span, an MCE could cause a multi-span collapse, potentially resulting in numerous casualties and requiring months to reopen the bridge or years to build a replacement. A replacement bridge system is being designed not only to withstand an MCE, but also to achieve a "lifeline" performance level between YBI and Oakland. "Lifeline" refers to infrastructure that is constructed to a higher standard or "hardened" to provide necessary post-disaster functionality and assist in emergency response efforts. A "lifeline" connection would provide post-earthquake access to link major population centers, emergency relief routes, emergency supply and staging centers and intermodal links with major distribution centers. Additionally, the bridge would be upgraded to meet current operation and safety standards to the maximum extent feasible.

Because much of the replacement bridge would be built over water, barge access would be necessary to transport construction materials, equipment and personnel to the site and to provide stable working platforms. Construction of the Oakland approach structures and the skyway are not feasible from land. Using large cranes and other construction equipment in shallow water areas underlain by Young Bay Mud poses a significant safety problem. Heavy construction equipment, particularly cranes and pile drivers, would likely sink into the Bay mud and tip over causing the potential loss of life and equipment. To allow for barge access in shallow water areas at the Oakland Touchdown area, a barge access channel must be dredged. Caltrans has narrowed the barge access channel from its initial design to minimize impacts to eelgrass beds, while allowing for reasonable access to construct the bridge.

There is no feasible upland alternative for the permanent solid fill for the westbound roadway (bridge approach) and the Caltrans maintenance road. When constructing the replacement bridge, existing traffic must be maintained with little or no disruptions during peak travel periods. There is limited land area at the Oakland Touchdown area in which to: maintain traffic on the existing westbound and eastbound roadways; maintain traffic on the existing Caltrans maintenance road; construct temporary detours; site the new approach; and relocate the Caltrans maintenance road. Furthermore, Caltrans could not site the westbound roadway entirely on upland areas because it would compromise the geometrics and safety of the eastbound roadway and affect access to the Caltrans maintenance road, which is necessary for emergency response.

There is no alternative for the temporary barge dock at YBI. Barge access is necessary at YBI to facilitate the transport of construction materials, equipment and personnel to the construction site. Access on YBI is limited by the narrow and curving roadways. Transporting large construction equipment and materials would be extremely difficult under such conditions. The siting of the barge dock would take advantage of the large, flat, Parade Ground that would be used as a construction staging and laydown area. By its very nature, a dock must be located over water and provides an essential transition from water to land. The dock has been sited to minimize impacts to eelgrass beds.

### **MITIGATION**

#### **Bay Plan Policies**

In part, BCDC's Bay Plan policies on mitigation state that mitigation for the unavoidable adverse environmental impacts of the any Bay fill should be considered by BCDC in determining whether the public benefits of a project clearly exceed the public detriments from the loss of water areas due to the fill. When mitigation is necessary to offset the unavoidable adverse impacts of approvable fill, the mitigation program should assure: (1) that the benefits from the mitigation would be commensurate with the adverse impacts on the resources of the Bay; (2) that the mitigation would be at the project site or as close as possible; and (3) that the mitigation would, to the extent possible, be provided concurrently with those parts of the project causing adverse impacts.

## Attachment 5: Bay Fill Information

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### Proposed Bay Fill

The proposed project would place approximately 103,253 cubic yards (78,942 cubic meters) of permanent fill covering approximately 45.52 acres (18.42 hectares) of Bay surface area (see Table 5-1 for detailed breakdown of Bay fill). However, this includes approximately 41.93 acres (16.96 hectares) of high-level suspended fill represented by the side-by-side bridge decks for which there would be few impacts to Bay-related resources. Proposed permanent fill includes:

- Submerged fill for piles and pile caps to support the bridge piers at the main span, the skyway and the Oakland approach segments;
- Submerged fill for fenders to protect the bridge from ship collisions at the main span and the skyway segment;
- High-level suspended and pile-supported fill for the bridge deck and the bicycle and pedestrian path;
- Solid engineered fill (geotechnical) for the westbound roadway and shoreline protection at the Oakland Touchdown area; and
- Solid engineered fill (geotechnical) to relocate the Caltrans maintenance road and provide shoreline protection at the Oakland Touchdown area.

Although the East Span Project would result in new fill in San Francisco Bay, removal of dredged sediments and the removal of the existing bridge would offset the volume of new fill. The volume of San Francisco Bay would increase by approximately 340,487 cubic yards (260,321 cubic meters) as a result of the following construction activities:

- Removing dredged sediments to create a barge access channel for construction;
- Removing dredged sediments to construct piers for the replacement bridge;
- Removing dredged sediments to create a barge access channel to remove the existing bridge;
- Removing dredged sediments to dismantle the existing bridge piles below the mud line; and
- Removing the existing bridge piers and fenders.

Although the East Span Project would remove sediments for barge access and to prepare for pile installation and would remove the existing bridge, the fill removal would not offset the surface area of new fill in San Francisco Bay. There would be a net increase of approximately 33.03 acres (13.37 hectares) of Bay fill. However, the majority of fill associated with the new bridge (41.93 acres/16.96 hectares) is high-level suspended fill represented by the bridge decks. High-level suspended fill generally does not result in adverse impacts to Bay related resources, such as permanent shading of special aquatic sites, because of its significant height above the surface of the Bay.

Permanent fill in San Francisco Bay would result in the loss of approximately 2.63 acres (1.07 hectares) of sand flats. Approximately 0.40 acres (0.16 hectares) of sand flats would be impacted by permanent shading from the bridge deck at the Oakland Touchdown. Approximately 3.15 acres (1.27 hectares) of eelgrass beds and 1.17 acres (0.47 hectares) of sand flats would be impacted by dredging.

In addition to the permanent fill, the proposed project would place approximately 62,910 cubic yards (48,098 cubic meters) of temporary fill covering approximately 14.15 acres (5.72 hectares) of Bay surface area (see Table 5-2 for detailed breakdown of Bay fill). However, this includes approximately 7.77 acres (3.15 hectares) of high-level suspended fill for falsework for which there are few impacts to Bay-related resources. All temporary fill would be removed at the completion of the project.

Proposed temporary fill includes:

## Attachment 5: Bay Fill Information

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- Pile-supported fill for a barge dock at YBI to facilitate the movement of construction supplies, equipment and personnel;
- Pile-supported fill for construction access trestles at the main span, the skyway and the Oakland approach;
- High-level suspended and pile-supported fill for falsework and falsework piers at the main span, the skyway and the Oakland approach segments to erect various portions of the replacement bridge;
- Submerged fill for cofferdams at the main span, the skyway and the Oakland approach segments to install the piles and pile caps; and
- Solid fill for a geotube at the Oakland Touchdown area to facilitate dewatering when constructing the westbound roadway.

Temporary fill in San Francisco Bay would result in the permanent loss of approximately 0.10 acres (0.04 hectares) of eelgrass beds and the temporary displacement of approximately 0.80 acres (0.32 hectares) of sand flats. Approximately 0.36 acres (0.14 hectares) of eelgrass beds would be temporarily impacted from turbidity.

### Location of Mitigation/Site Feasibility

Caltrans conducted an extensive review of potential mitigation sites in the central San Francisco Bay over the course of 1 ½ years to identify areas suitable for creating and/or restoring eelgrass beds, sand flats, mudflats and tidal marsh. Most of the sites were not feasible because they were either too small or were not available for mitigation purposes. Only one site within the Central Bay, the Breuner property, was large enough to meet the mitigation requirements of the project. However, several significant constraints precluded Caltrans from utilizing the site. As a result, Caltrans now proposes on-site restoration of sand flats and eelgrass beds and providing \$8,000,000 to the USFWS to acquire and restore Skaggs Island in southern Sonoma County. Although Skaggs Island is not within the Central Bay, it would result in significant benefits to the San Francisco Bay ecosystem by supporting restoration of approximately 3,000 acres (1,214 hectares) of diked historic baylands to aquatic habitat. Below is a summary of the potential mitigation sites evaluated by Caltrans.

Potential mitigation sites immediately adjacent to the project area and the Emeryville Crescent were rejected because the sites were too small or not available for the required mitigation. These sites included:

- **Radio Point.** The Radio Point site is located immediately north of the Bay Bridge Toll Plaza, less than 525 feet (160 meters) from the project area in the City of Oakland. The Port currently owns the land and has reserved it for its own future mitigation needs.
- **West Grand Avenue.** The West Grand Avenue site is located north of the new West Grand Avenue overpass at Interstate 80, just east of the Bay Bridge Toll Plaza in the City of Oakland. This site is partially owned by the Port of Oakland and the State of California. The East Bay Regional Park District (EBRPD) manages the state-owned portion of this site as part of the Eastshore State Park. Caltrans previously used the state-owned portion of the site as mitigation for the I-80 HOVL and I-880 Cypress projects. The Port may retain its portion of the site for future mitigation needs.
- **Oakland Touchdown.** The Oakland Touchdown site is within the existing Caltrans right-of-way where the existing Bay Bridge touches land in Oakland. It would revert to the Port of Oakland if Caltrans declares it excess to transportation needs. EBRPD has expressed interest in this land becoming part of the proposed Gateway Park. Caltrans may also use a portion of this site for its off-bridge collection and treatment of stormwater runoff.

## Attachment 5: Bay Fill Information

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Several potential sites north of the project area within the Eastshore State Park are managed by the EBRPD. EBRPD is developing a long-range plan for the Park to identify potential recreational uses and improvements. This may include habitat creation and enhancement. However, the planning process, which will include extensive public participation, may not be completed until 2002. EBRPD's timeline is not in accord with the plans for the East Span Project; therefore these sites were eliminated from consideration as potential mitigation sites. These sites included:

- **Brickyard Cove.** The Brickyard Cove site is located just south of University Avenue on the west side of Interstate 80 in the City of Berkeley. The EBRPD manages Brickyard Cove as part of the Eastshore State Park and the State of California owns the property.
- **Berkeley Meadows/Virginia Street.** The Virginia Street site is located north of University Avenue on the west side of Interstate 80 in the City of Berkeley. The EBRPD manages the Virginia Street site as part of the Eastshore State Park complex and the State of California owns the property.

Potential mitigation sites at and near the City of Albany's former landfill were also evaluated. However, these sites are too small to meet Caltrans' mitigation needs. Moreover, the City of Albany has received funds from the State of California to restore Albany Bulb and Albany Beach, precluding the use of these sites by Caltrans for mitigation purposes. These sites included:

- **Buchanan Marsh.** The Buchanan Marsh site is located south of Buchanan Street and west of Interstate 80 in the City of Albany. Magna Entertainment, owner of the adjacent Golden Gate Fields Racetrack, owns this property.
- **Albany Bulb and Beach.** The Albany Bulb and Beach are located northwest of Golden Gate Fields racetrack, west of Interstate 80, near the terminus of Buchanan Street. The City of Albany owns these parcels and has funds for their restoration.

Two potential mitigation sites were identified in the City of Richmond including the Liquid Gold property and the Breuner property. The Liquid Gold/Hoffman site is too small to meet Caltrans' mitigation needs. The Breuner site is sufficiently large and was initially identified by Caltrans as a preferred mitigation site. Caltrans developed conceptual mitigation scenarios for the site. However, several significant constraints precluded Caltrans from utilizing the site for mitigation.

- **Liquid Gold/Hoffman Marsh.** The Liquid Gold/Hoffman Marsh site is located just north of Point Isabel Regional Park in the City of Richmond. Southern Pacific and the EBRPD own these properties.
- **Breuner.** The Breuner site is located west of Interstate 80 and north of the Richmond Parkway in the City of Richmond. Bay Area Wetlands (BAW) owns this property and plans to develop it as a wetlands mitigation bank.

In preparing the site feasibility analysis in the Conceptual Mitigation Plan for Special Aquatic Sites, dated November 2000, Caltrans consulted with state and federal resource agencies including: the San Francisco Bay Conservation and Development Commission (BCDC); the Regional Water Quality Control Board (RWQCB); the California Department of Fish and Game (CDFG); U.S. Army Corps of Engineers (ACOE); U.S. Environmental Protection Agency (USEPA); and USFWS. Caltrans presented and refined its site selection and mitigation proposal in response to agency concerns expressed at several ACOE Interagency meetings. Recognizing the inherent uncertainty in creating new eelgrass habitat and sand flats within San Francisco Bay, and the difficulty in finding suitable mitigation sites in the Central Bay, the Interagency Group reached consensus that off-site and out-of-kind mitigation at the Breuner site was acceptable. Pursuant to the NEPA/404 process, the USFWS, USEPA and the ACOE gave preliminary agreement that the Conceptual Mitigation Plan for Special Aquatic Sites was adequate.

At the Breuner property, off-site mitigation would have involved creating and enhancing approximately 64.35 acres (26.05 hectares) of a tidal marsh ecosystem including:

- 1.01 acres (0.41 hectares) of new mudflats;

## Attachment 5: Bay Fill Information

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- 2.05 acres (0.83 hectares) of new tidal marsh channels;
- 22.86 acres (9.25 hectares) of new tidal marsh;
- 5.94 acres (2.41 hectares) of enhanced uplands;
- 24.39 acres (9.87 hectares) of enhanced jurisdictional wetlands; and
- 8.10 acres (3.28 hectares) of existing intertidal areas.

This approach provided a replacement of aquatic habitat at a 3 to 1 ratio. The estimated cost for implementing mitigation at the Breuner property was approximately \$8,000,000 based on initial per-acre costs provided by BAW.

Below is a summary of the issues that would have significantly delayed implementing mitigation at the Breuner site and obtaining state and federal permits for the East Span Project:

- **Hazardous Materials Testing.** Caltrans requires access to the mitigation site to determine whether hazardous materials are present and the extent of their presence prior to entering into any agreement for mitigation services. BAW would not grant Caltrans access to the site and would not do so unless Caltrans enters into an agreement to acquire BAW's services;
- **Section 7 Endangered Species Consultation.** Under the Endangered Species Act, the ACOE must ensure that the project does not adversely affect an endangered or threatened species or their habitat. Accordingly, the ACOE would require that Caltrans initiate Section 7 Endangered Species Consultation with the USFWS. Given its proximity to Giant Marsh at Point Pinole, the Breuner property is likely to support the endangered Salt Marsh Harvest Mouse (SMHM). To ascertain the presence and distribution of the SMHM and other endangered and threatened wildlife and plant species, Caltrans must survey the site. However, BAW would not grant Caltrans access to the site to conduct such surveys;
- **Sole Source Contracts.** BAW has acquired the Breuner property with the intention of creating a wetland mitigation bank. It proposes to design, construct, and monitor the mitigation site consistent with the requirements of state and federal resource agencies and sell a turn-key product to interested parties on a per-acre basis. In essence, BAW is providing a service. A contract with BAW would be a sole source contract. Sole source contracts under State law are extremely difficult and time-consuming to justify. Caltrans has explored other arrangements to avoid a sole source contract but has not found any;
- **Acquisition of Property Interest.** BAW will only sell its service, not its land to Caltrans. Absent a willing seller, Caltrans must invoke the State's powers of eminent domain to acquire the property. The California Transportation Commission must approve any condemnation action. The process to approve a condemnation can be very time-consuming and may not be successful; and
- **Public Access.** The Bay Trail Project identifies a future Bay Trail segment along the eastern perimeter of the Breuner property and a spur trail along the shoreline to a spit of land that juts into the Bay. The Bay Trail Project, BCDC, the EBRPD and local trail groups all support implementation of the Bay Trail at the Breuner Property. However, the USFWS and USEPA have expressed some concern over siting the spur trail through potential endangered species habitat. Caltrans has concluded that disagreements among the various regulatory and resource agencies, as well as citizens' groups, on siting and designing the public access could result in additional delays to obtaining the necessary permits to construct the bridge.

### Proposed Mitigation

To offset the placement of permanent and temporary fill in San Francisco Bay and impacts to eelgrass beds and sand flats, Caltrans proposes on-site restoration of eelgrass beds and sand flats. In addition, Caltrans proposes to provide \$8,000,000 to the USFWS to acquire and restore approximately 3,000 acres (1,214 hectares) of diked historic baylands at Skaggs Island in southern Sonoma County consistent with the Baylands Ecosystem Habitat Goals (see Appendix J - Conceptual Mitigation Plan for Special Aquatic Sites). Below is a discussion of on-site mitigation followed by off-site mitigation.

### On-site Mitigation

Caltrans evaluated options for in-kind replacement of permanently impacted sand flats at or near the project site. Although in-kind mitigation is preferable, Caltrans has concluded that this is not feasible on the scale required for the East Span Project due to the difficulty of finding sufficient and suitable land at or near the project site. However, Caltrans proposes on-site restoration of a portion of the sand flats that would be temporarily impacted by construction activities.

Creation of new sand flat habitat is constrained by several factors. First, sand flats are a transitional intertidal habitat. Water permanently borders the lower edge of the sand flat while the upper edge of the sand flat transitions to tidal marsh or directly to uplands. There are two options for creating new sand flats: (1) extend the sand flat at the lower edge; or (2) extend the sand flat at the upper edge. Extending the sand flat at the lower edge is feasible, but not desirable, because it requires filling open water to create appropriate intertidal elevations. Extending the sand flat at the upper margin is desirable only if the sand flat is bordered directly by uplands. Otherwise it is necessary to excavate wetlands or other jurisdictional habitat.

If the sand flat is bordered directly by uplands, the sand flat can be extended on the landward side by excavating the uplands. The uplands would need to be excavated to a sufficient depth to prevent colonization by tidal marsh plant species. However, the upper edge of an existing sand flat is generally slightly lower than the lower limit of tidal marsh species. This leaves very little space with which to construct the new sand flats. It is likely that the created sand flats would quickly fill with sediment and become colonized by tidal marsh species. One possible solution, creating long strips of narrow sand flats, is not feasible because there are no sites in the project vicinity with a sufficient amount of shoreline available.

Caltrans also evaluated options for in-kind replacement of permanently impacted eelgrass beds at or near the project site. Initially, Caltrans proposed to create new eelgrass beds at the Oakland Touchdown area and at Clipper Cove on YBI by placing sand-filled plateaus to raise the elevations of the Bay bottom to a level suitable to support eelgrass growth and then planting the areas with eelgrass from a donor site. However, the staff of several resource and regulatory agencies, including BCDC, opposed creating new habitat in the Bay using fill material.

Creation of eelgrass habitat is still experimental in the Bay, and the success rate for such projects varies depending on what method is used<sup>6</sup>. The Richmond Harbor Training Jetty Eelgrass Transplant Program, which was completed in 1985, was among the first transplant programs in the Bay Area. Eelgrass was transplanted to a site that was not manipulated. The survival of the plants was mixed, depending on the location and age of the donor material. The eelgrass in the control and transplant areas did not expand their range in the spring and summer of the transplant year. Based on the experience of this project, Merkel concluded that in the Bay sites specifically manipulated for eelgrass transplantation may be more successful<sup>6, 7</sup>. Although much research on eelgrass restoration has occurred in southern California, the habitat in the San Francisco Bay is sufficiently different that available data from southern California is not readily transferable.

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<sup>6</sup> Merkel & Associates, Inc., Analysis of Eelgrass and Shallow Water Habitat Restoration Programs Along the North American Pacific Coast: Lessons Learned and Applicability to Oakland Middle Harbor Enhancement Area Design, Report to the Port of Oakland, CA, August 10, 1998.

<sup>7</sup> Fredette, T.J., M.S. Fonseca, W.J. Kenworthy and S. Wyllie-Echeverria, An Investigation of Eelgrass (*Zostera marina*) Transplant Feasibility in San Francisco Bay, CA, COE Report EL-88-2, Army Engineer Waterways Experiment Station, Vicksburg, MS, 1988.

## Attachment 5: Bay Fill Information

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Despite these challenges, Caltrans proposes on-site restoration of eelgrass habitat. This approach is distinct from creating new eelgrass habitat in that it focuses on restoring areas that are historically known to have supported eelgrass habitat. The proposed restoration would maximize the potential for planting success by incorporating site manipulation, monitoring and data collection.

Proposed on-site mitigation includes:

- Harvesting approximately 0.55 acres (0.22 hectares) of eelgrass from the footprint of the barge access channel prior to dredging, planting test plots in adjacent eelgrass beds and monitoring to evaluate performance;
- Restoring to its pre-construction bathymetry up to approximately 1.73 acres (0.70 hectares) of the barge access channel. Dredged material and excavated sand would be used to facilitate eelgrass colonization and the area would be replanted with eelgrass from an adjacent donor site;
- Restoring approximately 1.70 acres (0.69 hectares) of sand flats that are temporarily affected by the placement of a geotube or mud boils from engineered fill;
- Constructing rock slope protection to allow sand to accrete over the rock areas subject to tidal action. Slope gradients would be 1(V):3(H) at the toe of the slope and transition to a 1(V):2(H) gradient at mid-slope; and
- Capping rock slope protection areas with soil above the limits of tidal action to provide a medium to support growth of native upland plants and provide more natural upland transition than the existing abrupt slope.

### **Off-site Mitigation**

In addition to on-site mitigation, Caltrans proposes to provide \$8,000,000 to USFWS to acquire and restore approximately 3,000 acres (1,214 hectares) of habitat at Skaggs Island consistent with the Baylands Ecosystem Habitat Goals. Prior to construction of any portion of the East Span Project, Caltrans would deposit the funds in an interest-bearing trust account for use by USFWS. All principal and accrued interest would be available for acquisition and restoration of aquatic habitat. Caltrans would continue consultation with state and federal resource and regulatory agencies on the parameters of the acquisition and restoration fund and mitigation opportunities at Skaggs Island. The relevant agencies would include:

- San Francisco Bay Conservation and Development Commission;
- Regional Water Quality Control Board;
- California Department of Fish and Game;
- US Army Corps of Engineers;
- US Environmental Protection Agency;
- US Fish and Wildlife Service; and
- National Marine Fisheries Service.

Caltrans proposes the following parameters for the off-site mitigation:

- USFWS would be fully responsible for designing, constructing, monitoring and managing the habitat creation and/or restoration;
- USFWS would be responsible for obtaining all necessary local, state and federal permits and completing any required environmental compliance including endangered species consultation;
- The habitat creation and/or restoration would be consistent with the recommendations of the Baylands Ecosystem Habitat Goals and should include eelgrass and sand flat habitat to the extent practicable;

## **Attachment 5: Bay Fill Information**

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- The habitat creation and/or restoration should be planned and designed to be self-sustaining over time to the extent possible;
- The acquisition and restoration funds should be used for replacing the functions and values of aquatic habitat and not to finance non-mitigation programs (e.g., education projects or research); and
- The area encompassed by the habitat creation and/or restoration should be protected in perpetuity with appropriate real estate arrangements (e.g., conservation easements, transfer of title to federal or state resource agency or non-profit conservation agency).

### **Timing of Mitigation**

The first phase of mitigation, which involves harvesting and transplanting eelgrass, would occur prior to dredging for the Oakland Approach Structures contract. The remaining on-site eelgrass mitigation cannot be fully implemented until project completion, which would take approximately seven years. Sand flat mitigation could begin once the Geofill contract has been completed and the rock slope protection installed at the Oakland Touchdown. Establishment of the acquisition and restoration fund could be implemented prior to construction of the Skyway contract. Implementation of off-site mitigations at Skaggs Island depends on several factors including USFWS obtaining site control, preparing an appropriate plan, conducting environmental review and obtaining necessary regulatory permits.

### **Item p-9**

#### **Licensed Professionals Involved in the Project Design**

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## **TRANSPORTATION**

### **Bay Plan Transportation Policies**

In part, the Bay Plan Policies on transportation state that "If a route must be located across a waterway, the following provisions should apply:

- a. The crossing should be placed on a bridge or in a tunnel, not on solid fill.
- b. Structures should provide adequate clearance for commercial ships, Navy ships, and pleasure boats to have uninterrupted passage at all times.
- c. Toll Plazas, service yards, or other ancillary features should not be located on new fill.
- d. To provide maximum ultimate capacity on any new route that is allowed over or under a waterway (and thus to minimize the number that might have to be allowed in the Bay), the design of the route should, if feasible, accommodate future mass transit facilities and subsequent installation of automatic power and guidance elements for vehicles."

### **Crossing Should Be Placed on Bridge or in Tunnel**

The proposed replacement crossing would be placed on a bridge that spans from the Oakland Touchdown to YBI. Caltrans recognizes that it proposes to place permanent, solid fill at the Oakland Touchdown area for the westbound roadway (bridge approach) and to relocate the Caltrans maintenance road. The solid fill is necessary to provide a seismically upgraded bridge approach that can be quickly and easily repaired

## Attachment 5: Bay Fill Information

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in the event of an MCE and to provide necessary emergency access to respond to accidents on the bridge and to ensure safe and efficient access for maintenance personnel. The bridge approach is fundamentally linked to the bridge and provides an essential transition from land to water. The Caltrans maintenance road provides essential access to properly maintain and service the bridge.

Caltrans could utilize a bridge type structure (slab-on-piles) for the approach and the maintenance road rather than placing solid. However, the slab-on-pile option is seismically inferior to a solid fill option. MTC's EDAP also evaluated the slab-on-pile option and recommended the solid fill option for economic, aesthetic, and functional reasons. BCDC's Engineering Criteria Review Board concurred that a solid fill option is preferable. The following summarizes the benefits of using a solid fill option as identified in an advanced planning analysis:

- **Seismic Performance.** The slab-on-pile has poor seismic performance with possible failure and/or irreparable damage during an MCE. The solid fill option may incur lateral displacement and settlement with minor to moderate pavement distress;
- **Time to Re-open After Seismic Event.** The slab-on-pile option could be open to emergency traffic within hours after an MCE. However, it would require months to construct temporary detours for public use. The solid fill option could be open to emergency traffic within hours after an MCE and to full traffic within several days;
- **Repairs.** The slab-on-pile option would require replacing the entire structure in-kind or replacing it with solid fill and detouring five lanes of westbound traffic during construction. A detour would likely be on temporary structures located in the Bay further impacting sand flats and eelgrass beds. Repair of the solid fill option would involve new asphalt concrete overlay, which could be completed in days and avoids the need for most traffic detouring;
- **Repair Costs.** Permanent repair or replacement of the slab-on-pile option would cost approximately \$5,000,000. Repair of the solid fill option would cost approximately \$100,000 to \$500,000;
- **Initial Construction Costs.** The slab-on-pile option would cost approximately \$6,530,000 due to in-water construction and the need for deep pile foundations. The solid fill option would cost approximately \$4,990,000;
- **Maintenance Issues.** The slab-on-pile option would be costlier to maintain than the solid fill option due to its in-water location; and
- **Environmental Considerations.** The slab-on-pile option would create an abrupt shoreline transition with inlets that would be susceptible to trapping debris and garbage. The solid fill option could be designed with a 1V:3H/1V:2H slope to provide a transitional upland habitat area for shorebirds feeding on the adjacent sand flats and could be planted with native habitat to provide the appearance of a more natural shoreline as compared to the existing shoreline. Moreover, this slope design would minimize potential erosion of eelgrass by limiting the return of wave energy near the toe of the slope.

### Provides for Adequate Ship Clearance

Caltrans is working closely with the USCG to ensure that the new bridge would provide adequate clearance for commercial ships and recreational boats. The replacement bridge would have a navigation opening width of 1,164 feet (355 meters) between the main tower and Pier E2 (fender to fender) and a vertical clearance of 141 feet (43 meters) over mean high water at Pier E2. The new bridge would narrow the main navigation opening by approximately 166 feet (50 meters) from the existing opening. Nevertheless, the resulting horizontal and vertical clearance would conform to USCG recommendations.

Caltrans would obtain a permit to construct the new bridge from the USCG pursuant to Section 9 of the Rivers and Harbors Act and the General Bridge Act of 1946. Notification to mariners would be specified in the bridge permit. The proposed replacement bridge is required to conform to USCG Regulations Part 114 and 115 of Title 33, Code of Federal Regulations. Conformance with these regulations requires that marine navigation openings remain navigable during and after construction. The appropriate levels of

## **Attachment 5: Bay Fill Information**

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lighting and obstruction markers are required to identify permanent and temporary bridge structures, including construction vessels placed in the water within the bridge construction zone. The project would include installation of applicable navigation aids, such as fenders and lights.

### **ANCILLARY FEATURES NOT LOCATED ON NEW FILL**

No new ancillary features for the bridge would be located on new fill in the Bay. All ancillary features, such as service yards and toll plaza facilities would remain located in upland areas outside BCDC's jurisdiction.

### **ACCOMMODATES FUTURE MASS TRANSIT FACILITIES**

The SFOBB is within an important corridor of transbay travel between San Francisco and the East Bay. The bridge is currently a multi-modal highway facility that is used by public and private vehicles, trucks, buses, carpools, vanpools, and bicycle shuttle service. The corridor is also served by Bay Area Rapid Transit (BART), which provides rapid rail service via the submerged BART tube, and ferries.

Based on available data, approximately 36,000 people travel through the Transbay Corridor during the weekday morning peak hour in the peak direction (westbound). The following table summarizes existing person trips in the Transbay Corridor by mode:

	<b>Single- /Double- Occupant Vehicles</b>	<b>Carpools/ Vanpools</b>	<b>Buses</b>	<b>BART</b>	<b>Ferries</b>	<b>Total</b>
Number of Person Trips (AM peak hour, westbound)	8,900	9,400	3,100	14,000	400	35,800

Because the SFOBB is a critical regional facility whose approaches are severely congested during peak periods, the feasibility of incorporating an additional high-occupancy transportation facility within the corridor (either road- or rail-based) was evaluated. The purpose of such a facility would be to increase mobility within the corridor.

The East Span Project does not create any additional obstacles to implementing a rail project or other mass transit technologies in the Transbay Corridor. Nevertheless, the proposed project does not include facilities for high occupancy vehicle (HOV) lanes or rail transit. The new span could accommodate an HOV lane by converting one travel lane in each direction. Alternatively, it could accommodate light rail transit (LRT) by converting one travel lane and one shoulder in each direction, reducing the capacity of the East Span to four vehicular lanes, and making some structural modifications. Since multi-modal strategies would reduce the number of mixed flow traffic lanes, the selected strategy would have to capture an amount of ridership that matches the loss in mixed-flow vehicular capacity on the SFOBB and its approaches. Otherwise, vehicular operations on the SFOBB and its approaches would be comparatively worse. The accommodation of rail and five lanes of traffic would require significant modifications. As proposed, the East Span Project could accommodate the live loads associated with LRT type trains. Heavier vehicles, such as commuter or high-speed rail, could also be accommodated but would require substantial modifications to the current design.

Caltrans has concluded that the near term implementation of either multi-modal strategy would involve substantial institutional and funding challenges.

### **Institutional and Funding Issues**

Multi-modal strategies have not been identified as necessary in any regional planning process or document. MTC is the regional agency responsible for programming, transportation planning, and financing within the nine-county San Francisco Bay Area. It functions both as the regional transportation

## Attachment 5: Bay Fill Information

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planning agency and as the region's Metropolitan Planning Organization (MPO). These designations are mandated through state and federal legislation, respectively.

The SFOBB is a component of the Interstate 80 Corridor, an important corridor in the Bay Area for commute travel, freight movement, and recreational travel. It has been studied extensively by regional planning organizations such as MTC and local transit agencies. These studies include:

- MTC's Bay Crossing Study (1991);
- HOV Lane Master Plan (1997);
- Interstate 80 Corridor Study (1987);
- Phase I ACR 132 Intercity Rail Corridor Upgrade Study (1989);
- Greater East Bay Rail Opportunities Coalition's Commute Rail Operating Plan (1994);
- AC Transit's Alternative Modes Analysis (1993);
- Transbay Comprehensive Service Plan (1998);
- Caltrans' Rail Passenger Program Report 1993/94 - 2002/03 (1993);
- California High Speed Rail Commission studies;
- MTC's Blueprint for the 21<sup>st</sup> Century (1999); and
- MTC SFOBB Rail Alternatives Study (2000).

These studies identified existing and future system deficiencies and travel demand and evaluated improvement strategies, such as HOV lanes, improved ferry service, LRT corridor identification, and commuter rail service. None of these studies has identified an HOV lane or a rail-based system on the SFOBB as a preferred improvement strategy, although AC Transit has requested that Caltrans study an HOV lane on the SFOBB. Caltrans evaluated such a facility in October 1994.<sup>8</sup> The MTC SFOBB Rail Feasibility Study identified preliminary estimates of the cost of SFOBB rail, structural modifications to the East and West Spans, and possible service operating scenarios. The study did not estimate potential ridership or identify environmental constraints.

Because none of these studies has identified an HOV lane or rail on the SFOBB as a preferred strategy, neither of these multi-modal strategies has been included in either the Track 1 or Track 2 project lists of the MTC's 1994 Regional Transportation Plan (RTP) or its 1996 and 1998 updates, including a 1999 amendment.<sup>9</sup> The planning horizon for the RTP is 20 years. MTC could include the multi-modal strategies in subsequent RTPs if the projects are consistent with local and regional objectives and strategies for congestion management. In addition, neither multi-modal option was included in a recently enacted statewide funding package for transportation improvements (Governor's Traffic Congestion Relief Program, July 2000).

No funding has been programmed or identified for either strategy. MTC recently estimated the cost to implement rail on the SFOBB to be between \$4 and \$9 billion, depending on the technology used, and the infrastructure and bridge structural modifications required. The structural modifications to both the proposed East Span and West Span to accommodate rail would cost between \$3.06 and \$3.3 billion. The

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<sup>8</sup> Caltrans District 4 Highway Operations, Effects of Proposed Changes to Bay Bridge HOV Operation, October 19, 1994.

<sup>9</sup> The Regional Transportation Plan, which MTC prepares, is a comprehensive guide for the development of mass transit, highway, airport, seaport, railroad, bicycle, and pedestrian facilities within the Bay Area for the next 20 years. Track 1 refers to the list of regional transportation projects financially committed to in the past, as well as projects that maintain and operate the existing transportation infrastructure. Track 2 projects are regional transportation projects that do not yet have regional consensus or complete funding. MTC also allocates state and federal funds for transportation projects based on compatibility with this plan. The RTP is updated every two years through a public participation process to reflect a changing funding picture and the changing status of projects in Track 1, as well as to address new findings that emerge from corridor studies and Track 2 consensus building.

## Attachment 5: Bay Fill Information

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MTC study noted that heavy rail could be accommodated on the East Span with significant and costly modifications to its current design.

No cost estimates have been prepared for implementation of an HOV lane on the SFOBB but they would likely be less than rail. Costs may include modifications to existing ramps or construction of new ramps. These costs may be substantial.

The construction and operation of the facilities required to implement an HOV lane or rail system would require additional funding and sources of funding beyond those committed to the East Span Project. Replacement bridge types and amenities for which funding has been allocated by state legislative action do not include construction of HOV or rail systems. Other local, regional, state, and federal sources fund multi-modal projects. However, since costs to build, operate and maintain the existing local and regional transportation system exceed available transportation funding sources by \$7 billion over the next 20 years, it is assumed that existing sources of revenues would remain committed in the foreseeable future to support existing transit services and expenditure priorities.<sup>10</sup> Commitment of new potential funding and funding sources for multi-modal projects on the SFOBB would depend on the political and economic environment in the future.

Both strategies would require new institutional arrangements to implement and operate the facilities. Neither the HOV lane nor a rail system is currently identified as a regional transportation priority. Before either can be included in the RTP, new institutional arrangements would be required, such as the identification of a governing body to operate the rail system. This body would not be created until there is regional consensus and agency interest in the strategies. This consensus does not currently exist.

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<sup>10</sup> Metropolitan Transportation Commission, 1998 Regional Transportation Plan for the San Francisco Bay Area, August 1998.

## Box 6

### Shoreline Band Information

("Shoreline band" means the land area lying between the Bay shoreline and a line drawn parallel to and 100 feet from the Bay shoreline. The Bay shoreline is the Mean High Water Line, or five feet above Mean Sea Level in marshlands.)

- a. Types of activities to be undertaken or materials to be placed within the shoreline band:

See Attachment 6.

- b. Will the project be located within a water-oriented priority use area that is designated in the San Francisco Bay Plan?

Yes, see Attachment 6.

Will the project use be consistent with the priority use for which the site is reserved?

Yes, see Attachment 6.

- c. Total shoreline band area within project site: 13.33 acres/ 5.40 hectares

- d. Area within shoreline band to be reserved for non-public access uses: 13.03 acres/ 5.28 hectares

- e. Area within shoreline band to be reserved for public access: 0.30 acre/ 0.12 hectare

- f. **INFORMATION ABOUT THE SHORELINE WORK TO BE PROVIDED IN AN ATTACHMENT:**

1. Please describe the area, in square feet, to be covered by structures; used for roads; used for parking; used for pathways and sidewalks; covered with landscaping; used for shoreline protection; and used for other purposes (specify uses).
2. Please identify the total number of parking spaces in the project and within the shoreline band.
3. Please provide dimensions of portions of all structures to be built within the shoreline band, including length, width, area, height, and number of stories.

## Items a, b, and f

The project components that would occur within the BCDC shoreline band are included in Table 4-1. Table 4-1 also includes temporary structures and project components that would occur in the BCDC shoreline band.

## **PARK PRIORITY USE DESIGNATION**

### **Bay Plan Policies**

Bay Plan Map Number Four identifies YBI as a park priority use area. The Bay Plan notes state that “if and when not needed by Navy or Coast Guard, redevelop released areas for recreational use.” Replacing the existing East Span with a new bridge is consistent with the park priority use area and the intended use of YBI for future recreational purposes.

### **Background**

The existing East Span was originally opened for traffic in 1936 and has been a dominant feature of YBI ever since. The opening of the SFOBB predates BCDC’s designation of the park priority use area by 32 years. The proposed project would replace the existing East Span with a new bridge that is aligned just to the north of the existing bridge, thus replacing an existing feature on YBI.

The Legislature gave BCDC the authority to establish priority use areas to ensure that there was sufficient upland to accommodate certain water-oriented land uses, such as waterfront parks, and to minimize the placement of fill in the Bay for such uses. In this case, the replacement of the existing bridge would not pre-empt the future use of YBI as a waterfront park, nor would it result in the unnecessary placement of fill in the Bay for future park uses. The footprint of the existing bridge and access ramps within the park priority use area is approximately 3.6 acres (1.5 hectares) while the footprint of the proposed replacement bridge and ramps is approximately 7.8 acres (3.2 hectares). Although the new bridge would have a larger footprint within the park priority use area than the existing bridge, the majority of the footprint of the new bridge would be elevated far above existing grade on YBI. Similar to the existing bridge, the land areas beneath the new bridge and within Caltrans’ new right-of-way would not preclude future recreational uses as long as they are consistent with Caltrans’ requirements for maintaining the bridge and public safety. Caltrans’ existing permanent right-of-way on YBI includes in-fee property rights. Thus, the amount of land that would be available for future recreational purposes would not change significantly with the replacement bridge.

### **Enhancements to Park Priority Use Area**

The replacement bridge would enhance the park priority use area in several ways. First, the replacement bridge would facilitate automobile, pedestrian and bicycle access to YBI with a seismically upgraded structure. Currently the existing bridge does not include pedestrian and bicycle access to YBI. However, the replacement bridge would include an approximately 2.3-mile-long (3.7-kilometer-long) and 15.5-foot-wide (4.7-meter-wide) pedestrian and bicycle path on the south side of the eastbound structure. In addition, the SAS at YBI would have a belvedere at which pedestrians and bicyclists can rest and view YBI. The belvedere would provide a unique vantage point that would enhance the public’s appreciation of the park priority use area. The pedestrian and bicycle access would complement other travel modes if and when YBI is used for recreational purposes.

Second, the replacement bridge would reduce noise levels in the park priority use area as compared to the existing bridge. It is anticipated that future predicted peak-noise-hour levels from the new bridge would decrease 1 dBA to 14 dBA. The new bridge on YBI and the Oakland Touchdown area would use steel reinforced concrete, which would result in lower operational noise levels by eliminating radiation of sound

## **Attachment 6: Shoreline Band Information**

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through the bridge decks. Vehicular noise would be further reduced by the installation of new modular expansion joints. Vehicles passing over the expansion joints would cause less noise than the existing conditions. For the replacement bridge, the eastbound and westbound lanes would be side-by-side rather than stacked, with the exception of the YBI viaduct and tunnel portal. At YBI this would partially eliminate traffic noise that currently may be reflecting from the bottom of the upper deck. Reduction of noise levels would enhance the public's potential use and enjoyment of the park priority use area if and when YBI is used for recreational purposes.

Third, Caltrans would ensure that all excavated waste or hazardous materials generated from new construction and the removal of the existing bridge are appropriately managed, remediated, and disposed of in conformance with local, state and federal laws and regulations. Once the existing bridge is removed, the land areas occupied by the existing bridge that are no longer required for maintenance of the new bridge would revert back to the Navy and/or USCG. Caltrans would work with all potentially responsible parties and regulatory agencies to coordinate the disposal of excavated waste or hazardous materials. The area occupied by the existing bridge would then be available for future recreational purposes, if and when the Navy and/or USCG no longer needs the land and releases it for other non-military uses.

# Box 7

## Public Access Information

- a. Does public have access to the shoreline or do views to the Bay presently exist on the project site or on a contiguous property?

Yes. See Attachment 7.

- b. Will the project block public views of the Bay or adversely impact present or future public access to the shoreline?

No. See Attachment 7.

- c. Do public safety considerations or significant use conflicts make it infeasible to provide new public access to the shoreline on the project site?

See Attachment 7.

- d. **SUMMARIZE THE PUBLIC ACCESS TO BE PROVIDED AS PART OF THE TOTAL PROJECT:**

- |   |   |
|---|---|
| 1. Total amount of public access:                   | <u>5.6 acres/ 2.3 hectares</u>                        |
| 2. Length of waterfront public access area:         | <u>N/A</u>  |
| 3. Number of parking spaces for public access area: | <u>43 interim spaces on the<br/>Oakland Touchdown</u> |
| 4. Area and width reserved for view corridor(s):    | <u>0 square feet/ 0 square meters</u>                 |

- e. **DETAILED INFORMATION ABOUT PUBLIC ACCESS TO BE PROVIDED IN AN ATTACHMENT:**

The information requested below is provided in Attachment 7.

Please describe, in square feet, length and width, when appropriate, the existing and proposed public access areas and improvements, including areas used for decks, piers, pathways, sidewalks, landscaping, parking, and other public features. Please describe how the public access area facilities would be accessible to handicapped persons. Please describe the connections to existing public streets or offsite public pathways. Specify how the public access will be permanently guaranteed (e.g., dedication, deed restriction, etc.).

### Items a, b, c, and e

#### **BAY PLAN PUBLIC ACCESS POLICIES AND SENATE BILL 60**

Section 66602 of the McAteer-Petris Act states that existing public access to the shoreline and waters of San Francisco Bay is inadequate and that maximum feasible public access, consistent with a proposed project, should be provided. In addition, the San Francisco Bay Plan designates the East Span as a scenic roadway and YBI as a park priority use area. The Bay Trail Plan also designates the SFOBB as a proposed "spine" trail.

Notwithstanding the requirements of the McAteer-Petris Act, Senate Bill 60, authored by Senator Quentin Kopp in 1996, prohibits local and state permitting authorities from imposing any requirements that a bicycle, pedestrian, or mass transit facility be constructed on a replacement bridge for the East Span as a condition for issuing any permit, granting any easement, or granting any other approval needed for the construction of the new bridge.

#### **EXISTING PUBLIC ACCESS**

Currently, there is no existing public access to the shoreline in the vicinity of the SFOBB at either the Oakland Touchdown or YBI. Some informal unauthorized public access does occur at the Oakland Touchdown area. Fishermen have been observed fishing on the north side of the Oakland Touchdown and near Radio Beach. However, those areas within Caltrans right-of-way are signed no trespassing and public access is unauthorized.

In terms of visual access, the existing bridge affords some views to motorists. Westbound motorists ride on the upper deck of the bridge. Westbound views are partially obstructed by the architecture of the bridge itself, most noticeably by the presence of a 39.5-inch-high (1-meter-high) solid steel railing that runs along either side of the roadway. Steel beams reach from the upper deck into the cantilever structure at regular intervals, partially obstructing motorist views. Westbound motorists have several views, including the skyline of San Francisco and the Marin Headlands.

Eastbound motorists ride on the lower deck of the bridge. Eastbound views are significantly obstructed due to the physical enclosure of the double-deck structure on the lower deck. The westbound roadway above blocks light and views. The 39.5-inch-high (1-meter-high) solid steel railing located on both sides of the lower span blocks views and the steel truss support beams from the upper to lower deck occur at regular intervals and interrupt views. For motorists commuting in buses and vehicles with a higher passenger compartment, visibility is not as compromised by the solid railing and the architecture of the bridge.

#### **FUTURE PUBLIC ACCESS**

As part of the I-880/Cypress Freeway Replacement Project, Caltrans is required by BCDC to provide and maintain a bicycle and pedestrian pathway connecting the cities of Emeryville and Oakland between Shellmound Street and Nelson Mandela Parkway, through the distribution structure for I-80, I-580, and I-880 to the Oakland Touchdown area. Caltrans is also required to provide two scenic overlooks, a 5,000-square-foot (465-square-meter) overlook on the north side of the Oakland Touchdown area and a 2,500-square-foot (232-square-meter) overlook on the south side of the area. The overlooks are supposed to include public amenities such as parking, restrooms, benches, a fish cleaning facility, trash cans, and native landscaping. EBRPD has plans to develop the Gateway Park on the south side of the bridge on former OBRA property. If the locations of all or portions of the conceptual overlooks and bikeway alignments prove infeasible due to the replacement of the existing bridge, the permit conditions allow Caltrans to pay an in-lieu fee rather than constructing the improvements, subject to BCDC approval.

### **PROPOSED PUBLIC ACCESS**

Based on the regional desires, as expressed and funded through MTC and its EDAP<sup>11</sup>, the East Span Project includes major improvements that would significantly enhance both physical and visual public access to and along the Bay shoreline and meet BCDC's requirement for maximum feasible public access consistent with the project.

The proposed public access for the East Span Project includes a bicycle and pedestrian path that would provide physical access from the Oakland Touchdown area to YBI. In addition, the bridge would include design features such as belvederes and side-by-side bridge decks that would provide panoramic views of San Francisco Bay, the Marin Headlands, and the San Francisco and East Bay skylines. The public access includes:

- **Overall Public Access Circulation.** When combined with the bicycle and pedestrian path requirements of BCDC Permit No. 11-93, Caltrans would provide a bicycle and pedestrian path from the City of Emeryville to YBI. The path would wind from Shellmound Street in Emeryville through the distribution structure for I-80, I-580 and I-880, continue west to the Oakland Touchdown area, cross the Bay on the replacement bridge, and terminate at South Gate Road on YBI (see Figures 37a-c and Appendix G).
- **Oakland Touchdown Landing and Staging Area.** Caltrans would construct a 43-car parking facility at the Oakland Touchdown area as a staging area for pedestrians and bicyclists who wish to access the path on the replacement bridge. Parking would be provided for the disabled as well as bicyclists. The parking lot would either be gravel or asphalt. The staging area is temporary, or interim in nature, and easily removable to ensure that it does not conflict with the design of EBRPD's future Gateway Park. Vehicular access to the parking lot would occur through the Caltrans maintenance facilities unless OBRA makes provisions for access on Burma Road.

In terms of physical access, BCDC's DRB was concerned that the public access proposal must allow people to enter and exit the path at the landing in a clear, continuous and inviting manner. At the eastern end of the bridge, where the Class I path reaches grade, the path transitions to the proposed parking facility and to Class II bike lanes on both the northern and southern side of the Caltrans maintenance road (See Figure 38). This solution has been designed with flexibility in mind so that it does not constrain the design of the future Gateway Park.

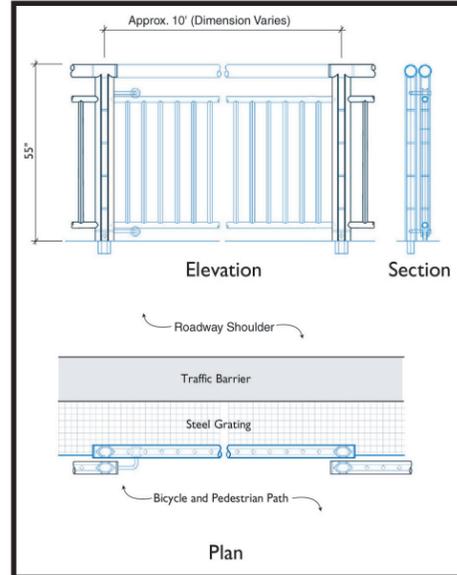
- **Yerba Buena Island Landing and Staging Area.** The CCSF is projected to acquire ownership of Treasure Island and the Navy portion of YBI in the year 2003. A caretaker agreement between the CCSF and Navy is currently in place. The caretaker agreement defines levels of maintenance on Treasure Island during the transfer and conveyance process and defines funding and service responsibilities. However, at this time it is not known how the CCSF will accommodate bicyclists and pedestrians. Caltrans has no agreements with the Navy or the CCSF regarding use of the local street system for pedestrian and bicycle access, nor does Caltrans own or control any of the local street system on YBI. Accordingly, a YBI landing would be limited to property controlled or owned by Caltrans and the pedestrian and bicycle path would terminate within the Caltrans' right-of-way (see Figure 39). Caltrans is negotiating with the Coast Guard to obtain adequate property rights to construct and maintain the YBI landing and staging area.

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<sup>11</sup> Several members of BCDC's Design Review Board (DRB) and Engineering Criteria Review Board (ECRB) were EDAP members and were involved in the design of the replacement bridge.



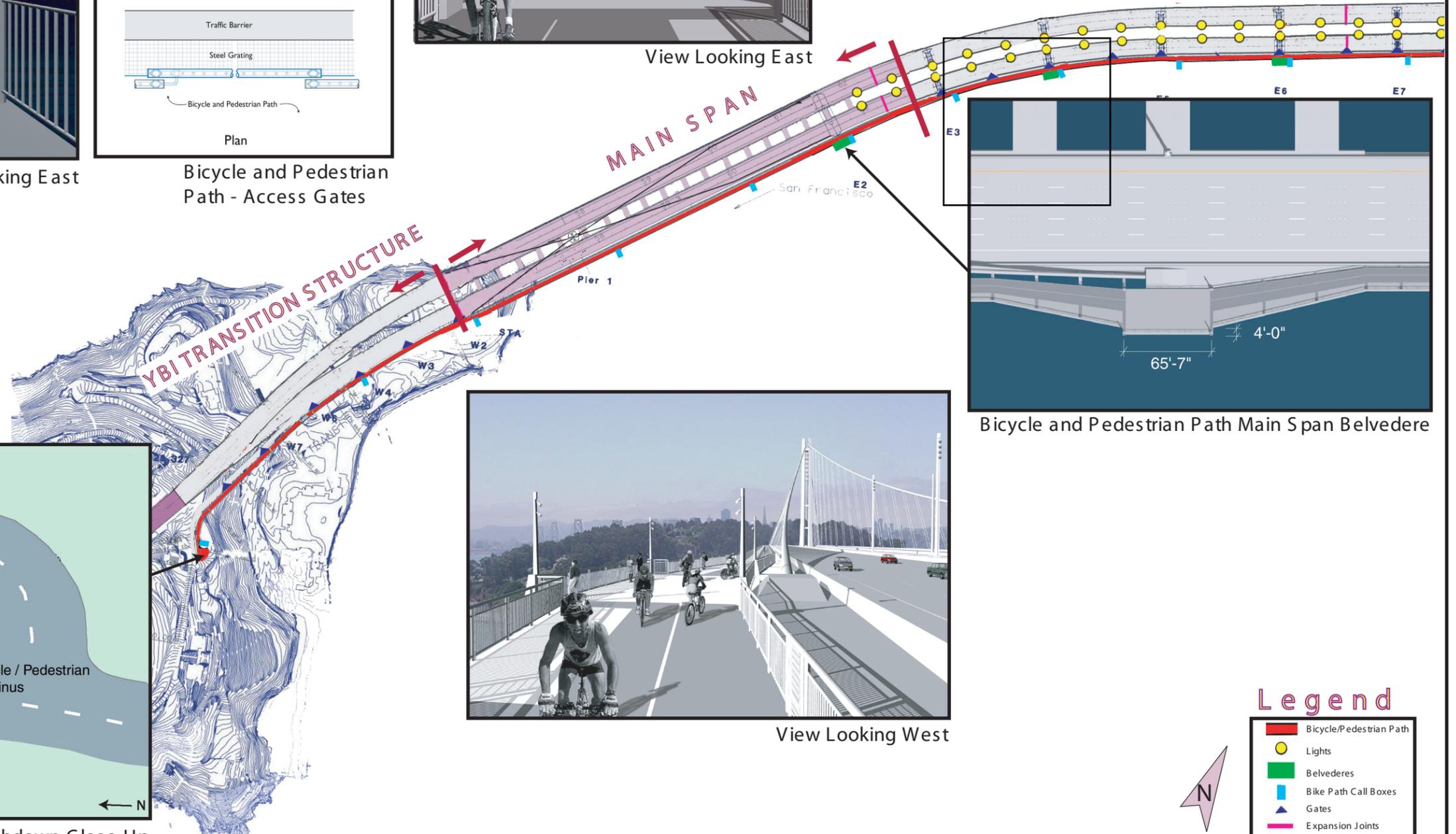
Bicycle and Pedestrian Path-View Looking East



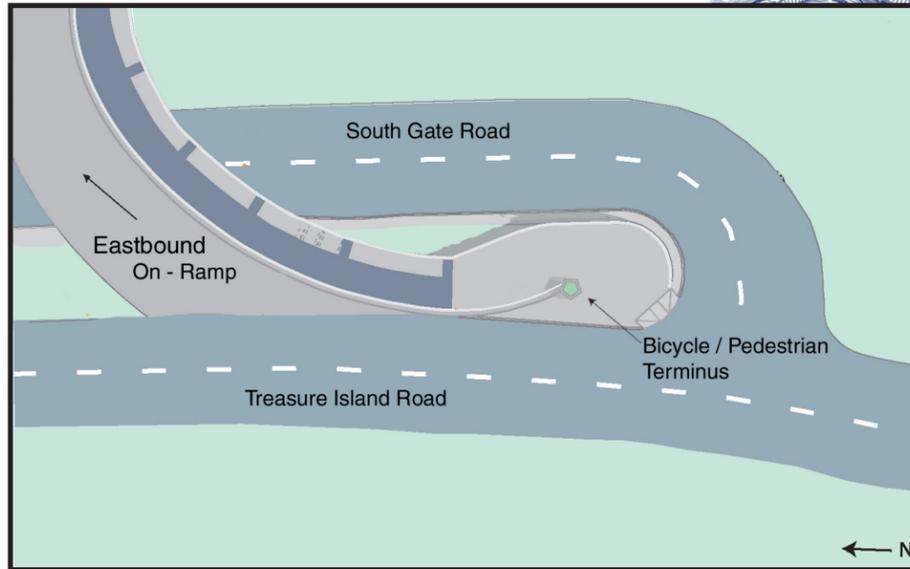
Bicycle and Pedestrian Path - Access Gates



View Looking East



Bicycle and Pedestrian Path Main Span Belvedere



YBI Touchdown Close Up

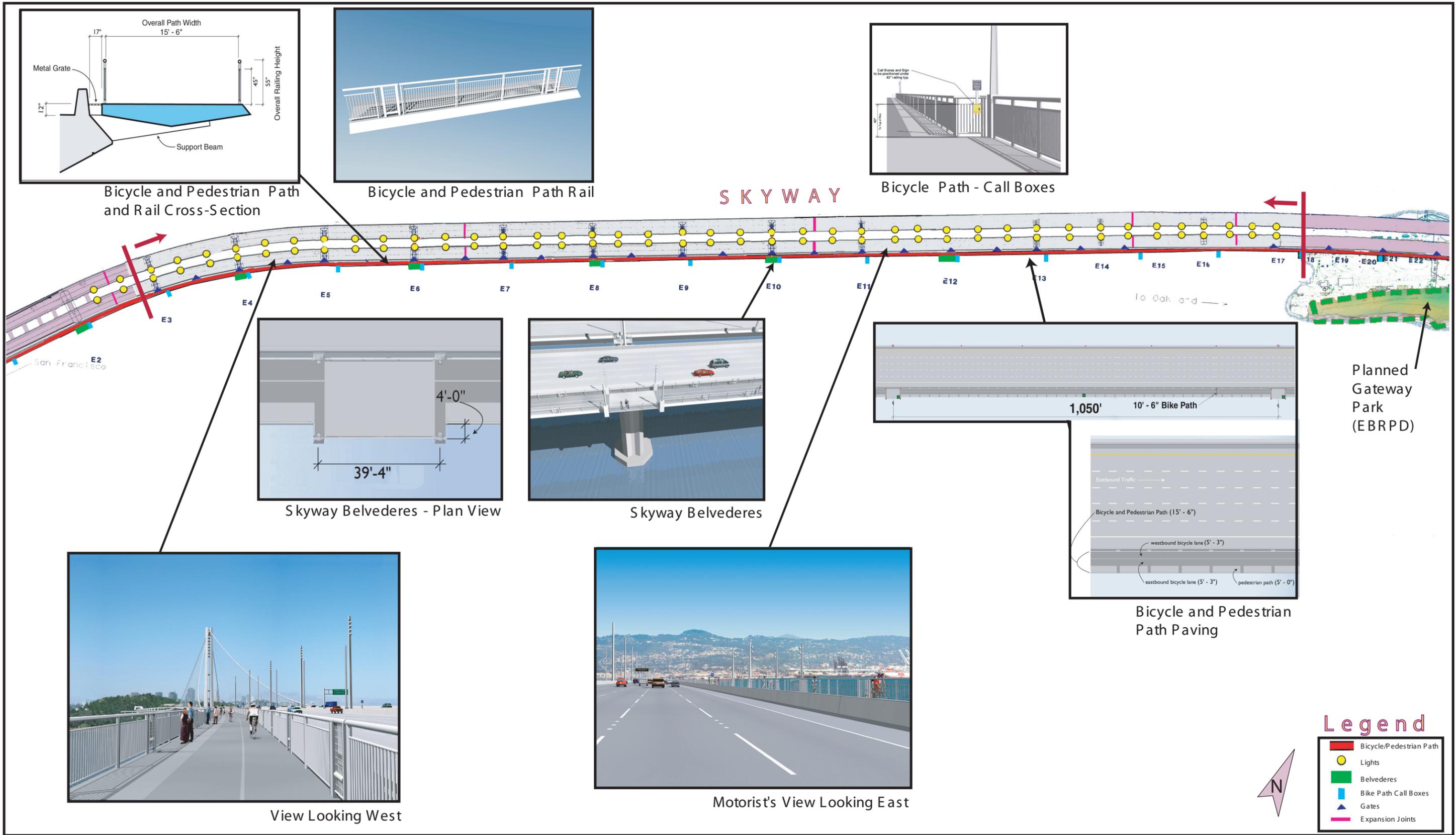


View Looking West

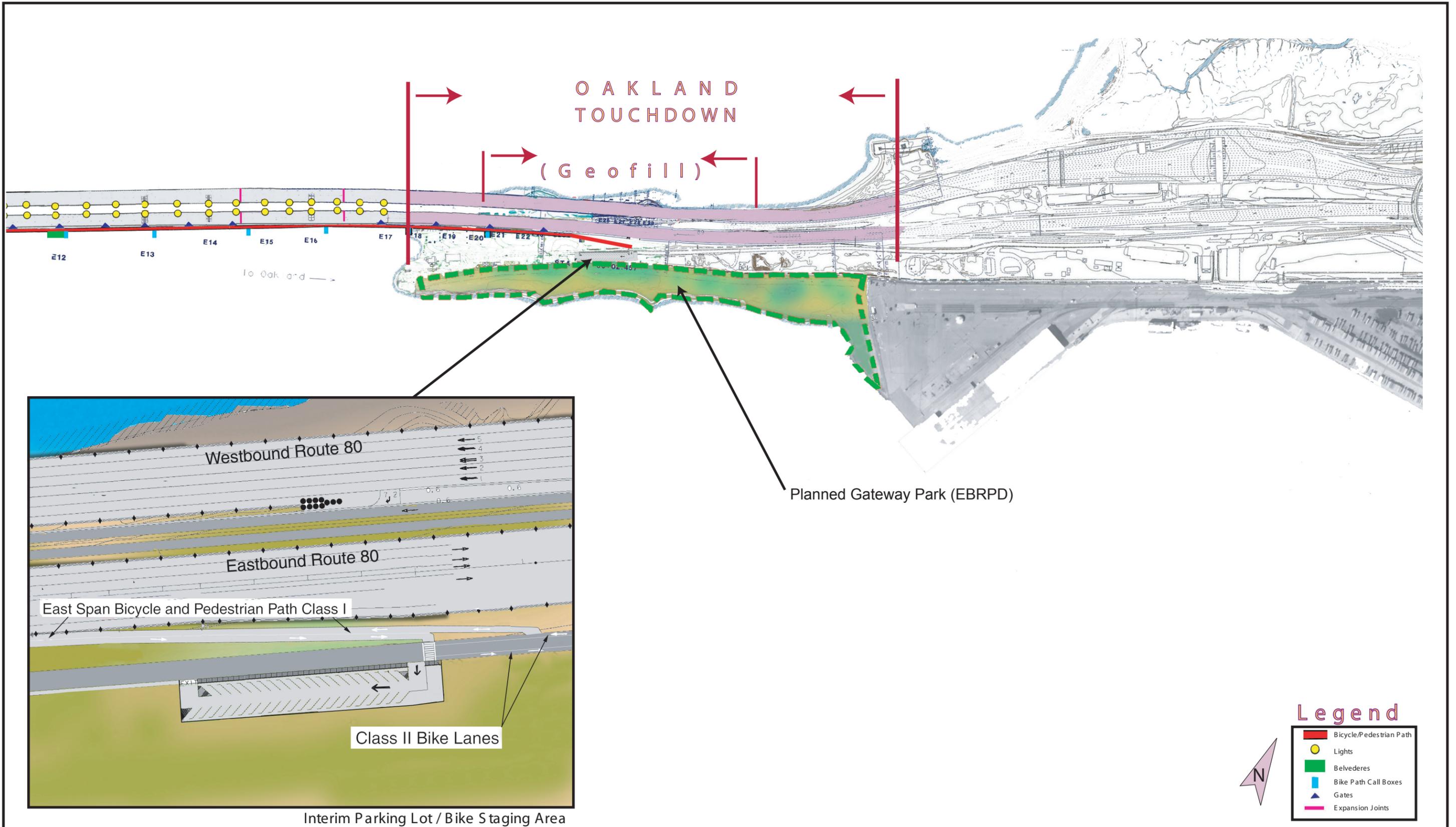
Legend

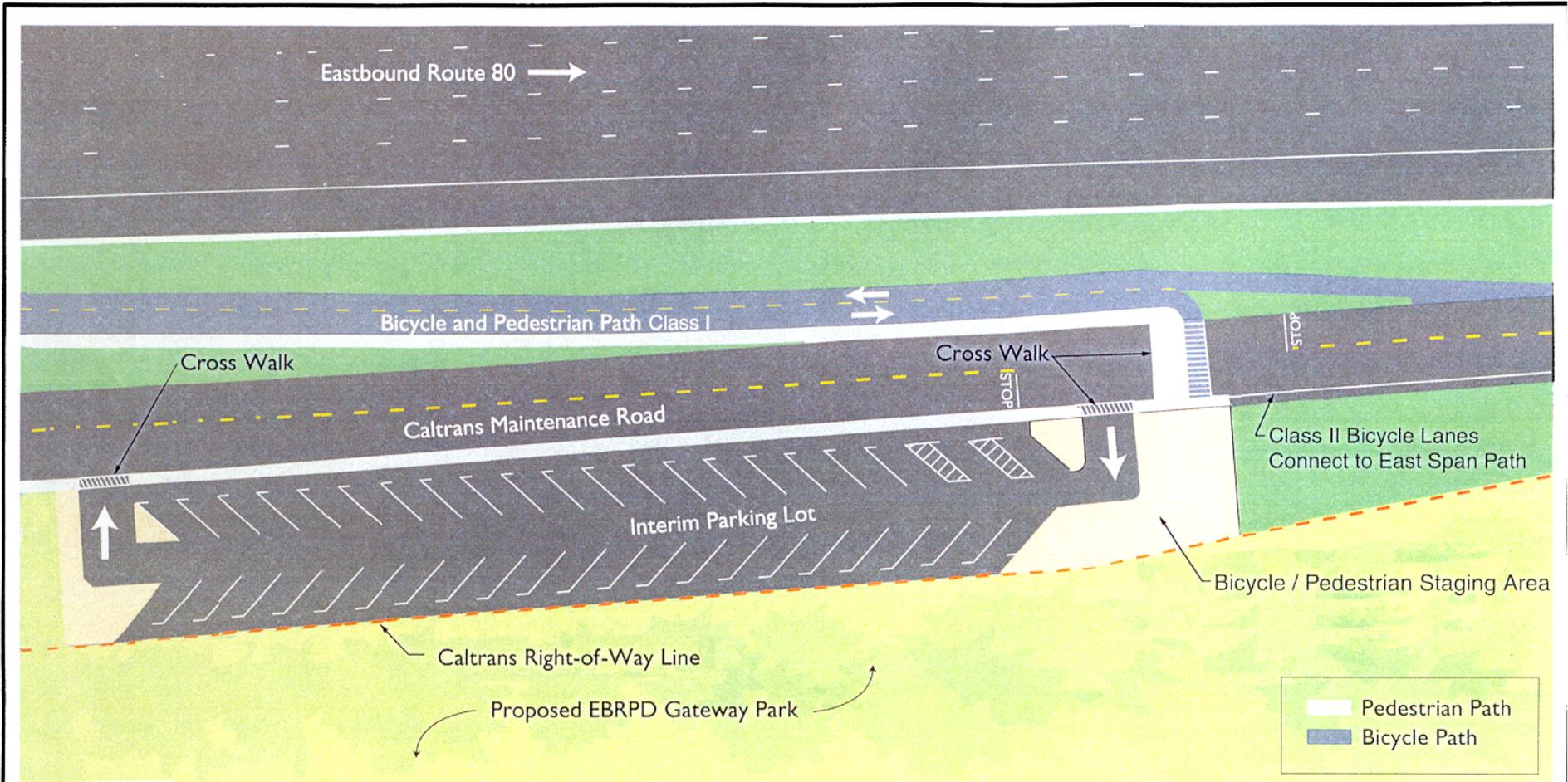
- Bicycle/Pedestrian Path
- Lights
- Belvederes
- Bike Path Call Boxes
- ▲ Gates
- Expansion Joints





Planned Gateway Park (EBRPD)



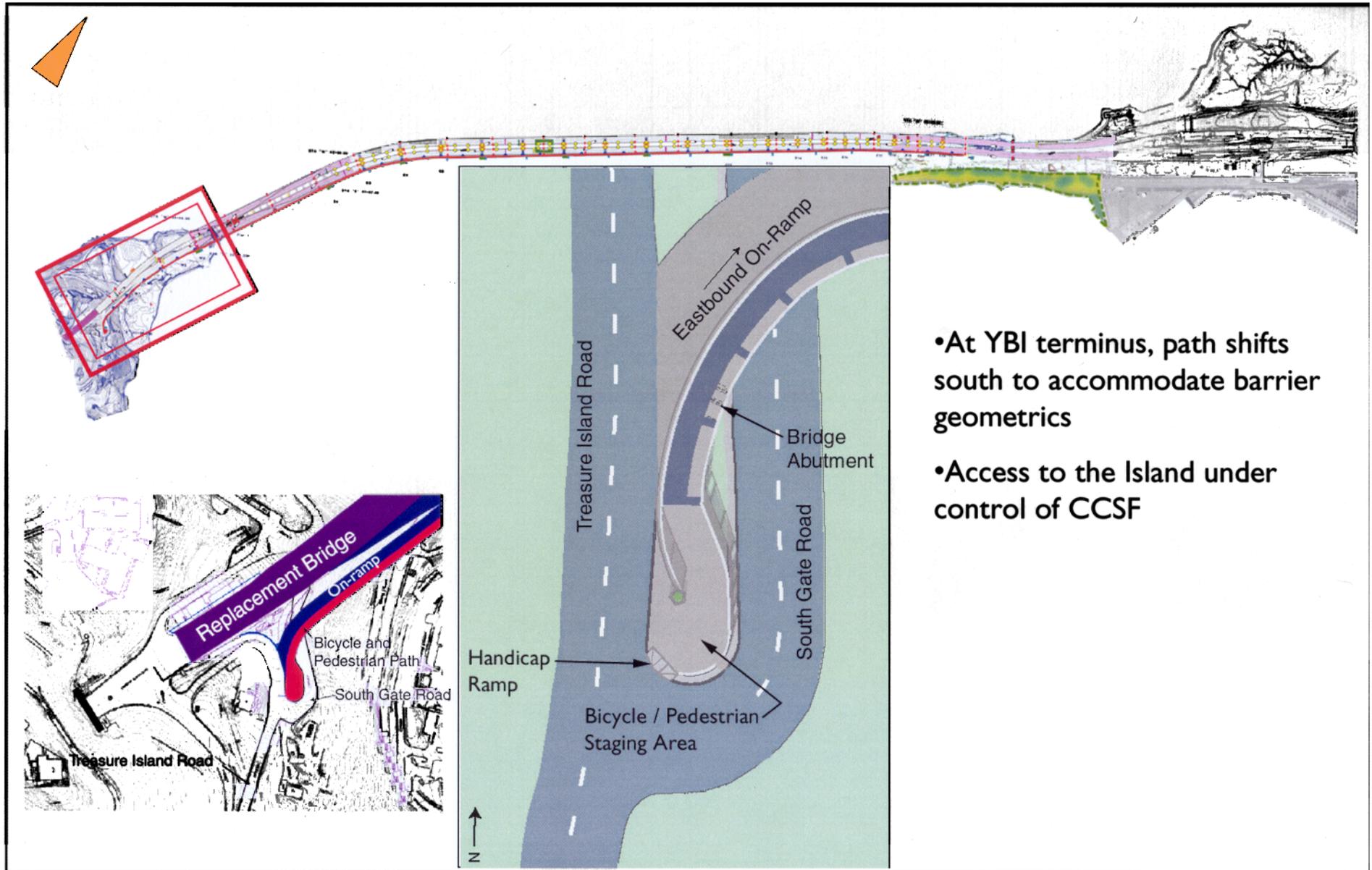


SFOBB  
 EAST SPAN  
 SEISMIC SAFETY  
 PROJECT

### Oakland Touchdown Bicycle and Pedestrian Path Landing

Not to Scale

Figure 38



- At YBI terminus, path shifts south to accommodate barrier geometrics
- Access to the Island under control of CCSF



SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

Yerba Buena Island Bicycle and Pedestrian Landing

Not to Scale

Figure 39

## Attachment 7: Public Access Information

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Caltrans would provide signage at the landing alerting bicyclists and pedestrians that the path ends and that there are difficult or dangerous conditions, such as steep grades and narrow roadways, on YBI.

In terms of physical access, the DRB was concerned that the public access proposal must allow people to enter and exit the path at the landing in a clear, continuous and inviting manner. The path would terminate at the intersection of Treasure Island and South Gate Roads on YBI (see Figure 39). Access to YBI itself would be determined by the appropriate landowners: the Navy, the USCG and the CCSF.

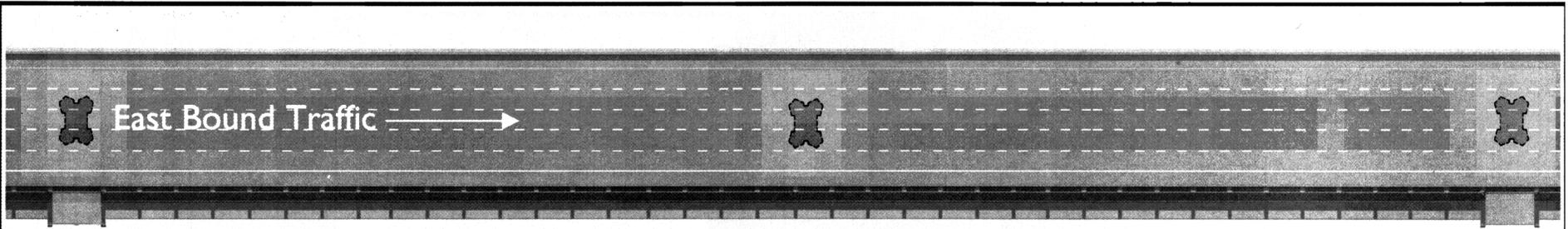
- **Bicycle and Pedestrian Path.** The existing East Span has no physical access for pedestrians or bicyclists. The proposed replacement bridge would include an approximately 2.3-mile-long (3.7-kilometer-long) and 15.5-foot-wide (4.7-meter-wide) pedestrian and bicycle path on the south side of the eastbound structure (from landing to landing). The path would be separated from the road deck by a 17-inch-gap (43 centimeter-gap) for a majority of the bridge length and elevated one foot (0.3 meter) above the roadway deck (see Figure 40). This would emphasize the separation of the path from the roadway, provide better views for bicyclists and pedestrians and reinforce the pedestrian scale of the path (see Figures 41 and 42). The path would be separated further from the road deck by a 55-inch-high (1.4-meters-high) steel safety railing and a separate 32-inch-high (0.81-meter-high), safety barrier. The path surface would be polyester concrete. Bicycle and pedestrian traffic would be separated and controlled with visual cues for public safety: a 10.5-foot-wide (3.2-meter-wide) section of the path would be shaded dark gray to delineate the area for bicyclists and a 5-foot-wide (1.5-meter-wide) section would be shaded a lighter gray for pedestrians. Signage and graphic legends painted onto the path would further emphasize separation of user groups.

The DRB expressed concern about the safety of cyclists and pedestrians sharing the same path and inquired if Caltrans considered physical means of separating users. The pathway design was developed with input from the Bay Bridge Bicycle and Pedestrian Advisory Committee (BBBPAC)<sup>12</sup> and from discussions with managers of the Golden Gate Bridge, Highway and Transportation District and the New York City Department of Transportation. As a result, the new East Span's path would use visual cues of color and markings in the pavement to separate user groups (see Figure 43). In addition, signs at the beginning and end of the path would reinforce the separations and caution pedestrians and bicyclists. The path would have an approximate grade of two percent on the bridge and an approximate grade of three percent at the touchdowns. As a result, bicyclists may travel at faster speeds down the grade. Caltrans is studying whether a speed limit should be imposed for bicyclists. No decision has been made at this time. However, it is important to note that there are inherent difficulties in monitoring and enforcing speed limits for bicyclists on the bridge.

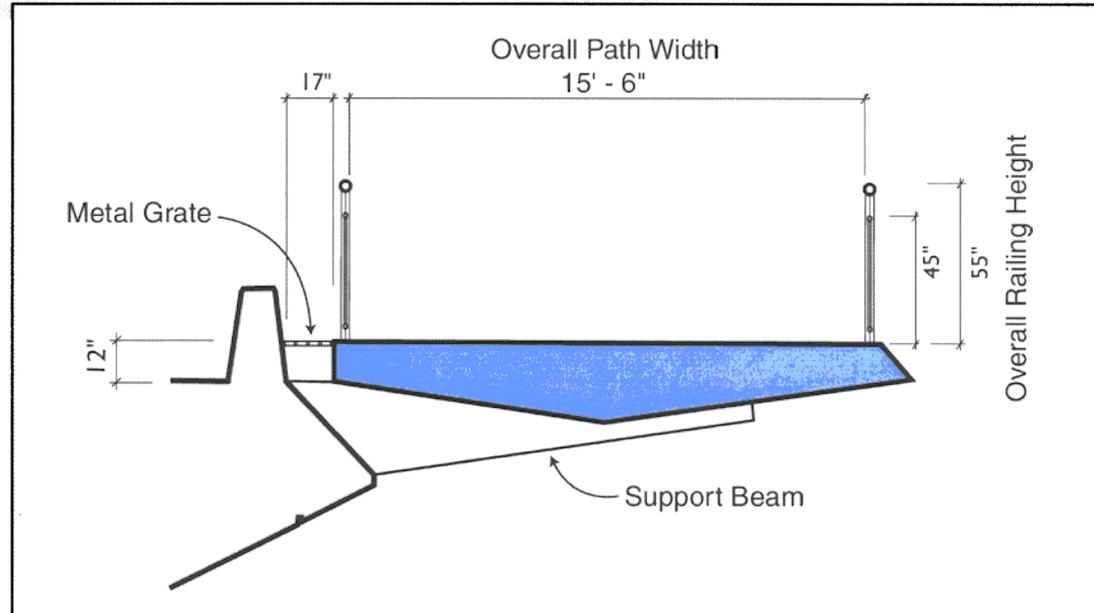
The BBBPAC discussed the issue of separating users and requested that there be no physical or tactile separation. They believed that these types of separation cause more accidents rather than reduce the number of accidents because cyclists may constrict the inner bike lane to avoid the barrier or tactile separation. This was also confirmed by discussions with the New York Department of Transportation. Additionally, recovery distances may be reduced and cyclists may be startled by grooves or texture separations and lose control. Caltrans would monitor the operation of the path as currently designed without a barrier or tactile separation. In the event Caltrans determines the path conditions warrant a physical separation, a solution could be implemented to physically separate the bicyclists and pedestrians.

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<sup>12</sup> The BBBPAC is a committee formed by members of and to represent the interests over 40 interest groups advocating non-vehicular access on the new East Span.



Path is designed to provide a pedestrian scale experience with a sense of separateness from motorized traffic

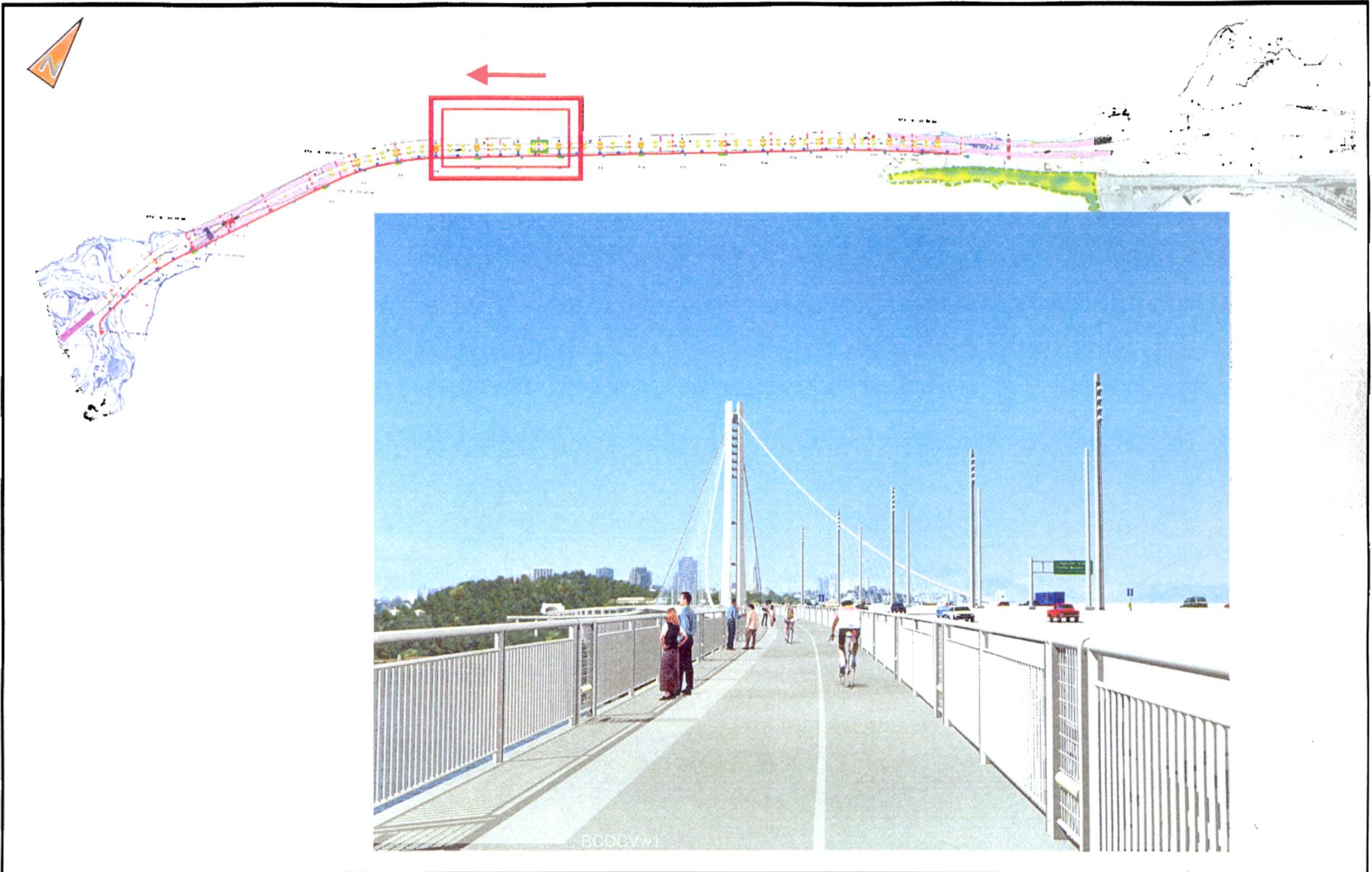


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Bicycle and Pedestrian Path

Not to Scale

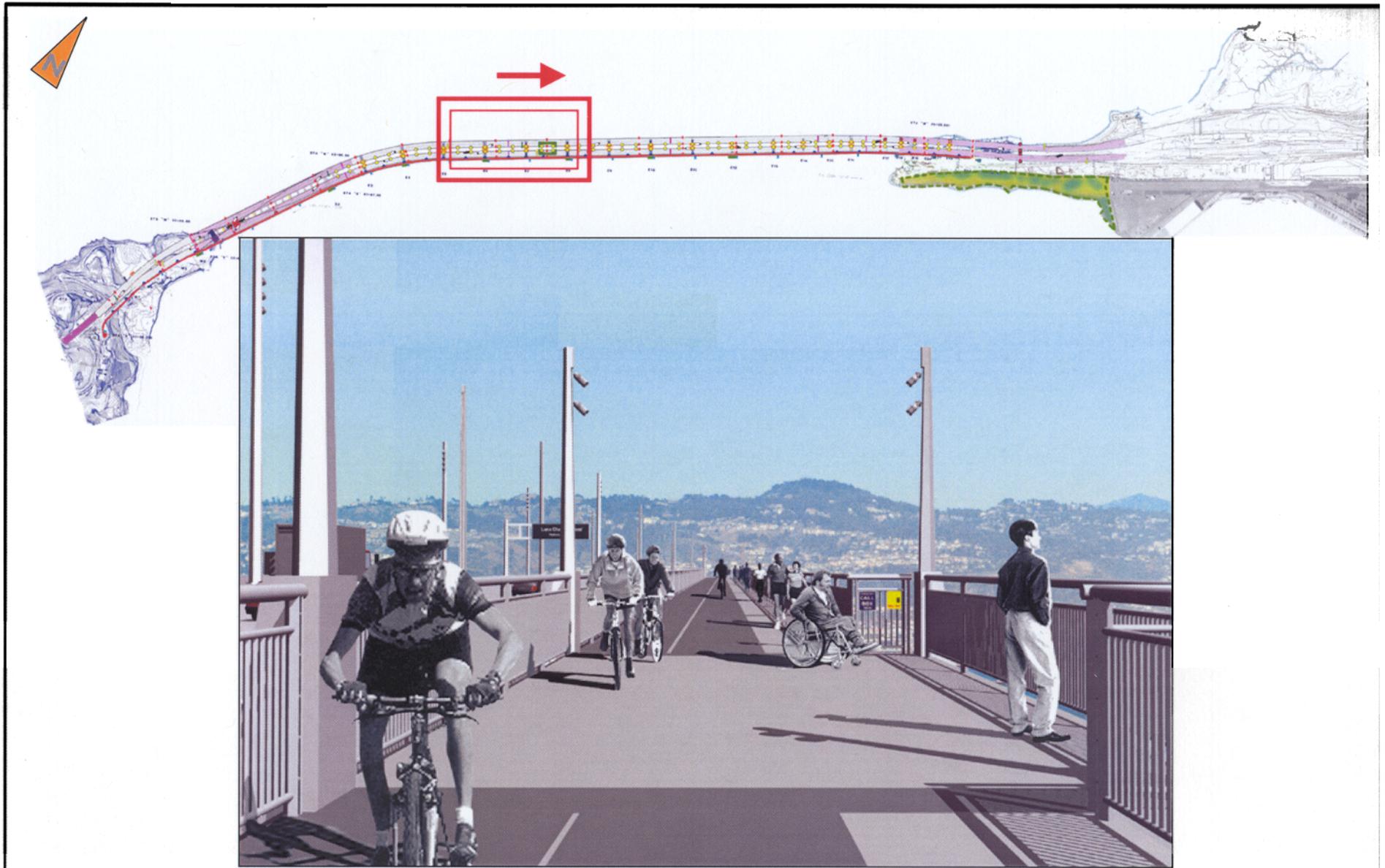
Figure 40



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**Bicycle and Pedestrian Path - View Looking West**

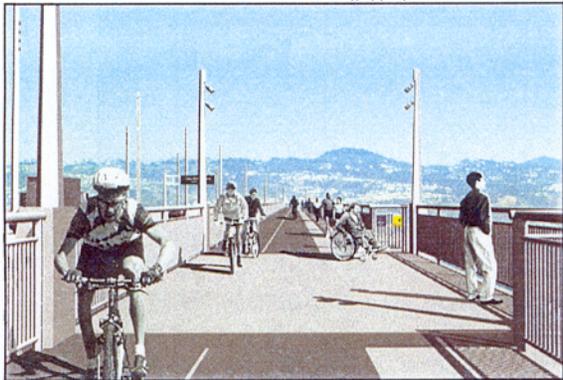
**Figure 41**



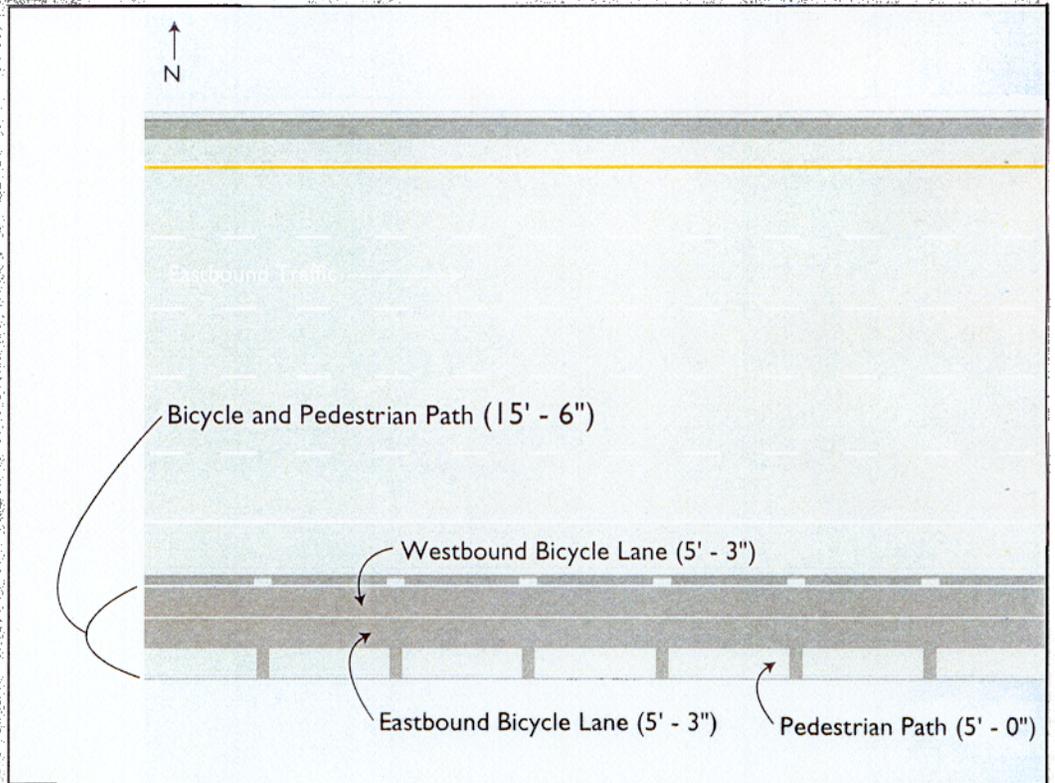
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Bicycle and Pedestrian Path - View Looking East

Figure 42



•Bicyclists and pedestrians separated by color of paving



Plan



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### Bicycle and Pedestrian Path Paving

Not to Scale

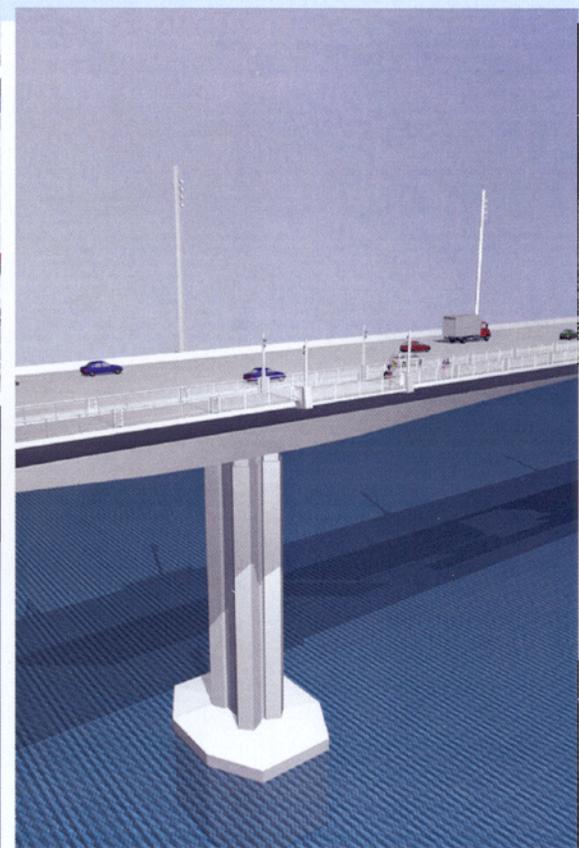
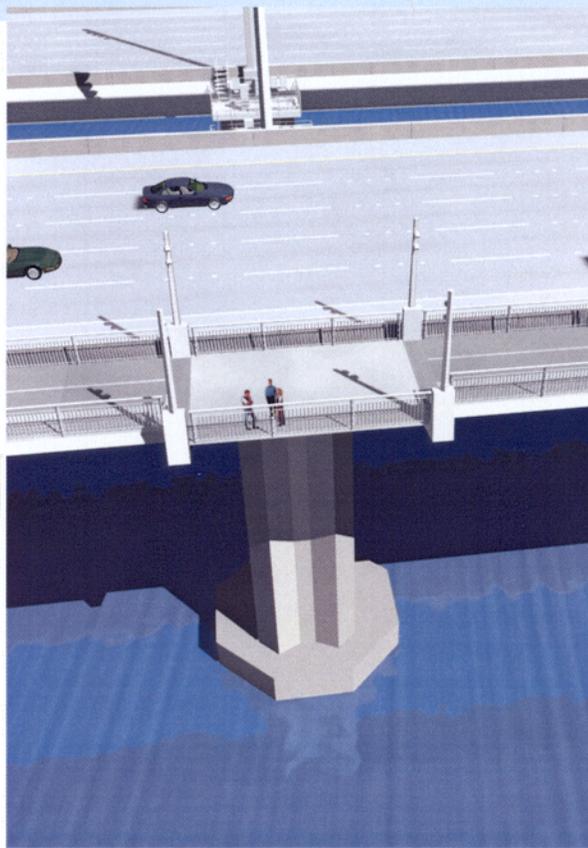
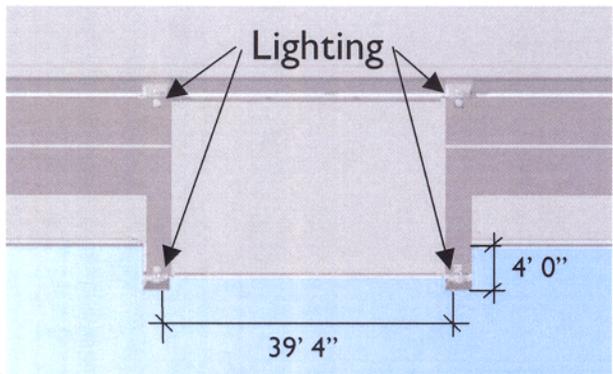
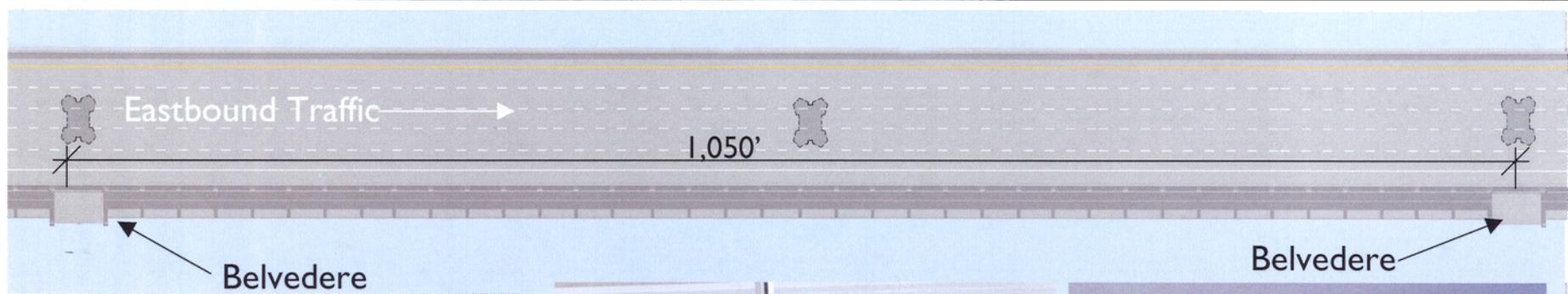
Figure 43

- **Skyway Belvederes.** Caltrans proposes to construct six belvederes along the bicycle and pedestrian path, five of which would be located on the skyway (see Figure 44) and the remaining one on the main span. The belvederes would allow opportunities for bicyclists and pedestrians to move off the path, rest and view the Bay. From Oakland, the first belvedere would be located at Pier E12. Along the skyway, the belvederes would be located approximately 1,050-feet-apart (320-meters-apart) at every other pier location. The belvederes would be approximately 39-feet-long (12-meters-long) and 4-feet-deep (1.2-meters-deep). Light gray paving consistent with that for the pedestrian path would be provided at each belvedere to signal bicyclists that they are entering a pedestrian zone.

The DRB requested that for the safety and comfort of the public additional belvederes be provided and that seating be added at the belvederes. Caltrans has concluded that no additional belvederes or seating can be provided given existing funding constraints and loading concerns. Bay Area Toll Authority (BATA) Resolution No. 19 was approved in September of 1999 and specified that belvederes should be added at five locations along the bicycle and pedestrian path on the bridge at the approved cost of \$1,000,000. Caltrans can provide six belvederes within the budget approved by BATA. Caltrans is precluded from making design changes that significantly increase the project costs and do not contribute to the purpose and need of the project, which is to provide seismic safety and a lifeline connection between Oakland and YBI; design changes that require additional funds need MTC approval as the BATA and regional funding agency.

If seating were to be provided, it would be located near the southern edge of the belvederes which is the furthest cantilevered point from the support. This would further increase the load demands on the support requiring additional analysis and design. Caltrans is concerned that if seating were provided, people might densely congregate at the southern edge of the belvederes, causing load demands greater than designed for as required by the Bridge Design Specifications Manual. In addition, Caltrans is concerned that seating would provide a platform to facilitate jumpers seeking to commit suicide.

- **Main Span Belvedere.** A single belvedere would be located at the eastern anchorage of the main span cables and the path would traverse around the main cable shrouds (see Figures 45 and 46). The 17-inch (43-centimeter) separation from the roadway deck on the skyway would increase to 6.58 feet (2 meters) through the entire main span to accommodate the main span cable and suspender cable connections. Because of the asymmetrical suspension system, the cables would anchor at different angles at each end with the cable being steeper on the west than the east. Accordingly the main span belvedere is designed to respond to this unique geometry and would be 65.6-feet-long (20-meters-long) and 4-feet-deep (1.2-meters-deep). Functionally, the main span belvedere would provide dramatic viewing opportunities as it is located at the highest point of the bridge, approximately 190 vertical feet (58 meters) above the water line. Its proximity to the east anchorage, the main span and tower would give the public a unique opportunity to view the bridge architecture. No seating would be provided as part of the belvederes.
- **Railings.** Caltrans has designed the railings on the new bridge to achieve the greatest transparency possible and maximize views to the Bay for pedestrians, bicyclists and motorists. Critical to the design and height of the railings is public safety. On the eastbound span, the road deck would be separated from the pedestrian and bicycle path by a 32-inch-high (0.81-meter-high) safety barrier and a 55-inch-high (1.4-meter-high) railing. There would also be a 55-inch-high (1.4-meter-high) railing on the outer edge of the path. The steel railings would have bollards that are spaced approximately 33-feet-apart (10-meters-apart) on the main span and approximately 26.2-feet-apart (8-meters-apart) on the skyway with some variation. The bollard placement and design are integral to the cantilever beams that support the path. The railings would be further divided by



- Belvederes provide destinations and safety
- Paving and lighting break up the large scale of the path

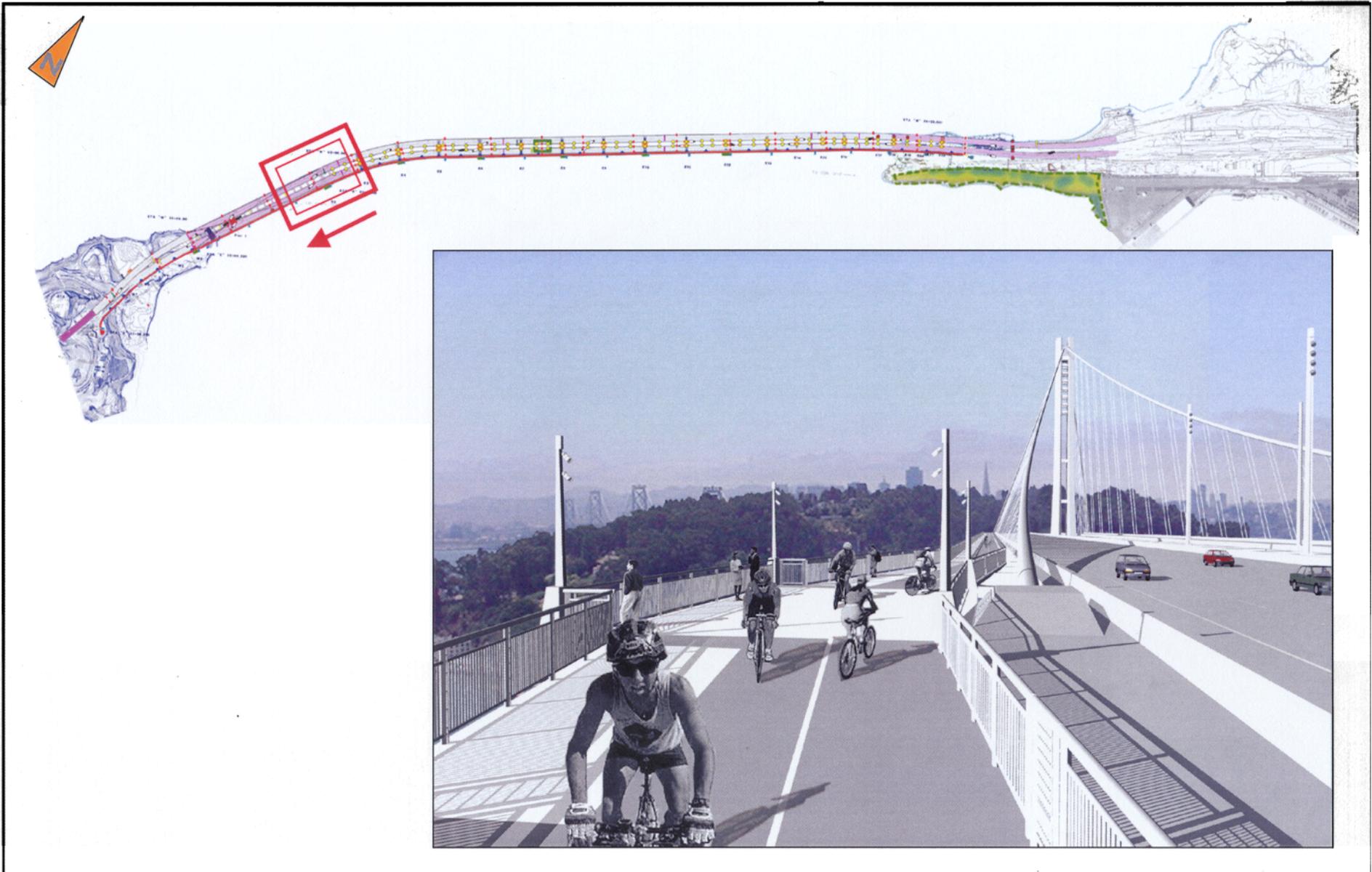


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Bicycle and Pedestrian Path - Skyway Belvederes

Not to Scale

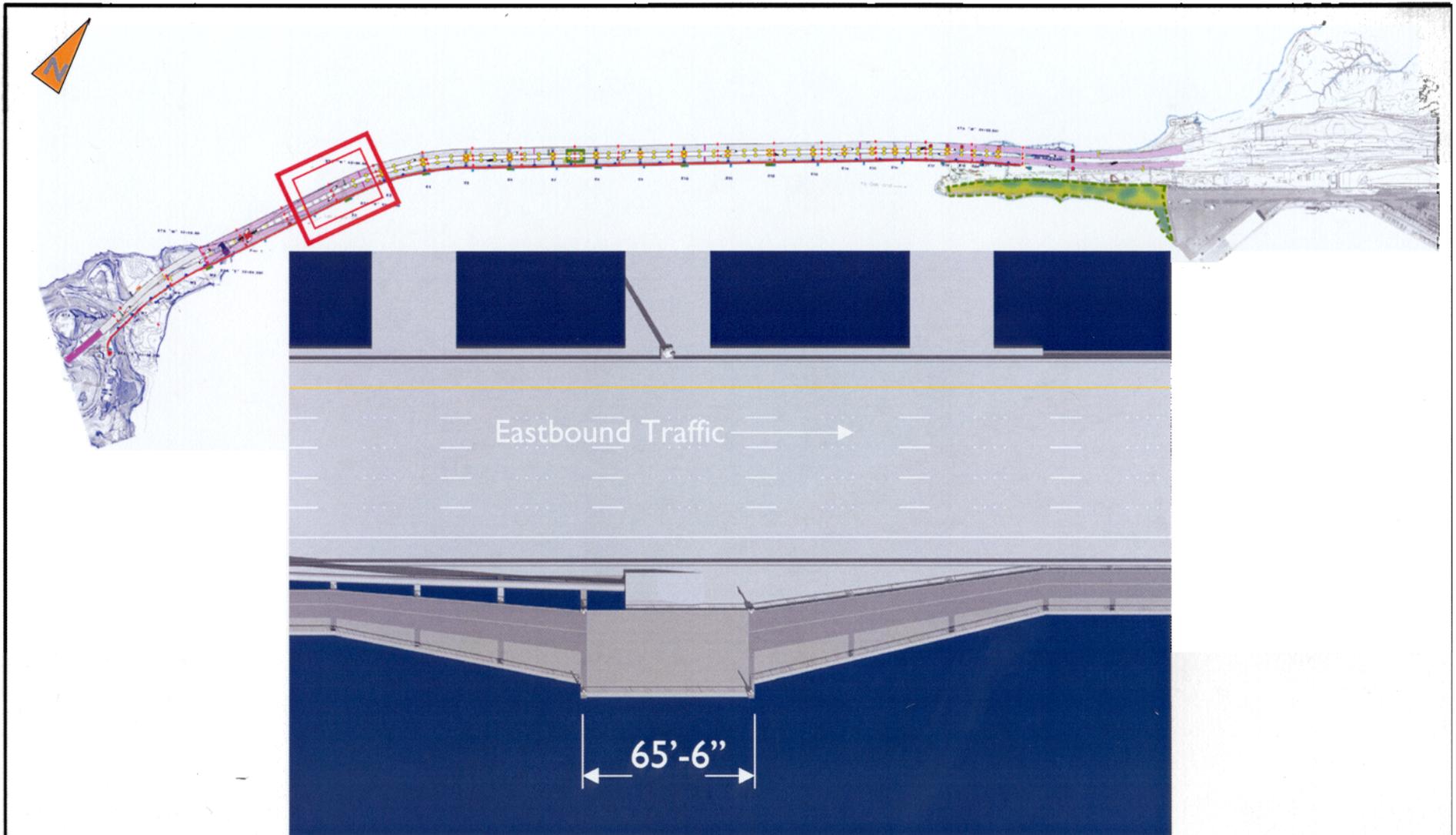
Figure 44



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Bicycle and Pedestrian Path - Main Span Belvedere

Figure 45



•Belvedere designed to reflect unique forms of main span



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Bicycle and Pedestrian Path - Main Span Belvedere

Not to Scale

Figure 46

## Attachment 7: Public Access Information

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angle posts spaced every 11 feet apart (3.3 meters apart) and square pickets spaced 4 inches apart (10 centimeters apart) (see Figure 47).

The DRB was concerned that the railing design did not share enough of the architectural vocabulary of the tower, piers and other bridge elements. Caltrans has attempted to address the DRB's concerns to the extent practicable. Due to cost, maintenance, and structural constraints, Caltrans has concluded that it cannot accommodate the Board's advisory recommendation.

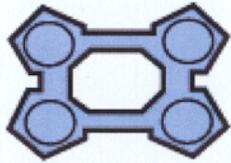
Since the last presentation by Caltrans to the DRB in November 2000, there have been a number of design changes that affect the appearance and design of the outer railings on the pedestrian and bicycle path. The railings have been re-designed to simplify the railing and to address concerns regarding the ability to maintain such railings (e.g., clean and paint the interior surfaces of the posts). In addition, the design of the bollard portion of the railing has changed such that the top rail is continuous at one side of the bollard.

**Post Design.** The railing posts originally consisted of two different cross-sections, one for the typical railing post and one for the bollard post. The typical railing post, to which the horizontal rails and pickets would be attached, was designed to have two 2-1/2-inch (6.4-centimeter) steel angles spaced approximately two inches (five centimeters) apart and connected by a series of four steel spacers, or links, to give the post a sense of lightness and transparency. It also referred to the architecture of the main tower. The bollard post was designed to be square tube steel set at right angles to the bridge in response to previous EDAP direction to simplify the bollard design. Currently, the railing post and bollard post utilize the same 2-1/2-inch (6.4-centimeter) square tube steel post. These posts are turned at 45 degrees to accentuate the faceted forms of the bridge structure (see Figure 47).

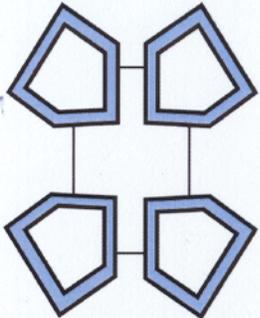
**Bollard Design.** The bollard design has not changed in size, but has changed in its appearance due to engineering constraints associated with the expansion and contraction of the steel bike path segments, and with the new and weaker support posts. The most significant change to the bollard, aside from the change in support posts, is that the top horizontal railing would no longer 'break' at both sides of the bollard, but rather would be broken on one side only. In addition, the bottom horizontal support rail for the picket portion of the railing would attach to one side of the bollard (see Figure 47). At the railing bollards of the skyway path, there is an expansion joint where the steel superstructure units meet. The bollards span this joint, but cannot lock the sections together. The section must be free to expand and contract with temperature changes. The railing itself must also be able to contract and expand. It must have breaks in the horizontal rails. Therefore, one post of the bollard section supports the bollard against vertical and horizontal load. The other post can help prevent horizontal load, but takes no vertical load. That is where the expansion and contraction can take place. In essence, the bollard is cantilevered off the one post. However, the new post is weaker than the original, so it cannot support the bollard on its own. It has to be attached to the previous segment at the top rail to support the cantilever. In addition, the railing must have breaks for its own expansion, so the top rail has a gap at the cantilevered end.

The original design intent of the bollard was to unify the railing with the structure of the bike path and to provide a visual rhythm along the pathway. Although this goal can still be achieved, it is somewhat compromised by the fact that the design of the bollard segment would appear asymmetrical. Changes to post and bollard design, however, would not affect visual access to the Bay.

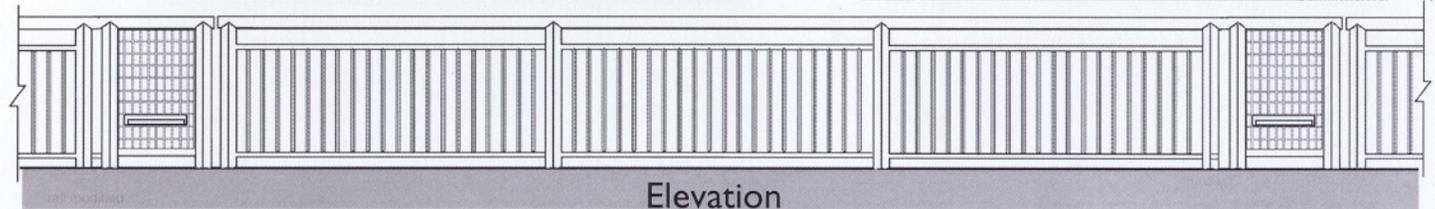
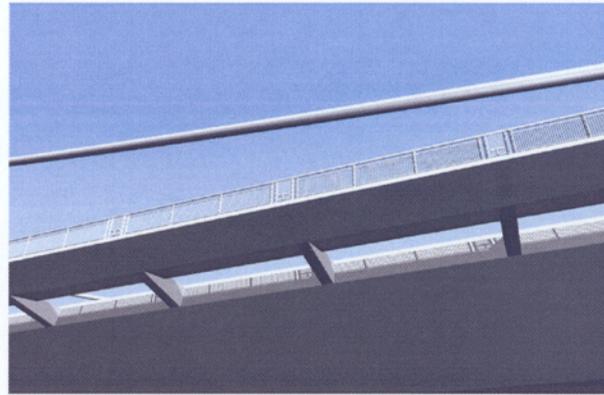
In terms of visual access, the DRB recommended lowering the path railing from 55 inches (1.4 meters) to 48 inches (1.2 meters) to expand views of the Bay, enhance public access and improve the pedestrian scale of the path. The DRB requested empirical data showing



Pier section



Tower section

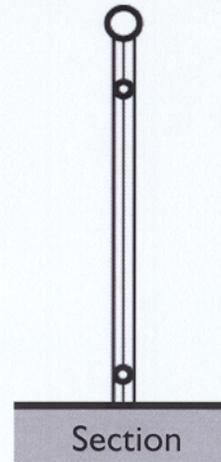


Elevation

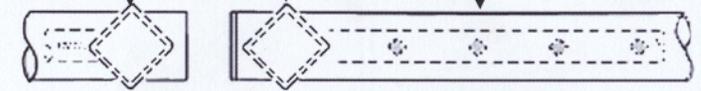
Design Concerns:

- Consistent with EDAP recommendations
- Picket rail selected for maximum transparency and safety
- Vertical elements- angular forms which are derived from the bridge's faceted forms
- Bollards unify the railing with the supporting structure of the bike path and provide a visual rhythm along the path
- Bollard design has been simplified in response to EDAP direction and maintenance considerations
- Horizontal rails are circular - carry the form of the main cables along the length of the bridge

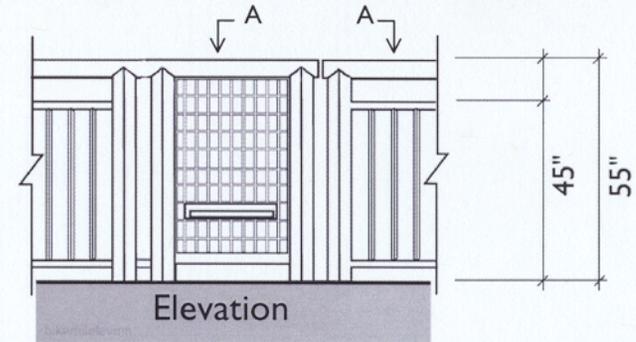
Bollard Post Railing Post Angled Pickets



Section



Plan detail A-A



Elevation



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Bicycle and Pedestrian Path Railing

Not to Scale

Figure 47

## Attachment 7: Public Access Information

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that the lower railing, such as 48 inches (1.2 meters), is not as safe for bicyclists as a 55-inch (1.4-meter) railing.

Both the AASHTO and Caltrans' standards are established to provide safe conditions for the public. AASHTO establishes nationwide policies and standards. AASHTO standards require that the minimum height of a railing on structures must be 54 inches (1.37 meters). The 54-inch (1.37-meter) rail height was one of several standards adopted by Caltrans in 1978 as part of its development of the Planning and Design Criteria for Bikeways in California. As of 1978, there were no accepted standards for the design of bicycle facilities, and there was also a dearth of research on the topic. Caltrans formed a committee, composed of engineers, bicyclists (League of American Wheelmen, California Association of Bicycling Organizations), public agencies and safety experts, to establish design standards to facilitate the development of bicycle facilities in California. This committee used its expertise to study and develop bicycle facility design guidelines. With respect to bridge railings, the committee developed an estimated center of gravity for an assumed large bicycle with a tall rider, added a safety factor to deal with high impact or broadside accidents, and concluded that 54 inches (1.37 meters) was an appropriate rail height to insure bicycle rider safety. To date, the work done by the committee remains the only study of the issue, and the rail height standard has been adopted as a national standard by AASHTO.

Caltrans' current standards specify a minimum height of 55 inches (1.4 meters)<sup>13</sup> for bicycle railings. After evaluating various factors associated with the East Span Project, including the profile of the path, the height of the structure above water, and the potential for high impact accidents due to the grade, Caltrans concluded that a minimum height of 55 inches (1.4 meters) for the railing is necessary to provide safe conditions for cyclists and pedestrians.

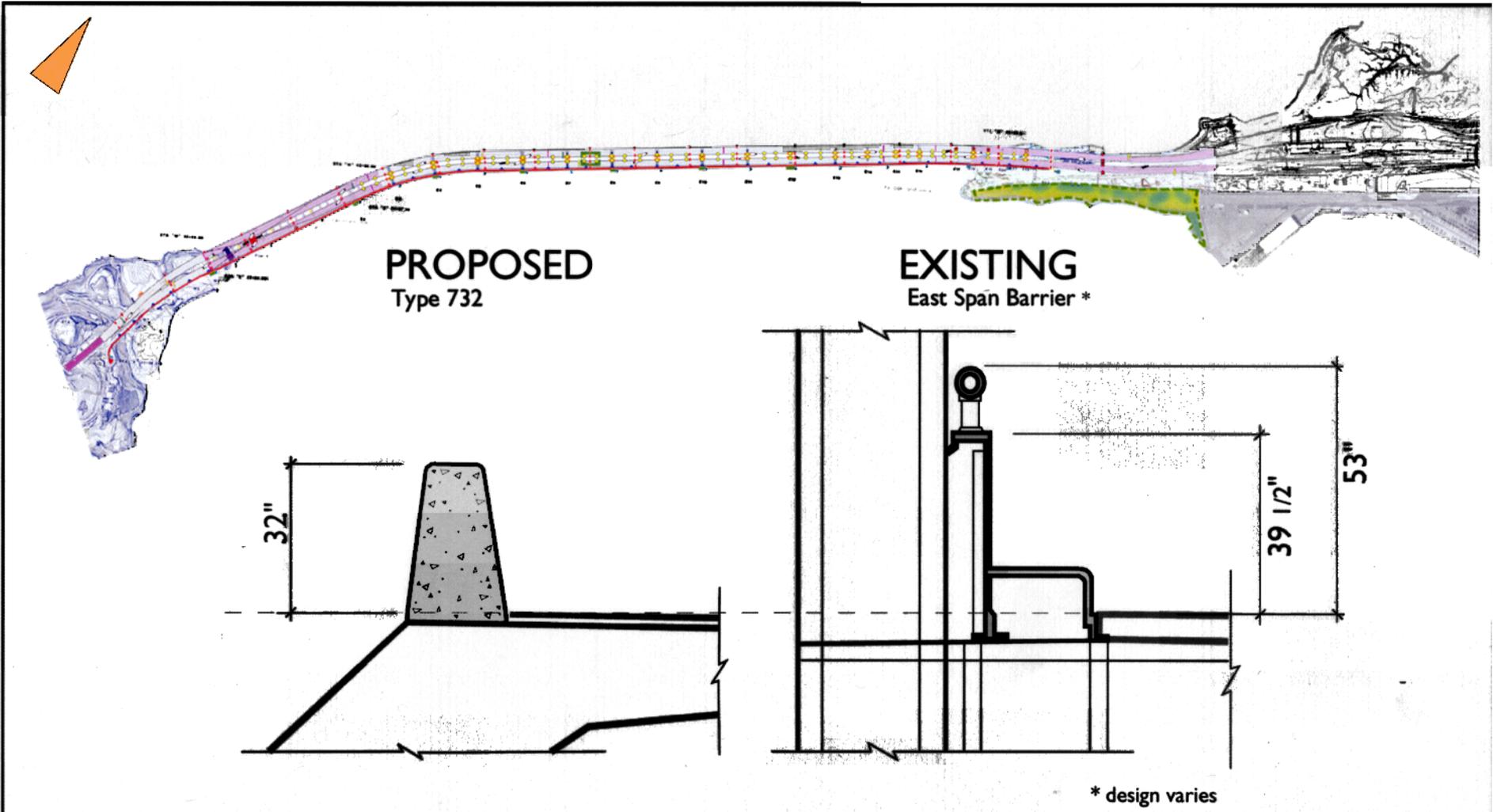
- **Safety Barriers.** The safety barriers on the existing East Span are solid steel and approximately 39.5-inches-high (1-meter-high). As a result, they impair views to the Bay for many motorists. The replacement bridge would have 32-inch-high (0.81-meters-high), double-sloped, safety barriers (modified Type 732) on the outer edges of the shoulders of both the east and westbound decks to maximize views to the Bay (see Figures 48 and 49). The safety barriers would be smooth on both the inside and outside faces with no articulation. The majority of the safety barrier would be concrete, except a portion of the skyway and the entire main span, which would be steel.

The DRB recommended that the solid safety barrier be replaced with a barrier that allows improved visual access and a greater connection to the Bay. In 1997 and 1998, when Caltrans was designing the roadway barriers for the replacement bridge, only solid barriers were accepted by FHWA and approved for use in California by Caltrans. The Type 732 modified barrier is a solid concrete barrier that would be used on the skyway. The design of the main span requires the use of lighter-weight safety barriers to reduce the dead loads on the steel structure. The Type 732S modified barrier was specifically designed and tested for use on the main span.

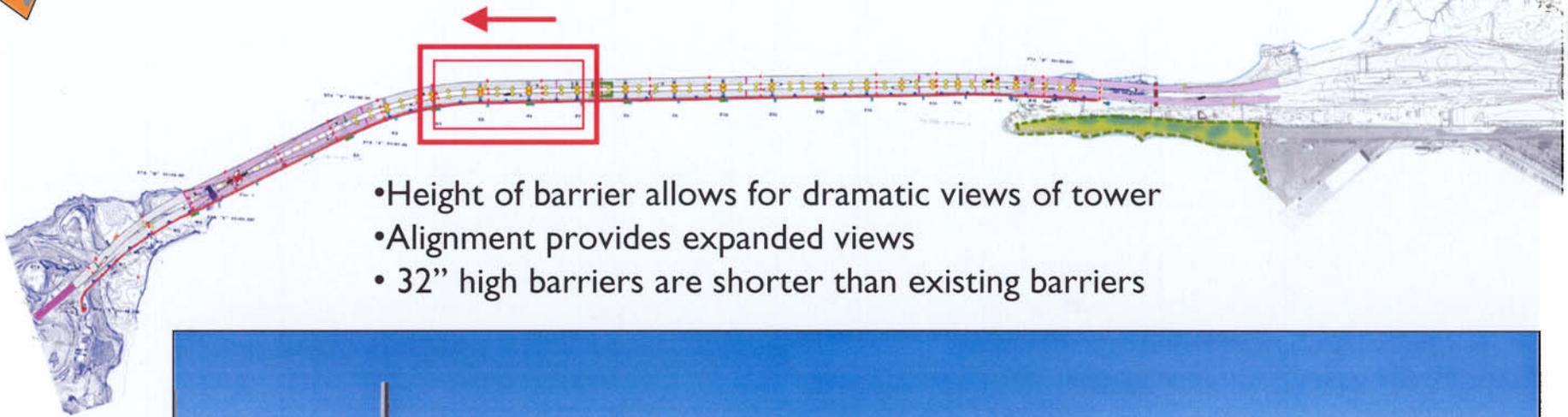
To address concerns regarding the visual impacts of safety barriers within the Coastal Zone, Caltrans has been working with the California Coastal Commission's Bridge Rail Subcommittee. BCDC staff has participated in some subcommittee meetings. Caltrans made a commitment to design a new more open safety barrier that could be used in future bridge projects. Caltrans presented its bridge rail demonstration project to determine

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<sup>13</sup> In 1993, Caltrans adopted the International System of Units (SI) as its preferred system of weights and measures. When the 54-inch rail height standard was converted to metric units, it was rounded to a suitable metric approximation (i.e., 1.4 meters). Therefore, when the Caltrans standard is now presented in English units it becomes 55 inches.



•Proposed 732 barrier is a maximum 21" lower than the existing East Span barriers



- Height of barrier allows for dramatic views of tower
- Alignment provides expanded views
- 32" high barriers are shorter than existing barriers



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Not to Scale

Safety Barrier Type 732

Figure 49

what bridge rails should be used for its projects in the Coastal Zone. Caltrans has been evaluating several bridge railings including the California Type 80, the Modified Wyoming, and the Alaska and Minnesota railings (see Figures 50 and 51).

The Type 80 barrier, which is a concrete barrier with 11-inch (28-centimeter) maximum openings, was approved for use by FHWA on May 18<sup>th</sup>, 1999 (see Figure 52). Using a Type 80 barrier with gaps for the East Span Project would require structural redesign, especially for the self-anchored suspension span, to accommodate the difference in impact dispersal between the Type 80 barrier and the Type 732S modified barrier. Loads are concentrated in periodic vertical supports in the Type 80 barriers, whereas the loads are distributed more evenly through the solid Type 732S modified barriers. For the concrete portion of the skyway, no new crash test would be needed, but structural redesign would be necessary if the Type 80 barrier were to be used. However, new crash tests and significant structural redesign would be required for the main span. This is because the Type 80 barrier has not been approved for use with steel bridge decks, and it would add more dead load to the main span as compared to the Type 732S barrier. Crash testing would be vital to ensure that the connection between the barrier and the steel deck performs acceptably when impacted. A new wind tunnel analysis would also be required if the Type 80 barrier were installed on the main span. Additionally, the current proposal to route conduits on the main span within the proposed solid barrier would not fit inside a barrier with gaps and would have to be accommodated elsewhere. A change in barriers would increase the cost of the project and would delay construction. The Type 80 barrier costs approximately \$600 per 3.3-linear-foot (1.4-linear-meter), while the Type 732 modified barrier costs approximately \$180 per 3.3-linear-foot (1.4-linear-meter). Increased costs of structural redesign and schedule delays due to crash testing must also be considered. Because of cost constraints and potential delays in schedule, Caltrans has concluded that it cannot accommodate the DRB's recommendation.

- **Bridge Lighting.** Along the road deck, light standards would be located on the inside of each roadway. These standards would vary in height from 33 to 66 feet (10 to 20 meters) and would be pointed in the direction of travel for traffic. As the bridge rises toward the main span, the light standards would become increasingly taller (see Figure 53). Metal halide light fixtures would provide a white light source that would make the bridge look more brilliant at night and would provide ambient lighting on the bicycle and pedestrian path. The light fixtures would also include marker lights, which are bright lights on top of the fixtures. They are architectural in nature and appear as bright pin points from a distance. Along the bicycle/pedestrian path, the lighting would be pedestrian-scaled with four 17.5-foot-high (5.35-meter-high) light standards, similar to those on the roadway, located at the corners of each belvedere. In addition, fluorescent lights would be located within each of the railing bollards (on opposite sides of the path) and angled downward to illuminate the path and reinforce the rhythm of the cantilever structure (see Figure 54).

In terms of appearance and design, which is advisory only for BCDC, the DRB requested a more detailed description of the lighting and specifically asked for an explanation of the methods of lighting the main span and the reasons for varying the height of the light standards.

The East Span's lighting is designed to celebrate transit across the bridge as much as the structure itself and to emphasize the symbolic nature of a bridge as the joining of two places and an invitation to enter a community.

Consistent with EDAP's recommendation, the replacement bridge would be illuminated exclusively (except for bollard lighting) with metal halide fixtures to produce a cool white light rather than the warm yellow tones of the low-pressure sodium lights found on a typical freeway. The roadway lighting would result in a constant level of light for the entire length of the bridge and from a distance there would be a rising line of white lights punctuated by the main tower (see Figure 55).



Alaska Barrier



Modified Wyoming Barrier



Minnesota Barrier



California Type 80 Barrier



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Open Safety Barriers

Figure 50



Alaska Barrier



Modified Wyoming Barrier



Minnesota Barrier



California Type 80 Barrier



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Open Safety Barriers - Visual Simulations

Figure 51

- Caltrans has investigated the feasibility of the type 80 barrier. Issues include:

- Type 80 is 4x the cost of the type 732 barrier

- Type 80 sustains more damage / more difficult to repair than type 732 barrier

- Bridge cross section would have to be redesigned for barrier connection

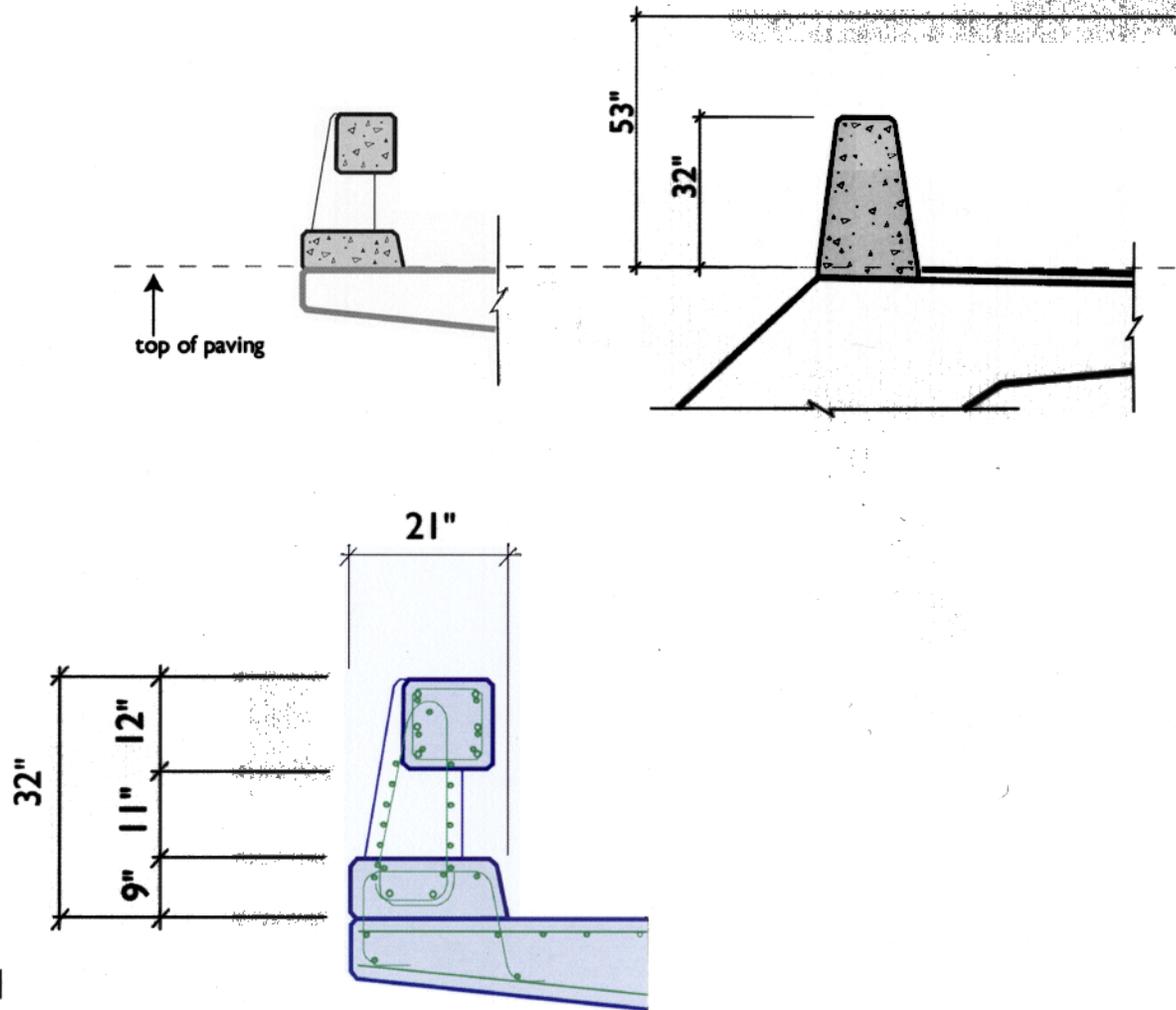
- Main span would require reanalysis for changes in weight and wind response

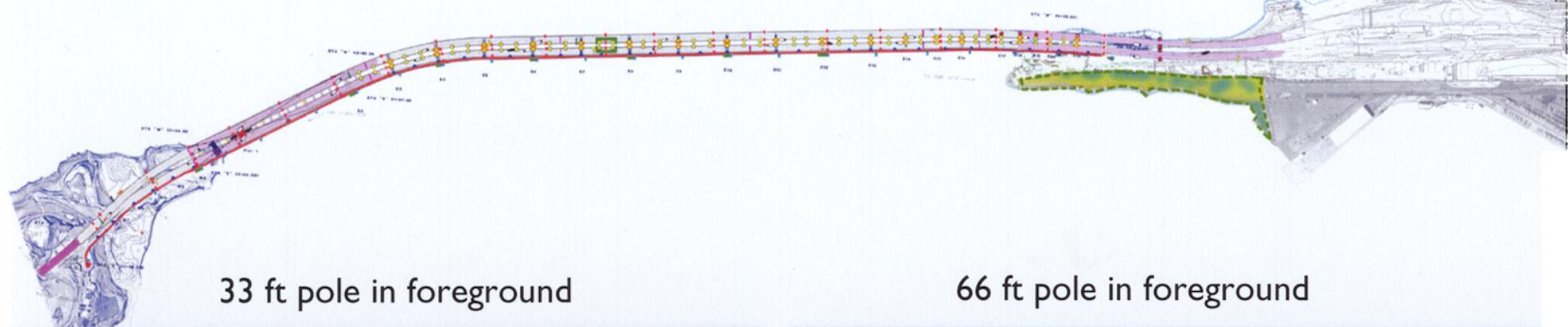
- Type 80 connection to a steel structure (main span) has not been crash-tested

- Utilities inside the 732 barrier would have to be relocated

Type 80

Type 732





33 ft pole in foreground

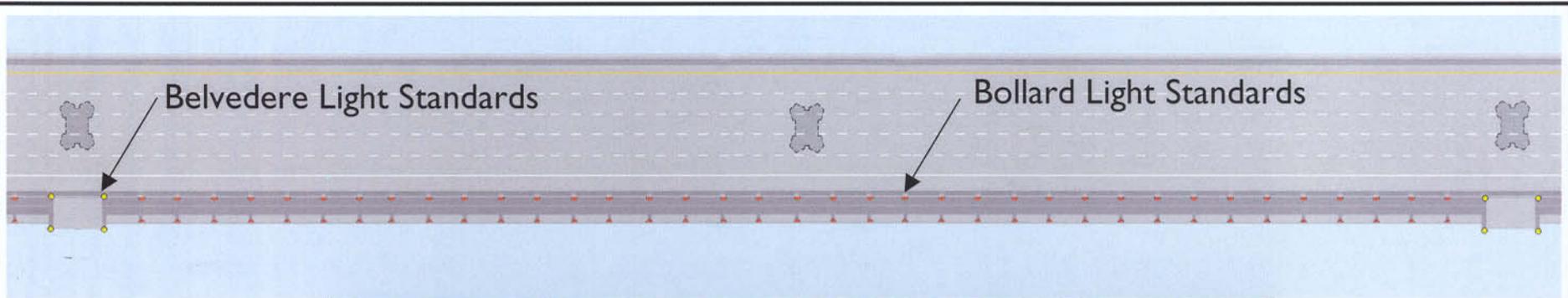
66 ft pole in foreground



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Progression in Height of Light Standards

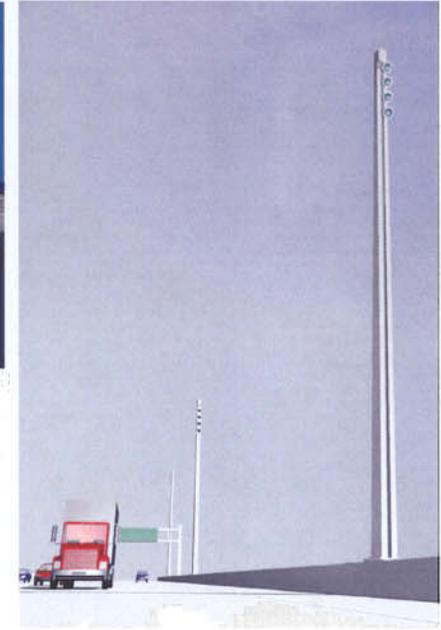
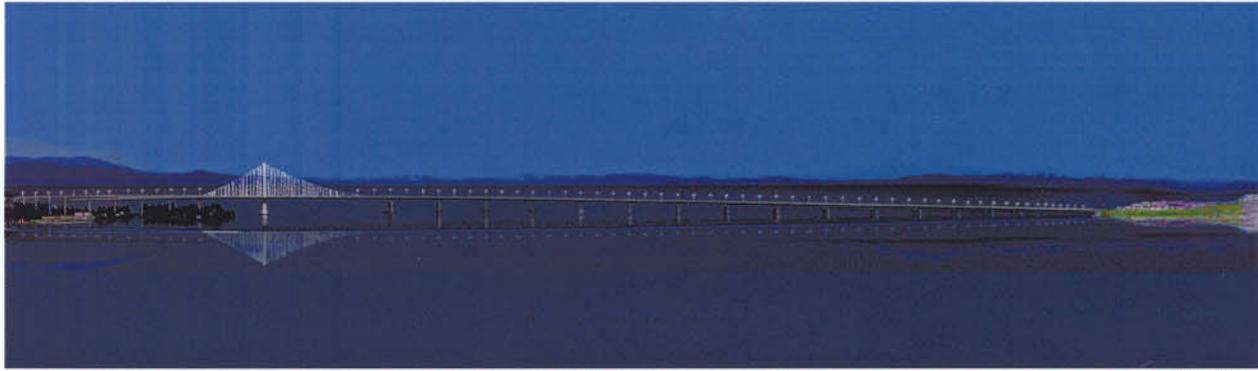
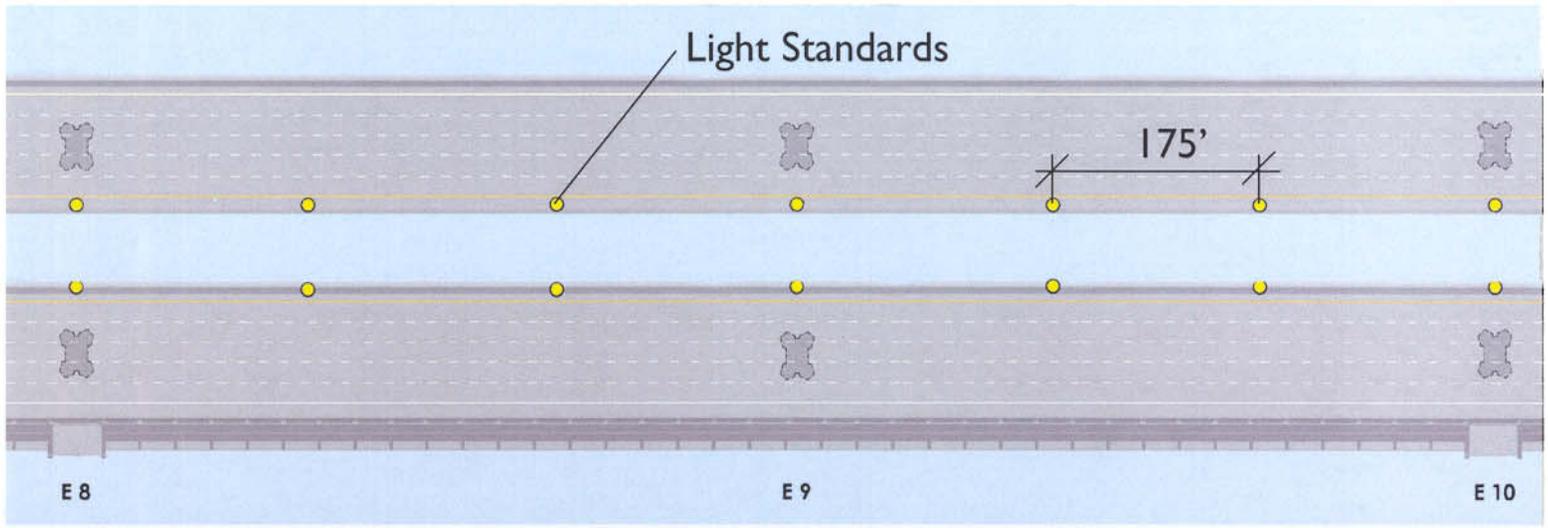
Figure 53



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Bicycle and Pedestrian Path - Lighting Perspective

Figure 54



- Prominent visual element
- Design based on main tower and piers
- Heights range from 33' - 66'



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Not to Scale

Roadway Light Standards

Figure 55

## Attachment 7: Public Access Information

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Caltrans has designed the new East Span's lighting to heighten the experience of both motorists and path users crossing the Bay and to distinguish the experience from that of driving on a conventional highway.

**Skyway.** Lights pointing in the direction of traffic illuminate the skyway. The light standards would be the most prominent and repetitive vertical element above the bridge deck. Consequently, they are important to views of the structure from a distance and to the visual experience of traveling across the new East Span. The standards' tapered pentagonal shape is derived from the shape of the main tower legs and piers. The standards are further related to the structure by their differing heights, which would rise from the Oakland shore to the main span as do the piers. This progression of height adds to the drama when approaching and leaving the tower during both day and night and adds unity to the structure from a distance. Light fixtures and their location on the standards would rise in the same way the standards gain in height to achieve a uniform wash of light on the roadway. The pentagonal light standards would end at the beginning of the main span and would resume at the beginning of the transition structure.

**Main Span.** The main span would be a focal point of the bridge, both day and night, due to its height and unique form. The lighting strategy for this portion of the bridge is to reveal the geometry and openness of the structure. Fixtures directed up from the deck and down from the suspension cables light the cables and the roadway. The tower itself would be lit from below in a graduated wash of light that is brightest at the top to accentuate the tower's height. The deck would also be lit from below to create a reflection in the water. The overall effect would be that individual light sources are not distinguishable; instead the main span would be dramatically lit as one structure and seemingly by one source of light.

**Transition Structure.** West of the main span at YBI, the side-by-side bridge decks would begin to converge horizontally and vertically and connect to the existing double deck structure at the tunnel. The pentagonal light fixtures would resume at the west end of the self-anchored suspension span and would step down westward.

**Light Pipe.** Originally, an important element of the lighting design was a light pipe along the outside edges of both decks from end to end that would add visual unity and celebrate the linear quality of the bridge connection between YBI and Oakland. While the Bay Bridge Design Task Force expressed enthusiasm for this feature, it did not recommend that MTC approve additional funds to incorporate the light pipe. At this time, due to budget constraints, the light pipe is not included in the project. However, provisions have been made so that the light pipe can be added later if funding becomes available.

- **Disabled Accessibility.** All public access improvements and areas, including the Oakland and YBI touchdowns and the pedestrian and bicycle path, would be accessible to the disabled pursuant to the Americans with Disabilities Act. The East Span Project has also been reviewed and approved by the State Architect for handicap accessibility. In most cases, the Americans with Disabilities Act requires the maximum grade on a pathway to be five percent. On the new bridge, the path would have a maximum grade of 1.95 percent. At the YBI Touchdown the path would have a grade of 2.98 percent and at the Oakland Touchdown 2.68 percent.

## **Attachment 7: Public Access Information**

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- **Public Safety Features.** Call boxes would be located along the pedestrian and bicycle path. The spacing of call boxes would be 525 feet (160 meters) on center and would be flush with the railing or located inside the belvederes. The call boxes would be handicap accessible. In addition, along the eastbound roadway, the inside 55-inch-high (1.4-meter-high) railings would have approximately 10-foot-wide (3-meter-wide) sliding gates between the path and the roadway to allow emergency access from the roadway onto the bicycle and pedestrian path. The spacing of gates would be 262 feet (80 meters) on center.

### **PROPOSED VISUAL ACCESS IMPROVEMENTS**

In addition to the visual access provided by the bicycle/pedestrian path, belvederes, and the side-by-side deck configuration of the replacement bridge would provide for a significant increase in views to and around the San Francisco Bay for motorists.

#### **Views Toward the East Bay**

With the existing bridge configuration, eastbound motorists are on the lower deck. The 39.5-inch-high (1-meter-high), solid steel safety barriers and the steel truss significantly impair motorists' views of the Bay and the East Bay foothills. The eastbound roadway on the proposed replacement bridge would have 32-inch-high (0.81-meter-high) safety barriers on the outer edges of the road deck. In addition, motorists looking in a southerly direction would encounter a set of 55-inch-high (1.4-meter-high), open, steel railings that line the pedestrian and bicycle path. Because the pedestrian path is located one foot above the roadway deck, the effective railing height would be 67-inches (1.7-meters). However, the side-by-side deck configuration combined with the eastbound downgrade would give eastbound motorists panoramic views of the East Bay including the foothills, the Port, and the cities of Oakland, Emeryville and Berkeley (see Figure 56).

#### **Views Toward the Main Span Tower and San Francisco City Skyline**

With the existing bridge configuration, westbound motorists are on the upper deck. Although the views for motorists on the upper deck are not as impaired as those on the lower deck, the 39.5-inch-high (1-meter-high), solid steel railing and the steel truss obstruct many motorists' views. Similar to the eastbound roadway, the westbound roadway on the replacement bridge would have 32-inch-high (0.8-meter-high) safety barriers on the outer edges of the road deck (see Figure 57). The replacement structure maximizes views of the San Francisco skyline to the west, the Marin Headlands and Mount Tamalpais to the northwest. Westbound motorists would also see dramatic and changing views of the main tower.

### **COORDINATION WITH BCDC PERMIT NO. 11-93**

The development and design of the public access has been coordinated with both the public access conditions of BCDC Permit No. 11-93 for the I-880/Cypress Freeway Replacement Project and EBRPD's planning efforts for the Gateway Park at the Oakland Touchdown.

#### **Required Public Access**

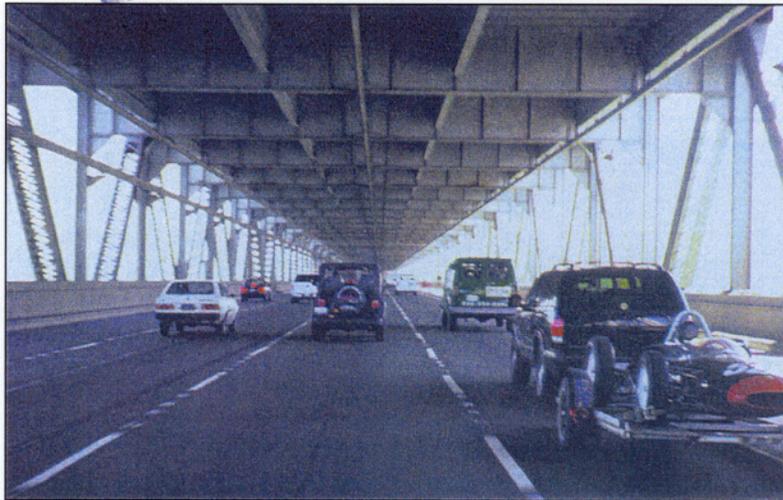
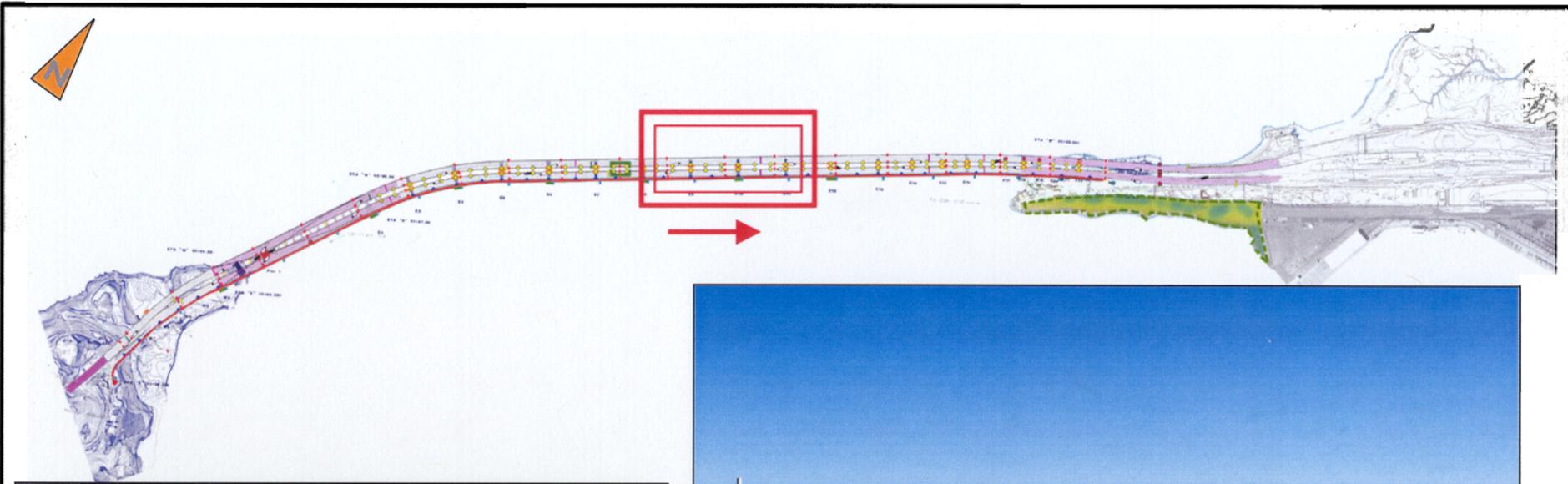
BCDC Permit No. 11-93 requires that prior to December 31, 2006, Caltrans construct the following public access improvements at or near the Oakland Touchdown:

- **Spur Trail to the Oakland Touchdown/Bay Bridge.** A bicycle and pedestrian path and landscaping adjacent to eastbound I-80 to connect the Cities of Oakland and Emeryville with the Oakland Touchdown area. This includes connections to one lookout area on the north and one lookout area on the south side of the Oakland Touchdown. Portions of the pathway are required to be Class I and Class III;
- **Bay Bridge Overlook Areas.** This includes an approximately 5,000-square-foot (465-square-meter) overlook area on the north side of the existing East Span with a paved circulation area, four benches, fish cleaning facilities, two trash cans and native landscaping. Caltrans is to locate a second, 2,500-square-foot (232-square-meter)

## **Attachment 7: Public Access Information**

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overlook area on the southern side of the East Span approach with benches, trash cans and native landscaping. The final design is to incorporate special features to minimize, to



View towards the East Bay from existing bridge



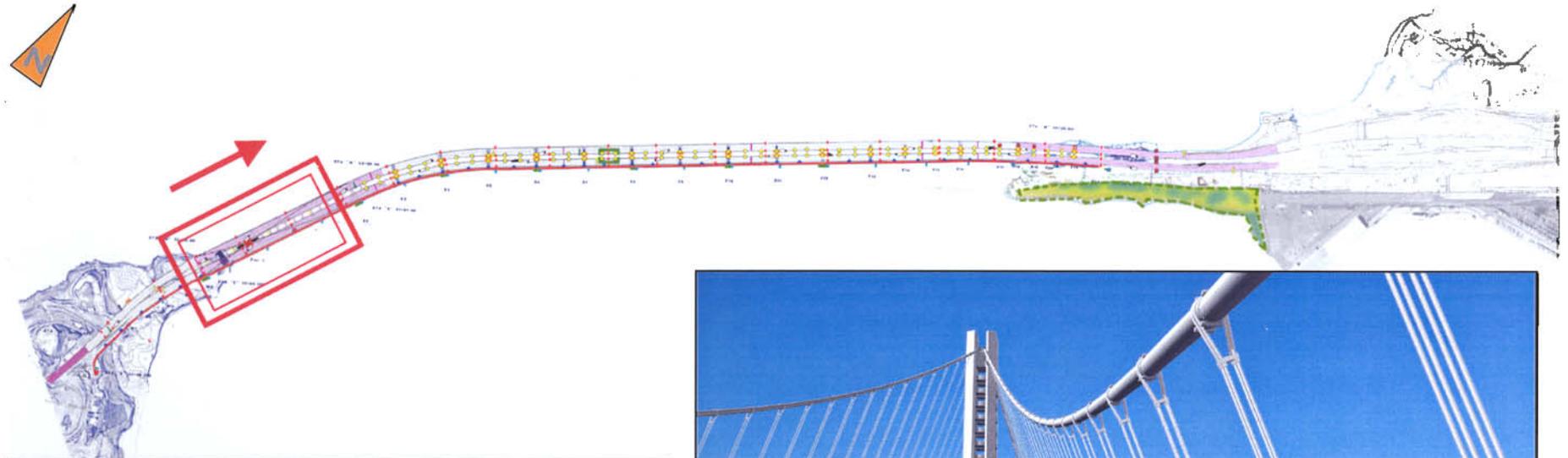
View towards the East Bay from replacement bridge



SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

Motorists' View Looking East

Figure 56



View towards San Francisco from existing bridge



View towards San Francisco from replacement bridge



SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

Motorists' View Looking West

Figure 57

## Attachment 7: Public Access Information

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the maximum extent feasible, adverse impacts to bird feeding and roosting areas as well as other sensitive wildlife in the area; and

- **Roadway and Parking Improvements.** This includes using Caltrans' and/or another entity's property to provide for public use of Burma Road or Caltrans' maintenance road and to provide a six-car parking area at the terminus of the maintenance road for those visiting the lookout areas. The parking lot is to be located as close as possible to the southern overlook area and must include a minimum 10-foot-wide (3.0-meter-wide) asphalt pathway between the parking area and the pathway to the southern overlook and a 10-foot-wide (3.0-meter-wide) asphalt pathway between the parking area and the pathway to the northern overlook. The parking area is to include public access signs and toilet facilities. The final design is also to incorporate special features to minimize, to the maximum extent feasible, adverse impacts to bird feeding and roosting areas as well as other sensitive wildlife in the area.

### Caltrans' Proposed Improvements/Coordination

#### *Spur Trail*

The East Span Project would not fundamentally alter the spur trail between the Cities of Oakland and Emeryville and the Oakland Touchdown area. Caltrans will meet the obligations required under BCDC Permit No. 11-93 and may be able to upgrade portions of the spur trail that are specified in the permit as Class III to a Class II facility. Vehicular access to the proposed parking lot would occur through the Caltrans maintenance facilities unless OBRA provides for access on Burma Road. Caltrans is working with the City of Oakland, Port of Oakland, OBRA and EBRPD to establish an appropriate alignment for the spur trail and vehicular access.

Given the land use changes precipitated by the adoption of the Oakland Army Base Reuse Plan and BCDC's deletion of the port priority use areas at the Oakland Touchdown, BCDC may consider it more desirable to locate a portion of the permanent public access connection along the shoreline in the form of a promenade, rather than inland along Burma Road and/or the Caltrans maintenance road. Because construction activities would continue through 2009 and would require the use of Burma Road and/or the Caltrans maintenance road, Caltrans will request an amendment to BCDC Permit 11-93 to extend the time for implementing the spur trail. Since land uses and land ownership in this area are dynamic and subject to change, Caltrans has concluded that a time extension would allow an appropriate planning horizon to work with the affected agencies and land owners to finalize the design and location of the spur trail. While many of the land use changes that may affect a final alignment for the bicycle and pedestrian path are outside the control of Caltrans, Caltrans is committed to meeting the obligations of BCDC Permit 11-93.

#### *Overlooks and Parking Area*

Permit No. 11-93 provides that if the siting of the overlooks or other required public access improvements is infeasible, Caltrans could pay an in-lieu fee to BCDC subject to the approval of BCDC's Executive Director. The East Span Project would preclude construction of the northern overlook area because the new westbound and eastbound roadways would cover the area originally considered for the northern overlook area.

EBRPD is currently evaluating land at the Oakland Touchdown area, south of the existing bridge (on former Oakland Army Base land), for acquisition and stewardship to develop the Gateway Park. The City and Port of Oakland are working with EBRPD in the creation of this park. Caltrans has concluded that constructing the southern overlook and the overlook roadway would unnecessarily constrain EBRPD in developing the Gateway Park.

At the Oakland Touchdown area south of the replacement bridge, Caltrans would provide a temporary or interim 43-car parking and staging area. This would meet the requirement of BCDC Permit 11-93 to construct a six-car parking area (see Figure 37). It would also accommodate public access to the new bicycle and pedestrian path and meet the interim demand generated for public access as a result of the East Span Project. However, because of EBRPD's park planning efforts, the improvements associated with the interim parking and staging area would be designed to be easily removable and replaceable. This

## **Attachment 7: Public Access Information**

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strategy would give EBRPD the maximum flexibility in designing and programming future uses for the Gateway Park.

Given the impacts of the East Span Project on required public access under BCDC Permit 11-93 and the planning efforts of the EBRPD, Caltrans proposes that BCDC accept an in-lieu fee of \$1.1 million for the two overlooks and associated amenities, the overlook roadway and the parking area (see Appendix H for a detailed estimate). BCDC could then use these funds to support EBRPD's effort to develop the Gateway Park or to support other public access in the City of Oakland. Although Caltrans is fully confident that the proposed Gateway Park will be developed, it is assessing what, if any, public access it could provide within the Caltrans right-of-way to meet the obligations of BCDC Permit 11-93 in the event the proposed Gateway Park does not come to fruition. However, the areas remaining after construction of the replacement bridge are limited due to the need to maintain existing utilities (above ground) and to possibly accommodate stormwater collection and treatment facilities. The stormwater facilities may be studied further as a separate project from the replacement of the East Span. Caltrans is working with EBMUD, PG&E and other agencies to determine if such public access is viable or would unduly constrain existing services.

### **FUTURE PUBLIC ACCESS CONNECTIONS TO THE WEST SPAN**

Under AB 2038, legislators provided that MTC could use bridge tolls to design and construct a bicycle and pedestrian path on the West Span of the SFOBB for continuous access through the Transbay Corridor. Caltrans has prepared a study on the cost and feasibility of providing such an amenity, including access around YBI to the West Span. The study found that it is feasible to construct a bicycle and pedestrian path on the West Span. Cost estimates range from \$ 160.4 million to \$ 386.8 million to construct the path depending upon the design option. Funding for this amenity has not been approved. This path would be carried out as a separate project. The East Span Project would not preclude future bicycle and pedestrian access onto the West Span.

# Box 8

## Dredging Information

a. Purpose of the dredging:

See Attachment 8.

b. Method of dredging:

Caltrans is still investigating dredging techniques.

c. Volume of material to be dredged from open waters, sloughs, creeks or tidal marshes: 616,721 cubic yards/ 471,517 cubic meters

d. Volume of material to be dredged from managed wetlands in the primary management area of the Suisun Marsh: N/A

e. Total volume of material to be dredged: 616,721 cubic yards/ 471,517 cubic meters

f. Size of the area from which material will be dredged in open waters, sloughs, creeks or tidal marshes: 99 acres/ 40 hectares

g. Size of the area from which material will be dredged in managed wetlands in the primary management area of the Suisun Marsh: N/A

h. Total size of area to be dredged: 99 acres/ 40 hectares

i. Location(s) where dredged material will be disposed: Dredging locations are described in Attachment 8.

j. Total volume of material to be disposed: 616,721 cubic yards/ 471,517 cubic meters

k. Estimated future maintenance dredging required annually: N/A

**I. ADDITIONAL INFORMATION TO BE PROVIDED IN AN ATTACHMENT:**

1. If the dredged material is to be disposed of in the Bay, please explain why the material cannot be disposed of in the ocean, upland, or inland out of the Commission's jurisdiction.
2. Please describe the type of investigations that have been or will be carried out regarding the nature and content of the dredged material.
3. Please provide a copy of a water quality certification, waiver of water quality certification or waste discharge requirements for the dredging or disposal of dredged material from the California Regional Water Quality Control Board, San Francisco Bay Region.

# Attachment 8

## Dredging Information

Items a and I1-3.

### **BAY PLAN POLICY 1 ON DREDGING**

In part, BCDC's Bay Plan policies on dredging state that "Dredging should be authorized when the Commission can find:

- a. The applicant has demonstrated that the dredging is needed to serve a water-oriented use or other important public purpose;
- b. The materials to be dredged meet the water quality requirements of the San Francisco Bay Regional Water Quality Control Board;
- c. Important fisheries and Bay natural resources would be protected; and
- d. The materials would be disposed of in accordance with Policy 2".

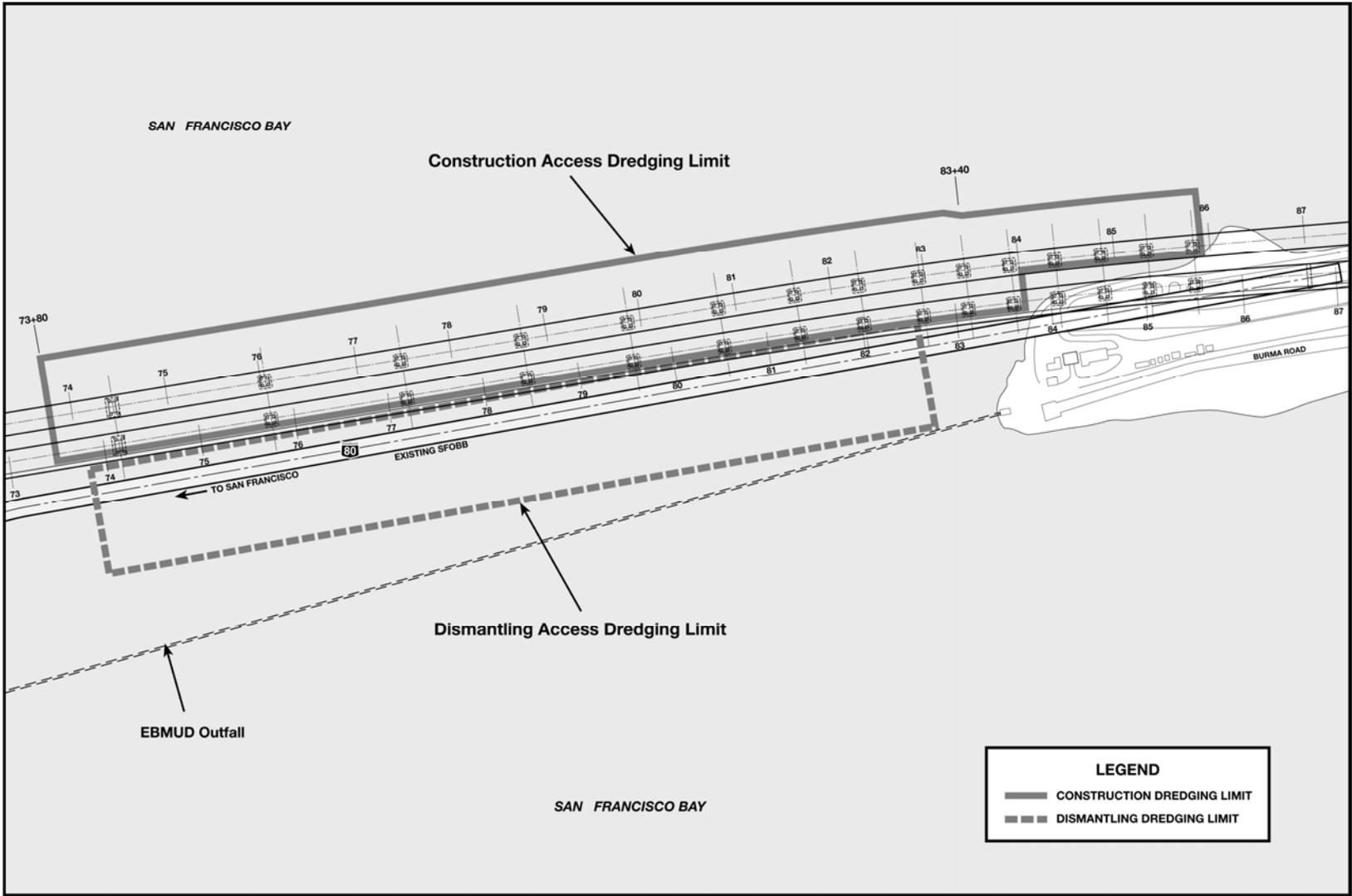
### **DREDGING FOR WATER-ORIENTED USE**

The proposed dredging is necessary to construct the new East Span and to dismantle the existing bridge, both of which BCDC considers to be water-oriented uses under Section 66605 of the McAteer-Petris Act. A total of 616,721 cubic yards (471,517 cubic meters) of material would be dredged over approximately 99 acres (40 hectares) of the Bay (see Figures 58 and 59). Four construction components would generate dredged material:

- Dredging to create a barge access channel to facilitate movement of construction materials, personnel and equipment when constructing the replacement bridge (generated in two periods, 6 months and 3 months long, respectively, early in the construction sequence);
- Dredging at individual pier locations to install piles and pile caps (piers and footings) for the new bridge piers (generated over approximately 45 months, in the beginning and middle of the construction sequence);
- Dredging to create a barge access channel to facilitate movement of equipment, personnel, and bridge debris when dismantling the existing bridge (generated over about 12 months, at the end of the construction sequence); and
- Dredging to dismantle the existing bridge and remove piers (also generated over about 12 months, at the end of the construction sequence).

#### **SUMMARY OF DREDGING QUANTITIES**

<b>Activity</b>	<b>Dredging for Barge Access Channel to Construct New Bridge</b>	<b>Dredging to Construct New Piers and Footings</b>	<b>Dredging for Barge Access Channel to Dismantle Existing Bridge</b>	<b>Dredging to Remove Existing Bridge Piers</b>	<b>Total Dredged Volume</b>
<b>Volume</b>	<b>216,230 cubic yards</b>	<b>187,087 cubic yards</b>	<b>190,680 cubic yards</b>	<b>22,724 cubic yards</b>	<b>616,721 cubic yards</b>
	<b>165,320 cubic meters</b>	<b>143,038 cubic meters</b>	<b>145,785 cubic meters</b>	<b>17,374 cubic meters</b>	<b>471,517 cubic meters</b>

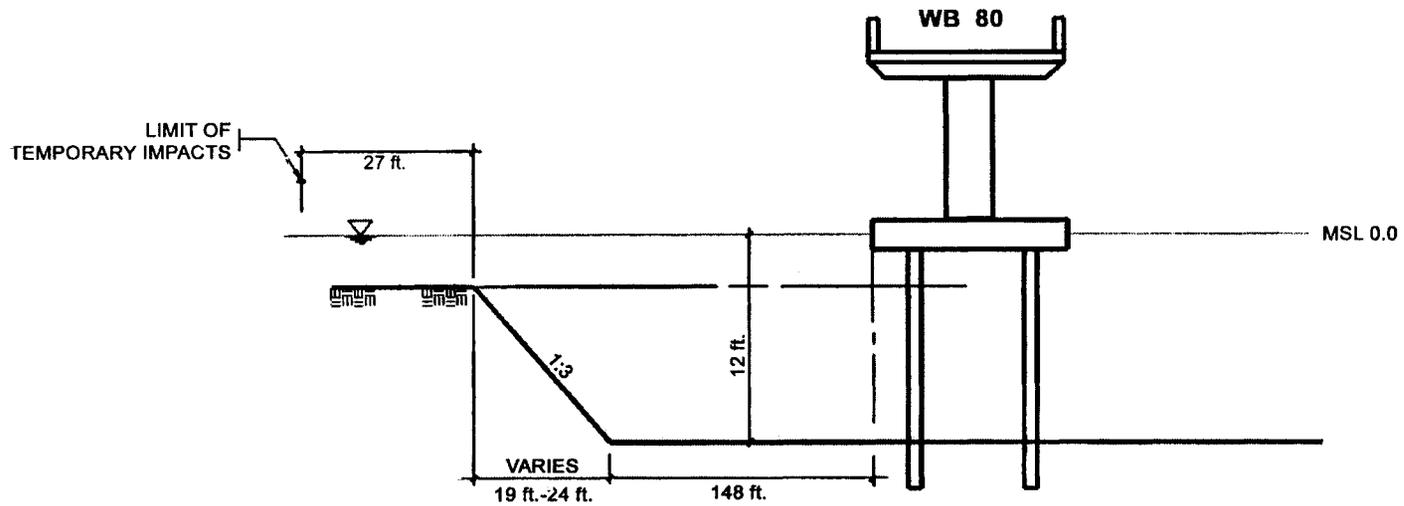


**GT** SFOBB EAST SPAN  
SEISMIC SAFETY  
PROJECT

GRAPHIC SCALE 1:8,000  
0 50 100 150 m

Construction Dredging

Figure 58



**VIEW: LOOKING EAST, NORTH SIDE OF  
 PROPOSED EAST SPAN**



SFOBB  
 EAST SPAN  
 SEISMIC SAFETY  
 PROJECT

Barge Access Channel at the Oakland  
 Touchdown Area

Not to Scale

Figure 59

## **Attachment 8: Dredging Information**

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### **MATERIALS CONSISTENT WITH REQUIREMENTS OF RWQCB**

Caltrans is working with the Regional Water Quality Control Board (RWQCB) to assure that the materials to be dredged are consistent with the water quality requirements contained in the Basin Plan. Caltrans will obtain a 401 Water Quality Certification from the RWQCB for dredging and discharges in San Francisco Bay.

In May of 1999, Caltrans prepared and circulated for agency and public review, including to the RWQCB, a Dredged Material Management Plan (DMMP) for the East Span Project. The DMMP identified the quantities to be dredged and potential disposal options. Since circulating the DMMP, a Sediment Sampling and Analysis Plan (SAP) was prepared and circulated for review. The results of this analysis have been reviewed by the Dredged Material Management Office (DMMO), of which the RWQCB is a participating agency. In its letter of October 31, 2000 (see Appendix I) the DMMO identified the volumes of dredged materials that would be suitable for unconfined aquatic disposal (SUAD) and the volumes not suitable for unconfined aquatic disposal (NUAD). Additional letters were sent on July 6, 2001 and August 17, 2001. The vast majority of material has been found to be SUAD.

In the suitability letter, the DMMO determined that some material proposed to be dredged in the area adjacent to the north of the Oakland Touchdown area was not suitable for unconfined aquatic disposal. This area is no longer included in the proposed dredging footprint because the length of the access channel has been substantially reduced. As a result, all materials meet DMMO criteria for unconfined aquatic disposal at the disposal and reuse sites proposed in the disposal/reuse plan presented by Caltrans. The RWQCB did not object to the DMMO determination regarding the suitability of material for disposal.

### **PROTECTS FISHERIES AND BAY RESOURCES**

Dredging at the Oakland Touchdown would result in unavoidable impacts to sand flats and eelgrass beds. Approximately 3.15 acres (1.27 hectares) of eelgrass beds and 1.17 acres (0.47 hectares) of sand flats would be permanently impacted by dredging. Caltrans would implement on-site mitigation to partially compensate for the impacts to sand flats and eelgrass beds and would provide \$8 million to USFWS to acquire and restore 3,000 acres (1,214 hectares) of diked historic baylands at Skaggs Island in southern Sonoma County (see Appendix J - Conceptual Mitigation Plan for Special Aquatic Sites). In addition, Caltrans would implement several mitigation measures to minimize impacts to fisheries and Bay resources including:

- **Environmentally Sensitive Areas (ESAs).** Caltrans would delineate ESAs in the field using buoys or other similar devices to limit the location of dredging activities and prevent encroachments into the eelgrass beds outside the construction zone;
- **Turbidity Control Program.** Caltrans would implement a turbidity control program. The program would include measuring turbidity and light attenuation at the project boundary to compare with ambient conditions within the eelgrass beds. These measurements would be used to monitor additional sediment transport caused by dredging and other construction activities within the project boundaries. If necessary, turbidity control measures would be implemented;
- **Dredge Windows.** If construction sequencing permits, dredging would be avoided in shallow water during the peak juvenile outmigration period for chinook salmon (January 1 through May 31). In addition, pile driving would be scheduled whenever possible to occur outside the peak juvenile outmigration period;
- **Selection of Dredge Types.** Caltrans would investigate the use of dredge types, such as hydraulic dredging, that minimize disturbance and resuspension of sediments. The selection of hydraulic dredging could further minimize impacts to fisheries and eelgrass beds;
- **Herring Monitoring.** Construction activities that occur during the peak herring spawning season, generally January to March, would be monitored by a qualified biologist to watch for the presence of spawning herring. If the biologist (or CDFG) observes spawning in the

## **Attachment 8: Dredging Information**

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project area, in-water construction activities such as pile driving and dredging would be suspended within 660 feet (200 meters) of observed spawn. In-water construction activities would not resume at that location for a period of up to 14 days (as determined by a qualified biologist), allowing herring eggs to hatch and larvae to disperse. In addition, a turbidity control program, as described above, would further reduce the impacts of turbidity on the herring spawn; and

- **Eelgrass Monitoring.** Caltrans would conduct pre- and post-construction surveys to evaluate the impacts of turbidity on eelgrass beds. If additional eelgrass beds have been impacted during construction, Caltrans would consult with state and federal permitting agencies to determine if additional mitigation is warranted. After construction, Caltrans would restore a portion of the barge access channel to its original bathymetry using dredged material and excavated sand from the project site that is suitable for in-Bay disposal. The restored channel would then be planted with eelgrass from an adjacent donor site.

### **BAY PLAN POLICY 2 ON DREDGING**

Policy 2 states that “disposal of dredged materials should be encouraged in non-tidal areas where the material can be used beneficially, or in the Ocean. Disposal in tidal areas of the Bay should be authorized when the Commission can find that:

- a. The applicant has demonstrated that non-tidal and ocean disposal is infeasible because there are no alternate sites available or likely to be available for use in a reasonable period, or the cost of disposal at alternate sites is prohibitively expensive;
- b. Disposal would be at a site designated by the Commission;
- c. The quality and volume of material to be disposed of is consistent with the advice of the San Francisco Bay Regional Water Quality Control Board; and
- d. The period of disposal is consistent with the advice of the Department of Fish and Game and the National Marine Fisheries Service.”

### **FEASIBILITY OF NON-TIDAL AND OCEAN DISPOSAL**

Caltrans would dredge a total of approximately 616,721 cubic yards (471,517 cubic meters) of material for the East Span Project. Of this, Caltrans proposes to dispose approximately 216,230 cubic yards (165,320 cubic meters) of material dredged for barge access at the federally-designated deep ocean disposal site (SF-DODS). Of the remaining material approximately 209,811 cubic yards (160,412 cubic meters) of material dredged at individual pier locations would be disposed of at SF-11, except the upper 12 feet (3.66 meters) of Piers E1-E6 (SAP testing locations: SFOBB N1 and SFOBB N2) and Piers E15-E18 (SAP testing location: SFOBB N5) as recommended by DMMO; these materials would be disposed of at appropriate upland facilities.

Caltrans proposes to dispose of the majority of material dredged from individual pier locations at SF-11 because it is not practicable or cost-effective to dispose of the material at SF-DODS. In addition, upland reuse sites, such as Hamilton and Montezuma, are not currently available.

Caltrans has developed a proposal to dispose of dredged material at a combination of disposal sites rather than a single site. This strategy is based on comments on the DMMP, results of the SAP, the components of the project dredging activities, and the practicability of various disposal options. Caltrans presented its proposal to the DMMO on June 6, 2001, and the DMMO gave its concurrence in writing on July 6, 2001. Caltrans sent a clarification letter to the DMMO on August 15, 2001 and received a second concurrence letter dated August 17, 2001 (see Appendix I for copies of the letters). The proposal focuses on the disposal of material that would be dredged to construct the replacement bridge. Dredging to dismantle the existing bridge would be reconsidered in a few years when two planned upland reuse sites, Hamilton Wetland Reuse Site and Montezuma Wetlands Site, may be ready to receive materials.

### **MATERIAL DREDGED BY PROJECT**

## **Attachment 8: Dredging Information**

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The creation of barge access channels would generate high volumes of dredged material within relatively shorter time frames. Disposal of this material at SF-DODS was found to be practicable. In contrast, construction activities at individual bridge piers would generate smaller volumes per month over much of the project life. It is these smaller volumes, amounting to approximately one barge trip per month, which Caltrans proposes to dispose at SF-11.

The first component of the plan proposes dredging and disposal of up to 216,230 cubic yards (165,320 cubic meters) of dredged material at SF-DODS. This material would be generated by the construction of a barge access channel along the north side of the new bridge. (See Figure 58.)

The second component of the plan proposes the dredging and disposal of up to 187,087 cubic yards (143,038 cubic meters) to construct the piers for the replacement East Span. This material would be dredged in small quantities over approximately four years as each pier is constructed. Because of the small monthly volumes to be generated over the four-year period, Caltrans proposes to dispose of this material at the SF-11 site. Within the piles, materials would be dredged to a depth of approximately 164 feet (50 meters) below bay bottom. Caltrans proposes to disperse all material dredged from within the piles at SF-11, except the upper 12 feet (3.66 meters) of Piers E1-E6 (SAP testing locations: SFOBB N1 and SFOBB N2) and Piers E15-E18 (SAP testing location: SFOBB N5) as recommended by DMMO; these materials would be disposed of at appropriate upland facilities.

When construction is completed and the new structure is opened to vehicular traffic, Caltrans would begin the third and fourth components of the project: dismantling of the existing East Span. In the third component, Caltrans would dredge a barge access channel south of the existing East Span. Dredging this channel would generate up to 190,680 cubic yards (145,785 cubic meters) of dredged material. Based on current sampling for the replacement structure and previous sampling for the retrofit alternative, Caltrans assumes that the material is suitable for unconfined aquatic disposal. Caltrans intends to beneficially reuse material dredged from the dismantling access channel at the Hamilton Wetland Reuse Site, assuming the site is operational, can accept the materials, and reuse is practicable.

Under the fourth component, Caltrans would dredge an additional 22,724 cubic yards (17,374 cubic meters) of dredged material. The material would be generated by the removal of the existing East Span piers to 1.5 feet (0.46 meter) below the mud line and is proposed for disposal at the SF-11 site. Caltrans recognizes that additional sampling would be required prior to implementing these last two components to determine the suitability of the material for aquatic disposal. A supplemental Sampling and Analysis Plan would be submitted to the DMMO prior to this dredging operation.

### **PROJECT COMPLIANCE WITH LTMS GOALS FOR SF-11**

Prior to approval of the Long-Term Management Strategy (LTMS), SF-11 had 30-day disposal volume limits as low as 300,000 cubic yards (229,357 cubic meters). Under the LTMS, disposal limits would ultimately be reduced to 20 percent of its previous limit. With this reduction, the monthly disposal limit would be about 60,000 cubic yards (46,000 cubic meters). The volumes of dredged material generated at the bridge piers, about 2,600 cubic yards (2,000 cubic meters) per month, are less than 5 percent of this projected monthly limit.

### **PRACTICABILITY OF DISPOSAL SITES**

Two key upland reuse sites, Hamilton Wetland Reuse Site and Montezuma Wetlands Site, are not expected to be ready to receive materials when the project would begin to generate them. These sites are therefore impracticable for disposal of material generated early in the project construction sequence.

The sites that are ready to receive dredged materials are SF-DODS (for disposal) and landfills (for reuse as daily cover). Multiple trips to these sites with smaller volumes of dredged material results in significantly higher unit costs than those incurred for larger volumes. As a result, disposal of these small volumes at SF-DODS and landfills would cost about four and seven times as much, respectively, as disposal of the same volumes at SF-11. In addition, trips to SF-DODS and landfills would generate more air pollutants than trips to SF-11 due to greater travel distances.

## Attachment 8: Dredging Information

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### Approximate Cost Comparison Disposal of Material Dredged for New Pier Construction\*

	SF-11	SF-DODS	Landfills
Cost per cubic yard	\$7.26	\$27.17	\$49.84
Total cost	\$1.3 million	\$5.0 million	\$9.2 million

### DREDGED MATERIAL PROPOSAL

In summary, the proposal to dispose of dredged material for the East Span Project includes disposal of limited volumes at SF-11, with much of the initial dredged material taken to SF-DODS, and the minor volumes of NUAD material taken to a Class II landfill. The practicability of future upland reuse sites would be reconsidered in a few years, mid-way through project construction, to determine whether to use those sites to dispose of material dredged later in the construction sequence. The DMMO has approved this proposal, which would be incorporated into various state and federal permit applications.

### **Disposal at Site Designated by BCDC**

Caltrans would dispose of dredged material at a BCDC-designated site. Pursuant to BCDC Regulation Section 1013.5, BCDC has designated SF-11 as one of four in-Bay sites to accept the disposal of dredged material. SF-DODS is located outside BCDC's jurisdiction, but has been designated by the ACOE and EPA to accept the disposal of dredged material.

### **Disposal Consistent with Advice of RWQCB**

Caltrans is working with RWQCB to assure that the materials to be disposed of at SF-11 are consistent with the water quality requirements contained in the Basin Plan. Caltrans will obtain a 401 Water Quality Certification from the RWQCB for dredging and discharges in San Francisco Bay. On July 6, 2001 and August 17, 2001, the DMMO, of which the RWQCB is a member, approved Caltrans' disposal strategy. In addition, the RWQCB received the Draft and Final Environmental Impact Statement for the East Span Project, which identified the quantities and location of dredging, the dredge disposal options and the potential environmental impacts of dredging and dredge disposal. To date, the RWQCB has not raised any significant concerns or objections to Caltrans' proposal. Caltrans will obtain a Deep Ocean Disposal permit from the ACOE and a federal consistency determination from the California Coastal Commission for disposal at SF-DODS.

### **Disposal Consistent with Advice of CDFG and NMFS**

In May of 1999, Caltrans circulated for agency review, including to the CDFG and NMFS, the DMMP for the East Span Project. The DMMP identifies dredge quantities and disposal options. Since circulation of the DMMP, Caltrans has also prepared a Sediment Sampling and Analysis Plan of potential dredged materials. The results of this analysis have been reviewed by the DMMO for which the CDFG provides advice and expertise on the impacts to fisheries and other wildlife of dredging and dredge disposal. In its letter of October 31, 2000, the DMMO identified the volumes of dredged materials that would be SUAD and the volumes that would be NUAD. On July 6, 2001 and August 17, 2001, the DMMO concurred with Caltrans' dredged material disposal and beneficial reuse plan. In addition, the CDFG received the Draft and Final Environmental Impact Statement for the East Span Project, which identified the quantities and location of dredging, the dredge disposal options and the potential environmental impacts of dredging and dredge disposal.

In anticipation of the CDFG's concerns regarding herring spawning, Caltrans would implement a herring monitoring program during dredging activities. Construction activities that occur during the peak herring spawning season, generally January to March, would be monitored by a qualified biologist to watch for the presence of spawning herring. If the biologist (or CDFG) observes spawning in the project area, in-water construction activities such as pile driving and dredging would be suspended within 660 feet (200) meters of observed spawn. In-water construction activities would not resume at that location for a period of up to 14 days (as determined by a qualified biologist), allowing herring eggs to hatch and larvae to disperse. In

## Attachment 8: Dredging Information

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addition, a turbidity control program would be implemented to further minimize the impacts of turbidity on the herring spawn.

NMFS has recommended that Caltrans dispose of all materials at the SF-DODS and to not dispose of any materials at SF-11. Caltrans has chosen not to adopt NMFS' conservation recommendation of avoiding SF-11 as a disposal site for the following reasons:

- The "Long Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region" (LTMS) calls for a steady reduction of dredged material volumes disposed of at SF-11 to 20 percent of dredged materials generated overall in the Bay Area, but did not eliminate this disposal site from future use;
- NMFS' conservative recommendation is not consistent with its comments on the LTMS. In commenting on the LTMS, NMFS proposed closure of the Carquinez Strait disposal site, but NMFS did not propose closure of SF-11. NMFS' comments recommended selection of the LTMS alternative that proposed in-Bay disposal for 20 percent of dredged materials; NMFS did not recommend elimination of in-Bay disposal. NMFS' conservation recommendation for the East Span Project is therefore not consistent with its position regarding the LTMS, which would allow continuing disposal at SF-11, with reduced volumes.
- Only the materials dredged at individual pier locations for new construction would be disposed of at SF-11. These materials would be generated in smaller amounts over approximately 45 months. As a result, the volume of material as an expression of time would be very small (approximately one barge trip per month); thereby, minimizing the impact of disposal at SF-11;
- The volumes proposed for disposal at SF-11 each month are below the reduced limits set for SF-11 in the LTMS; and
- SF-11 is the most practicable disposal site for this dredging component, particularly in terms of site availability and unit disposal costs.

**Box 9****Government Approvals**

<b>Agency Approvals and Certifications Summary</b>		
<b>Agency and Approval Required</b>	<b>Date of Submittal</b>	<b>Status</b>
<b>FHWA</b> Record of Decision	EIS submitted 5/8/01.	Record of Decision issued 7/11/01.
<b>EPA</b> LEDPA determination  Permit to discharge at SF-DODS site.	LEDPA analysis submitted 1/27/01.	LEDPA determination granted, 3/15/01.
<b>USFWS</b> Section 7 Consultation (Endangered Species)	Biological Assessment submitted 7/99.	Letter of 8/31/99 found that Section 7 Consultation was not required.
<b>NMFS</b> Section 7 Consultation (Endangered Species)  Incidental Harassment Authorization- Marine Mammal  Incidental Take Statement	Biological Assessment submitted 7/99.  Submittal to NMFS is forthcoming.  Submittal to NMFS is forthcoming.	Letter of 9/24/99 concluded informal consultation.  Authorization is pending.  Authorization is pending.
<b>U.S. ACOE</b> LEDPA determination  Permit to discharge to wetlands and Waters of the U.S.	LEDPA analysis submitted 1/27/01.  ACOE permit application submitted 9/13/01.	LEDPA determination granted 2/12/01.  Concurrence with 404 b(1) Alternatives Analysis obtained 3/15/01.
<b>U.S. Coast Guard</b> Permit to construct new bridge piers (only).	Draft permit application submitted 5/24/01.	USCG is reviewing application.
<b>SFRWQCB</b> 401 Water Quality Certification	RWQCB permit application submitted 9/13/01.	Authorization is pending.
<b>CEQA</b>	Project is exempt by statute from the requirements of CEQA (see Appendix A).	Statutory exemption issued in 1998.
<b>DMMO</b>	Consultation has been conducted regarding suitability of dredged material for unconfined aquatic disposal.	Letter indicating percent of sediments SUAD and NUAD, 10/31/00.  Concurrence letters from DMMO on disposal options issued 7/06/01 and 8/17/01.

# Box 10

## Public Notice Information

### ADDRESSES OF PROPERTY OWNERS WHOSE PROPERTY BORDERS THE PROJECT AREA

The United States Navy  
Assistant Secretary of the Navy  
Installations and Environment  
1000 Navy Pentagon  
Washington, D.C. 20360-5000

The United States Army  
Oakland Army Base  
Oakland, CA 94626

The United States Coast Guard  
Coast Guard Island  
Building 54D  
Alameda, CA 94501-5100

The Port of Oakland  
P.O. Box 2084  
Oakland, CA 94604-2064

The Port of San Francisco  
Ferry Building  
San Francisco, CA 94111

The City of Oakland  
City Hall  
One City Hill Plaza  
Oakland, CA 94612

The State of California  
Department of Transportation  
District 4  
111 Grand Avenue  
Oakland, CA 94612

East Bay Municipal Utility District  
P.O. Box 24055  
Oakland, CA 94623-1055

## Box 11

### Environmental Impact Documentation

- a. Is the project statutorily exempt from the need for any environmental documentation?  
**YES** - Appendix A includes the CEQA Statutory Exemption.
- b. Is the project categorically exempt from the need for any environmental documentation?  
**NO**
- c. Has a government agency other than BCDC, serving as the lead agency, certified a “negative declaration” on the project?  
**NO** - A copy of the Environmental Impact Statement/Statutory Exemption and Final Section 4(f) Evaluation is attached to the application. A summary of impacts is included in Appendix K.
- d. Has a government agency other than BCDC, serving as the lead agency, certified an environmental impact document on the project?  
**YES** - The Record of Decision (ROD) is included in Appendix B.

# Box 12

## Disclosure of Campaign Contributions

The following contributions of \$250 or more were made by the applicant or applicant's agent to a BCDC commissioner or commissioner's alternate in the preceding twelve months to support the commissioner's or alternate's campaign for election to a local, state or federal office.

**Contribution Made To:**

**Contribution Made By:**

**Date of Contribution:**

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No such contributions have been made.

**Appendix A**

**CEQA Statutory Exemption**

## NOTICE OF EXEMPTION

To:  Office of Planning and Research  
1400 Tenth Street, Room 121  
Sacramento, CA 95814

County Clerk  
County of

From: State of California  
Department of Transportation  
Environmental Planning, South  
P.O. Box 23660  
Oakland, CA 94623-0660

**Project Title:** San Francisco-Oakland Bay Bridge East Span Seismic Safety Project

**Project Location - Specific:** Interstate 80 between Yerba Buena Island and the Oakland shore

**Project Location - City:** San Francisco and Oakland

**Project Location - County:** San Francisco and Alameda

**Description of Nature, Purpose, and Beneficiaries of Project:** The project proposes to seismically retrofit or replace the existing East Span to provide a "lifeline" connection (providing post earthquake relief access) between San Francisco and the East Bay. After implementation of the project, it is expected that the East Span would be able to withstand a maximum credible earthquake on the San Andreas or Hayward faults. It would also bring the East Span up to current roadway design standards for operations and safety to the greatest extent possible. The direct beneficiaries would be users of the East Span. Communities in San Francisco, the San Francisco Peninsula, and the East Bay would benefit after an earthquake due to the East Span project in combination with other seismic safety projects undertaken by Caltrans.

**Name of Public Agency Approving Project:** California Department of Transportation and the Federal Highway Administration

**Name of Person or Agency Carrying Out Project:** California Department of Transportation

**Exempt Status:** *(check one)*

- Ministerial (Sec. 21080(b)(1); 15268);
- Declared Emergency (Sec. 21080(b)(3); 15269(a));
- Emergency Project (Sec. 21080(b)(4); 15269(b)(c));

**Reasons why project is exempt:** The San Francisco-Oakland East Span Seismic Safety Project is statutorily exempt from the requirements of the California Environmental Quality Act (CEQA) under California Streets and Highways Code Section 180.2 and CEQA Section 21080.

CEQA Section 21080, subdivision (b) sets forth the types of activities that are excluded from CEQA, and paragraph (4) of this subdivision specifically includes actions necessary to prevent or mitigate an emergency. According to the California Streets and Highway Code, as amended, the structural modification of an existing highway structure or toll bridge (Section 180.2 (a)); and the replacement of a highway structure or toll bridge within, or immediately adjacent to an existing right-of-way (Section 180.2 (b)) shall be considered to be activities under subdivision (b), paragraph (4).

**Lead Agency Contact Person:** Tony Anziano  
Area Code/Telephone/Extension: 415/982-3130

**Notice of Exemption**

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California Department of Transportation  
San Francisco-Oakland East Span Seismic Safety Project  
Page 2

**If filed by applicant:**

1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project?  
 Yes     No

Signature: Harry G. Galante

Date: 9/18/98

Title: DISTRICT DIRECTOR

Date received for filing at OPR:

**Appendix B**

**Record of Decision**

U.S. DEPARTMENT OF TRANSPORTATION  
Federal Highway Administration

RECORD OF DECISION

SAN FRANCISCO-OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY  
PROJECT

Interstate Route 80  
San Francisco and Alameda Counties, California

**A. Decision**

The selected alternative for the San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Safety Project (referred to as the East Span Project) is Replacement Alternative N-6 with the self-anchored suspension bridge design option. The Final Environmental Impact Statement (FEIS) for the project (FHWA-CA-EIS-98-01-F), prepared by the Federal Highway Administration (FHWA) and the California Department of Transportation (Caltrans), identified this alternative as the Preferred Alternative. Replacement Alternative N-6 will meet the project purpose and need.

The existing East Span of the SFOBB is located on Interstate 80 in Alameda and San Francisco Counties, California. It will be replaced by a new bridge across the Central San Francisco Bay between Yerba Buena Island (YBI) and a spit of land referred to as the Oakland Touchdown area. The new bridge will be built on an alignment to the north of the existing bridge. It will transition from a double-deck viaduct structure to two parallel structures east of the YBI Tunnel, span across the Bay to the Oakland Touchdown area along its northern shore and conform to the existing traffic lanes west of the SFOBB Toll Plaza. The bridge over the main navigation opening is a self-anchored suspension span with a main tower serving as part of the structural system. The new bridge will be approximately 3,514 meters (11,526 feet) long and approximately 70 meters (230 feet) wide, including the space between the eastbound and westbound bridge decks.

The replacement bridge will provide 5 mixed-flow traffic lanes that will each be 3.6 meters (12 feet) wide and two shoulders that will each be 3.0 meters (10 feet) wide for each direction of travel. On the south side of the eastbound deck a 4.7-meter (15.5-foot) bicycle/pedestrian path will be constructed 0.3 meter (1 foot) above the roadway and be separated from traffic by the roadway shoulder, a concrete barrier, and a railing. The bicycle/pedestrian path will extend from the Oakland Touchdown area to the western terminus of the bridge at YBI. A 3.2-meter (10.5-foot) wide section of the path will be shaded dark gray to delineate the area for bicyclists and a 1.5-meter (5-foot) wide section will be shaded a lighter gray for pedestrians.

Following construction and the transfer of traffic onto the new East Span, the existing East Span will be dismantled and removed. The steel spans of the superstructure will be dismantled and transported on barges to land and the concrete piers of the substructure in Bay will be removed to an elevation at least 0.46 meter (1.5 feet) below the mudline in accordance with United States Coast Guard (USCG) regulations. The hollow interiors of the caissons remaining below the mudline may be used as receptacles for pieces of concrete as the column above is dismantled. This method would substantially reduce the quantity of material requiring transport and disposal. The receptacles would naturally silt over by deposition of sediment. Footings on YBI and the Oakland Touchdown area will also be removed to an elevation 0.46 meter (1.5 feet) below grade.

The existing toll plaza at the Oakland Touchdown area will remain in place and tolls will continue to be collected from westbound traffic.

#### **B. Alternatives Considered**

The following alternatives were considered during project development and environmental analysis. For additional information, refer to the FEIS pages referenced after each alternative description.

##### **No-Build Alternative**

Under the No-Build Alternative, the existing 193 6 bridge would not be retrofitted or replaced. See pages 2-3 to 2-4 of the FEIS.

##### **Retrofit Existing Alternative**

The Retrofit Existing Structure Alternative would retrofit both the existing East Span and the East Viaduct section on YBI. The alignment of the bridge would remain unchanged and the bridge would remain a double-deck structure. Each deck roadway cross section would also remain the same, including five 3.5-meter (11.5-foot) wide lanes with no roadway shoulders.

The seismic retrofit strategy of this alternative is based on isolating the superstructure from the substructure (towers and foundations). This work would include constructing additional large diameter piles and new pile caps around the existing foundations, strengthening and stiffening the towers, installing isolation bearings at the top of the towers, and strengthening and/or stiffening the superstructure truss members. Two new large deepwater columns would be added to the cantilever span in the main navigation opening. See pages 2-6 to 2-7 of the FEIS.

##### **Replacement Alternative S4**

Replacement Alternative S-4 would involve constructing a new bridge (two-side-by-side bridge decks each with five mixed-flow traffic lanes) south of the existing alignment. Replacement Alternative S-4 would be approximately 3,550 meters (11,644 feet) long and approximately 70 meters (230 feet) wide including the space between the eastbound and the westbound bridge decks. Replacement Alternative S-4 was developed to avoid offshore conflicts with the existing East Bay Municipal Utility District (EBMUD) sewer outfall, which parallels the existing East Span to the south. This alternative would transition from a double-deck Viaduct structure to two parallel structures east of the YBI Tunnel, reach the Oakland Touchdown area along its southern shore and conform to the existing traffic lanes west of the SFOBB Toll Plaza. The bridge over the main navigation opening is a self-anchored suspension span with a main tower serving as part of the structural system. Replacement Alternative S-4 would include a bicycle/pedestrian path on the south side of the eastbound structure with the same dimensions and characteristics as described for the selected alternative above.

Following construction and the transfer of traffic onto the new East Span, the existing East Span would be dismantled and removed in the same manner as described for the selected alternative above. See pages 2-5 to 2-6 of the FEIS.

The existing toll plaza at the Oakland Touchdown area would remain in place and tolls would continue to be collected from westbound traffic.

##### **Replacement Alternative N-2**

Replacement Alternative N-2 would involve constructing a new bridge (two-side-by-side bridge decks each with **five** mixed flow traffic lanes) north of the existing alignment and south of the alignment for Replacement Alternative N-6. Replacement Alternative N-2 would be approximately 3,479 meters (11,411 feet) long and approximately 70 meters (230 feet) wide,

including the space between the eastbound and the westbound bridge decks. This alternative was designed to minimize the length of the new bridge by closely following the alignment of the existing East Span. The new bridge would transition from a double-deck viaduct structure to two parallel structures east of the YBI Tunnel, span across the Bay to the Oakland Touchdown area along its northern shore and connect to the existing traffic lanes west of the SFOBB Toll Plaza. The bridge over the main navigation opening is a self-anchored suspension span with a main tower serving as part of the structural system. Replacement Alternative N-2 would include a bicycle/pedestrian path on the south side of the eastbound structure with the same dimensions and characteristics as described for the selected alternative above.

Following construction and the transfer of traffic onto the new East Span, the existing East Span would be dismantled and removed in the same manner as described for the selected alternative above. See page 2-5 of the FEIS.

The existing toll plaza at the Oakland Touchdown area would remain in place and tolls would continue to be collected from westbound traffic.

#### **Replacement Alternative N-6 (Selected Alternative)**

The selected alternative is described above under Decision. See pages 2-4 to 2-5 of the FEIS.

#### **Alternatives Considered and Withdrawn**

Other alternatives developed for the East Span Project were withdrawn from further consideration based on engineering constraints, and/or not meeting the project purpose and need. These included four northern alternatives, four southern alternatives, and one double-deck alternative. See pages 2-42 to 2-51 of the FEIS.

#### C. Basis for the Decision

In December 1998, after a thorough evaluation of project alternatives and consideration of comments from the public and agencies on the DEIS, Caltrans identified Replacement Alternative N-6 as the Preferred Alternative. In October 2000, FHWA also identified Replacement Alternative N-6 as the Preferred Alternative.

The Retrofit Existing Structure Alternative was not selected because it would not meet the project Purpose and Need.

This alternative would retrofit the existing SFOBB East Span to withstand a maximum credible earthquake (MCE) on the San Andreas or Hayward faults, however it is anticipated that substantial damage would occur as a result of an MCE and require extensive reconstruction or replacement. Replacement would be necessary if structural safety criteria could not be met through repairs to the damaged bridge.

If damage was such that repair of the cantilever section was feasible, it could require complete closure of the East Span from six months to one year. If, however, damage were sufficiently severe that replacement became necessary, the East Span would be completely closed for a substantially longer period of time. As a result, this alternative does not meet "lifeline" criteria established in the Purpose and Need.

In addition, this alternative would not meet current roadway design standards, which is another criterion of the Purpose and Need.

Replacement Alternative S-4 was not selected due to the engineering challenges and logistical impediments associated with its construction.

On YBI, Replacement Alternative S-4 would involve a permanent take of developable land from the USCG facility. Footings and support columns for Replacement Alternative S4 would use the southeastern portion of YBI and span approximately 1.5 hectares (3.8 acres) of the 17-hectare (41-acre) USCG facility. USCG could develop the land under the bridge, subject to review and approval by Caltrans. Personnel at the facility perform search and rescue operations, maintain the Vessel Traffic Service that directs in-Bay ship traffic, and maintain and repair USCG boats and aids to navigation 24-hours a day, 7 days a week. The USCG coordinates over 2,000 local emergency response requests each year, and in 1999 alone its YBI facility saved 180 lives and over \$34 million in property. The Vessel Traffic Service is essential for the safe passage of large ocean-going ships, such as those moving daily to and from the Ports of Oakland and San Francisco, and is important in protecting the Bay environment by averting and responding to maritime accidents.

In a letter to Caltrans dated October 18, 2000, the USCG stated that a southern alignment for the East Span Project such as Replacement Alternative S4, would severely restrict its flexibility to utilize that part of its already constrained facilities. The USCG further stated that a southern alignment would constrain its ability to effectively conduct emergency service operations from YBI.

Replacement Alternatives N-2 and N-6 would minimize permanent impact on usable land area at the USCG facility.

At the Oakland Touchdown area, Replacement Alternative S-4 would permanently take approximately 3 hectares (7.4 acres) from a 5.9-hectare (14.7-acre) parcel on the former United States Army's Oakland Army Base (OARB) that has been designated by the Oakland Base Reuse Authority (OBRA) for a proposed Gateway Park. The parcel is protected by the provisions of Section 4(f) of the Department of Transportation Act of 1966. Under Section 4(f), the Secretary of Transportation may approve a transportation project requiring the use of publicly owned land of a public park only if there is no prudent and feasible alternative to using that land, and the project includes all possible planning to minimize harm to the protected Section 4(f) property.

Replacement Alternatives N-2 and N-6 are prudent and feasible alternatives that avoid the use of the proposed Gateway Park

Another impediment to construction of Replacement Alternative S-4 is that it would restrict road access to EBMUD's dechlorination facility at the Oakland Touchdown. The dechlorination facility, which operates 24 hours a day, 7 days a week, helps provide water treatment and discharge for over 640,000 people living along the east shore of San Francisco Bay. Under Replacement Alternative S-4, the bridge structure would be located above the existing service road to the dechlorination facility and the resulting vertical clearance would restrict access to the facility required for service and delivery vehicles. Consequently, the dechlorination facility, the service road, or both would need to be relocated.

Neither the road nor the dechlorination facility would need to be relocated as a result of Replacement Alternative N-2 or N-6.

Replacement Alternative S-4 would also conflict with a portion of EBMUD's concrete outfall pipeline located underground on the southern portion of the Oakland Touchdown area. The outfall is a 2.8-meter (9-foot) diameter concrete, zero-load facility, which means that it cannot support any weight and must be protected or spanned to avoid being damaged. The technology exists to span the outfall; however, doing so would increase the potential for damage to the facility and add to construction complexity. If the outfall were damaged during construction, secondarily treated effluent would likely be prematurely released into the Bay, and EBMM

would likely be fined for violation of its water quality permit. The time required to repair the facility would further delay implementation of the East Span Project.

Replacement Alternatives N-2 and N-6 avoid this construction risk and complexity.

Construction of the main tower for Replacement Alternative S-4 would be substantially more complex. The depth to bedrock for construction of the main tower of Replacement Alternative S-4 is 67-71 meters (220-233 feet) below the mudline, as compared to 11-14 meters (36-46 feet) for Replacement Alternative N-2 and 6-9 meters (20-30 feet) for Replacement Alternative N-6. Placing a key structural element of the bridge in over 60 meters (200 feet) of soft sediments would present substantial engineering challenges during construction and as a result, construction of this alternative would be much more difficult than construction of Replacement Alternatives N-2 or N-6. Replacement Alternative S4 would require a longer tower to reach bedrock that would be subject to greater stresses in an earthquake and require a more massive foundation. The larger foundation would increase the area of bedrock to be excavated.

Construction of the main tower component under Replacement Alternatives N-2 and N-6 would be less complex.

In summary, Replacement Alternative S-4 was not selected because, even though it could provide equal seismic safety to that of Replacement Alternatives N-2 and N-6, it would take land from an operating USCG facility, thereby constraining the mission of that facility; it would use land from a Section 4(f) resource (proposed Gateway Park) for which there is a prudent and feasible alternative; it could compromise the operation of an important wastewater facility that serves over 600,000 people along the east side of the Bay; and it would result in more difficult in-Bay construction of the main tower. Replacement Alternatives N-2 and N-6 would minimize or avoid these impacts and were therefore preferred over Replacement Alternative S-4.

Because both Replacement Alternatives N-2 and N-6 could achieve equal seismic safety and would impact comparable amounts of resources, consideration was given to other factors in determining which alternative to select for this project. Replacement Alternative N-6 is the environmentally preferred alternative and has been chosen over Replacement Alternative N-2 on the basis of greater ease of construction of the main tower based on geologic conditions, consistency with the regionally preferred alignment and design features as expressed by the MTC and aesthetic benefits such as the optimal drivers' views of the San Francisco skyline for westbound motorists. The selected alternative was also identified as the Least Environmentally Damaging Practicable Alternative (LEDPA) by ACOE (on February 12, 2001) and EPA (on March 15, 2001). Documentation letters can be found in Appendix F of the FEIS. For additional information, see Section 2.2.6 of the FEIS.

#### D. Bay Plan Consistency

The project was coordinated extensively with the San Francisco Bay Conservation and Development Commission (BCDC) staff prior to the FEIS approval to assure that the preferred alternative conformed to the Coastal Zone Management Act, the McAteer-Petris Act and the policies of the San Francisco Bay Plan. BCDC staff stated in a February 4, 2000 letter to Caltrans that Replacement Alternative N-6, with the self-anchored suspension design option, generally conforms to BCDC's amended Coastal Zone Management Program for San Francisco Bay.

Caltrans' final project plans, specifications, and estimates (PS&E) for those portions of the project within or affecting resources within BCDC's jurisdiction will incorporate conditions of the Bay Plan permit once they are obtained from BCDC. BCDC concurrence on the federal consistency determination will be included in the findings of its permit.

Caltrans will continue to coordinate with BCDC regarding activities within its jurisdiction during further project design and development. For additional information, see Section 4.1.6 of the FEIS.

#### E. Air Quality Conformity

The selected East Span Project is located in a federal air quality non-attainment area for ozone and a maintenance area for carbon monoxide. As a result, the Bay Area Air Quality Management District (BAAQMD) prepared an Ozone Attainment Plan in 1999. The EPA is proposing to disapprove the 1999 Ozone Attainment Plan. As a result, the Metropolitan Transportation Commission (MTC), the California Air Resources Board, and the BAAQMD are currently preparing a 2001 Ozone Attainment Plan for submittal to EPA. A public hearing to discuss the 2001 Plan will be held July 18, 2001. The 2001 plan projects attainment of the ozone standard by 2006.

The East Span Project is included in the currently conforming MTC's 1998 Regional Transportation Plan (RTIP) approved on January 21, 1999 and the 2000/01 Federal Statewide Transportation Improvement Program (FSTIP), which incorporates the State's 2001 Transportation Improvement Program (TIP) developed by MTC for the Bay Area. MTC's 2001 TIP was found to conform by FHWA and IFTA on October 5, 2000. The conformity analysis conducted by MTC is consistent with the requirements of the Transportation Conformity Rule (40 CFR Parts 51 and 93).

The design concept and scope of the proposed project have not changed since inclusion into the MTC 1998 RTP and 2001 TIP and do not interfere with the timely implementation of transportation control measures in the applicable State Implementation Plan (SIP).

The project-level air quality analysis shows that there are no current violations of the carbon monoxide (CO) standards nor are any predicted in the future under the selected alternative. Consequently, the project meets the 40 CFR 93.116 requirement that the "project must not cause or contribute to any new localized CO violations or increase the frequency or severity of any existing CO violations in CO non-attainment and maintenance areas."

Therefore, pursuant to the transportation conformity regulations for implementing the provision of the Clean Air Act Amendments of 1990, the selected alternative conforms to the SIP for achieving the National Ambient Air Quality Standards. Refer to FEIS pages 3-35 to 3-39 and 4-45 to 4-47 for additional information regarding air quality.

#### F. Project Cost

In April 2001, Caltrans published updated cost information for Replacement Alternative N-6, which reflects cost increases due to such factors as increasing construction costs in a robust and competitive local economy; significant increases in the costs of steel; schedule delays which magnified the inflationary effect; and additional design amenities such as the belvederes and a wider bicycle path. Caltrans estimates that the current cost of Replacement Alternative-N-6, suspension bridge option, would be \$2.6 billion.

The enabling legislation for the project, Senate Bill 60, signed by then-governor Pete Wilson in 1997, anticipated the possible need for additional funding beyond original estimates and required Caltrans to return to the Legislature if necessary. In accordance with Senate Bill 60, Caltrans has submitted its cost estimates to the Legislature and anticipates that it will address the need for additional funding within the next few months.

Caltrans did not prepare updated cost estimates for the other project alternatives in April 2001. However, the most significant factors contributing to increased costs would apply to all of the build alternatives.

A financial plan is under development and will be provided and approved by FHWA before **Federal** funds can be authorized.

### G. Measures to Minimize Harm

The measures described below have been or will be incorporated into the project to reduce the impact of constructing the selected alternative. Other measures to mitigate project impacts, including standard specifications and practices, are included in FEIS Chapter 4 and in Responses to DEIS comments contained in Volume H of the FEIS. These additional mitigation measures are incorporated into this record of decision by reference.

#### **Community Impacts**

The City and County of San Francisco (CCSF) would be reimbursed for documented losses in rental income from Quarters.1 - 7. A pre-and post-construction survey of Quarters I- 7 and Building 262 will be conducted and construction-related damage would be repaired. Measures to protect the buildings from construction period damage will be developed in consultation with property owners.

For the displacement of Buildings 3 0, 40, 75, 213, and 270 on YBI, Caltrans will work with the USCG and the Navy and, upon request, will provide buildings of like size, construction, construction materials, and quality, built to current code requirements. The USCG and the Navy will need to provide suitable sites for the replacement buildings outside State right-of-way if necessary.

The project will not have any disproportionately high and adverse human health or environmental effect on minority and low-income populations because there are no identified minority or low income populations or communities in the project area. For additional information, see Sections 4.1 and 4.14.1 of the FEIS.

#### **Transportation**

The following discussion is solely related to transportation impacts during the construction period. Permanent transportation impacts will be negligible.

Lane and bridge closures are being investigated in an effort to simultaneously minimize public inconvenience, facilitate construction and maximize public safety. Closures will be timed during off-peak hours to the extent feasible and a traffic management plan will be implemented to manage impacts to traffic.

On YBI, the contractor will construct a detour around the column foundations to keep Macalla Road open or provide another travel way for USCG personnel. Column construction will be staged so that entrances to the USCG facility will remain open to the maximum extent feasible. Caltrans will coordinate with the USCG when brief closures of the entrances are necessary. Temporary detours will be constructed and flaggers employed to ensure motorist safety-for USCG vehicles in the construction zone, barges will deliver wide and oversized construction loads when possible, and the contractor will be limited to parking within the temporary construction easement.

For pedestrian circulation on YBI, a new stairway will be constructed to replace the existing stairway that must be removed. Replacement will be done after consulting with the USCG, the Navy, and the CCSF about the appropriate site. Construction-period shuttle service will be provided for USCG personnel and authorized visitors of YBI.

For maritime operations, the USCG will issue a notification to mariners and implement a vessel warning system for periods when construction vessels and barges are moored within the bridge construction zone. For additional information, see Section 4.14.2 of the FEIS.

### **Visual**

The appearance of the hillside adjacent to where the YBI tunnel meets the existing East Span on YBI may be permanently altered due to the removal of approximately 3 5 0 mature trees (mostly eucalyptus). A construction access plan will be developed to identify the location of grading, access roads, vegetation removal, and equipment platforms on YBI. Construction limits will protect selected vegetation and screening to the maximum extent feasible and a re-vegetation plan will include the planting of mature trees, monitoring, and replanting as necessary to return disturbed areas to a natural appearance and to establish visual screening between the bridge and the historic buildings in the Historic District on YBI. The slope behind the historic properties will be restored to provide a natural appearance and to reestablish visual screening of the bridge comparable to the existing conditions.

Approximately 71 mature trees (mostly pine) at the Oakland Touchdown area will be removed. For the Oakland Touchdown area, a master planting plan will be developed in coordination with local agencies and will be implemented within two years of completing bridge construction. For additional information, see Section 4.3 of the FEIS.

### **Noise**

The contractor will be required to comply with local noise control ordinances to the extent practicable.<sup>1</sup> Consultation with the USCG will continue to identify and implement feasible and reasonable measures that reduce construction-related noise levels at USCG facilities. In addition, Caltrans is continuing to investigate the possibility of limiting the hours for pile driving to further reduce the construction noise impacts to other residents of YDI and Treasure Island. For additional information, see Section 4.14.5 of the FEIS.

### **Hazardous Wastes**

FHWA met with the Navy, USCG, the Department of Toxic Substance Control (DTSC), CCSF, and the EPA regarding Installation Restoration (IR) sites on YBI, addressing the coordination of the cleanup of these sites through the Navy's Base Realignment and Closure (BRAC) with this project. Coordination with all responsible regulatory agencies will continue to ensure that hazardous wastes are appropriately managed, remediated and disposed of, if necessary.

All excavated material, including dredged material, will be disposed of offsite in conformance with federal, state, and local laws and regulations with the exception of a small quantity of dredged material that may be used to restore part of the barge access channel. However, excavated materials that contain lead from vehicle emissions within the ranges specified in the variance granted by the DTSC may be reused within the highway right-of-way for this project or at another Department project along the project corridor. For additional information, see Sections 4.6 and 4.14.6 of the FEIS.

### **Geology, Soils, and Seismicity**

Caltrans will ensure that the project does not exacerbate pre-existing slope stability and erosion problems within Caltrans right-of-way or its temporary construction easement on YBI during or after construction. Consultation with the USCG and collection of information on slope stability prior to and during construction will be conducted. For additional information, see Section 4.7 of the FEIS.

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<sup>1</sup> According to Section 2908 of the San Francisco Noise Ordinance, if the nature of construction activities required is such that compliance with local noise control ordinances is not feasible, a special permit may be applied for with the CCSF Director of Public Works.

### **Water Resources and Quality**

A Storm Water Pollution Prevention Program (SWPPP) will be prepared to identify pollutant sources that may affect the quality of storm water discharge associated with the construction activities and control measures to reduce the volumes and/or concentrations of such discharges. Using the current Best Management Practices (BNTS) for the construction industry, the objectives of the SVVTPP will be to minimize the degradation of off-site receiving waters to the maximum extent practicable and to reduce the mass loading of chemicals and suspended solids to the downstream drainage system and the receiving water bodies. For additional information, see Section 4.14.7 of the FEIS.

### **Special Aquatic Sites**

Special aquatic sites (as defined by ACOE under Section 404 of the federal Clean Water Act) impacted by the project include sand flats and eelgrass beds.

### **Sand Flats**

A geotube rather than engineered fill will be used as a dewatering berm to construct the westbound roadway at the Oakland Touchdown to reduce impacts to sand flats. A geotube is a large, high-density polyethylene tube filled with excavated material and is used as a temporary tidal barrier during construction.

A portion of the sand flats at the Oakland Touchdown area will be restored on-site and rock slope protection will be constructed to provide an upland transition zone. In addition, a tidal marsh ecosystem is being planned off-site at an appropriate location, per agreement among resource agencies on out-of-kind mitigation. Should this plan prove infeasible, alternate mitigation will be developed in consultation with permitting and resource agencies. For additional information, see Sections 4.9 and 4.14.8 of the FEIS.

### **Eelgrass Beds**

Delineation of Environmentally Sensitive Areas (ESAS) with fencing and buoys or similar devices will be included in the project plans, specifications, and estimates to avoid additional construction impacts. Caltrans will monitor for turbidity resulting from dredging pile driving, barge maneuvering, and mud boils. Caltrans will require the contractor to implement a turbidity control program, which may include turbidity curtains and limitations on barge and tug boat maneuvering. Post-construction surveys to evaluate impacts of turbidity on eelgrass will also be conducted and if additional eelgrass beds are affected during construction, consultation will take place with the permitting agencies. Eelgrass from a portion of the barge access channel will be harvested prior to dredging and will be replanted in adjacent eelgrass beds.

In addition, a tidal marsh ecosystem is being planned off-site at an appropriate location, per agreement among resource agencies on out-of-kind mitigation. Should this plan prove infeasible, alternate mitigation will be developed in consultation with permitting and resource agencies.

In addition, the following design considerations have been included in the project to further minimize impacts to special aquatic sites:

Reduction in the width and depth of the barge access channel proposed in the Dredged Material Management Plan (DM2vT), dated June 1999 to minimize impacts to eelgrass beds. The channel width has been reduced from 82 meters (270 feet) to 50 meters (164 feet) for the

Skyway contract and from 82 meters (270 feet) to 45 meters (148 feet) for the Oakland Touchdown contract.<sup>2</sup> The channel depths have been reduced to 3.7 meters (12 feet) below Mean Sea Level (MSL) from 4.3 meters (14 feet) as proposed in the DM2vT; and

Use of temporary trestles, rather than temporary solid fill, for construction access in the Bay to reduce impacts to sand flats and eelgrass beds. For additional information, see Sections 4.9 and 4.14.8 of the FEIS.

### **Double-crested Cormorant and Western Gull**

The double-crested cormorant colony will be monitored during breeding season and birds will be prevented from nesting on the existing bridge where potential impacts could occur as a result of dismantling activities. The protocol to prevent double-crested cormorants from nesting will follow the methods implemented for maintenance activities on the existing bridge, which involves washing partially constructed nests off the bridge with water before the nests are occupied. If the nests are completed and the birds have laid eggs, the nests will not be disturbed. Similar measures will be used to prevent western gulls from nesting in areas of potential impacts.

Caltrans will include cormorant nest platforms on the new bridge. Gulls will be able to use the pile caps. For additional information, see Sections 4.9 and 4.14.8 of the FEIS.

### **American Peregrine Falcon**

The Santa Cruz Predatory Bird Research Group will monitor the American peregrine falcon on the existing bridge during their nesting period and if they show signs of disturbance during construction or dismantling operations, the eggs and/or chicks will be collected, raised off-site and eventually released at a natural site.

No long-term impacts are anticipated because the American peregrine falcon will probably nest on the new bridge. For additional information, see Sections 4.9 and 4.14.8 of the FEIS.

Black-crowned Night Heron, Allen's Hummingbird, White-Tailed Kite, Bank Swallow, and Bewick's Wren.

Prior to the removal of vegetation and trees on YBI, a biological monitor will survey for nests. Vegetation and trees with nests or vegetation and trees adjacent to areas with nests will not be removed until the nesting period (usually between January and July) is complete. Alternatively, to the extent feasible, vegetation and trees that need to be removed will be removed prior to the nesting season (after surveys have been conducted), so as to not affect the construction schedule. For additional information, see Section 4.14.8 of the FEIS.

### **Harbor Seal, California Sea Lion, and Gray Whale**

Methods such as a sound attenuation system and/or monitoring could be used to avoid or minimize impacts to marine mammals resulting from pile driving. The decision as to what measures to implement will be made in consultation with the National Marine Fisheries Service (NMFS). These measures will be implemented pursuant to the terms of the Incidental Harassment Authorization that will be obtained from NMFS prior to project construction. For additional information, see Section 4.14.8 of the FEIS.

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<sup>2</sup>Construction of the new bridge will be divided among four separate contracts including YBI and the Main Span, the Skyway, the Oakland Approach, and the Geofill contract at the Oakland Touchdown area. Geofill is a flowable **fill** with controlled and variable density that can be used for highway repair, trench filling, and tunnel and void filling.

### **Chinook Salmon, Steelhead, Green Sturgeon, and Longfin Smelt**

Caltrans will require the contractor to implement a turbidity control program that will reduce the amount of sediments suspended by construction activities. If construction sequencing permits, dredging will be avoided in shallow water areas during the peak outmigration period for juvenile salmonids (January 1 through May 31).

In its letter concluding Section 7 consultation for special status fish species, NMFS proposed the use of sound attenuation during salmonid outmigration as a method to avoid pile driving impacts. FHWA and Caltrans agreed to implement such measures. Since release of the FEIS, FHWA and Caltrans have continued coordination with NMFS regarding potential impacts to special status fish species. Through this coordination, it was recognized that sound attenuation may reduce but not fully avoid impacts to special status fish species. In addition, it was also recognized that accurate assessment of pile driving impacts to special status fish species might not be possible. As a result of this recent coordination, NNEIS is considering off-site measures to reduce the mortality of special status fish; such measures may provide greater long-term benefit to special status fish species. The decision as to what measures to implement will be made in consultation with NWS. For additional information, see Section 4.14.8 of the FEIS.

### **Pacific Herring**

During construction, a qualified biologist will monitor the Pacific Herring spawning period (January to March). If spawning is observed in the project area, in-water activities such as dredging will be suspended within 200 meters (600 feet) of spawning and not resume for a period of up to 14 days, allowing herring eggs to hatch and larvae to disperse. In addition, implementation of a turbidity control program, which may include turbidity curtains during dredging and limitations on barge and tugboat maneuvering, will reduce the impacts of turbidity on the herring spawn. For additional information, see Sections 4.9 and 4.14.8 of the FEIS.

### **Coast Live Oak Woodland**

In accordance with the CCSF tree ordinance, displaced oak trees on YBI will be replaced in-kind at a 3:1 ratio in the same area to create a habitat comparable to the existing condition. Due to the root structure of mature oak trees, the replacement trees may be smaller than those displaced. Planted trees will be monitored and replanting will be performed as necessary. For additional information, see Section 4.9 of the FEIS.

### **Historic Properties**

Measures to mitigate project effects on historic properties have been stipulated in a Memorandum of Agreement (MOA) among the FHWA, USCG, the State Historic Preservation Officer (SBPO) and the Advisory Council on Historic Preservation (ACBP), with Caltrans as a concurring party. The Navy, local governments, and Native Americans were also asked to participate in the development of mitigation measures and invited to sign the MOA as concurring parties. For additional information, see Appendix 0 in the FEIS for a copy of the MOA.

Mitigation of Effects to the existing historic San Francisco-Oakland Bay Bridge include, but are not limited to salvage, interpretive exhibits, museum exhibits, oral history and school curriculum materials.

Mitigation of Effects to the Senior Officers' Quarters Historic District, Quarters 8, Quarters 10, Building 267, and Building 262 cited in the MOA includes but is not limited to:

Protective Measures: Appropriate measures will be developed, in consultation with the Navy and USCG, to protect the historic buildings from damage during the project.

Repair of Inadvertent Damage to Buildings: Any damage to any of the historic buildings resulting from the project would be repaired in accordance with the Secretary of the Interior's Standards for Rehabilitation.

Restoration of the Grounds: Caltrans will ensure that the grounds within the Senior Officers' Quarters Historic District, Quarters 8 and Quarters 10 are restored after completion of the bridge project to their condition prior to the start of the project.

Measures in the MOA concerning archaeological resources include development and implementation of a Treatment Plan for data recovery in consultation with USCG, SHPO, ACHP, and Native Americans.

Per the MOA, Caltrans will be responsible for preparing an annual report for all signatories to the MOA on efforts to carry out the mitigation program for historic properties.

#### H. Section 4(f)

The 4(f)-protected resources that will be used by the project include the existing San Francisco Oakland Bay Bridge and its contributing elements (a historic structure eligible for the National Register) and the Senior Officers' Quarters Historic District on Yerba Buena Island (a historic district eligible for the National Register). The use of land within the Senior Officers' Historic District will be limited to the construction period. No historic building will be used or subjected to a change in ownership by this project. This determination is documented in the Final Section 4(f) Evaluation prepared for the project.

Based upon the considerations outlined in the Section 4(f) evaluation, it is determined that there is no feasible and prudent alternative to these uses and that the proposed action includes all possible planning to minimize harm resulting from such use. For additional information, see Chapter 6 of the FEIS.

#### I. Monitoring and Enforcement

Other than the biological resource and historic building monitoring described in the MOA, special monitoring or enforcement programs are not required for specific project mitigation. Current FHWA and Caltrans policies and procedures are adequate to ensure that all of the project monitoring and mitigation measures referenced and/or prescribed above are carried out.

*Caltrans* will be responsible for preparing an annual report for the SHPO and all other signatories to the MOA on efforts to carry out the mitigation program for historic properties per the MOA as described above.

#### J. Comments on the FEIS

The FEIS was distributed to governmental agencies, organizations, and the public on May 8, 2001 and the Notice of Availability was published in the May 18, 2001 *Federal Register*. The FEIS 30-day availability period ended on June 18, 2001. As a result of FEIS circulation, comment letters were received from the Navy, the USCG, the EPA, EB MUD, the City of Emeryville, Kenneth A. Gosting (Transportation Involves Everyone), the Law Offices of Stuart Flashman (representing the Transportation Defense and Education Fund, Citizens' Alliance for a Better Bay Bridge, and Ken Bukowski), Rick Feher and Robert Freehling, and Dr. Robert R. Piper of the Sierra Club.

**Purpose and Need:**

The Law Offices of Stuart M. Flashman questioned why providing a "lifeline" link on the East Span warrants near-emergency priority when contingency plans already exist for an East Span failure, why the seismic safety and operations of the East Span are examined separately from the other components of the Bay Bridge, and why such a link would need to provide five lanes of traffic and two shoulders, as opposed to other combinations of lanes.

**Response:**

It is acknowledged that contingency plans for post-MCE emergency relief exist in the event of an East Span failure; however, reliance on such plans could delay the response-time of post-MCE emergency services. Designation of the East Span as part of a lifeline route represents the State's intention to use the East Span to provide high-level post-earthquake transportation services for emergency response and support for the safety and economic livelihood of the Bay Area. A key element in this decision was that the Bay Bridge provides the most direct vehicular route into San Francisco from the East Bay. '

The replacement East Span is being designed to appropriately connect with other segments of the SFOBB; however, it has independent utility (i.e., it would be usable and a reasonable expenditure of funds even if no additional transportation improvements on the bridge are made). Having separate, independent projects whose overall goal is to provide seismic safety on the SFOBB brings implementation of that goal sooner to the citizens of the Bay Area because some projects can be completed sooner than others.

The Project Purpose and Need calls for maintaining the existing number of lanes (thereby maintaining current capacity); current design standards require the provision of shoulders. In addition, providing fewer or more than **five** lanes would require changes to the lanes at the YBI tunnel. Neither the YBI tunnel, the West Span, nor the West Approach could accommodate more than five lanes without major reconstruction.

**Compliance with NEPA-**

The City of Emeryville and the Law Offices of Stuart Flashman stated that the East Span Project is inconsistent with NEPA regulations because the FEIS did not analyze a sufficient range of project alternatives, and therefore did not provide full public disclosure. They stated that the retrofit alternative, rail on the replacement East Span, and reuse of the existing East Span for bicycle and pedestrian use or rail were not adequately considered. In addition, all projects on the SFOBB were not considered in their entirety.

**Response: ,**

The FEIS considered a reasonable range of alternatives pursuant to NEPA. The range of alternatives considered in the FEIS was established by Caltrans and FHWA in accordance with NEPA requirements and in consultation with permitting and regulatory agencies under guidance of the NEPA/404 MOU. Participants considered options and provided written concurrence on the range of alternatives and the criteria established for selection of alternatives. For additional information, see response to Comment 2 of the CCSF Planning Department-letter dated 11/23/98 and responses to Comments 3 and 4 of the City of Emeryville letter dated 10/26/98 in Volume H of the FEIS.

**Rail on the East Span:**

Comments from the City of Emeryville state that rail should be considered and/or implemented on the new East Span because it could have less environmental impacts than solely providing vehicular lanes, could be politically and structurally impossible in the future, could be managed by existing transit agencies, could be built before the institutional framework is in place and the "insurmountable" obstacles mentioned in the FEIS could be overcome.

The Law Offices of Stuart Flashman commented that there is little difference between including a rail component and adding a bicycle/pedestrian component to the new East Span.

Kenneth A. Gosting commented that rail should not be withdrawn from consideration on the basis that local and/or regional transportation planning agencies have not included it in their plans. Failure to include rail in the East Span Project could hinder the viability of California in the 21<sup>st</sup> century because the inclusion of rail capacity could be an incubator for rail emerging in the I-80 corridor between Oakland and Sacramento, where ridership has grown by 50 percent in the last year.

Dr. Robert R. Piper of the Sierra Club commented that the design does not facilitate future expansion of capacity at reasonable cost to accommodate growth in demand with minimal environmental damage.

**Response:**

The East Span Project does not preclude implementing a rail project, or other technologies, in the Transbay Corridor in the future. Engineering solutions can be found to make rail feasible on all segments of the SFOBB, if political and financial obstacles can be overcome. The City of Emeryville mentioned that the removal of the Transbay Terminal ramps precludes rail service on the East Span. Future rail could connect to the Transbay Terminal or other destinations in San Francisco with the addition of appropriate connections at that time.

As mentioned in the comments, rail is not currently part of the Regional Transportation Plan (RTP). The Metropolitan Transportation Commission (MTC), as the regional governmental agency that provides regional transportation planning and coordinating of transportation activities for the nine-county Bay Area, does not currently envision rail in the Transbay Corridor other than Bay Area Rapid Transit (BART). The near-term implementation of either a road- or rail-based high-occupancy transportation strategy on the SFOBB would be constrained by several factors. Planning, funding, and implementing new transit services, which would have to be integrated with existing transit services in the Bay Area, would take substantially longer than the East Span Project would take to build, thereby further delaying seismic safety on the East Span. For additional information, see Section 2.5 of the FEIS.

**Construction-Period Impacts:**

The USCG made several comments regarding construction activities on YBI adjacent to its facility and it expressed concern about noise and light impacts on residents, impacts from potential landslides on adjacent slopes, access and shuttle service, power supply during construction, contamination from dismantling operations, interference with implementation of its future projects, and displacement of recreational facilities. ,

EBMUD stated its concerns regarding potential impacts to its dechlorination facility and sewer outfall. EBMLTD remains concerned about access to and protection of the facilities during and after construction. Specifically, EBMUD wants assurance from Caltrans that is in compliance with the zero-load specification for the outfall contained in EBMUD's RWQCB permit and that EBMUD is provided the opportunity to review the outfall damage prevention plan and requirements for pre- and post-construction inspection. EBMUD also expressed its concern regarding a temporary span of the outfall on the Oakland Touchdown.

**Response:**

Caltrans and the USCG will continue to coordinate to identify and address USCG concerns regarding construction-period impacts. Measures will be included to the extent feasible in contractor specifications to address USCG concerns. Some of the issues identified will be

resolved prior to selection of a contractor and others will be resolved through continued coordination.

Caltrans acknowledges that construction will interfere with implementation of some of USCG's plans, but will not interfere with USCG being able to finalize its Master Plan. Some recreational facilities will not be available during construction. This would only be during the duration of the work on YBI and would be for approximately four years, not the entire construction period (i.e., seven years).

Caltrans will also coordinate with EBMUD to address EBMUD's concerns regarding potential construction-period impacts and to ensure that during construction EBMUD can comply with its RWQCB permit specifications. EBNITJD will have the opportunity to review drawings and requirements for pre- and post-construction inspections.

The temporary span proposed for the EBMUD outfall at the Oakland Touchdown area has been removed from the design plans and there are currently no plans for placing any load on the outfall during construction. The contractor will use the existing span that is currently used by Caltrans' vehicles. EBMUD and Caltrans would be required to approve it if the contractor proposes a new crossing.

Caltrans will also specify in the contract provisions that EBMUD and any other agencies owning or operating facilities at the western end of the Oakland Touchdown area will have access to them during construction. Any brief closures of the road required for the safe movement of construction equipment would be coordinated with EBMUD and other affected agencies.

Caltrans is currently preparing a letter to respond to EBMUD's letter of April 11, 2001 concerning pre-and post-construction inspection of the outfall.

For additional information, see Section 4.14 of the FEIS.

**Relocation and Accommodation of Utilities:**

Rick Feher and Robert Freehling commented that the location of the EBMUD sewer outfall should not have been a determining factor in the selection of a northern alignment since the need to move a sewer pipe seldom renders a construction plan unreasonable. They suggested that, at a cost of \$ 1 00 millions the outfall should be moved if it provides for a simpler and more seismically safe alternative.

The Navy commented that Caltrans needs to commit to providing all necessary rights of ownership and access to utilities that serve the U.S. Coast Guard and other portions of YBI in their present and future locations. It said that the FEIS failed to recognize its February 12 and April 12, 2001 notices to Caltrans that the Navy will not fund relocation of the backup water supply line on the existing East Span, but instead intends to abandon the line in place, in conformance with the 1944 permit between the Navy and Caltrans referenced in the FEIS. Also, because the October 26, 2000, deed ( land transfer to the State) is silent on the matter of utilities, the FEIS and ROD should clearly commit Caltrans to provide all necessary rights of ownership and access to utilities that serve the USCG and other portions of YBI in their present and future locations.

**Response:**

There would be numerous issues associated with relocating the EBMUD sewer outfall including additional permitting, cross-agency coordination, potential for interruption of utility service to 640,000 residents of the East Bay and increased risk of environmental damage. Because of these factors, an alternative was selected that would not conflict with the outfall and would achieve seismic safety sooner than if the outfall were relocated.

Selecting a southern alternative would not have resulted in a more seismically safe bridge. All replacement alternatives would be built to the same seismic standard.

Standard utility accommodation and relocation procedures will be used by Caltrans so as to ensure no disruption of service to the USCG during and after project construction in those areas conveyed in fee to Caltrans. Should investigation reveal operating utilities in areas where Caltrans holds an easement and should it be necessary for such utilities to be relocated, Caltrans will provide for such relocation. Subsurface Utility Engineering (potholing) will be conducted to determine the location, type, and ownership of all operating and abandoned utilities. Operating utilities will be accommodated in place and permanent easements will be provided if they do not interfere with construction or will be relocated at the expense of Caltrans and provided with easements in areas controlled by Caltrans. Non-operating or abandoned utilities will not be provided easements. On 7/1/01, Caltrans is in the process of issuing an encroachment permit to CCSF for the continued maintenance of utilities that pass through Caltrans' right-of-way. The permit will allow CCSF to service the utilities until a final resolution on utility ownership and operation, as a result of the federal land transfer, is obtained between all parties. Caltrans will seek an appropriate new owner of the existing water pipe line on the bridge.

#### **Dredging, Air Quality and Related Issues.**

The EPA encouraged Caltrans to provide its air quality analysis of dredging-related impacts to ACOE. It also mentioned that cost-effectiveness should not be the only factor considered when making decisions about the disposal of dredged material.

The Law Offices of Stuart Flashman commented that the level of analysis provided in the FEIS on impacts from dredging and disposal of contaminated sediments was insufficient and that the public was not provided the opportunity to comment on the information added to the FEIS on contaminated dredged materials.

#### **Response:**

*Caltrans* has offered its analyses to the ACOE and will provide them should the ACOE need them.

Caltrans agrees with the EPA that criteria other than cost also need to be used in identifying appropriate reuse/disposal sites. Caltrans has been in consultation with the EPA and other members of the Dredged Material Management Office (DMMO) during the decision-making process. On June 6, 2001, Caltrans presented its plan for dredged material disposal and beneficial reuse to the DMMO and received preliminary verbal agreement about the plan.

Caltrans prepared a Dredged Material Management Plan (DMMP) that was circulated to agencies and the public in June of 1999. Comments on the DMMP and responses are in Volume II, Section III of the FEIS. Sediment testing was conducted in accordance with DMMO procedures. A Sediment Sampling and Analysis Report (SAR) was prepared that summarized the results of the testing. The results of the SAR are discussed in the FEIS. A small volume of dredged material is contaminated to a degree that would not be suitable for aquatic disposal or beneficial reuse. Those sediments that did not qualify for unconfined aquatic disposal showed only slightly more toxicity than the allowable limit when compared with reference sediments at the aquatic disposal sites. Transportation of these sediments and handling of accidental spills are strictly regulated. Leakage would not be allowed during transport. These sediments would be disposed of at appropriate upland facilities in accordance with all applicable laws and regulations.

Public circulation of the SAR is not required; however the executive summary of the report was made available at public libraries and at Caltrans' District 4 Information Office. Caltrans has

been in consultation with EPA throughout the environmental process and dredging disposal/sediment sampling analysis and EPA has not indicated that it has any issues with the FEIS, the sediment sampling, or proposed reuse/disposal options. For additional information, see Section 4.14.10 of the FEIS.

**Cumulative Impacts:**

The Law Offices of Stuart Flashman and Kenneth A. Gosting commented that the FEIS failed to adequately analyze the cumulative impacts of the project, including but not limited to impacts from disposal of waste materials generated during dismantling of the existing East Span and construction of the new East Span.

**Response:**

Cumulative impacts have been identified and are addressed in Section 4.15. The EPA has stated in its comment letter on the FEIS that the cumulative analysis for the East Span Project is adequate and does a good job "in adequately describing the regulatory framework and the methodology used in the analysis. Cumulative impacts of waste generated by construction and dismantling processes are expected to be minor.

**Transfer and Control of Property on YBI:**

The Navy made the following comments on the FEIS:

- YBI property and adjacent submerged lands conveyed in fee or burdened by construction and aerial easements to Caltrans by the FHWA in the October 26, 2000, deed are incorrectly identified in the FEIS as still being under the control of the Navy. Also, archaeological site CA-SFr-04/H and improvements on the deeded property, including Building 213, historic Buildings 262 and 267 and historic Quarters 10, are incorrectly identified as still under Navy control. The Navy's EIS for the base closure will evaluate the effects of the Navy's disposal and reuse of base lands not affected by the FHWA-to-Caltrans deed. The Navy's disposal decisions, based on that EIS, are expected to begin in 2002. The Defense Base Closure and Realignment Act will not be available for disposal of any deeded land reconveyed to the U.S.
- The FEIS was also incorrect in stating that Caltrans will consult with the Navy regarding mitigation of effects to historic properties. The Record of Decision (ROD) should clearly state that the Navy was not party to or a concurring signatory to the MOA included in Appendix 0 of the FEIS. Because the Navy no longer controls Quarters 10, Building 267 or Building 262, maintenance of these buildings is the responsibility of the State of California and FHWA.

**Response:**

Regarding control of property, property permanently needed for the bridge has been transferred in fee and is no longer under the ownership or control of the Navy. This fee.-property contains archaeological site CA-SFr-04/1-I and part of the property on which Building 213 is located. Caltrans takes responsibility for the archaeological site as specified in the MOA (See Appendix 0 of the FEIS) and has agreed, if requested by the Navy, to construct a building- similar to Building 213 (a fire station currently used for storage of a fire truck) on Navy land outside the bridge right-of-way. See Section 4.1 - Community Impacts of the FEIS.

The air space above Building 262 and over a portion of the grounds of the Senior Officers' Quarters Historic District has been transferred to Caltrans as a permanent aerial easement; this easement includes restrictions on the uses of the land improvements that conflict with the aerial easement. This easement leaves substantial control over the land and improvements on land, including Building 262, to the Navy.

A temporary construction easement (TCE) includes substantial restrictions on access to and through such property during the period of construction (approximately 7 years), but includes specific rights of access to the Navy and does not change the underlying ownership of the property. The TCE, which will be extinguished when construction is complete, includes Building 267 and Quarters 10. As specified in the deed, restricted rights of access will be provided to Building 262 across Caltrans' right-of-way for maintenance and monitoring during construction. Any damage caused to the buildings by Caltrans during construction will be repaired. See Section 4.10 and Appendix 0 of the FEIS.

Regarding reconveyance of property, transferred property includes some fee property, as described above, that will not be needed for Replacement Alternative N-6. The fee interest of such property will be reconveyed to the United States, but as provided in the deed, will be encumbered by a TCE, as described above. Once the TCE is extinguished at the completion of construction of the project, the underlying fee will be clear of that encumbrance. The Navy retains the fee interest of those properties encumbered by the TCE and the aerial easements and any further transfer it wants to make of that property could be, and would have to be, done with the easements in place.

Regarding consultation with the Navy on the MOA, Caltrans and FHWA met with the Navy to discuss the MOA and incorporated some of the changes to the MOA recommended by the Navy. The Navy was invited to sign the MOA as a concurring party, but did not do so. See Sections 4.1 and 4.10, and Appendix 0 of the FEIS.

**Land Use:**

The Navy commented that the FEIS fails to adequately explore the adverse effects that construction actions and the new bridge will have on existing land use and future land uses.

**Response:**

A technical report was prepared for the East Span Project entitled, Land Use Issues Associated with the SFOBB East Span Seismic Safety Project and the Naval Station Treasure Island Draft Reuse Plan, January 2000. The purpose of the report was to provide an overview of CCSF's proposed development on the eastern side of YBI as outlined in the CCSF Naval Station Treasure Island Draft Reuse Plan, July 1996, in relation to the proposed alternatives for the East Span Project. The findings of this report, which included an analysis of how the replacement alternatives could affect future land uses, were incorporated into Section 4.1 of the FEIS. Impacts to existing land use were addressed in Section 4.14.1 of the FEIS, which was expanded to include a more comprehensive discussion of construction-period impacts on land use.

**Design Standards - Lifeline Criteria and MCE vs. SEE:**

Rick Feher and Robert Freehling commented that the FEIS includes inconsistencies as to whether the project design meets lifeline criteria and whether the MCE or SEE standard was used for achieving seismic safety of bridge design. Kenneth A. Gosting (Transportation Involves Everyone) commented that the use of the "probabilistic" seismic criteria as opposed to "deterministic" criteria raises design doubts concerning the seismic safety of the proposed design.

**Response:**

An MCE is the largest earthquake reasonably capable of occurring based on current geological knowledge. Caltrans has projected the MCE for the SFOBB as an earthquake of magnitude 8 (Richter Scale) on the San Andreas Fault or 7.4 on the Hayward Fault. The design standard reflected in the DEIS was the MCE approach. The design standard for the East Span Project was upgraded to the more stringent SEE standard, meaning that a replacement span would be able to withstand a larger earthquake than an MCE. In other words, the design meets the SEE standard,

thereby meeting and exceeding the MCE standard. For additional information, see Appendix K in the FEIS.

In its report entitled, Evaluation and Assessment of Proposed Alternatives to Retrofit/Replace the East Span of the San Francisco-Oakland Bay Bridge, dated October 2000, the ACOE says, "The replacement bridge does not meet lifeline criteria as defined in the ACOE's Scope of Work, but is being conformed to a unique Design Criteria, including the Safety Evaluation Earthquake (SEE) performance criteria. The design work is not yet complete and conformance to the SEE cannot be verified. However, it is the COE Team's opinion that Caltrans' team is highly qualified, using state-of-the-art design methods and is moving along a path to design a bridge that meets the seismic performance criteria."

**K. Conclusion**

---

Based upon careful consideration of all the social, economic and environmental evaluations contained in the Final Environmental Impact Statement; the input received from other agencies, organizations, and the public; and the factors and project commitments outlined above, it is the decision of the Federal Highway Administration to select Replacement Alternative N-6 with the self-anchored suspension design option for the San Francisco-Oakland Bay Bridge East Span Seismic Safety Project in San Francisco and Alameda Counties, California, identified as the Preferred Alternative in the Federal Highway Administration and California Department of Transportation's Final Environmental Impact Statement.

**L. Record of Decision Approval**

---

*July 11, 2001*  
Date

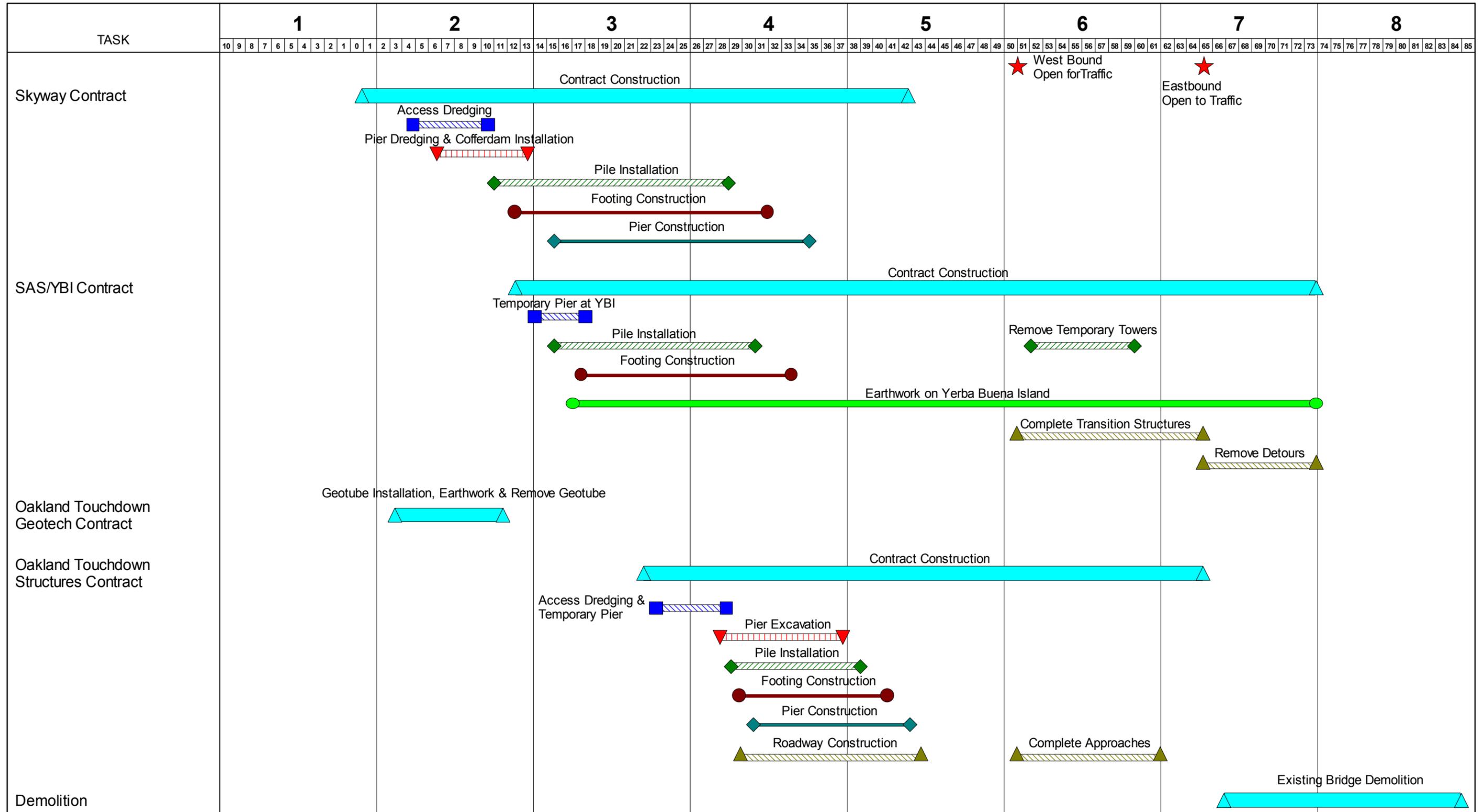
  
Michael G. Ritchie  
Division Administrator  
Federal Highway Administration

## **Appendix C**

## **Estimated Construction Schedule**

# SFOBB - East Span Seismic Safety Project Construction Milestones

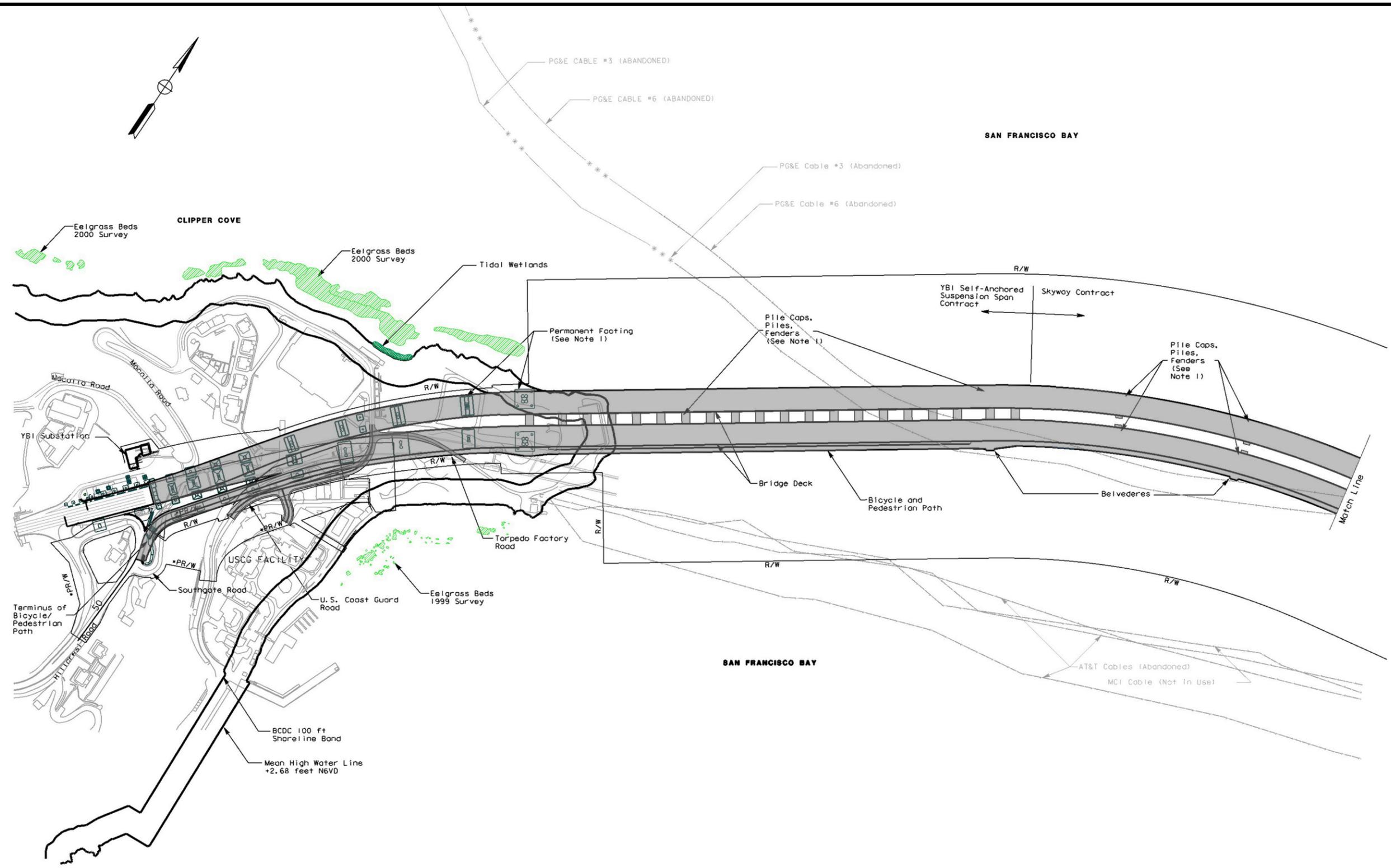
7/20/01



Note: Schedule is for planning purposes only. Actual schedule will be determined after contract award by the selected construction contractors.

**Appendix D**

**Site Plans**



**General Notes:**

1. See Contract Drawings for Construction Details.
2. This plan is not to scale. See Contract Plans for scaled drawings.

**Legend:**

- R/W - Permanent Right of Way
- \*PR/W - Pending Right of Way. See Property Interest Map for Right of Way Status

07 September 2001

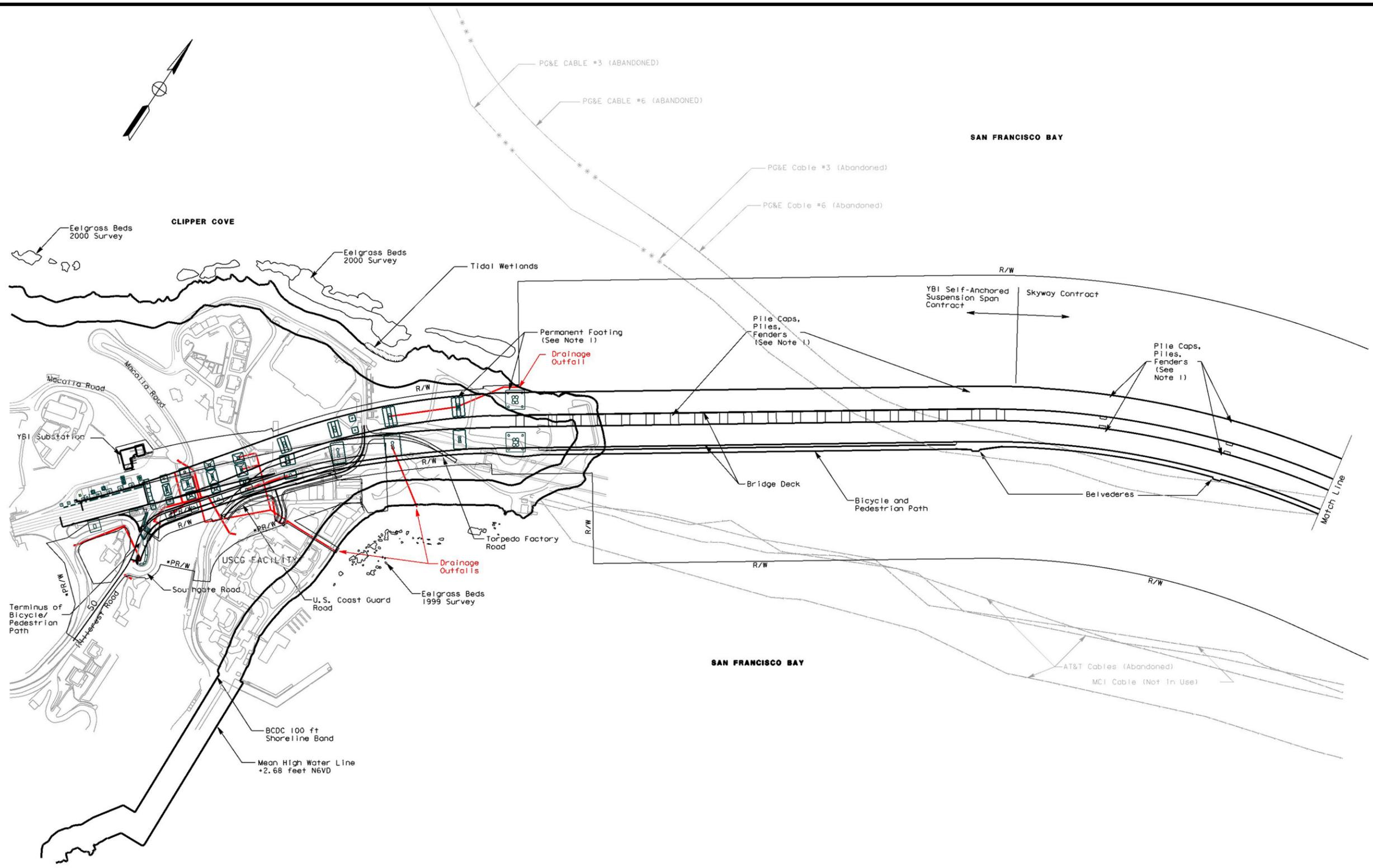


SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

Proposed Permanent Improvements  
YBI/Self-Anchored Suspension Span Contract

Not to Scale

Figure 5



**General Notes:**

1. See Contract Drawings for Construction Details.
2. This plan is not to scale. See Contract Plans for scaled drawings.
3. Drainage Facilities are subject to change.

**Legend:**

- R/W - Permanent Right of Way
- \*PR/W - Pending Right of Way. See Property Interest Map for Right of Way Status

07 September 2001

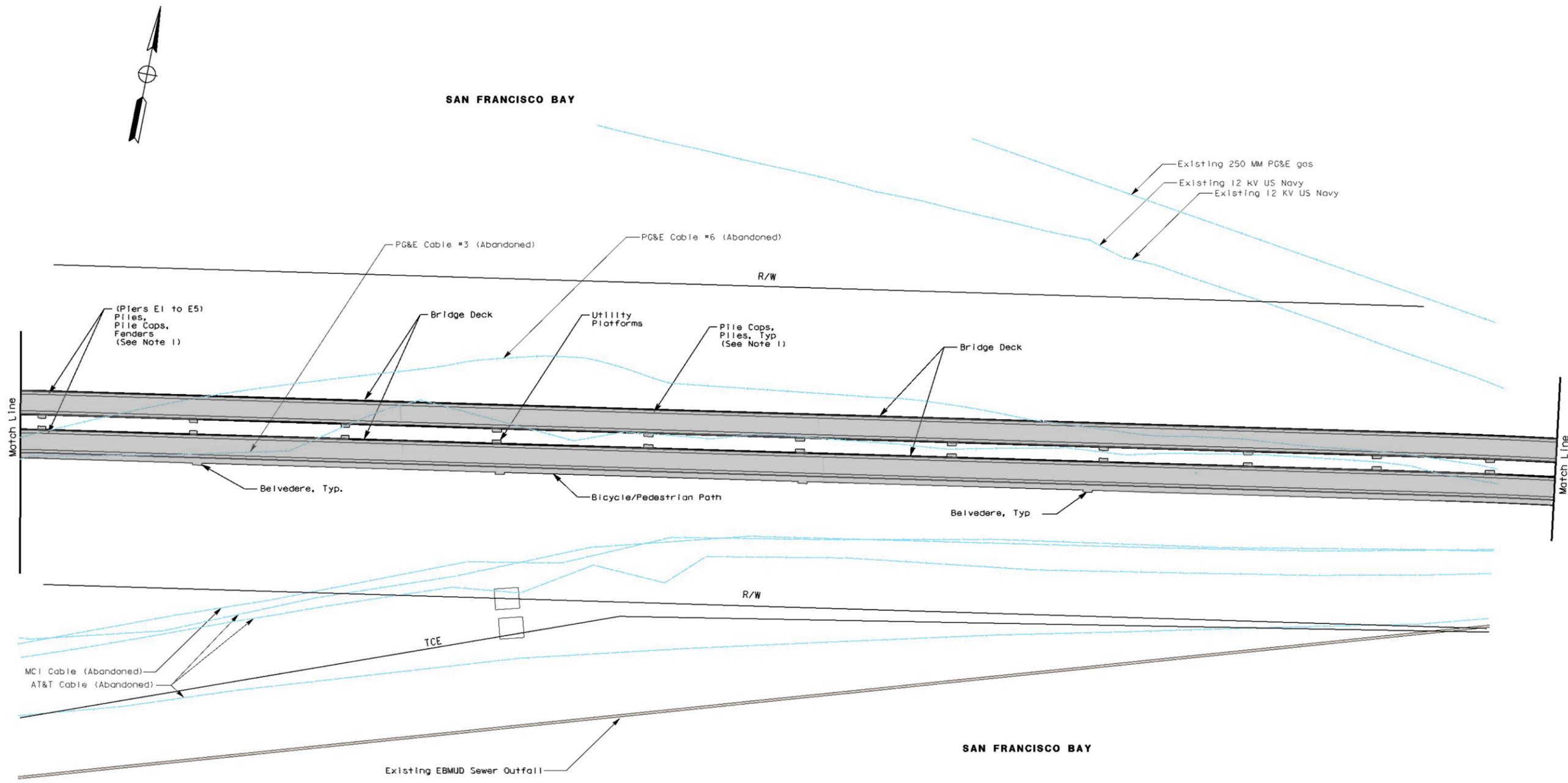


SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

Proposed Drainage Improvements  
YBI/Self-Anchored Suspension Span Contract

Not to Scale

Figure 5A



**General Notes:**

1. See Contract Drawings for Construction Details.
2. This plan is not to scale. See Contract Plans for scaled drawings.

**Legend:**

- R/W - Permanent Right of Way
- TCE - Temporary Construction Easement

09 September 2001

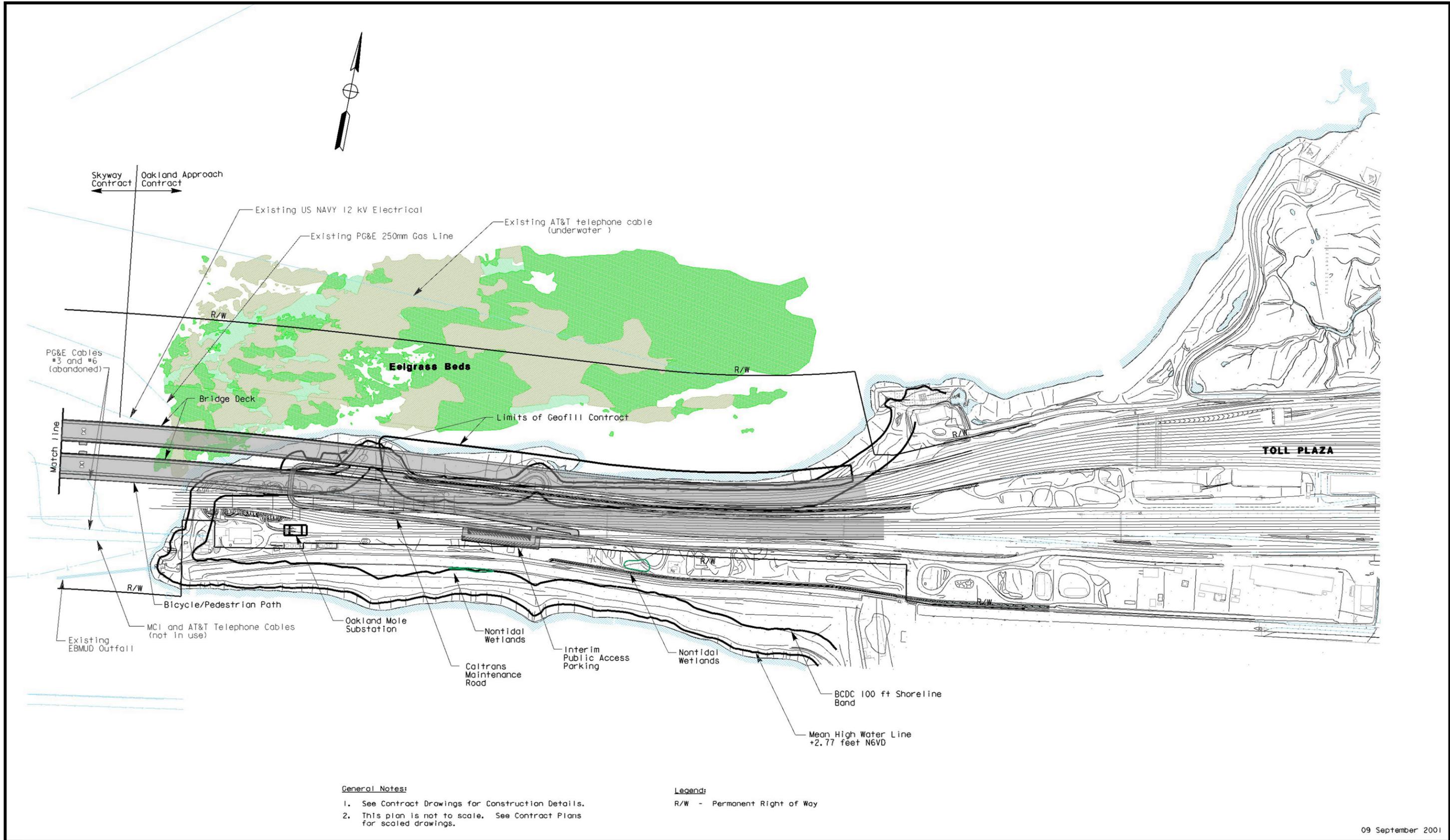


SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

Proposed Permanent Improvements  
Skyway Contract

Not to Scale

Figure 6



09 September 2001

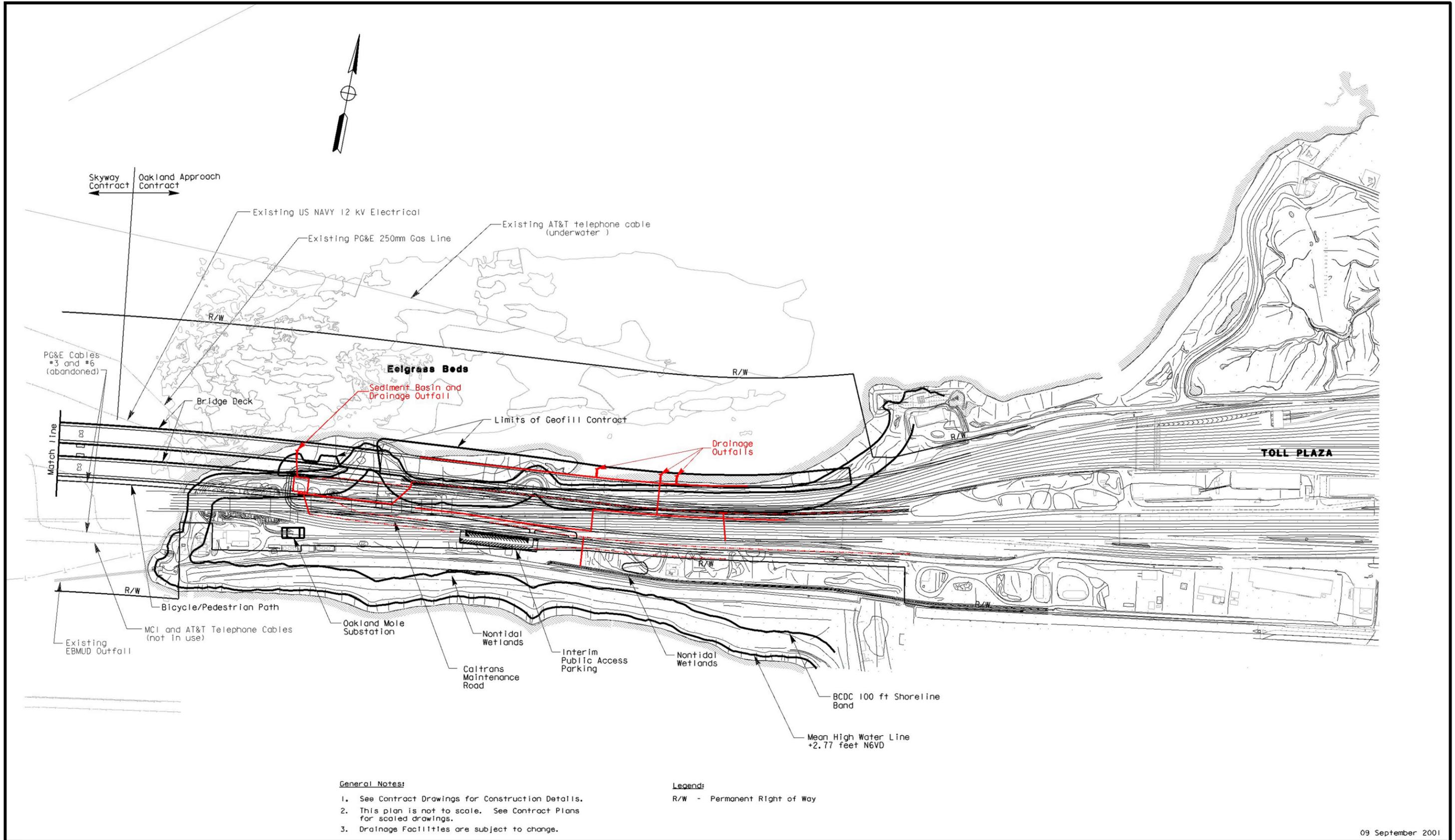


SFOBB  
 EAST SPAN  
 SEISMIC SAFETY  
 PROJECT

Proposed Permanent Improvements  
 Oakland Approach and Geofill Contracts

Not to Scale

Figure 7

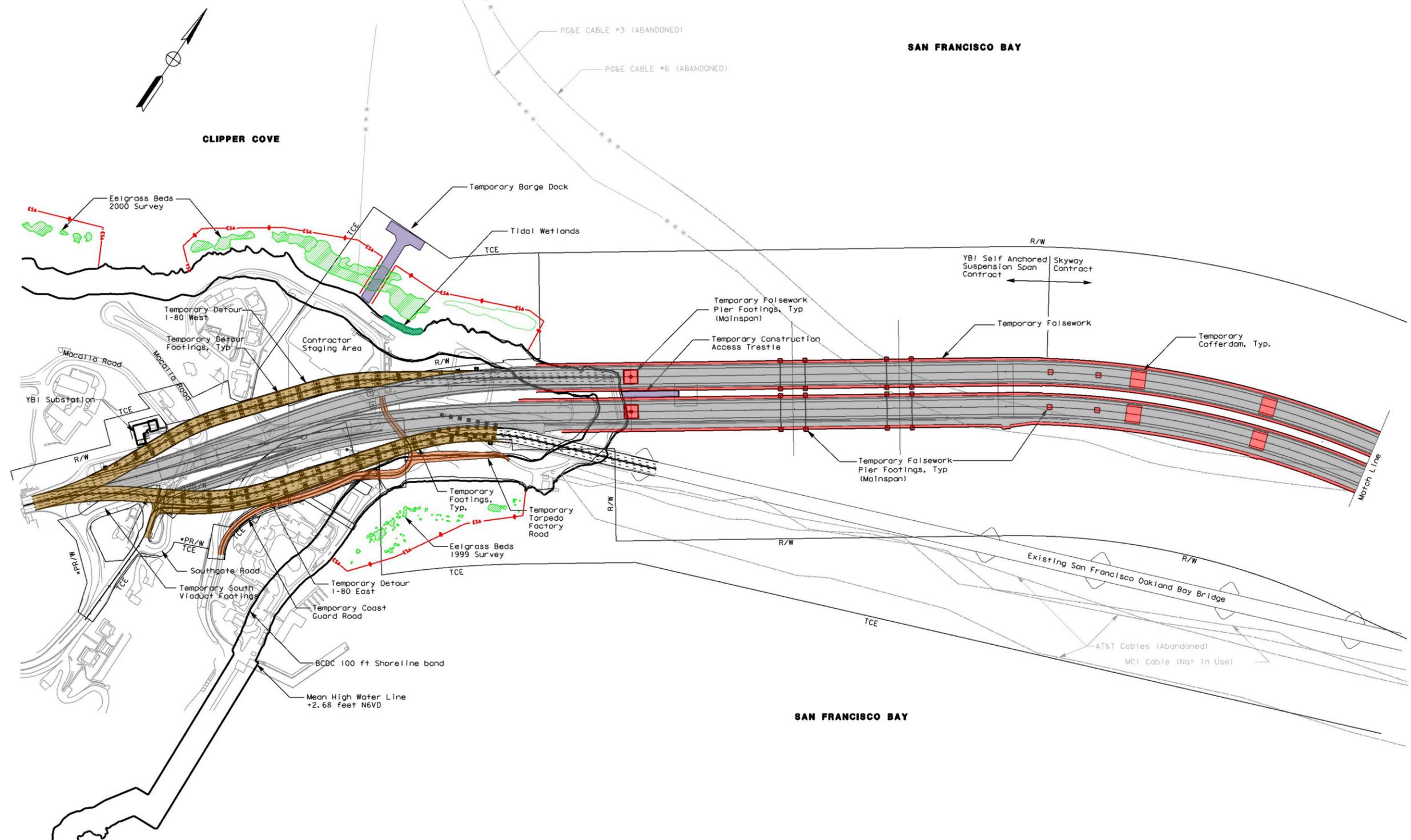


SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

Not to Scale

Proposed Drainage Improvements  
Oakland Approach and Geofill Contracts

Figure 7A



**General Notes:**

1. See Contract Drawings for Construction Details.
2. This plan is not to scale. See Contract Plans for scaled drawings.

**Legends:**

- R/W - Permanent Right of Way
- TCE - Temporary Construction Easement
- ESA - Environmentally Sensitive Area
- \*PR/W - Pending Right of Way. See Property Interest Map for Right of Way Status

09 September 2001



SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

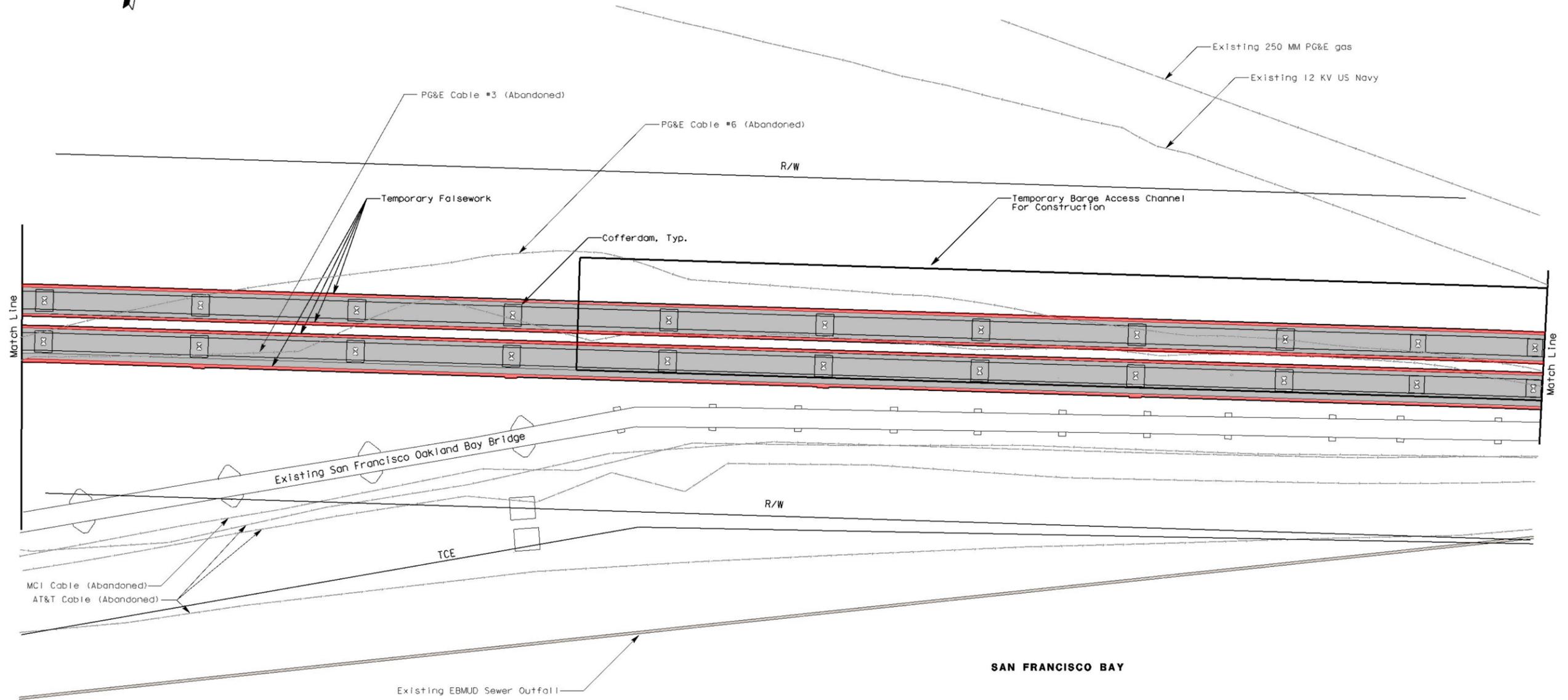
Proposed Temporary Improvements  
YBI/ Mainspan Contract

Not to Scale

Figure 8



SAN FRANCISCO BAY

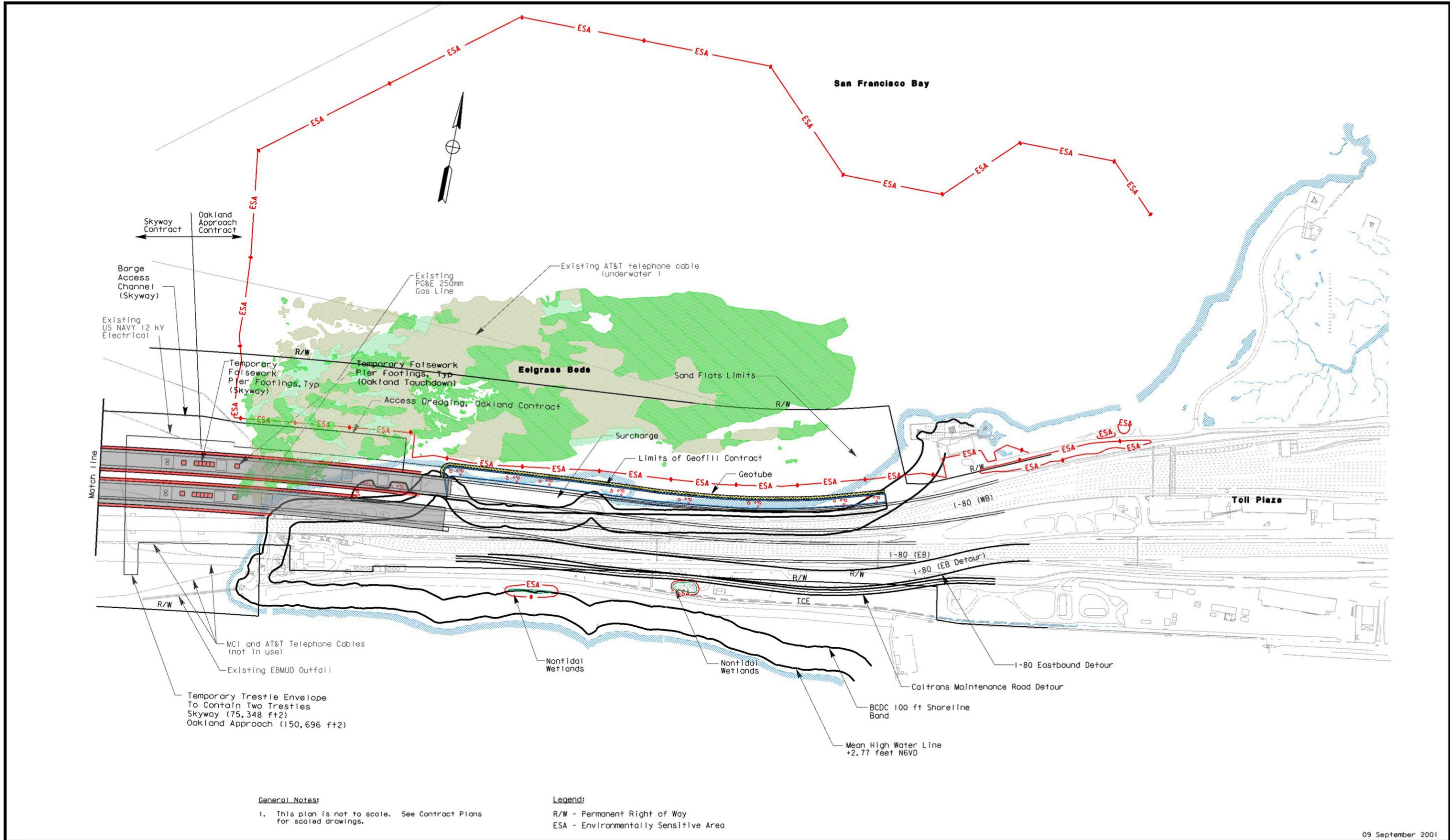


SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

Proposed Temporary Improvements  
Skyway Contract

Not to Scale

Figure 9



**General Notes:**

1. This plan is not to scale. See Contract Plans for scaled drawings.

**Legend:**

- R/W - Permanent Right of Way
- ESA - Environmentally Sensitive Area

09 September 2001



SFOBB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

Proposed Temporary Improvements  
Oakland Approach and Geofill Contracts

Not to Scale

Figure 10

**Appendix E**

**Property Map**

DATE	REVISIONS	REV CK									

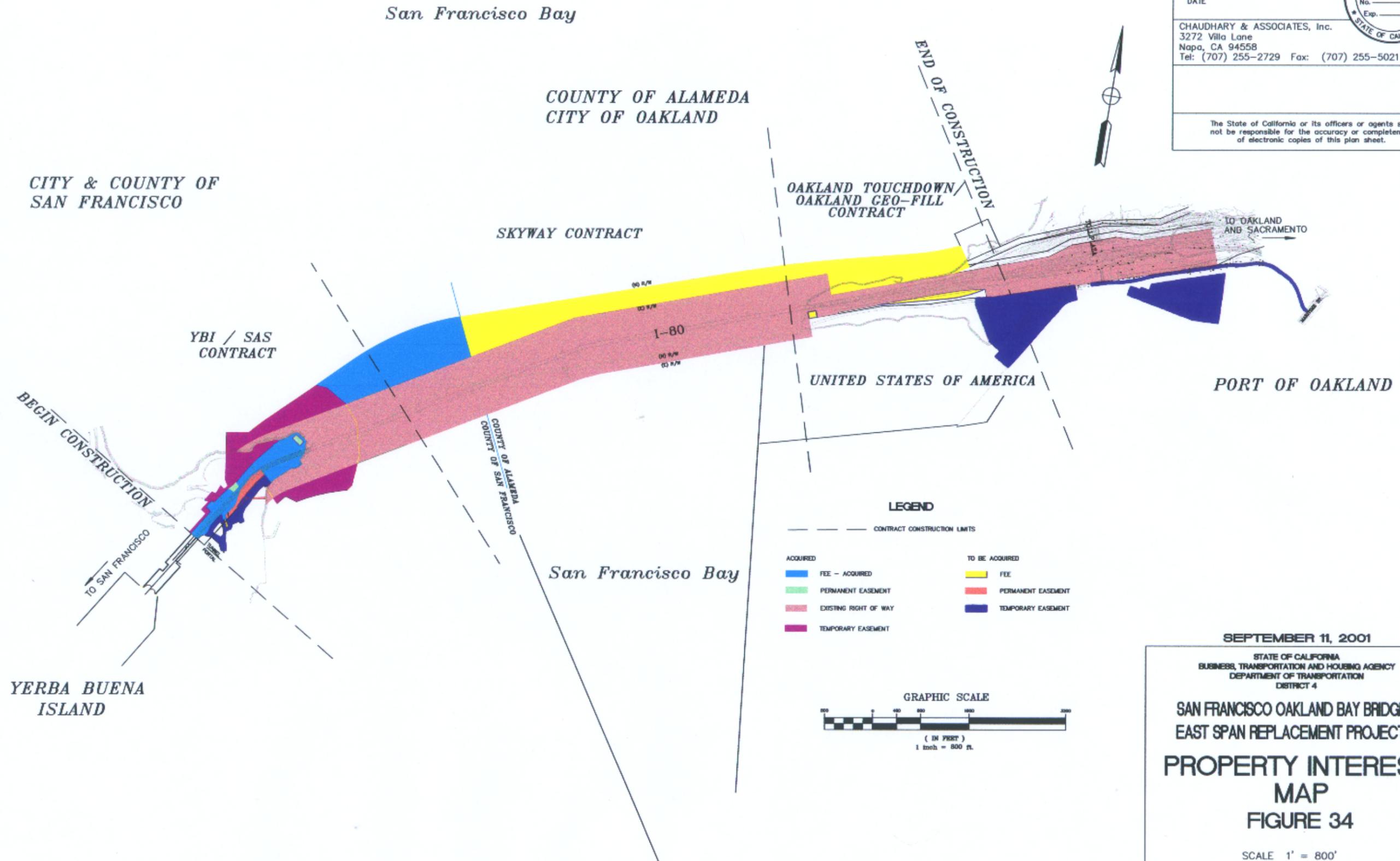
DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	ALA/SF	80	SF 12.6/14.2 ALA 00.0/2.7	0	

LICENSED LAND SURVEYOR

DATE

CHAUDHARY & ASSOCIATES, Inc.  
3272 Villa Lane  
Napa, CA 94558  
Tel: (707) 255-2729 Fax: (707) 255-5021

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.



SEPTEMBER 11, 2001

STATE OF CALIFORNIA  
BUSINESS, TRANSPORTATION AND HOUSING AGENCY  
DEPARTMENT OF TRANSPORTATION  
DISTRICT 4

**SAN FRANCISCO OAKLAND BAY BRIDGE  
EAST SPAN REPLACEMENT PROJECT  
PROPERTY INTEREST  
MAP  
FIGURE 34**

SCALE 1" = 800'

**Appendix F**

**AASHTO and Caltrans Criteria**

American Association of State Highway and Transportation Officials'  
*A Policy on Geometric Design of Highways and Streets, 1990*  
(Table V-16, pp. 461-462)

where traffic volumes are less than 100 vehicles per day, it may be feasible to use a two-directional one-lane roadway. This type of road is often desirable from an economic and environmental standpoint. When one-lane roadways with two-directional traffic are used, turnouts for passing should be provided. Traffic convenience requires that such turnouts be intervisible, provided on all blind curves, and supplemented as necessary so that the maximum distance between turnouts is no more than 1,000 ft. The turnouts should be a minimum of 10 ft wide for a length of 50 ft and should have a 25-ft taper on each end. For overwide and extra-long vehicles the values should be adjusted to accommodate the usage. Figure V-10 shows a typical design that may be used for turnouts on tangent and curve sections for two-directional one-lane roads.

#### Widths of Traveled Way, Shoulder, and Roadway

A roadway is defined as that portion of the highway including shoulders for vehicular use. Proper roadway width is selected on the basis of numerous factors including existing and anticipated vehicular and bicycle traffic, safety, terrain, and design speed. Table V-16 gives recommended traveled way widths and shoulder widths for the various types of roadways. The sum of the traveled way and shoulder widths given in Table V-16 constitutes the roadway width.

Type	Traveled Way Width (ft) <sup>a</sup>	Shoulder Width (ft)
Primary Access Roads (two lanes)	22-24	2-4
Circulation Roads (two lanes)	20-22	2-4
Area Roads (two lanes)	18-20	0-2
Area Roads (one lane) <sup>b</sup>	12	0-1

<sup>a</sup>Widening on the inside of sharp curves should be provided. Additional width equal to 400 divided by the curve radius in feet is recommended.

<sup>b</sup>Roadway widths greater than 14 ft should not be used because of the tendency for drivers to use the facility as a two-lane road.

Table V-16. Widths of traveled way and shoulder.

The low operating speeds and relatively low traffic volumes on recreational roads do not warrant wide shoulders. In addition, wide shoulders may be esthetically objectionable. These facts and concerns are reflected in the shoulder width values given in Table V-16. Under adverse terrain conditions, intermittent shoulder sections or turnouts may be suitable alternatives to continuous shoulders, particularly on lower functional roadway classes. Where guardrail is used, the graded width of the shoulder should be increased about 2 ft.

### Surface Cross Slope

Surface cross slope must be provided to ensure adequate drainage. However, excessive surface sloping can cause steering difficulties. Cross slope rates given in the first section of this chapter are generally applicable to recreational roads.

On one-lane roads with low-type surfaces, a crown would not usually be provided. Roads of this type would be inslope graded (toward the cut ditch) or outslope graded (toward the embankment fill), depending on the resistance of the soil to erosion. Where the soil is unstable and subject to major erosion, inslope grading should be used. Foreslope or backslope grading should exceed the horizontal gradient of the road to a maximum of 5 percent.

### Clear Recovery Area

Providing a clear zone adjacent to a road involves a trade-off between safety and esthetics. A driver who leaves the road should be provided a reasonable chance to regain control and avoid serious injury. On the other hand, the philosophy of recreational roads dictates that natural roadside features be preserved where possible. Because of the character of the traffic and the relatively low operating speeds on recreational roads, wide clear zones are not as important as on high-speed, high-volume facilities. For these reasons, dimensions smaller than those used on these higher order roads are appropriate. Desirably, 10 or more ft of recovery area, measured from the edge of the traffic lane, should be provided on the higher order recreational roads, i.e., the primary access roads. These values are recommended for the general case; however, where economic and environmental concerns are great, even smaller values are appropriate. Clear zone widths on the lower order recreational roads, i.e., circulation roads and areas, are even less critical than on primary access roads. In areas where the accident potential is greater than normal, such as on the outside of sharp horizontal curves at the end of long, steep downgrades, liberal clear zone widths should be provided.

Caltrans Highway Design Manual  
Design criteria Index 203.4



single factor. Topography controls both curve radius and design speed to a large extent. The design speed, in turn, controls sight distance, but sight distance must be considered concurrently with topography because it often demands a larger radius than the design speed. All these factors must be balanced to produce an alignment which optimizes the achievement of various objectives such as safety, cost, harmony with the natural contour of the land, and at the same time adequate for the design classification of the highway.

**Horizontal alignment shall provide at least the minimum stopping sight distance for the chosen design speed at all points on the highway, as given in Table 201.1 and explained in Index 201.3. See Index 101.1 for technical reductions in design speed.**

### 203.2 Standards for Curvature

Following is a table which gives the minimum radius of curve for specific design speeds. This table is based upon speed alone; it ignores the sight distance factor. If the minimum radius indicated in Table 203.2 does not provide the desired lateral clearance to an obstruction, Figure 201.6 should govern.

**Table 203.2**

### Standards for Curve Radius

Design Speed km/h	Minimum Radius of Curve (m)
30	40
40	70
50	100
60	150
70	200
80	260
90	320
100	400
110	600
120	900
130	1200

Every effort should be made to exceed minimum values, and such minimum radii should be used only when the cost or other adverse effects of realizing a higher standard are inconsistent with the benefits. As an aid to designers, Figure 203.2 displays the comfortable speed for various curve radii and superelevation rates.

The recommended minimum radii for freeways are 1500 m in rural areas and 900 m in urban areas.

If a glare screen or a median barrier is contemplated, either initially or ultimately, adjustments may be necessary to maintain the required sight distance on curves on divided highways. In such cases, a larger curve radius or a wider median may be required throughout the length of the curve. For design purposes, a planting screen is presumed to be 2.4 m wide. See Chapter 7 of the Traffic Manual for glare screen criteria.

### 203.3 Alignment Consistency

Sudden reductions in alignment standards should be avoided. Where physical restrictions on curve radius cannot be overcome and it becomes necessary to introduce curvature of lower standard than the design speed for the project, the design speed between successive curves should change not more than 15 km/h. Introduction of curves with lower design speeds should be avoided at the end of long tangents, steep downgrades, or at other locations where high approach speeds may be anticipated.

### 203.4 Curve Length and Central Angle

The minimum curve length for central angles less than 10 degrees should be 240 m to avoid the appearance of a kink. For central angles smaller than 30 minutes, no curve is required. Above a 6000 m radius, a parabolic curve may be used. In no event should sight distance or other safety considerations be sacrificed to meet the above requirements.

On 2-lane roads a curve should not exceed a length of 800 m and should be no shorter than 150 m.

### 203.5 Compound Curves

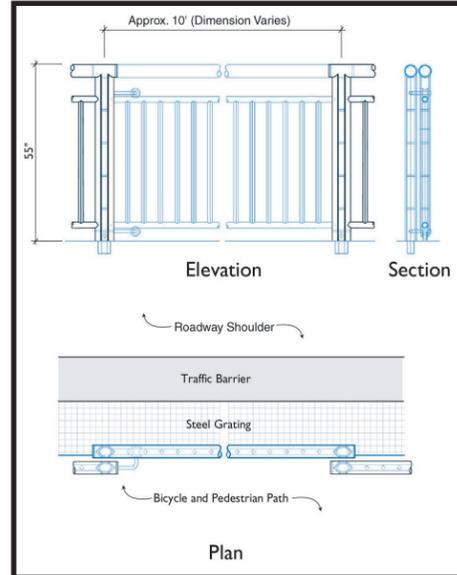
Compound curves should be avoided, except in mountainous terrain or other situations where

## **Appendix G**

## **Public Access**



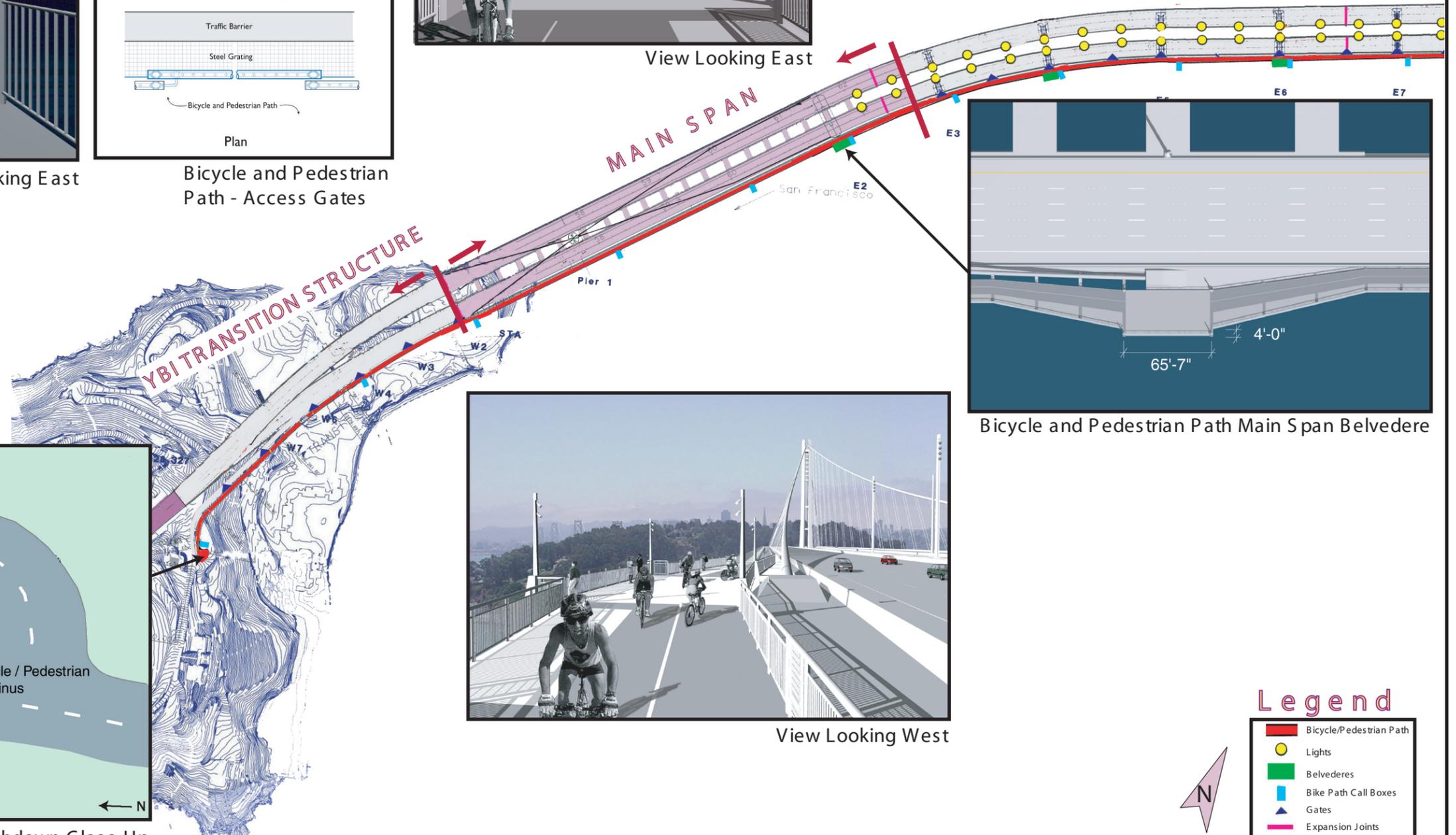
Bicycle and Pedestrian Path-View Looking East



Bicycle and Pedestrian Path - Access Gates



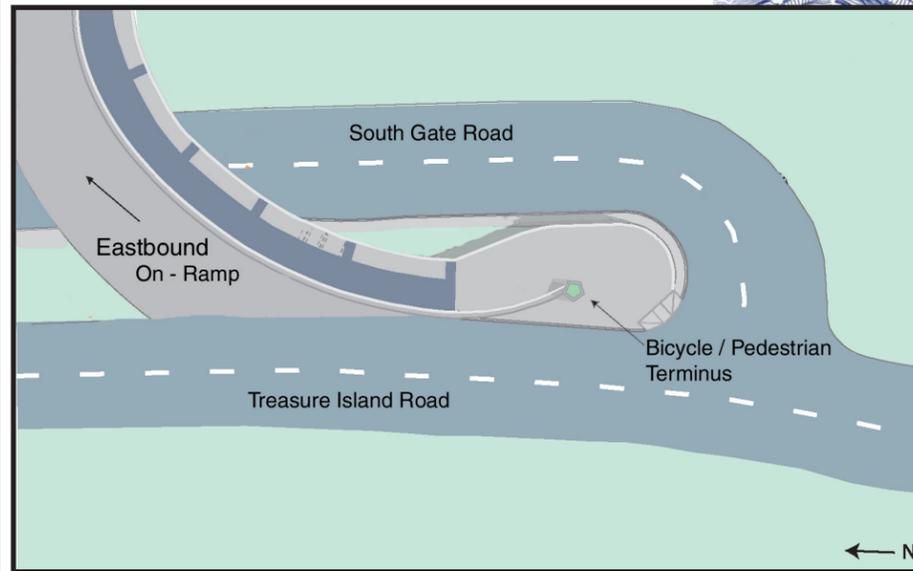
View Looking East



Bicycle and Pedestrian Path Main Span Belvedere



View Looking West

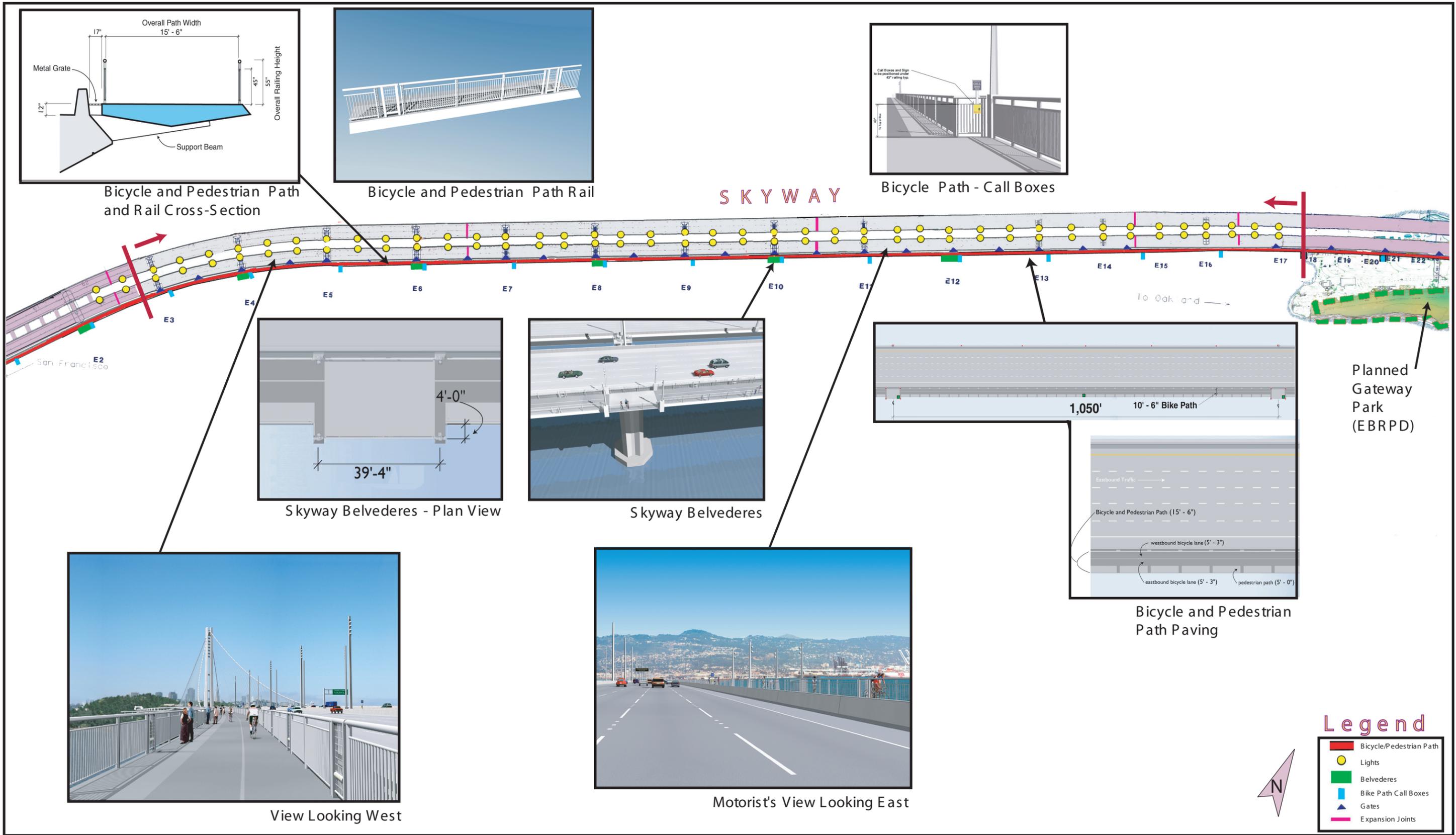


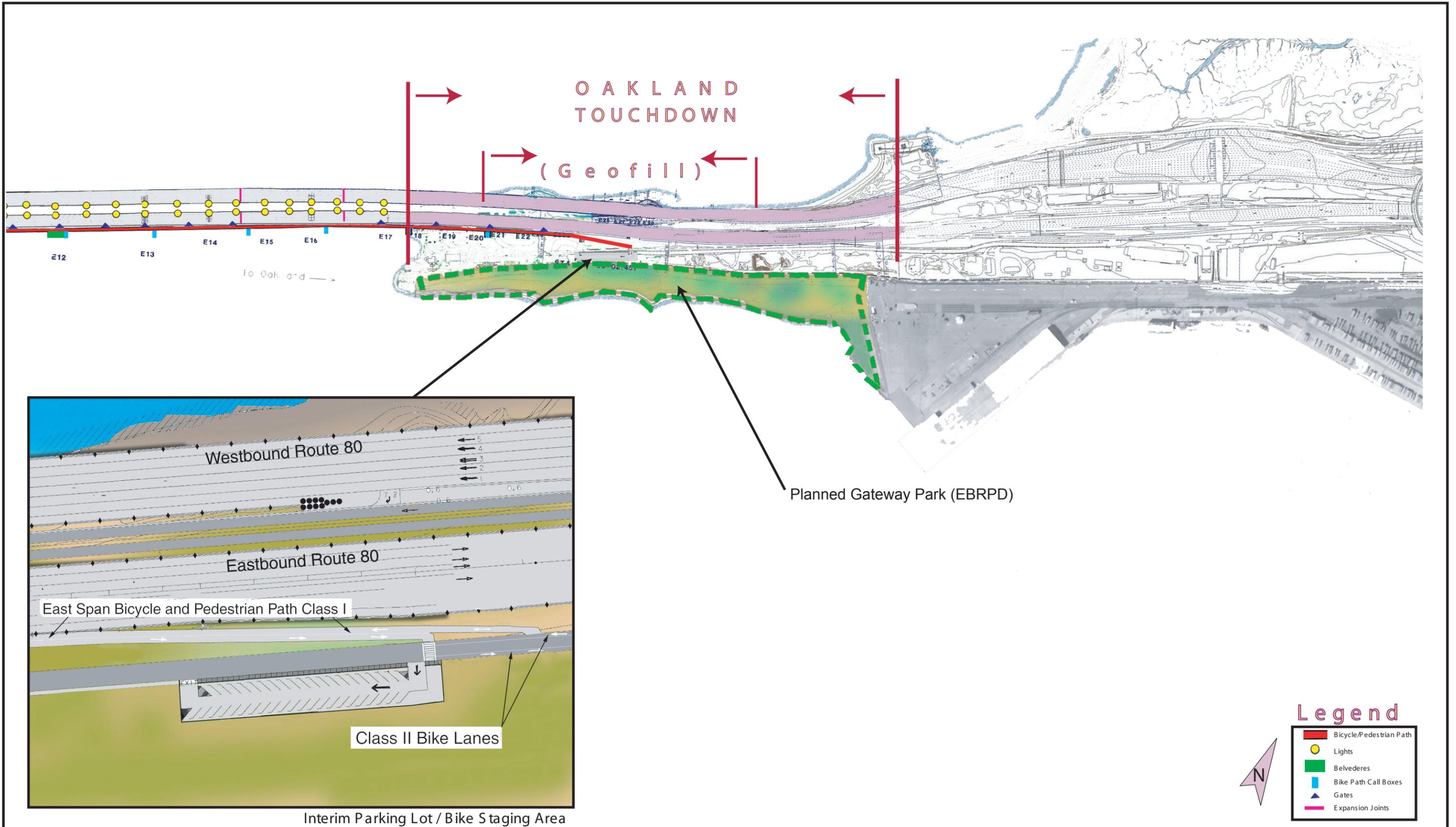
YBI Touchdown Close Up

Legend

- █ Bicycle/Pedestrian Path
- Lights
- █ Belvederes
- █ Bike Path Call Boxes
- ▲ Gates
- █ Expansion Joints







**Appendix H**

**BCDC Permit 11-93 In-Lieu Fee Estimate for  
Overlooks**

## Draft Landscape Estimate for Cypress Mitigation Commitments within the Limits of the East Span Seismic Safety Project

*Description:* A bike path, two overlooks, and associated amenities were planned for the Oakland Touchdown area as mitigation for the Cypress Replacement Project. Subsequently the decision was made to replace the existing SFOBB East Span. This estimate outlines the costs associated with the construction of the overlooks and the portion of the bike path that falls within the East Span's project limits.

This estimate is escalated to 2002 costs.

Item description	Quantity	Unit	Unit Price (\$)	Estimated Construction Cost (\$)
<b>Clearing and grubbing</b>	1	ls	4,380.00	4,380.00
<b>Earthwork</b>				
<i>Imported borrow (12" depth)</i>				
North Overlook (30,000 sf), 30,000 cf	1120	cy	26.02	29,139.26
South Overlook (6,000 sf), 6,000 cf	220	cy	26.02	5,723.78
Screen Planting along Bike Path 3,000 lf within project limits @ 6' wide = 18,000 sf 12" deep = 18,000 cf	670	cy	26.02	17,431.52
<b>Total borrow (cf)</b> 54,270	2,010	cy	26.02	52,294.57
<i>*Imported Topsoil (12" depth)</i>				
North Overlook (30,000 sf), 30,000 cf	1120	cy	34.00	38,077.27
South Overlook (6,000 sf), 6,000 cf	220	cy	34.00	7,479.46
Screen Planting along Bike Path 3,000 lf within project limits @ 6' wide = (18,000 sf) 12" deep = 18,000 cf	670	cy	34.00	22,778.37
Topsoil between path and rip rap 1'x12"x1600lf (part of rip rap replacement	60	cy	34.00	2,039.85
<i>*Note: Topsoil/borrow quantities increased to encapsulate hazardous material. Allow for two feet of cover within all planting areas.</i>				
<b>Total topsoil (cf)</b> 55,890	2,070	cy	34.00	70,374.95
<b>Earthwork subtotal</b>				<b>122,669.52</b>

Item description	Quantity	Unit	Unit Price (\$)	Estimated Construction Cost (\$)
<b>*Hazardous Waste Remediation</b>				<b>200,000.00</b>

\*Note: In addition to two feet of cover(Topsoil) this cost to allow for "Hot spot" removal within project limits.

<b>Rip Rap Replacement</b>				
Excavate portions of concrete rubble rip rap	1s	ls	24,528.00	24,528.00
Rock rip rap infill or replacement 3'x4'x1600lf	715	cy	122.64	87,687.60
<b>Rip rap replacement subtotal</b>				<b>112,215.60</b>

<b>Construction</b>				
Toilet facilities				
2 chemical unisex toilets	2	ea	12,264.00	24,528.00
Fish cleaning station with potable water	2	ea	15,330.00	30,660.00
Wind screens at seat walls	4	ea	3679.20	14,716.80
Backless wood bench (6')	3	ea	981.12	2,943.36
Wood/metal picnic table with benches (6')	6	ea	1471.68	8,830.08
Waste receptacle	4	ea	1226.40	4,905.60
Bicycle rack	2	ea	3679.20	7,358.40
Temporary fencing along rock rip rap area (ESA line)	1,700	lf	1.47	2,501.86
<i>Signage</i>				
Interpretive sign with concrete pedestal	2	ea	4,905.60	9,811.20
Non-standard directional sign on metal post	4	ea	122.64	490.56
*Parking Stalls	6			
*Note: Estimate for six parking stalls, not included in this estimate. This original BCDC commitment (#11-93) is accounted for at the interim parking area shown on contract plans.				
<b>Construction subtotal</b>				<b>106,745.86</b>

Item description	Quantity	Unit	Unit Price (\$)	Estimated Construction Cost (\$)
<b>Materials</b>				
<i>Mulch (shredded bark)</i>				
North overlook 14,800 lf x .3' = 4,440 cf	165	cy	35.04	5,781.60
6,000 lf x .3' = 1,800 cf	67	cy	35.04	2,347.68
<i>Minor concrete</i>				
North overlook paving 6,110 sf 6,100 sf x .33' = 2,013 cf	75	cy	429.24	32,193.00
North overlook retaining/seat walls 185 lf x 6 sf = 1,110 cf	41	cy	429.24	17,598.84
North overlook concrete pad 65 lf x 1.5 sf = 98 cf	4	cy	429.24	1,716.96
South overlook paving 4,450 sf 4,450 sf x .33' = 1,469 cf	54	cy	429.24	23,178.96
South overlook retaining/seatwalls 335 lf x 6 sf = 2010 cf	75	cy	429.24	32,193.00
South overlook concrete pad 115 lf x 1.5 sf = 173 cf	7	cy	429.24	3,004.68
<b>Materials subtotal</b>				<b>118,014.72</b>
<b>*Water connection</b>				
Water meter	1	ea	43,008	43,008.00
Water assessment (overlooks + 3000'x6' screen planting)	1.42	ac	1,243	1,765.34
*Since water connection costs are more volatile than typical construction costs, the most current cost was obtained from EBMUD and increased 5% per year to 2007 costs.				
<b>Water connection subtotal</b>				<b>44,773.34</b>
<b>Erosion control, SWPPP</b>	ls	ls	ls	<b>14,716.80</b>

Item description	Quantity	Unit	Unit Price (\$)	Estimated Construction Cost (\$)
<b>Planting and irrigation</b> (costs include 3yr plant establishment)				
North overlook (30,000 sf)	0.69	ac	55,188.00	38,079.72
South overlook (6,000 sf)	0.32	ac	55,188.00	17,660.16
Screen planting along bike path (3,000 lf)	0.57	mile	80,942.40	46,137.17
<b>Planting and irrigation subtotal</b>				<b>101,877.05</b>
<b>Electrical service</b>	ls	ls	ls	18,396.00
<b>ITEM TOTAL</b>				<b>843,788.89</b>
10% Mobilization				84,378.89
<b>SUBTOTAL</b>				<b>928,167.78</b>
20% contingency				168,832.22
<b>TOTAL</b>				<b>1,097,000.00</b>

**Appendix I**

**Caltrans Dredged Material Disposal Proposal  
Letter and Dredged Material Management Office  
Concurrence Letters**



DEPARTMENT OF THE ARMY  
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS  
333 MARKET STREET  
SAN FRANCISCO, CALIFORNIA 94105-2197

OCT 31 2000

REPLY TO  
ATTENTION OF:

Regulatory Branch(1145b)

SUBJECT: File Number 23013: San Francisco-Oakland Bay Bridge

Dennis Mulligan  
California Department of Transportation  
111 Grand Avenue  
Oakland, California 94623

Dear Mr. Mulligan:

The U.S. Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, San Francisco Bay Regional Water Quality Control Board, and the Corps of Engineers have completed their review of the sediment test results and supplemental information for the approximately 418,000 cubic yards of sediments proposed to be dredged from the construction of the San Francisco-Oakland Bay Bridge East Span replacement project located between Yerba Buena Island and the City of Oakland in Alameda and San Francisco Counties, California. The test results and supplemental information reviewed are as follows:

1. The test results as presented in the report prepared by California Department of Transportation District 04 (Caltrans) and Geocon Consultants, Inc. entitled "Sediment Sampling and Analysis Report San Francisco-Oakland Bay Bridge East Span Seismic Safety Project Alameda and San Francisco Counties, California" Volumes 1 and 2 dated June 2000.
2. The Sampling and Analysis Plan (SAP) as presented in the report prepared by California Department of Transportation District 04 and Geocon Consultants, Inc. entitled "Amended Sampling and Analysis Plan San Francisco-Oakland Bay Bridge East Span Seismic Safety Project Alameda and San Francisco Counties, California" dated June 2000.
3. The letter from the California Department of Transportation District 04 addressed to the U.S. Army Corps of Engineers dated October 4, 2000, which provided additional information and clarification of the test results.

The members of the above inter-agency group are recommending to their respective agency's management that the material proposed for dredging from the San Francisco-Oakland Bay Bridge East Span replacement project, as characterized in the above report and supplemental information, is suitable for disposal as shown in the enclosed Table with the following comments and conditions:

1. The agencies found that there were numerous oversights by personnel during the sampling and testing. For example, the bioassays for the reference sediments from Tubbs Island and Paradise Cove were not analyzed at the same time as the bioassays from the proposed dredge sites.
2. Please note that because a sediment is found suitable for disposal at a particular location does not necessarily mean that the material can be disposed at that location. The selection of the disposal sites should be coordinated with the agencies during the permitting process. Disposal site selection needs to take into account the factors (implementability, effects and cost) and decision-making criteria in your Dredged Material Management Plan along with the suitability determination in the enclosed Table.
3. The Alcatraz Disposal Site (SF-11) is a dispersive disposal site and only material that will disperse can be disposed at SF-11. Because your material is new work and not maintenance material, any material found during dredging that is of a nature that will not easily disperse (rock, gravel, heavily consolidated material) may not be disposed at this site. An alternative disposal option will need to be found for any non-dispersive material.
4. The material below 12 feet depth (measured from top of sediment) in sample locations SFOBB-N-1 through SFOBB-N-7 is considered not to have been exposed to contaminants and has been granted an exclusion from testing by the agencies. Therefore, even though samples SFOBB-N-1, SFOBB-N-2 and SFOBB-N-5 are unsuitable for aquatic disposal, the material below 12 feet is considered suitable for disposal at the San Francisco Deep Ocean Disposal Site (SF-DODS) and (depending on grain size, etc.) suitable for in-bay disposal at SF-11. Because the agencies maintain data on the volumes of material suitable for different disposal locations, the agencies request that Caltrans provide the volume of material below the 12 foot level, as described above, for these three sites.

5. Material from Sites SFOBB-N-2, SFOBB-N-5 and Access-N-5 is not suitable for unconfined aquatic disposal because of significant solid phase toxicity to Nephtys when compared to the reference sites. However, no amphipods exhibited significant toxicity in these samples. The agencies note that it is unusual to find significant solid phase toxicity to Nephtys and a high survival in Ampelisca (e.g., the for Access-N-5 amphipod toxicity tests showed 100% survival in all five replicates). It is possible there could have been some confounding factors involved in the toxicity to Nephtys, but none were described or discussed in the report. Because of the volumes involved (especially Access-N-5), Caltrans may want to consider testing these sites at a higher resolution. The agencies would not require bioaccumulation testing for this higher resolution testing. Caltrans should submit any proposal for additional testing to the agencies for approval prior to the start of sampling or testing.

6. The reason the material from Site SFOBB-N-1 is unsuitable for unconfined aquatic disposal (ocean and SF-11) and wetland surface is the excessive bioaccumulation of individual constituents of polynuclear aromatic hydrocarbons (PAHs).

Please be advised that this letter does not constitute an authorization to proceed with your dredge project. You must first obtain Federal, State and local permits as appropriate.

Should you have any questions please call or write Mr. David Dwinell of our Operations and Readiness Division (415-977-8471), and refer to the file number at the head of this letter.

Sincerely,  
ORIGINAL SIGNED  
By  
Calvin C. Fong  
For  
Max R. Blodgett  
Chief, Operations and  
Readiness Division

Enclosure

Copies Furnished:

US EPA, San Francisco, CA, Attn: Dadey  
CA BCDC, San Francisco, CA, Attn: Goldbeck  
CA RWQCB, Oakland, CA, Attn: Collins  
CA SLC, Sacramento, CA, Attn: Howe  
CA F&G, Menlo Park, CA, Attn: Ota  
US NMFS, Santa Rosa, CA, Attn: Mulvey

SF-Oakland Bay Bridge

Suitability Determination						
DUID	Volume (CY)	Ocean	Wetland Surface *	SUAD	Wetland Foundation *	Construction Fill *
SFOBB-N-1	4,208				X	X
SFOBB-N-2	12,227				X	X
SFOBB-N-3	13,955	X	X	X	X	X
SFOBB-N-4	7,751	X	X	X	X	X
SFOBB-N-5	2,018				X	X
SFOBB-N-6	4,473	X	X	X	X	X
SFOBB-N-7	4,871	X	X	X	X	X
	72,876	X	X	X	X	X
	73,591	X	X	X	X	X
	73,703	X	X	X	X	X
	73,461	X	X	X	X	X
Access-N-5	74,371				X	X
<b>Total</b>	<b>417,503</b>	<b>324,681</b>	<b>324,681</b>	<b>324,681</b>	<b>417,503</b>	<b>417,503</b>

\* May be suitable for use, depending on the characteristics of the proposed disposal sites and project specifications. For Wetland Foundation and Construction Fill, an additional analysis of the leaching potential of the sediments, using a modified waste extraction test (WET), may be necessary to determine final suitability.

## DEPARTMENT OF TRANSPORTATION

BOX 23660  
OAKLAND, CA 94623-0660  
(510) 286-4444  
TDD (510) 286-4454



June 19, 2001

Mr. David Dwinell, US Army Corps of Engineers  
Mr. Jim Delorey, US Army Corps of Engineers  
Mr. Larry Fade, US Army Corps of Engineers  
Ms. Kathy Dadey, US Environmental Protection Agency  
Mr. Brian Ross, US Environmental Protection Agency  
Mr. Steve Goldbeck, SF Bay Conservation and Development Commission  
Ms. Brenda Goeden, SF Bay Conservation and Development Commission  
Ms. Glynnis Collins, Regional Water Quality Control Board  
Ms. Becky Ota, California Department of Fish and Game  
Ms. Mary Howe, State Lands Commission

Subject: Request for Concurrence from Dredged Material Management Office (DMMO) in  
Dredged Material Disposal Plan  
San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Safety Project  
(East Span Project) on Interstate 80, Crossing San Francisco Bay  
(04-SF-80 KP 12.2/Kp 14.3, 04-ALA-80 KP 0.0/KP 2.1)

U.S. Army Corps of Engineers file #: 23013

Dear DMMO Members:

The California Department of Transportation (Department) is proposing to replace the existing East Span of the SFOBB. This project is critical to providing increased seismic safety to the occupants of approximately 272,000 vehicles that use the SFOBB each day. The Department has consulted with DMMO members concerning the East Span Project and is currently preparing an application to dispose of dredged materials generated by the construction of the proposed new East Span structure.

The DMMO has provided valuable guidance to the Department concerning recent large-scale dredged material testing and disposal plans. Consistent with the Long Term Management Strategy for Placement of Dredged Material in the San Francisco Bay Region (LTMS), the Department is pleased to report to the DMMO that the total volume of dredged material generated by seismic safety projects, which was proposed for placement in-bay at SF-11, has been significantly reduced. The Department has minimized dredged material disposal for the Richmond-San Rafael Bridge, including the access channel, and Carquinez Bridge seismic safety projects, reducing in-bay disposal volumes planned for SF-11 by approximately 191,139 cubic meters (215,000 cubic yards). This reduction amounts to 90% of approved volume for these contracts.

On June 6, 2001, the Department presented the dredged material disposal and beneficial reuse plan for the East Span Project to the DMMO. This plan is based on the assumption that Replacement Alternative N-6, the preferred alternative, will be selected as the project in the Record of Decision. Based on input received from DMMO members at the June 6 meeting, the Department requests written concurrence with the dredged material disposal/reuse plan as described below. The disposal reuse plan addresses the dredged material for which the DMMO provided a suitability letter on October 31, 2000. In the suitability letter, the DMMO determined that some material proposed to be dredged in the area adjacent to the north of the Oakland Touchdown area was not suitable for unconfined aquatic disposal. This area is no longer included in the proposed dredging footprint because the length of the access channel has been substantially reduced. As a result, all materials included in the plan meet DMMO criteria for unconfined aquatic disposal at the disposal and reuse sites proposed in the disposal/reuse plan presented by the Department (see quantities in the enclosed Figures).

The first component of the plan calls for the disposal of up to 165,320 cubic meters (216,230 cubic yards) of dredged material at the San Francisco-Deep Ocean Disposal Site (SF-DODS). This material, to be dredged in the initial construction phase, will be generated by the construction of a barge access channel along the north side of the replacement East Span. (See attached Dredging Episode 1 Figure).

The second component of the plan will be the dredging and disposal of up to 143,038 cubic meters (187,087 cubic yards) to construct the piers for the replacement East Span. This material will be dredged in small quantities over 4 years as each pier is constructed. Because of the small monthly volumes to be generated over the 4-year period, the Department plans to dispose of this material at the SF-11 site. Within the piles, materials will be dredged to a depth of approximately 50 meters (164 feet) below bay bottom. The Department proposes to disperse all material dredged from within the piles at SF-11 except the upper 3.66 meters (12 feet) of Piers E20, E21, and E22 (SAP testing location: SFOBB N1 and SFOBB N2) as recommended by DMMO; these materials will be disposed of at appropriate upland facilities. (See Dredging Episode 2 Figure).

When construction is completed and the new structure is opened to vehicular traffic, the Department will begin the third and fourth components of the project: dismantling of the existing East Span. First, a dismantling access channel will be constructed to the south of the existing East Span and dredging this channel will generate up to 145,785 cubic meters (190,680 cubic yards) of dredge material. Based on current sampling for the replacement structure and previous sampling for the retrofit alternative, it is assumed that the material is suitable for unconfined aquatic disposal. (See Dredging Episode 3 Figure). The Department intends to beneficially reuse material dredged to construct the dismantling access channel at the Hamilton restoration site, assuming the site is operational, can accept the materials, and reuse is practicable. Second, up to an additional 17,374 cubic meters (22,724 cubic yards) of dredged material generated by the removal of existing East Span piers to 0.45 meters (1.5 feet) below the mud line is proposed for disposal at the SF-11 site. (See Dredging Episode 4 Figure). It is understood that additional sampling will be required prior to these components to determine the suitability of the material for disposal. A supplemental Sampling and Analysis Plan (SAP) will be submitted to the DMMO prior to this dredging operation.

DMMO Members  
June 19, 2001  
Page 3

Your concurrence with the disposal plan will facilitate the timely construction of this vitally important public safety project. Once the Department receives your concurrence, we will pursue all appropriate permits from various regulatory agencies.

Please contact Allen Baradar, SFOBB Senior Environmental Engineer, at (510) 286-5636 if you have questions or need additional information.

Sincerely,

HARRY Y. YAHATA  
District Director

by

  
for MARA MELANDRY  
Environmental Manager, SFOBB

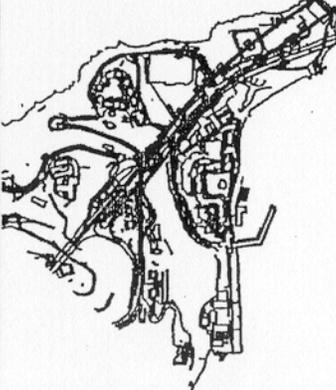
cc:

Ms. Alexis Strauss, Director, Water Division, US Environmental Protection Agency  
Lieutenant Colonel Timothy S. O'Rourke, District Engineer, US Army Corps of Engineers  
Ms. Loretta Barsamian, Executive Officer, San Francisco Regional Water Quality Control Board  
Mr. Will Travis, Executive Director, SF Bay Conservation and Development Commission  
Mr. Bill Wong, FHWA  
Mr. Paul Hensley, Toll Bridge Program Manager, Department of Transportation

SAN FRANCISCO BAY

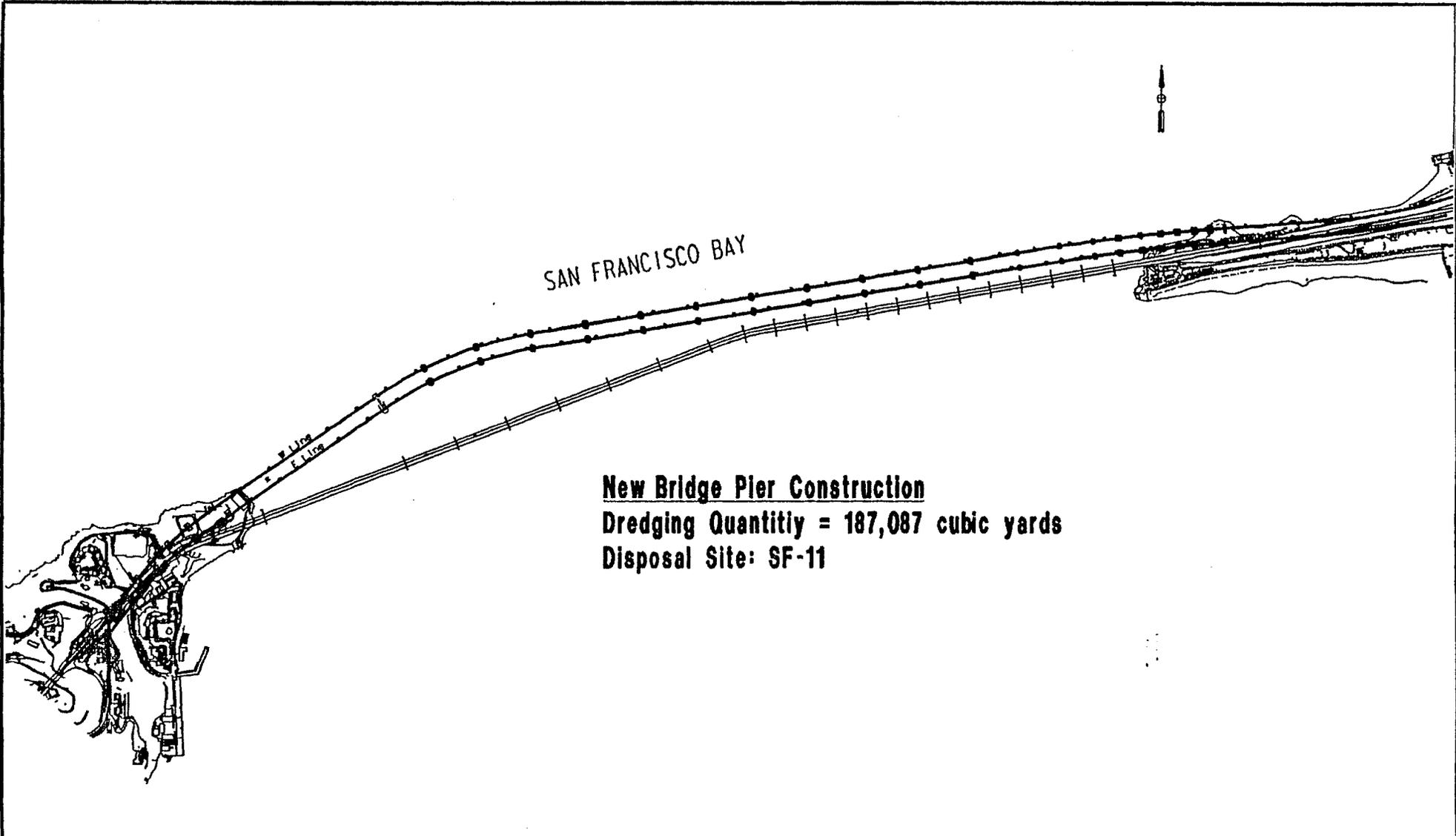
Approximate dredging limits

**New Bridge Construction Access**  
**Dredging Quantity = 216,230 cubic yards**  
**Disposal Site: SF-DODS**



**M**  
SF OOH  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

San Francisco-Oakland Bay Bridge New East Span  
New Bridge Construction Access  
Dredging Episode 1  
June 2001



The map shows the San Francisco-Oakland Bay Bridge with its spans extending across San Francisco Bay. A north arrow is located in the upper right corner. The text 'SAN FRANCISCO BAY' is written across the upper middle of the map. Two lines with dots represent the bridge spans, and a line with cross-ticks represents a dredging path. Labels 'P. Line' and 'E. Line' are visible near the left end of the spans.

SAN FRANCISCO BAY

**New Bridge Pier Construction**

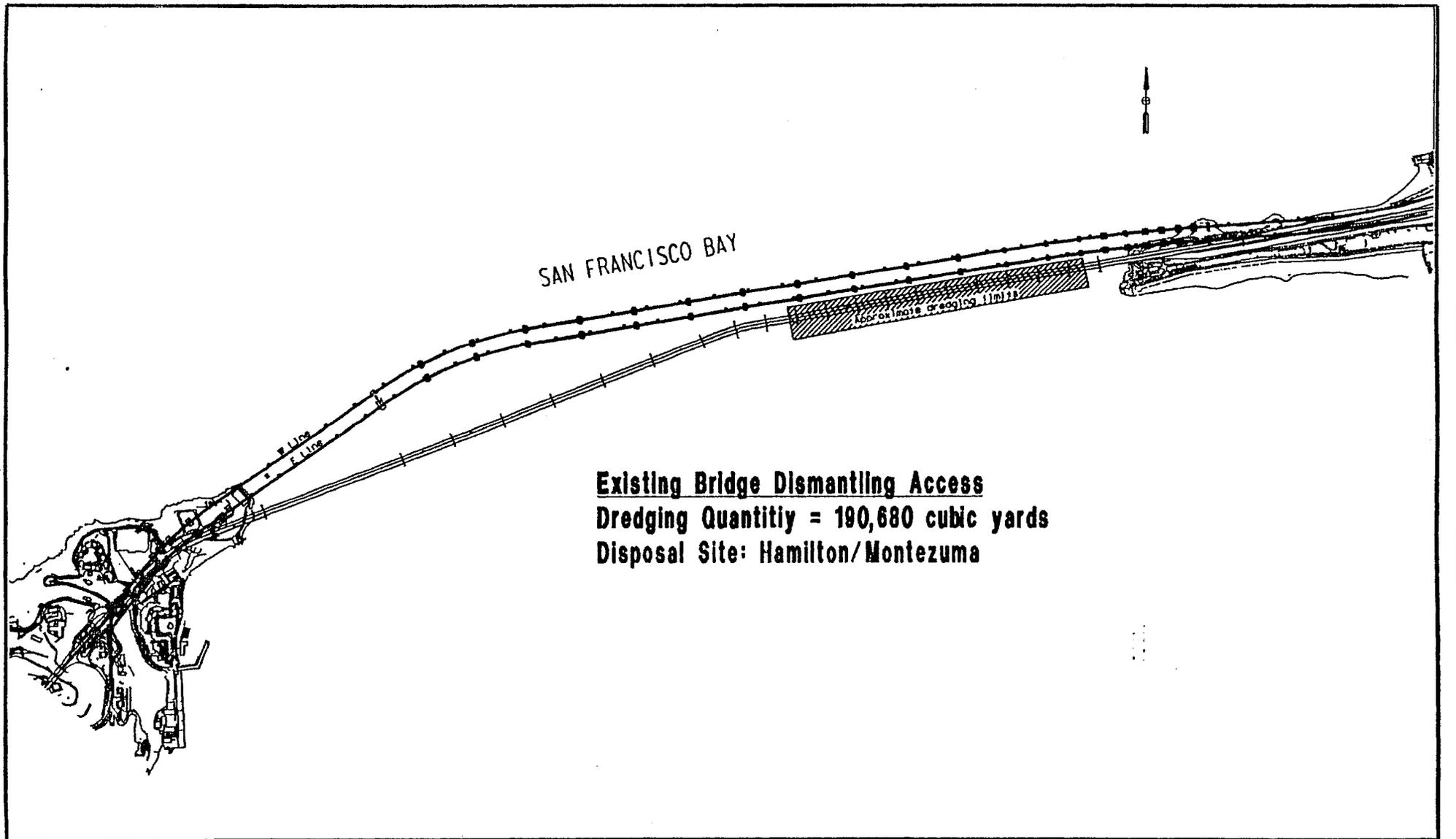
**Dredging Quantity = 187,087 cubic yards**

**Disposal Site: SF-11**

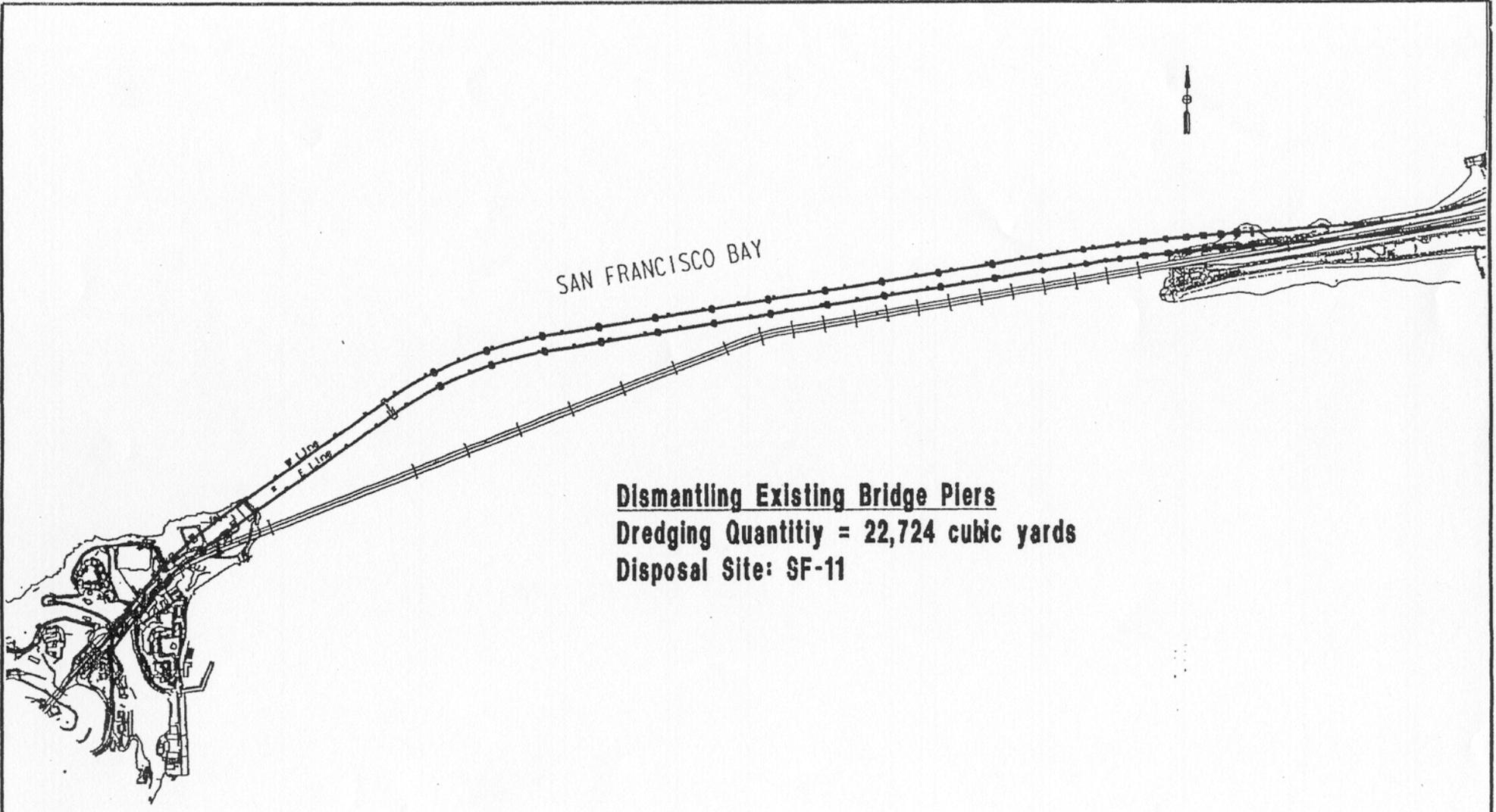


SFOOB  
EAST SPAN  
SEISMIC SAFETY  
PROJECT

San Francisco-Oakland Bay Bridge New East Span  
New Bridge Pier Construction  
Dredging Episode 2  
June 2001



**Existing Bridge Dismantling Access**  
**Dredging Quantity = 190,680 cubic yards**  
**Disposal Site: Hamilton/Montezuma**



A technical map of San Francisco Bay showing the proposed route for the new East Span of the San Francisco-Oakland Bay Bridge. The map includes the existing bridge structure, with the new span route indicated by a line with circular markers. A north arrow is located in the upper right corner. The text 'SAN FRANCISCO BAY' is written across the upper portion of the map. In the lower center, there is a text box providing project details. The map also shows the bridge's connection to the city of San Francisco on the left side.

SAN FRANCISCO BAY

**Dismantling Existing Bridge Piers**  
**Dredging Quantity = 22,724 cubic yards**  
**Disposal Site: SF-11**



**SFOOB**  
**EAST SPAN**  
**metric SEISMIC SAFETY**  
**PROJECT**

**San Francisco-Oakland Bay Bridge New East Span**  
**Dismantling Existing Bridge Piers**  
**Dredging Episode 4**  
**June 2001**



DEPARTMENT OF THE ARMY  
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS  
333 MARKET STREET  
SAN FRANCISCO, CALIFORNIA 94105-2197

Regulatory Branch (1145b)

JUL 0 0 2001

SUBJECT: File Number 23013S

Mr. Dennis Mulligan  
California Department of Transportation  
111 Grand Avenue  
Oakland, California 94623--660

Dear Mr. Mulligan:

The U.S. Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, San Francisco Bay Regional Water Quality Control Board, and the Corps of Engineers, have completed their review of your June 19, 2001 letter that details your proposed disposal locations for the dredged material from your San Francisco - Oakland Bay Bridge (SFOBB) East Span Seismic Safety Project.

The above inter-agency group concurs with your proposed disposal locations for the material from the San Francisco - Oakland Bay Bridge (SFOBB) East Span Seismic Safety Project as detailed in the above letter and look forward to receiving your permit application. Please note that although the agencies concur to you letter, actual approval of the disposal locations is only provided when you receive your various permits.

Please be advised that this letter does not constitute an authorization to proceed with your dredge project. You must first obtain Federal, State and local permits as appropriate.

Should you have any questions please call or write to Mr. David Dwinell of our Operations-Readiness Division (415-977-8471), and refer to the file number at the head of this letter.

Sincerely,

**ORIGINAL SIGNED**

By

**Max R. Blodgett**

Max R. Blodgett  
Chief, Operations-  
Readiness Division

Copies Furnished:

US EPA, San Francisco, CA, Attn: Dadey  
CA BCDC, San Francisco, CA, Attn: Goldbeck  
CA RWQCB, Oakland, CA, Attn: Collins  
CA SLC, Sacramento, CA, Attn: Howe  
CA F&G, Menlo Park, CA, Attn: Ota  
US NMFS, Santa Rosa, CA Attn: Mulvey

CF:

CESPN-OR Rdg File  
CESPN-OR-R Rdg File  
CESPN-OR-DM(DWINELL)

DWINELL  
CESPN-OR-DM  
7-8471  
July 5, 2001

WIRTZ  
CESPN-OR-R

FONG  
CESPN-OR-R

BLODGETT  
CESPN-OR

## DEPARTMENT OF TRANSPORTATION

BOX 23660  
OAKLAND, CA 94623-0660  
(510) 286-4444  
TDD (510) 286-4454



August 15, 2001

Mr. David Dwinell, US Army Corps of Engineers  
Mr. Jim Delorey, US Army Corps of Engineers  
Mr. Larry Fade, US Army Corps of Engineers  
Ms. Kathy Dadey, US Environmental Protection Agency  
Mr. Brian Ross, US Environmental Protection Agency  
Mr. Steve Goldbeck, SF Bay Conservation and Development Commission  
Ms. Brenda Goeden, SF Bay Conservation and Development Commission  
Ms. Glynnis Collins, Regional Water Quality Control Board  
Ms. Becky Ota, California Department of Fish and Game  
Ms. Mary Howe, State Lands Commission

Subject: Amendment to Dredged Material Disposal Plan, Described in Caltrans Letter  
Dated June 19, 2001  
San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Safety Project  
(East Span Project) on Interstate 80, Crossing San Francisco Bay  
(04-SF-80 KP 12.2/Kp 14.3, 04-ALA-80 KP 0.0/KP 2.1)

U.S. Army Corps of Engineers file #: 23013

Dear DMMO Members:

This is to inform you of a minor correction in the proposed disposal plan described in our letter of June 19, 2001. On page 2, paragraph 3 the letter stated that:

“The Department proposes to disperse all material dredged from within the piles at SF-11 except the upper 3.66 meters (12 feet) of Piers E20, E21, and E22 (SAP testing location: SFOBB N1 and SFOBB N2) as recommended by DMMO; these materials will be disposed of at appropriate upland facilities. (See Dredging Episode 2 Figure).”

In fact, the correct pier numbers and their locations are as follow:

E1 through E6 for Sediment Sampling Plan (SAP) testing locations SFOBB N1 & SFOBB N2  
E15 through E18 for Sediment Sampling Plan (SAP) testing location SFOBB N5

The materials from these locations will be disposed of at appropriate upland facilities as recommended by DMMO.

## DEPARTMENT OF TRANSPORTATION

BOX 23660  
OAKLAND, CA 94623-0660  
(510) 286-4444  
TDD (510) 286-4454



August 15, 2001

Mr. David Dwinell, US Army Corps of Engineers  
Mr. Jim Delorey, US Army Corps of Engineers  
Mr. Larry Fade, US Army Corps of Engineers  
Ms. Kathy Dadey, US Environmental Protection Agency  
Mr. Brian Ross, US Environmental Protection Agency  
Mr. Steve Goldbeck, SF Bay Conservation and Development Commission  
Ms. Brenda Goeden, SF Bay Conservation and Development Commission  
Ms. Glynnis Collins, Regional Water Quality Control Board  
Ms. Becky Ota, California Department of Fish and Game  
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San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Safety Project  
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U.S. Army Corps of Engineers file #: 23013

Dear DMMO Members:

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In fact, the correct pier numbers and their locations are as follow:

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The materials from these locations will be disposed of at appropriate upland facilities as recommended by DMMO.

DMMO Members  
August 15, 2001  
Page 2

Your concurrence with dredged material disposal plan as described will be appreciated. Please contact Allen Baradar, SFOBB Senior Environmental Engineer, at (510) 286-5636 if you have questions or need additional information.

Sincerely,

HARRY Y. YAHATA  
District Director

by

*for Allen Baradar*  
MARA MELANDRY  
Environmental Manager, SFOBB



**DEPARTMENT OF THE ARMY**  
**SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS**  
**333 MARKET STREET**  
**SAN FRANCISCO, CALIFORNIA 94105-2197**

**AUG 7 2001**

**Regulatory Branch**

**SUBJECT: File Number 23013S**

**Ms. Mara Melandry**  
**California Department of Transportation**  
**P.O. Box 23660**  
**Oakland, California 94623-0660**

**Dear Ms. Melandry:**

The U.S. Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, San Francisco Bay Regional Water Quality Control Board, and the Corps of Engineers, have completed their review of your August 15, 2001 letter (Subject: Amendment to Dredged Material Disposal Plan, Described in Caltrans Letter Dated June 19, 2001: San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Safety Project (East Span Project) on Interstate 80, crossing San Francisco Bay (04-SF-80 KP 12.2/Kp 14.3, 04-ALA-80 KP 0.0/KP 2.1); U.S. Army Corps of Engineers file #:23013) that provides minor corrections in the proposed disposal plan described in your California Department of Transportation letter dated June 19, 2001. Your June 19, 2001 provided proposed disposal locations for the dredged material from your San Francisco - Oakland Bay Bridge (SFOBB) East Span Seismic Safety Project. The agencies provided concurrence to your June 19, 2001 letter in a letter from the U.S. Army Corps of Engineers addressed to the California Department of Transportation dated July 6, 2001.

The above inter-agency group concurs with the minor corrections detailed in your August 15, 2001 letter. Please note that although the agencies concur to your letter, actual approval of the disposal locations is only provided when you receive your various permits.

Please be advised that this letter does not constitute an authorization to proceed with your dredge project. You must first obtain Federal, State and local permits as appropriate.

Should you have any questions please call or write to Mr. David Dwinell of our Operations-Readiness Division (415-977-8471), and refer to the file number at the head of this letter.

Sincerely,

  
Max R. Blodgett  
Chief, Operations-  
Readiness Division

Copies Furnished:

US EPA, San Francisco, CA, Attn: Dadey  
CA BCDC, San Francisco, CA, Attn: Goldbeck  
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CA SLC, Sacramento, CA, Attn: Howe  
CA F&G, Menlo Park, CA, Attn: Ota  
US NMFS, Santa Rosa, CA, Attn: Mulvey

**Appendix J**

**Conceptual Mitigation Plan for Special Aquatic  
Sites**

THIS APPENDIX J IS NOT AVAILABLE AT THIS TIME

**Appendix K**

**Environmental Impacts Summary**

**Table S-3 Summary of Impacts and Mitigations-Build Alternatives**

<b>Community</b>				
<b>Impact Category</b>	<b>Replacement Alternative N-6</b>	<b>Replacement Alternative N-2</b>	<b>Replacement Alternative S-4</b>	<b>Retrofit Existing Structure Alternative</b>
<b>Employment</b>	The estimated total number of human employment years is projected to be 4,290.	The estimated total number of human employment years is projected to be 4,232.	Same as N-2	The estimated total number of human employment years is projected to be 2,356.
<b>Community Services</b>	No impact	No impact	Due to insufficient clearance between the bridge structure and EBMUD's existing service road, EBMUD's service trucks would be prevented from accessing its dechlorination facility at the west end of the Oakland Touchdown requiring relocation of the service road and/or the dechlorination facility. The road could be relocated to the north, south, via a tunnel or on an overpass. The dechlorination facility could be moved to the east. Potential impacts of relocation are reduced visual public access to the Bay for westbound motorists approaching the bridge if an overpass is constructed, fill in the Bay (approximately 13,650 cubic meters (18,000 cubic yards) and 0.36 hectare (0.9 acre), drainage problems, and/or modifications to the design and/or operation of EBMUD's discharge system. All relocation options entail increased construction and maintenance costs. <b>Mitigation</b> -Caltrans would work with EBMUD to relocate the service road and/or the dechlorination facility to maintain EBMUD's operations. Caltrans would obtain necessary permits/permit amendments, fund relocation costs, and implement any necessary mitigation. Caltrans would assure continual operation of EBMUD's discharge system during relocation.	No impact

## Existing Land Use

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Former Navy Building 213 on YBI</b>	Would displace Building 213 (which currently serves as storage for one fire truck) on YBI. <b>Mitigation</b> -If requested by the Navy, Caltrans will replace Building 213 with a structure of like size, construction materials and quality, built to current building codes. The Navy would need to provide a suitable site for the replacement of Building 213 outside State right-of-way.	Same as N-6	No impact	No impact on Navy buildings.
<b>USCG Buildings on YBI</b>	Would displace buildings 30 (storage), 40 (administration), 75 (vacant), and 270 (vacant). <b>Mitigation</b> -Caltrans would provide replacement buildings of like size, construction materials and quality, built to current building codes. The USCG would need to provide suitable sites for the replacements outside State right-of-way.	Same as N-6	Same as N-6	No impacts to USCG buildings.
<b>Land Use on USCG YBI facility</b>	No permanent impact on USCG usable land area.	Same as N-6	Footing and support columns of new bridge would span approximately 1.5 hectares (3.8 acres) of 2 hectares (5 acres) of USCG usable land area. USCG land under bridge could be developed subject to review and approval by Caltrans.	Same as N-6
<b>Land Use at the Oakland Touchdown Area</b>	Would require permanent displacement of 0.2-hectare (0.5-acre) of the City of Oakland-designated Resource Conservation Area north of the existing bridge. New upland/aquatic interface areas would be improved on-site for wildlife.	Same as N-6	See Community Services impacts of Replacement Alternative S-4.	No impact

## Section 4(f) Evaluation

Section 4(f) of the Department of Transportation Act of 1966 specifies that “[t]he Secretary [of Transportation] may approve a transportation program or project... requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of a historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge or site) only if 1) there is no prudent and feasible alternative to using that land; and 2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.” Permanent 4(f) uses are summarized below; temporary 4(f) uses are discussed on page S-38.

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Use of Resources Protected by Section 4(f) of the Department of Transportation Act</b>	Removal of existing East Span of SFOBB. <b>Mitigation</b> -Caltrans would comply with the Memorandum of Agreement executed pursuant to the National Historic Preservation Act (see Appendix O).	Same as N-6	Removal of existing East Span of SFOBB and occupation of about 3.0 hectares (7.4 acres) of the 5.9-hectare (14.7-acre) proposed Gateway Park. <b>Mitigation</b> -For the loss of the bridge, Caltrans would comply with the Memorandum of Agreement executed pursuant to the National Historic Preservation Act. To minimize harm to the proposed park, Caltrans would replace public shoreline access for loss of proposed parkland.	Substantial modifications to the existing East Span of SFOBB.  On YBI, enlarged column would incorporate about 0.001-hectare (0.002-acre) of the grounds of the Senior Officers' Quarters Historic District. <b>Mitigation</b> -Caltrans would comply with the Memorandum of Agreement executed pursuant to the National Historic Preservation Act.

## Development Trends

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Treasure Island Draft Reuse Plan Consistency</b>  <b>The CCSF has a conceptual proposal under the 1996 Treasure Island Draft Reuse Plan to develop commercial and residential properties on the east side of YBI. The Draft Plan was prepared for the Office of Military Base Conversion, Planning Development, City and County of San Francisco, and the San Francisco Redevelopment Agency.</b>	Bridge would span 1.1 hectares (2.9 acres) of 3.2 hectares (7.8 acres) of developable land. Air space under bridge could be leased for development by the CCSF per review and approval by Caltrans. The number of live/work units and the size of the conference center would be reduced due to location of bridge footings. Proposed development would require Bay Plan amendments and a federal consistency determination from the Bay Conservation and Development Commission (BCDC) pursuant to the Coastal Zone Management Act. N-6 is consistent with the transportation element of the CCSF reuse plan.	Same as N-6	Bridge would span 0.6-hectare (1.4 acres) of 3.7 hectares (9.1 acres) of developable land; approximately 0.8-hectare (2.0 acres) of land occupied by existing span would become available for development. Otherwise, same as N-6.	No permanent impacts on the CCSF's redevelopment concepts described in the 1996 Treasure Island Draft Reuse Plan. Bridge would continue to span 0.2-hectare (0.6-acre) of 3.2 hectares (7.8 acres) of developable land.

**Development Trends (continued)**

<b>Impact Category</b>	<b>Replacement Alternative N-6</b>	<b>Replacement Alternative N-2</b>	<b>Replacement Alternative S-4</b>	<b>Retrofit Existing Structure Alternative</b>
<p><b>Port of Oakland</b></p> <p>BCDC amended its Seaport Plan and Bay Plan in January 2001, which included the deletion of the port priority use area at the Bay Bridge Site (Oakland Touchdown area).</p>	<p>No permanent impact on the Port of Oakland expansion plans.</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>Same as N-6</p>
<p><b>Oakland Touchdown Area Proposed Gateway Park</b></p> <p>Reuse plan of Oakland Base Reuse Authority (OBRA) has designated 5.9 hectares (14.7 acres) at the Oakland Touchdown area as a future public park. Led by East Bay Regional Park District, park planning agencies include the City of Oakland, National Park Service, Port of Oakland and BCDC.</p>	<p>Would not involve use of the proposed Gateway Park. At the closest point, the bridge structure would be approximately 46 meters (151 feet) from the OBRA-designated park boundary.</p>	<p>Same as N-6</p>	<p>The structure would bisect and occupy 3.0 hectares (7.4 acres) of 5.9 hectares (14.7 acres) from the OBRA-designated park.</p>	<p>Would not involve use of proposed Gateway Park. At the closest point, the bridge structure would be approximately 30 meters (98 feet) from the OBRA-designated park boundary.</p>
<p><b>BCDC Permit 11-93</b></p> <p>As part of the I-880/Cypress Freeway Replacement Project, Caltrans is required to provide public access to the Bay at the Oakland Touchdown area. These access areas, or overlooks, and other improvements are required by BCDC to maximize public access to the west end of the Oakland Touchdown area.</p>	<p>Consistent with Permit 11-93 as amended. Pursuant to the amended permit, the final location and design of public access improvements would be jointly planned in coordination with the East Span Project subject to BCDC approval. Should it prove infeasible to construct some or all of the improvements required under Permit 11-93, Caltrans may pay BCDC an in-lieu fee.</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>Same as N-6</p>

## Transportation

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Vehicular Transportation</b>	<p>Would retain five eastbound and five westbound traffic lanes on the East Span. No long-term impacts to local traffic, transit, or maritime traffic. Addition of shoulders may reduce non-recurrent congestion caused by accidents or stalls and would result in fewer lane closures for maintenance operations.</p> <p>The existing Caltrans maintenance road at the Oakland Touchdown area would be realigned but there would be no loss of access.</p>	Same as N-6	Same as N-6; however S-4 would require modification of existing access patterns on the local roadways of the Oakland Touchdown area. Realigned access roadways would serve existing facilities and future park development, with the exception of the EBMUD dechlorination facility where restricted access would require relocation of the service road and/or dechlorination facility. (Mitigation for this impact is discussed in the Community Services section on page S-22).	Traffic operations would remain the same as under existing conditions.
<b>Non-Motorized Traffic: Bicycles and Pedestrians</b>	Provision of bicycle/pedestrian path between Oakland and YBI would be consistent with the CCSF's Treasure Island Draft Reuse Plan, BCDC's Bay Plan, City of Oakland's Pedestrian and Bicycle Master Plan and Association of Bay Area Government's Bay Trail Plan.	Same as N-6	Same as N-6	Would not implement a bicycle/pedestrian path on East Span and is therefore inconsistent with local plans listed under N-6.
<b>Parking on YBI and the Oakland Touchdown area</b>	No impact	No impact	No impact	No impact
<b>Marine Traffic</b>	No impact	No impact	No impact	No impact
<b>Air Traffic</b>	<p>Would change existing obstruction markings and lighting.</p> <p>Federal Administration (FAA) form 7460-1, "Notice of Proposed Construction or Alteration," would be filed with the FAA, which would disclose the location and height of a cable-supported tower. Warning lights are required because the tower would exceed 61 meters (200 feet), which is FAA's maximum height for which warning lights are not required.</p>	Same as N-6	Same as N-6	No impact

**Visual**

<b>Impact Category</b>	<b>Replacement Alternative N-6</b>	<b>Replacement Alternative N-2</b>	<b>Replacement Alternative S-4</b>	<b>Retrofit Existing Structure Alternative</b>
<p><b>Removal of Vegetation and Slope Disturbance on Yerba Buena Island and the Oakland Touchdown Area</b></p>	<p>The appearance of the hillside to the south of the East Span may be permanently altered, and approximately 350 mature trees (mostly eucalyptus) on eastern facing slopes of YBI and 71 mature trees (mostly pine) at the Oakland Touchdown area would be removed. <b>Mitigation</b>-Caltrans would approve a construction access plan detailing grading, access roads, vegetation removal, and location of equipment platforms. Construction limits on YBI would protect select vegetation and screening to the maximum extent feasible. A re-vegetation plan would include the planting of mature trees, monitoring, and replanting as necessary to return disturbed acres to a natural appearance and to establish visual screening of the bridge. Re-planted vegetation would require approximately ten years to reestablish itself to current density. Caltrans would develop a master-planting plan in coordination with local agencies to be implemented within two years after bridge construction is completed.</p>	<p>Same as N-6</p>	<p>Construction would result in removal of approximately 325 mature trees at YBI (mostly eucalyptus) and approximately 12 mature trees at the Oakland Touchdown area (mostly pine). <b>Mitigation</b>-Same as N-6</p>	<p>Construction would result in removal of approximately 150 mature trees at YBI (mostly eucalyptus). <b>Mitigation</b>-Same as N-6</p>
<p><b>Visual Image Types</b></p>	<p>For the main span, the self-anchored design variation would result in the most favorable impact upon visual quality regardless of viewpoint location due to an increase in the vividness of the span and overall unity of the view. The skyway design variation would result in the least favorable impact upon visual quality due to a reduction in the vividness and intactness of the span.</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>Would have a negligible impact on visual quality from distant viewpoints, as the structural elements added to the East Span would not be perceptible. For some of the closer viewpoints, the Retrofit Alternative would have a minimally adverse impact on viewers, as the additional structural elements (new piers and strengthened existing piers) would obstruct views underneath the bridge.</p>

<b>Air Quality</b>				
<b>Impact Category</b>	<b>Replacement Alternative N-6</b>	<b>Replacement Alternative N-2</b>	<b>Replacement Alternative S-4</b>	<b>Retrofit Existing Structure Alternative</b>
<b>Permanent Air Quality Impacts</b>	No impact. Project would not increase roadway capacity.	Same as N-6	Same as N-6	Same as N-6

<b>Noise and Vibration</b>				
<b>Impact Category</b>	<b>Replacement Alternative N-6</b>	<b>Replacement Alternative N-2</b>	<b>Replacement Alternative S-4</b>	<b>Retrofit Existing Structure Alternative</b>
<b>Noise</b>	On YBI, future predicted peak noise levels at certain locations would exceed FHWA Noise Abatement Criteria (NAC), but would generally decrease by 1 to 14 dBA compared to the existing noise levels. At the Oakland Touchdown area, future users of the proposed Gateway Park could experience slightly higher noise levels (increases of 1-2 dBA) in the eastern portion of the park. Increases of less than 3 dBA are generally not perceptible. Noise levels at the western end of the park would be 3 to 6 dBA lower than existing noise levels.	Same as N-6.	On YBI, peak noise levels at certain locations would exceed FHWA NAC, but would decrease by 1 to 14 dBA compared to the existing noise levels. At the Oakland Touchdown area, future users of the proposed Gateway Park could experience slightly higher noise levels (increases of 2 to 3 dBA) in the eastern portion of the park. These increases should not be perceptible. Noise levels at certain locations in the western end of the park cannot be quantified using the noise model because the bridge would be directly over the area, but the bridge deck would likely shield the area from traffic noise on the structure above.	No change from existing noise levels.
<b>Noise on the bike/pedestrian path</b>	Future predicted noise on the path would be approximately 82-84 dBA. Exposure to typical noise levels on the bridge would not cause hearing problems for path users.	Same as N-6	Same as N-6	Retrofit Alternative would not include a bicycle/pedestrian facility.

**Noise and Vibration (continued)**

<b>Impact Category</b>	<b>Replacement Alternative N-6</b>	<b>Replacement Alternative N-2</b>	<b>Replacement Alternative S-4</b>	<b>Retrofit Existing Structure Alternative</b>
<b>Vibration</b>	Vibration levels from traffic operations (i.e. heavy-truck traffic) would probably be below the levels of human perception at distances of more than 30 meters (100 feet) from bridge support columns. Vibration levels at nearby locations, including the film studios on TI, are predicted to remain below architectural damage criterion and human perception levels.	Same as N-6	Same as N-6	Same as N-6; however vibration levels may be slightly than those resulting from replacement alternatives because this alternative would not include use of higher-mass concrete on bridge decks.

**Hazardous Waste Sites**

<b>Impact Category</b>	<b>Replacement Alternative N-6</b>	<b>Replacement Alternative N-2</b>	<b>Replacement Alternative S-4</b>	<b>Retrofit Existing Structure Alternative</b>
<b>Hazardous Waste Sites and Materials</b>	May impact eight hazardous waste sites on YBI and three on the Oakland Touchdown area. <b>Mitigation</b> -Off-site disposal would be at an appropriate landfill or recycling facility. Licensed waste haulers would transport hazardous soil.	Same as N-6 <b>Mitigation</b> -Same as N-6	May impact nine hazardous waste sites on YBI and four on the Oakland Touchdown area. <b>Mitigation</b> -Same as N-6	May impact five hazardous waste sites on YBI and two on the Oakland Touchdown area. <b>Mitigation</b> -Same as N-6

## Geology, Soils and Seismicity

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<p><b>Soil and Rock Stability Settlement</b></p>	<p>Pre-existing slope stability and erosion problems on YBI adjacent to the USCG facility. An incident of slope failure could interfere with USCG operations by obstructing the USCG road next to the facility. In addition, a temporary road would be required through an existing slope approximately 35 meters (115 feet) south of Building 206 and Quarters 8. <b>Mitigation-</b> Caltrans would ensure that the project does not exacerbate pre-existing problems within Caltrans' right-of-way or its temporary construction easement during or after construction. Consultation with the USCG and collection of information on slope stability prior to and during construction would be conducted. Caltrans will require the contractor to prepare a conceptual plan for slope stability and erosion control on the hillside above the USCG facility and solicit comments on the plan from the USCG. In order to minimize slope impacts associated with the temporary road, temporary retaining walls would be used. Excavation required for construction of the walls would be filled in.</p> <p>At the Oakland Touchdown area, the potential for liquefaction of the fill that lies beneath the water table exists. <b>Mitigation-</b>At-grade approach structures would be created by placing embankment fill on certain sections of the landfall that may be prone to settlement.</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>No impact</p>

**Geology, Soils and Seismicity (continued)**

<b>Impact Category</b>	<b>Replacement Alternative N-6</b>	<b>Replacement Alternative N-2</b>	<b>Replacement Alternative S-4</b>	<b>Retrofit Existing Structure Alternative</b>
<b>Seismicity</b>	Meets lifeline criteria. Expected to withstand an MCE on the San Andreas or Hayward fault. Design criteria include non-collapse and serviceability of structures when subjected to ground motions during a seismic event.	Same as N-6	Same as N-6	Does not meet lifeline criteria. It is expected that the retrofitted main span would withstand an MCE or smaller event however it is anticipated that in the event of an MCE, the retrofitted East Span would experience damage to truss members in the steel superstructure.
<b>Tsunamis</b>	The structural design on the Oakland Touchdown area would include the capability of resisting water/wave/current-induced loading.	Same as N-6	Same as N-6	Same as N-6

**Water Quality**

<b>Impact Category</b>	<b>Replacement Alternative N-6</b>	<b>Replacement Alternative N-2</b>	<b>Replacement Alternative S-4</b>	<b>Retrofit Existing Structure Alternative</b>
<b>Water Quality</b>	Not expected to increase concentration levels of pollutants commonly found in highway runoff nor is the design expected to elevate the levels of less common constituents. A reduction in sandblasting and painting operations and use of non-lead based paint on steel portions of the new span would decrease discharge of lead debris and residue into the Bay. Addition of shoulders would improve response time for emergency vehicles, maintenance crews and hazardous spills response teams, minimizing discharges into the Bay. No impacts to ground water quality.	Same as N-6	Same as N-6	No impact. The current practice of sweeping the bridge decks would continue and storm water would continue to discharge directly into the Bay.

### Permanent Change in Volume and Area of Other Waters of the U.S. as defined by ACOE

Under the Clean Water Act, the ACOE considers fill in Other Waters of the U.S. to be solid material placed in jurisdictional waters below the Mean High Water Line (MHW), which is approximately +1.42 meters National Geodetic Vertical Datum (NGVD) (+4.63 feet) at Yerba Buena Island and the Oakland touchdown area. The analysis of fill in Other Waters of the U.S. does not include fill in special aquatic sites. Impacts to special aquatic sites are addressed separately.

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Change in Volume to Other Waters of the U.S.</b>	Would result in a net increase of 386,000 cubic meters (504,900 cubic yards).	Same as N-6	Would result in a net increase of 368,300 cubic meters (481,700 cubic yards).	Would result in a net decrease of 26,300 cubic meters (34,200 cubic yards).
<b>Change in Surface Area to Others Waters of the U.S.</b>	Would result in a net decrease of 0.26 hectare (0.63 acre).	Same as N-6	Would result in a net decrease of 0.93 hectare (2.31 acre).	Would result in a net decrease of 1.70 hectare (4.19 acre).

### Permanent Change in Volume and Area of San Francisco Bay as defined by BCDC

Under the McAteer-Petris Act, BCDC considers Bay fill to be any solid, pile-supported, floating, cantilevered or high-level suspended material that is placed bayward of the Mean High Tide Line (MHTL) which is approximately +0.82 meters NGVD (+2.68 feet) at Yerba Buena Island and +0.84 meters NGVD (+2.77 feet) at the Oakland Touchdown area. Unlike the ACOE, the analysis of fill under BCDC's jurisdiction includes fill in special aquatic sites such as wetlands, eelgrass beds and sand flats.

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Change in Volume of the Bay</b>	Would result in a net increase of 352,400 cubic meters (460,900 cubic yards).	Same as N-6	Would result in a net increase of 367,500 cubic meters (480,600 cubic yards).	Would result in a net decrease of 16,500 cubic meters (21,300 cubic yards).
<b>Change in Surface Area of the Bay</b>	Would result in a net decrease of 13.96 hectares (34.51 acres).	Would result in a net decrease of 13.03 hectares (32.40 acres).	Would result in a net decrease of 12.30 hectares (30.40 acres).	N/A

### Special Aquatic Sites

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<p><b>Sand flats</b></p> <p>The sand flats located within the project area are along the north side of the Oakland Touchdown area and along the southeast side of Yerba Buena Island, east of the U.S. Coast Guard facility. Their functions are feeding, and roosting habitat for a variety of shorebirds.</p>	<p>Permanent impacts to 1.36 hectares (3.36 acres) at the Oakland Touchdown area.</p> <p><b>Mitigation</b>-On-site restoration of a portion of sand flats following construction; off-site creation of tidal marsh ecosystem.</p>	Same as N-6	<p>Permanent impacts to 0.01 hectare (0.03-acre) at YBI.</p> <p><b>Mitigation</b>-Off-site creation of tidal marsh ecosystem.</p>	No impact

**Special Aquatic Sites (continued)**

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<p><b>Eelgrass Beds</b></p> <p>Five areas of eelgrass beds have been identified in the project area. There are two on the north shore of YBI, two on the south shore of YBI and one on the north shore of the Oakland Touchdown area. Their functions are food source, nursery, spawning ground, and/or habitat for resident and migratory species of birds, fish, and invertebrates.</p>	<p>Permanent impacts to 0.21-hectare (0.52 acre) at the Oakland Touchdown area and 0.01-hectare (0.03 acre) at YBI. <b>Mitigation</b>-Minimization of impacts through a turbidity control program; harvesting eelgrass from the barge access channel and replanting in adjacent beds as a pilot program; restoring bathymetry of portions of barge access channel and replanting with eelgrass to facilitate eelgrass colonization; off-site creation of tidal marsh ecosystem.</p>	<p>Same as N-6</p>	<p>Permanent impacts to 0.16-hectare (0.40-acre) at YBI. <b>Mitigation</b>-Minimization of impacts through a turbidity control program; harvesting eelgrass from the barge access channel at YBI and replanting it in adjacent beds as a pilot program; restoring bathymetry of portions of barge access channel and replanting with eelgrass to facilitate eelgrass colonization; off-site creation of tidal marsh ecosystem.</p>	<p>No impacts</p>
<p><b>Wetlands</b></p> <p>The tidal wetlands in the project study area possess a moderate level of functions and values since they are remnant wetlands surrounded by non-native species that do not provide extensive habitat for wildlife. The two non-tidal wetlands in the project area possess very limited functions and values due to the lack of wetland species diversity and human disturbance.</p>	<p>No impact</p> <p>Avoidance of habitat by marking the wetlands as Environmentally Sensitive Areas (ESAs)</p>	<p>Same as N-6</p>	<p>Permanent impacts to 0.05-hectare (0.12-acre) of non-tidal wetlands on the south side of the Oakland Touchdown area from construction. <b>Mitigation</b>-Off-site creation of non-tidal wetlands.</p>	<p>Same as N-6</p>

<b>Special Status Species</b>				
<b>Impact Category</b>	<b>Replacement Alternative N-6</b>	<b>Replacement Alternative N-2</b>	<b>Replacement Alternative S-4</b>	<b>Retrofit Existing Structure Alternative</b>
<b>Double-Crested Cormorant</b>  <b>Protected by Migratory Bird Treaty Act.</b>	Dismantling the existing structure would remove nesting sites. <b>Mitigation</b> -Nesting habitat would be constructed on the new bridge.	Same as N-6	Same as N-6	No impact
<b>Peregrine Falcon</b>  <b>Removed from Federal Endangered Species List. Protected by State Endangered Species Act and Migratory Bird Treaty Act.</b>	Dismantling the existing structure would remove nesting site. <b>Mitigation</b> -None required: peregrine falcon is likely to nest on a replacement bridge. Santa Cruz Predatory Bird Research Group would continue monitoring and off-site release efforts to avoid potential impacts during scheduled maintenance activities.	Same as N-6	Same as N-6	No impact

<b>Other Natural Communities</b>				
<b>Impact Category</b>	<b>Replacement Alternative N-6</b>	<b>Replacement Alternative N-2</b>	<b>Replacement Alternative S-4</b>	<b>Retrofit Existing Structure Alternative</b>
<b>Shorebird Habitat</b>	Would result in a small loss of sand flats that provide shorebird foraging and roosting habitat on the north side of the Oakland Touchdown area. However, due to the small area impacted, it is not anticipated that this will adversely impact shorebirds. <b>Mitigation</b> -See construction period mitigation.	Same as N-6	Would result in a small loss of upland area on the south side of the Oakland Touchdown area that is known to provide roosting habitat for shorebirds during the winter months. <b>Mitigation</b> -See construction period mitigation.	No impact
<b>Coast Live Oak Woodlands</b>	Would result in the loss of six coast live oak trees on YBI. <b>Mitigation</b> -Replacement of trees per the CCSF tree ordinance at a 3:1 ratio. Due to the root structure of mature oak trees, the replacement trees may be smaller than those displaced.	Same as N-6	Same as N-6	No impact

## Historic Properties

In accordance with Section 106 of the National Historic Preservation Act, measures to mitigate project effects on historic properties have been stipulated in a Memorandum of Agreement (MOA) among the Federal Highway Administration (FHWA), U.S. Coast Guard, the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP), with Caltrans as a concurring party. The Navy, local governments, and Native Americans were also asked to participate in the development of mitigation measures and invited to sign the MOA as concurring parties. Mitigation measures for the impacts below are identified in the MOA (Appendix O). The following discussion includes permanent and construction-period impacts.

<b>Impact Category</b>	<b>Replacement Alternative N-6</b>	<b>Replacement Alternative N-2</b>	<b>Replacement Alternative S-4</b>	<b>Retrofit Existing Structure Alternative</b>
<b>Archaeological Site CA-SFr-04/H on YBI</b>	Columns for eastbound and westbound permanent structures and one column for the westbound temporary detour would disturb site.	No impact	North half of site removed due to westbound temporary detours. <b>Mitigation</b> -Same as N-6	Excavation to strengthen Column YB3 would disturb site. <b>Mitigation</b> -Same as N-6
<b>Building 262 (Torpedo Building)</b>	Impact due to “visual, audible, or atmospheric elements that are out of character with the property.” In addition, construction activities in the vicinity and overhead could result in inadvertent damage.	Same as N-6	No impact	No impact
<b>Senior Officers’ Quarters Historic District (includes Quarters 1 to 7 and Buildings 83, 205, and 230).</b>	Views from Quarters 1 would be slightly modified by placement of a concrete column and removal of existing steel column. Footings for temporary detours would be constructed within the district. The affected areas would be restored to their prior condition at the completion of the project.	Same as N-6	Would not modify the views from Quarters 1, otherwise same as N-6.	The encasement of steel columns in concrete at Piers YB2 through YB4 would introduce a visual intrusion.
<b>Quarters 8, 9, 10 and Building 267 (garage associated with Building 10).</b>	No impact	Same as N-6	Same as N-6	Same as N-6
<b>Existing East Span of SFOBB</b>	Removal of bridge and two ancillary buildings (Caltrans garage and electric substation on YBI).	Same as N-6	Same as N-6	Alteration of bridge.
<b>Key Pier Substation (Oakland Touchdown area)</b>	Removal of existing East Span, to which substation contributes; station itself not removed or altered, but its historic association with the SFOBB would be lost.	Same as N-6	Same as N-6	No impact

### Scientific Resources

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Scientific Resources</b>	<p>Potential for disturbance of paleontologic resources during in-Bay construction of new piers and footings.</p> <p><b>Mitigation</b>-Should paleontological resources be discovered, Caltrans would ensure that the provisions of the California Public Resources Code Section 5097.6 are implemented using their "Interim Guidance for the Identification, Assessment, and Treatment of Paleontological Resources," July 1991.</p>	Same as N-6	Same as N-6	<p>Potential for disturbance of paleontologic resources during in-Bay construction to retrofit existing piers and footings.</p> <p><b>Mitigation</b>-Same as N-6</p>

### Utilities

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Impacts to Utilities</b>	<p>Utilities on the existing East Span would be relocated to the replacement span. Caltrans or the utility owner will pay relocation costs depending on agreements made prior to relocation. Submarine utilities would be avoided to the greatest extent possible. If utilities cannot be avoided, they would be protected in place or relocated. Caltrans and the contractor would assume responsibility for damage and payment for documented income loss and difference in power costs. A temporary span of the land portion of the EBMUD outfall facility may be required and would be coordinated with EBMUD.</p>	Same as N-6	<p>Same as N-6; however a special bridge design would be required to sufficiently span the outfall facility in order to prevent construction period damage.</p>	<p>Utilities on the existing East Span would be maintained. Otherwise, same as N-6.</p>

## Energy

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Energy</b>	No long-term impacts.	Same as N-6	Same as N-6	Same as N-6

## Construction Period Impacts

The following are construction period impacts which would occur during construction of a replacement or retrofit alternative. These impacts are temporary and are not anticipated to have environmental impacts beyond completion of the project.

## Construction Period Community Impacts

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Community Impacts</b>	The desirability of Quarters 1-7 would be reduced during construction due to noise, lighting, and visual impacts of construction. Building 262, currently vacant and in disrepair, would be accessible but would not be usable due to adjacent construction activity. <b>Mitigation-</b> Caltrans would reimburse the CCSF for documented losses in rental income from Quarters 1- 7. A pre- and post-construction survey of Quarters 1- 7 and Building 262 would be conducted and construction-related damage would be repaired as necessary. Protective measures would be developed in consultation with property owners.	Same as N-6	Same as N-6	Same as N-6; however, causes for motorist delays on YBI and the Oakland Touchdown would be limited to the use of local streets for transport of workers, equipment, and materials.

**Construction Period Community Impacts (continued)**

<b>Impact Category</b>	<b>Replacement Alternative N-6</b>	<b>Replacement Alternative N-2</b>	<b>Replacement Alternative S-4</b>	<b>Retrofit Existing Structure Alternative</b>
<b>Safety and Security</b>	Heavy vehicle movements, possible hazardous waste excavation and transport, and construction site activity could create safety concerns for construction workers and members of the public on YBI and the Oakland Touchdown. <b>Mitigation</b> -Best construction management practices would be in place to ensure the safety of construction workers, local employees, and residents during construction.	Same as N-6	Same as N-6	Same as N-6
<b>Temporary use of Resources Protected by Section 4(f) of the Department of Transportation Act</b>	On YBI, four to six column footings of a temporary detour would be placed in landscaped or paved areas of the Officers' Quarters Historic District. <b>Mitigation</b> -Caltrans would protect historic buildings in the senior Officers' Quarters Historic District during construction and restore disturbed areas following construction.	Same as N-6	Same as N-6	No impact

## Construction Period Transportation Impacts

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<p><b>Impacts to traffic on the East Span</b></p>	<p>Lane or bridge closures would be necessary to connect the new structure and the existing viaduct at YBI. These closures could result in some traffic delays on the East Span and its approaches. Additional delays could occur as “rubbernecking” drivers watch construction of the new superstructure and dismantling of the existing bridge from the new bridge. <b>Mitigation-</b> Caltrans is continuing to investigate lane and bridge closures in an effort to simultaneously minimize public inconvenience, facilitate construction and maximize public safety. Closures would be timed during off-peak hours to the extent feasible and Caltrans would implement a traffic management plan to manage impacts to traffic.</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>Would result in longer and more frequent lane closures (i.e., almost every day during the construction period), compared to the replacement alternatives. <b>Mitigation-</b>Same as N-6</p>

### Construction Period Transportation Impacts (continued)

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<p><b>Impacts to Traffic Circulation on YBI</b></p>	<p>Occasional congestion could occur on YBI due to construction-related vehicle traffic on local roadways, an increase in the volume of vehicles entering and exiting the island, closure of westbound on-ramp and eastbound off-ramp on the east side of the island, closure of Southgate Road, and modifications to the USCG access road, Macalla Road, and the road that provides access to Building 262. Also, there would be no public access to the parade grounds and a temporary restriction of access to Building 267 (the garage at Quarters 10), for about a day. <b>Mitigation</b>-The contractor would construct a detour around the column foundations to keep Macalla Road open or provide another travel way for USCG personnel and column construction could be staged so that entrances to the USCG Station would be open at all times. Temporary detours would be constructed and flaggers employed to ensure motorist safety for USCG vehicles in the construction zone. Barges would deliver wide and oversized construction loads, where possible. Caltrans would limit contractor parking to the temporary construction easement.</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>Same as N-6; however, would not restrict access to Building 267.</p>
<p><b>Impacts to pedestrian circulation on YBI</b></p>	<p>Would displace stairway linking USCG facility with bus stop on SFOBB. <b>Mitigation</b>-Caltrans would construct new stairway after consulting with USCG, Navy, and the CCSF about appropriate site. Construction-period shuttle service would be provided.</p>	<p>Same as N-6</p>	<p>No long-term impact on stairway linking USCG facility with bus stop on SFOBB. Stairway would be closed during construction. <b>Mitigation</b>-Construction-period shuttle service would be provided.</p>	<p>Construction may require the temporary closure of stairway linking USCG facility with the bus stop on SFOBB. <b>Mitigation</b>-Construction-period shuttle service would be provided in the event of a closure.</p>

**Construction Period Transportation Impacts (continued)**

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<p><b>Impacts to Traffic Circulation on the Oakland Touchdown area</b></p>	<p>Would require closure of access road on north side of I-80, eliminating shoreline access for authorized vehicles west of Radio Point Beach. Construction-related vehicle traffic could potentially cause minor delays to other traffic and two AC Transit lines. No mitigation is recommended for potential minor delays.</p>	<p>Same as N-6</p>	<p>Same as N-6; however, would not require closure of shoreline access road used by authorized vehicles.</p>	<p>Same as S-4</p>
<p><b>Marine Operations</b></p>	<p>Non-project-related marine traffic would be diverted from areas of construction. Barges, other construction vessels, and falsework would restrict the navigation opening. Temporary closures of portions of the navigation opening could occur.  <b>Mitigation</b>-Caltrans would consult with the USCG to implement a vessel warning system for periods when construction vessels are placed in the water within the bridge construction zone. Notification to mariners and other requirements will be specified in the permit completed for the USCG.</p>			

### Construction Period Visual Impacts

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Visual Impacts on YBI</b>	Visual changes for residents and users of YBI due to location of temporary detour columns, construction staging, lighting equipment and the reduction of some Bay views from Quarters 1-7. Changes would not substantially alter the character of the Bay or YBI. <b>Mitigation</b> -To reduce glare from lighting used during nighttime construction activities, Caltrans would require contractor to direct lighting onto the immediate area under construction only and avoid shining lights toward residences and marine traffic.	Same as N-6	Same as N-6	Same as N-6, including possible visual impacts from the use of scaffoldings.
<b>Visual Impacts on the Oakland Touchdown area</b>	Visual changes due to construction activities and staging.	Same as N-6	Same as N-6	Same as N-6

### Construction Period Air Quality Impacts

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
Air Quality Impacts	<p>Would contribute to area air pollutants emissions during most stages of construction. The largest sources of anticipated pollutants would be dust generated by excavation, grading, and other ground disturbing activities on YBI and the Oakland Touchdown area and exhaust emissions from equipment and marine vessels. Because emissions would vary from day to day depending on construction activity, construction location, and distance to receptors, an exact estimate of total construction emissions and impacts are not possible.</p> <p>Measures to reduce emissions during construction, as specified in Caltrans' Standard Specifications, would be included in the contract specifications. These measures include: watering exposed soil surfaces, covering trucks transporting dust producing material, reducing-construction vehicle travel speeds on unpaved surfaces, maintaining equipment per manufacturers' specifications and conforming to all air pollution regulations. Because these measures will be included in the contractor specifications, no mitigation is proposed.</p>	Same as N-6	Same as N-6	Same as N-6

### Construction Period Noise and Vibration Impacts

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Noise Impacts</b>	<p>During construction of the temporary eastbound detour, noise levels at Bachelor Enlisted Quarters may increase by ten dBA over existing conditions. During pile driving operations, noise levels at Quarters 8, the Bachelor Enlisted Quarters Building 240, and Building 262 may increase by 19-20 BA and 7 dBA at the Treasure Island film studios. <b>Construction-period Noise Abatement-All</b> construction equipment would conform to provisions in Section 7-1.01I of the latest edition of Standard Specifications. The contractor would be required to comply with local noise control ordinances to the extent practicable.</p> <p>Caltrans would continue to consult with the Coast Guard to identify and implement feasible and reasonable measures to reduce construction-related noise levels at USCG facilities. In addition, Caltrans is continuing to investigate the possibility of limiting the hours for pile driving to reduce the construction noise impacts to other residents of YBI and TI.</p>	Same as N-6	Same as N-6	<p>During rivet removal operations, noise levels at USCG Building 40 (administration) and Navy Building 213 (storage for 1 fire truck) may increase by 3-16 dBA over existing conditions. Pile driving would occur in closest proximity to Quarters 1 and noise levels at that location might increase by 24 dBA.</p> <p><b>Construction-period Noise Abatement</b>-Same as N-6.</p>
<b>Traffic Noise from temporary detours associated with Replacement Alternatives</b>	Noise generated by detour traffic is anticipated to be similar to noise from existing traffic. Slight increases of 1-2 dBA at certain locations would generally not be perceptible.	Same as N-6	Same as N-6	No detours structures required.

### Construction Period Noise and Vibration Impacts (continued)

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Vibration Impacts</b>	Due to distance of buildings from construction activities, no architectural damage is expected to occur as a result of vibrations. Due to distance from construction activities, vibrations should not be perceptible at the Treasure Island film studios. <b>Abatement</b> -Historic properties on YBI would be monitored for construction related damage including the use of vibration measuring devices on buildings. Caltrans would photographically document the condition of these buildings prior to the start of construction to establish the baseline condition. Any damage to the buildings resulting from construction activities would be repaired in accordance with the Secretary of the Interior's Standards for Rehabilitation.	Same as N-6	Same as N-6	Same as N-6

### Construction Period Hazardous Material Impacts

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Hazardous Wastes and Materials</b>	Construction workers or public may be exposed to contaminated soil, groundwater, lead-based paint and asbestos during grading, excavation, and dismantling of existing bridge. <b>Mitigation</b> -Construction and dismantling of all structures would include procedures for the identification, abatement, handling, and disposal of contaminated materials, as well as worker health and safety. All procedures would be consistent with Caltrans' guidelines and all federal, state and local laws and regulations.	Same as N-6	Same as N-6	Same as N-6

**Construction Period Impacts to Water Resources and Water Quality**

<b>Impact Category</b>	<b>Replacement Alternative N-6</b>	<b>Replacement Alternative N-2</b>	<b>Replacement Alternative S-4</b>	<b>Retrofit Existing Structure Alternative</b>
<b>Water Quality</b>	<p>Potential impacts from construction activities include but are not limited to: groundwater contamination from excavations; surface water impacts from dredging and dewatering, concrete placement and washout activities, management and application of chemical products; construction activities performed on barges; use of floating batch plants; and accidental spills from construction equipment and materials. <b>Mitigation-A</b> Storm Water Pollution Prevention Program (SWPPP) would be prepared to identify pollutant sources that may affect the quality of the discharges of storm water associated with the construction activities of the project and to identify and implement storm water pollution control measures to reduce pollutants in storm water discharges. The objectives of the SWPPP would be to minimize the degradation of off-site receiving waters to the maximum extent practicable with the current Best Management Practices (BMPs) for the construction industry and to reduce the mass loading of chemicals and suspended solids to the downstream drainage system and the receiving water bodies.</p>	Same as N-6	Same as N-6	Same as N-6; however, because the existing structure would not be dismantled, a separate SWPPP for dismantling would not be required.

### Temporary Change in the Volume and Area of Other Waters of the U.S. as defined by ACOE

Under the Clean Water Act, the ACOE considers fill in Other Waters of the U.S. to be solid material placed in jurisdictional waters below the Mean High Water Line (MHWL), which is approximately +1.42 meters NGVD (+4.63 feet) at Yerba Buena Island and the Oakland touchdown area. The analysis of fill in Other Waters of the U.S. does not include fill in special aquatic sites. Impacts to special aquatic sites are addressed separately.

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Change in Volume to Other Waters of the U.S.</b>	Would result in a net decrease of 41,000 cubic meters (54,000 cubic yards).	Same as N-6	Would result in a net decrease of 45,000 cubic meters (58,000 cubic yards).	Would result in a net decrease of 13,000 cubic meters (17,000 cubic yards).
<b>Change in Surface Area to Others Waters of the U.S.</b>	Would result in a net decrease of 0.80 hectare (1.97 acre).	Same as N-6	Would result in a net decrease of 1.05 hectare (2.59 acre).	Would result in a net decrease of 0.36 hectare (0.90 acre).

### Temporary Change in the Volume and Area of San Francisco Bay as defined by BCDC

Under the McAteer-Petris Act, BCDC considers Bay fill to be any solid, pile-supported, floating, cantilevered or high-level suspended material that is placed bayward of the Mean High Tide Line (MHTL) which is approximately +0.82 meters NGVD (+2.68 feet) at Yerba Buena Island and +0.84 meters NGVD (+2.77 feet) at the Oakland Touchdown area. Unlike the ACOE, the analysis of fill under BCDC's jurisdiction includes fill in special aquatic sites such as wetlands, eelgrass beds and sand flats.

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Change in Volume of the Bay</b>	Would result in a net increase of 48,000 cubic meters (63,000 cubic yards).	Same as N-6	Would result in a net increase of 42,000 cubic meters (54,000 cubic yards).	Would result in a net decrease of 12,000 cubic meters (15,000 cubic yards).
<b>Change in Surface Area of the Bay</b>	Would result in a net decrease of 7.12 hectares (17.6 acres).	Would result in a net decrease of 7.07 hectares (17.48 acres).	Would result in a net decrease of 6.25 hectares (15.44 acres).	Would result in a net decrease of 0.05 hectares and (0.13 acres).

### Construction Period Impacts to Special Aquatic Sites

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<p><b>Sand flats</b></p> <p>The sand flats located within the project area occur along the north side of the Oakland Touchdown area and along the southeast side of Yerba Buena Island, east of the U.S. Coast Guard facility. Their functions are foraging and roosting habitat for a variety of shorebirds.</p>	<p>Placement of a geotube for dewatering would impact approximately 0.69 hectare (1.70 acres) of sand flats along the north shore of the Oakland Touchdown area, resulting in a small reduction in roosting and feeding habitat for shorebirds.</p> <p><b>Mitigation</b>-On-site restoration of portions of sand flats following construction; off-site creation of tidal marsh ecosystem would include enhancement or creation of upland refugia for shorebirds.</p>	Same as N-6	<p>Trestles would temporarily impact 0.01 hectare (0.02 acre) along the south shore of YBI.</p> <p><b>Mitigation</b>-Same as N-6</p>	No impact

**Construction Period Impacts to Special Aquatic Sites (continued)**

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<p><b>Eelgrass Beds</b></p> <p>Five areas of eelgrass beds have been identified. There are two on the north shore of YBI, two on the south shore of YBI and one on the north shore of the Oakland Touchdown area. Their functions are food source, nursery, spawning ground, and/or habitat for resident and migratory species of birds, fish, and invertebrates.</p>	<p>Temporary impacts to 0.01 hectare (0.02 acre) of eelgrass at the Oakland Touchdown area from turbidity associated with dredging, pile driving, and barge maneuvering.</p> <p><b>Mitigation</b>-Would include utilization of dredge types and techniques that minimize turbidity and implementation of a turbidity control program; marking eelgrass beds outside access channel as Environmentally Sensitive Areas (ESAs); harvesting eelgrass from within the barge access channel and replanting in adjacent beds as a pilot program; restoring bathymetry of portions of barge access channel and replanting with eelgrass to facilitate eelgrass colonization; off-site creation of tidal marsh ecosystem.</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>No impact</p>
<p><b>Wetlands</b></p> <p>The tidal wetlands in the project study area are located along the north shore of the Oakland Touchdown area and the north side of Yerba Buena Island. These wetlands possess a moderate level of functions and values. The two non-tidal wetlands on the south side of the Oakland Touchdown area possess very limited functions and values due to the lack of wetland species diversity and human disturbance.</p>	<p>Caltrans would avoid potential construction period impacts to the tidal wetlands at the Oakland Touchdown area and Yerba Buena Island and the two isolated non-tidal wetlands at the Oakland Touchdown area by designating them as Environmentally Sensitive Areas (ESAs).</p>	<p>Same as N-6</p>	<p>Tidal wetlands at YBI would be marked as ESA's. No construction-period impacts to non-tidal wetlands at the Oakland Touchdown. For permanent impacts, see page S-33.</p> <p><b>Mitigation</b>-Off-site creation of non-tidal wetlands.</p>	<p>Same as N-6</p>

### Construction Period Impacts to Wildlife

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<p><b>Peregrine falcon</b></p> <p><b>Removed from Federal Endangered Species List. Protected by State Endangered Species Act and Migratory Bird Treaty Act.</b></p> <p><b>Mitigation would apply even though the falcon has been delisted.</b></p>	<p>Construction activities could impact breeding and nesting.</p> <p><b>Mitigation</b>-The Santa Cruz Predatory Bird Research Group would monitor the birds during their nesting period and if they show signs of disturbance during construction or dismantling operations, the eggs and/or chicks would be collected, raised off-site and eventually released at a natural site such as Point Reyes.</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>Same as N-6</p>
<p><b>Double-Crested cormorant and the Western Gull</b></p> <p><b>Protected by Migratory Bird Treaty Act.</b></p>	<p>If cormorants or gulls nest within construction work areas, nests could be disturbed during construction.</p> <p><b>Mitigation</b>-Caltrans would prevent nesting on the new span during construction.</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>Same as N-6</p>
<p><b>Black-crowned Night Heron, Allen's hummingbird, white-tailed kite, bank swallow, and Bewick's wren</b></p>	<p>Vegetation and tree removal on YBI may impact nesting on YBI.</p> <p><b>Mitigation</b>-Prior to the removal of vegetation and trees, a biological monitor would survey for nests. Vegetation and trees with nests or those adjacent to areas with nests would not be removed until the nesting is complete or to the extent feasible, vegetation and trees that need to be removed could be removed prior to the nesting season.</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>Same as N-6</p>
<p><b>Shorebirds</b></p>	<p>Construction period impacts to sand flats would cause a reduction in roosting and feeding habitat for shorebirds. In addition, a small portion of upland roosting habitat located on the south side of the Oakland Touchdown area would be temporarily displaced for use as a construction staging area. <b>Mitigation</b>-See mitigation for construction period impacts to sand flats.</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>A small portion of upland roosting habitat located on the south side of the Oakland Touchdown area would be temporarily displaced for use as a construction staging area. <b>Mitigation</b>-Same as N-6.</p>

**Construction Period Impacts to Wildlife (continued)**

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<p><b>California sea lion and harbor seal</b></p> <p><b>California sea lions and harbor seals are protected from harassment under the Federal Marine Mammal Protection Act.</b></p>	<p>Noise from pile driving may disturb harbor seals and sea lions when they are foraging in the area. Marine mammals swimming in the project vicinity would be temporarily displaced if they chose to avoid the area. <b>Mitigation-</b>Appropriate mitigation would be developed as necessary in coordination with National Marine Fisheries Service (NMFS) such as establishing a safety zone around pile driving activities and sound attenuation during pile driving.</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>Same as N-6</p>
<p><b>Gray Whale</b></p>	<p>Noise from the pile driving activity may disturb or impact the behavior of gray whales passing through the project vicinity. It is likely that whales will avoid the pile driving area during the 3-month period in which they are observed in the Bay. <b>Mitigation-</b>See mitigation for California sea lion and harbor seal.</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>Same as N-6</p>
<p><b>Chinook salmon, Steelhead, Green sturgeon, and Longfin smelt</b></p> <p><b>Steelhead are threatened under the Federal Endangered Species Act. Green sturgeon and longfin smelt are state and federal species of concern. Winter-run Chinook salmon are endangered at federal and state level. Spring-run is listed as federally proposed endangered. Fall-run is listed as proposed threatened at the federal level.</b></p>	<p>Potential increased turbidity and resuspended contaminants in water column due to dredging, pile driving, barge maneuvering, and trestle and cofferdam construction. Increased amounts of sediment in water could lower dissolved oxygen levels and adversely affect oxygen uptake by fish. <b>Mitigation-</b> Implementation of a turbidity control program. If construction sequencing permits, dredging would be avoided in shallow water during the peak juvenile out migration period (January 1 through May 31).</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>Same as N-6</p>

**Construction Period Impacts to Wildlife (continued)**

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<p><b>Pacific herring</b></p> <p><b>Pacific herring is a commercially important fish in San Francisco Bay monitored by California Department of Fish and Game.</b></p>	<p>Acoustical impacts and turbidity could affect winter spawning.</p> <p><b>Mitigation</b>-A qualified biologist would monitor construction during the spawning period (January to March). If spawning is observed in the project area, in-water activities such as dredging would be suspended within 200 meters (656 feet) of spawning and not resume for a period of up to 14 days. Would include utilization of dredge types and techniques that minimize turbidity, and implementation of a turbidity control program.</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>Same as N-6</p>
<p><b>Fish (in General)</b></p>	<p>Pile driving may have impacts on fish within the immediate vicinity. During the PIDP, injury and mortality of small fish (anchovies, herring, and perch) were observed within the immediate vicinity of pile driving operations.</p> <p><b>Mitigation</b>-Noise attenuation measures would be used for any pile driving during the peak juvenile salmon outmigration period that will protect the non-salmonid species as well.</p>	<p>Same as N-6</p>	<p>Same as N-6</p>	<p>Same as N-6</p>

## Construction Period Impacts to Cultural Resources

Discussed under permanent impacts to Cultural Resources identified earlier in the table.

### Construction Period Excavation and Dredging

The Dredged Material Management Office (DMMO) approved the Sampling and Analysis Plan (SAP) and the Sediment Sampling and Analysis Report (SAR). The purpose of the plan and report was to collect and analyze sediment samples from new pier locations and access dredging necessary for Replacement Alternative N-6. Additional sediment characterization may be required by the DMMO if an alternative other than Replacement Alternative N-6 is selected. For all replacement alternatives, the sediments in the barge access channel for dismantling the existing bridge would need to be characterized in the future. The Dredged Material Management Plan describes reuse/disposal of materials and can be found in Appendix M. The determination of the DMMO concerning reuse/disposal sites is discussed in Section 4.14.10-Construction Excavation and Dredging.

Impact Category	Replacement Alternative N-6	Replacement Alternative N-2	Replacement Alternative S-4	Retrofit Existing Structure Alternative
<b>Estimated Dredged Quantities</b>	Total estimated volume is 413,000 cubic meters (540,000 cubic yards).	Same as N-6	Total estimated volume is 417,000 cubic meters (545,000 cubic yards).	Total estimated volume is 116,000 cubic meters (152,000 cubic yards).