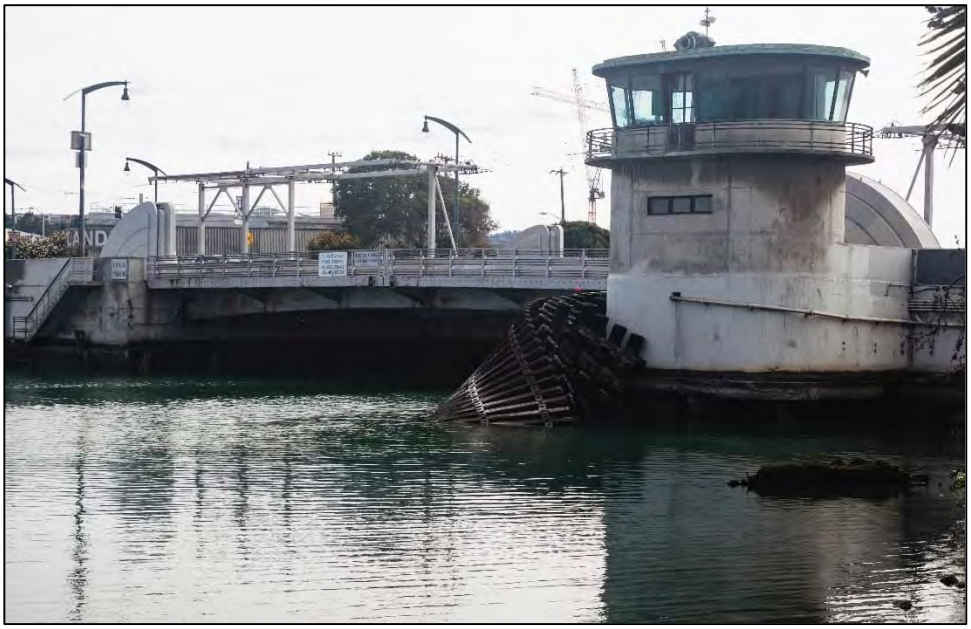


FINDING OF ADVERSE EFFECT

for the

Islais Creek Bridge Replacement Project

San Francisco, California

Federal Project No. BHLO-5934(168)

04-SF-0-CR

Caltrans

CALIFORNIA DEPARTMENT OF TRANSPORTATION

September 2024

FINDING OF ADVERSE EFFECT

for the

Islais Creek Bridge Replacement Project

San Francisco, California

Federal Project No. BHLO-5934(168)

Prepared by:

CHANDRA MILLER

_____

Chandra Miller
AECOM Senior Architectural Historian
Caltrans PQS-Equivalent Principal Architectural Historian
300 Lakeside Drive, Suite 400
Oakland, CA 94612

Reviewed for Approval by:

Kelli J. Alahan 09/30/2024

_____

Kelli Alahan
Caltrans PQS Principal Investigator Prehistoric Archaeology
Office of Local Assistance, Caltrans District 4 111 Grand Avenue
Oakland, CA 94612

Approved by:

T. Holstein 09/30/2024

_____

Tom Holstein
Caltrans District 4 Environmental Branch Chief
Office of Local Assistance, Caltrans District 4
111 Grand Avenue
Oakland, CA 94612

September 2024

TABLE OF CONTENTS

ATTACHMENTS

LIST OF PHOTOGRAPHS

ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
ADI	Area of Direct Impact
APE	Area of Potential Effects
ASR	Archaeological Survey Report
AWSS	San Francisco Fire Department Auxiliary Water Supply System
BERD	Built Environment Resource Directory
Caltrans	California Department of Transportation
CIDH	cast in drilled hole
CISS	cast-in-steel-shell
CCSF	City and County of San Francisco
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHRIS	California Historical Resources Information System
CIP	cast-in- place
DPR	California Department of Parks and Recreation
EA	Environmental Assessment
FAE	Finding of Adverse Effect
HBRRP	Highway Bridge Replacement and Rehabilitation Program
HPSR	Historical Property Survey Report
HRER	Historical Resources Evaluation Report
LRT	Light Rail Transit
MOA	Memorandum of Agreement
MUNI	San Francisco Municipal Railway
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places

NHPA	National Historic Preservation Act
NWIC	Northwest Information Center
OCRS	Office of Cultural Resource Studies
OCS	overhead catenary system
PA	Programmatic Agreement
PC/PS	precast/prestressed
PS&E	plans, specifications, and estimates
RC	reinforced concrete
SFPW	San Francisco Public Works
SFMTA	San Francisco Municipal Transportation Agency
SFPUC	San Francisco Public Utilities Commission
SHPO	State Historic Preservation Officer
SOI	Secretary of the Interior's
USGS	United States Coast Guard

1 INTRODUCTION

In 2018, San Francisco Public Works (SFPW), in cooperation with the California Department of Transportation (Caltrans) District 4, proposed to seismically retrofit the 1950-constructed double-leaf, bascule structure drawbridge Islais Creek Bridge (Bridge No. 34C0024) located along Third Street in the City and County of San Francisco (CCSF). Previous efforts under Section 106 of the National Historic Preservation Act (Section 106) for the original undertaking resulted in a Finding of No Adverse Effects with Standard Conditions because with the implementation of an Environmentally Sensitive Area and consistency with the Secretary of the Interior's Standards for the Treatment of Historic Properties, the project would not adversely affect the following resources in the Area of Potential Effects (APE): Islais Creek Bridge; the San Francisco Fire Department Auxiliary Water Supply System (AWSS); and the Central Waterfront / Potrero Point Historic District.

SFPW now proposes to demolish and remove the existing bascule leaves, trunnions, counterweights, all electrical equipment, and drive machinery associated with the bascule-drawbridge operability. These features will be replaced with a new 115-foot-long, 105-foot-wide, single-span precast/ prestressed (PC/PS) concrete adjacent box beams bridge at a higher elevation than the existing bridge structure. The structure will consist of 3-foot-wide and 4-foot-wide box beams. The beams would be 3-foot-6-inches tall with a 6-inch-thick concrete deck above, for a total structure depth of four feet. The new bridge will accommodate a center 24-foot-wide dedicated LRT trackway, two 11-foot travel lanes in each direction, a 12-foot-wide pedestrian path on the eastern side of the bridge, and a 17-foot-wide Class I shared pedestrian/bicycle path on the western side of the bridge. See Attachment A for the project vicinity map (Figure 1), and Area of Potential Effects (APE) map (Figure 2).

The supplemental project Section 106 compliance documents prepared for the project include a revised APE map, a First Supplemental Archaeological Survey Report (ASR), and a First Supplemental Historic Property Survey Report (HPSR).

The APE remains unchanged. A focused Area of Direct Impact (ADI) was expanded northward to accommodate potential excavation. No archaeological resources have been identified in the APE or the focused ADI. The following historic properties in the APE are:

- Islais Creek Bridge (Bridge No. 34C0024)
- San Francisco Fire Department Auxiliary Water Supply System (AWSS)
- Central Waterfront / Potrero Point Historic District.

AECOM prepared this Finding of Adverse Effect to assist with project compliance under Section 106 by applying the Criteria of Adverse Effect, set forth in Title 36 Code of Federal Regulations (CFR) 800.5, to historic properties in the APE. The

studies for this undertaking were carried out in a manner consistent with Caltrans' regulatory responsibilities under Section 106 (36 CFR Part 800) and pursuant to the January 2014 *First Amended Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act* (Section 106 PA).

This report concludes in a Finding of Adverse Effect of the project on a historic property (Islais Creek Bridge) pursuant to Stipulation X.C of the Section 106 PA, and Caltrans is consulting the State Historic Preservation Officer (SHPO) regarding this finding, pursuant to Stipulation XI of the Section 106 PA, and 36 CFR 800.6(a) and 800.6(b)(1). Due to the change from bascule-drawbridge to fixed-bridge operability, some features of the superstructure that were determined to contribute to the historic significance of the Islais Creek Bridge will be removed and not restored. Additionally, the bridge's historic function as a movable-span bascule-drawbridge will not be retained under the new fixed-bridge design. The removal of these historic features will result in an adverse effect on the Islais Creek Bridge.

This report concludes the project will not result in an adverse effect on the AWSS. Based upon the 2018 updated Department of Parks and Recreation (DPR) 523 recordation of the AWSS by ICF, the circa 1988-89 constructed high-pressure hydrant and below-grade distribution pipe within the APE were identified as non-contributing elements of the historic district because they post-date the resource's period of significance of 1908-13. While the hydrant and distribution pipe in the APE contribute to the function of the AWSS, they do not directly contribute to the historical significance of the district (ICF 2018: 2); therefore, the project will not result in adverse effects on the AWSS.

This report also concludes that the project will not result in an adverse effect on the Central Waterfront / Potrero Point Historic District historic properties as all contributing properties are far outside the ADI.

This report was prepared in compliance with Section 106 and the implementing regulations of the Advisory Council on Historic Preservation (ACHP) because they pertain to federally funded undertakings and their impacts on historic properties. This report follows the current format described in the *Standard Environmental Reference Handbook, Volume 2 – Cultural Resources, Exhibit 2.9: Finding of Adverse Effect Format and Content Guide* (Caltrans 2022).

This report does not include mitigation measures to resolve adverse effects on historic properties. Mitigation measures will be discussed in separate consultation documentation, accompanying a draft Memorandum of Agreement (MOA) under separate cover.

2 DESCRIPTION OF UNDERTAKING

San Francisco Public Works (SFPW) is proposing to replace the superstructure of the Islais Creek Bridge (Bridge No. 34C0024) (officially named the Levon Hagop Nishkian Bridge) along Third Street in the City and County of San Francisco (CCSF). The bridge is approximately 1,700 feet east of Interstate 280, and approximately 3,300 feet west of San Francisco Bay (the Bay). The bridge spans the Islais Creek Channel, a dredged, channelized, tidal embayment with predominantly armored shorelines that extends from the Bay to the site of the former outfall of the now culverted and buried Islais Creek.

The existing bridge is a double-leaf bascule structure (drawbridge) constructed in 1949 with an open steel-grate roadway draining to the bay, and concrete abutments. It is approximately 114 feet long and 100 feet wide. A California Department of Transportation evaluation in 2004 determined that the bridge was significant as an example of Art Moderne style applied to a bridge.

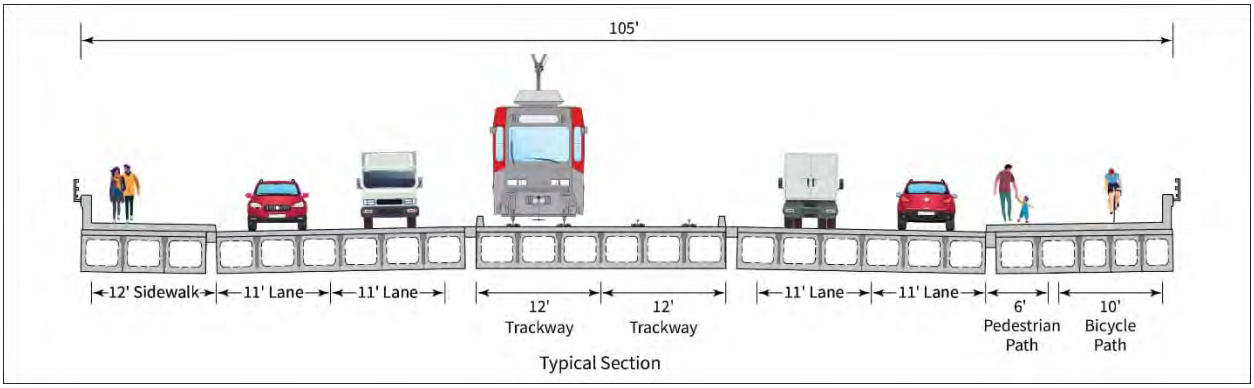
The project area is very susceptible to seismic liquefaction and the condition of the bridge's structural system is poor. The bridge originally carried only vehicular traffic, but now additionally carries MUNI light-rail tracks. The deteriorated condition of the bridge makes the bridge deck susceptible to vibration induced by heavy vehicles, trucks, and light-rail vehicles crossing the span.

The areas surrounding Islais Creek are at risk of flooding from heavy rainfall events, coastal storm surge, and wave hazards, which will be exacerbated by sea-levels rise and rising groundwater. The steel sections of the bridge are increasingly subject to the deleterious effects of corrosion and saltwater intrusion.

Standard Project Alternative

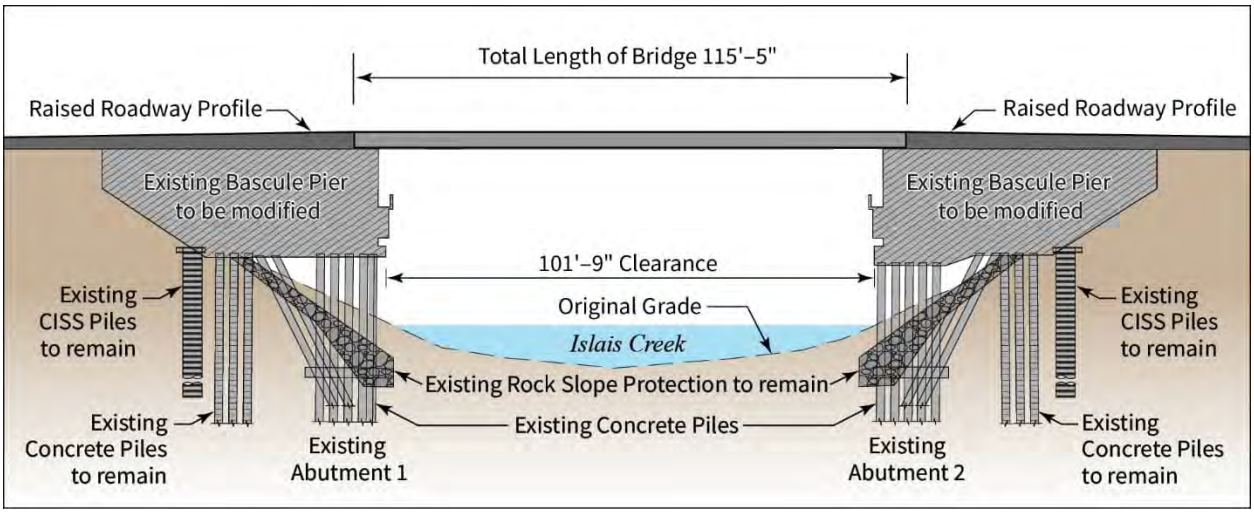
The Standard Project Alternative will remove the existing drawbridge leaves, which have not been opened for navigation for over ten years, and all other drawbridge features. These features will be replaced with a new 115-foot-long, 105-foot-wide, single-span precast/prestressed (PC/PS) concrete adjacent box beams bridge at a higher elevation than the existing bridge structure to improve freeboard for flood flows and to accommodate sea-level rise.

Proposed Bridge Cross Section



The structure will consist of 3-foot-wide and 4-foot-wide box beams. The beams would be 3-foot-6-inches tall with a 6-inch-thick concrete deck above, for a total structure depth of four feet. The new bridge will accommodate a center 24-foot-wide dedicated LRT trackway, two 11-foot travel lanes in each direction, a 12-foot-wide pedestrian path on the eastern side of the bridge, and a 17-foot-wide Class I shared pedestrian/bicycle path on the western side of the bridge. The reconstructed trackway and roadway will be designed to convey surface runoff to the existing combined sewer/stormwater system. The control tower will be demolished down to the sidewalk level and the remaining portion will be used to create a public observation platform.

Proposed Bridge Longitudinal Section



The project's accommodation of a shared bicycle/pedestrian facility (Class I or Class IV) is based on advanced planning between the San Francisco Public Utilities Commission, Port of San Francisco, and the San Francisco Municipal Transportation Agency in response to opportunities presented by the removal of

the bridge's drawbridge function per the City's Islais Creek Southeast Mobility Adaptation Strategy). Although not yet officially designated a bicycle facility, the Islais Creek Bridge and portion of Third Street connecting to Cargo Way will be adopted as part of the updated San Francisco Bicycle Network and citywide active transportation plan that is currently under way and expected to be completed in 2024.

Besides the Standard project alternative described above, there are two other alternatives under consideration.

No Build Alternative

Under the project's No Build Alternative, no modifications will be made to the Islais Creek Bridge; only routine maintenance will be performed. Deterioration will continue to be addressed through short-term remedies but existing bridge structural and seismic deficiencies will remain and worsen. There will be no increase in bridge freeboard, so flood risks to the bridge and light-rail operations will remain and will increase with sea-level rise.

Partial Preservation Alternative

The Partial Preservation Alternative includes the project features described above for the Proposed Project, but will include salvage, rehabilitation, and reinstallation of as many of the historic character-defining features of the original bridge as feasible. If it is determined that for reasons of safety, construction standards, or sound engineering practice any of the character-defining features are not salvageable for reinstallation, these elements will be replicated with substitute materials to recreate the historic appearance. The Control Tower will be retained, its foundation and window system retrofitted, and its damaged concrete repaired.

Construction will last 24 months and is assumed to begin no sooner than spring 2025. Bridge closure is expected to last the duration of construction. Detours that will route traffic to arterials that have capacity for the additional vehicles will be established to re-route traffic around the construction site. Detour routes will be developed during final design. The City of San Francisco will develop plans for substitute forms of transit to provide a comparable level of service during construction. The most probable replacement for disrupted light-rail service is a temporary bus service. Construction is anticipated to use typical eight-hour work shifts during daylight hours; nighttime and weekend construction is not anticipated. In addition to staging areas on the bridge approaches and on anchored barges, three potential off-site construction staging area options owned by the Port of San Francisco that are currently used for Port-related industrial purposes have been identified.

Construction of the proposed project would require temporary construction easements in the areas immediately adjacent to the Islais Creek Bridge within the existing street right-of-way; however, no relocations or property acquisitions would be required.

2.1.1 Alternatives Considered But Rejected

Bridge Rehabilitation Alternative

The Bridge Rehabilitation Alternative will include repair and replacement of components of the existing bascule bridge to bring the structure up to current seismic standards, as well as replacing and upgrading bridge safety features, with the objective of increasing the bridge's service life by an additional 50 years. Under this Alternative, the existing bascule leaves, bridge counterweights, span drive brakes, and bridge span locks will be replaced. The machinery systems, including the bridge trunnions (the pivot axles for the bridge leaves), trunnion bearings, pinion support columns, drive motors, drive machinery, and the electrical systems in the machine rooms (inside the abutment structures at both ends of the bridge) will be removed and replaced. The bridge sidewalks and railings will be modified to comply with applicable requirements to meet the Americans with Disabilities Act; and CCSF required standard control devices will be installed (including flashers, gates, and warning signs) to prevent pedestrians, bicyclists, and vehicles from entering the bridge during a bridge lift operation. The control tower, including the foundation and window framing system, will be repaired and upgraded to meet current seismic standards. The electrical, mechanical, and security equipment inside all levels of the control tower (including the basement) will be replaced. The existing submarine cable that supplies power to the south abutment machine room is damaged and will be replaced. After repair/placement of the steel bridge members and deck, rust removal, and corrosion mitigation, the bridge structure will be repainted/ recoated with a multi-part coating system designed for use in marine environments.

A NEPA Categorical Exclusion for the Bridge Rehabilitation Alternative was approved by Caltrans on February 13, 2018. However, the Bridge Rehabilitation Alternative was eliminated from future consideration because it does not meet the updated purpose and need, in particular the purpose of increasing the bridge's freeboard to the maximum extent practicable. In addition, maintaining an operable drawbridge has high capital and maintenance costs that are hard to justify The Bridge Rehabilitation Alternative also has a higher risk of bridge closure after an earthquake, which will impede disaster response functions that require bridge throughput.

New Bascule Bridge

Under this alternative, a new bascule bridge (with either operable or non-operable draw bridge functions) will be constructed to replace the existing bridge. The new bascule bridge will be constructed at the same elevation of the existing bridge and will include a center dedicated LRT trackway, two travel lanes in each direction, and a shared pedestrian/bicycle path on both sides of the bridge. The street work included in this alternative will be minimal, and will include the abutments or approaches and street deck over the bascule pier on both sides of the bridge.

While replacing the bridge as-is has potential schedule and budget benefits, it was eliminated from future consideration for reasons similar to the Bridge Rehabilitation Alternative. Because this alternative will be constructed at the same elevation as the existing bridge, it will not increase freeboard or the lifespan of the bridge relative to sea level rise. It will retain the same flood risk as the existing bridge despite being a new replacement bridge. The operable bridge option will be more vulnerable to flood risk due to the low elevation of the mechanical equipment. The seismic performance of this alternative is likely inferior to the fixed-bridge alternative. Therefore, this option has a higher risk of bridge closure after an earthquake, which will impede disaster response functions that require bridge throughput. This alternative will also have a higher construction cost due to the type and material of the bridge, as well as higher operations and maintenance cost under the operable bridge option. This increase in cost will be hard to justify when considering the alternative's inherent flood risk. The Standard Project Alternative will better address additional City needs, including sea-level rise resilience.

New Through Girder Bridge, Same Elevation

This alternative will include the construction of a new through-girder bridge similar to the Standard Project Alternative, but with the same length and elevation as the existing bridge. Similar to the Standard Project Alternative , the new bridge will include a center dedicated LRT trackway, two travel lanes in each direction, and a shared pedestrian/bicycle path on both sides of the bridge. However, the new cross section of the bridge will allow for a wider roadway than the existing bridge. The street work for this alternative will include the abutment modifications to support the new girders at both sides of the bridge, as well as a haunch to support the additional width of the new cross section. While the bridge under this alternative will be constructed at the same elevation as the existing bridge, it will have a higher clearance due to the use of through girders.

While this alternative will increase freeboard and the lifespan of the bridge relative to sea level rise and increase the structural seismic resiliency and serviceability of the bridge, it was eliminated from future consideration because it will not increase

bridge freeboard to the maximum extent practicable when compared to the Standard Project Alternative.

New Standard Girder Bridge, Raised

This alternative will include the construction of a new standard-girder bridge at a higher elevation than the existing bridge. Similar to the Standard Project Alternative, the new bridge will include a center dedicated LRT trackway, two travel lanes in each direction, and a shared pedestrian/bicycle path on both sides of the bridge. However, the cross section of the proposed bridge will be wider than the existing bridge. The street work included in this alternative will include abutment modifications to support the new girders, and to strengthen the deck over the existing bascule pier to support the fill at both sides of the bridge. Because the bridge will be raised, the approaches will also need to be regraded.

While this alternative will increase freeboard and the lifespan of the bridge relative to sea level rise and increase the structural seismic resiliency and serviceability of the bridge, it was eliminated from future consideration because it will not increase bridge freeboard to the maximum extent practicable when compared to the Standard Project Alternative.

New-Through Girder Bridge, Raised

This alternative will include a new 115 foot-long, 114 foot-wide, single-span PC/PS concrete through-girder bridge with a PC/PS concrete deck with a cast-in-place reinforced-concrete topping at a higher elevation than the existing bridge structure. The new bridge will accommodate a center 26-foot-wide dedicated LRT trackway, two 11-foot travel lanes in each direction, a 12-foot-wide pedestrian path on the eastern side of the bridge, and a 16-foot-wide Class I shared pedestrian/bicycle path on the western side of the bridge. The pedestrian/bicycle paths will be cantilevered off the exterior girders and would include a steel pedestrian/bicycle railing. The structure will consist of four through-girders. The two exterior girders will support the combined pedestrian/bicycle path and half of the vehicle lanes, while the interior girders will support the other half of the vehicle lanes and the LRT trackway. Approximately 3 feet 9 inches of the overall girder depth will be below the deck surface, with 4 feet 9 inches (exterior) and 5 feet 9 inches (interior) above the deck surface. The portions of the girders above the deck surface will serve as barriers between the trackway, roadway, and pedestrian/bicycle path.

While this alternative would increase freeboard and the lifespan of the bridge relative to sea level rise, and increase the structural seismic resiliency and serviceability of the bridge, is offers no benefits over the Standard Project Alternative yet would result in increased costs. It was therefore eliminated from future consideration.

2.2 Area of Potential Effects (APE) Description

The Area of Potential Effect (APE) and a focused Area of Direct Impact (ADI) for this project were developed by AECOM in consultation with Caltrans. The APE represents the maximum extent of project-related activities for the proposed undertaking and contains all area that could be permanently or temporarily affected by the project.

The APE (Attachment A, Figure 2, 2A-2D) extends around the Central Waterfront / Potrero Point Historic District that follows the south bank of the Islais Creek Channel west of Islais Creek Bridge to Interstate 280, then west to Pennsylvania Avenue where it extends north to 16th Street. It follows 16th Street east to the Bay and extends south to the south bank of the Islais Creek Channel. It continues west to the Islais Creek Bridge at Third Street. At Third Street, the APE extends south of the channel to a point approximately 50 feet north of the railroad tracks. The APE also incorporates a discontiguous area that encompasses the AWSS.

The ADI includes the footprint of the Islais Creek Bridge and encompasses the Islais Creek Channel from approximately 100 feet west of Tennessee Street to immediately west of the Illinois Street Bridge, and extends northward from the bridge on Third Street to Cesar Chavez for potential excavation to tie into existing storm/sewer drains within the public road right-of-way. The project would either replace the existing 415 feet of 15-inch-diameter vitrified clay pipe sewer line constructed in 1940 that is present under the Third Street roadway from Arthur Avenue/Cargo Way to Marin Street with new larger-diameter line or provide a second supplemental line. Work would also extend to existing laterals connecting to the existing line. Final design would be dependent on detailed hydraulic analysis. The vertical APE is based on the maximum depth of construction anticipated to be 80 feet below the floor of the existing abutment if cast-in-drilled-hole (CIDH) or cast-in-steel-shell (CISS) piles are necessary. No archaeological resources were identified in the ADI.

Three potential construction staging areas have been identified in the ADI. Tennessee Street right-of-way has been included for potential project construction laydown area. On the south side of the channel, a small area west of the bridge abutments is a potential construction laydown area, and at the southeast corner of the bridge includes Potential Staging Area 1. South and west of the Islais Creek Bridge are Potential Staging Areas 2 and 3 which are within the APE and ADI. One or more of these staging areas may be selected by the construction contractor and could be used to stage and store materials and equipment as well as construction vehicles. All staging areas are located on Port of San Francisco property or within the public road right-of-way. Refer to Figure 1 in Attachment A for the project vicinity and location map.

3 PUBLIC PARTICIPATION

The bridge project is funded through the FHWA funding program (Highway Bridge Replacement and Rehabilitation Program, HBRRP) which is administered by the Caltrans Highway Bridge Program, and is currently being undertaken by SFPW.

On February 10, 2022, a planning charrette was conducted with representatives from several CCSF departments including SFPW, San Francisco Public Utility Commission (SFPUC), the San Francisco Planning Department (Planning Department), Department of Emergency Management, Municipal Transportation Agency (SFMTA), Fire Department (SFFD), Police Department (SFPD), Port of San Francisco (Port), and members of the Planning, Engineering, and Environmental Consultant (PEC) team for the Port Waterfront Resilience Program to discuss possible design options to increase the flood resilience of the Islais Creek Bridge Project. The primary objective of the charrette was to deepen the collective understanding of constraints, benefits, and opportunities of different bridge design concepts, and to better understand the needs and uses of the concepts relative to each CCSF department. As part of the charrette, 22 different bridge configuration combinations were used to facilitate an initial screening process. The options were then narrowed to four options plus a "No Build" option for more detailed analysis. The options analyzed included construction of a new bascule bridge, construction of a new through girder bridge at the same elevation of the existing bridge, construction of a new standard girder bridge at a raised elevation and construction of a new through girder bridge at a higher elevation. The latter is the option that was advanced in the proposed project. The No Build option was deemed to pose an excessive safety risk and thus eliminated from the charrette discussion. The rehabilitation of the existing bridge is described as the Full Preservation Alternative. The remaining three options carried forward for further analysis and discussion during the charrette, as well as the reasons these options were rejected, are described below. None of these options would avoid the removal of all the character-defining features of the bridge.

<u>San Francisco Planning Department</u>

As part of the interested parties outreach and consultation for the undertaking, AECOM, on behalf of SFPW, has worked closely with the Planning Department to explore alternatives to identify strategies that would address the adverse effects of the proposed project on the Section 106 historic property (the Islais Creek Bridge) while still accomplishing most of the project objectives. In preparing the preservation alternatives, the Planning Department and SFPW explored several different approaches while considering the project objectives, character-defining features, and feasibility. Some of the design constraints discussed included the existing location and height of the control tower. Because the proposed project raises the height of the bridge and widens the sidewalk, it would affect the bridge's relationship and connection to the tower, which is a character-

defining feature. Some early alternative explorations included cutting the tower at the basement level to relocate the tower onto the shore, or raising the tower to match the elevated height of the bridge, or demolishing and rebuilding the tower in the same location but at a higher elevation to match the new elevation of the bridge. Planning Department staff and SFPW ultimately identified two alternatives: a Preservation Alternative that meets most of the project objectives while still retaining the majority of the bridge's character defining features, and a no project alternative that would include no demolition, construction, or any improvements to the Islais Creek Bridge. A wide variety of alternatives were explored for the Islais Creek Bridge Project. The proposed project would remove all the character-defining features of the bridge; however, it would meet all of the project objects including addressing sea-level rise, structural and seismic deficiencies, increase the serviceability of the bridge to improve safety and operational facilities of light rail operations, among other objectives. The Preservation Alternative would retain or replicate the majority of bridge's character-defining features while meeting the majority of project objectives.

San Francisco Historic Preservation Commission

The Planning Department, on behalf of SFPW, presented the preservation alternatives to the San Francisco Historic Preservation Commission (HPC) on May 17, 2023 as part of a public hearing regarding the project. Planning Department staff presented a short presentation on the project, described the methodology for developing preservation alternatives, and sought comment on the project by HPC staff and any members of the public. The following comments

- The HPC found the preservation alternative to be adequate and did not have any comments on the preservation alternative presented.
- Commissioner Wright asked if the sponsor had explored the feasibility of building a new bridge nearby and retaining the existing historic bridge as a possible preservation alternative.
- Commissioners were supportive overall of the proposed project and understood the importance of this infrastructure upgrade.
- Commissioners did have questions about how the proposed bridge replacement project fit within the City's larger approach for addressing sea level rise in the neighborhood.
- Commissioners Nageswaran and Wright suggested the proposed project incorporate public interpretation of the historical significance of the bridge, which could include salvage and reinstallation of some elements of the existing bridge.
- Commissioners So and Foley expressed the importance of the T-line in providing essential transportation for residents and the need to provide a better transit connection for Bayview residents.

- Commission President Matsuda requested additional information about any community outreach that has been done as part of development of the proposed project. Commission President Matsuda expressed concern that the surrounding community needed to know about implications of the proposed project and related efforts to address sea level rise along Islais Creek.

Under Section 106 consultation, non-tribal interested parties letters were sent via email and certified mail by AECOM on behalf of the SFPW on September 25, 2023 to the following organization:

- San Francisco Heritage Society
- San Francisco Historical Society
- Armenian Engineers and Scientists of America
- Bayview Hunters Point Citizen Advisory Committee
- California Preservation Foundation

As of 30 days, no organizations had responded to the letters. Follow-up phone calls were conducted on November 14, 2023 and voicemails were left for each organization with the exception of the contact at the San Francisco Historical Society, whose mailbox was full. A second call was attempted on November 15, 2023 and a voicemail left. On November 15, 2023 the Armenian Engineers and Scientists of America requested AECOM to re-email the letter. AECOM emailed the letter with a copy of the original email; however, the email was undeliverable. On November 15, 2023, the Armenian Engineers and Scientists of America messaged AECOM that they would call at a future time.

Consultation with Native American tribes is summarized in the Supplemental Historic Property Survey Report prepared for this project.

4 DESCRIPTION OF HISTORIC PROPERTIES

4.1 Islais Creek Bridge

The Islais Creek Bridge (34C0024) was determined eligible for listing in the NRHP on December 7, 2005 by SHPO (FHWA051028B) and is a Caltrans Category 2 bridge (Caltrans Historical Significance Local Agency Bridges Log January 2023).

4.1.1 Physical Description of Historic Property – Islais Creek Bridge

Islais Creek Bridge (Bridge No. 34C0024) is a double-leaf bascule-type bridge with concrete abutments and measures about 100 feet wide and 160 feet long, with 52.5-foot-long bascule leaves. Among the most distinctive features of the bridge are quarter-round shaped girder housing units with Art Moderne detailing located near the four corners of the bridge. At the north and south ends of the center of the bridge are similarly stylized teardrop-shaped housing units. The units serve as a cap to cover the openings in the machinery pit roof where the ends of the bascule girders protrude. Each of the leaves features two riveted steel side box girders and a center box girder that run the length of the leaf. The top of these girders includes several small hatch doors. A heel girder runs the width and supports the concrete counterweights, which are located under the bridge deck. When the bridge leaves are lifted, the heel girder and counterweight drop into subterranean concrete machinery pits that are integrated into the bridge abutments and supported by concrete pilings. The concrete abutment sidewalls are visible from the sides of the bridge. The west wall of the north abutment and both walls of the south abutment feature steel hatch doors that provide access into the machinery pits. The door on the east side of the south abutment also includes a staircase with Art Moderne styled railings leading from the bridge deck to the hatch door. In comparison to the hatch door at the southeast corner, the doors on the west side are not as prominent, do not appear to have permanent exterior access, and are not currently operable.

The bridge carries four vehicular lanes flanking two sets of light rail tracks that run down the center of the bridge. The tracks are separated from the automobile lanes by short metal and concrete curbs. The roadway and tracks run across an open, steel-grate deck. Asphalt covers the roadway over the concrete abutments. The roadway is flanked on both sides by cantilevered, bracket-supported sidewalks with open, steel-grate decks and steel railings. The riveted steel side box girders form barriers between the roadway and the sidewalks.

The sidewalk railings consist of two horizontal rows of L-shaped rails and a top row of two L-shaped rails and a U-shaped cap rail that is similar in appearance to the L-shaped rails. There are small gaps between the individual rails in each row and larger gaps between the rows. Along the length of the bridge, the rails are supported by square posts. At the north and south ends of the railings and at the

center of the bridge, the L-shaped horizontal bars wrap back around on outside of the railings to the nearest post. The stylization of these railings is a key feature of the Art Moderne design of the bridge. The staircase railings leading to the hatch door on the east side of the south abutment differ from the main sidewalk railings. The staircase railings have two rows of two bars and a railing cap, all supported by square posts.

The bridge includes modern light poles at the four corners of the bridge and steel overhead catenary poles supporting light rail power lines that run down the center of the bridge. Four of these poles are attached to the center girder and are supported by angle braces that also attach to the girder. Replacement traffic control gates on the west side lanes for south bound traffic and on the east side lanes for north bound traffic are located just off the bridge structure. Automobile traffic lights are located near the control gates, and train traffic lights are located between the tracks. The light and catenary poles were added after 2004, and the control gates were installed at some point after 1997.

A concrete control tower, oblong in plan, is located at the northeast corner of the bridge. The two-story structure is accessed from a concrete walkway attached to the sidewalk and includes a passageway in the basement to the machinery pit on the north side of the bridge. The entrance features two metal doors, which open into the first-story storage room. A circular staircase leads up to the control room and down to the machinery pit passageway. The top floor includes a cantilevered balcony with bronze railing that wraps around the structure's perimeter. The control room features canted windows above a short wall. The tinted windows have bronze sashes and are separated by galvanized steel supports. Some of the windows have operable awning sashes. The first story wall features three small bronze-sash awning windows on each of the east and west sides. The roof is copper. The interior ceiling of the control room shows evidence of past water infiltration from the roof.

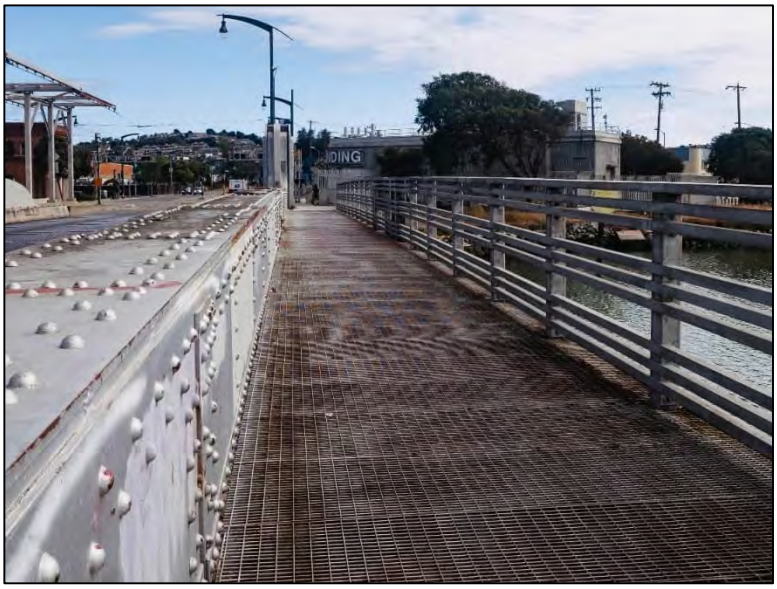
The bridge includes navigational lights at four different locations, although it is not known which are operational. The oldest appears to be located at the center of the bridge on the outer sides of the sidewalk decks. These lights were not included in the original as-built plans for the bridge, so it remains unclear whether they are original to the bridge. Nonetheless, they appear to exhibit the Art Moderne elements of the bridge. There is a light on top of the control tower and one on each fender system at the northeast and northwest corners of the bridge. These three lights are modern additions.

AECOM took the following photographs (Photographs 1 through 9) of the Islais Creek Bridge on May 28, 2022.

Photograph 1: Islais Creek Bridge with control tower at northeast corner, facing southwest

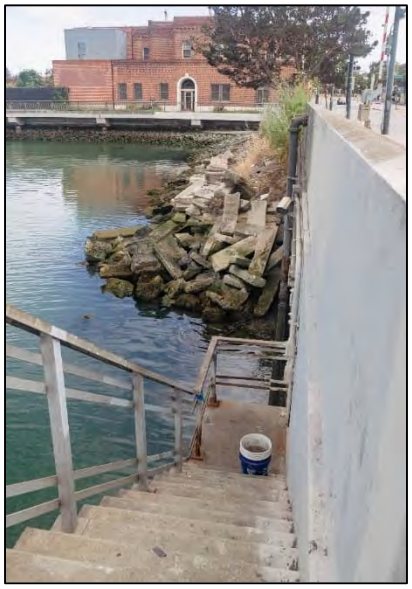
Photograph 2: Islais Creek Bridge, facing northeast

Photograph 3: Two quarter-round and one teardrop-shaped girder housing units with Art Moderne styling near the north end of Islais Creek Bridge, facing southeast



Photograph 4: Riveted steel side box girder, steel-grate sidewalk decking, and steel sidewalk guardrails with Art Moderne styling, facing south

Photograph 5: Sidewalls of concrete abutments and machinery pit, showing stairs on southeast corner leading to steel hatch, facing northwest



Photograph 6: South abutment steel hatch access with pared-down version of Art Moderne style sidewalk handrails, facing south

Photograph 7: Catenary poles for light rail trains, modern light fixtures and traffic gates, and replacement control gates, facing northwest

Photograph 8: Two-story, oblong-plan concrete control tower at the northeast corner of the bridge with fender pile system at base in waterway at base of tower, facing northwest

Photograph 9: Control tower with canted window configuration, walkway and handrails surrounding the top floor, copper roofing with overhang, and door and window configuration, facing south

4.1.2 National Register of Historic Places Significance – Islais Creek Bridge

The Islais Creek Bridge (Bridge No. 34C0024) was previously found eligible for listing in the NRHP as a result of a survey and evaluation for the Third Street Light Rail Project in 1997. The 1997 finding concluded that the bridge was eligible for listing in the NRHP under Criterion C at the local level because it is "an outstanding example of a Moderne style drawbridge." It was also found eligible as the work of a master, L.H. Nishkian because it "best expresses not only his engineering skill but his design sensitivity as well." The period of significance was identified as 1950, its date of construction.

The bridge underwent some alterations during the Third Street Light Rail Project in 2006, which added rail tracks to the bridge, which required removing some of the steel-grate decking. Additionally, steel was added to the floor system to support the rails, but this is not visible from the roadway. Because of the new steel and rails added weight to the bridge, additional mass was added to the counterweights, which is also not be visible from the roadway.

The project also added catenary poles and structured with overhead wires for light rail trains along the center of the bridge with some mounted on the top of the center steel boxed girder. The catenary poles and wires did not change the operation of the bridge.

The Caltrans Historic Bridge Inventory updates of the early 2000s included an evaluation of the Islais Creek Bridge, as a result of which the bridge was determined eligible on December 7, 2005 by SHPO (FHWA051028B).

The period of significance has been identified as 1950, the original date of construction. The boundaries of this historic property include the bridge from its approach at the north end to its approach at the south end. The bridge is eligible for listing in the NRHP under Criteria A and C at the local level of significance.

The character-defining features of the bridge are as follows:

- bridge type (i.e., bascule type bridge with two spans and concrete abutments);
- above-deck elements of the bascule leaves, including:
  - visible elements of riveted steel side and center box girders
  - quarter-round and teardrop bascule girder housing units with Art Moderne styling
  - steel sidewalk guardrails with Art Moderne styling, including the guardrails for the staircase leading to the abutment machinery pit entrance on southeast corner;
- steel hatch door on the east side of the south machinery pit;
- control tower location, design and materials, including:
  - the oblong plan
  - two-story (with basement) design
  - concrete walls
  - canted window configuration, size, and materials
  - copper roofing with overhang
  - walkway and handrails surrounding the top floor, and
  - door locations and configurations.

It should be noted that the following elements are not character-defining features because they do not contribute to the important design qualities of the bridge that make it significant under NRHP Criterion C:

- Bascule leaf structural elements, including:
  - end floor beams
  - stringers
  - cross-bracing
  - below-deck elements of side and center girders
  - steel decking, and
  - grid bars;
  - Bascule leaf lifting mechanisms and machinery located below the bridge deck and mostly in the abutments.

4.2 San Francisco Fire Department Auxiliary Water Supply System

Two components of the AWSS are in close proximity to the Islais Creek Bridge, a 1988-date stamped high-pressure hydrant, and a below-grade distribution pipe. Based on mapping of the system, it appears an underground pipe runs along Third Street south of the Islais Creek Bridge and terminates at the hydrant located on the east sidewalk of Third Street, approximately 50 feet south of the Islais Creek Bridge southern abutment. All other features of the AWSS are located well away from the Islais Creek Bridge.

4.2.1 Physical Description of Historic Property – AWSS

According to project plans, a short segment of AWSS below-grade water pipe is in close proximity to the Islais Creek Bridge. This pipe comes into the project construction site under the east side of the Islais Creek Bridge. This pipe comes into the project construction site under the east side of the southbound lanes on Third Street south of the Islais Creek Bridge. It proceeds east under the LRT tracks and continues north under the northbound lanes of Third Street turning to meet the fire hydrant located just south of the bridge's safety crossing arm. The pipe is not visible from the surface and plans do not indicate its material or size. It is presumed, based on the historical evidence reviewed for this report, that the pipe is cast iron. The length of pipe in the project construction site is less than 0.02% of the 135 miles of pipes in the AWSS.

The AWSS hydrant just south of Islais Creek Bridge is one of the system's high-pressure hydrants that is designed to supply a high flow without the use of a pumper engine. The date stamp on the bonnet and on the side of the hydrant states that this hydrant was manufactured in 1988. The three-foot tall hydrant is heavy cast iron with a diameter of 10 inches. According to the 2009 AWSS evaluation, hydrants in the AWSS are designed with bronze valves so that they can be used with salt water. This hydrant has a blue bonnet indicating that it is in the system's Lower Zone and is supplied from the Jones Street Tank, which is located at 1221 Jones Street (between Clay and Sacramento streets). The hydrant is one of approximately 1,600 hydrants in the AWSS.

The hydrant and pipeline were installed circa 1988-89 when the AWSS pipe and cistern networks were expanded to cover additional areas that lacked high-pressure protection (ICF 2018: 31).

AECOM took the following photograph (Photograph 10) of the AWSS hydrant just south of Islais Creek Bridge on April 26, 2022. There are no features of the AWSS distribution pipeline visible above ground.

Photograph 10: AWSS hydrant with blue bonnet at southeast corner of Islais Creek Bridge, facing north

4.2.2 National Register of Historic Places Significance – AWSS

In 2020 the AWSS was determined eligible for listing in the NRHP and CRHR (FHWA_2020_0312_001). The AWSS is significant under NRHP/CRHR Criteria A/1 because it is directly associated with the historically significant period of reconstruction in San Francisco following the 1906 earthquake and fires that destroyed 28,188 buildings, including almost all of the city's financial, retail, manufacturing, warehouse and produce districts, administrative buildings, dense working-class residential neighborhoods in the Mission and South of Market, and city infrastructure. The AWSS was a crucial component of San Francisco's recovery effort, as a highly important infrastructural system that provided fire protection to the city's most densely populated neighborhoods. Within the context of the city's recovery, the completion of the AWSS had a direct influence on fire insurance rates in the city and facilitated widespread building reconstruction, which may not have been possible had the system not been built. Following 1906, insurance companies kept rates extremely high, and in many cases refused to provide fire insurance at all until they could be assured that changes had been made to the city's fire protection system that will prevent the recurrence of failures that had occurred in 1906. After bond funding for the system was approved in 1908, and while the system was installed between 1908 and 1913, fire insurance rates did fall: in October of 1908, rates for new Class A buildings in the downtown business district were reduced between 50 and 75 percent, and rates in the Western Addition and other residential districts were reduced by 33 percent; in November of 1910, rates were reduced another 15 percent; and in November of 1913, when the system was declared officially complete by the city

engineer, the Board of Fire Underwriters promised a further rate reduction of 10 percent. Improved fire protection and reduced fire insurance rates within the area covered by the AWSS was an integral element that enabled the city to confidently reconstruct its financial district, retail and manufacturing districts, and residential neighborhoods. Construction of the AWSS represents a key effort during the recovery period following the 1906 earthquake, which involved concerted collaboration between insurance underwriters and city officials from multiple departments. Possibly more than any other resource in San Francisco, the AWSS clearly conveys the city's efforts to improve fire protection infrastructure in the aftermath of 1906 to bolster residents' and officials' confidence in the municipal firefighting infrastructure. The AWSS is associated with the historically significant period of reconstruction and for this reason is significant under NRHP/CRHR Criteria A/1. The period of significance under NRHP/CRHR Criteria A/1 is 1908–1913: this period begins when city engineers drafted a preliminary plan for the AWSS and city voters overwhelmingly supported a bond measure funding its construction, and ends when the Board of Public Works and the Board of Fire Underwriters certified that construction of the system was complete.

The AWSS is significant under NRHP/CRHR Criteria C/3 because it is a unique example of an emergency water supply system adapted to the specific geographic and seismic conditions of San Francisco, which required innovative design and engineering to meet the specific needs of the city after the 1906 earthquake and fires. Although San Francisco engineers began researching precedent examples of auxiliary water supply systems in other United States cities (including Boston, Buffalo, Cleveland, Providence, and Philadelphia) in 1903, and expanded their examination of other systems after 1906, they adapted their plans for the AWSS to address unique geographic and seismic conditions in San Francisco. The form the AWSS ultimately took reflects painful lessons learned from the 1906 earthquake's crippling effect on the city's existing firefighting system. Thus, the San Francisco system includes elements that had been used successfully in other cities, including high-altitude reservoirs and tanks that could feed the system by gravity, and fire boats that could pump a nearly endless supply of water into the system if needed. The system originally included other elements that are unique to San Francisco, including the following:

- An all-cast-iron pipeline connected solely to water supply sources and hydrants;
- Pipe joints that are selected based on pipe location, with bell and spigot joints in areas of solid ground and double spigot joints with sleeves in areas of filled ground;
- Leaded pipe joints in all locations for increased malleability in case of earthquake vibration;
- Reinforced concrete cisterns located in areas of filled ground, where distribution pipes are most likely to rupture;

- Triple redundancy in sources of available water, including fresh water from the Twin Peaks reservoir, salt water pumped from two salt-water pumping stations, and salt water pumped from San Francisco Bay via fire boats; and
- A system of gate valves within the distributing system, by which areas of pipe which are unavoidably located in areas of filled ground can be closed off if ruptured, protecting water and water pressure within the undamaged portions of the system.

Finally, almost every major distributive element of the system was constructed in duplicate, including a division within the Twin Peaks reservoir, two water storage tanks, two saltwater pumping stations, and two fire boats. While some elements of the system were not constructed as originally planned, including two fresh water pumping stations and a dedicated telephone system for the fire department, the construction of the AWSS represented an engineering achievement unique to San Francisco. The successful design and engineering with which the system was constructed are reflected in the fact that the system, for which the first campaign of construction ended 105 years prior to the preparation of the current study, has not been removed or replaced, but rather expanded and reinforced, and remains operational in the present day. The AWSS is a unique example of an auxiliary water supply system adapted to the specific geographic and seismic conditions of San Francisco, and for this reason is significant under NRHP/CRHR Criteria C/3.

The period of significance under NRHP/CRHR Criteria C/3 is 1908–1913: this period begins when city engineers completed their report for an auxiliary water supply system for San Francisco and contracts for its construction started to be awarded, and ends in 1913, when the Board of Public Works certified that construction of the system was complete. Subsequent phases of construction of the system have expanded and reinforced the essential engineering principles that were designed and installed during this period of significance, such that no post-1913 improvements introduced to the AWSS represent engineering or design advances that are significant in their own right. Improved facilities (such as new fireboats) and computer software control mechanisms, represent modern developments upon the original system operations but do not deviate substantially from the principles originally introduced and implemented between 1908 and 1913.

The following identification of character-defining features of the AWSS recognizes the significance of the system under NRHP/CRHR Criteria A/1 and C/3 for the period of significance 1908–1913.

Overall design and engineering of the AWSS

- Operation and physical separation independent of domestic water supply;
- Configuration of three separate pressure zones, based on elevation, capable of being combined into a single pressure zone;

- Multiple redundancies expressed through the paired reservoir bays, pumping stations, and water tanks, as well as a complex gridiron of pipes and means of receiving water from independent sources (cisterns, San Francisco Bay).

Twin Peaks Reservoir

Pumping Stations No. 1 and No. 2

Ashbury Tank and Jones Street Tank

High Pressure Hydrants

- Cast iron construction and original design of wide barrel and bonnet;
- Hydrants manufactured in 1909 and placed within the original extent of the AWSS;
- Painted bonnet signifying source of water: Twin Peaks Reservoir (black); Ashbury Tank (red); Jones Street Tank (blue);
- Sub-surface hydrant branch valve, expressed through covers embedded in the street surface and signified through the stamp on the hydrant's operating valve;
- Interior valves engineering design capable of withstanding high-pressure water flow;
- Configuration in discernible corridors adjacent to city streets, with hydrants generally located at or near corners or mid- block and spaced relatively regularly;
- Consistent placement of hydrants near the curb (generally between 18 and 24 inches);
- Continued function of the hydrants as outlets of high-pressure water used only for fire suppression.

Pipes and Valves

- Gridiron configuration of distribution pipeline delivering water from reservoir and water tanks to hydrant locations within the original AWSS extent, allowing multiple routes to any one hydrant;
- Presence of valves at the ends of blocks that can isolate a given block if the pipeline ruptures;
- Design and construction of cast iron pipes and isolation gate valves located in the original extent of the AWSS;
- Presence of cast iron utility covers signifying the location of gate valve chambers, bearing the letters "HPFS" (high- pressure fire system;
- Connections to fireboat manifolds and two salt water pumping stations;
- Continued function delivering water to the AWSS and ability to withstand pressurized water.

Cisterns

- Round or ellipse shaped configurations of cisterns constructed before 1913, generally located at street intersections;
- Reinforced concrete construction;
- Separation from the AWSS pipelines;
- Below ground position, expressed at the street surface by circular configurations of brick pavers;
- Presence of cast iron utility covers (generally once at center and one at edge) with letters reading "SFFD CISTERN;"
- Continued function storing water for firefighting use.

Manifolds

- Original design of symmetrical, cast iron assembly of two tapered arms;
- Ten plugged 3-inch inlets;
- Location alongside the San Francisco Bay waterfront (although specific locations of these features do not date to the period of significance);
- Connection to the AWSS pipelines;
- Continued function allowing SFFD fireboats to connect directly and pump salt water into the AWSS.

4.3 Central Waterfront / Potrero Point Historic District

The Central Waterfront / Potrero Point Historic District (P-38-004952) was identified within the Architectural History APE as a result of the records search conducted on December 1, 2015, at the NWIC at Sonoma State University, Rohnert Park by AECOM. The Central Waterfront / Potrero Point Historic District was evaluated as eligible for listing in the NRHP as a result of a 2001 DPR 523 District Record. Following the 2001 survey, the historic district was listed in 2002 in the Historic Property Data File as "3S," meaning it appears eligible for listing in the NRHP (Reference Number 4101-1125-9999). In 2008, Christopher VerPlanck, Rebecca Fogel, and Rich Sucré of Kelley & VerPlanck and Page & Turnbull prepared a DPR 523 District Record that documented the Central Waterfront / Potrero Point Historic District (also identified in that form as the Potrero Point Historic District). See Plate 1. The VerPlanck, et al. study found the historic district eligible for listing in the CRHR, but the recordation was not clear if the entire area surveyed was to be considered a single historic district, or if just the portions therein that were evaluated as such qualified as a historic district. As identified in the two previous studies, the southern boundary of the district follows along the south side of Islais Creek. However, all contributing elements identified in the previous studies on file at the NWIC are several blocks or more north of the Islais Creek Bridge (see Plate 2). Neither the 2001 nor the 2008 study mentioned the Islais Creek Bridge.

The 2015 record search did not identify records that indicate previous forms were reviewed or concurred on by SHPO. As such, this historic district has been assumed eligible for the purposes of this undertaking only, per Stipulation VIII.C.4. of the Section 106 PA.

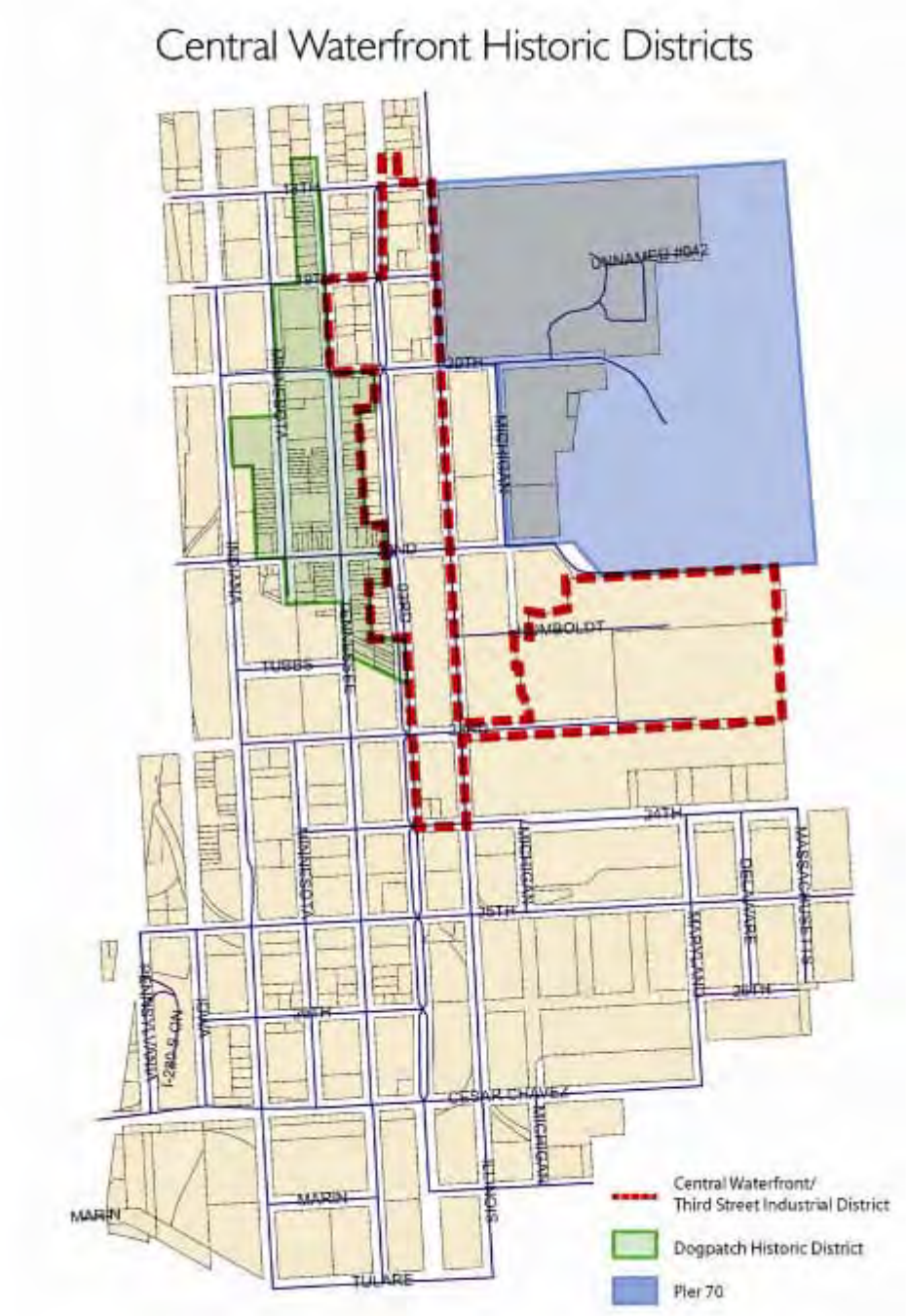


Plate 1. 2008 Central Waterfront / Potrero Point Historic District Boundary (Source: Kelley & VerPlanck and Page & Turnbull 2008)

4.3.1 Physical Description of Historic Property – Central Waterfront / Potrero Point Historic District

Based on the 2008 recordation, the Potrero Point Historic boundary begins at the northwest corner of Pennsylvania and Sixteenth streets, the northern boundary of the area extends east along Sixteenth Street into San Francisco Bay. The boundary turns ninety degrees and heads south through the bay encompassing the entirety of Piers 70 and 80. At Islais Creek Channel, the boundary makes a ninety degree turn and heads west along the southern shore of the channel. At the western end of Islais Creek Channel, the boundary shifts north and proceeds along Pennsylvania Street until it reaches the point of beginning.

The 2008 report identified three historic districts within the larger Central Waterfront / Potrero Point district: Pier 70, the Third Street Industrial District, and Dogpatch Historic District (see Plate 1). These were considered contributors to the Central Waterfront / Potrero Point Historic District. VerPlanck revised the period of significance to start in 1872 and end in 1958. The 2008 updated context statement and district record includes an updated period of significance spanning the years 1872 to 1958. The year 1872 indicates the date of construction of the earliest known building or structure in the area (the Thompson House at 718 Twenty-Second Street) and 1958 marks fifty years before the present year (2008), a standard threshold used by the National Park Service in evaluating historic properties.

In 2008, VerPlanck described the building types in the historic district as ranging from “large multi-story brick, concrete, and steel-frame industrial buildings along the waterfront, to smaller pre-World War II brick and concrete light industrial structures along Illinois Third Streets, to lighter corrugated steel and concrete warehouses south of Twenty-Third Street. The residential enclave of Dogpatch is mostly characterized by frame single-family and multiple-family housing, most of which was built between 1880 and 1920.”Buildings or structures that are assumed to contribute to the Central Waterfront / Potrero Point Historic District are on several blocks north of the Islais Creek Bridge. Only a small section of Third Street from the south end of the Islais Creek Channel to just north of the Islais Creek Bridge is within the project construction site. None of the properties listed as contributors to the Central Waterfront / Potrero Point Historic District are located adjacent to or near the Islais Creek Bridge. See Plate 2.

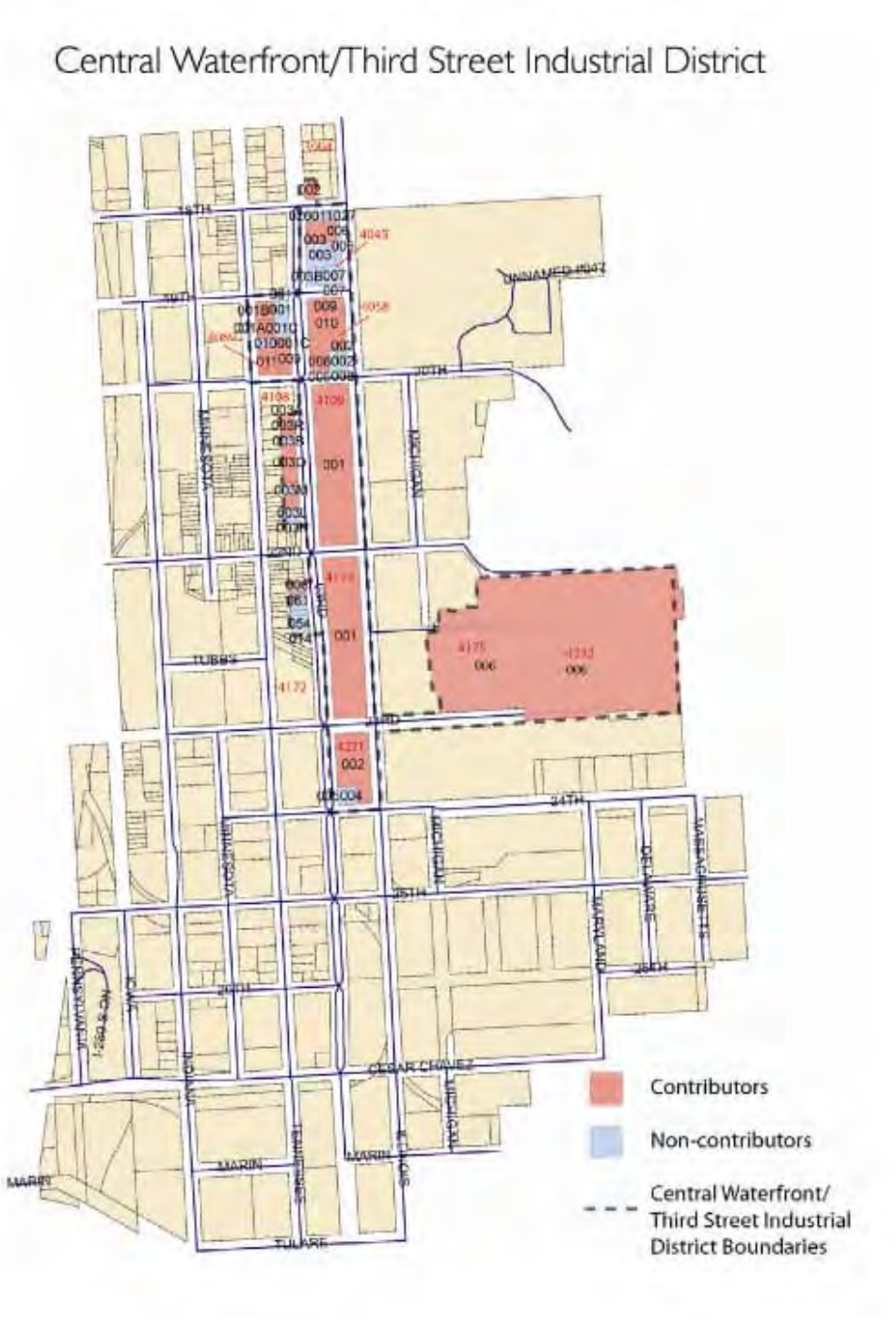


Plate 2. 2008 Central Waterfront Contributors and Non-Contributors (Source: Kelley & VerPlanck and Page & Turnbull 2008)

Photograph 11: View of southern boundary of Central Waterfront / Potrero Point Historic District from north side of Islais Creek Bridge as viewed along Third Street, view facing north, July 6, 2022.

4.3.2 National Register of Historic Places Significance – Central Waterfront / Potrero Point Historic District

The Central Waterfront, inclusive of Pier 70, the proposed Third Street Industrial District, and the Dogpatch Historic District appears significant under Criterion 1 (Events) for association with the industrial development of the City of San Francisco from 1872 to 1958. The Central Waterfront Historic District contains a significant concentration of mixed-use industrial properties, associated residential and commercial properties, and civic infrastructure oriented to water, railroad, and road transportation. The district was the epicenter of major industrial production beginning in the late 1850s, and continuing through the end of World War II. During the World Wars, the Central Waterfront was a centerpiece of the single-largest shipbuilding region in the Western United States (and briefly, the world), employing up to 18,500 workers at the height of World War II. The district

also includes one of the only surviving grouping of workers' housing located adjacent to industrial sites in the City of San Francisco: the Dogpatch neighborhood. The Central Waterfront contains some of the most significant industrial buildings and structures in the West, primarily the historic industrial buildings and structures at Pier 70 associated with Bethlehem Steel and the earlier Union Iron Works. Elements of other important industrial facilities, including PG & E's Station A, the Western Sugar Refinery and the American Can Company, remain substantially intact.

Pier 70 is not a historic district, although it is informally treated as a potential National Register-eligible historic district by the City and County of San Francisco.

Dogpatch is a local landmark district in San Francisco and as such most contributors have a status code of 5D1, meaning that they are contributors to a local district; however, they are not considered historic properties under Section 106 of the NHPA.

.

The previous DPR 523 forms of the Central Waterfront / Potrero Point Historic District are in Attachment C.

5 APPLICATION OF THE CRITERIA OF ADVERSE EFFECT

5.1 Criteria of Adverse Effect

Section 106 regulations state that if there are historic properties in the APE that may be affected by a federal undertaking, the agency official shall assess adverse effects, if any, in accordance with the Criteria of Adverse Effect defined in 36 CFR 800.5. These regulations state an "adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that will diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association." Application of the criteria of adverse effect assesses how an undertaking will affect those features of a historic property that contribute to its eligibility for listing in the NRHP, specifically examining an undertaking's impacts on a historic property's historic integrity, i.e., location, design, setting, materials, workmanship, feeling, and association. Effects can be direct, indirect, and cumulative. Direct effects include physical destruction or damage. Indirect effects include the introduction of visual, auditory, or vibration impacts as well as neglect to a historic property, and cumulative effects are the impacts of this project taken into account with known past or present projects as well as foreseeable future projects. This section of the Finding of Adverse Effect (FAE) assesses the effect the project may have on the Islais Creek Bridge, AWSS, and Central Waterfront / Potrero Point Historic District, which are the historic properties in the APE.

To comply with Section 106, the Criteria of Adverse Effect (36 CFR 800.5[a][1]–[a][2]) were applied, as follows:

1) Criteria of adverse effect. An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that will diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

2) Examples of adverse effects. Adverse effects on historic properties include, but are not limited to:

i) Physical destruction of or damage to all or part of the property;

ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of

handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;

iii) Removal of the property from its historic location;

iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;

vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

5.2 Application of Criteria of Adverse Effect

The Criteria of Adverse Effect were applied to address potential effects of the project with or without the design option on each of the three historic properties within the APE.

Of the examples of adverse effects from 36 CFR 800.5(a)(2) listed above, the two most relevant for this project are:

> i) Physical destruction of or damage to all or part of the property;
>
> ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;

These types are addressed in this report.

Five of the examples are not applicable for this project. These are examples iii, iv, v, vi, and vii.

This project will not result in the removal of the historic properties from their location, nor change the character of the use of the properties or of physical features within the setting of the properties that contribute to their historic significance, including the AWSS and the Central Waterfront / Potrero Point historic district. The project also will not add visual, atmospheric, or audible elements that diminish the integrity of the significance of the property's historic

features or cause neglect to the properties that will cause deterioration. The historic properties are also not transferring out of federal ownership.

5.2.1 Effects Analysis for Islais Creek Bridge

The project proposes to replace the existing bascule bridge with a fixed-bridge design. These tasks are detailed in Section 2.

The project will cause physical destruction of or damage to all or part of the property, including removal of the bridge deck, elements associated with bascule operability with two spans and concrete abutments, quarter-round and teardrop bascule girder housing units with Art Moderne styling, steel sidewalk guardrails with Art Moderne styling, including the guardrails for the staircase leading to the abutment machinery pit entrance on southeast corner; steel hatch door on the east side of the south machinery pit, and the control tower location, design and materials that are character-defining features. Overall, the project would adversely affect the integrity of the design, setting, materials, workmanship, feeling, and association of the Islais Creek Bridge. The new bridge would be in the same location.

The alteration of the property is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines.

Therefore, the project will result in an adverse effect on the Islais Creek Bridge.

5.2.2 Effects Analysis for AWSS

The project proposes to replace the Islais Creek Bridge's existing bascule bridge with a fixed-bridge design adjacent to the AWSS. Neither the circa 1988-89 constructed hydrant nor the circa 1988-89 below-grade distribution pipeline in the APE are contributing elements to the AWSS historic district because they post-date the period of significance of the historic property. No indirect effects due to the change in setting resulting from the adjacent bridge replacement are anticipated on contributing elements or character-defining features of the discontiguous AWSS historic district located outside the project area. The project would not affect any aspect of integrity of location, design, materials, workmanship, feeling, or association of the AWSS historic district.

Therefore, the project will not cause an adverse effect on the AWSS.

5.2.3 Effects Analysis for Central Waterfront / Potrero Point Historic District

The project proposes to replace the Islais Creek Bridge's existing bascule bridge with a fixed bridge design adjacent to the Central Waterfront/Potrero Point Historic District. The northern abutment of the Islais Creek Bridge is located in the southernmost edge of the district boundary but is not a contributing resource to the Central Waterfront / Potrero Point Historic District.

The project will not have direct physical effects on the district or its contributors. As shown in Plate 2, the nearest contributor in the district is approximately 0.44-mile north of the Islais Creek Bridge at the northeast intersection of Third and 24th streets. The farthest contributor is approximately 1.04-mile north of the Islais Creek Bridge at the northeast intersection of Third and 18th streets. The project will alter the peripheral setting of the southernmost area of the district, but indirect visual, audible, or atmospheric adverse effects on the district are not anticipated, because the majority of the district contributors are not within close enough proximity to the bridge for the project to cause a significant change in their setting. The setting of the district contributors in closest proximity to the project area is urbanized with a variety of public utility, industrial, and commercial development, as it was during the period of significance, and the new bridge will not change that setting. While the district as a whole has undergone changes throughout its history, the project will not alter the district; therefore, it will not add to any cumulative effects on the district. The proposed project would not affect any aspect of integrity, design, materials, workmanship, feeling or association of any of the character-defining features of the identified historic districts and sub-regions, nor to any contributors to the districts or sub-regions. Therefore, the project will not cause an adverse effect on the Central Waterfront / Potrero Point Historic District historic property.

6 CONCLUSIONS

This FAE provides an assessment of the effect the project will have on historic properties in the APE. For the proposed undertaking, Caltrans finds that there are historic properties affected pursuant to the Section 106 PA Stipulation IX.B. Three historic properties are within the APE, including the Islais Creek Bridge (Bridge No. 34C0024), the AWSS, and the Central Waterfront / Potrero Point Historic District.

The Islais Creek Bridge was determined eligible for listing in the NRHP in 2005. The project will demolish and replace the existing Islais Creek Bridge. The demolition of the bridge will be a direct adverse effect on the Islais Creek Bridge.

Non-contributing elements of the AWSS historic district are in the APE. The historic property will not be directly, indirectly, or cumulatively affected by the project.

The Central Waterfront / Potrero Point Historic District is partially located within the APE, and is assumed eligible for the purposes of this undertaking only per Stipulation VIII.C.4 of the Section 106 PA. It will not be directly, indirectly, or cumulatively affected by the project.

Based on this effects assessment, Caltrans has determined that the undertaking will have an Adverse Effect on the Islais Creek Bridge and is seeking SHPO concurrence with these findings pursuant to Section 106 PA Stipulation XI.C and 36 CFR 800.5. Caltrans will continue consultation regarding resolution of adverse effects pursuant to Section 106 PA Stipulation XI, and 36 CFR 800.6 through preparation of a separate Memorandum of Agreement (MOA) in consultation with consulting parties. This document serves to obtain SHPO concurrence on Caltrans' Finding of Adverse Effect on historic properties. Mitigation measures will be discussed in a separate consultation document along with a draft MOA.

7 PREPARERS QUALIFICATIONS

This Finding of Adverse Effect report was prepared for Caltrans District 4 by AECOM Senior Architectural Historian Chandra Miller (MA, Public History, California State University, Sacramento). She meets the Secretary of the Interior's Professional Qualification Standards in Section 106 PA Attachment 1, equivalent to a Caltrans-PQS Principal Architectural Historian.

ATTACHMENT A

Figures

Figure 1. Project Vicinity & Location Map

Figure 2. Area of Potential Effects Map

N

0 1,000 Feet

DATA SOURCE
USGS (NAIP) Imagery 2022

AECOM

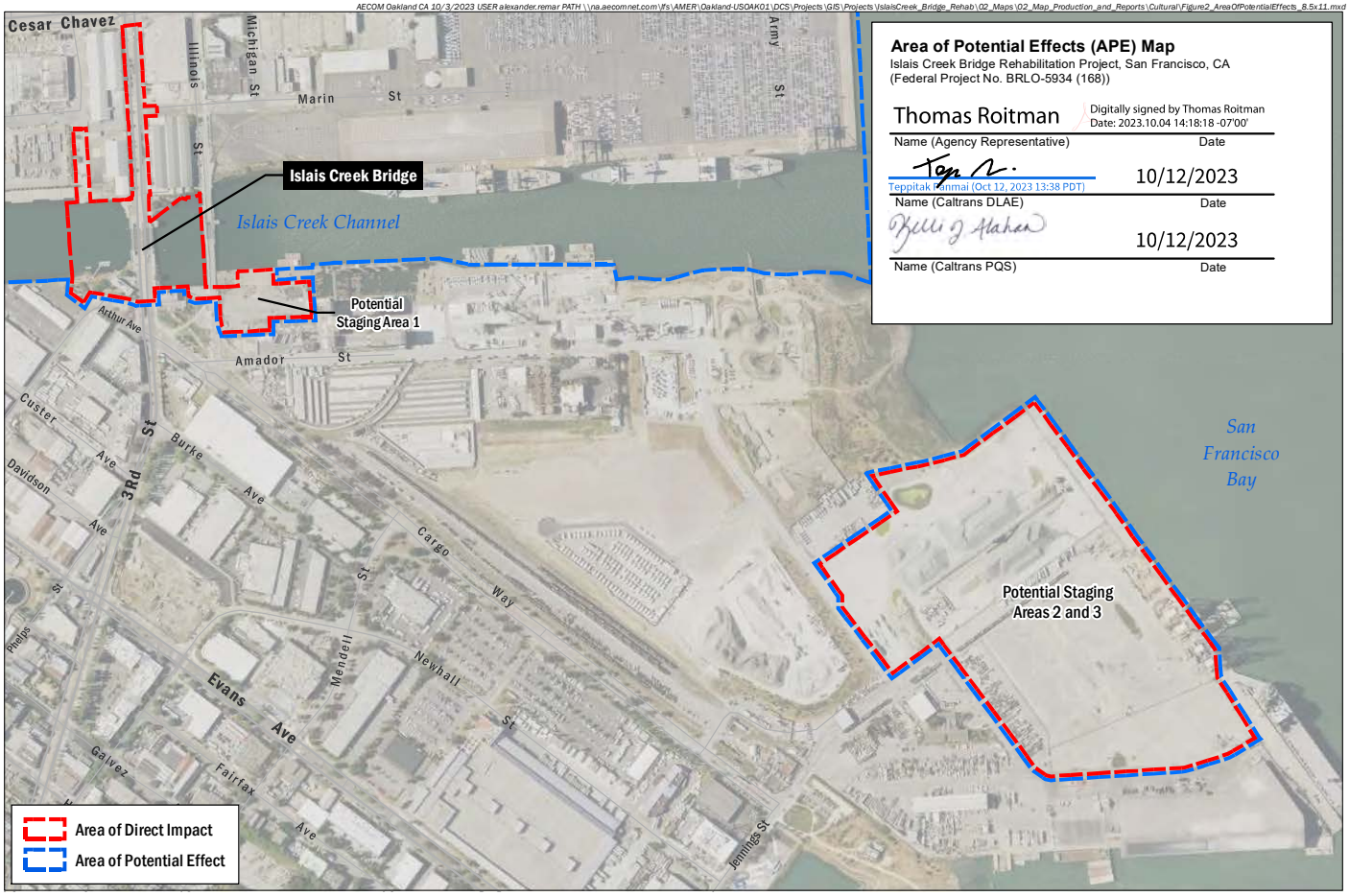
San Francisco Public Works

Islais Creek Bridge Replacement Project

FEDERAL PROJECT NO. BRLO-5934 (168)

FIGURE 1

Project Location and Vicinity Map



AECOM

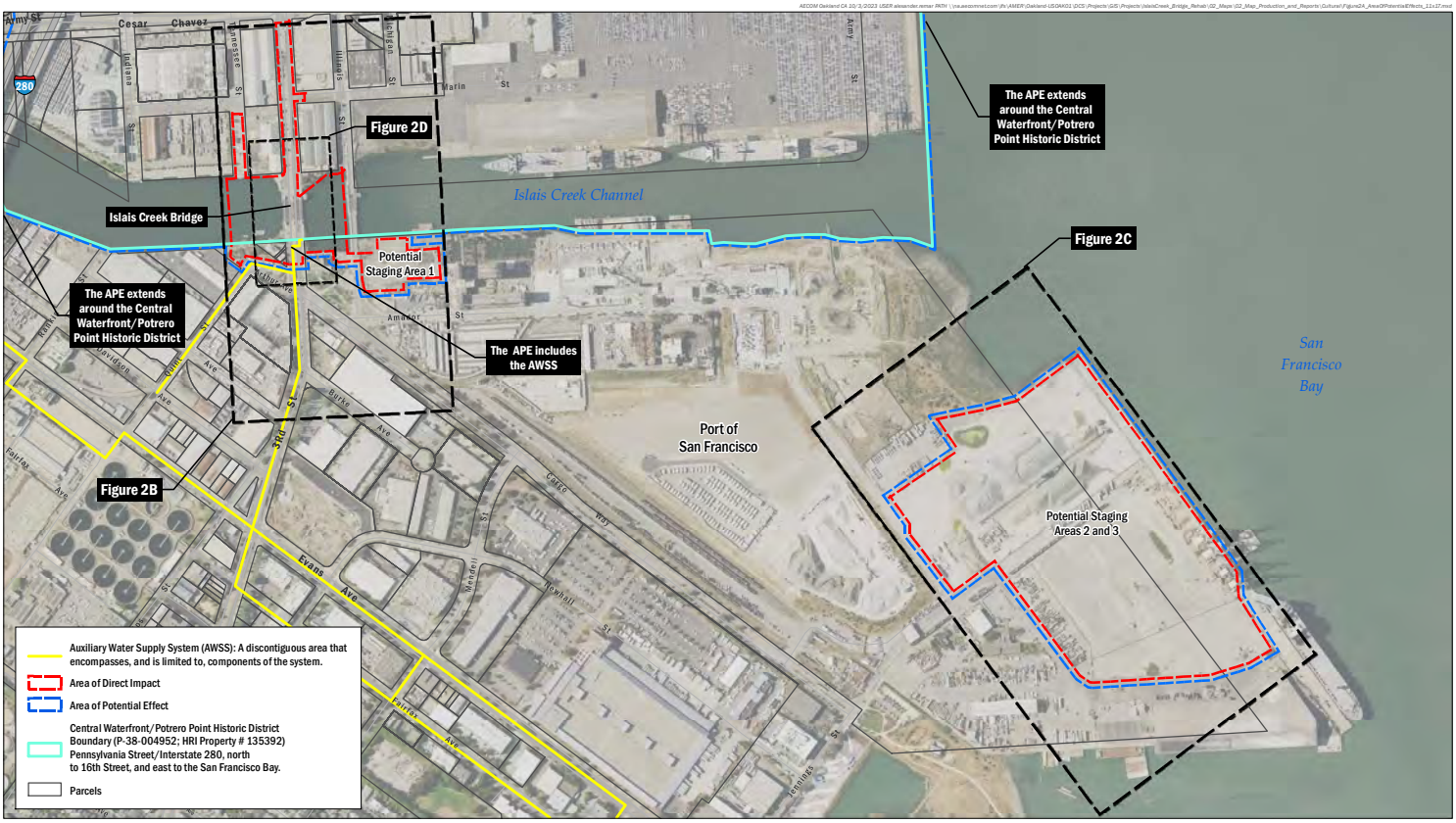
San Francisco Public Works

Islais Creek Bridge Replacement Project

FEDERAL PROJECT NO. BRLO-5934 (168)

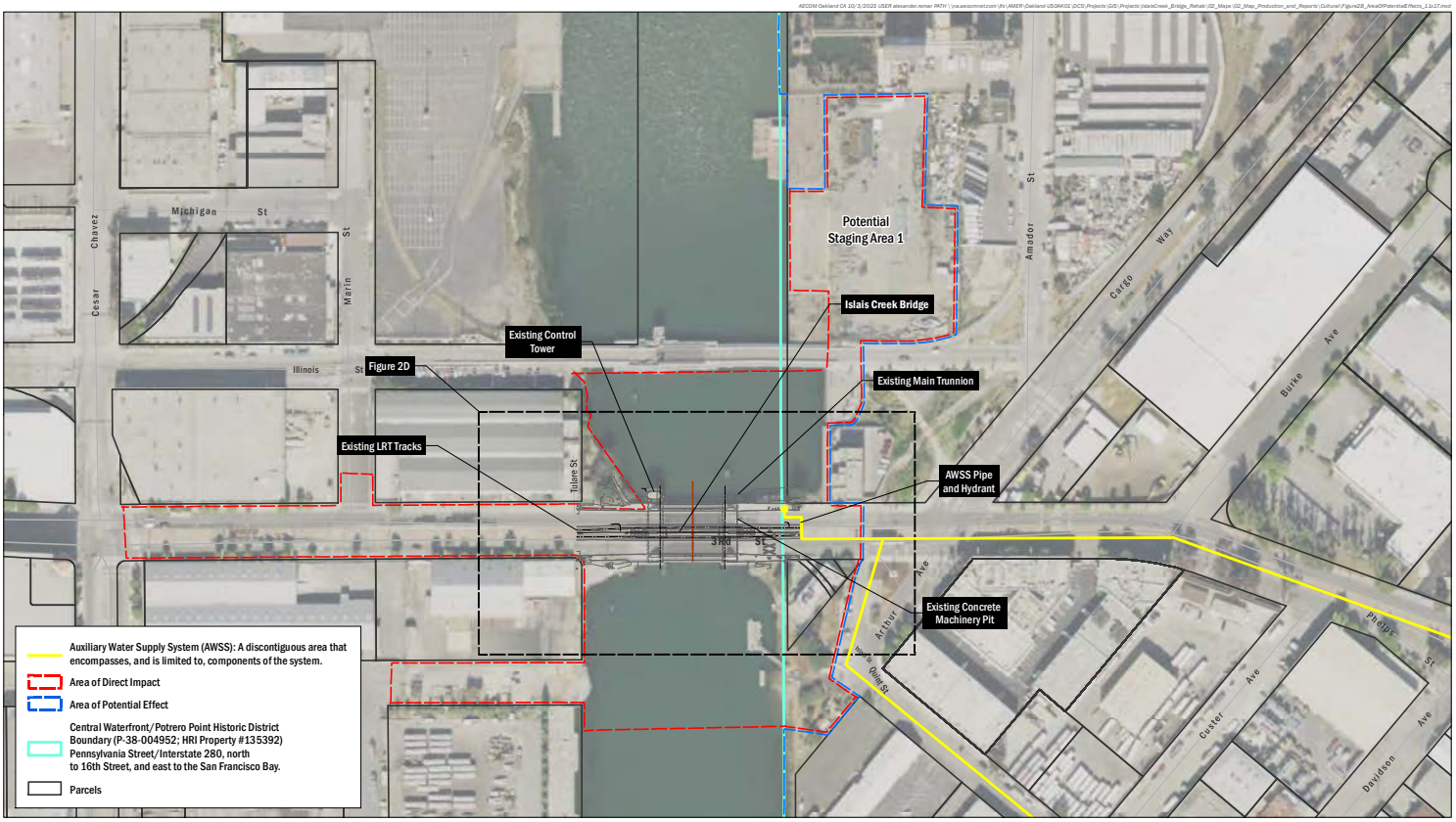
FIGURE 2

Area of Potential Effects



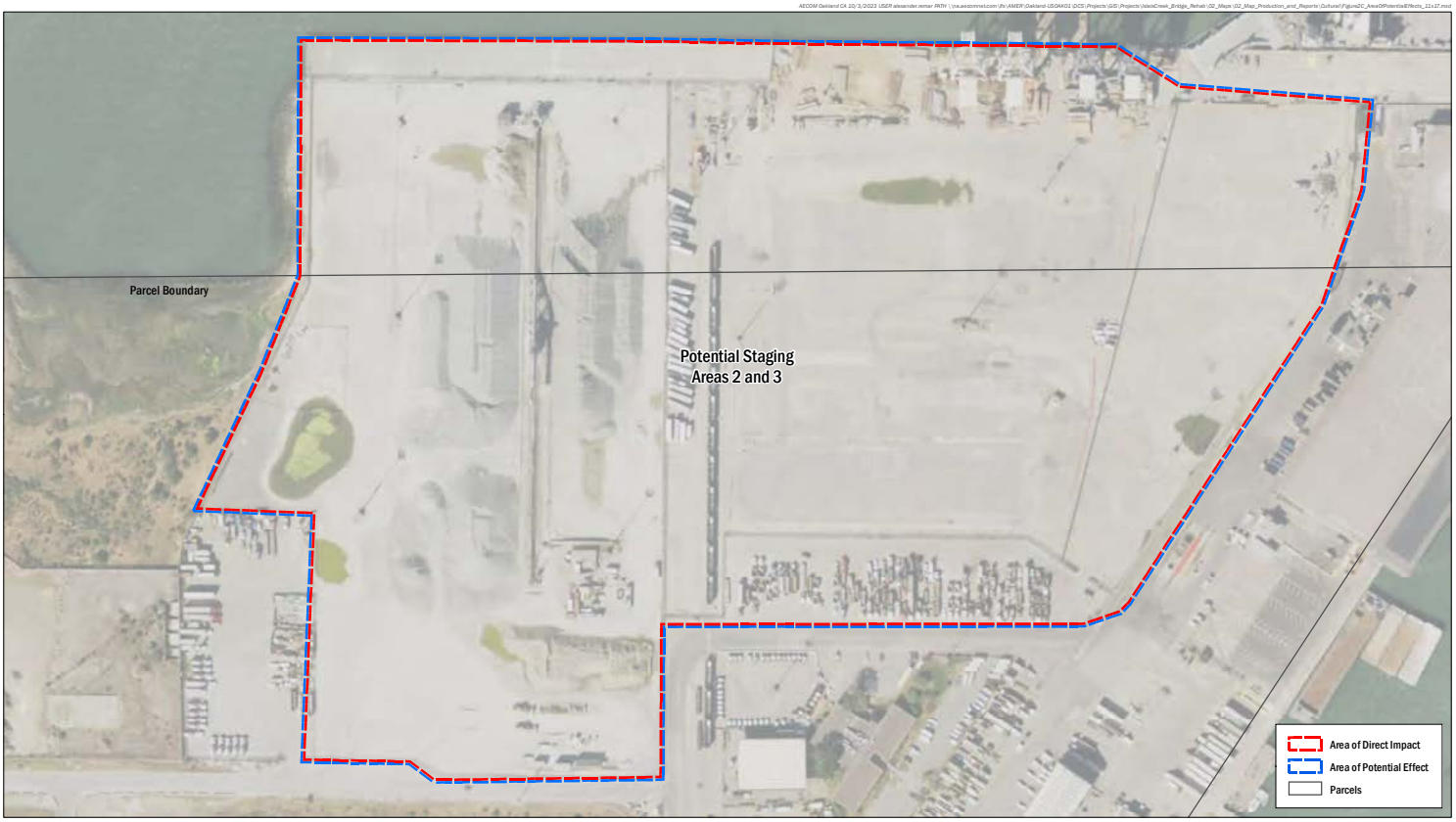
AECOM
San Francisco Public Works
Islais Creek Bridge Replacement Project
FEDERAL PROJECT NO. BRLO-5934 (168)

FIGURE 2A
Area of Potential Effects



AECOM
San Francisco Public Works
Islais Creek Bridge Replacement Project
FEDERAL PROJECT NO. BRLO-5934 (168)

FIGURE 2B
Area of Potential Effects

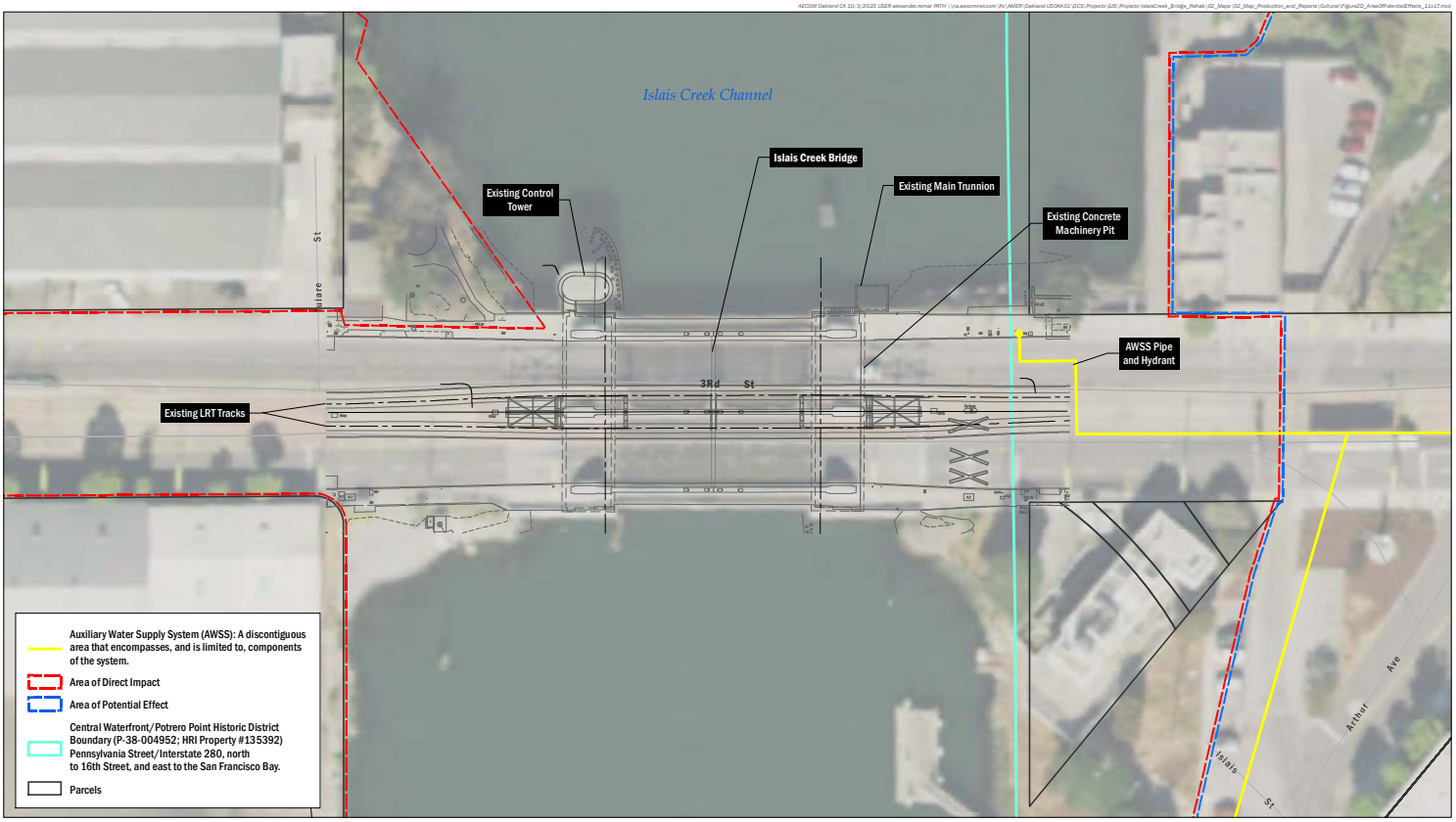


0 500
Feet

USGS (NAIP) Imagery 2022

AECOM
San Francisco Public Works
Islais Creek Bridge Replacement Project
FEDERAL PROJECT NO. BRLO-5934 (168)

FIGURE 2C
Area of Potential Effects



AECOM
San Francisco Public Works
Islais Creek Bridge Replacement Project
FEDERAL PROJECT NO. BRLO-5934 (168)

FIGURE 2D
Area of Potential Effects

ATTACHMENT B

Section 106 Consultation

Section 106 Consultation Log - Islais Creek Bridge Replacement Project, Federal Project No. BHLO-5934(168)			
Name/ Affiliation Contact Info	**Type of Contact**	**Date**	**Action/Response**
Kevin O'Brien **CEO and Executive Director** **San Francisco Historical Society** **608 Commercial St, San Francisco, CA 94111** **kobrien@sfhistory.org** **Phone: 415-537-1105**	Certified Mail	9/25/2023	Delivered 9/28/2023 (USPS Tracking 940711189956207433723)
	Emailed	9/25/2023	None
	Phone call	11/15/2023	Left voicemail
Stephen "Woody" LaBounty **San Francisco Heritage** **2007 Franklin St, San Francisco, CA 94109** **wlabounty@sfheritage.org** **Phone: 415-441-3000**	Certified Mail	9/25/2023	Delivered 9/28/2023 (USPS tracking 940711189956207433170)
	Emailed	9/25/2023	None
	Phone call	11/14/2023	Left voicemail
Cindy Heitzman **Executive Director** **California Preservation Foundation** **101 The Embarcadero #120, San Francisco, CA 94105** **cheitzman@californiapreservation.org** **Phone: 415.495.0349 x 3**	Certified Mail	9/25/2023	Requested re-delivery on 10/10/2023 (USPS tracking 940711189956207480366)
	Emailed	9/25/2023	None
	Phone call	11/14/2023	Left voicemail
Ace Tarakchian **President** **Armenian Engineers and Scientists of America** **326 Mira Loma Ave, Glendale, CA 91204** **contact@aesa.org** **Phone: (818) 547-3372**	Certified Mail	9/25/2023	Appears lost in transit as of 10/01/2023 (USPS tracking 940711189956207480197)
	Emailed	9/25/2023	None
	Phone call	11/14/2023	Left voicemail. AESA replied on 11/15/2023 requesting to re-email the letter. AECOM emailed the letter with a copy of the original email; however, the email was undeliverable. Aida at AESA messaged AECOM that they would call later on 11/15/2023.
Bayview Hunters Point **Citizen Advisory Committee** **1 Dr. Carlton B. Goodlett Place, San Francisco, CA 94102** **bayviewcac@sfgov.org** **Phone: 1-415-554-4928**	Certified Mail	9/25/2023	Delivered 10/28/2023 (USPS tracking 940711189956207433107)
	Emailed	9/25/2023	None
	Phone call	11/14/2023	Left voicemail

Patrick Rivera, PE, Acting Bureau Manager | Bureau of Project Management
patrick.rivera@sfdpw.org | T. 628.271.2456 | 49 South Van Ness Ave. 7th Floor, San Francisco, CA 94103

LETTER

TO: Ace Tarakchian — Sent via Registered U.S. Mail and email
President
Armenian Engineers and Scientists of America
326 Mira Loma Ave, Glendale, CA 91204
contact@aesa.org

FROM: Thomas Roitman, SE, PMP
Project Manager
San Francisco Public Works – Bureau of Project Management

DATE: September 25, 2023

SUBJECT: Section 106 of the National Historic Preservation Act Consultation
Federal Aid Project No. BHLO-5934(168)
Islais Creek Bridge Rehabilitation Project - San Francisco, California

Dear Ace:

San Francisco Public Works (SFPW) and the California Department of Transportation (Caltrans), are consulting with your organization regarding the proposed Islais Creek Rehabilitation project in San Francisco, California. The project is under the oversight of the Federal Highway Administration (FHWA). AECOM is assisting with the associated federal historic-preservation consultation process.

The 1950 Islais Creek Bridge, a double-leaf, bascule-structure drawbridge (Bridge No. 34C0024, officially named the Levon Hagop Nishkian Bridge) would be replaced due to structural deterioration. A single-span concrete bridge would be constructed at a higher elevation to address flooding and sea-level rise concerns. The bridge currently carries light-rail traffic for which it was not originally designed, which exacerbates its poor vibration tolerance. Its 2013 National Bridge Inventory Rating is 20 out of 100 ("poor"). (The National Bridge Inspection Standards are the standards established by the United States Secretary of Transportation that govern the safety inspections of highway bridges on public roads to maintain safe bridge operation and to prevent structural and functional failures.) Because of its distinctive Art Moderne design, it was deemed eligible for the National Register of Historic Places in 2005 with concurrence from the State Historic Preservation Officer (SHPO).

As the project is funded through a federal agency, project development must comply with Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires federal agencies to consider the impact of their actions on historic properties and to provide individuals and organizations with a demonstrated interest in the project with an opportunity to comment on these projects before implementation. The Act also obligates agencies to seek and consider the views of the public in a

manner that reflects the nature and complexity of the undertaking and its effects on historic properties, as well as the likely interest of the public in the effects on historic properties.

The bridge replacement project is considered an "Adverse Effect" under Section 106 of NHPA. We are developing a Memorandum of Agreement (MOA) with the State Historic Preservation Officer to minimize the adverse effect of the project to the historic resource, and we would like to hear from your organization regarding ideas and input on topics and implementation methods.

Please contact AECOM Architectural Historian Chandra Miller at Chandra.Miller@aecom.com or 1-916-917-9523 within 30 days of receipt of this letter.

Please see enclosure for an Area of Potential Effects (APE) map for the project.

Very Sincerely Yours,

Thomas Roitman,
Project Manager
San Francisco Public Works

thomas.roitman@sfdpw.org

415.297.0736

N

0 1,000 Feet

DATA SOURCE
USGS (NAIP) Imagery 2022

AECOM

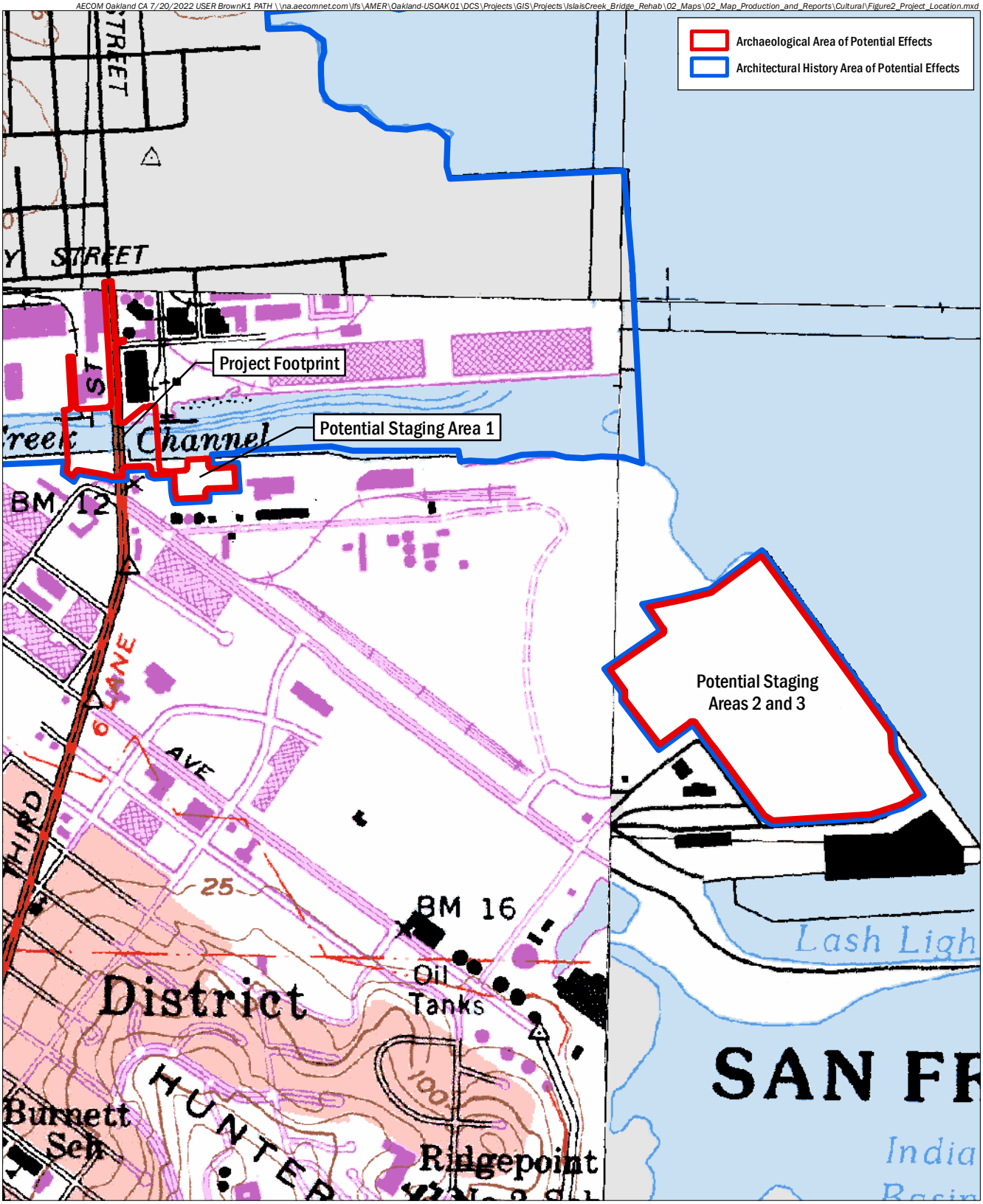
San Francisco Public Works

Islais Creek Bridge Replacement Project

FEDERAL PROJECT NO. BRLO-5934 (168)

FIGURE 1

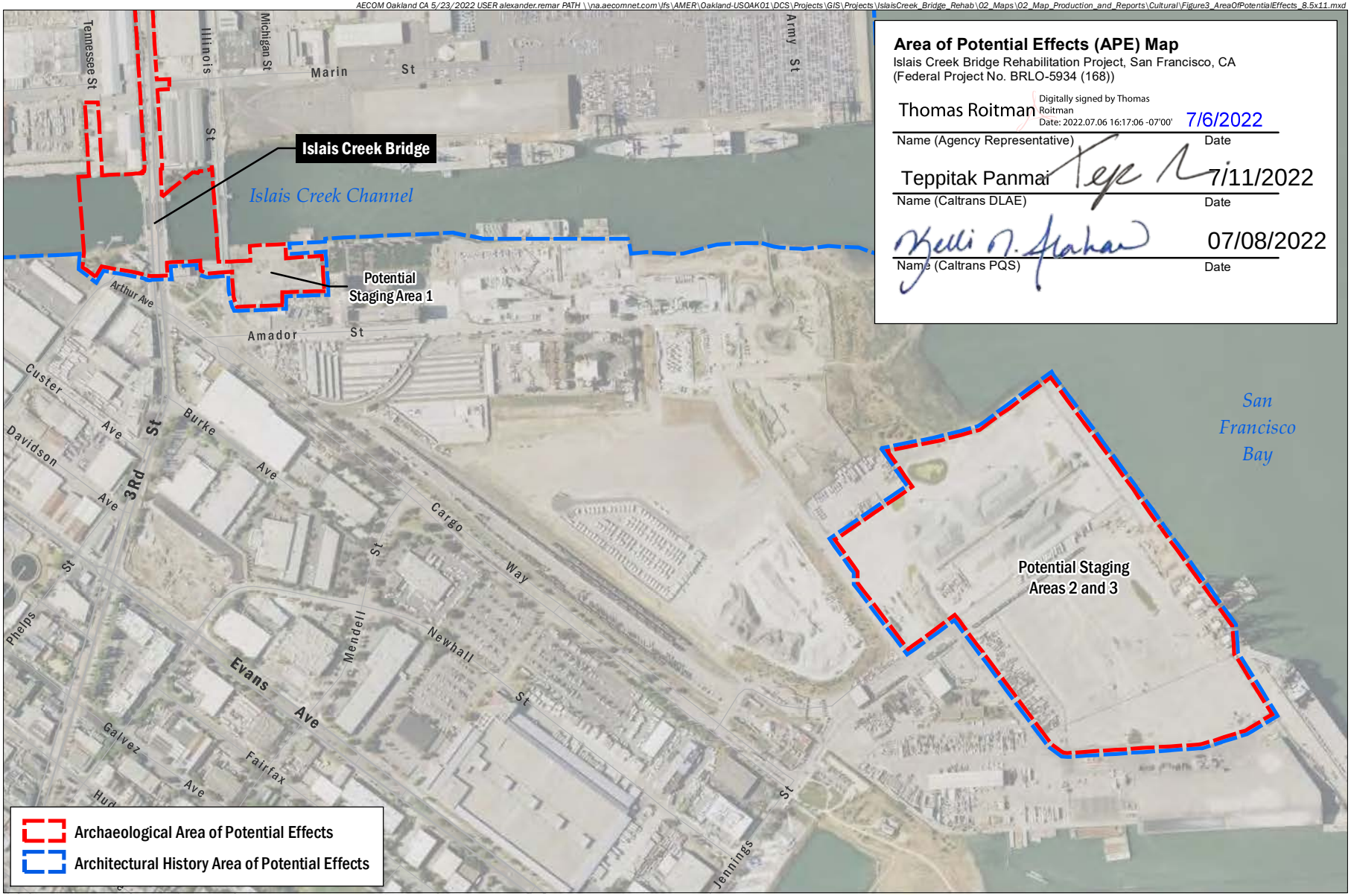
Project Vicinity



DATA SOURCE
CDFW, 2021. USGS 7.5-minuteTopographic Quadrangle - San Francisco North, San Francisco South, Oakland West, Hunters Point

AECOM
San Francisco Public Works
Islais Creek Bridge Replacement Project
FEDERAL PROJECT NO. BRLO-5934 (168)

FIGURE 2
Project Location



AECOM

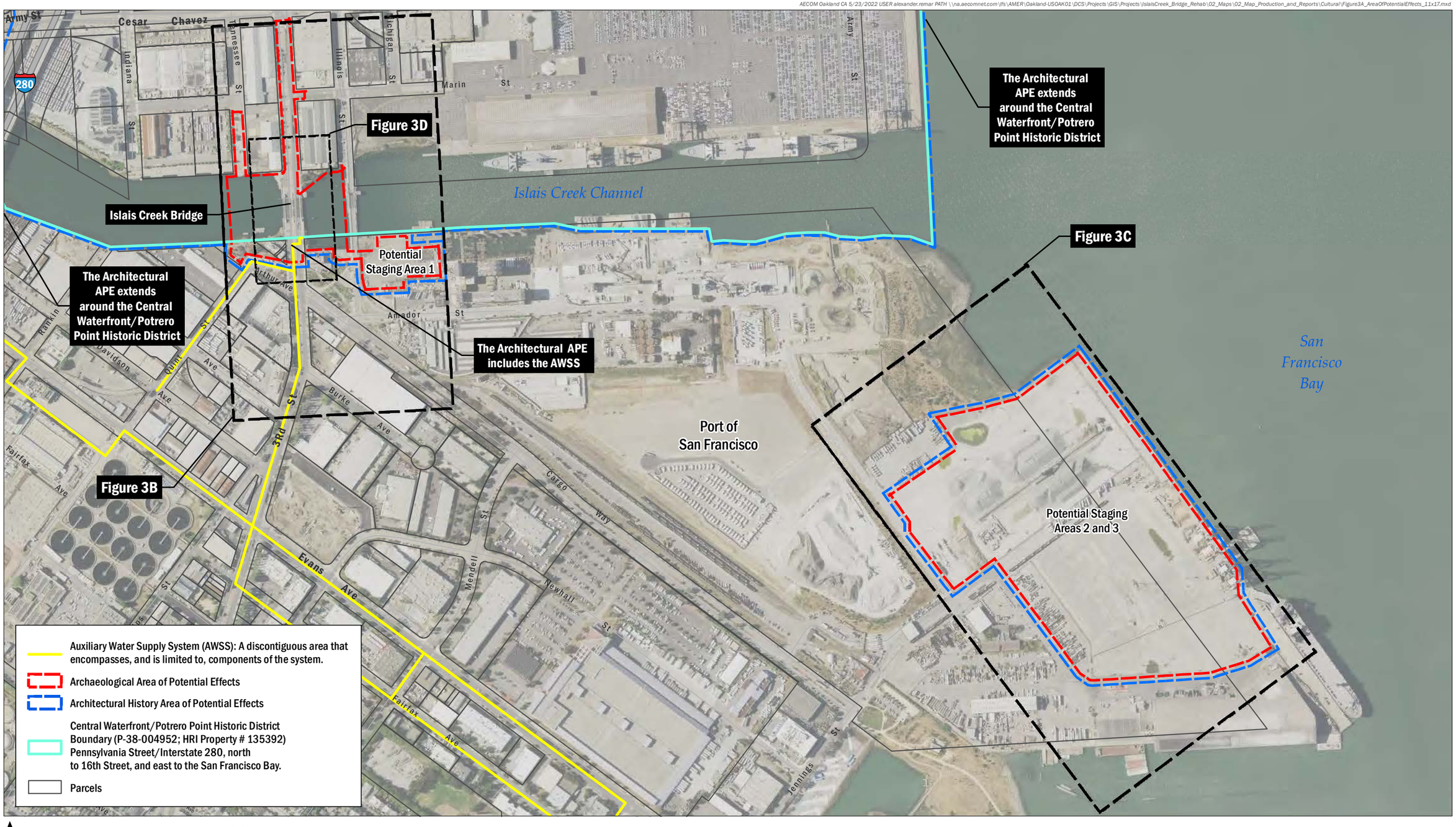
San Francisco Public Works

Islais Creek Bridge Replacement Project

FEDERAL PROJECT NO. BRLO-5934 (168)

FIGURE 3

Area of Potential Effects



AECOM

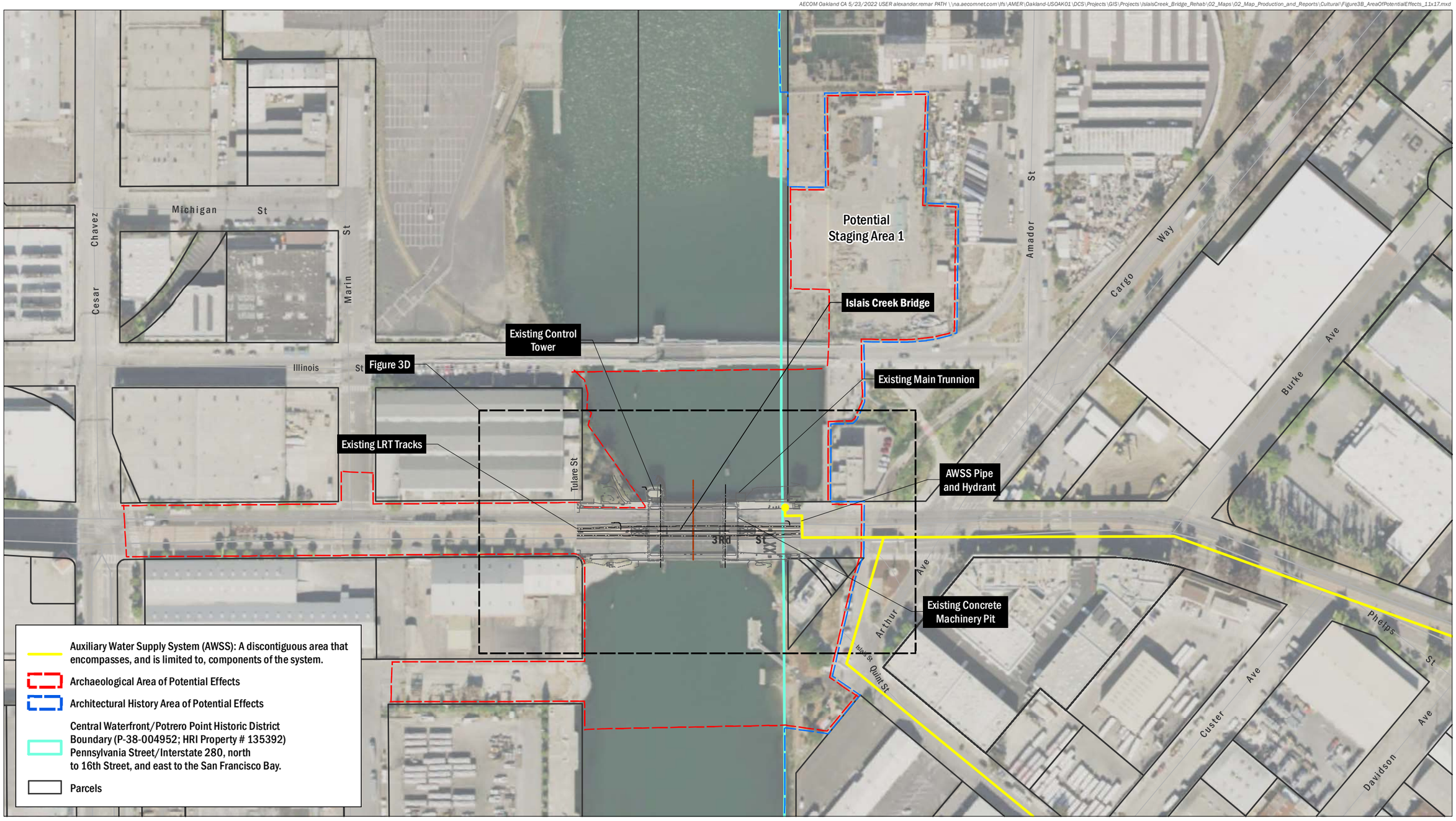
San Francisco Public Works

Islais Creek Bridge Replacement Project

FEDERAL PROJECT NO. BRLO-5934 (168)

FIGURE 3A

Area of Potential Effects



AECOM

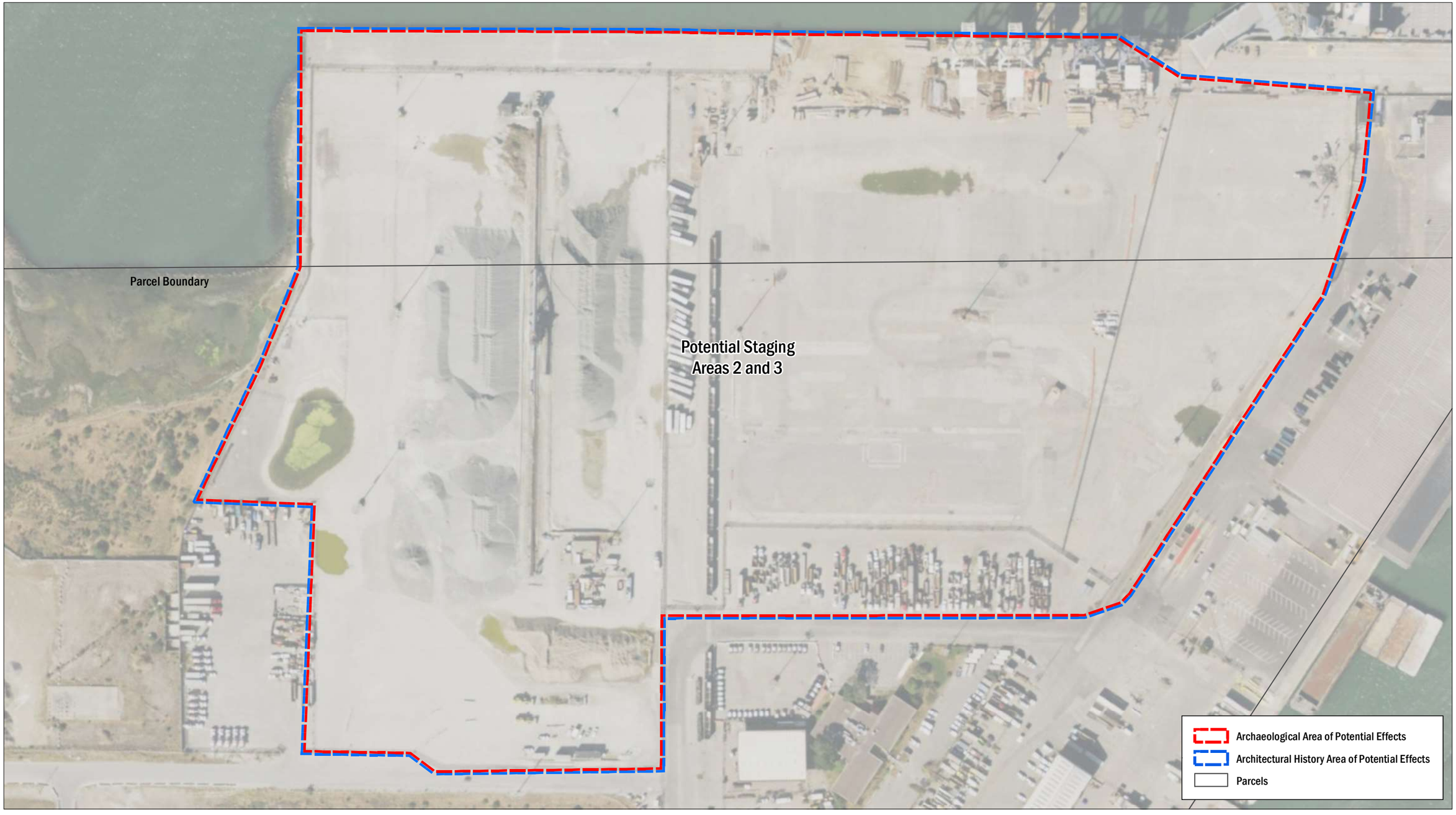
San Francisco Public Works

Islais Creek Bridge Replacement Project

FEDERAL PROJECT NO. BRLO-5934 (168)

FIGURE 3B

Area of Potential Effects

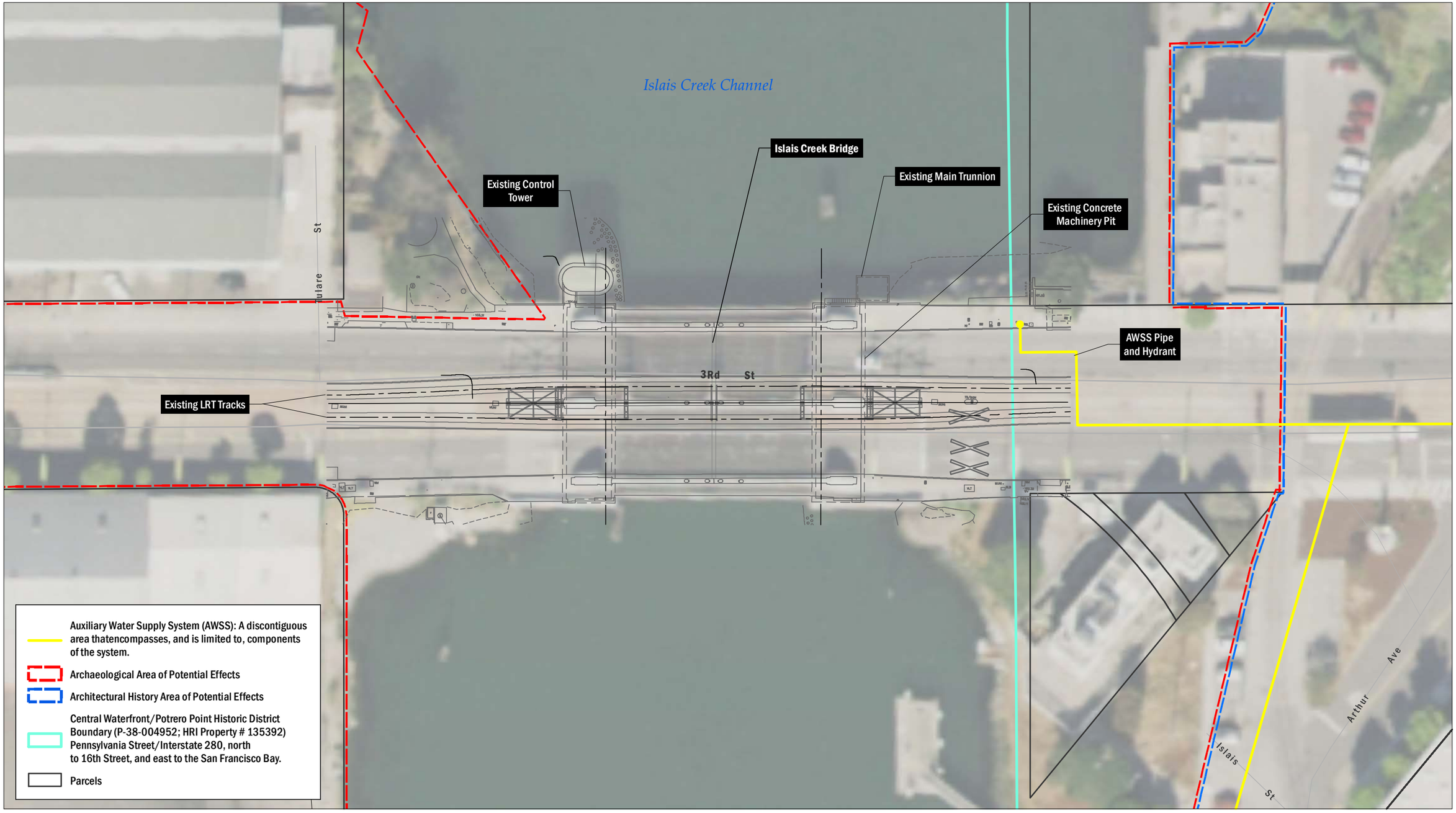


0 500
Feet

USGS (NAIP) Imagery 2022

AECOM
San Francisco Public Works
Islais Creek Bridge Replacement Project
FEDERAL PROJECT NO. BRLO-5934 (168)

FIGURE 3C
Area of Potential Effects



USGS (NAIP) Imagery 2022

AECOM
San Francisco Public Works
Islais Creek Bridge Replacement Project
FEDERAL PROJECT NO. BRLO-5934 (168)

FIGURE 3D
Area of Potential Effects

Patrick Rivera, PE, Acting Bureau Manager | Bureau of Project Management
patrick.rivera@sfdpw.org | T. 628.271.2456 | 49 South Van Ness Ave. 7th Floor, San Francisco, CA 94103

LETTER

TO: Bayview Hunters Point Citizen Advisory Committee
1 Dr. Carlton B. Goodlett Place, San Francisco, CA 94102
bayviewcac@sfgov.org

Sent via Registered U.S. Mail and email

FROM: Thomas Roitman, SE, PMP
Project Manager
San Francisco Public Works – Bureau of Project Management

DATE: September 25, 2023

SUBJECT: Section 106 of the National Historic Preservation Act Consultation
Federal Aid Project No. BHLO-5934(168)
Islais Creek Bridge Rehabilitation Project - San Francisco, California

To Whom It May Concern:

San Francisco Public Works (SFPW) and the California Department of Transportation (Caltrans), are consulting with your organization regarding the proposed Islais Creek Rehabilitation project in San Francisco, California. The project is under the oversight of the Federal Highway Administration (FHWA). AECOM is assisting with the associated federal historic-preservation consultation process.

The 1950 Islais Creek Bridge, a double-leaf, bascule-structure drawbridge (Bridge No. 34C0024, officially named the Levon Hagop Nishkian Bridge) would be replaced due to structural deterioration. A single-span concrete bridge would be constructed at a higher elevation to address flooding and sea-level rise concerns. The bridge currently carries light-rail traffic for which it was not originally designed, which exacerbates its poor vibration tolerance. Its 2013 National Bridge Inventory Rating is 20 out of 100 ("poor"). (The National Bridge Inspection Standards are the standards established by the United States Secretary of Transportation that govern the safety inspections of highway bridges on public roads to maintain safe bridge operation and to prevent structural and functional failures.) Because of its distinctive Art Moderne design, it was deemed eligible for the National Register of Historic Places in 2005 with concurrence from the State Historic Preservation Officer (SHPO).

As the project is funded through a federal agency, project development must comply with Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires federal agencies to consider the impact of their actions on historic properties and to provide individuals and organizations with a demonstrated interest in the project with an opportunity to comment on these projects before implementation. The Act also obligates agencies to seek and consider the views of the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties, as well as the likely interest of the public in the effects on historic properties.

The bridge replacement project is considered an "Adverse Effect" under Section 106 of NHPA. We are developing a Memorandum of Agreement (MOA) with the State Historic Preservation Officer to minimize the adverse effect of the project to the historic resource, and we would like to hear from your organization regarding ideas and input on topics and implementation methods.

Please contact AECOM Architectural Historian Chandra Miller at Chandra.Miller@aecom.com or 1-916-917-9523 within 30 days of receipt of this letter.

Please see enclosure for an Area of Potential Effects (APE) map for the project.

Very Sincerely Yours,

Thomas Roitman,
Project Manager
San Francisco Public Works

thomas.roitman@sfdpw.org

415.297.0736

Patrick Rivera, PE, Acting Bureau Manager | Bureau of Project Management
patrick.rivera@sfdpw.org | T. 628.271.2456 | 49 South Van Ness Ave. 7th Floor, San Francisco, CA 94103

LETTER

TO: Cindy Heitzman — Sent via Registered U.S. Mail and email
Executive Director
California Preservation Foundation
101 The Embarcadero #120, San Francisco, CA 94105
cheitzman@californiapreservation.org

FROM: Thomas Roitman, SE, PMP
Project Manager
San Francisco Public Works – Bureau of Project Management

DATE: September 25, 2023

SUBJECT: Section 106 of the National Historic Preservation Act Consultation
Federal Aid Project No. BHLO-5934(168)
Islais Creek Bridge Rehabilitation Project - San Francisco, California

Dear Cindy:

San Francisco Public Works (SFPW) and the California Department of Transportation (Caltrans), are consulting with your organization regarding the proposed Islais Creek Rehabilitation project in San Francisco, California. The project is under the oversight of the Federal Highway Administration (FHWA). AECOM is assisting with the associated federal historic-preservation consultation process.

The 1950 Islais Creek Bridge, a double-leaf, bascule-structure drawbridge (Bridge No. 34C0024, officially named the Levon Hagop Nishkian Bridge) would be replaced due to structural deterioration. A single-span concrete bridge would be constructed at a higher elevation to address flooding and sea-level rise concerns. The bridge currently carries light-rail traffic for which it was not originally designed, which exacerbates its poor vibration tolerance. Its 2013 National Bridge Inventory Rating is 20 out of 100 ("poor"). (The National Bridge Inspection Standards are the standards established by the United States Secretary of Transportation that govern the safety inspections of highway bridges on public roads to maintain safe bridge operation and to prevent structural and functional failures.) Because of its distinctive Art Moderne design, it was deemed eligible for the National Register of Historic Places in 2005 with concurrence from the State Historic Preservation Officer (SHPO).

As the project is funded through a federal agency, project development must comply with Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires federal agencies to consider the impact of their actions on historic properties and to provide individuals and organizations with a demonstrated interest in the project with an opportunity to comment on these projects before implementation. The Act also obligates agencies to seek and consider the views of the public in a

manner that reflects the nature and complexity of the undertaking and its effects on historic properties, as well as the likely interest of the public in the effects on historic properties.

The bridge replacement project is considered an "Adverse Effect" under Section 106 of NHPA. We are developing a Memorandum of Agreement (MOA) with the State Historic Preservation Officer to minimize the adverse effect of the project to the historic resource, and we would like to hear from your organization regarding ideas and input on topics and implementation methods.

Please contact AECOM Architectural Historian Chandra Miller at Chandra.Miller@aecom.com or 1-916-917-9523 within 30 days of receipt of this letter.

Please see enclosure for an Area of Potential Effects (APE) map for the project.

Very Sincerely Yours,

Thomas Roitman,
Project Manager
San Francisco Public Works

thomas.roitman@sfdpw.org

415.297.0736

Patrick Rivera, PE, Acting Bureau Manager | Bureau of Project Management
patrick.rivera@sfdpw.org | T. 628.271.2456 | 49 South Van Ness Ave. 7th Floor, San Francisco, CA 94103

LETTER

TO: Stephen "Woody" LaBounty
President & CEO
San Francisco Heritage
2007 Franklin St, San Francisco, CA 94109
wlabounty@sfheritage.org

Sent via Registered U.S. Mail and email

FROM: Thomas Roitman, SE, PMP
Project Manager
San Francisco Public Works – Bureau of Project Management

DATE: September 25, 2023

SUBJECT: Section 106 of the National Historic Preservation Act Consultation
Federal Aid Project No. BHLO-5934(168)
Islais Creek Bridge Rehabilitation Project - San Francisco, California

Dear Woody:

San Francisco Public Works (SFPW) and the California Department of Transportation (Caltrans), are consulting with your organization regarding the proposed Islais Creek Rehabilitation project in San Francisco, California. The project is under the oversight of the Federal Highway Administration (FHWA). AECOM is assisting with the associated federal historic-preservation consultation process.

The 1950 Islais Creek Bridge, a double-leaf, bascule-structure drawbridge (Bridge No. 34C0024, officially named the Levon Hagop Nishkian Bridge) would be replaced due to structural deterioration. A single-span concrete bridge would be constructed at a higher elevation to address flooding and sea-level rise concerns. The bridge currently carries light-rail traffic for which it was not originally designed, which exacerbates its poor vibration tolerance. Its 2013 National Bridge Inventory Rating is 20 out of 100 ("poor"). (The National Bridge Inspection Standards are the standards established by the United States Secretary of Transportation that govern the safety inspections of highway bridges on public roads to maintain safe bridge operation and to prevent structural and functional failures.) Because of its distinctive Art Moderne design, it was deemed eligible for the National Register of Historic Places in 2005 with concurrence from the State Historic Preservation Officer (SHPO).

As the project is funded through a federal agency, project development must comply with Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires federal agencies to consider the impact of their actions on historic properties and to provide individuals and organizations with a demonstrated interest in the project with an opportunity to comment on these projects before implementation. The Act also obligates agencies to seek and consider the views of the public in a

manner that reflects the nature and complexity of the undertaking and its effects on historic properties, as well as the likely interest of the public in the effects on historic properties.

The bridge replacement project is considered an "Adverse Effect" under Section 106 of NHPA. We are developing a Memorandum of Agreement (MOA) with the State Historic Preservation Officer to minimize the adverse effect of the project to the historic resource, and we would like to hear from your organization regarding ideas and input on topics and implementation methods.

Please contact AECOM Architectural Historian Chandra Miller at Chandra.Miller@aecom.com or 1-916-917-9523 within 30 days of receipt of this letter.

Please see enclosure for an Area of Potential Effects (APE) map for the project.

Very Sincerely Yours,

Thomas Roitman,
Project Manager
San Francisco Public Works

thomas.roitman@sfdpw.org

415.297.0736

Patrick Rivera, PE, Acting Bureau Manager | Bureau of Project Management
patrick.rivera@sfdpw.org | T. 628.271.2456 | 49 South Van Ness Ave. 7th Floor, San Francisco, CA 94103

LETTER

TO:	Kevin O'Brien CEO and Executive Director San Francisco Historical Society 608 Commercial St, San Francisco, CA 94111 kobrien@sfhistory.org	Sent via Registered U.S. Mail and email
FROM:	Thomas Roitman, SE, PMP Project Manager San Francisco Public Works – Bureau of Project Management	
DATE:	September 25, 2023	
SUBJECT:	Section 106 of the National Historic Preservation Act Consultation Federal Aid Project No. BHLO-5934(168) Islais Creek Bridge Rehabilitation Project - San Francisco, California	

Dear Kevin,

San Francisco Public Works (SFPW) and the California Department of Transportation (Caltrans), are consulting with your organization regarding the proposed Islais Creek Rehabilitation project in San Francisco, California. The project is under the oversight of the Federal Highway Administration (FHWA). AECOM is assisting with the associated federal historic-preservation consultation process.

The 1950 Islais Creek Bridge, a double-leaf, bascule-structure drawbridge (Bridge No. 34C0024, officially named the Levon Hagop Nishkian Bridge) would be replaced due to structural deterioration. A single-span concrete bridge would be constructed at a higher elevation to address flooding and sea-level rise concerns. The bridge currently carries light-rail traffic for which it was not originally designed, which exacerbates its poor vibration tolerance. Its 2013 National Bridge Inventory Rating is 20 out of 100 ("poor"). (The National Bridge Inspection Standards are the standards established by the United States Secretary of Transportation that govern the safety inspections of highway bridges on public roads to maintain safe bridge operation and to prevent structural and functional failures.) Because of its distinctive Art Moderne design, it was deemed eligible for the National Register of Historic Places in 2005 with concurrence from the State Historic Preservation Officer (SHPO).

As the project is funded through a federal agency, project development must comply with Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires federal agencies to consider the impact of their actions on historic properties and to provide individuals and organizations with a demonstrated interest in the project with an opportunity to comment on these projects before implementation. The Act also obligates agencies to seek and consider the views of the public in a

manner that reflects the nature and complexity of the undertaking and its effects on historic properties, as well as the likely interest of the public in the effects on historic properties.

The bridge replacement project is considered an "Adverse Effect" under Section 106 of NHPA. We are developing a Memorandum of Agreement (MOA) with the State Historic Preservation Officer to minimize the adverse effect of the project to the historic resource, and we would like to hear from your organization regarding ideas and input on topics and implementation methods.

Please contact AECOM Architectural Historian Chandra Miller at Chandra.Miller@aecom.com or 1-916-917-9523 within 30 days of receipt of this letter.

Please see enclosure for an Area of Potential Effects (APE) map for the project.

Very Sincerely Yours,

Thomas Roitman,
Project Manager
San Francisco Public Works

thomas.roitman@sfdpw.org

415.297.0736

Miller, Chandra

From: Miller, Chandra
Sent: Monday, September 25, 2023 4:43 PM
To: contact@aesa.org
Cc: Roitman, Thomas (DPW); Deunert, Boris; Iberien, Oliver (DPW); Kay, Michael
Subject: Section 106 NHPA Consultation - Islais Creek Bridge Project
Attachments: BHLO-5934(168) Islais Creek Bridge 106 Letter_Armenian.pdf

Good Afternoon,

Please see the attached letter sent on behalf of the San Francisco Public Works (SFPW) and the California Department of Transportation (Caltrans) by AECOM, which is assisting with the associated federal historic-preservation consultation process. We are consulting with your organization regarding the proposed Islais Creek Rehabilitation project in San Francisco, California. The 1950 Islais Creek Bridge, a double-leaf, bascule-structure drawbridge (Bridge No. 34C0024, officially named the Levon Hagop Nishkian Bridge) would be replaced due to structural deterioration. The bridge was deemed eligible for the National Register of Historic Places in 2005 with concurrence from the State Historic Preservation Officer (SHPO). The project is under the oversight of the Federal Highway Administration (FHWA) and because the project is funded through a federal agency, project development must comply with Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires federal agencies to consider the impact of their actions on historic properties and to provide individuals and organizations with a demonstrated interest in the project with an opportunity to comment on these projects before implementation. The Act also obligates agencies to seek and consider the views of the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties, as well as the likely interest of the public in the effects on historic properties.

The bridge replacement project is considered an "Adverse Effect" under Section 106 of NHPA. We are developing a Memorandum of Agreement (MOA) with the State Historic Preservation Officer to minimize the adverse effect of the project to the historic resource, and we would like to hear from your organization regarding ideas and input on topics and implementation methods. Please contact AECOM Architectural Historian Chandra Miller at Chandra.Miller@aecom.com or 1-916-917-9523 within 30 days of receipt of this letter.

Chandra Miller, M.A.
(CHAN-druh)
Senior Architectural Historian
M +1-916-917-9523
chandra.miller@aecom.com

AECOM
2020 L Street, Suite 300
Sacramento, CA, 95811, USA
aecom.com

Miller, Chandra

From: Miller, Chandra
Sent: Monday, September 25, 2023 4:43 PM
To: bayviewcac@sfgov.org
Cc: Roitman, Thomas (DPW); Deunert, Boris; Iberien, Oliver (DPW); Kay, Michael
Subject: Section 106 NHPA Consultation - Islais Creek Bridge Project
Attachments: BHLO-5934(168) Islais Creek Bridge 106 Letter_Bayview Hunter.pdf

Good Afternoon,

Please see the attached letter sent on behalf of the San Francisco Public Works (SFPW) and the California Department of Transportation (Caltrans) by AECOM, which is assisting with the associated federal historic-preservation consultation process. We are consulting with your organization regarding the proposed Islais Creek Rehabilitation project in San Francisco, California. The 1950 Islais Creek Bridge, a double-leaf, bascule-structure drawbridge (Bridge No. 34C0024, officially named the Levon Hagop Nishkian Bridge) would be replaced due to structural deterioration. The bridge was deemed eligible for the National Register of Historic Places in 2005 with concurrence from the State Historic Preservation Officer (SHPO). The project is under the oversight of the Federal Highway Administration (FHWA) and because the project is funded through a federal agency, project development must comply with Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires federal agencies to consider the impact of their actions on historic properties and to provide individuals and organizations with a demonstrated interest in the project with an opportunity to comment on these projects before implementation. The Act also obligates agencies to seek and consider the views of the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties, as well as the likely interest of the public in the effects on historic properties.

The bridge replacement project is considered an "Adverse Effect" under Section 106 of NHPA. We are developing a Memorandum of Agreement (MOA) with the State Historic Preservation Officer to minimize the adverse effect of the project to the historic resource, and we would like to hear from your organization regarding ideas and input on topics and implementation methods. Please contact AECOM Architectural Historian Chandra Miller at Chandra.Miller@aecom.com or 1-916-917-9523 within 30 days of receipt of this letter.

Chandra Miller, M.A.
(CHAN-druh)
Senior Architectural Historian
M +1-916-917-9523
chandra.miller@aecom.com

AECOM
2020 L Street, Suite 300
Sacramento, CA, 95811, USA
aecom.com

Miller, Chandra

From: Miller, Chandra
Sent: Monday, September 25, 2023 4:43 PM
To: cheitzman@californiapreservation.org
Cc: Roitman, Thomas (DPW); Deunert, Boris; Iberien, Oliver (DPW); Kay, Michael
Subject: Section 106 NHPA Consultation - Islais Creek Bridge Project
Attachments: BHLO-5934(168) Islais Creek Bridge 106 Letter_CPF.pdf

Good Afternoon,

Please see the attached letter sent on behalf of the San Francisco Public Works (SFPW) and the California Department of Transportation (Caltrans) by AECOM, which is assisting with the associated federal historic-preservation consultation process. We are consulting with your organization regarding the proposed Islais Creek Rehabilitation project in San Francisco, California. The 1950 Islais Creek Bridge, a double-leaf, bascule-structure drawbridge (Bridge No. 34C0024, officially named the Levon Hagop Nishkian Bridge) would be replaced due to structural deterioration. The bridge was deemed eligible for the National Register of Historic Places in 2005 with concurrence from the State Historic Preservation Officer (SHPO). The project is under the oversight of the Federal Highway Administration (FHWA) and because the project is funded through a federal agency, project development must comply with Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires federal agencies to consider the impact of their actions on historic properties and to provide individuals and organizations with a demonstrated interest in the project with an opportunity to comment on these projects before implementation. The Act also obligates agencies to seek and consider the views of the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties, as well as the likely interest of the public in the effects on historic properties.

The bridge replacement project is considered an "Adverse Effect" under Section 106 of NHPA. We are developing a Memorandum of Agreement (MOA) with the State Historic Preservation Officer to minimize the adverse effect of the project to the historic resource, and we would like to hear from your organization regarding ideas and input on topics and implementation methods. Please contact AECOM Architectural Historian Chandra Miller at Chandra.Miller@aecom.com or 1-916-917-9523 within 30 days of receipt of this letter.

Chandra Miller, M.A.
(CHAN-druh)
Senior Architectural Historian
M +1-916-917-9523
chandra.miller@aecom.com

AECOM
2020 L Street, Suite 300
Sacramento, CA, 95811, USA
aecom.com

Miller, Chandra

From: Miller, Chandra
Sent: Monday, September 25, 2023 4:43 PM
To: wlabounty@sfheritage.org
Cc: Roitman, Thomas (DPW); Deunert, Boris; Iberien, Oliver (DPW); Kay, Michael
Subject: Section 106 NHPA Consultation - Islais Creek Bridge Project
Attachments: BHLO-5934(168) Islais Creek Bridge 106 Letter_SF Heritage.pdf

Good Afternoon,

Please see the attached letter sent on behalf of the San Francisco Public Works (SFPW) and the California Department of Transportation (Caltrans) by AECOM, which is assisting with the associated federal historic-preservation consultation process. We are consulting with your organization regarding the proposed Islais Creek Rehabilitation project in San Francisco, California. The 1950 Islais Creek Bridge, a double-leaf, bascule-structure drawbridge (Bridge No. 34C0024, officially named the Levon Hagop Nishkian Bridge) would be replaced due to structural deterioration. The bridge was deemed eligible for the National Register of Historic Places in 2005 with concurrence from the State Historic Preservation Officer (SHPO). The project is under the oversight of the Federal Highway Administration (FHWA) and because the project is funded through a federal agency, project development must comply with Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires federal agencies to consider the impact of their actions on historic properties and to provide individuals and organizations with a demonstrated interest in the project with an opportunity to comment on these projects before implementation. The Act also obligates agencies to seek and consider the views of the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties, as well as the likely interest of the public in the effects on historic properties.

The bridge replacement project is considered an "Adverse Effect" under Section 106 of NHPA. We are developing a Memorandum of Agreement (MOA) with the State Historic Preservation Officer to minimize the adverse effect of the project to the historic resource, and we would like to hear from your organization regarding ideas and input on topics and implementation methods. Please contact AECOM Architectural Historian Chandra Miller at Chandra.Miller@aecom.com or 1-916-917-9523 within 30 days of receipt of this letter.

Chandra Miller, M.A.
(CHAN-druh)
Senior Architectural Historian
M +1-916-917-9523
chandra.miller@aecom.com

AECOM
2020 L Street, Suite 300
Sacramento, CA, 95811, USA
aecom.com

Miller, Chandra

From: Miller, Chandra
Sent: Monday, September 25, 2023 4:42 PM
To: kobrien@sfhistory.org
Cc: Roitman, Thomas (DPW); Deunert, Boris; Iberien, Oliver (DPW); Kay, Michael
Subject: Section 106 NHPA Consultation - Islais Creek Bridge Project
Attachments: BHLO-5934(168) Islais Creek Bridge 106 Letter_SF Historical Society.pdf

Good Afternoon,

Please see the attached letter sent on behalf of the San Francisco Public Works (SFPW) and the California Department of Transportation (Caltrans) by AECOM, which is assisting with the associated federal historic-preservation consultation process. We are consulting with your organization regarding the proposed Islais Creek Rehabilitation project in San Francisco, California. The 1950 Islais Creek Bridge, a double-leaf, bascule-structure drawbridge (Bridge No. 34C0024, officially named the Levon Hagop Nishkian Bridge) would be replaced due to structural deterioration. The bridge was deemed eligible for the National Register of Historic Places in 2005 with concurrence from the State Historic Preservation Officer (SHPO). The project is under the oversight of the Federal Highway Administration (FHWA) and because the project is funded through a federal agency, project development must comply with Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires federal agencies to consider the impact of their actions on historic properties and to provide individuals and organizations with a demonstrated interest in the project with an opportunity to comment on these projects before implementation. The Act also obligates agencies to seek and consider the views of the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties, as well as the likely interest of the public in the effects on historic properties.

The bridge replacement project is considered an "Adverse Effect" under Section 106 of NHPA. We are developing a Memorandum of Agreement (MOA) with the State Historic Preservation Officer to minimize the adverse effect of the project to the historic resource, and we would like to hear from your organization regarding ideas and input on topics and implementation methods. Please contact AECOM Architectural Historian Chandra Miller at Chandra.Miller@aecom.com or 1-916-917-9523 within 30 days of receipt of this letter.

Chandra Miller, M.A.
(CHAN-druh)
Senior Architectural Historian
M +1-916-917-9523
chandra.miller@aecom.com

AECOM
2020 L Street, Suite 300
Sacramento, CA, 95811, USA
aecom.com

MEMORANDUM

Islais Creek (Third Street) Bridge Charrette

PREPARED FOR: Port of San Francisco
PREPARED BY: CH2M/Arcadis Team
DATE: April 12, 2022

Executive Summary

The Islais Creek Bridge (Third Street Bridge) is part of a key north-south transportation corridor connecting the Islais Creek and Bayview areas with Mission Bay and downtown San Francisco. The bridge is in poor condition and a project is underway to perform a seismic and structural retrofit and rehabilitation. The existing drawbridge supports an important throughfare with four lanes of vehicle traffic (two lanes in each direction), a track-based light rail line in the center, and separated lanes for pedestrian access. At present, the Islais Creek channel is federally designated as a navigable waterway, which requires the drawbridge to remain operational for creek navigation; however, portions of the bridge are vulnerable to high creek water levels today, and rising sea levels and coastal flood events will be increasing the flood risks over time.

A charrette with representatives from several City and County of San Francisco (City) departments was held on February 10, 2022, to discuss possible design options that could increase the flood resilience of the Islais Creek Bridge Rehabilitation project at Islais Creek. Participants included representatives from San Francisco Public Works (SF Public Works), Public Utilities Commission, Planning, Department of Emergency Management, Municipal Transportation Agency (SFMTA), Fire Department (SFFD), Police Department, Port of San Francisco (Port), and members of the Planning, Engineering, and Environmental Consultant team for the Port Waterfront Resilience Program (WRP), who organized and presented during the charrette.

The primary objective of the charrette was to deepen the collective understanding of constraints, benefits, and opportunities of different bridge design concepts, and to better understand the needs and uses of the concepts relative to each City department.

The presented bridge options included different design combinations and configuration decisions, such as maintaining the existing bridge design versus considering different new bridge types - including fixed-bridge options that would require changing the navigability status of the creek channel. Additional considerations included a possible center bent (new row of piles within the channel), bridge raising, creek widening, environmental permitting considerations, and flood risk scenarios. A matrix of 22 different configuration combinations was used to facilitate a screening process. This initial screening narrowed the potential options from 22 to 4 options, plus a “No Build” scenario, which was deemed to pose excessive safety risk and thus eliminated. The four options carried forward for further analysis and discussion during the charrette include:

- Option 1: New Bascule Bridge, replacing the existing bridge as is (with either operable or non-operable draw bridge functions)

- Option 2: New Through Girder Bridge, Same Elevation (without a center bent)
- Option 3: New Standard Girder Bridge, Raised (without a center bent)
- Option 4: New Through Girder Bridge, Raised (without a center bent)

The charrette participants were divided into three break-out groups. Each break out group evaluated two of the four options relative to benefits, constraints, and opportunities. The feedback received on each option is summarized below.

Option 1: New Bascule Bridge

Replacing the bridge as-is has both potential project design schedule and budget benefits because most work completed to date by SF Public Works follows this path. However, the City department representatives expressed that the need for longer-term resilience outweighs the potential shorter-term benefits. In addition, maintaining an operable drawbridge has high capital and maintenance costs that are hard to justify when considering the design's inherent flood risk. It was also noted that the seismic performance of this option was likely inferior to fixed-bridge options. Therefore, this option has a higher risk of bridge closure after an earthquake, which would impede disaster response functions that require bridge throughput.

Option 2: New Through Girder Bridge, Same Elevation

A fixed-bridge design requires a regulatory change to the navigability of the waterway. If this is achieved, a fixed-bridge would have greater flood resilience than Option 1 because the lowest bridge elements would have marginally more clearance above the existing creek water level elevations. Even though the bridge is left at the same elevation, this option has higher clearance than option 3 (a raised bridge). However, the City department representatives expressed that even though this option provides some resilience, this option is not preferred, due to the limited additional clearance.

Option 3: New Standard Girder Bridge, Raised

This option can provide up to 2 feet of additional rail elevation and increase the flood resilience of the bridge. However, due to the depth of the structural elements below the deck, more freeboard is reached with option 2. The elevation increase is constrained by the existing Union Pacific Railroad crossing just south of the creek. Similar to Option 2, this concept improves seismic and transit reliability while requiring the removal of the navigable waterway designation. This option will also require an extension of the project footprint on the approaches and schedule.

Option 4: New Through Girder Bridge, Raised

With a governing elevation of 14.9 feet North American Vertical Datum of 1988 for its lowest element, this option provides the most clearance above the creek. Preliminary concepts indicate that this will allow the below bridge clearance requirements to be met until approximately 2070. This option has the same benefits and constraints noted for Option 3, while providing more sea level rise resilience. The through -girder design allows for a smaller bridge depth, which provides additional clearance between the lowest bridge elements and

the existing creek water level elevations. The increase in elevation gain along the bridge deck would be about 2 feet, same as in Option 3.

Important issues identified by charrette participants included pedestrian access across the bridge, safe navigability for cars and SFMTA light rail, flood resilience, bicycle access, and access equity for the neighborhood and Bayview geography. Main opportunities identified for Options 2, 3, and 4 included the possibility to run utilities across the bridge. Most public realm improvements opportunities are associated with Options 3 and 4. These include adding the Blue Greenway bike path on the bridge, allowing a safer path for bikers, and adding walkways and overlook areas. Further mentions included improving the bridge serviceability as a Muni Metro facility, using a corrosion-resistant construction, capturing the stormwater runoff instead of discharging directly into the channel, and recognizing the Islais Creek Bridge as the gateway to the Bayview neighborhood.

The charrette presented an opportunity for all participating agencies to discuss the potential bridge options. At this time, a preferred option has not been selected. Options 2, 3, and 4 have challenges, including (1) whether all City departments are in alignment regarding removing the navigability designation of the creek can be achieved, (2) resolving the environmental process and funding pathway for a revised bridge design, and (3) aligning the future shoreline resilience strategy with the bridge design. Although the charette feedback provides a potential indicator for the future direction of the bridge project, these challenges must be resolved before Options 2, 3, or 4 can be selected.

The following action items are in progress to address these challenges:

- Prior to the charrette, SFFD voiced a preference for maintaining creek navigability. However, they are interested in understanding the reasons for pursuing a fixed-bridge option. SF Public Works, the Port, and SFFD are currently working to address this concern.
- SF Public Works is actively working to a incorporate the charrette feedback into the environmental process and work plan to ensure federal funding remains in place.
- The Port WRP, in collaboration with City departments, are developing long-term adaptation strategies for the Port's shoreline, including the Islais Creek area. Additional coordination between SF Public Works and the Port will continue relative to the bridge design and the WRP.

1 Introduction

A charrette with representatives from several City and County of San Francisco (City) departments was held on February 10, 2022, to discuss possible design options that could increase the flood resilience of the Islais Creek Bridge Rehabilitation project at Islais Creek. Participants included representatives from San Francisco Public Works (SF Public Works), Public Utilities Commission (SFPUC), Planning (SF Planning), Department of Emergency Management, Municipal Transportation Agency (SFMTA), Fire Department (SFFD), Police Department (SFPD), Port of San Francisco (Port), and members of the Planning, Engineering, and Environmental Consultant (PEC) team for the Port Waterfront Resilience Program (WRP), who organized and presented during the charrette.

The primary objective of the charrette was to deepen the collective understanding of constraints, benefits, and opportunities of different bridge design concepts, and to better understand the needs and uses of the concepts relative to each City department.

The bridge rehabilitation project is funded through the FHWA funding program (Highway Bridge Replacement & Rehabilitation, HBRRP) which is administered by the Caltrans Highway Bridge Program, and is currently being undertaken by SF Public Works.

2 Objectives

The objectives of this document are to:

- Summarize the charrette goals, context, and assumptions for potential design modifications for the Islais Creek Bridge Rehabilitation project
- Summarize considerations and feedback from the respective City departments
- Document longer-term flood resilience strategies discussed during the charette to inform adaptation strategy development for Islais Creek within the Port WRP
- Present next steps

3 Background

3.1 Overview

The Islais Creek Bridge is part of a key north-south transportation corridor connecting the Islais Creek and Bayview areas with Mission Bay and downtown San Francisco. This north-south corridor also plays an important role for disaster response and recovery for the city. At present, the bridge is in poor condition and plans are underway to perform a seismic and structural retrofit and rehabilitation. The existing drawbridge was constructed across Islais Creek between 1945 and 1949 with a double-bascule bridge design and supports four lanes of vehicle traffic (two lanes in each direction) with the track-based Muni T-Line in the center and separated lanes for pedestrian access (Figure 1).

Figure 1. Transportation Connections Across and Near Islais Creek Bridge

The Islais Creek channel is federally designated as a navigable waterway and is part of the San Francisco Bay, directly affected by the tidal flows of the Pacific Ocean. Therefore, the drawbridge must remain operational to allow for creek navigation. However, there is rarely a need to open the Islais Creek Bridge, or the Illinois Street drawbridge that crosses Islais Creek directly east. At present, no businesses or operations west of the Illinois Street Bridge require navigable creek access. Elements of the drawbridge (for example, the access hatches and the openings below the girders) make the current design of the drawbridge vulnerable to flooding today. The areas surrounding Islais Creek, including the bridge approaches, are vulnerable to stormwater-related flooding when San Francisco Bay (Bay) and creek water levels are high. As sea levels rise, the vulnerabilities to stormwater-related flooding and coastal flooding will increase, and the bridge could become inoperable due to flooding within 20 years and inaccessible due to the bridge access being flooded within 50 years.

Accommodating future sea level rise and maintaining drawbridge operability within the existing land use and grade constraints, including maintaining safe rail grade changes on either side of the bridge, pose a significant design challenge.

3.2 Structural Considerations

The two leaves of the existing bridge each consist of three tapered girders supporting a grid of beams and steel grating. The girder depth is least at the center of the span where the two leaves join and greatest at the support near the shoreline. This taper results in a bridge soffit that varies in elevation. The deck surface elevation also varies in elevation due to the roadway profile.

The two leaves raise and lower by pivoting about a trunnion that extends from the sides of each girder, and that bears on a concave metal casting. Each girder extends beyond the trunnion to support a counterweight. Gear

teeth located along the radiused end of each girder above the counterweight engage an electrically driven pinion which, when rotated, raises the leaves. The trunnions, girder extensions, counterweights, pinions, motors, and electrical infrastructure are located within a mechanical pit at each end of the bridge. This mechanical pit, the exterior concrete enclosure walls, base slab, and lid are collectively referred to as the bascule pier. The bascule pier is pile supported.

Each enclosure wall facing the creek centerline contains three large slots to receive the girders. The thresholds of these slots represent low points vulnerable to water intrusion.

Maintenance access to each mechanical pit is via exterior stairs mounted to the side of the bascule pier and a hatch through the side enclosure wall. The thresholds of the hatches also represent low points vulnerable to water intrusion.

3.3 Function

The bridge is an important transportation asset, carrying four traffic lanes, two Muni light-rail tracks, and two sidewalks over Islais Creek. It connects a main thoroughfare, Third Street, which is a major arterial and designated post-disaster lifeline street, providing an important connection between the Bayview/Hunters Point neighborhoods and the city. Light-rail vehicles must slow considerably to safely pass through the horizontal alignment reverse curve at the approaches and across the three rail-joints where the bascule leaves separate during bridge operations. The deteriorated condition of the bridge increases the level of vibration within the structure as heavy vehicles, trucks, and light rail cross the span. This increased vibration can, in turn, enhance the degradation of the structure. The sidewalks and roadways include open steel grates that discharge roadway stormwater directly to the channel.

A second bridge, Illinois Street Bridge, was added as a channel crossing in 2006 east of Islais Creek Bridge. This smaller and lower bridge provides two lanes for heavy truck and vehicle traffic and is crossed by San Francisco Bay Railroad and Union Pacific Railroad tracks. The railroads are important for Port operations, connecting the Piers 80 and 90-96 industrial areas. The Illinois Street Bridge, and especially the railroad tracks that cross the Islais Creek on-ramp, need to be considered in the option evaluation for the Islais Creek Bridge. Illinois Street Bridge is also in need of rehabilitation due to subsidence issues, and it sits at lower elevation than the Islais Creek Bridge, making it vulnerable to sea level rise and coastal flooding, and reducing its ability to function as an alternate route during flood events and/or during construction.

Both moveable bridges keep the Islais Creek Channel navigable and accessible by boat (with a 72-hour notice). No maritime facilities or operations are located west of either bridge. However, a kayak launch pad, small park, and open space sit west of the Islais Creek Bridge. Kayakers can pass underneath the closed bridges during regular and low tides and their freeboard needs have been considered during the option evaluation process.

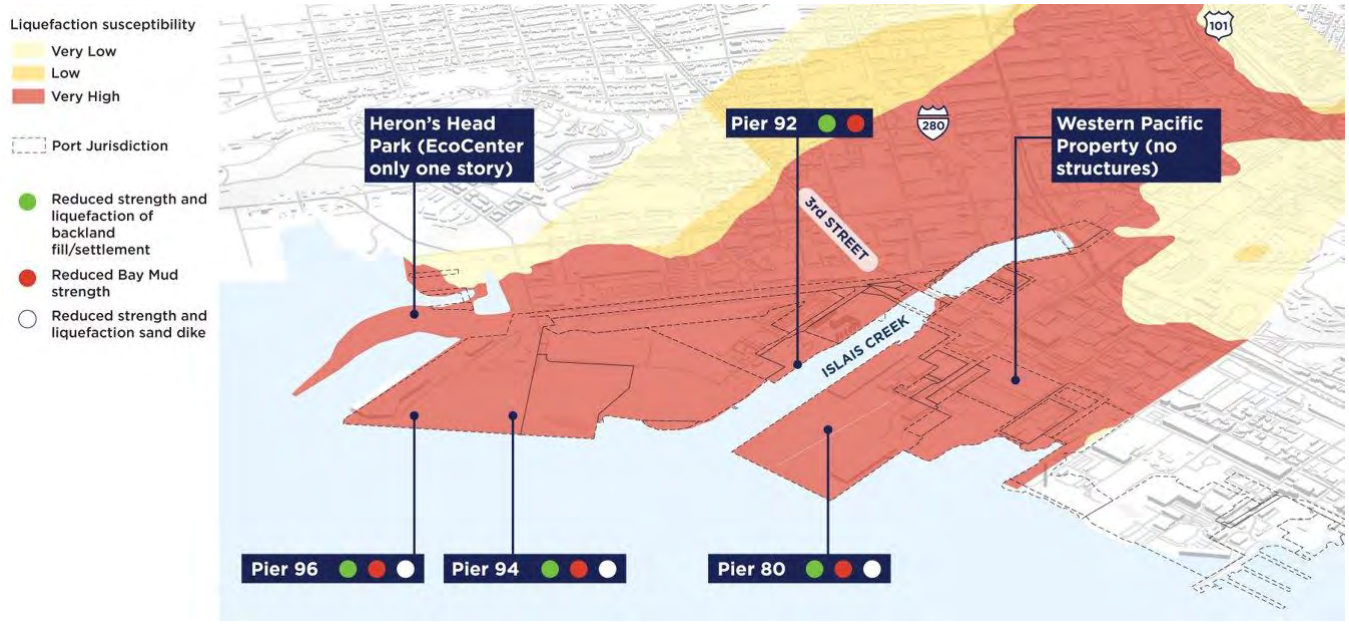
Several wastewater assets are located along Islais Creek and in the channel. On the southwest bank next to the Islais Creek Bridge is the Booster Pump station that discharges effluent from the Southeast Treatment Plant to the Bay via the Southeast Bay Outfall, which runs underneath both bridges to the Bay. Several combined sewer discharge (CSD) outfalls located along the creek (six are west of Islais Creek Bridge) and connected to the transport/storage boxes. The CSD outfalls only discharge to the creek if heavy rains fill the transport/storage

boxes and the City's treatment plants exceed their capacity. Islais Creek drains rain and stormwater from San Francisco's largest watershed.

Disaster Response and Emergency Firefighting Water System assets are also present at the station. Fire Station 25 is located on the south side of the creek between the bridges. Both the bridges and the railroads are considered critical for disaster response and recovery. There is a firetruck suction connection west of Islais Creek Bridge on the south side of the creek and a fireboat manifold near Fire Station 25 east of Islais Creek Bridge. These connections allow water to be pumped directly from the Bay for fire suppression.

3.4 Seismic Risk

The project area is underlain by artificial fill over Young Bay Mud deposits at a depth of 60 feet. Due to the large amount of Bay fill used to shape Islais Creek and create land from its former floodplain and marsh areas, the vulnerability to liquefaction susceptibility in this area is very high (Figure 2). This situation also increases the risk for subsidence, which can be observed in the area. These risks add to the seismic vulnerability of the bridge, which is already in poor condition.

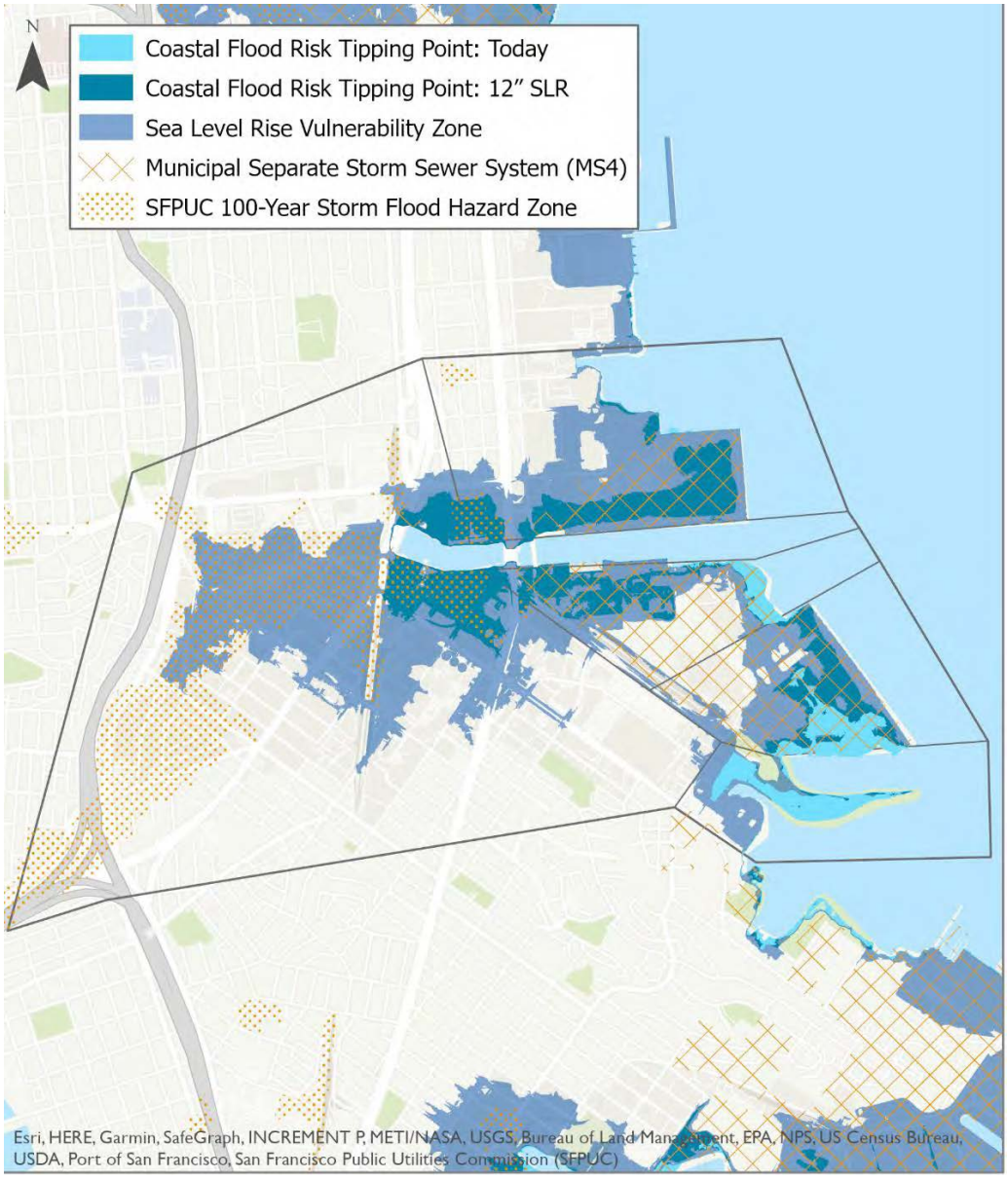


Source: Port of San Francisco 2021

Figure 2. Seismic Risk and Liquefaction Susceptibility

3.5 Flood Risk

The Islais Creek/Bayview geography is at risk of flooding from heavy rainfall events, coastal storm surge, and wave hazards (Figure 3). These flood hazards will increase in severity as sea levels rise, and rising groundwater could create an additional compounding flood hazard. The areas around Islais Creek will be entirely reclaimed by the Bay if no projects are implemented to reduce flood risks. A primary flooding pathway is shoreline overtopping of Islais Creek near the Third Street and Illinois Street Bridges.



Note: Flood risks were assessed separately, and extreme precipitation coupled with a coastal event could results in greater flood hazards than those reflected here.

Figure 3. Coastal Flood Risk from Sea Level Rise and Storm Flood Hazard Zone

Flood risks to the bridge include:

- Coastal flood exposure of electrical and mechanical systems, which will reduce their useful life and increase maintenance costs
- Overtopping of the bridge and adjacent roads, which can result in transit disruptions along the Third Street corridor

The bottom of the existing bridge's access hatches are at an elevation of 7.93 feet North American Vertical Datum of 1988 (NAVD88) (Figure 4). The thresholds at the wall slots below the girders at the bascule pier sit at 9.68 feet NAVD88. Both elevations are below an anticipated 100-year storm surge (1-percent coastal flood event) for existing conditions (9.86 feet NAVD88). Beyond direct impairment, repeated flooding with saltwater can damage equipment and accelerate corrosion. The access hatches can only be accessed during low tide and the metal doors of the access hatches show rust due to exposure to saltwater.

With 12 inches of sea level rise (relative to the year 2000), a 10-year storm event would flood the girder slots. With 24 inches of sea level rise, a 1-year tide would flood the gap (estimated to occur between 2040 and 2060 (OPC and CNRA).

The top of road at center stands at 15.48 feet NAVD88, indicating that the bridge deck itself is likely not at risk of flooding before the end of the century.

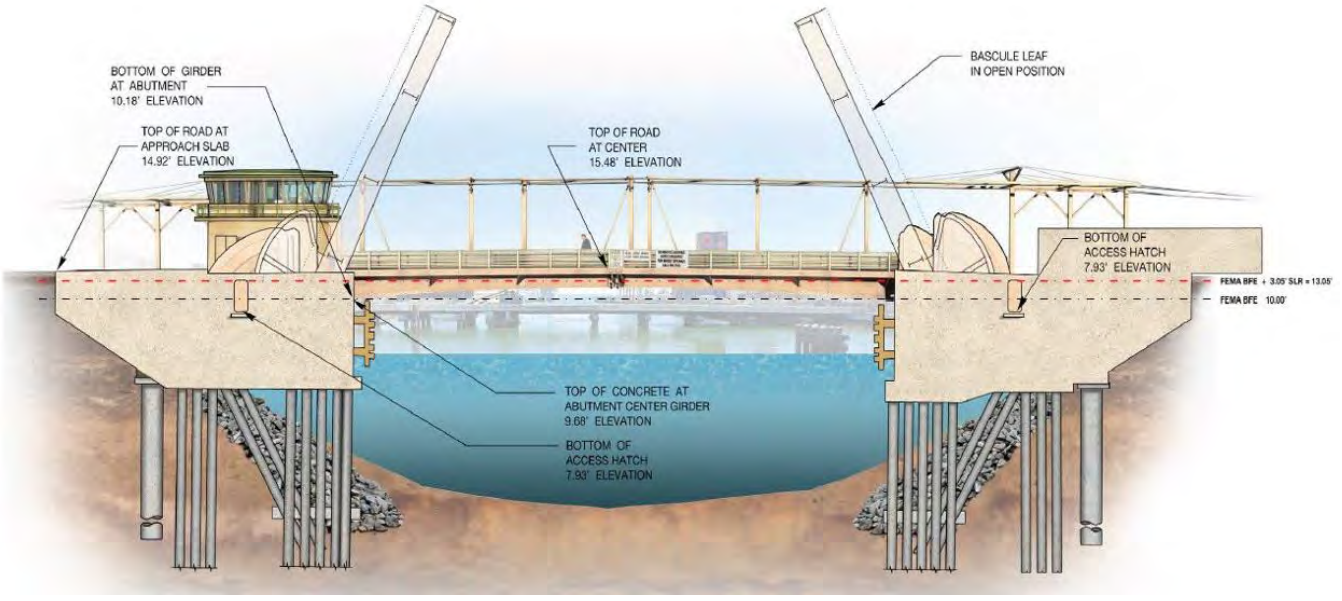


Figure 4. Asset Specific Strategies Islais Creek - Third Street Bridge

3.6 Fixed versus Movable Bridge and Navigability Considerations

The channel west of Islais Creek is currently a navigable waterway, which requires the two bridges crossing Islais Creek to be moveable (that is, drawbridges that can open to allow ship traffic to pass through). However, there are no current maritime uses on the western portion of Islais Creek that require access for large watercraft

(beyond a kayak launch pad). SFFD has expressed a desire and preference to retain watercraft access to the creek channel west of Islais Creek Bridge with a moveable bridge option. A fixed bridge would be less vulnerable to flooding and mechanical failure than the existing moveable bridge, which in its current state is vulnerable to flooding through the access hatches and openings below the girders. These have flooded in the past and can flood during a 1-percent coastal flood event today. Rebuilding the bridge as a fixed bridge would add additional clearance between the lowest bridge members and the creek water level elevations, increasing the time (and the amount of sea level rise that can occur) before flooding would affect the bridge itself. A fixed bridge would also add resilience and dependability after a seismic event. It is uncertain if the existing bascule bridge would remain operable after a seismic and/or 1-percent coastal flood event. However, it needs to be determined if selecting fixed-type bridge as the preferred option could define the non-navigability of the creek by default.

Potential Permitting Process

Per conversations in June 2021 among City departments (Port, SF Public Works, SFMTA) and the U.S. Coast Guard (USCG), replacing the Islais Creek Bridge with a fixed bridge requires a permit amendment to remove the federal navigable waterway designation. If the City departments decide to seek a permit amendment (and provide a formal written proposal to USCG),[1] USCG (the San Francisco Sector in coordination with District 11) would initiate communication with waterway users and other interested parties to begin the permitting and stakeholder engagement process. Within 30 days of the public comment and response period, USCG would respond to the City's request with a letter either supporting or not supporting the City's request. The formal permit amendment application process to change a drawbridge to a fixed bridge is subject to National Environmental Policy Act (NEPA) review, which ensures agencies consider the significant environmental consequences of their proposed actions and inform the public about their decision making. Caltrans, by delegation from FHWA, is the NEPA lead Federal agency and the USCG is a NEPA cooperating agency in the environmental review process. In most cases, the NEPA process results in a categorical exclusion. However, the process would require consultation with resource agencies (such as the National Marine Fisheries Service and US Fish and Wildlife Service) and a Section 106 review. In cases with a categorical exclusion, the permit amendment process generally takes 9 months to 1 year.

If there is no other federal interest in the project, the Coast Guard would be the lead agency. The Coast Guard has limited resources to handle complex environmental review and would rely on the City for studies to support the process. If another federal agency has an interest (such as FHWA), that agency would be the lead agency.

3.7 Historic Considerations

The Islais Creek Bridge is a double leaf bascule bridge constructed between 1945 and 1949, which replaced a Strauss heel trunnion bascule bridge. It was modified in 2006 as part of the Third Street light rail project, when

[1] Per USCG and Port/City Meeting Notes from June 9, 2021, the Port/City would commence the process with a request to USCG stating the reasons for the conversion (for example, improved reliability for light rail and freight rail access, sea level rise adaptation, and no intent to develop), coupled with draw tender logs for the existing drawbridges showing how often the bridges have opened for a representative period (for example, the last 5 years). The Port/City would also provide USCG with the names and addresses of landowners abutting Islais Creek inward of the bridge.

tracks for the Muni T-Line were added. The bridge was considered eligible for a historic designation by a 2004 Caltrans assessment, but so far has not received an official historic designation.

On June 21, 2021, City departments (including SF Planning, Port, SF Public Works, and SFMTA) held a meeting to discuss Islais Creek Bridge, its potential historic considerations, and the concept of replacing the existing bridge with a fixed bridge. According to meeting notes, the bridge replacement could likely be a significant and unavoidable impact under the California Environmental Quality Act, even if the Art Modern elements of the Islais Creek Bridge (such as the control tower) were incorporated into a new fixed bridge design. The recommendation was to pursue an environmental impact report.

Further analysis is required; however, SF Public Works estimates that an adverse impact under Section 106 to the bridge as a cultural resource would not inevitably trigger the need for a NEPA document above an environmental assessment, and that the programmatic 4(f) evaluation for historic bridges should apply to this project. The Caltrans local office would be the lead for this work, but consultation with Caltrans headquarters is strongly advised.

3.8 Habitat Considerations

This area has a long history of industrial uses, resulting in several contaminated sites along the shoreline. Islais Creek itself is a Regional Water Quality Control Board, San Francisco Region (RWQCB)[2] regulated site[3] with a monitoring station on the southern shoreline west of Islais Creek Bridge and one near the bridge span on the northwest side. There is also a hazardous material site in that location. On the northern shoreline next to the recently built SFMTA facility, old pilings were removed from the creek in a clean-up effort, which improved the habitat restoration potential of the creek in that area.

Before Islais Creek was filled, the mouth of the creek was almost 1 mile wide. Over time, as areas around the creek were filled and industrial and agricultural uses near the creek began to pollute it, it became significantly degraded. After the 1906 earthquake, debris was used to fill the polluted creek and create land, which reduced the size of the creek to the channel that remains today. Only very small pockets of wetland habitat along the shores of Islais Creek remain. Aquatic life, such as protected harbor seals, can be present in the channel, including the area west of the Islais Creek Bridge.

3.9 Public Realm Considerations

Islais Creek is a potential major open-space asset to the local community, which has a history of being underserved. However, public waterfront access along the creek is limited. Improving access to - and creating

[2] Regional Water Quality Control Board

[3] The western portion of Islais Creek (west of the Third Street Bridge) was designated as "toxic hot spot" by RWQCB in 1999 due to elevated concentrations of metals, polycyclic aromatic hydrocarbon s, polychlorinated biphenyl s, and pesticides in sediment and observed toxicity to aquatic organisms in toxicity tests (RWQCB 1999). Discharges from four combined sewer overflows and a wastewater outfall to the creek are the primary sources of contaminants to Islais Creek (RWQCB 1999).

new and resilient open spaces along - the creek and Bay shoreline are community goals identified in the Islais Creek Southeast Mobility Adaptation Study (ICSMAS) engagement efforts in 2019-2020.

Existing open space resources include Islais Creek Park (including a boat and kayak launch) and Bayview Gateway Park on the southern bank of the creek; Islais Creek Shoreline Access; Islais Creek Promenade (including a skate area); and Tulare Park, which needs improvements on the northern bank of the creek. The public realm has been improved in recent years, but the park areas are small and discontinuous. The habitat and public realm value could be increased by creating continuous access along the creek, including connections from the bridge crossings.

Figure 5 shows the existing open space and park areas.

Figure 5. Open Space around the Islais Creek Bridge

3.10 Southern Waterfront Resilience Planning Context

In June 2021, the City completed the ICSMAS (San Francisco Planning 2021). The strategy recommended concepts to raise and/or modify the bridge design to increase resilience to sea level rise and coastal flooding. The document served as an important resource for this charrette.

In addition, the Port, in concert with other City departments, is embarking on an effort to develop geographic scale adaptation strategies that reduce the risks of coastal flooding and seismic hazards along the larger southern waterfront - from Oracle Park to Heron's Head Park, including Islais Creek. Within this context, it is timely to revisit the retrofit and rehabilitation design for the Islais Creek Bridge and assess if design modifications or alternative options could increase the seismic and flood resilience of the bridge, as well as enhance and/or support the longer-term flood resilience strategies for the larger Islais Creek geography.

4 Charrette Approach

A charrette with representatives from several City departments was held on February 10, 2022, to brainstorm and discuss a range of replacement and/or rehabilitation options for the Islais Creek Bridge. Options are intended to address some degree of sea level rise and future climate change related flood hazards, in addition to addressing the known condition and seismic deficiencies associated with the existing bridge.

4.1 Charrette Goals

The goal of the charrette was to solicit feedback and input regarding the high-level feasibility (or lack thereof) of the presented options from each City department's perspective and understand priorities and potential consensus on evaluation criteria. The charrette was not intended to select a preferred design modification or alternative strategy, but serve to broaden the dialogue related to potential bridge and creek options, including the discussion of creek navigability. The charrette was also intended to identify opportunities and constraints from each City department's perspective to inform the design process.

4.2 Charrette Process

The process included several steps:

- **Prep Meetings**: An alternatives options definition meeting was held on January 6, 2022, with representatives from each City department (Table 1), to discuss and brainstorm potential alternative options for increasing the seismic and flood resilience of the Islais Creek Bridge and the surrounding area. Based on the feedback received at the January 6 meeting, the Port revised the alternatives definition approach and focused on a range of design modifications and alternative options to better inform the Islais Creek Bridge Rehabilitation project. Agreed upon action items from the prep meeting(s) included:
  - Exploring removing the federal designation of the Islais Creek channel as a navigable waterway. Removing this designation would allow for a fixed bridge design that may better accommodate future sea level rise. The creek would remain navigable by small watercraft but would no longer open for the passage of larger vessels.
  - Obtaining clarity on the potential for designating the Islais Creek Bridge as a city, state, or federal historic landmark. Although the bridge does not currently have a historic designation, it has been identified as potentially eligible.
  - Summarizing charrette outcomes for future use by SF Public Works no later than end of February to allow the project to advance under the existing grant requirements and schedule.
- **Matrix Range of options:** A matrix with 22 options was created using different bridge configurations and possible screening filters. After this was created, one- on- one meetings were conducted between Matt Wickens (Port) and the City departments to gain feedback and discuss options and define the screening criteria. After this process was completed, four options were selected to discuss and analyze during the charrette.

- **Charrette:** The charrette was held on February 10, 2022. The screening of the options and the four bridge pre-selected options were presented and discussed. Feedback received during the charrette is intended to inform the design modification(s) for the bridge and support larger scale strategies for consideration under the WRP for this geography.
- **Final Report**. All charrette feedback and outcomes are summarized in a technical document (this memo).

4.3 Charrette Agenda and Breakout Groups

The charrette agenda was divided into three segments:

- Introduction and background presentation - this included the introduction of all the attendees, and a presentation providing an overview of:
  - Background information
  - Site challenges and opportunities
  - A matrix with the range of options and screening criteria
  - In-depth descriptions of four remaining options
- Breakout groups discussion - the participants were divided into three groups, and each group was assigned two potential options for discussion. Each group had an assigned facilitator to present the options, guide the conversation, and collect feedback on a digital comment board. To guide the conversation, fact sheets were presented for each option, with a description; preliminary defined pros, cons, and opportunities; as well as technical data on elevation and sea level rise risk. These fact sheets are included in Attachment 1. The breakout groups reviewed the four bridge design options as follows:
  - Group A: Options 1 and 2
  - Group B: Options 2 and 3
  - Group C: Options 1 and 4[4]
- Regroup and present collected feedback and impressions from the group, inform the next steps, and close out the charrette.

Table 1 shows the participants and their breakout group attribution. The full charrette presentation is included in Attachment 2.

[4] The description of each option is presented in Section 5.4

Table 1. Prep Meeting and Charrette Participants

Department	Name	Group
Port	• Steven Reel[a]	C
	• Matt Wickens[a]	A / B / C
	• Adam Varat	A
	• Kelley Capone	B
	• Brad Benson	B
SFPUC	• Sarah Minick[a]	A
	• Murat Bozkurt (infrastructure group PM)	A
	• Abdel Abdelsalam (infrastructure group PE)	B
	• Mira Chokshi (wastewater/H&H)	C
	• Lisa Beyer (World Resources Institute)	
SFMTA	• Timothy Doherty[a]	B
	• Roger Nguyen (transit)	B
	• Charles Drane (transit)	A
	• Casey Hildreth (streets)	C
	• Matt Lasky (streets – bike program)	A
	• Kyi Keanway (Capital Prog./Const)	C
	• Dustin White	
SF Public Works	• Thomas Roitman[a]	C
	• Patrick Rivera[a]	A
	• Boris Deunert	B
	• Oliver Iberien	C
	• Freddy Padilla[a]	A
	• John Sprinkle	C
	• Raymond Lui	B
SFFD	• Chief Ken Cofflin[b]	N/A
	• Captain Tracy O'Keeffe	C
SFPD	• Lt. Amy Hurwitz	C
SF Planning	• Lisa Fisher (only in Prep Meeting)	N/A
	• Luiz Barata	B
	• Justin Greving	A
PEC	• Paulina Farias[a]	A – FACILITATOR
	• Yanna Badet[a]	C – FACILITATOR
	• Kris May[a]	B
	• Ramon Perez-Zaragoza[a]	C
	• Stella Kim[a]	A
	• Kevin Clinch[a]	B - FACILITATOR

[a] Present at January 6, 2022 Meeting

[b] Present partially at Charrette Meeting

5 Islais Creek (Third Street) Bridge Options

5.1 Challenges

The following challenges were identified for the Islais Creek Bridge:

- Existing and future flood risk from coastal flooding and sea level rise.
- Existing seismic risk of the existing bridge due to its age and deteriorated condition require action.
- Rail and light rail restrictions: The existing freight rail line intersects the light rail line at the southern end of the Islais Creek Bridge. This intersection generates a fixed point that cannot be elevated. The vertical profile of the light rail alignment between this point and the start of the bridge can be adjusted to gain elevation, but must remain within safe, operational, and maintainable limits.
- Surrounding Area and Assets: The footprint of the bridge and elevations around the area need to allow access to the Fire Station 25 entrance at the southern end of the bridge.
- The bridge is eligible for historic designation due to its age and design (it is one of four movable bridges in San Francisco). If the design of the bridge changes (for example, from a moveable bascule leaf bridge to a fixed bridge), it would lose this eligibility. This change would also necessitate an environmental permitting and review process.
- The creek channel west of the Islais Creek Bridge is a contaminated. Improving the water quality west of the existing bridge is challenging.
- Coordination with existing infrastructure: The SFPUC outfall from the Southeast Treatment Plant and the Booster Pump Station are located just southwest of the bridge, with the outfall pipes running across the creek adjacent to the bridge (below the channel) and along the northern side of the creek to the Bay.
- Pedestrian and bicycle crossings and connections into the surrounding area are currently difficult to navigate.
- Minimizing the construction duration and area of disruption would likely allow easier adjustments and alternative transportation offerings for Muni – light rail line, vehicles, and pedestrians.
- SF Public Works has been working on this project for several years. If the project were to change substantially, the funds spent on the project to date may need to be returned to the funding agency, FHWA (approximate spend to date is around $7 million).

5.2 Opportunities

Opportunities identified for the Islais Creek Bridge include:

- Increased flood and seismic resiliency and serviceability of the bridge.
- A wider bridge could incorporate a bike lane, wider sidewalks, and overlook areas, supporting cyclists and pedestrians with a better (safer) connection across the creek.
- The bridge could be connected to broader shoreline protection and flood risk reduction measures.
- New, direct pedestrian connections from the bridge to a continuous promenade along the creek could integrate flood risk reduction measures and provide access to existing open space amenities, which would overall improve access to Islais Creek as a community open space asset.

- A fixed bridge would allow the installation of new fixed utility infrastructure across the bridge.
- Generation of new public space along the northwest shoreline between the Third Street and Illinois Street Bridges.
- Bridge could be designed as an attractive, recognizable landmark to serve as a gateway to the Bayview community.
- Greening and ecological restoration opportunities exist at surrounding embankments.

Figure 6 shows a sketch of possible improvement opportunities that could be integrated with the bridge design.

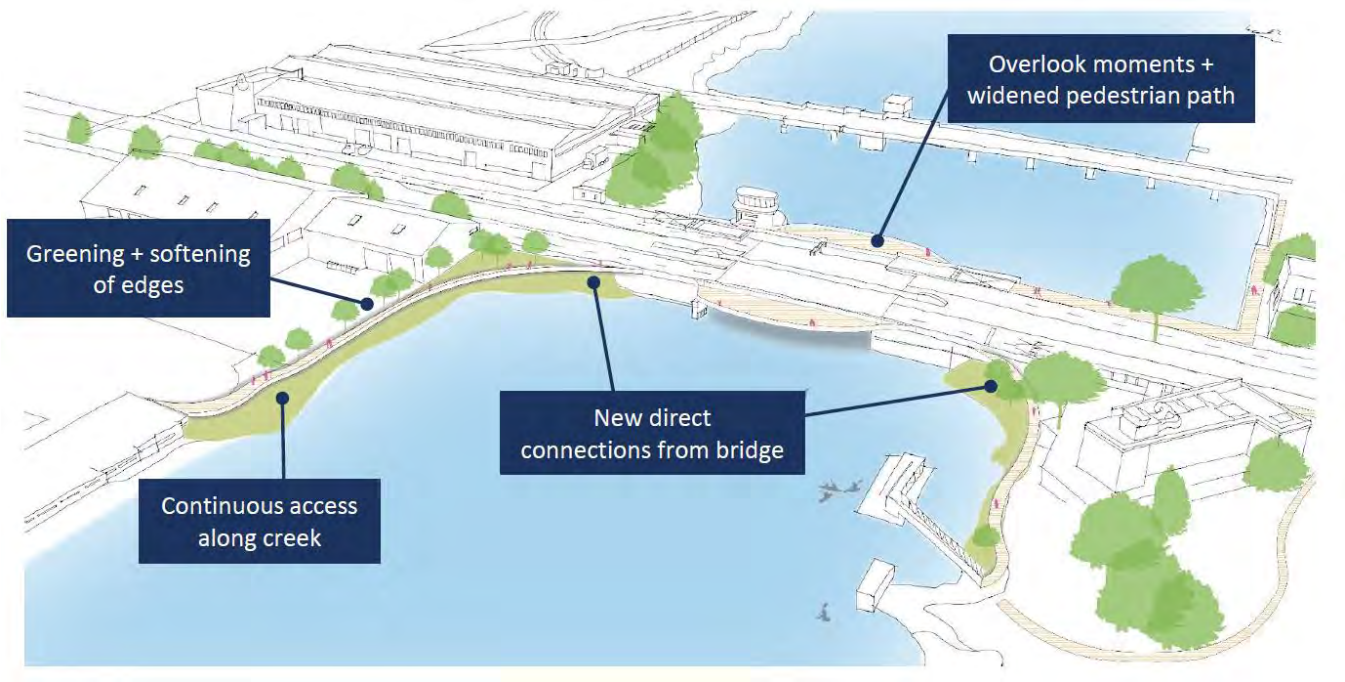


Figure 6. Example of Public Realm Enhancements Opportunities

5.3 Screening the Range of Options

A matrix that considers different bridge options and structure types was developed to sort and filter a range of possible configurations. This matrix identifies the elevation of critical and/or mechanical elements vulnerable to flood risk, the below deck clearance per Caltrans requirements, expected sea level rise impacts, and the timing of lost clearance and sea level rise impacts based on current sea level rise guidance (applying two sea level rise projection scenarios, likely and plausible high impact [OPC and CNRA 2018]). Attachment 3 contains the complete matrix. All bridge options would need to add mid-term shoreline adaptations to prevent the bridge approaches from flooding.

The matrix contains 22 bridge options to allow consideration of all configurations. Table 2 shows the complete list of options, including the regulatory requirements.

Table 2. Matrix Bridge Options

ID	Bridge Option and Structure Type	Movable/Fixed	Channel	Center Bent	Raised	Shoreline Resilience Option the Bridge Option could support
1	Maintain Existing Bascule Bridge	Movable	Existing	No	No	Defend @ Current Shoreline
2	New Bascule Bridge	Movable	Existing	No	No	Defend @ Current Shoreline
3	New Bascule Bridge	Non-Operable	Existing	No	No	Defend @ Current Shoreline
4	Maintain Existing Bascule Bridge	Non-Operable	Existing	No	No	Defend @ Current Shoreline
5	New Standard Girder Bridge	Fixed	Existing	No	No	Defend @ Current Shoreline
6	New Through Girder Bridge	Fixed	Existing	No	No	Defend @ Current Shoreline
7	New Standard Girder Bridge	Fixed	Existing	Yes	No	Defend @ Current Shoreline
8	New Standard Girder Bridge	Fixed	Widened	Yes	No	Accommodate
9	New Through Girder Bridge	Fixed	Widened	Yes	No	Accommodate
10	New Bascule Bridge	Movable	Existing	No	Yes	Defend @ Current Shoreline
11	New Bascule Bridge	Non-Operable	Existing	No	Yes	Defend @ Current Shoreline
12	New Standard Girder Bridge	Fixed	Existing	No	Yes	Defend @ Current Shoreline
13	New Through Girder Bridge	Fixed	Existing	No	Yes	Defend @ Current Shoreline
14	New Standard Girder Bridge	Fixed	Existing	Yes	Yes	Defend @ Current Shoreline
15	New Standard Girder Bridge	Fixed	Widened	Yes	Yes	Accommodate
16	New Through Girder Bridge	Fixed	Widened	Yes	Yes	Accommodate
17	New Bascule Bridge	Non-Operable	Existing	No	No	Defend Across Creek
18	Maintain Existing Bascule Bridge	Non-Operable	Existing	No	No	Defend Across Creek
19	New Standard Girder Bridge	Fixed	Existing	No	No	Defend Across Creek
20	New Through Girder Bridge	Fixed	Existing	No	No	Defend Across Creek
21	Levee Crossing at Islais Bridge Alignment	Levee	None	Fill	Yes	Defend Across Creek

ID	Bridge Option and Structure Type	Movable/Fixed	Channel	Center Bent	Raised	Shoreline Resilience Option the Bridge Option could support
22	Flood Control Structure East of Illinois St. Bridge with roadway re-alignment	Levee	None	Fill	Yes	Defend Across Creek

5.4 Options Definition

The 22 bridge options were screened with the configurations shown in Table 2 to select the most promising potential configurations for further discussion within the charette. Figure 7 illustrates the bridge configuration options.

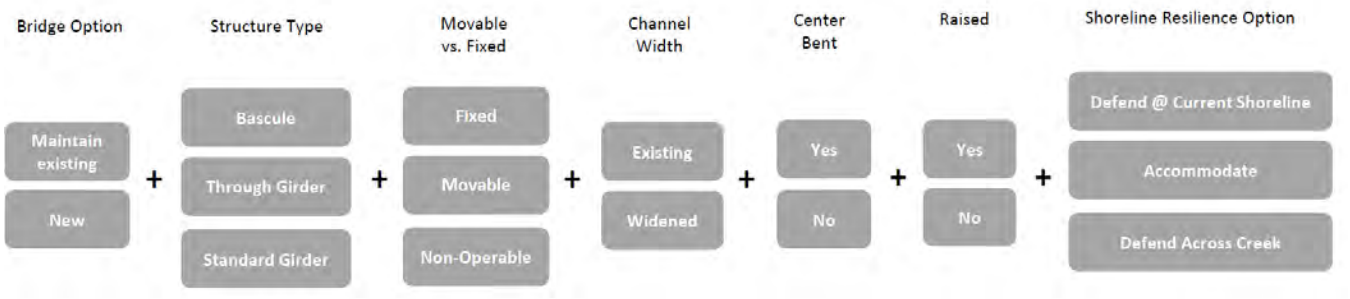


Figure 7. Matrix Configuration Options

This screening process eliminated several options:

- **Width of the channel**: The main goal of widening the channel is to improve the creek water west of the Islais Creek Bridge, which represents the narrowest point in the creek due to its bridge abutments. Widening this section of the creek could improve tidal flows and enhance water quality. Based on discussions with SFPUC, water quality improvements would likely be minimal due to the limited amount of additional width that could be gained. Therefore, all options that considered widening the channel were not carried forward.

- **Center bent**: The center bent (an intermediate vertical support element) does not significantly reduce the width of the structural elements of the bridge, and it increases the impact of the bridge on the creek bathymetry. Therefore, all options that considered a center bent were not carried forward.

- **Shoreline resilience option**: Several resilience options that considered flood risk reduction along the shoreline or tidal barriers or gates across the creek were initially considered as potential options. However, these options exceed what can be accomplished by the bridge rehabilitation project on its own. Including larger-scale resilience measures within the bridge rehabilitation project would result in a much larger project that would result in significant delays and substantial cost increases for the bridge rehabilitation project. In addition, the options do not solve the existing bridge seismic, age, and

condition challenges. Therefore, all options that considered larger geographic-scale resilience approaches were not carried forward.

- **Maintaining the existing bridge**: This option requires retrofitting the project in place, and not conducting a complete replacement. Although the most expedient and least costly, this option is unlikely to provide the desired design life due to the bridge's poor condition, and existing risk reduction or sea level rise challenges. Consequently, all options that considered maintaining the existing bridge were eliminated.

After the screening process, four options remained and were carried forward for further analysis and discussion during the charrette:

- Option 1: A New Bascule Bridge, replacing the existing as is (operable and non-operable draw bridge functions) (Table 2 ID 2 and ID 3)
- Option 2: A New Through Girder Bridge without a center bent at the same elevation (Table 2 ID 6)
- Option 3: A New Standard Girder Bridge without a center bent at a higher elevation (Table 2 ID 12)
- Option 4: A New Through Girder Bridge without a center bent at a higher elevation (Table 2 ID 13)

Each option is defined in the following subsections. Considerations and feedback received during the charrette are included with each respective option. Fact sheets summarizing each option are presented in Attachment 1.

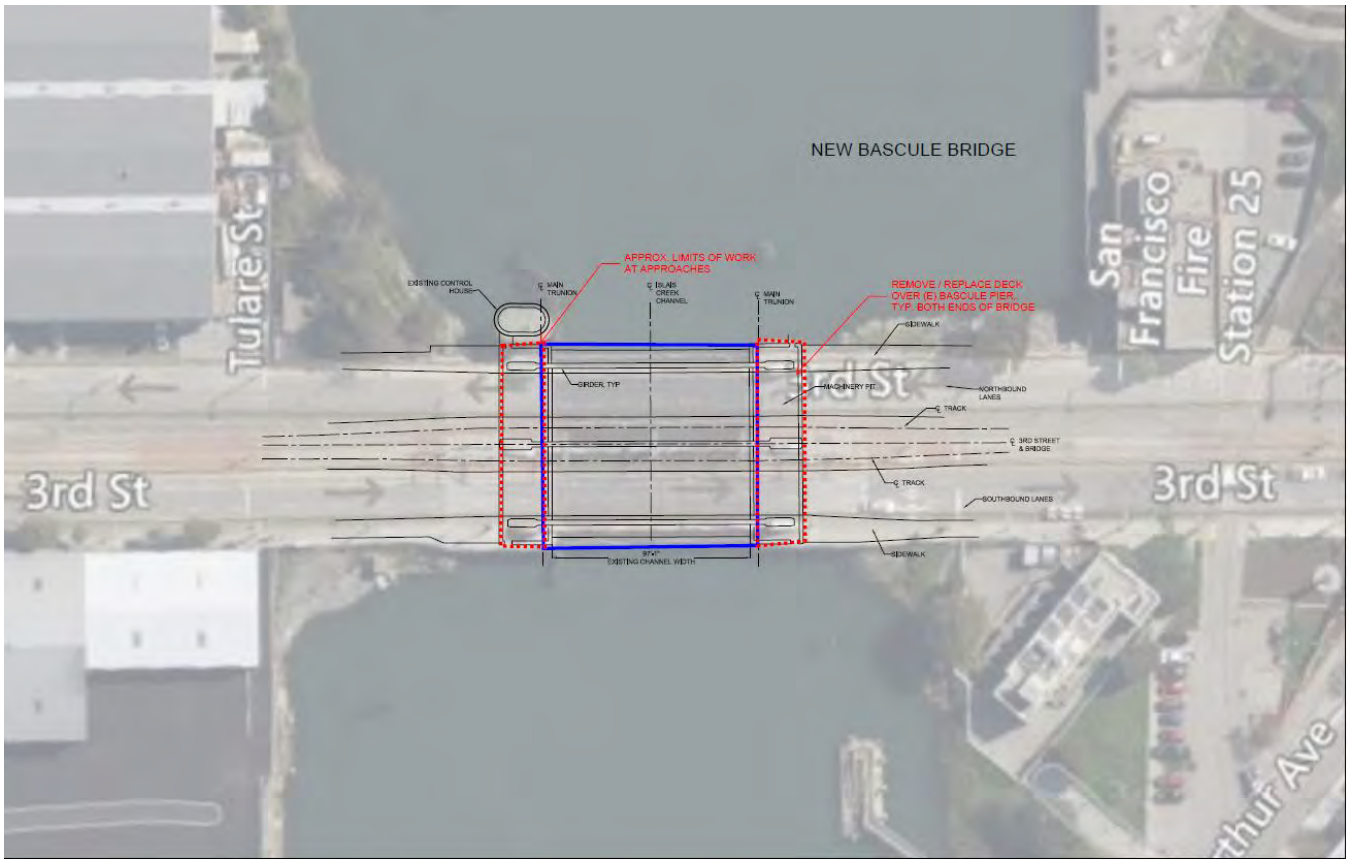
5.4.1 Option 1: New Bascule Bridge

5.4.1.1 Definition

Option 1 considers replacing the existing bridge with a new bascule bridge that can be either (a) moveable or (b) non-operable. In both cases, the bridge would be the same design, with the difference that in Option1b, the mechanical equipment to make the bridge operable (and therefore able to be opened for ship traffic) would not be installed. Option 1b results in a fixed bridge design.

Figure 8 shows the plan view of Option 1. The street work considered for this option is minimal, and it includes the abutments or approaches and street deck over the bascule pier at both sides of the bridge.

Attachment 4 contains the engineering plan, elevation and typical cross section for this option.



Note: The solid blue line shows the extent of work in the bridge itself, and the dashed red line shows the street and surrounding area work.

Figure 8. Option 1 – New Bascule Bridge Plan View

5.4.1.2 Flood Risk

With the same design as the existing bascule bridge, Option 1 would retain the same flood risk (despite being a new replacement bridge), with the distinction that the operable bridge (Option 1a) would be more vulnerable to flood risk due to the low elevation of the mechanical equipment. The elevation at which flooding could impact operation of the bridge, and thus also the governing flood risk elevation for this option, is at 8 feet NAVD88 (rounded up from 7.93 feet NAVD88, the machinery pit elevation). The access hatches of the existing bridge can flood today and have been impacted by extreme tides and coastal flood events in the last several years. However, it is possible that the bridge elements at risk could be floodproofed to reduce flood risk while still maintaining historic integrity. Yet, Option 1a would remain the option with the lowest clearance between the bridge and the creek.

The non-moveable fixed bridge option (Option 1b) would be a bit less vulnerable to flood risk because the vulnerability of the mechanical equipment for the bascules would no longer be the determining factor. However, the governing elevation for Option 1b is 10.3 feet NAVD88, at the bottom girder elevation, which could be reached today during a 1-percent coastal flood event. This bride design is at risk of flooding under both the likely and plausible high impact sea level rise projections used to assess the exposure of the bridge options

(OPC and CNRA). The bridge approach (the vehicular accessway to the bridge) could flood between 2030 and 2040 with 12 inches of sea level rise and a 1-percent coastal flood event due to direct shoreline overtopping along the creek edge.

Figure 9 shows a cross section of the bridge design with flood elevations and elements vulnerable to coastal flooding and sea level rise. Attachment 1 contains additional information.

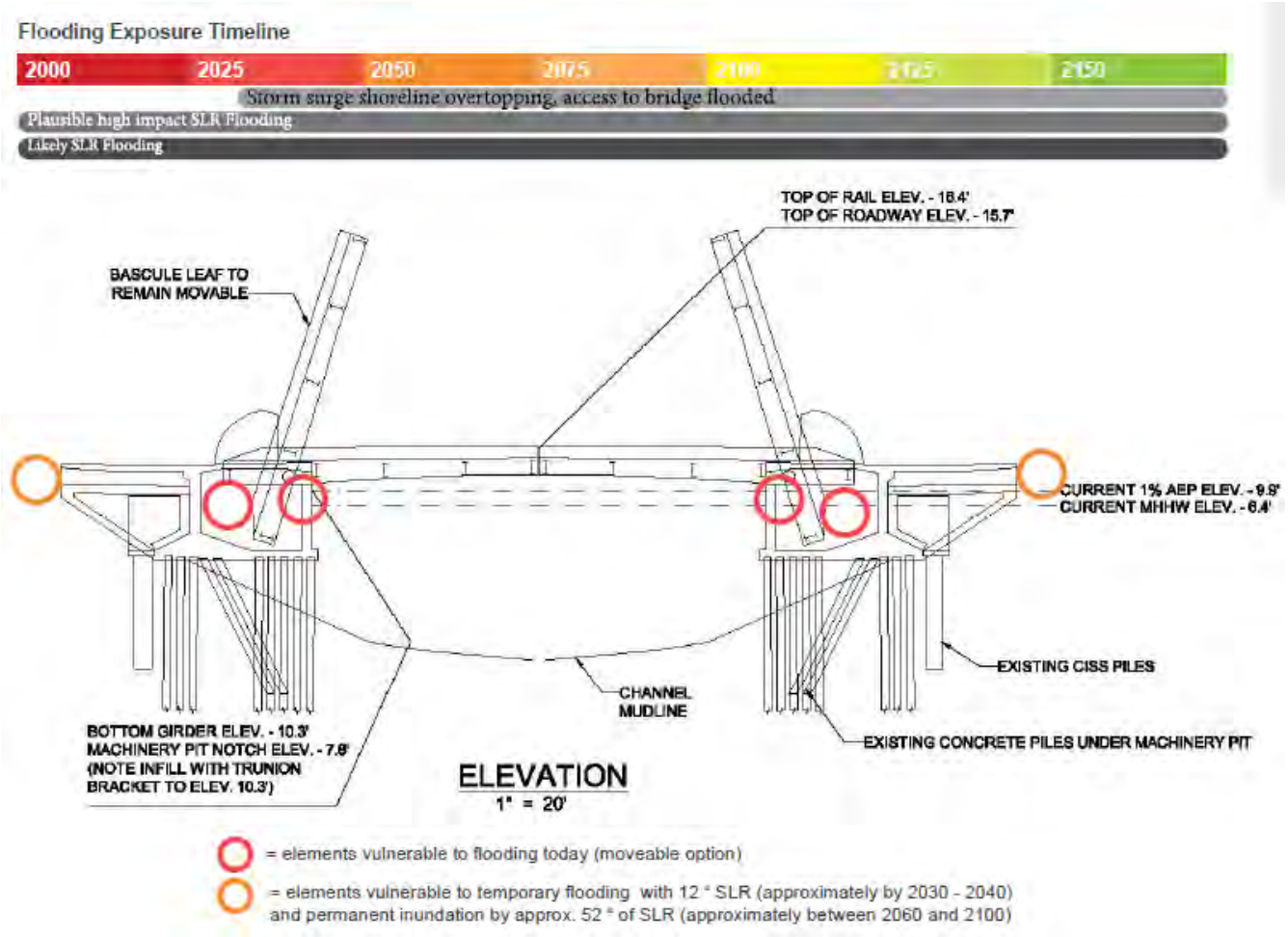


Figure 9. Cross Section of New Bascule Bridge Depicting Flood Elevations and Elements Vulnerable to Coastal Flood Events

5.4.1.3 Pros, Cons, and Opportunities

The preliminary pros identified for Option 1 are as follows:

- Generates the least impact on existing design efforts, and is most likely to maintain current budget and schedule.
- Does not require modifications to bridge footings or the creek channel with this construction project.
- May allow the bridge to remain eligible for future historic designation.
- Option 1a maintains creek navigability.

- The new bridge is designed for increased seismic resilience.

The preliminary constraints identified for Option 1 are as follows:

- Does not include shoreline resilience modifications to reduce coastal flooding and near-term sea level rise risks.
- Design does not address coastal flood and sea level rise risks.
- If the new structure soffit profile must replicate the existing for historical reasons, it may negate the opportunity to increase the freeboard, exposing the bridge to flood risks in the near term.
- Kayakers and small watercraft would need to time creek access (crossing under the bridge) during lower tidal elevations (for Option 1b).

There were no preliminary public realm or public access opportunities identified for Option 1.

5.4.1.4 Charrette Feedback

The feedback from the break-out groups was combined and summarized as benefits, constraints, and general comments.

Option 1 Benefits

- There is a familiarity in the neighborhood with this type of bridge, and therefore presents no visual impact if it was replaced with the same design.
- The bridge is eligible as an historic asset. Option 1 would maintain its existing character and keep its historic integrity. However, this is not a defining criterion.
- The project would stay on schedule.
- Lower cost for Option 1b (in comparison to keeping it moveable [Option 1a] and the related construction and maintenance costs). These savings could be used for other improvements.
- SFMTA: Option 1b won't have nearly as much equipment underneath the bridge if it is not moveable span. If it is fixed, equipment can also be moved above.

Option 1 Constraints

- The current bridge equipment is at risk.
- The light rail machinery is located in the room that currently gets flooded by the highest annual high tides. If the bridge would be non-movable, all this equipment (for example, for the traffic light required for the movable drawbridge) could be installed at street level.
- There is no clarity if the historic asset eligibility would remain.
- There are no recreational or access to open space benefits.
- More maintenance and repair needs, highest initial and operations and maintenance costs of the three options presented.
- Clearly less resiliency to flooding, traffic impacts, and lack of scope to better integrate bicycle/pedestrian access improvements across and connecting to the bridge.

- SF Public Works: Maintenance costs, disruption to traffic during bridge exercising, disruption to emergency routes, high cost of construction, SFMTA light rail disruption.
- Light rail power/signal infrastructure on moveable bridge is not as reliable.
- Four moveable bridges (two on Islais Creek and two on Mission Creek) and all will need rehabilitation/replacement because of sea level rise. Keeping the creeks navigable increases costs.
- The current open roadway and sidewalk deck is a safety and maintenance issue versus a closed deck option. It is also a water quality issue (run-off goes directly into the creek).
- Option 1b: lower initial cost and operations and maintenance cost than Option 1a, but likely more than Option 4.
- Option 1b: If navigability is not maintained, why not raise the bridge? No benefit seen for doing this option because it doesn't have the same benefits as the raised solutions.

Option 1 General Feedback

- SF Public Works and the general sentiment is that the pros do not outweigh the cons of longer-term resiliency.
- No point replacing as is, at the same elevation, because of the sea level rise and flood risk. Explore elevating the bridge leaves as an option instead. This will be easier for Option 1 b (fixed) than 1a (moveable).
- SF Planning: Historical integrity would be most preserved with this option, but ultimately resiliency outweighs that. Would be great if the design can mirror the original design for historical integrity purposes.
- Having the creek be non-navigable is preferred for wastewater assets, because the dredging would become easier.
- Drawbridges are too low for sea level rise.
- Only SFFD may be asking to retain navigability, otherwise the group leans toward non-navigability (Option 1b). SFFD voiced a preference for a navigable bridge but is open to discussions to identify any potential operational issues and understand the trade-offs. Any change that restricts operations needs further analysis. A future meeting with SFFD, Port, and SF Public Works should be held to discuss the navigability issue and constraints.
- The cost to construct this bridge is very high. Adding some public spaces would be a marginal cost compared to the bridge.
- Having a bike path in the bridge cross section is a "must-have" for a city like San Francisco.
- Expensive, non-functioning design that looks like a drawbridge, but is not the best engineered solution.

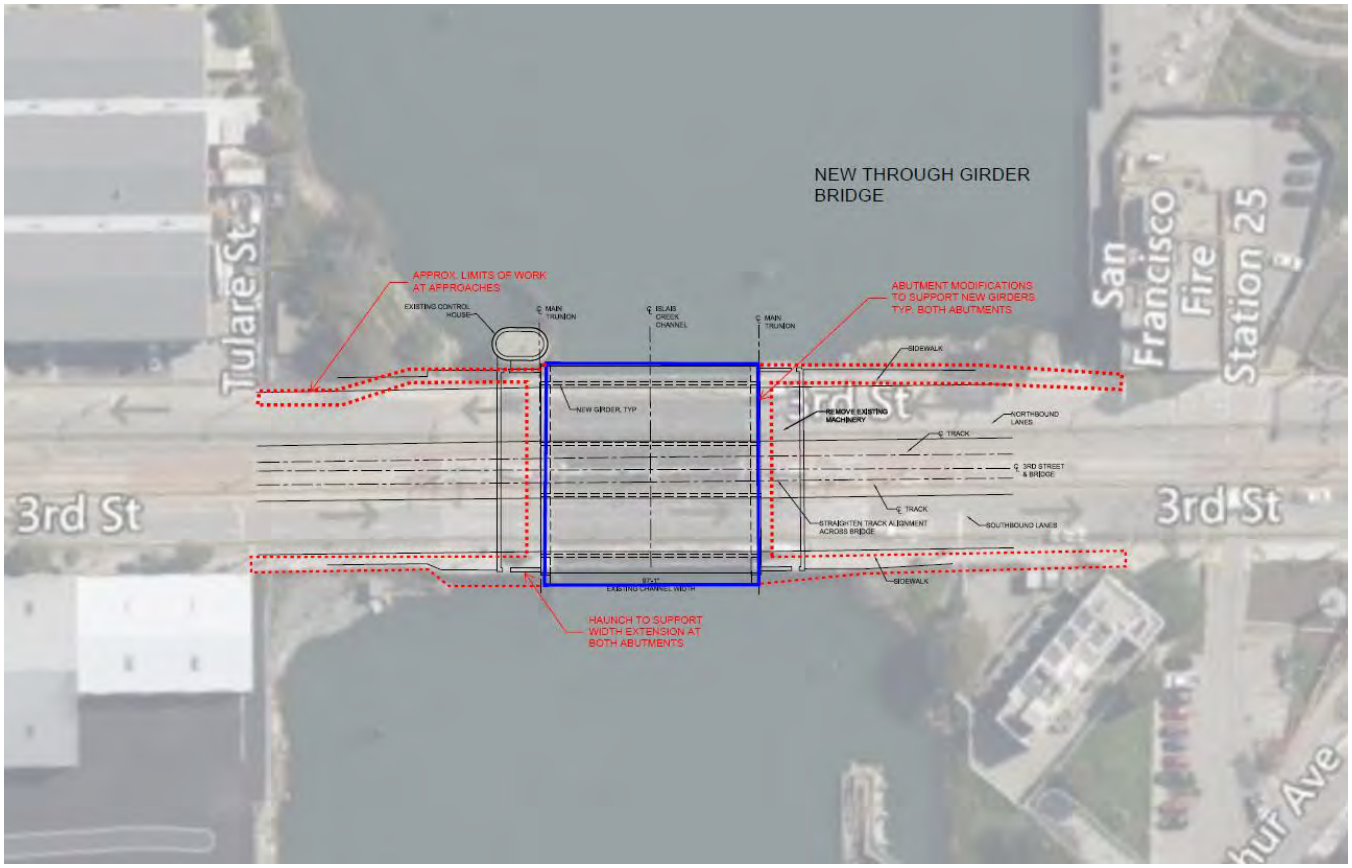
5.4.2 Option 2: New Through Girder, Same Elevation

5.4.2.1 Definition

Option 2 considers a new through girder (fixed) bridge, without a center bent, that would have the same length and elevation of the existing bridge. The new cross section of the bridge would allow for a wider roadway than existing conditions.

Figure 10 shows the plan view of Option 2. The street work considered for this option includes the abutment modifications to support the new girders at both sides of the bridge, as well as a haunch to support the

additional width of the new cross section. This option only considers additional work in the street approaching the bridge to allow a consistent cross section throughout the creek area.



Note: The solid blue line shows the extent of work on the bridge itself, and the dashed red line shows the street and surrounding area work. Disclaimer: Maps throughout this book were created using ArcGIS ® software by Esri. ArcGIS ® and ArcMap ™ are the intellectual property of Esri and are used herein under license. Copyright © Esri. All rights reserved.

Figure 10. Option 2 – New Through Girder Bridge Plan View

Attachment 4 contains the engineering plan, elevation and typical cross section for this option.

5.4.2.2 Flood Risk

The bridge approach (vehicular access point to the bridge) presented in Option 2 can flood from 12 inches of sea level rise and a 1-percent coastal flood event due to shoreline overtopping between 2030 and 2040. Permanent inundation of the bridge approach is possible between 2060 and 2100, depending on the rate of sea level rise. The lowest structural element for this option is at an elevation of 12.9 feet NAVD88, which could be reached by flood waters with 36 inches of sea level rise and a 1-percent coastal flood event as early as 2065 under the plausible high impact sea level rise scenario used to assess the exposure of the bridge options (OPC and CNRA 2018). Figure 11 shows a cross section of the bridge design with flood elevations and elements vulnerable to coastal flooding and sea level rise. Attachment 1 contains additional information.

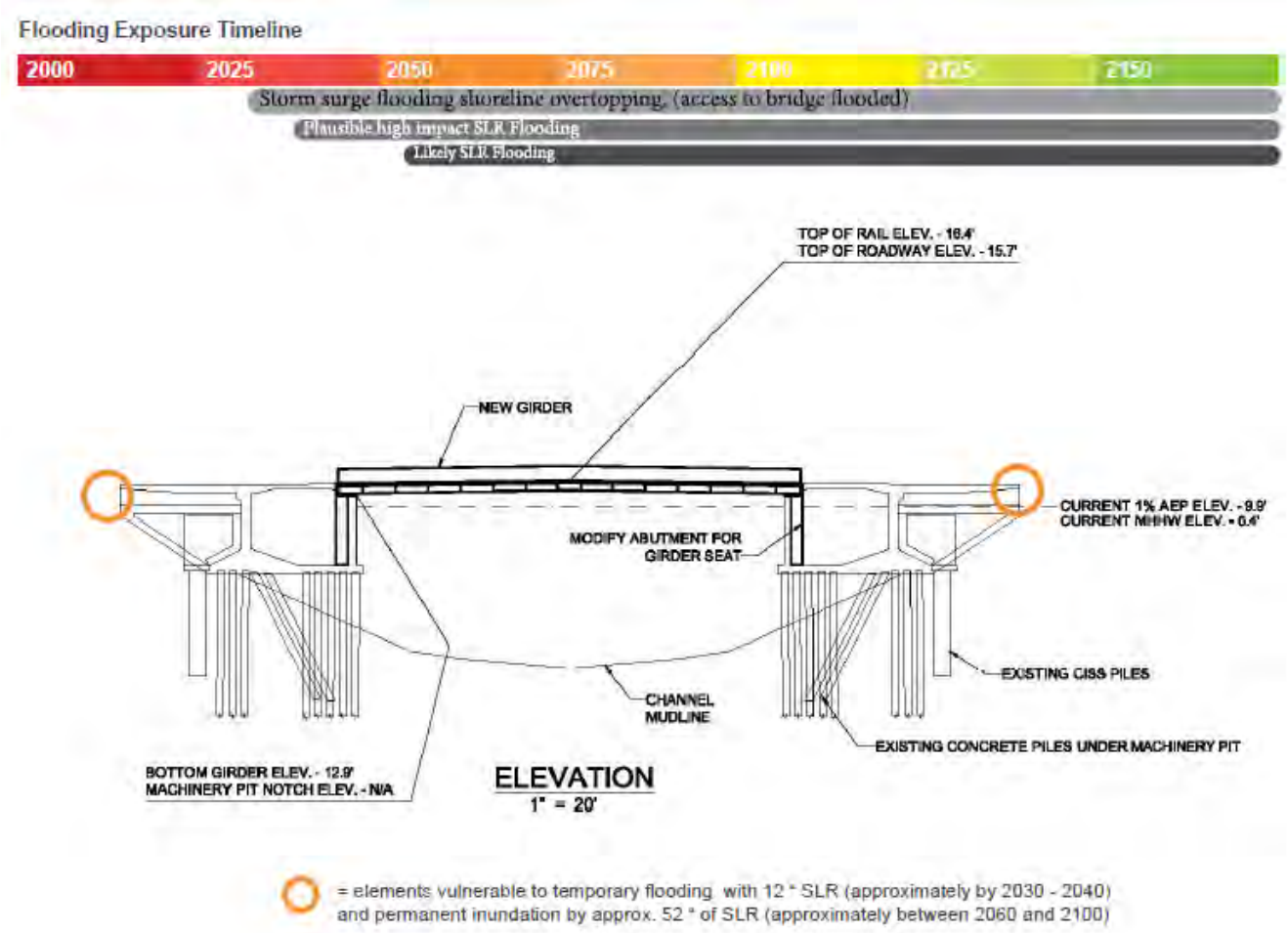


Figure 11. Option 2 - Cross Section of New Standard Girder Bridge Depicting Flood Elevations and Elements Vulnerable to Coastal Flood Events

5.4.2.3 Pros, Cons, and Opportunities

The preliminary pros identified for Option 2 are as follows.

- Moderate flood risk resilience is achieved because the vulnerable lower elevation mechanical parts are no longer required (and thus affected) with a fixed-type bridge.
- The freeboard (the clearance between the lowest bridge member and the existing creek water level elevation) is increased due to the primary structural element (the girders) being elevated relative to the bridge deck.
- The new bridge is designed for increased seismic resilience.

The preliminary constraints identified for Option 2 are as follows:

- The channel is no longer navigable.
- The bridge loses its historical eligibility.

- The kayakers and boaters would need to time creek access (crossing under the bridge) during lower tidal elevations.

The preliminary public realm and public access opportunities for Option 2 are as follows.

- A fixed-type bridge would allow for utilities to cross the channel with the bridge.
- The Blue Greenway bicycle path could be added to the Islais Creek Bridge, creating a safer path for bicyclists.
- Include open space use that currently gets flooded.

5.4.2.4 Charrette Feedback

The feedback from the break-out groups was combined and summarized as benefits, constraints, and general comments.

Option 2 Benefits

- There is a significant cost saving for the type of bridge that could have precast girders. There is a reduced construction timeline (and bus bridges) compared to Bascule bridge replacement.
- There would be no need for a center median of the light rail track, allowing for tracks to be straight. (The through girder being higher allows going wider, but tracks can continue straight in the center as is).
- There is less environmental impact.
- SF Planning: If it's a new bridge, it would be great if it can mirror the original design for historical purposes.
- A new bridge means a new design, which allows for a wider deck for sidewalks and bike lanes, overlooks, etc.
- Reduced maintenance cost.

Option 2 Constraints

- A limited bridge lifespan (due to limited freeboard).
- Could create a constraint for mid-term shoreline adaptation.
- Requires non-navigability declaration.

Option 2 General Feedback

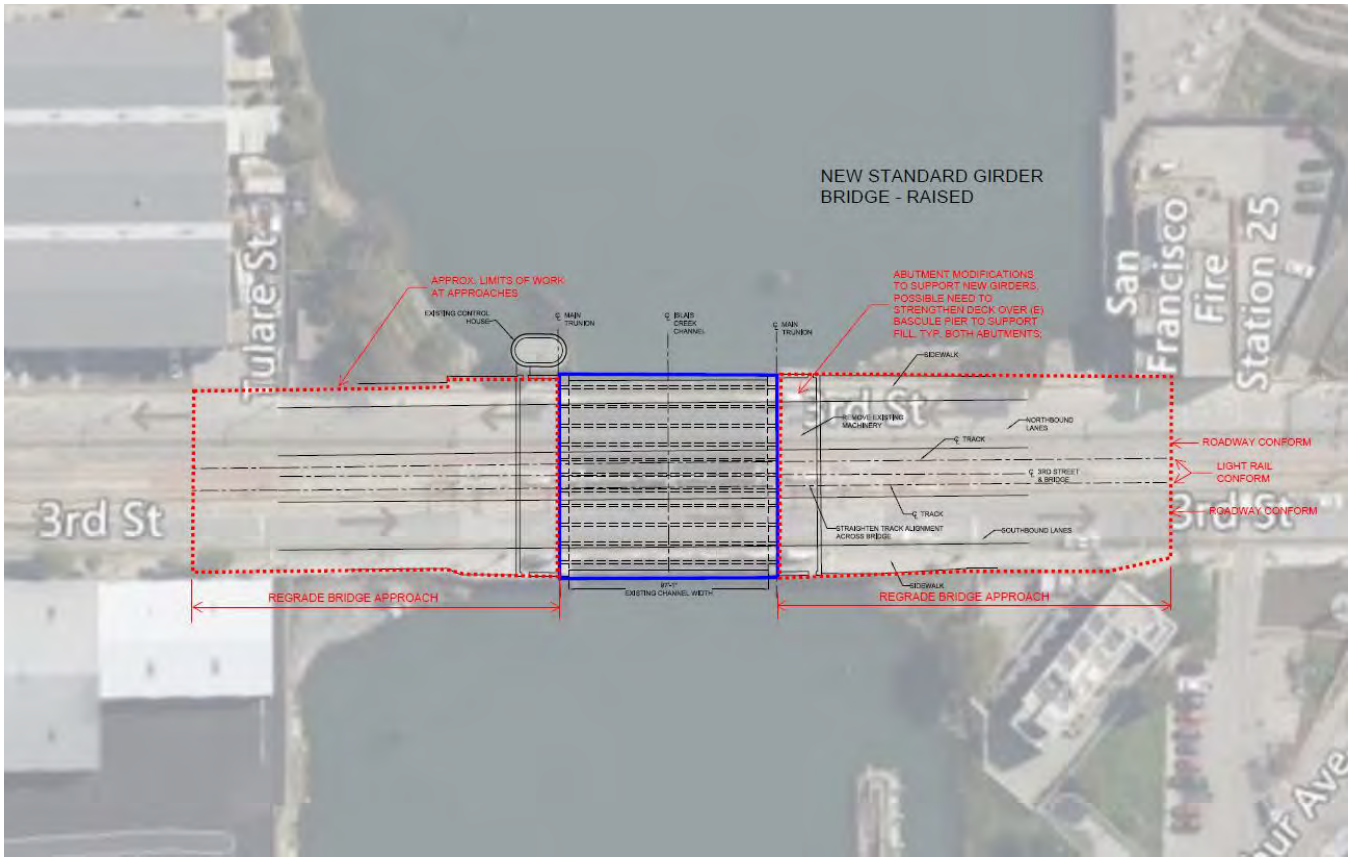
- The cons outweigh the pros.
- Reducing the amount of disruption over time due to construction is a desirable outcome from both City departments and from an equity standpoint. Therefore, the longer life span gain, and the less disruption to the community seems to be important criteria that need to be considered.
- SFMTA strongly favors a fixed span.
- Safe pedestrian and bicycle path is required for the bridge.

5.4.3 Option 3: New Standard Girder Bridge, Raised

5.4.3.1 Definition

Option 3 considers a new standard girder (fixed) bridge, without a center bent, that would be the same length as the existing bridge, but with a higher elevation across the creek channel. The new cross section of the bridge would be wider than the existing bridge width. Based on preliminary discussions between the Port and SFMTA prior to the charrette, the grade at the south approach was increased to 3.5 percent while maintaining a vertical curve near the start of the bridge and at the bridge midspan. This resulted in a top of rail elevation gain of about 2 feet at the start of the bridge.

Figure 12 shows the plan view of Option 3. The street work considered for this option includes abutment modifications to support the new girders, and to strengthen the deck over the existing bascule pier to support the fill at both sides of the bridge. Because the bridge is raised, the approach needs to be regraded. On the southern side of the bridge, the limit of new work in the roadway and light rail needs to end before the entry to Fire Station 25.



Note: The solid blue line shows the extent of work in the bridge itself, and the dashed red line shows the street and surrounding area work.

Figure 12. Option 3 – New Raised Standard Girder Bridge Plan View

Attachment 4 includes the engineering plan, elevation and typical cross section for this option.

5.4.3.2 Flood Risk

The lowest structural element for Option 3 is at an elevation of 11.7 feet NAVD88, which could be reached by flood waters with 36 inches of sea level rise and a 1-percent coastal flood event as early as 2065 under the likely sea level rise scenario (OPC and CNRA). The elevation of a 50-year coastal event and 2 feet of freeboard is reached today. The bridge approach presented in Option 3 could flood between 2030 and 2040 with 12 inches of sea level rise and a 1-percent coastal event that causes shoreline overtopping along the creek edge. Permanent inundation of the bridge approach is possible between 2060 and 2100.

Figure 13 shows a cross section of the bridge design with flood elevations and elements vulnerable to coastal flooding and sea level rise. Attachment 1 contains additional information.

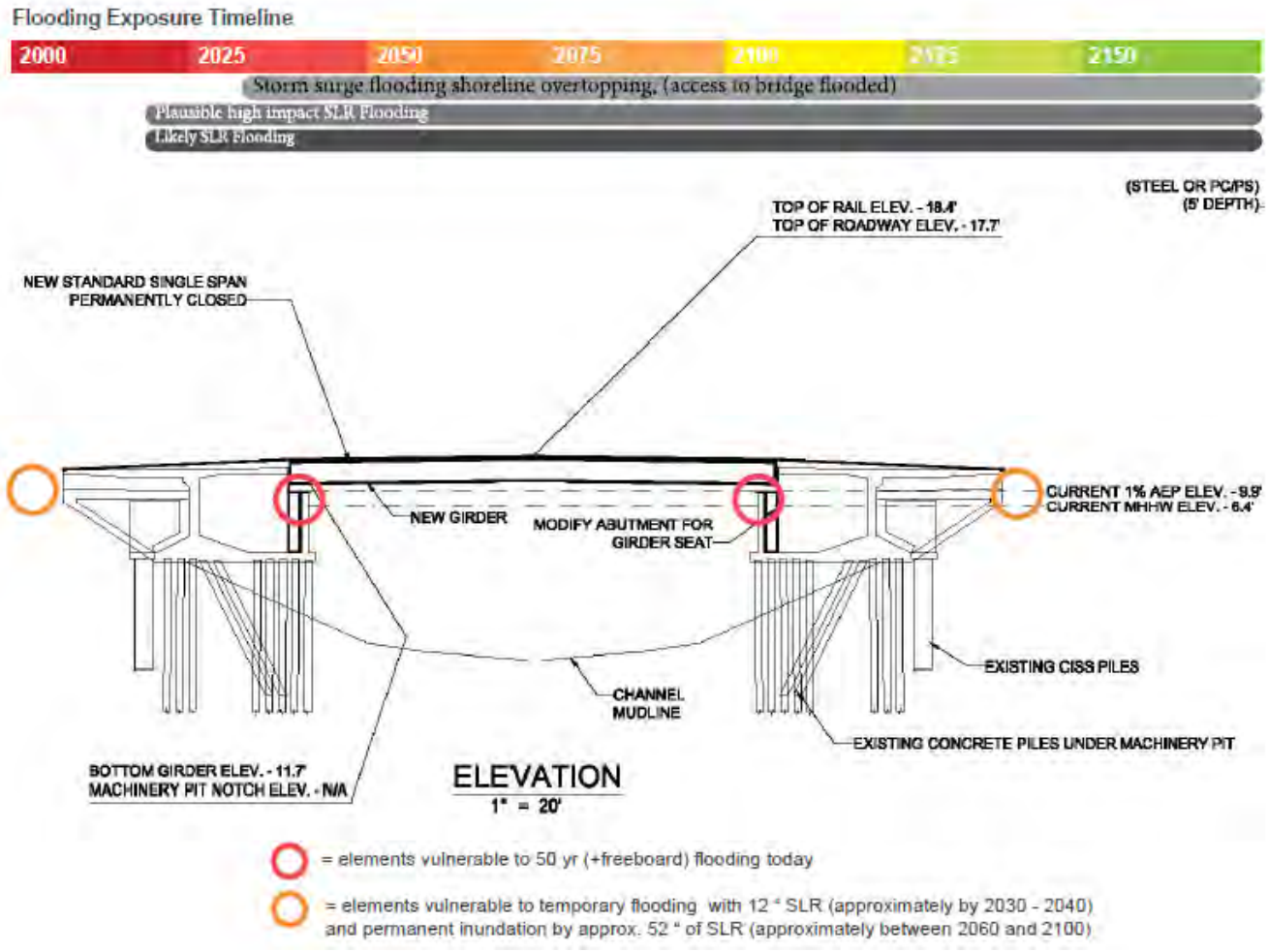


Figure 13: Option 3 - Cross Section of New Raised Standard Girder Bridge Depicting Flood Elevations and Elements Vulnerable to Coastal Flood Events

5.4.3.3 Pros and Cons and Opportunities

The preliminary pros identified for Option 3 are as follows:

- The vulnerability to flooding is reduced because there are no low elevation mechanical equipment or access hatches that could be impacted.
- The new bridge is designed for increased seismic resilience.
- A precast structural element can be used, diminishing the construction cost and timeline for the bridge work (please note that this option extends the surface extension of the project, making the overall construction timeline longer).

The preliminary constraints identified for Option 3 are as follows:

- The channel is no longer navigable.
- The bridge loses its historical eligibility.
- This option generates a larger scale intervention that could require an extension of the project schedule and likely an increase in the project budget.
- The height of the structural element is larger than a through girder type of element, diminishing the possible additional freeboard.

The preliminary public realm and public access opportunities for Option 3 are as follows:

- A fixed-type bridge would allow for utilities to cross the channel with the bridge.
- The Blue Greenway bicycle path could be added on Islais Creek Bridge, allowing a safer path for bicyclists.

5.4.3.4 Charrette Feedback

The feedback from the break-out groups was combined and summarized as benefits, constraints, and general comments.

Option 3 Benefits

- Reduced maintenance cost.
- Improved SFMTA operations.
- Reduces SPFUC infrastructure cost.
- Reduces construction timeline (and bus bridges) compared to Bascule bridge replacement.

Option 3 Constraints

- Requires non-navigability declaration.
- Limited bridge lifespan.
- Could create a constraint for mid-term shoreline adaptation.

Option 3 General Feedback

- Reducing the amount of disruption over time due to construction is a desirable outcome from both City departments and from an equity standpoint. Therefore, the longer life span gain, and the less disruption to the community, seem to be important criteria that need to be considered.
- SFMTA strongly favors a fixed span
- SFMTA intends to study sight lines that would result from increasing the grade at the bridge approaches

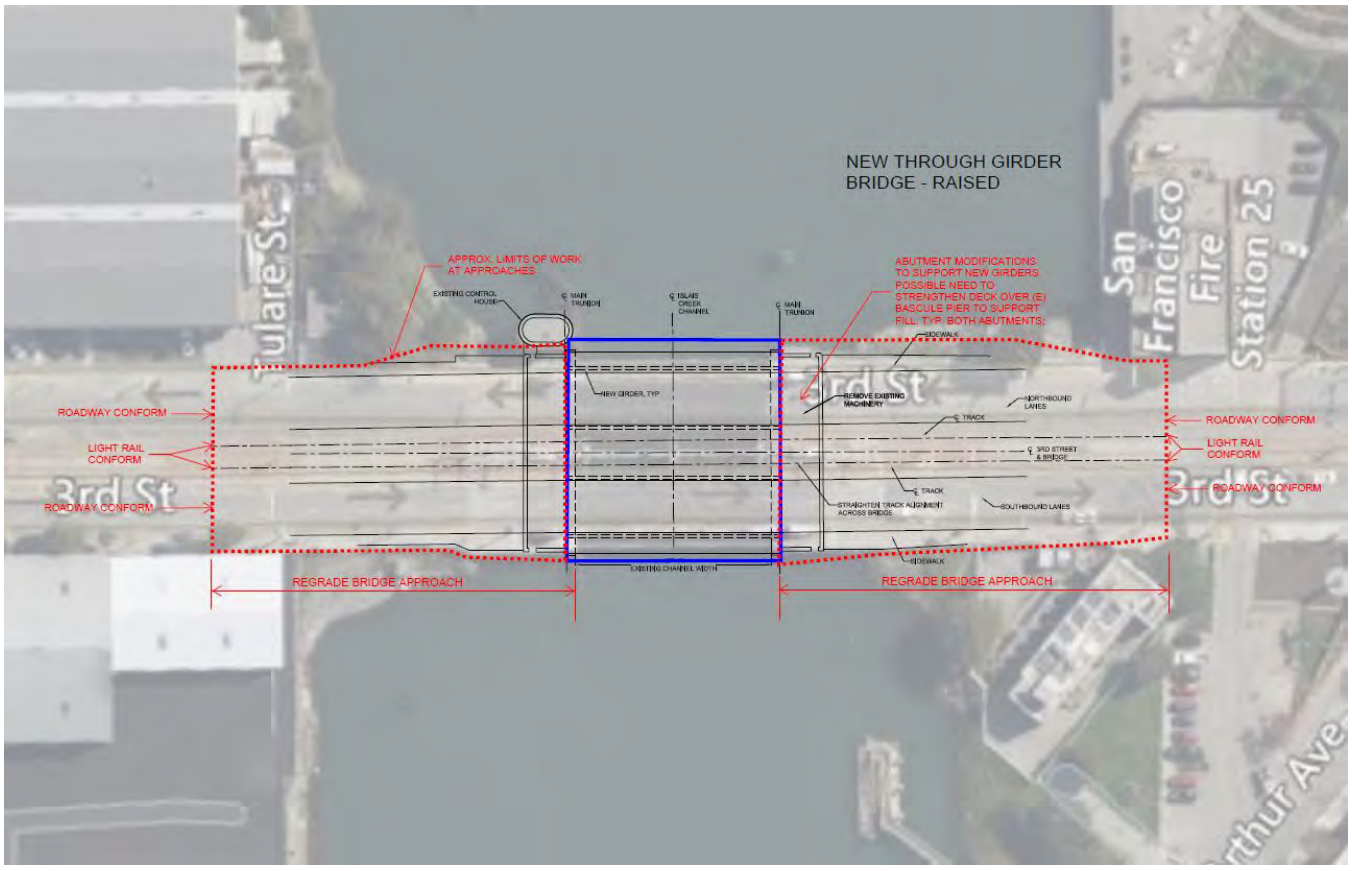
5.4.4 Option 4: New Through Girder Bridge, Raised

5.4.4.1 Definition

Option 4 considers a new through girder (fixed) bridge, single-span with a cast-in-place concrete deck, without a center bent, that would be at a higher elevation than the existing bridge. This bridge would be 114 feet long, 108 feet wide, and able to accommodate a center 25-foot-wide dedicated light rail track, two 12-foot-wide travel lanes in each direction, one dedicated 5-foot-wide Class III bikeway in each direction, and two 8-foot-wide concrete sidewalks with steel pedestrian guard rails. The new cross section of the bridge would be wider than the existing bridge.

Based on preliminary discussions between the Port and SFMTA prior to the charrette, the grade at the south approach was increased to 3.5 percent while maintaining a vertical curve near the start of the bridge and at the bridge midspan. This resulted in a top of rail elevation gain of about 2 feet at the start of the bridge.

Figure 14 shows the plan view of Option 4. The street work considered for this option includes the abutments modifications to support the new girders, and to strengthen the deck over the existing bascule pier to support the fill at both sides of the bridge. Because the bridge is raised, the approach needs to be regraded. On the southern side of the bridge, the limit of new work in the roadway and light rail needs to end before the entry to Fire Station 25.



Note: The solid blue line shows the extent of work in the bridge itself, and the dashed red line shows the street and surrounding area work.

Figure 14. Option 4 – New Raised Through Girder Bridge Plan View

Attachment 4 contains the engineering plan, elevation and typical cross section for this option.

5.4.4.2 Flood Risk

The bridge approach presented in Option 4 could flood between 2030 and 2040 with 12 inches of sea level rise and a 1-percent coastal flood event due to direct shoreline overtopping along the creek edge. Permanent inundation of the bridge touchdown is possible between 2060 and 2100. This impact may be reduced through a retaining wall, and benefits would depend on the height, depth, and length of such a retaining wall. However, such a structure is not a coastal flood risk reduction measure and alternative shoreline flood risk reduction measures will become necessary as sea levels rise. Longer-term flood risk reduction strategies are being developed with city collaboration under the WRP.

The lowest structural element for Option 4 is at an elevation of 14.9 feet NAVD88, which could be reached by flood waters with 55 inches of sea level rise and a 1-percent coastal flood event as early as 2085 under the plausible high impact sea level rise scenario and by 2125 under the likely sea level rise scenario (OPC and CNRA 2018). Figure 15 shows a cross section of the bridge design with flood elevations and elements vulnerable to

coastal flooding and sea level rise. The elevation of a 50-year coastal event and 2 feet of freeboard may be reached by 2070 under the plausible high impact sea level rise scenario. Attachment 1 contains additional information.

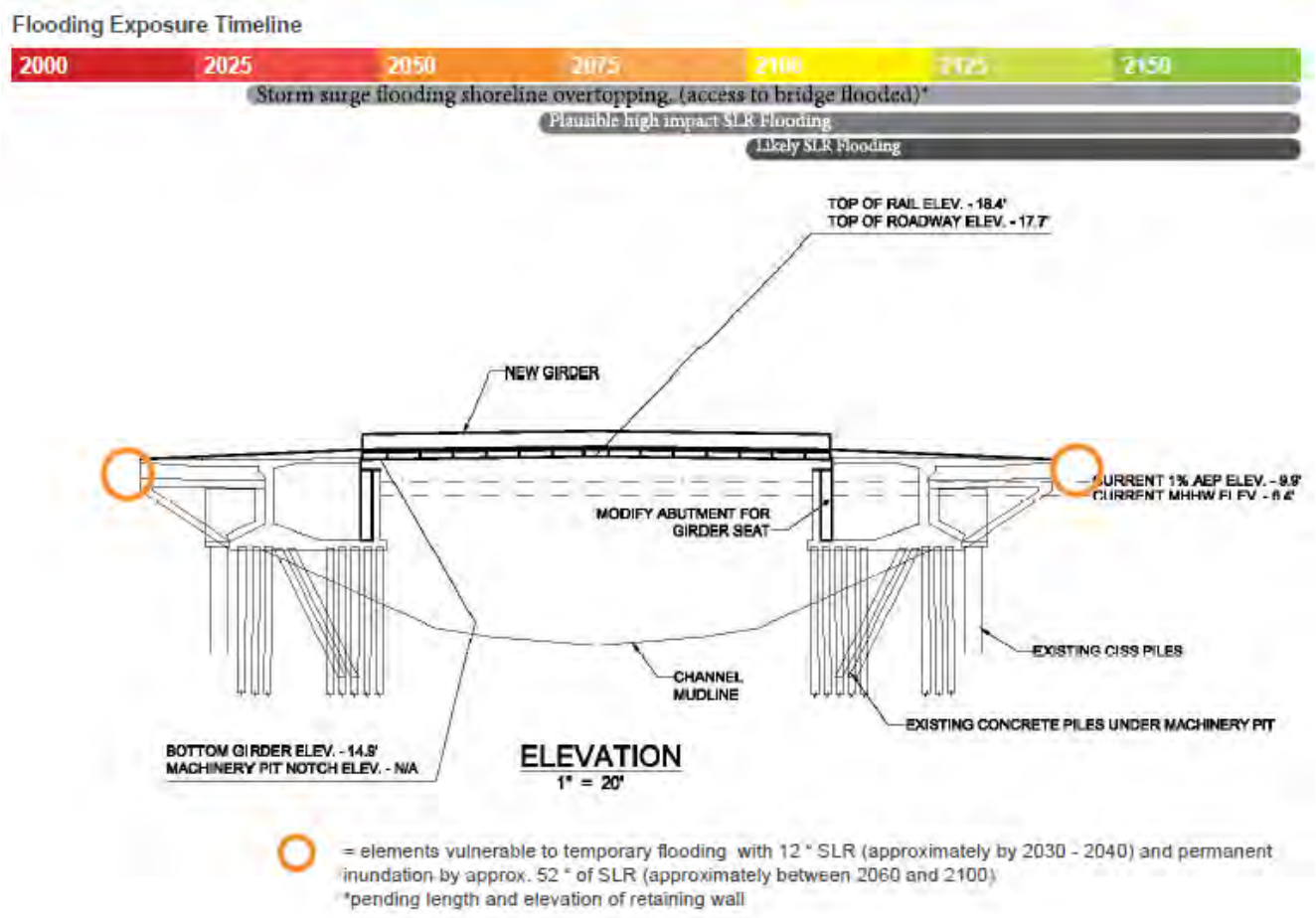


Figure 15: Option 4 - Cross Section of New Raised Through Girder Bridge Depicting Flood Elevations and Elements Vulnerable to Coastal Flood Events

5.4.4.3 Pros and Cons and Opportunities

The preliminary pros identified for Option 4 are as follows:

- Maximized flood resilience while maintaining landside existing infrastructure.
- The vulnerability to flooding is reduced because there are no low elevation mechanical equipment or access hatches that could be impacted.
- The new bridge is designed for increased seismic resilience, including retaining walls along the ramps, that can also provide some flood risk reduction.

The preliminary constraints identified for Option 4 are as follows:

- The channel is no longer navigable.

- The bridge loses its historical eligibility.
- This option generates a larger scale intervention that could require an extension of the project schedule and likely an increase in the project budget.
- Raising the bridge impacts the adjacent Third Street area and rail operations, which would result in a larger-scale planning effort.
- Rising groundwater and subsidence may cause additional issues.

The preliminary public realm and public access opportunities for Option 4 are as follows:

- A fixed-type bridge would allow for utilities to cross the channel with the bridge.
- The Blue Greenway bicycle path could be added on Islais Creek Bridge, allowing a safer path for bicyclists.

5.4.4.4 Charrette Feedback

The feedback from the break-out groups was combined and summarized as benefits, constraints, and general comments.

Option 4 Benefits

- Extends design life in the face of sea level rise.
- Provides the most opportunity to improve the Third Street corridor at/near the bridge from a user perspective, especially pedestrian and bicycle use.
- Opportunity to widen the bridge.
- Likely the least construction impact from a full road closure perspective. Approaches and abutment modification work can be completed with partial and evening closures. Replacement bridge deck will be faster than bascule in Option 1.
- This option can be designed with more earthquake reliability than movable span options, an important consideration for the Third Street corridor.
- Possibility to include walkways and overlook areas, improve the bridge serviceability as a Muni Metro facility, use a corrosion-resistant construction, and capture the stormwater runoff instead of discharging it through the bridge.

Option 4 Constraints

- Constraint on south side is proximity to Union Pacific Railroad tracks. Cannot elevate too high or when chasing grade, it would bump into their jurisdiction and that would significantly add to timeline and approvals process.
- Impact and disruption in the adjacent area. A raised bridge would involve impact into a larger area, as a higher elevation involves higher abutments, and would reduce the possibility of just retrofitting them. It is likely to be more expensive and disruptive (longer construction time) option.

Option 4 General Feedback

- SFMTA mentioned that on-street bicycle lanes are not a priority, and would rather have one or both sides of the bridge include shared use pathways of a minimum of 12-feet-wide to accommodate both pedestrians and bicycle activity. Most likely, this pathway would not tie back into the narrow Third Street sidewalk and roadway but would tie into the adjacent shoreline flood risk reduction strategy, such as a levee (with some pedestrian access to Third Street maintained).
- The bridge needs to meet design-life expectations of federal funding program.
- The bridge needs to be shut down for repair and maintenance for as little time as possible to avoid cutting off access to Bayview.
- The bridge option must include all practicable planning to avoid impact to Section 4(f) resource.
- City and community tolerance for disrupting rail during construction (to be substituted by buses) is unclear. However, rail could be maintained north of bridge, so the duration of disruption should not be overstated as a constraint/concern, especially given the long-term benefits of Option 4.

6 Remaining Challenges

SFFD initially expressed a preference for bridge replacement in kind (Option 1a), due to concern about impacts to their emergency response operations west of the bridge location. However, after participating in the charrette and learning about the options and potential benefits of a fixed-type bridge, SFFD representatives are developing a better understanding of the tradeoffs and benefits that a fixed bridge could provide, including enhanced seismic safety and sea level rise and coastal flood resilience. Subsequent to the charrette, additional communication with SFFD indicates they are open to a fixed bridge provided land-based access for fire suppression is assessed.

Charette participants would like to understand if selecting fixed-type bridge as the preferred option would define the non-navigability of the creek by default. Follow-up discussions are required to assess the priorities relative to navigability and flood resilience, which may govern the selection of the bridge option.

7 Summary and Next Steps

The charrette provided an opportunity to discuss possible Islais Creek Bridge replacement options that could also achieve greater flood resilience, seismic reliability, and potential community benefits. The charrette was well attended by all involved City departments, which bodes well for future resilience discussions. The City departments, Port, and PEC team were able to discuss a broad range of pros, cons, and other considerations for four bridge options that provide a full range of possibilities for replace the aging bridge.

The objective of the charrette was not to identify a preferred alternative, but to discuss possible options and build a deeper collective understanding of the benefits and constraints of different design options. For each option, feedback on the benefits, constraints, and opportunities were collected and in some cases, the constraints were found to outweigh the benefits. This particularly applied for the bascule bridge (Option 1a/1b) and the standard girder bridge at the same elevation (Option 2) due to the lack of flood resilience that would reduce the design life of the bridge.

Table 3 summarizes the key considerations for the four bridge options.

Table 3. Bridge Options Summary Overview and Key Considerations

Bridge Options	Bridge Type (Table 2 ID)	Center Span Lowest Elevation	Lowest Governing Elevation (feet NAVD88)	Year First Flooded [a] (50 year plus 2 foot freeboard)	Historic Designation Eligibility	Creek Navigability[b]	Construction Time	Cost[c]
1 a/b	ID 2 +3 New Bascule Bridge (a-operable and b-fixed)	12.4	8/10.3	Today		(1a) X (1b)	Long + maintenance disruptions	$$$$
2	ID 6 New Through Girder Bridge, same elevation	13.2	12.9	2040	(X)	X	Moderately rapid	$
3	ID 12 New Standard Girder Bridge, raised	12	11.7	Today	(X)	X	Rapid	$$
4	ID 13 New Through Girder Bridge, raised	15.2	14.9	2070	(X)	X	Moderately rapid	$$

[a] Below bridge clearance requirements

[b] X = Not achievable, (X) = Potentially partially achievable

[c] $$$$ = very high cost, $$ = moderate cost, $ = lower cost (to be verified, based on general assumptions)

Option 1a is the only option that maintains creek navigability. All other options change the bridge to a fixed bridge and would require a change in the creek's federal designation of a navigable waterway. However, full City alignment on this change has not yet been achieved.

Options 1 and 2 maintain the elevation of the bridge and the surrounding area. This generates a lower construction and community impact, but does not increase the lifespan of the bridge relative to sea level rise (Option 2 does have a moderate increase in flood resilience when compared with Option 1).

Options 2, 3 and 4 have reduced vulnerability to flooding because of the lack of low elevation mechanical equipment and access hatches. The fixed bridge design also allows for increased seismic reliability, which is important for disaster response and recover, and maintaining the Third Street Corridor as a lifeline route.

The cost differences depend on the type of bridge and the scale of the changes required to construct the new bridge. Option 1 reflects a higher construction cost due to the type and material of the bridge, as well as higher operations and maintenance cost due to maintaining an operable bridge and the respective SFMTA equipment (for Option 1a). Options 2, 3, and 4 could use precast structural elements, which would reduce the construction costs. The maintenance cost for a fixed-type bridge is also minimal compared to a moveable bascule-type bridge.

The construction impact and disruption time can be a defining criterion when deciding between bridge options. Options 3 and 4 would generate a larger scale intervention that could require an extension of the project schedule and likely an increase in the project budget. Raising the bridge also impacts the adjacent Third Street area and rail operations, which would require a larger-scale planning effort that could impact and disrupt a larger adjacent area, and therefore increase construction costs.

All bridge options could disrupt rail traffic during construction, with the greatest disruption associated with Options 3 and 4. The tolerance for disruption to the Union Pacific and San Francisco Bay Railroads is unknown at this time. In general, construction disruption should be minimized. This area relies heavily on public transportation, and equity considerations should be considered a priority.

The Port's WRP is a larger scale initiative underway that aims to address the Bay shoreline as a whole, including the Islais Creek/Bayview geography. The selected Third Bridge option would serve as a short- to mid-term solution to replace the existing Bridge, which is in deteriorated and aging condition and needs to be replaced or retrofitted in the near term. In the long term, holistic solutions that address stormwater flooding, coastal flooding, sea level rise, and provide community access and benefits are required not only in the area surrounding the Islais Creek Bridge, but along the entire Bay shoreline.

At this time, a preferred option has not been selected. All four options have challenges, including (1) whether all City departments are in alignment regarding removing the navigability designation of the creek can be achieved, (2) resolving the environmental process and funding pathway for a revised bridge design, and (3) aligning the future shoreline resilience strategy with the bridge design. Although the charette feedback provides a potential indicator for the future direction of the bridge project, these challenges must be resolved before any option can be selected.

The following action items are in progress to address these challenges:

- Prior to the charrette, SFFD voiced a preference for maintaining creek navigability. However, they are interested in understanding the reasons for pursuing a fixed-bridge option. SF Public Works, the Port, and SFFD are currently working to address this concern.
- SF Public Works is actively working to a incorporate the charrette feedback into the environmental process and work plan to ensure federal funding remains in place.
- The Port WRP, in collaboration with City departments, is developing long-term adaptation strategies for the Port's shoreline, including the Islais Creek area. Additional coordination between SF Public Works and the Port will continue relative to the bridge design and the WRP.

8 References

California Department of Transportation (Caltrans). *Structure Inventory and Appraisal Report*.

California Ocean Protection Council and the California National Resources Agency (OPC and CNRA). 2018. *State of California Sea Level Rise Guidance*. http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf.

Port of San Francisco. 2021. *Southern Waterfront Summary Brief - Islais Creek/Bayview*.

RWQCB. 1999. "Final Regional Toxic Hot Spot Cleanup Plan." San Francisco, CA.

San Francisco Planning. 2021. *Islais Creek Southeast Mobility Adaptation Strategy*. June 30. https://default.sfplanning.org/Citywide/Islais/IslaisCreek_FinalReport_August2021.pdf.

Attachment 1
Fact Sheets

Islais Creek/Third Street Bridge Option Fact Sheet

ID#2 and ID#3 New Bascule Bridge, replacing the existing as is (operable and non-operable draw bridge functions)

Description

New Bascule Bridge moveable (1a)/ non-operable (1b)
Existing Channel, No Center Bent, Not Raised
Original Plan brought to 65%
No flood resilience

Governing Elevations 8/10.3 ft

Pros

- Least impact on existing design efforts, most likely to maintain current budget and schedule
- Does not require modifications to footings or channel with this construction project
- May allow for historic elegibility
- Maintains the creek navigability (1a)

Opportunities

- No public realm/ public access improvements included

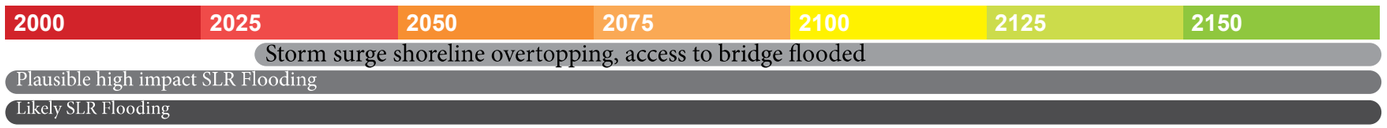
Cons

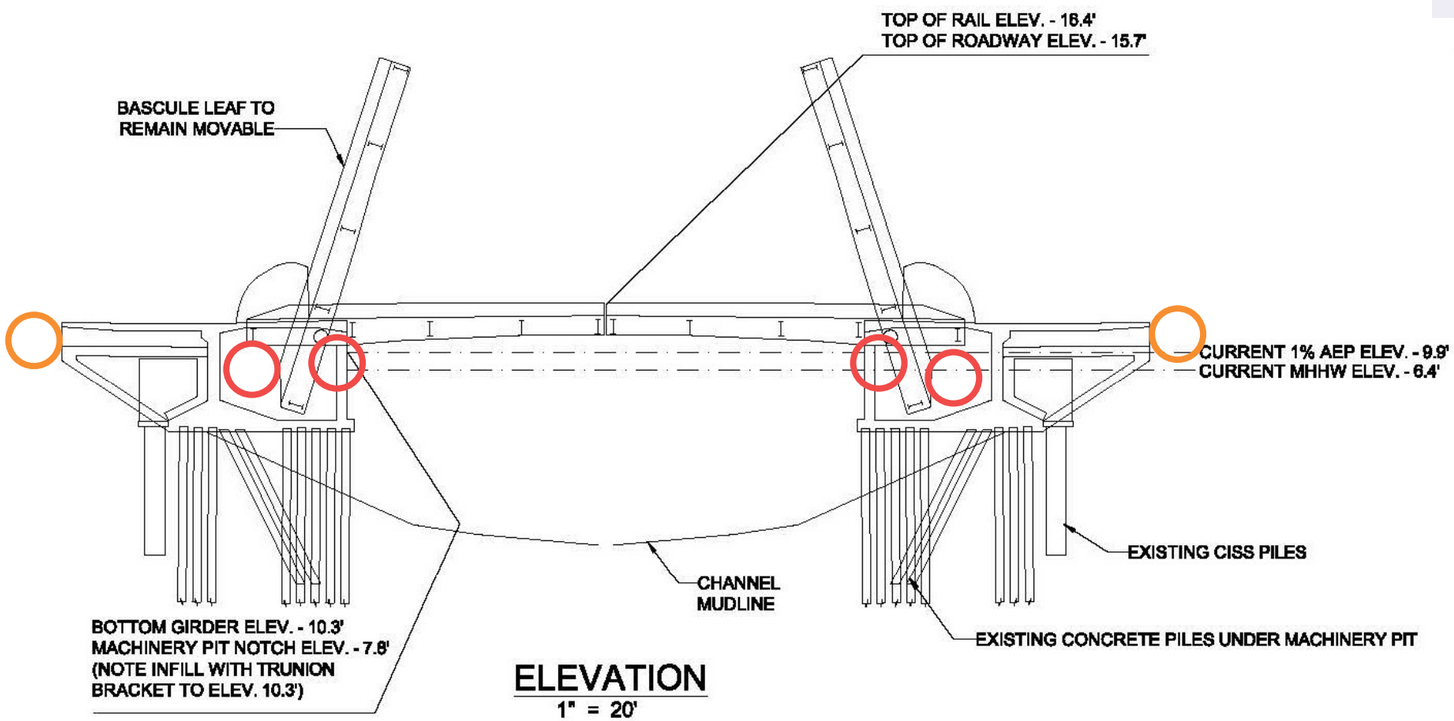
- Does not include shoreline resilience modifications to reduce nearer term sea level rise risks
- Design does not address sea level rise risk
- If the sofit profile of the new structure must replicate the existing radiused sofit for historical reasons, this constraint may negate the opportunity to increase freeboard, as the superstructure would have less freeboard at the abutments

Permitting Considerations [4(f), CEQA, NEPA, HPC Res. No. 0746]

- Not a prudent 4 (f) alternative in that it is unlikely to remain usable due to increasing seawater exposure; unlikely to meet required design life; a large cost for an obsolete function (1a), despite minimizing harm by retaining most of the original structure.
- Does not increase freeboard.
- Long construction due to precision machine work and complex commissioning of new moveable parts, frequent closures for maintenance expected.
- Increased structural seismic resiliency and serviceability of the bridge: 1a: No; 1b: Yes
- NEPA: 1a/1b would meet minimum standards for projected volume of traffic but may not be able to maintain them due to sea level rise.
- HPC Res 0746: Potential Full Preservation Alternative: 1a: Yes; 1b: No,
  Potential Partial Preservation Alternative: 1a: N/A; 1b: Yes

Flooding Exposure Timeline





= elements vulnerable to flooding today (moveable option)

= elements vulnerable to temporary flooding with 12 " SLR (approximately by 2030 - 2040) and permanent inundation by approx. 52 " of SLR (approximately between 2060 and 2100)

Major Infrastructure Impacted	Elevation
Lowest Element	8/10.3 ft
Center Span Lowest Elevation	12.4 ft
Potential Flood Operational Impact Elevation	8/NA
Governing Elevation	8/10.3 ft

Hydraulics	Elevation
Vessel Freeboard @ Center (MHHW Today)	6 ft
Margin until Kayak Freeboard Lost @ Center (MHHW)	2 ft
100yr @ Lowest Structural	0.4 ft
50yr (+ Freeboard) @ Lowest Structural	-1.2 ft
100yr (no Freeboard) @ Governing Elev	-1.9/0.4 ft
Channel Width and Depth	remain the same

Flooding by (Likely)	Year
Kayak Freeboard Lost @ Center (MHHW)	2070
100yr @ Lowest Structural	2025
50yr (+ Freeboard) @ Lowest Structural	2000
100yr (no Freeboard) @ Governing Elev	2000/2025

Flooding by (Plausible High Impact)	Year
Kayak Freeboard Lost @ Center (MHHW)	2050
100yr @ Lowest Structural	2020
50yr (+ Freeboard) @ Lowest Structural	2000
100yr (no Freeboard) @ Governing Elev	2000/2020

DRAFT 2/22/2022

Islais Creek/Third Street Bridge Option Fact Sheet

ID#6 New Through Girder Bridge at the same elevation without a center bent

Description

New Through Girder Bridge
Fixed bridge, Existing channel, no center bent, not raised

Increased freeboard with minimal additional scope

Governing Elevation 12.9 ft.

Pros

- Some resilience achieved to address flood risk (vulnerable lower-lying mechanical parts no longer affected with fixed bridge)
- Increased freeboard

Opportunities

Allows for utilitites across the bridge.

Public Realm Improvements

Bike Lane on Third Street Bridge

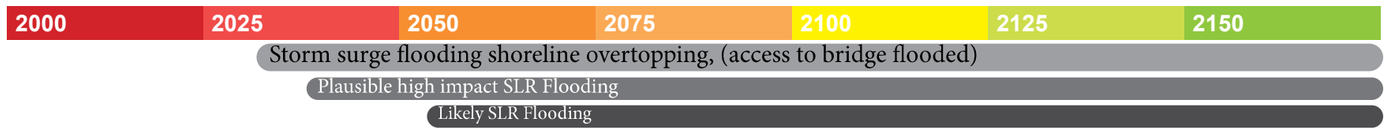
Cons

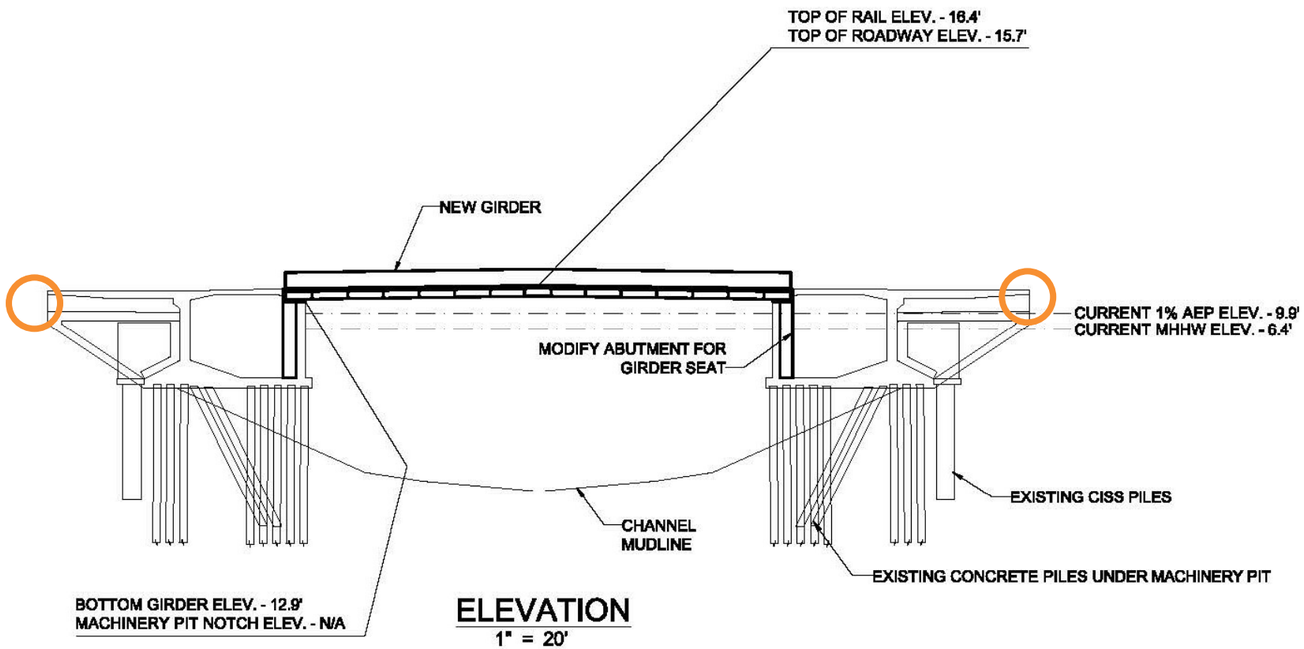
- Channel no longer navigable.
- Looses historical elegibility.
- Limitations to recreational boaters and kayak launch users (water passage still useable, especially if raised, but will need to be timed for low tides)

Permitting Considerations [4(f), CEQA, NEPA, HPC Res. No. 0746]

- 4 (f) property: Does not avoid use, not a prudent 4 (f) alternative as it completely removes original span. Potentially minimizes harm, if all possible historic features are retained.
- Moderatly increases freeboard.
- Moderatly rapid construction, although potentially longer than standard girder bridge.
- Maximum improvement to structural seismic resliency and serviceability.
- NEPA: meets all projected traffic volume standards, has plausibly acceptable design life.
- HPC Res 0746: Potential Full Preservation Alternative: No
  Potential Partial Preservation Alternative: No

Flooding Exposure Timeline





= elements vulnerable to temporary flooding with 12 " SLR (approximately by 2030 - 2040) and permanent inundation by approx. 52 " of SLR (approximately between 2060 and 2100)

Major Infrastructure Impacted

Lowest Element	12.9
Center Span Lowest Elevation	13.2
Potential Flood Operational Impact Elevation	N/A
Governing Elevation	12.9

Hydraulics

Vessel Freeboard @ Center (MHHW Today	6.8
Margin until Kayak Freeboard Lost @ Center (MHHW)	2.8
100yr @ Lowest Structural	3
50yr (+ Freeboard) @ Lowest Structural	1.4
100yr (no Freeboard) @ Governing Elev	3
Channel width and depth	remain the same

Flooding by (Likely)

Kayak Freeboard Lost @ Center (MHHW)	2090
100yr @ Lowest Structural	2090
50yr (+ Freeboard) @ Lowest Structural	2055
100yr (no Freeboard) @ Governing Elev	2090

Flooding by (Plausible High Impact)

Kayak Freeboard Lost @ Center (MHHW)	2060
100yr @ Lowest Structural	2065
50yr (+ Freeboard) @ Lowest Structural	2040
100yr (no Freeboard) @ Governing Elev	2065

Islais Creek/Third Street Bridge Option Fact Sheet

ID#12 New Standard Girder Bridge, without a center bent at a higher elevation

Description

New Standard Girder Bridge
Existing Channel, No Center Bent, Raised
Original Plan brought to 65%

Governing Elevation 11.7 ft

Pros

- Reduces vulnerability to flooding (no low-lying mechanical equipment or access hatch that could be impacted).
- New bridge designed for increased seismic resilience.

Opportunities

Allows for utilitites across the bridge
A wider bridge could allow the bike path for a safer Blue Greenway Path

Public Realm Improvements

Bike Lane on Third Street Bridge

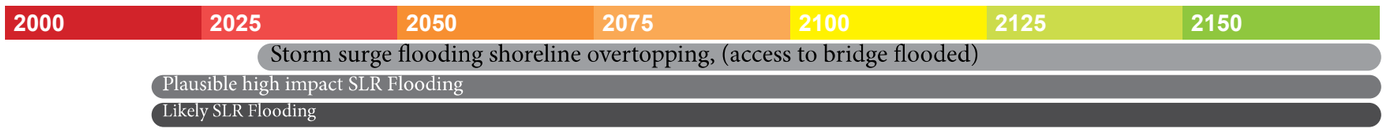
Cons

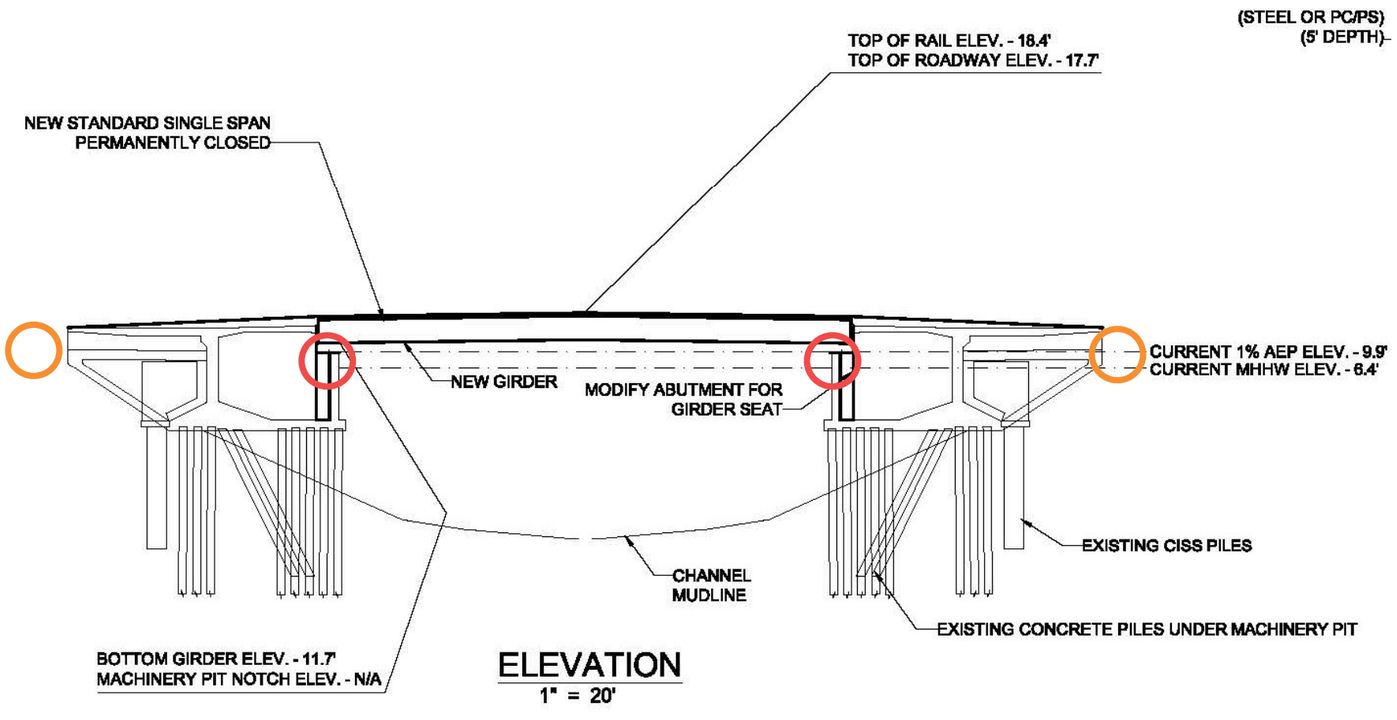
- Channel no longer navigable.
- Looses historical elegibility.
- Larger scale intervention could require an extension of project schedule and likely increase in the project budget, raising the bridge impacts more of adjacent Third Street and rail operations, potentially requiring larger-scale planning effort

Permitting Considerations [4(f), CEQA, NEPA, HPC Res. No. 0746]

- 4 (f) property: Does not avoid use, not a prudent 4 (f) alternative as it completely removes original span. Potentially minimizes harm, if all possible historic features are retained.
- Moderatly increases freeboard, limited by thickness of deck.
- Rapid construction, due to use of precast members and deck sections.
- Maximum improvement to structural seismic resliency and serviceability.
- NEPA: meets all projected traffic volume standards, has plausibly acceptable design life.
- HPC Res 0746: Potential Full Preservation Alternative: No
  Potential Partial Preservation Alternative: No

Flooding Exposure Timeline





= elements vulnerable to 50 yr (+freeboard) flooding today

= elements vulnerable to temporary flooding with 12 " SLR (approximately by 2030 - 2040) and permanent inundation by approx. 52 " of SLR (approximately between 2060 and 2100)

Major Infrastructure Impacted

Lowest Element	11.7
Center Span Lowest Elevation	12
Potential Flood Operational Impact Elevation	NA
Governing Elevation	11.7

Hydraulics

Vessel Freeboard @ Center (MHHW Today	5.6
Margin until Kayak Freeboard Lost @ Center (MHHW)	1.6
100yr @ Lowest Structural	1.8
50yr (+ Freeboard) @ Lowest Structural	0.2
100yr (no Freeboard) @ Governing Elev	1.8
Channel Width and Depth	remain the same

Flooding by (Likely)

Kayak Freeboard Lost @ Center (MHHW)	2060
100yr @ Lowest Structural	2065
50yr (+ Freeboard) @ Lowest Structural	2015
100yr (no Freeboard) @ Governing Elev	2065

Flooding by (Plausible High Impact)

Kayak Freeboard Lost @ Center (MHHW)	2045
100yr @ Lowest Structural	2050
50yr (+ Freeboard) @ Lowest Structural	2015
100yr (no Freeboard) @ Governing Elev	2050

DRAFT 2/22/2022

Islais Creek/Third Street Bridge Option Fact Sheet

ID#13 New Through Girder Bridge, without a center bent at a higher elevation

Description

New Through Girder Bridge, single-span with a cast-in-place concrete deck at a higher elevation than the existing bridge structure

Fixed bridge, Existing Channel, No Center Bent, Raised

114'-long, 108'-wide, would accommodate a center 25'-wide dedicated light-rail trackway, two 12' travel lanes in each direction, one dedicated 5' Class III bikeway in each direction, and two 8'-wide concrete sidewalks with steel pedestrian guard rail. The four 6'-deep through-girders, of which 2' would be below the top of the deck and 4' would be above, would serve as barriers between trackway, roadway, and sidewalk.

Governing Elevation 14.9 ft

Pros

- Maximized flood resilience while maintaining landside conforms
- Reduces vulnerability to flooding (no low-lying mechanical equipment and access that could be impacted)
- New bridge designed for increased seismic resilience, including retaining walls (150 ft on both sides of ramp, 2ft deep) Note: these are not flood risk reduction structures but can be beneficial in the nearterm.

Opportunities

- Allows for utilitites across the bridge.
- A wider bridge could allow the bike path for a safer Blue Greenway Path

Public Realm Improvements

Bike Lane on Third Street Bridge

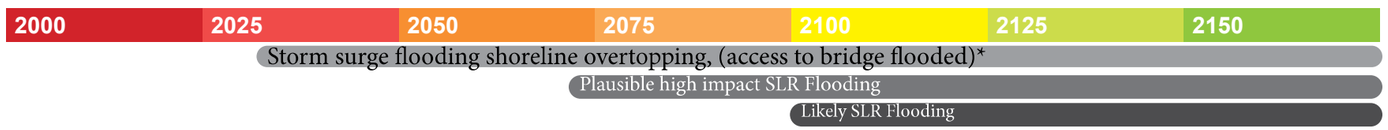
Cons

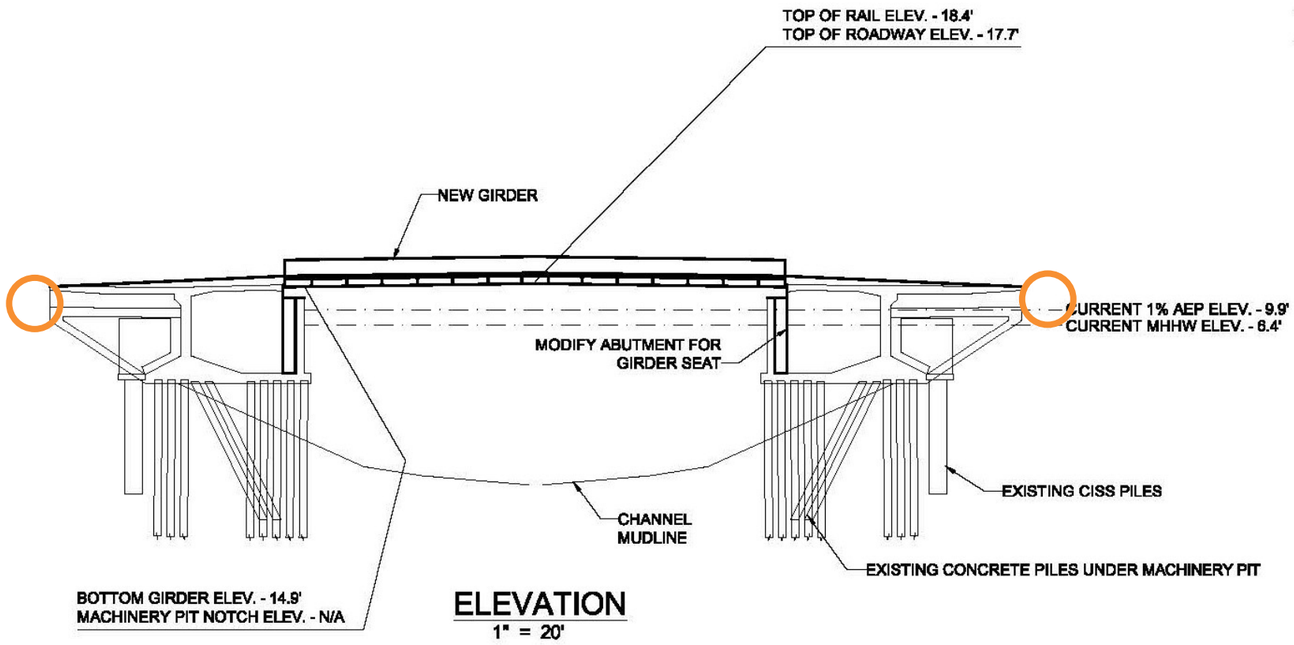
- Channel no longer navigable.
- Looses historical elegibility.
- Larger scale intervention would require an extension of project schedule and likely increase in the project budget
- Raising the bridge impacts more of adjacent Third Street and rail operations, potentially requiring larger-scale planning effort
- Rising groundwater and subsidence may cause additional issues, despite the retaining wall

Permitting Considerations [4(f), CEQA, NEPA, HPC Res. No. 0746]

- 4 (f) property: Does not avoid use, not a prudent 4 (f) alternative as it completely removes original span. Potentially minimizes harm, if all possible historic features are retained.
- Maximum increase of freeboard, due to combination of raising and thinner deck.
- Modereatly rapid construction, although potentially longer construction time than a standard bridge.
- Maximum improvement to structural seismic resliency and serviceability.
- NEPA: meets all projected traffic volume standards, has plausibly acceptable design life.
- HPC Res 0746: Potential Full Preservation Alternative: No
  Potential Partial Preservation Alternative: No

Flooding Exposure Timeline





Major Infrastructure Impacted

Lowest Element	14.9
Center Span Lowest Elevation	15.2
Potential Flood Operational Impact Elevation	NA
Governing Elevation	14.9

Hydraulics

Vessel Freeboard @ Center (MHHW Today	8.8
Margin until Kayak Freeboard Lost @ Center (MHHW)	4.8
100yr @ Lowest Structural	5
50yr (+ Freeboard) @ Lowest Structural	3.4
100yr (no Freeboard) @ Governing Elev	5
Channel width and depth	remain the same

Flooding by (Likely)

Kayak Freeboard Lost @ Center (MHHW)	2120
100yr @ Lowest Structural	2125
50yr (+ Freeboard) @ Lowest Structural	2100
100yr (no Freeboard) @ Governing Elev	2125

Flooding by (Plausible High Impact)

Kayak Freeboard Lost @ Center (MHHW)	2080
100yr @ Lowest Structural	2085
50yr (+ Freeboard) @ Lowest Structural	2070
100yr (no Freeboard) @ Governing Elev	2085

○ = elements vulnerable to temporary flooding with 12 " SLR (approximately by 2030 - 2040) and permanent inundation by approx. 52 " of SLR (approximately between 2060 and 2100)
*pending length and elevation of retaining wall

Attachment 2
Charrette Presentation

Third Street / Islais Creek Bridge Charrette

2/10/2022

AGENDA

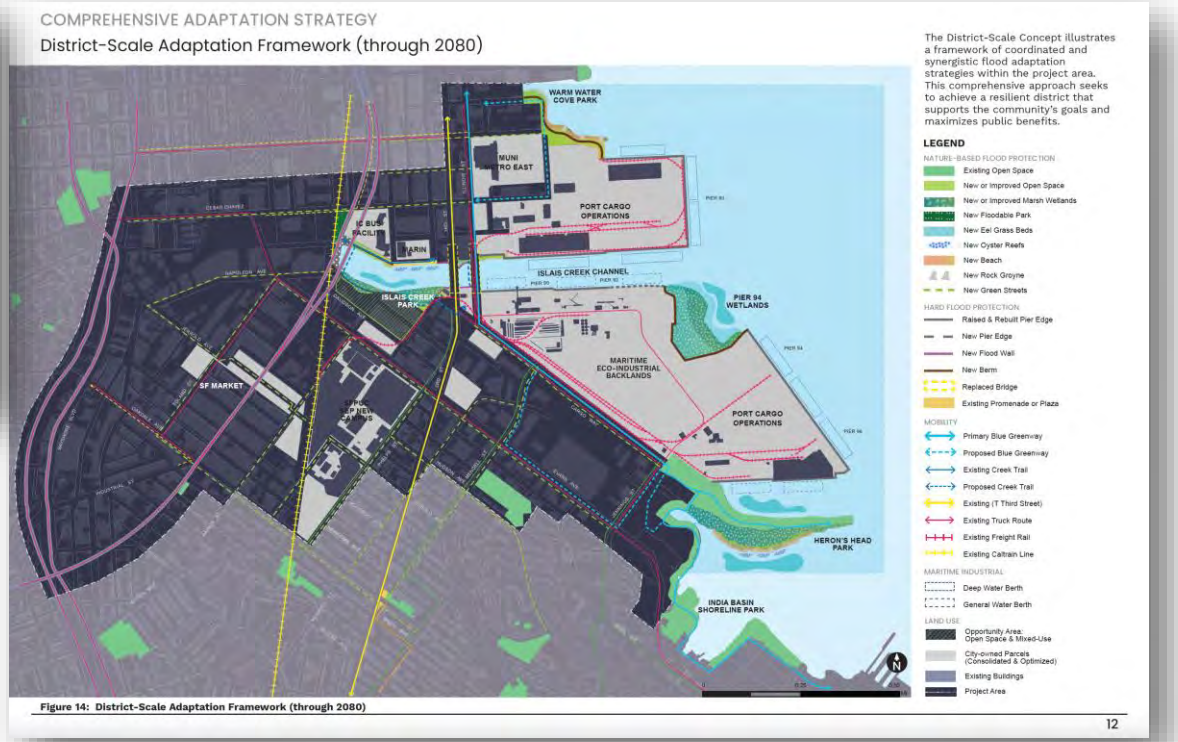
• Welcome & Introduction	*10 min*
• Culture of Caring Moment	*5 min*
• Overview of Existing Conditions and Considerations	*15 min*
• Matrix with Range of Options	*25 min*
• *5 min Break*	
• 3 Breakout Groups: 2 options each	*30 min*
• *5 min Break*	
• Regroup and present	*20 min*
• Final Discussion	*30 min*
• Next Steps and Closeout	*5 min*

Introduction

THIRD STREET BRIDGE

RECENT CITY INITATIVES

ICSMAS (2021)



PORT OF SAN FRANCISCO

The ch2m ARCADIS Team

WHY ARE WE HERE?

Previous Studies

SLR & Flood Hazards

City Needs & Opportunities

Age & Condition, Seismic Risk

Holistic perspective to enable good decisions that will benefit the City now and for the future.

Project Process & Timeline

- 2012 - Application for Highway Bridge Rehabilitation and Repair Program Funds
- 2013 to 2019 – Pre-design, environmental process, and detail design of replace in kind bascule bridge superstructure
- 2020 – Pandemic, budget impact, value engineering
- 2021 to Today –
  - Revisit selection of bridge type
  - Incorporate new information related to climate change
  - Evaluate previous and current design constraints
  - Recognize opportunities for community benefits that fall within the scope of HBRRP funding

Culture of Caring Moment

Black History Month

What Is Black History Month?

1915 – Dr Carter G Woodson forms the Association for the Study of African American Life and History (ASALH)

1926 – ASALH hosts the first weeklong celebration

1936 – Mary McLeod Bethune becomes ASALH president

(featured: Mary McLeod, Lucy Harth Smith, and Dr. Carter G Woodson at ASALH Conference in Chicago, 1940)

1960s – the movement grows during the Civil Rights Movement

1976 – February officially recognized as BHM

1995 – Canada also adopts February as BHM

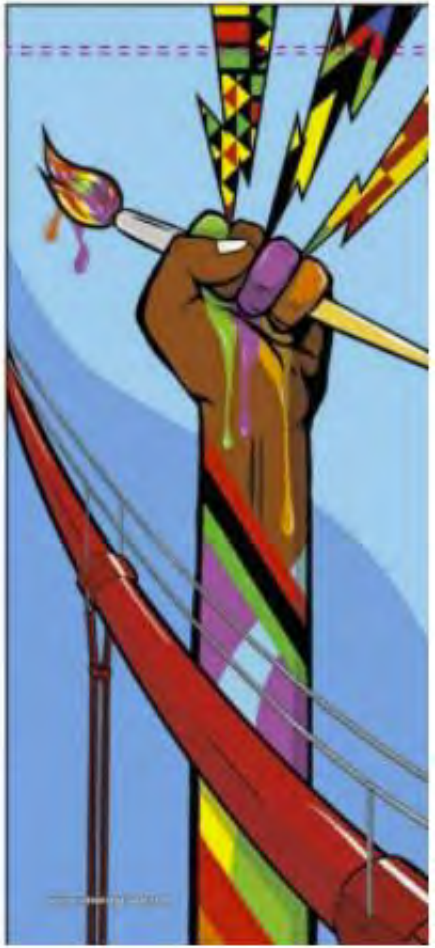
UK, Ireland, and the Netherlands celebrate October as BHM, too.

Black History Month – Did you know?

- According to a 2018 article in the Economist magazine
  - Black people comprise about 22% of poor Americans, but a random study of US media news stories found that 59% of poor people shown were black
  - In contrast, white people are about 66% of the poor population, but accounted for only 17% of the people shown in US news stories of poverty
  - This bias was found in both right- and left-leaning news sources
  - A similar phenomenon exists with media coverage of crime, according to The Sentencing Project
    - While only 10% of victims in crime reports were whites who had been victimized by Blacks, these crimes made up 42% of cases televised by local news
- Becoming aware that poverty and crime in the Black community is presented *disproportionately* in the news is *one step to overcoming implicit bias*

Islais Creek's Black Cultural Legacy

- The Bayview / Islais Creek neighborhood is ethnically diverse with a large Black population and a strong African American cultural legacy
- Most of this area included within the newly created **African American Arts and Cultural Heritage District**
- Artwork by Kenny Farris featured on new banners that line the Third Street corridor to promote the area's rich history and identity.



PORT OF SAN FRANCISCO

Overview of Existing Conditions and Considerations

PORT OF SAN FRANCISCO

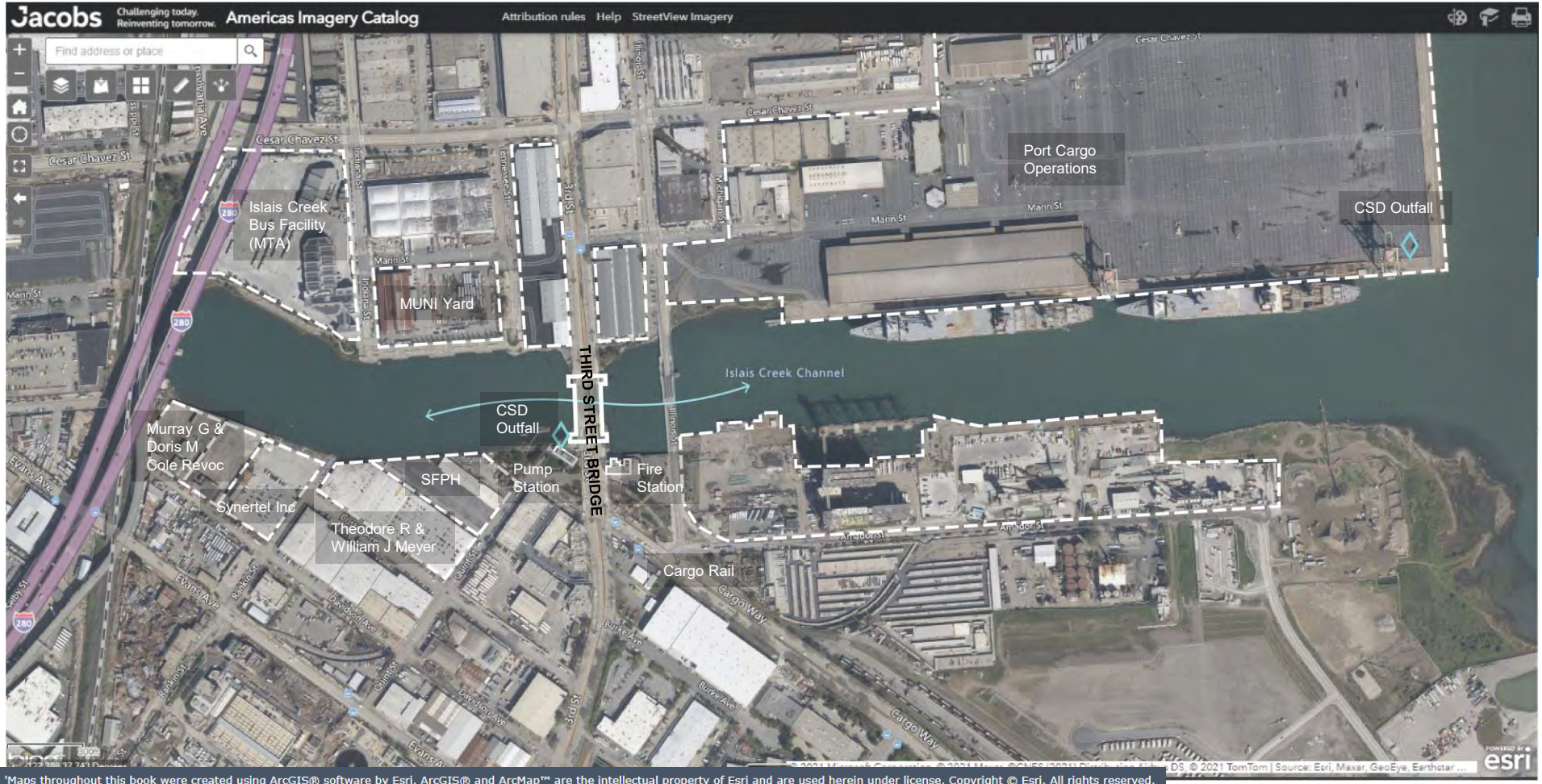
Waterfront Resilience Program

The ch2m ARCADIS Team

THIRD STREET / ISLAIS CREEK BRIDGE

- **One of two movable bridges on Islais Creek** (and one of four movable bridges in San Francisco). A **double leaf bascule bridge**, allowing navigation of the remainder of the creek west of the bridge.
- Carries **four traffic lanes**, **two SF Muni light rail tracks**, and **two sidewalks** over Islais Creek.
- **Constructed between 1945 and 1949**, replacing a Strauss heel trunnion bascule bridge, and **modified in 2006** as part of the 3rd St light rail project.
- In fair to poor condition, a retrofit and rehabilitation project led by San Francisco Public Works and funded through the FHWA Highway Bridge Replacement & Rehabilitation Program.
- Public Works project was carried through to 65% Design Phase and includes complete replacement of the movable leaves and rehabilitation of the machinery and control systems; however, collaboration within the City has enabled discussing alternatives that would better address other city needs including sea level rise resilience.

Existing Conditions + Site Considerations



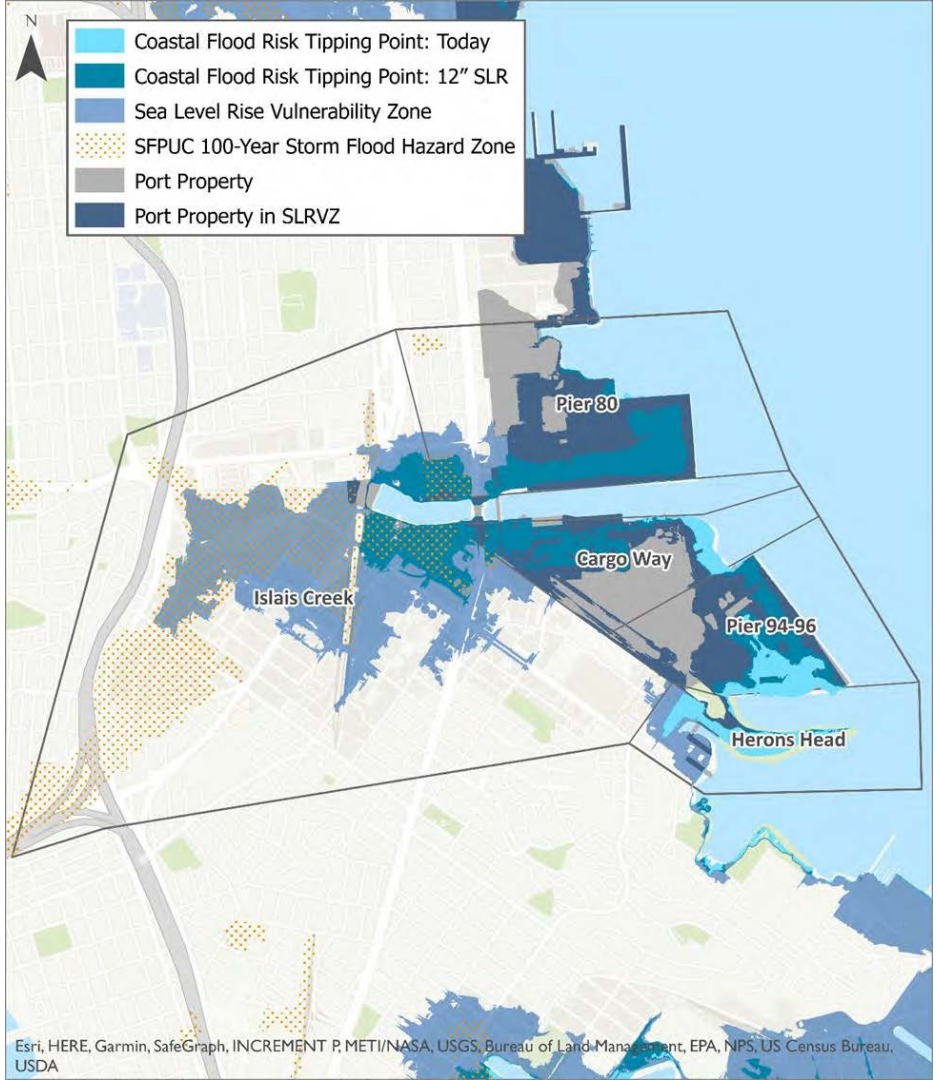
Open Space

Mobility

FLOOD RISK

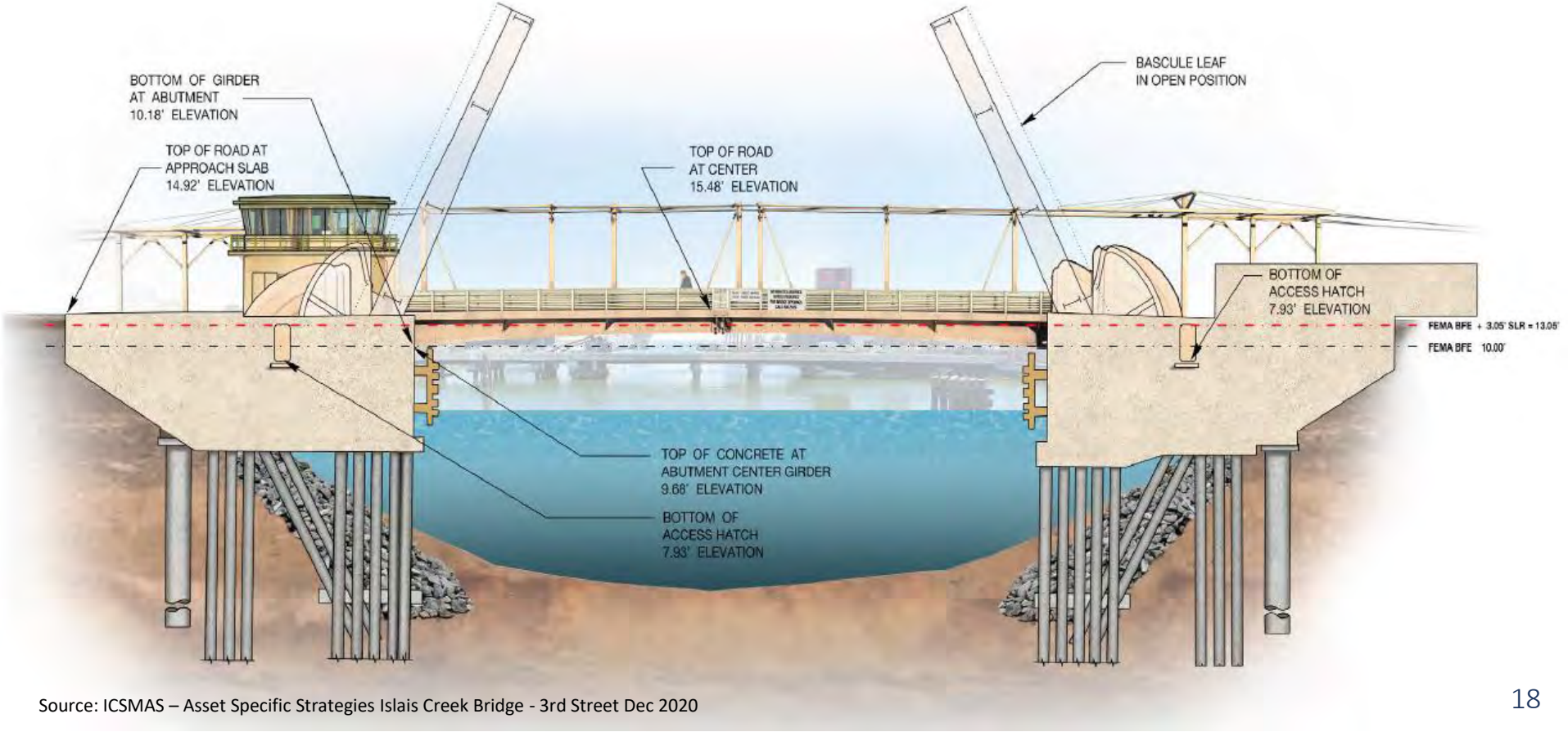
Sea Level Rise and Stormwater

- Both sides of Islais Creek could flood with 12 inches of SLR and a 1% coastal event
- Primary pathways of flooding are from overtopping along the northern shoreline near the 3rd St. Bridge and Illinois St. Bridge
- Bay water levels elevated by SLR can exacerbate stormwater flooding
- West of 3rd St. Bridge designated as a “toxic hot spot“



EXISTING CONDITIONS: FEMA BRIDGE ELEVATION

Note: Elevations to be confirmed



Source: ICSMAS – Asset Specific Strategies Islais Creek Bridge - 3rd Street Dec 2020

CHALLENGES & OPPORTUNITIES

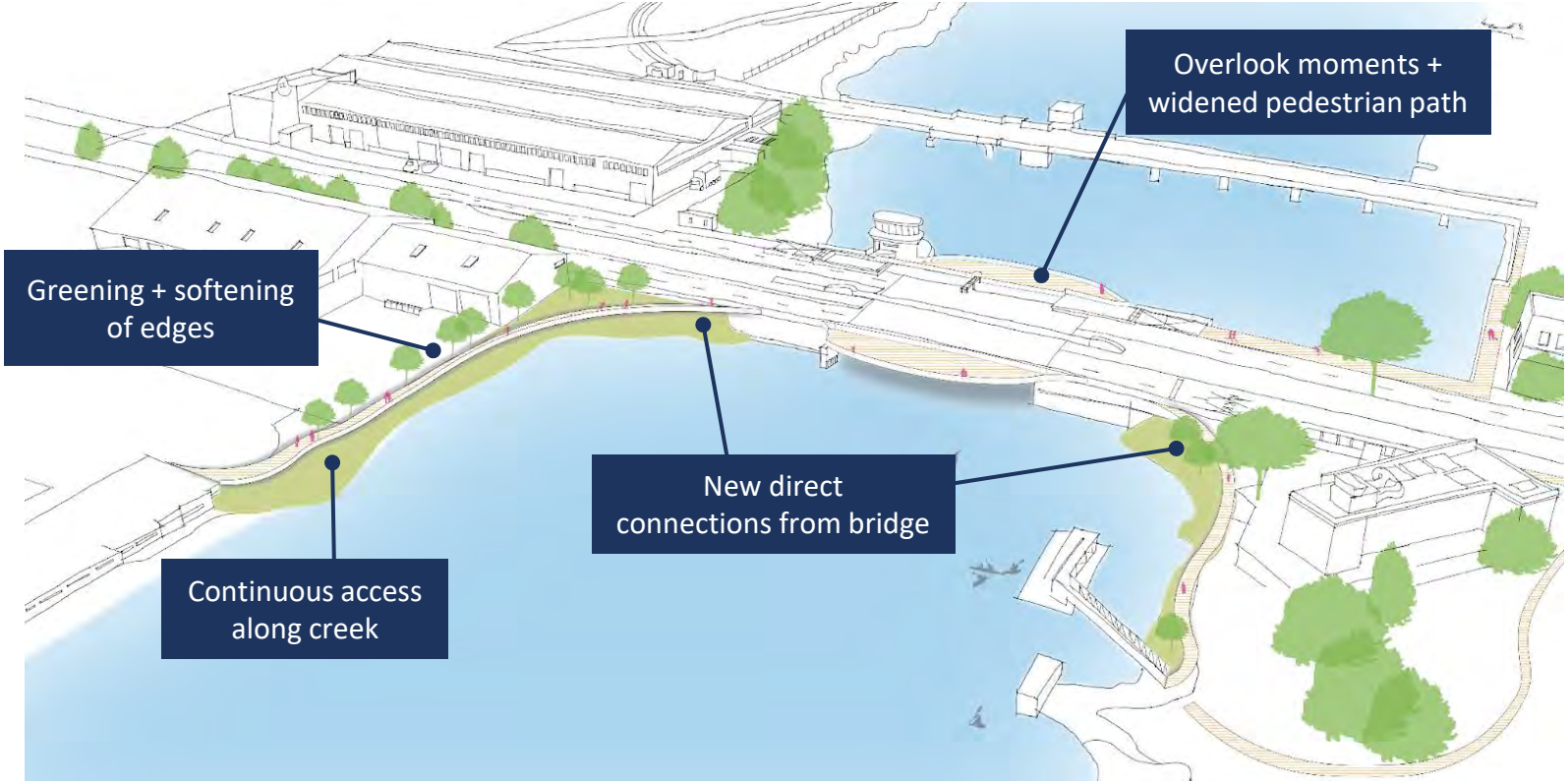
Challenges

- Flood risk
- Seismic Risk, age and condition
- Rail restrictions: fixed point in southern end, light rail operation + Port operations
- Footprint of the bridge and elevations around the area: Fire Station entry
- Historic eligibility
- Water quality & toxic hot spot
- Coordination with existing infrastructure
- Navigability
- Minimizing the construction duration & decrease disruption to light rail line, vehicles, and pedestrians.
- Funding

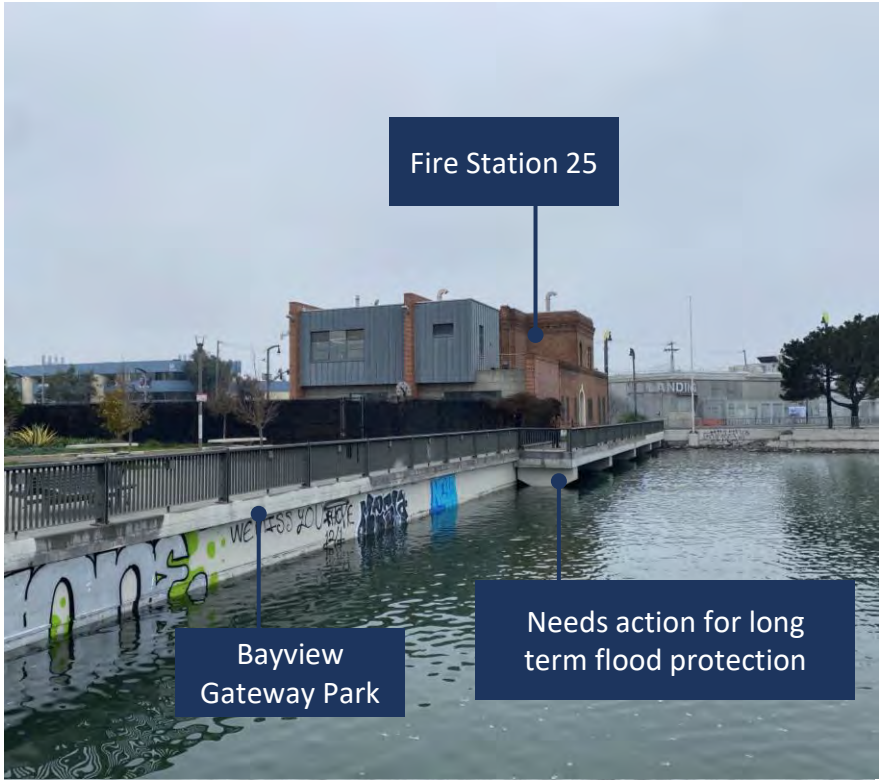
Opportunities

- Increased resiliency and serviceability of the bridge.
- Wider bridge to incorporate better multi-modal space (bike lane, wider sidewalk)
- Connection to shoreline protection and flood risk reduction measures.
- Connection from bridge to a continuous promenade that runs along the creek.
- Development application for the parcel northwest of the bridge on 3rd street.
- Installation of fixed utility infrastructure to the new bridge (if fixed span)
- New public space between bridges.

PUBLIC REALM ENHANCEMENT OPPORTUNITIES



SOUTHERN ACCESS + PROTECTION



Matrix Range of Options

PORT OF SAN FRANCISCO

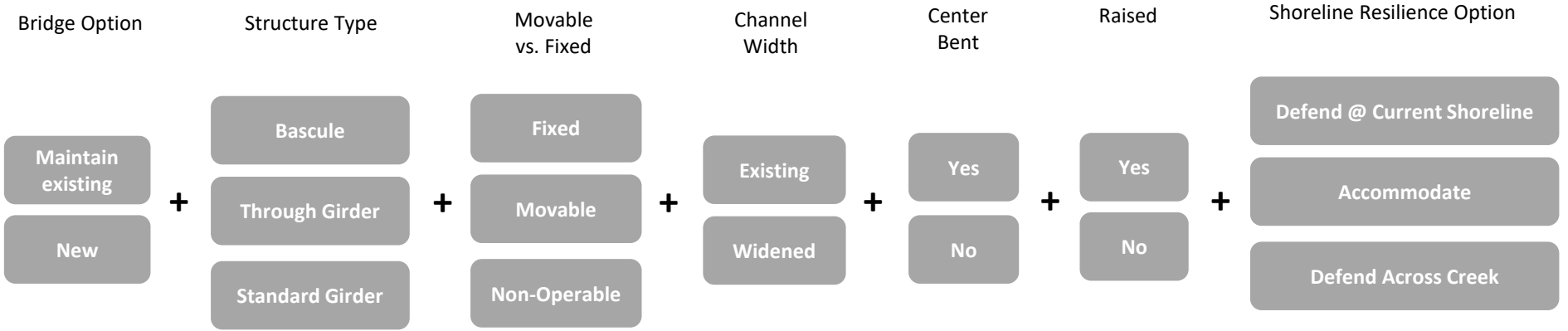
Waterfront Resilience Program

The ch2m ARCADIS Team

RANGE OF OPTIONS

- 22 options with different configurations and shoreline resilience options
- Identify elevation of critical structural or mechanical elements potentially vulnerable to flood risk
- Evaluate below deck clearance per Caltrans requirements, kayak usage and sea level rise impacts
- Timing of clearance and SLR impacts estimated based on the 2 adopted SLR curves (likely and plausible high impact, 2018 OPC)

PRIORITIZATION CRITERIA



Link to Matrix

Additional
4(f), NEPA, CEQA, and HPC
process considerations

NARROWED OPTIONS

0 Delay Substantial Bridge Investment

Risks losing funding plus possible impacts on repairs and monitoring

1 New Bascule Bridge

Replacing the existing bridge as is (operable and non-operable draw bridge functions)

2 New Through Girder Bridge

At the same elevation without a center bent

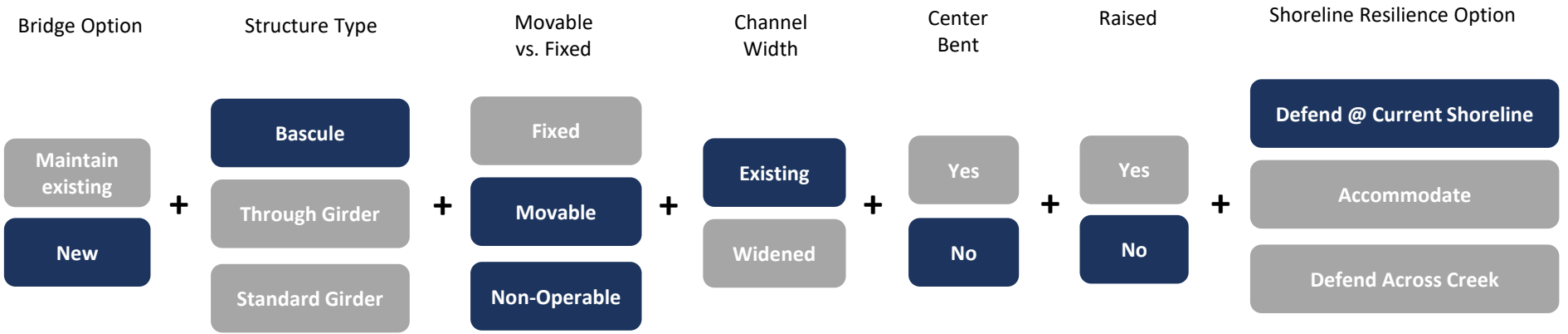
3 New Standard Girder Bridge - Raised

Without a center bent at a higher elevation

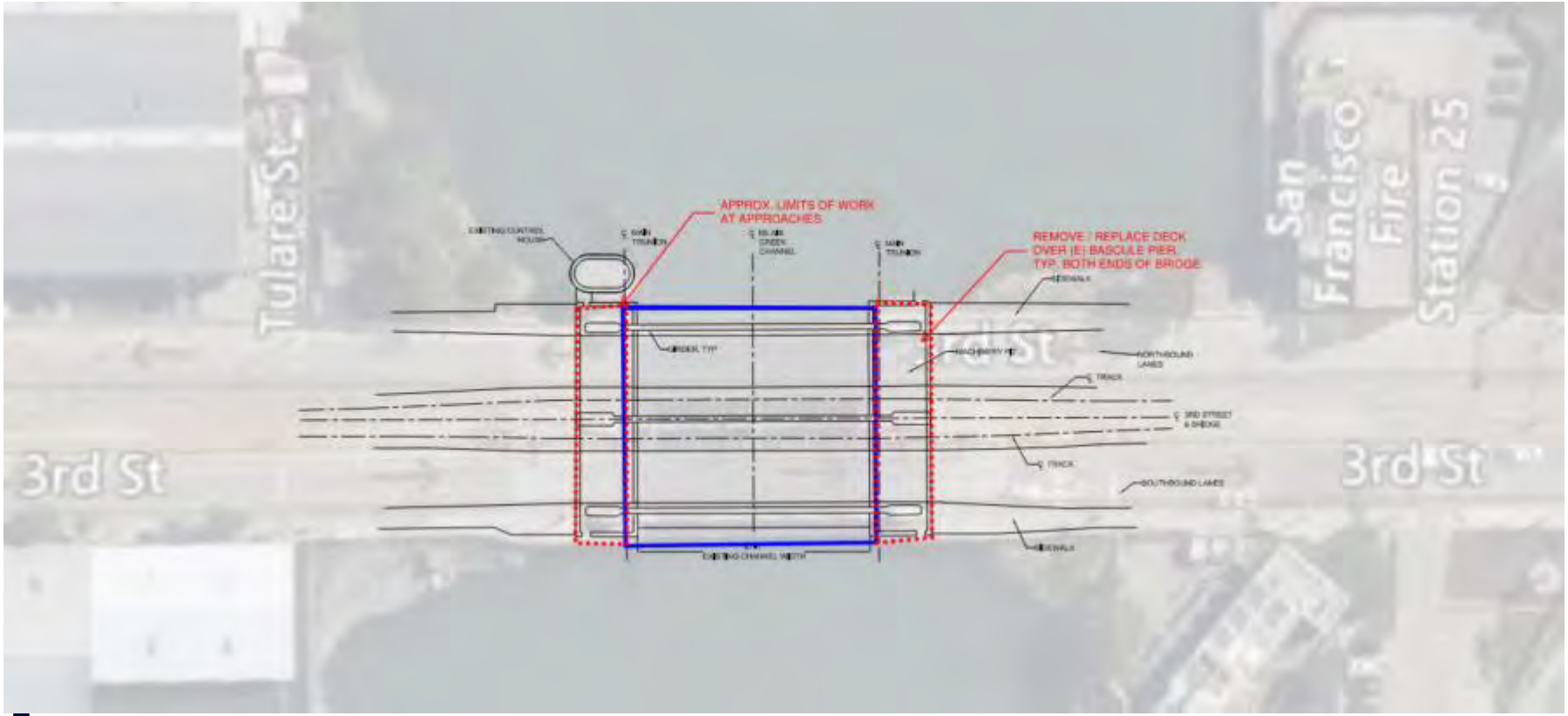
4 New Through Girder Bridge - Raised

Without a center bent at a higher elevation

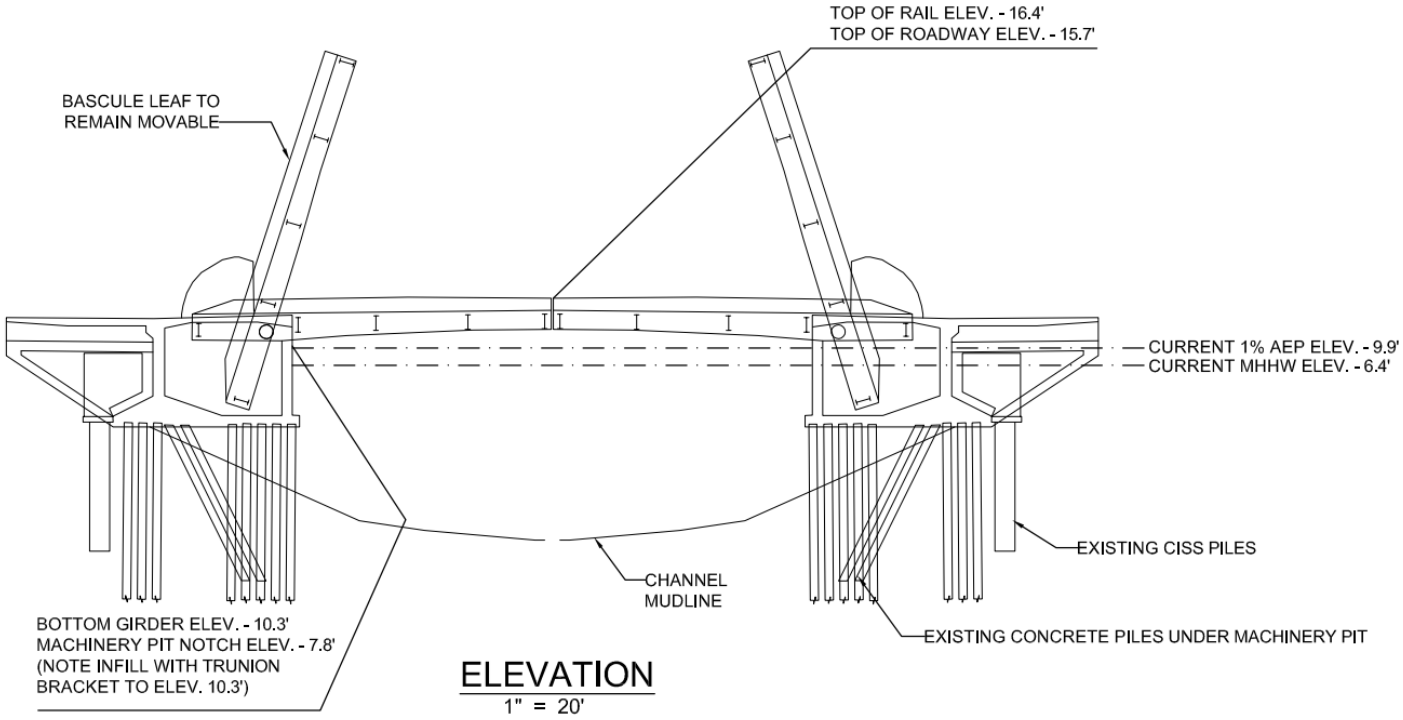
OPTION 1: NEW BASCULE BRIDGE



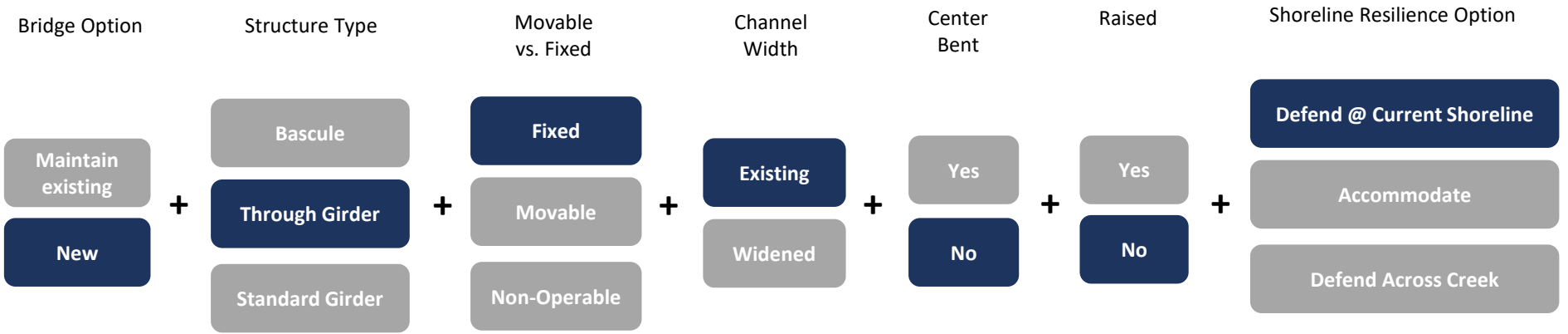
OPTION 1 : NEW BASCULE BRIDGE



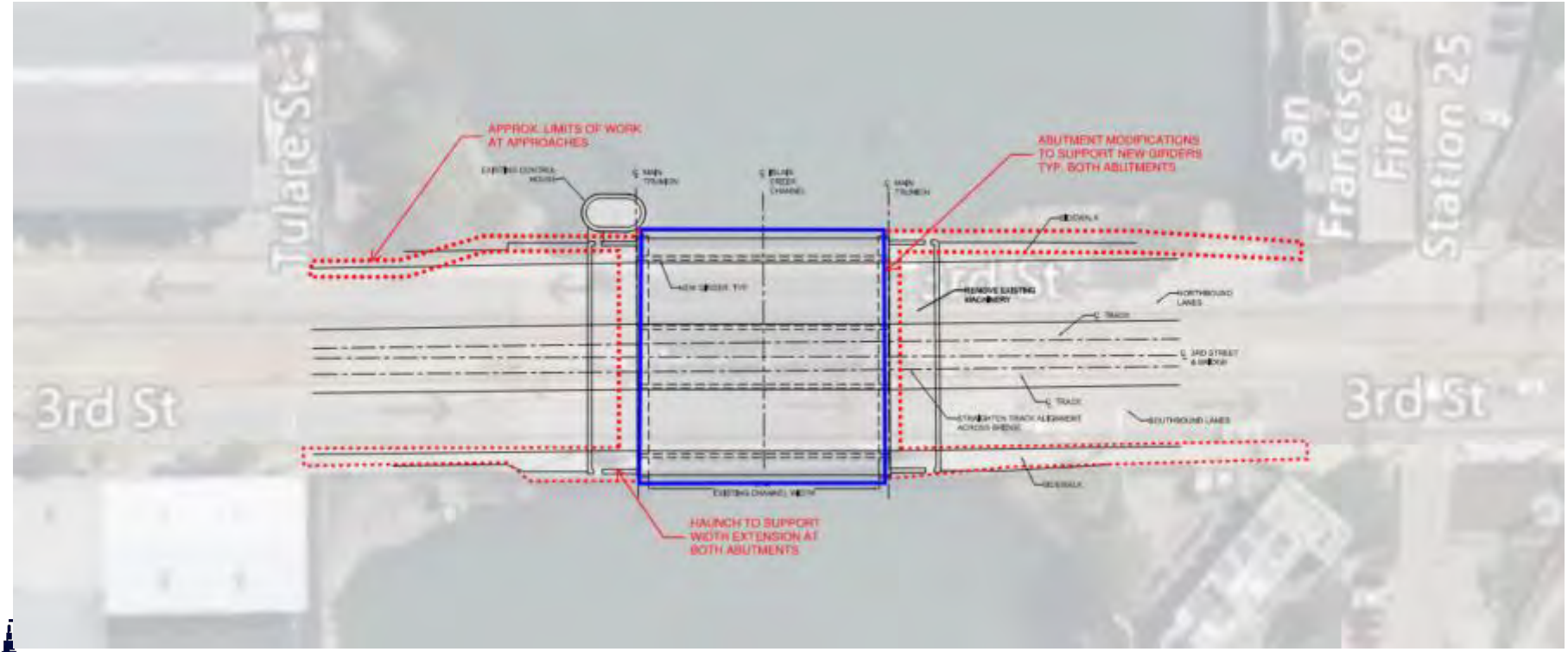
OPTION 1 : NEW BASCULE BRIDGE



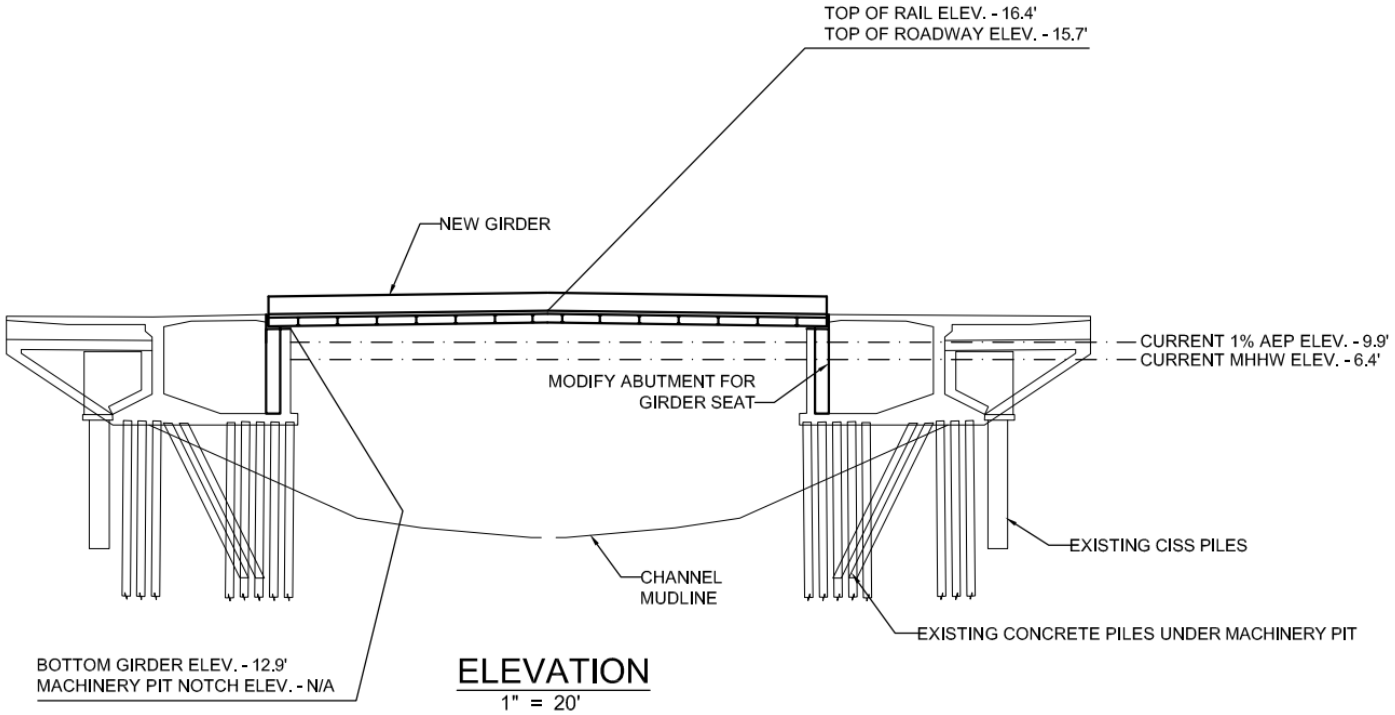
OPTION 2: NEW THROUGH GIRDER BRIDGE



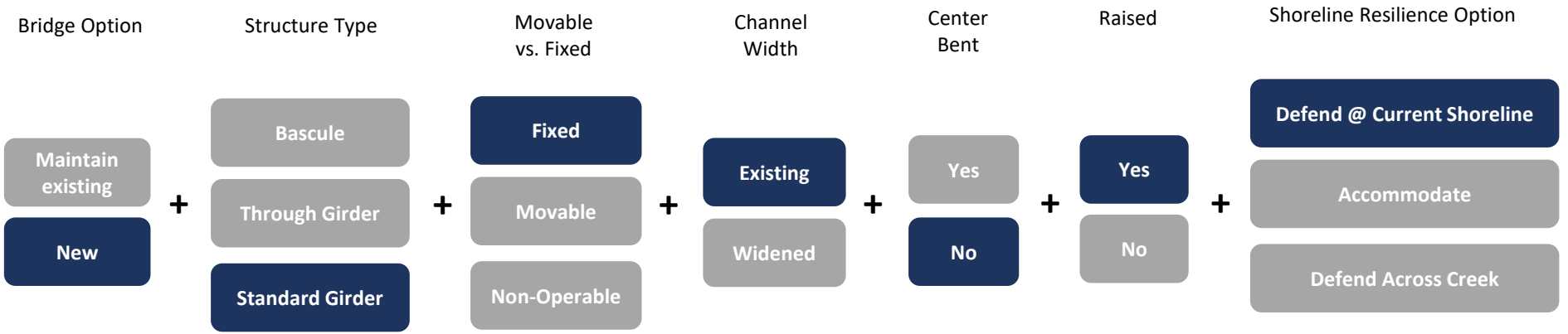
OPTION 2: NEW THROUGH GIRDER BRIDGE



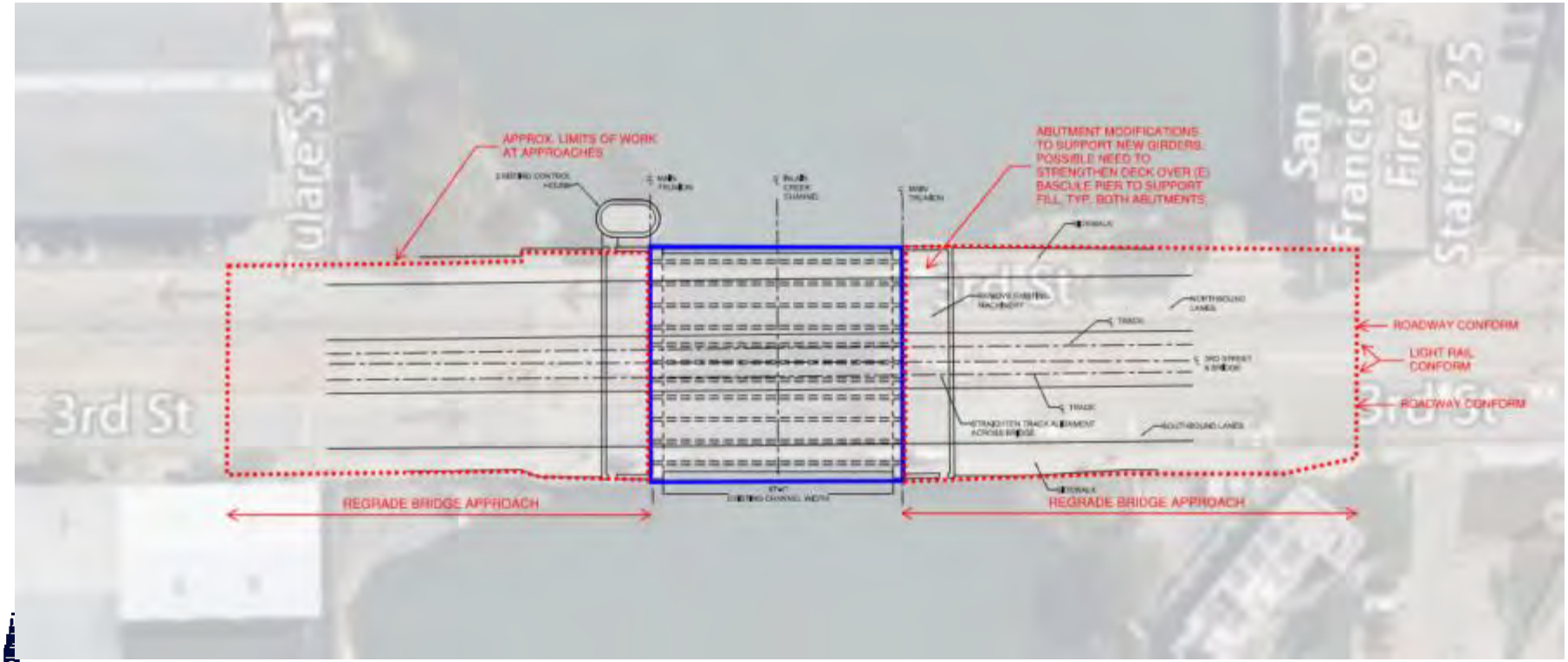
OPTION 2: NEW THROUGH GIRDER BRIDGE



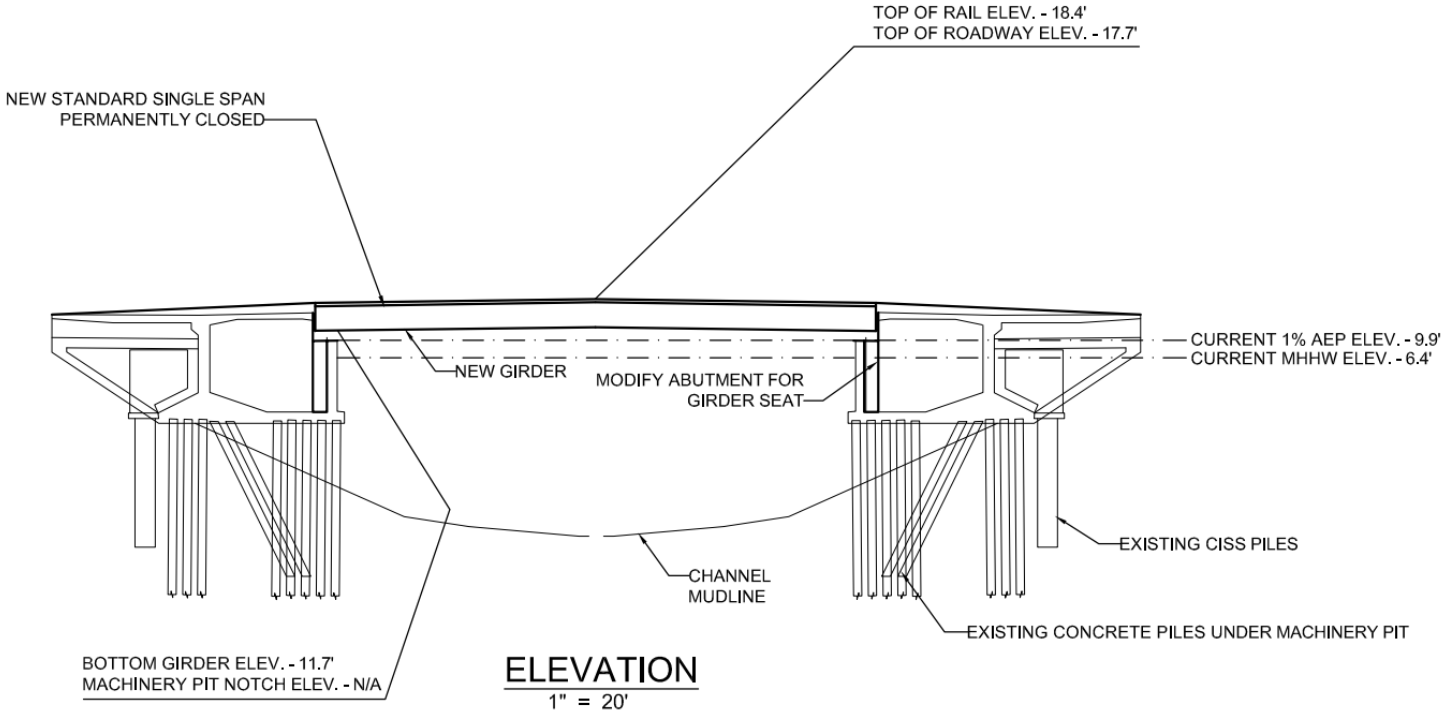
OPTION 3: NEW STANDARD GIRDER BRIDGE - RAISED



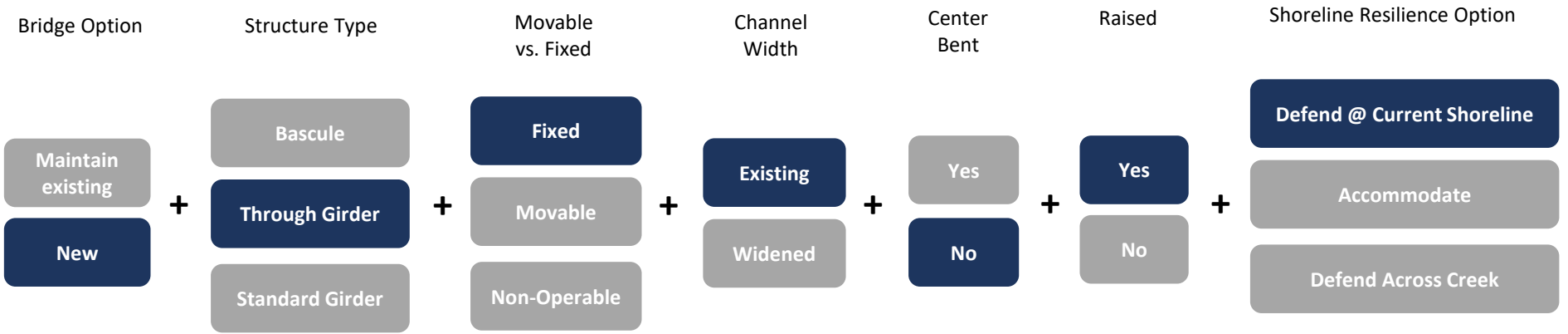
OPTION 3: NEW STANDARD GIRDER BRIDGE - RAISED



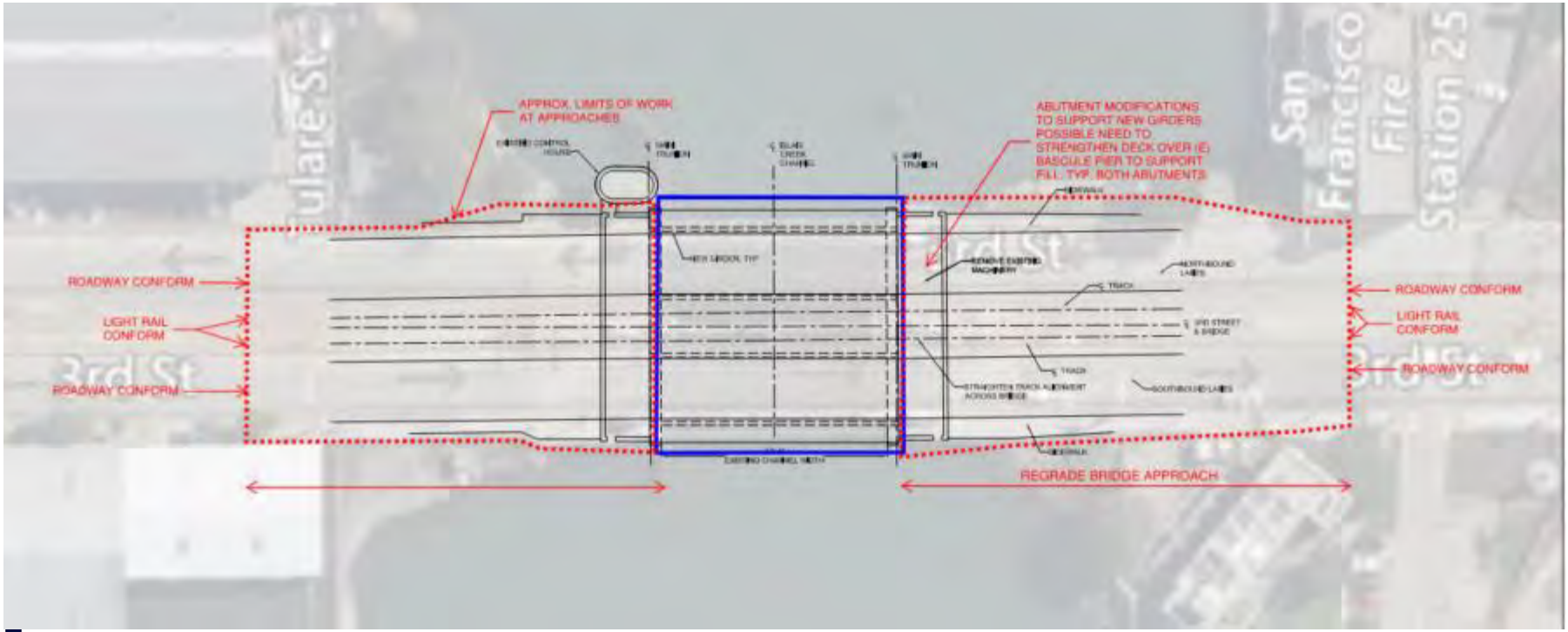
OPTION 3: NEW STANDARD GIRDER BRIDGE - RAISED



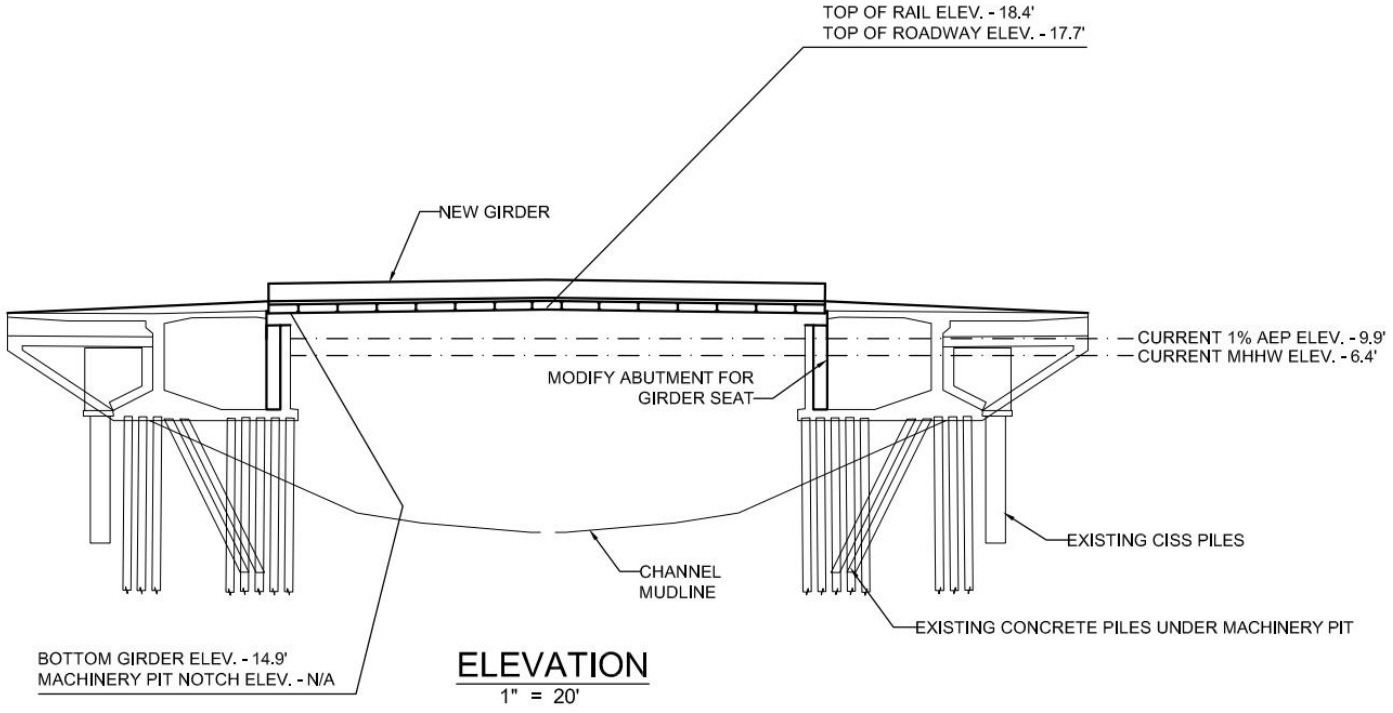
OPTION 4: NEW THROUGH GIRDER BRIDGE - RAISED



OPTION 4 : NEW THROUGH GIRDER BRIDGE - RAISED



OPTION 4 : NEW THROUGH GIRDER BRIDGE - RAISED



Breakout Groups

Breakout Groups

Group A: Options 1 & 2

Murat Bozkurt

Charles Drane

Paulina Farias - Facilitator

Justin Greving

Stella Kim

Matt Lasky

Sarah Minick

Freddy Padilla

Adam Varat

Group B: Options 2 & 3

Abdel Abdelsalam

Luiz Barata

Kelley Capone

Kevin Clinch- Facilitator

Boris Deunert

Timothy Doherty

Raymond Liu

Kris May, PhD

Roger Nguyen

Anna Roche

Group C: Options 1 & 4

Yanna Badet – Facilitator

Mira Chokshi

Casey Hildreth

Amy Hurwitz

Oliver Iberien

Andrea Jorgensen

Tracy O'Keeffe

Ramon Perez-Zaragoza

Steven Reel

Thomas Roitman

John Sprinkle

5 MIN BREAK

Regroup and Present

PORT of SAN FRANCISCO

Waterfront Resilience Program

The ch2m ARCADIS Team

Next Steps

- Collect feedback & incorporate into Charrette Summary Memorandum.

- Information collected during this Charrette effort will be incorporated into the next steps of the Public Works design and environmental process.

Thank You

Matt Wickens |
matthew.wickens@sfport.com

PORT OF SAN FRANCISCO

Waterfront Resilience Program

Attachment 3
Matrix Range of Options

																Hydraulics					Likely				Plausible High Impact				4(f)		CEQA			NEPA	HPC Res. No. 0746	
Y/N/M	Carry into Detail	ID#	Bridge Option	Movable/Fixed	Channel	Center Bent	Raised	Shoreline Resilience Option	Major Infrastructure Impacted	Lowest Element	Center Span Lowest Elevation	Potential Flood Operational Impact Elevation	Governing Elevation		Vessel Freeboard @ Center (MHHW Today)	Kayak Freeboard Lost @ Center (MHHW)	100yr @ Lowest Structural	50yr @ Lowest Structural	100yr @ Governing Elev	Kayak Freeboard Lost @ Center (MHHW)	100yr @ Lowest Structural	50yr @ Lowest Structural	100yr @ Governing Elev	Kayak Freeboard Lost @ Center (MHHW)	100yr @ Lowest Structural	50yr @ Lowest Structural	100yr @ Governing Elev	Feasible alternative that completely avoids the use of Section 4(f) property?	Prudent alternative that completely avoids the use of Section 4(f) property?	Includes all possible planning to minimize harm to the Section 4(f) property?	Increases bridge freeboard to the maximum extent practicable?	Minimizes construction times to the maximum practicable?	Increases the structural seismic resiliency and serviceability of the bridge?	Maintains current geometric, construction and structural standards required for the types and volume of projected traffic on the bridge over its design life to ensure continued use of the bridge?	Potential Full Preservation Alternative?	Potential Partial Preservation Alternative?
No	No, does not provide the desired design life from condition, risk reduction or SLR perspective	1	Maintain Existing Bascule Bridge	Movable	Existing	No	No	Defend @ Current Shoreline		10.3	12.4	8	8		6	2	0.4	-1.2	-1.9	2070	2025	2000	2000	2050	2020	2000	2000	Yes, avoids use and is engineering feasible.	Not prudent in that it is unlikely to remain usable due to increasing seawater exposure without continual maintenance;, and unlikely to provide required design life. A large cost component includes repairing an obsolete function	Yes, avoids harm by doing maintenance only.	No. No increase in freeboard.	No, bridge would be required to be closed frequently for maintenance.	No, no improvement.	No, fails to meet current standards.	Yes.	N/A
Maybe	Maybe, original plan brought to 65%	2	New Bascule Bridge	Movable	Existing	No	No	Defend @ Current Shoreline		10.3	12.4	8	8		6	2	0.4	-1.2	-1.9	2070	2025	2000	2000	2050	2020	2000	2000	No, does not avoid use of 4(f) property.	Not prudent in that it is unlikely to remain usable due to increasing seawater exposure without continual maintenance, and unlikely to provide required design life. A large cost component includes reconstructing an obsolete function	Yes, harm is minimized as much as possible by retaining as much of original structure as possible.	No. No increase in freeboard.	No, long construction due to precision machine work and complex commissioning of new moveable components. Also, bridge would be required to be closed frequently for maintenance.	No, no improvement.	Would meet minimum standards but may not be able to maintain them due to SLR.	Yes, previously exempted under CEQA by Planning.	N/A
Maybe	Maybe, close to original plan brought to 65%	3	New Bascule Bridge	Non-Operable	Existing	No	No	Defend @ Current Shoreline		10.3	12.4	N/A	10.3		6	2	0.4	-1.2	0.4	2070	2025	2000	2025	2050	2020	2000	2020	No, does not avoid use of 4(f) property.	Not prudent in that it is unlikely to remain usable due to increasing seawater exposure without continual maintenance, and unlikely to provide required design life.	No, as historic drawbridge function is no longer maintained.	No. No increase in freeboard.	No, extended construction time, and bridge would be required to be closed frequently for maintenance.	Yes, some improvement through connection of leaves at center.	Would meet minimum standards but may not be able to maintain them due to SLR.	No, historic drawbridge function is impaired.	Yes, most historic features are retained.
No	No, does not provide the desired design life from condition, risk reduction or SLR perspective	4	Maintain Existing Bascule Bridge	Non-Operable	Existing	No	No	Defend @ Current Shoreline		10.3	12.4	N/A	10.3		6	2	0.4	-1.2	0.4	2070	2025	2000	2025	2050	2020	2000	2020	No, does not avoid use of 4(f) property.	Not prudent in that it is unlikely to remain usable due to increasing seawater exposure without continual maintenance, and unlikely to provide required design life.	No, as historic drawbridge function is no longer maintained.	No. No increase in freeboard.	No, bridge would be required to be closed frequently for maintenance.	Yes, some improvement through connection of leaves at center.	No, fails to meet current standards.	No, historic drawbridge function is impaired.	Yes, most historic features are retained.
No	No, decreases freeboard compared to existing bridge	5	New Standard Girder Bridge	Fixed	Existing	No	No	Defend @ Current Shoreline		9.7	10	N/A	9.7		3.6	-0.4	-0.2	-1.8	-0.2	2000	2000	2000	2000	2000	2000	2000	2000	No, does not avoid use of 4(f) property.	No, completely removes original span.	Potentially yes, if all historic features that do not need to be removed are retained.	No, decreases freeboard.	Yes, rapid construction due to use of precast members and deck sections.	Yes, maximum improvement	Yes, meets all standards, plausibly acceptable design life.	No, bulk of historic features are removed.	Likely no, as most historic features will be removed.
Yes	Yes, increased freeboard with minimal scope of project	6	New Through Girder Bridge	Fixed	Existing	No	No	Defend @ Current Shoreline		12.9	13.2	N/A	12.9		6.8	2.8	3	1.4	3	2090	2090	2055	2090	2060	2065	2040	2065	No, does not avoid use of 4(f) property.	No, completely removes original span.	Potentially yes, if all historic features that do not need to be removed are retained.	Partially, freeboard moderately increased.	Moderately rapid construction, although potentially longer construction time than a standard bridge.	Yes, maximum improvement	Yes, meets all standards, plausibly acceptable design life.	No, bulk of historic features are removed.	Likely no, as most historic features will be removed.
No	No, insufficient benefit to freeboard compared to complication of in-water work	7	New Standard Girder Bridge	Fixed	Existing	Yes	No	Defend @ Current Shoreline		12.2	12.5	N/A	12.2		6.1	2.1	2.3	0.7	2.3	2075	2080	2035	2080	2050	2055	2030	2055	No, does not avoid use of 4(f) property.	No, completely removes original span. In-water work potentially expands the environmental impact.	Potentially yes, if all historic features that do not need to be removed are retained.	Partially, freeboard moderately increased.	Moderately rapid construction, although potentially longer construction due to in-water work.	Yes, maximum improvement	Yes, meets all standards, plausibly acceptable design life.	No, bulk of historic features are removed.	Likely no, as most historic features will be removed.
No	No, insufficient benefit to freeboard combined with major infrastructure impacts	8	New Standard Girder Bridge	Fixed	Widened	Yes	No	Accommodate	SEP Outfall crossing north of north abutment	10.9	11.5	N/A	10.9		5.1	1.1	1	-0.6	1	2050	2045	2000	2045	2035	2035	2000	2035	No, does not avoid use of 4(f) property.	Not prudent due to channel widening, which does not serve any project objectives at the cost of substantial additional environmental impact; does not avoid use of 4(f) facility. In-water bent potentially expands the environmental impact	Probably not, as control tower and abutments would also likely be removed.	Partially, freeboard slightly increased.	Moderately rapid construction, although potentially longer construction due to constructionof new abutments	Yes, maximum improvement	Yes, meets all standards, plausibly acceptable design life.	No, all historic features are removed.	No, all historic features are removed.
No	No, evaluate the widening option with a bridge raising as the maximum change to the bridge structure	9	New Through Girder Bridge	Fixed	Widened	Yes	No	Accommodate	SEP Outfall crossing north of north abutment	12.6	13.2	N/A	12.6		6.8	2.8	2.7	1.1	2.7	2090	2085	2050	2085	2060	2060	2035	2060	No, does not avoid use of 4(f) property.	Not prudent due to channel widening, which does not serve any project objectives at the cost of substantial additional environmental impact; does not avoid use of 4(f) facility. In-water bent potentially expands the environmental impact	Probably not, as control tower and abutments would also likely be removed.	Partially, freeboard slightly increased.	Moderately rapid construction, although potentially longer construction due to in-water work.	Yes, maximum improvement	Yes, meets all standards, plausibly acceptable design life.	No, bulk of historic features are removed.	No, all historic features removed.
No	No, impractical to raise the bridge and maintain the draw bridge function for limited use cases	10	New Bascule Bridge	Movable	Existing	No	Yes	Defend @ Current Shoreline		13.3	15.4	11	11		9	5	3.4	1.8	1.1	2125	2100	2065	2050	2085	2070	2050	2035	No, does not avoid use of 4(f) property.	Not prudent to rebuild a new movable bridge when it serves no apparent use as shown by bridge-opening records; does not avoid use of 4(f) resources. Major incidental work with attendent environmental impacts required in order to construct pits for new moveable bridge to maintain existing aesthetic.	Potentially yes, if all historic features are replicated at the new elevation.	Partially, freeboard moderately increased due to raising.	No, extended construction time.	Yes, moderate improvement.	Yes, meets all standards, plausibly acceptable design life.	No, bulk of historic features are removed.	Yes, if most historic features are retained or replaced in kind.
No	No, impractical to raise the bridge to make it look the same as non-operable bascule bridge	11	New Bascule Bridge	Non-Operable	Existing	No	Yes	Defend @ Current Shoreline		13.3	15.4	N/A	13.3		9	5	3.4	1.8	3.4	2125	2100	2065	2100	2085	2070	2050	2070	No, does not avoid use of 4(f) property.	Not prudent to rebuild a new movable bridge when it serves no apparent use as shown by bridge-opening records; does not avoid use of 4(f) resources.	Potentially yes, if all historic features are replicated at the new elevation.	Partially, freeboard moderately increased due to raising.	No, extended construction time.	Yes, moderate improvement.	Yes, meets all standards, plausibly acceptable design life.	No, bulk of historic features are removed.	Yes, if most historic features are retained or replaced in kind.
Maybe	Maybe, cost, constructability and mobility alignment flexibility considerations may make this advantageous over through girder bridge	12	New Standard Girder Bridge	Fixed	Existing	No	Yes	Defend @ Current Shoreline		11.7	12	N/A	11.7		5.6	1.6	1.8	0.2	1.8	2060	2065	2015	2065	2045	2050	2015	2050	No, does not avoid use of 4(f) property.	Engineering feasible; does not avoid use of 4(f) resources.	Potentially yes, if all historic features that do not need to be removed are retained.	Partially, freeboard moderately increased, limited by thickness of deck.	Yes, rapid construction due to use of precast members and deck sections.	Yes, maximum improvement	Yes, meets all standards, plausibly acceptable design life.	No, bulk of historic features are removed.	Likely no, as most historic features will be removed.
Yes	Yes, maximized SLR resilience while maintaining landside conforms	13	New Through Girder Bridge	Fixed	Existing	No	Yes	Defend @ Current Shoreline		14.9	15.2	N/A	14.9		8.8	4.8	5	3.4	5	2120	2125	2100	2125	2080	2085	2070	2085	No, does not avoid use of 4(f) property.	Engineering feasible; does not avoid use of 4(f) resources.	Potentially yes, if all historic features that do not need to be removed are retained.	Yes, maximum increase in freeboard due to combination of raising and thinner deck.	Moderately rapid construction, although potentially longer construction time than a standard bridge.	Yes, maximum improvement	Yes, meets all standards, plausibly acceptable design life.	No, bulk of historic features are removed.	Likely no, as most historic features will be removed.
No	No, insufficient benefit to freeboard compared to complication of in-water work	14	New Standard Girder Bridge	Fixed	Existing	Yes	Yes	Defend @ Current Shoreline		15.2	15.5	N/A	15.2		9.1	5.1	5.3	3.7	5.3	2125	2130	2105	2130	2085	2085	2070	2085	No, does not avoid use of 4(f) property.	Engineering feasible; does not avoid use of 4(f) resources. In-water work potentially expands the environmental impact.	Potentially yes, if all historic features that do not need to be removed are retained.	Yes, fairly good increase in freeboard due to thinner deck sections and raising.	Moderately rapid construction, although potentially longer construction due to in-water work.	Yes, maximum improvement	Yes, meets all standards, plausibly acceptable design life.	No, bulk of historic features are removed.	Likely no, as most historic features will be removed.
No	No, insufficient benefit to freeboard compared to complications and impacts to other infrastructure	15	New Standard Girder Bridge	Fixed	Widened	Yes	Yes	Accommodate	SEP Outfall crossing north of north abutment	13.9	14.5	N/A	13.9		8.1	4.1	4	2.4	4	2110	2110	2080	2110	2075	2075	2055	2075	No, does not avoid use of 4(f) property.	'Not prudent due to channel widening, which does not serve any project objectives; does not avoid use of 4(f) facility. In-water work potentially expands the environmental impact.	Probably not, as control tower and abutments would also likely be removed.	Yes, fairly good increase in freeboard due to thinner deck sections and raising.	Moderately rapid construction, although potentially longer construction due to in-water work.	Yes, maximum improvement	Yes, meets all standards, plausibly acceptable design life.	No, all historic features are removed.	No, all historic features are removed.
No	No, preliminary judgment from SFPUC is that there is limited improvement to creek circulation, to justify complication of impacts to other infrastructure and delay to bridge funding in hand for larger scope	16	New Through Girder Bridge	Fixed	Widened	Yes	Yes	Accommodate	SEP Outfall crossing north of north abutment	15.6	16.2	N/A	15.6		9.8	5.8	5.7	4.1	5.7	2135	2135	2110	2135	2090	2090	2075	2090	No, does not avoid use of 4(f) property.	'Not prudent due to channel widening, which does not serve any project objectives; does not avoid use of 4(f) facility. In-water work potentially expands the environmental impact	Probably not, as control tower and abutments would also likely be removed.	Yes, maximum increase in freeboard due to combination of raising and thinner deck.	Moderately rapid construction, although potentially longer construction due to in-water work.	Yes, maximum improvement	Yes, meets all standards, plausibly acceptable design life.	No, all historic features are removed.	No, all historic features are removed.
No	No, same decision as made above in item 3, just a future action to address problem in different manner	17	New Bascule Bridge	Non-Operable	Existing	No	No	Defend Across Creek	All SFPUC CSD in Islais Creek	10.3	12.4	N/A	10.3		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No, does not avoid use of 4(f) property.	'Not prudent to rebuild a new basucle bridge that does not function; Not prudent in that it is unlikely to remain usable due to increasing seawater exposure without continual maintenance; does not avoid use of 4(f) resources.	No, as historic drawbridge function is no longer maintained.	No, no increase in freeboard.	No, extended construction time, and bridge would be required to be closed frequently for maintenance.	Yes, some improvement through connection of leaves at center.	Would meet minimum standards but may not be able to maintain them due to SLR.	No, historic drawbridge function is impaired.	Yes, most historic features are retained.
No	No, same decision as made above in item 4, just a future action to address problem in different manner	18	Maintain Existing Bascule Bridge	Non-Operable	Existing	No	No	Defend Across Creek	All SFPUC CSD in Islais Creek	10.3	12.4	N/A	10.3		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No, does not avoid use of 4(f) property.	Not prudent in that it is unlikely to remain usable due to increasing seawater exposure without continual maintenance; and unlikely to provide required design life.	No, as historic drawbridge function is no longer maintained.	No. No increase in freeboard.	No, bridge would be required to be closed frequently for maintenance.	Yes, some improvement through connection of leaves at center.	No, fails to meet current standards.	No, historic drawbridge function is impaired.	Yes, most historic features are retained.
NO	No, risk too high to knowingly build a lower crossing that counts on future major action for protection	19	New Standard Girder Bridge	Fixed	Existing	No	No	Defend Across Creek	All SFPUC CSD in Islais Creek	9.7	10	N/A	9.7		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No, does not avoid use of 4(f) property.	No, completely removes original span.	Potentially yes, if all historic features that do not need to be removed are retained.	No, decreases freeboard.	Yes, rapid construction due to use of precast members and deck sections.	Yes, maximum improvement	Yes, meets all standards, plausibly acceptable design life.	No, bulk of historic features are removed.	Likely no, as most historic features will be removed.
No	No, trade off for this is weighed between options 6 and 13. Levee crossing is a future action that would impact each equally.	20	New Through Girder Bridge	Fixed	Existing	No	No	Defend Across Creek	All SFPUC CSD in Islais Creek	12.9	13.2	N/A	12.9		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No, does not avoid use of 4(f) property.	No, completely removes original span.	Potentially yes, if all historic features that do not need to be removed are retained.	Yes, moderate increase in freeboard.	Moderately rapid construction, although potentially longer construction time than a standard bridge.	Yes, maximum improvement	Yes, meets all standards, plausibly acceptable design life.	No, bulk of historic features are removed.	Likely no, as most historic features will be removed.
No	No, future iteration of the bridge replacement, far outside the scope of the current funding, requires long process for environmental clearance and long lead time on associated infrastructure improvements	21	Levee Crossing at Islais Bridge Alignment	Levee	None	Fill	Yes	Defend Across Creek	All SFPUC CSD in Islais Creek	N/A	N/A	N/A	18															No, does not avoid use of 4(f) property.	No, not prudent as it vastly expands extent of environmental impacts, and does not fix existing bridge structural deficiencies	No, change to channel geometry precludes existence of a bridge.	Yes, as the channel would be dry.	Bridge would be demolished to make space for an overland structure or roadway on the same alignment	Yes, maximum improvement	Yes, meets all standards, plausibly acceptable design life.	No, change to channel geometry precludes existence of a bridge.	No, change to channel geometry precludes existence of a bridge.
No	Vastly more impactful than any other alternative, and unlikely to receive regulatory permits. Useful to retain here for 4(f) analysis.	22	Flood Control Structure East of Illinois St.	Levee	None	Fill	Yes	Defend Across Creek	All SFPUC CSD in Islais Creek	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes, avoids use and is engineering feasible.	No, not prudent as it vastly expands extent of environmental impacts, requires a major roadway realignment. Unlikely to be permitted.	Yes, existing bridge would be preserved in place; traffic/transit could be rerouted over levee.	Yes, as the channel would be dry.	Bridge would remain in use while levee is in construction, so no construction impacts.	Yes, maximum improvement	Yes, meets all standards, plausibly acceptable design life. Historic bridge could be used for bike/ped crossing until it becomes entirely unusable.	Yes, bridge is entirely preserved.	Yes, bridge is entirely preserved.

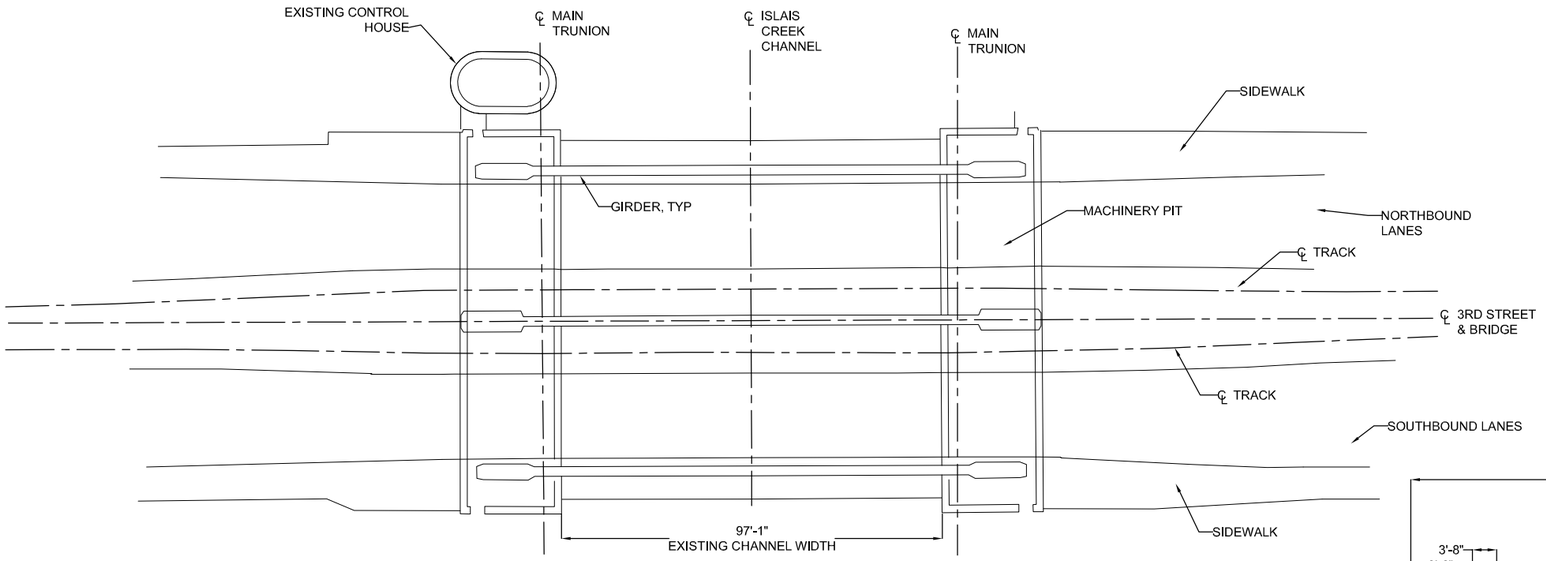
MHHW	6.4
50yr	9.5
100yr	9.9
Bridge Freeboard Target (50yr)	2
Kayak Clearance Assumed	4

The elevations are based on the sketches that we put together for SFPW, and in some cases I added the vertical elevation. You can see markup of the original drawings here which are used to baseline the sketches: Islais Creek Bridge as-builts (1950's) with markups.pd

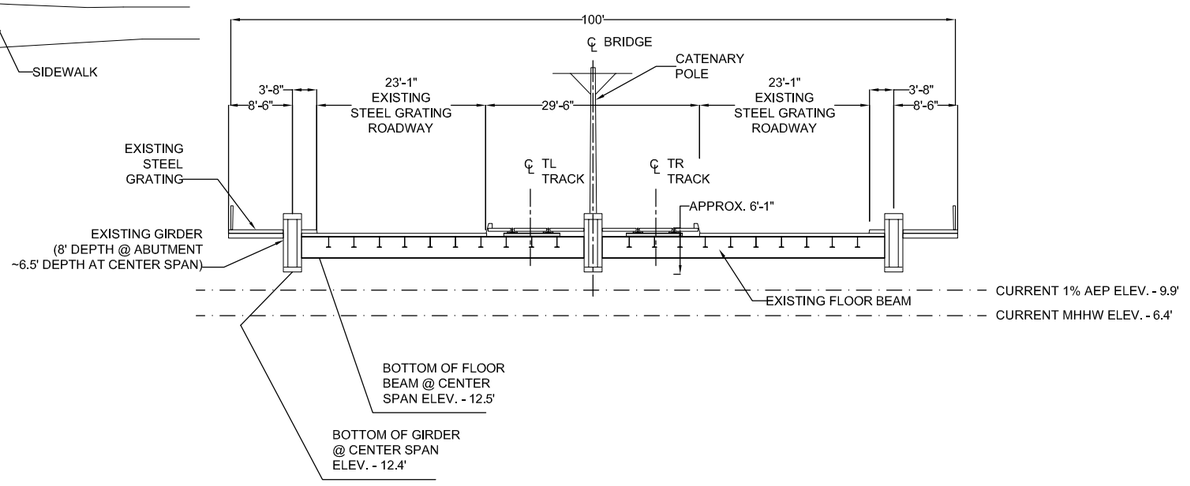
Attachment 4
Drawings for Bridge Options

NEW BASCULE BRIDGE, MOVABLE / NON MOVABLE, REPLACING EXISTING AS IS

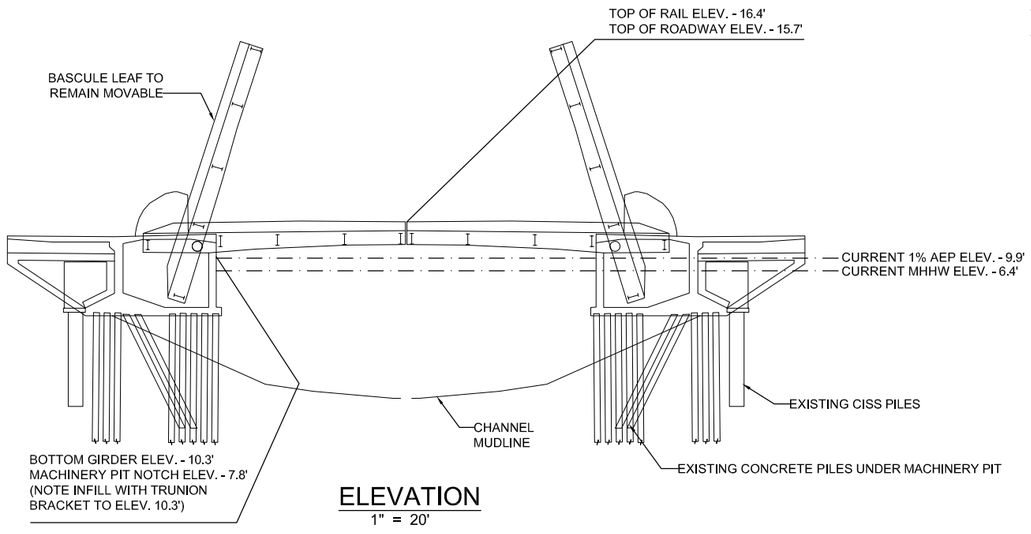
CONCEPT IS THE ORIGINAL PLAN FOR THE BRIDGE REHABILITATION AND RETROFIT PROJECT CURRENTLY FUNDED. DOES NOT ALTER GEOMETRY OR ELEVATION OF ROADWAY, TRACK, MECHANICAL OR STRUCTURAL ELEMENTS FROM CURRENT BRIDGE. MAY BE MOVABLE OR NOT.



PLAN
1" = 20'

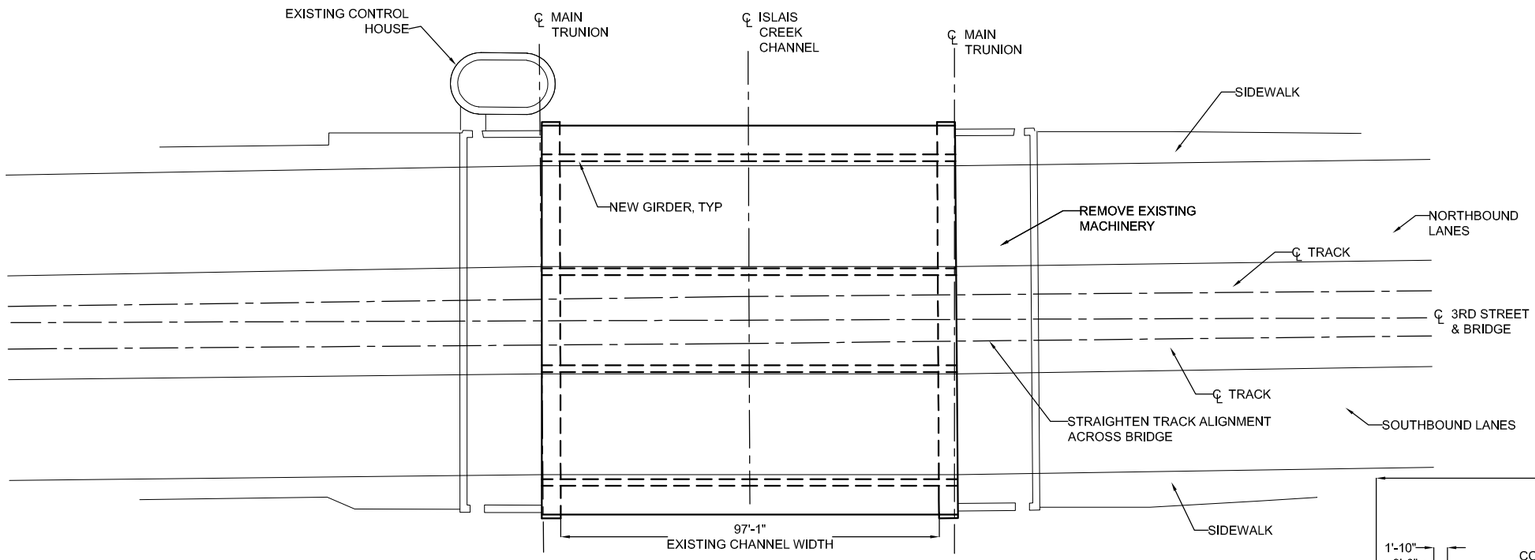


TYPICAL SECTION
1" = 10'

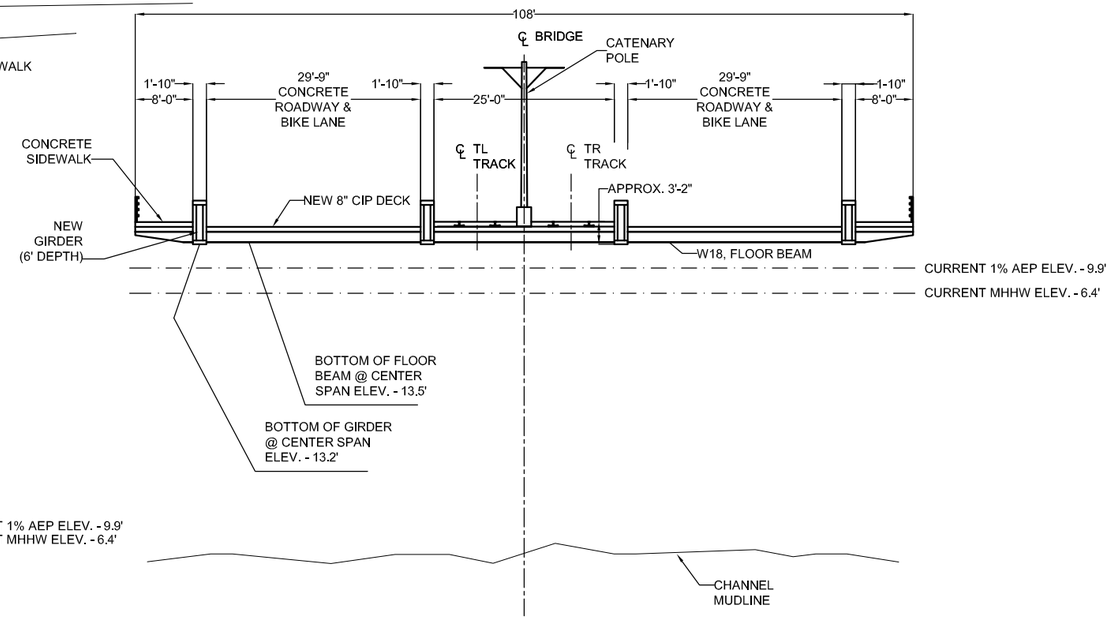


ELEVATION
1" = 20'

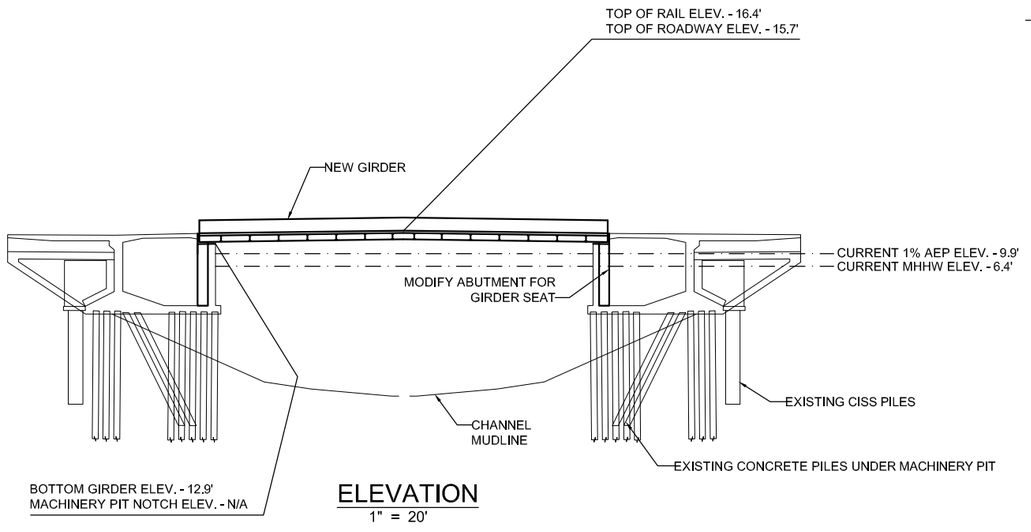
NEW THROUGH GIRDER BRIDGE AT THE SAME ELEVATION WITHOUT A CENTER BENT



PLAN
1" = 20'

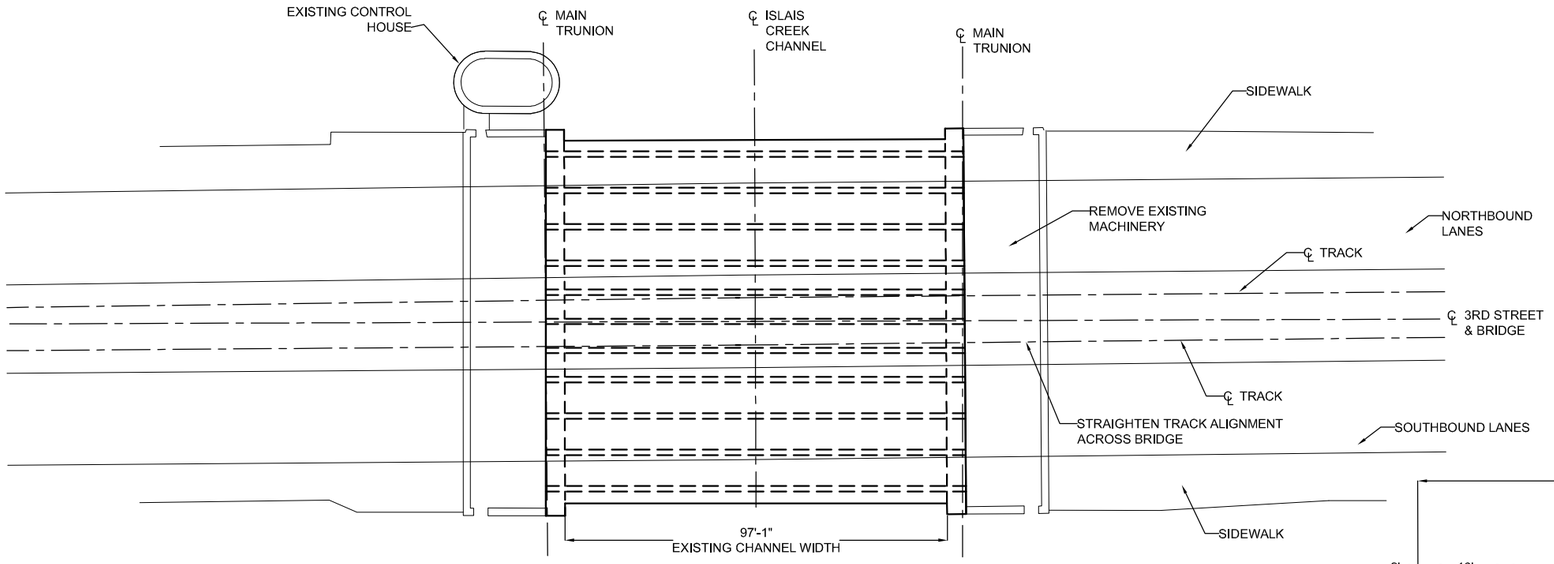


TYPICAL SECTION
1" = 10'

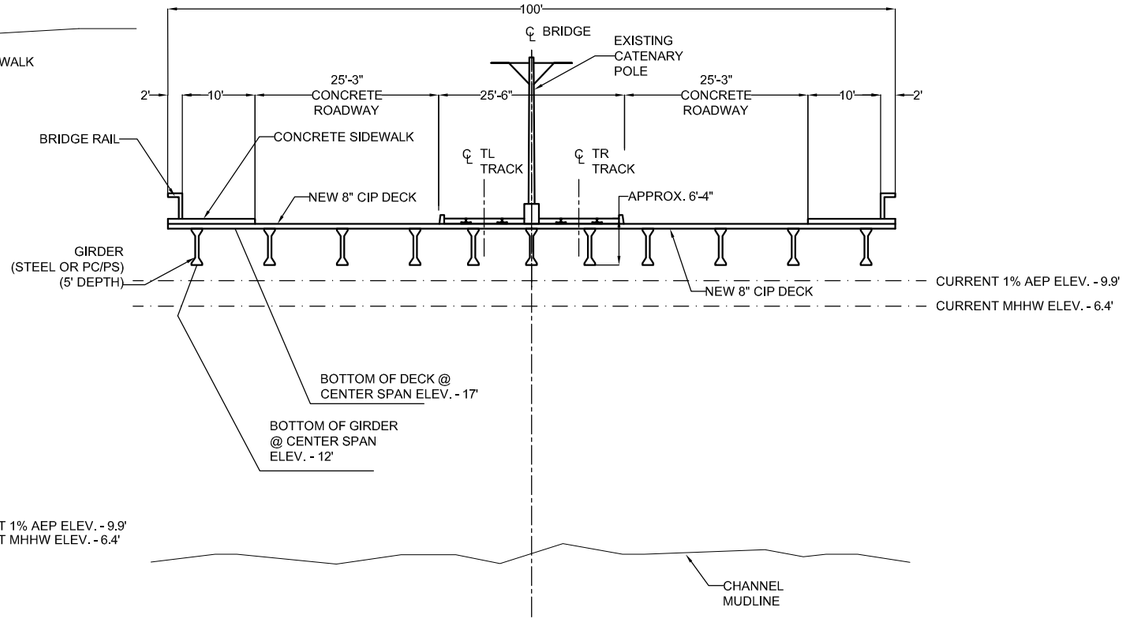


ELEVATION
1" = 20'

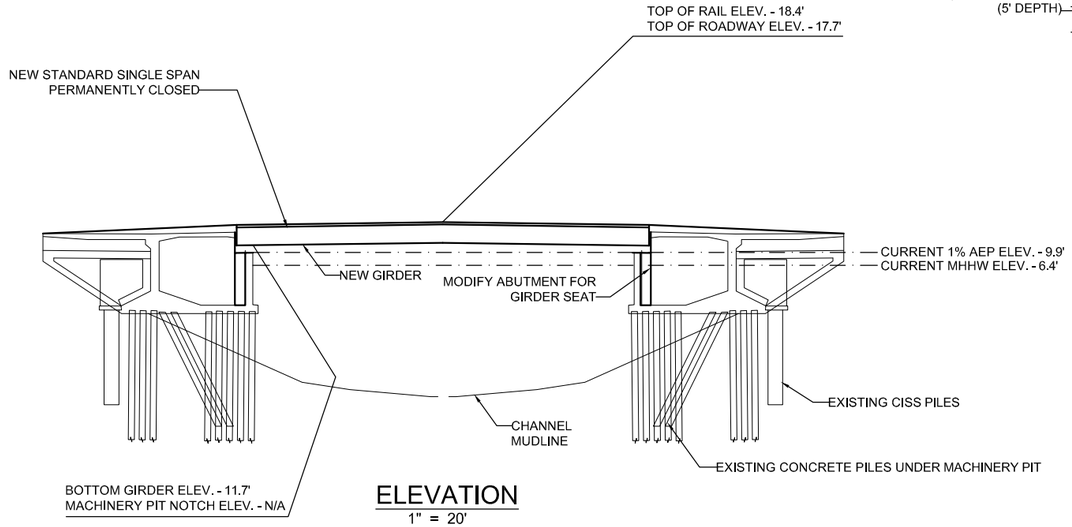
NEW STANDARD GIRDER BRIDGE, WITHOUT A CENTER BENT AT A HIGHER ELEVATION



PLAN
1" = 20'

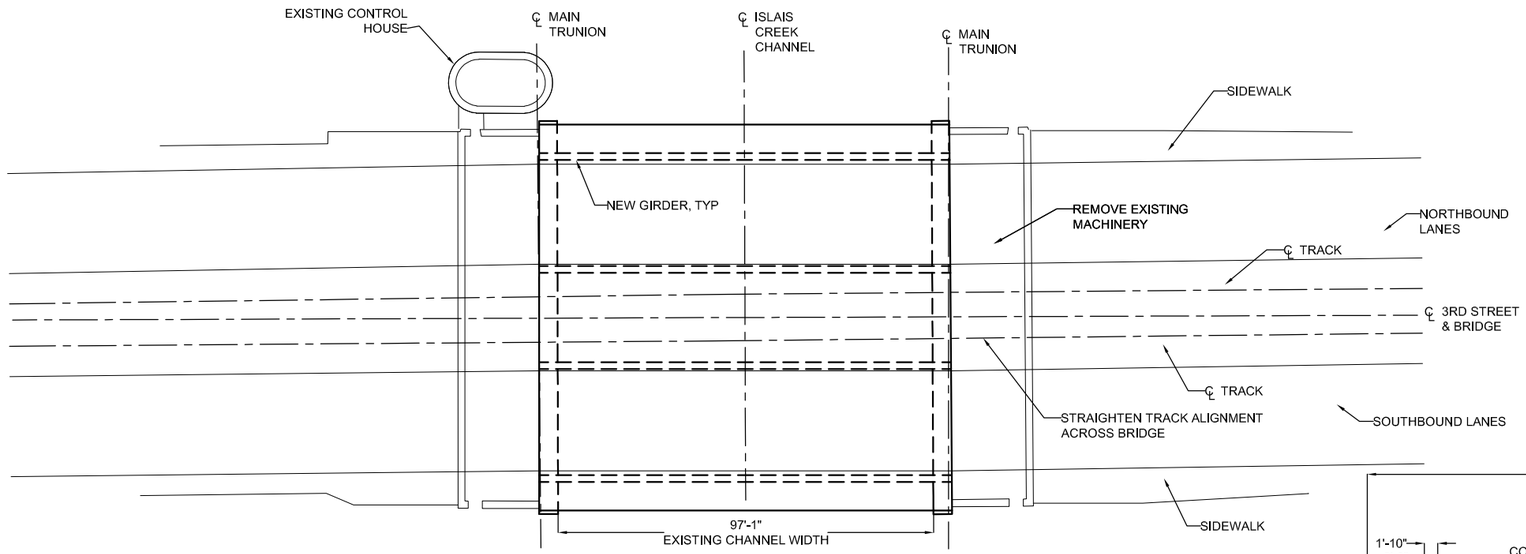


TYPICAL SECTION
1" = 10'

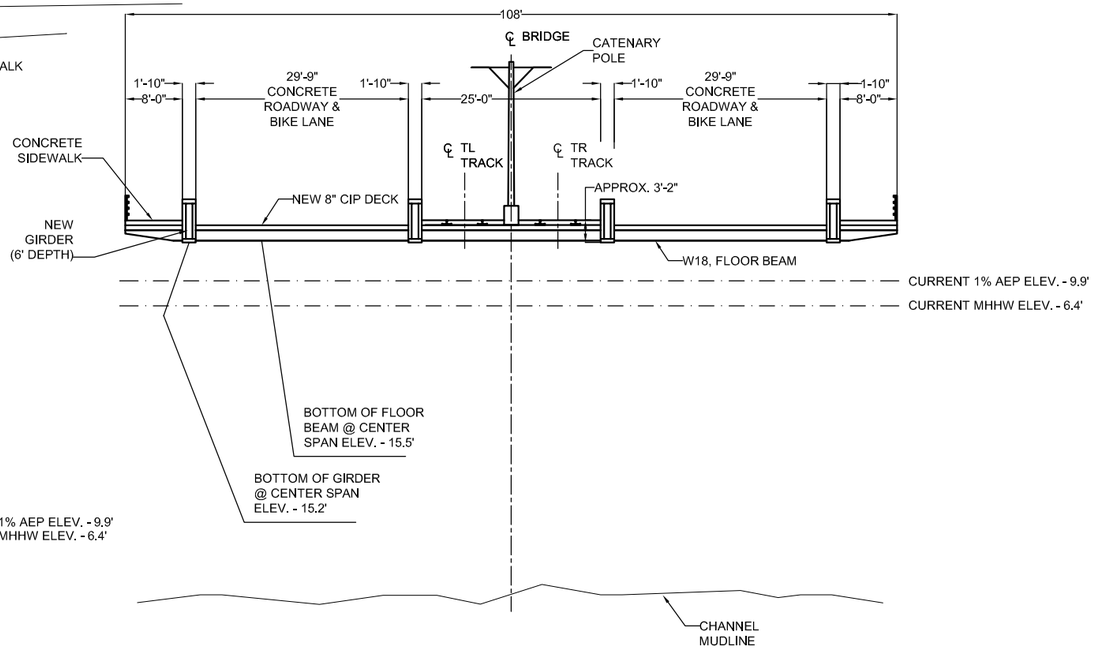


ELEVATION
1" = 20'

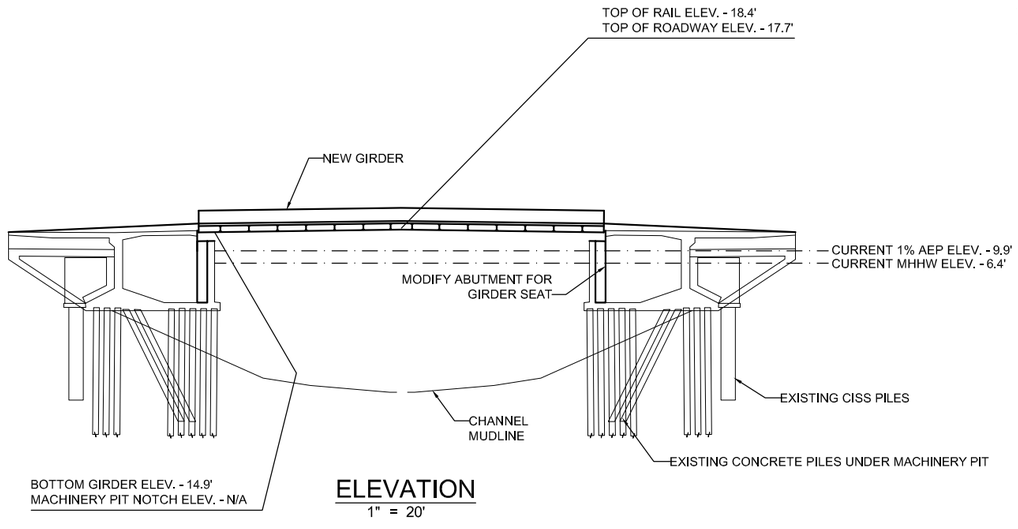
NEW THROUGH GIRDER BRIDGE, WITHOUT A CENTER BENT AT A HIGHER ELEVATION



PLAN
1" = 20'



TYPICAL SECTION
1" = 10'



ELEVATION
1" = 20'

AECOM
2020 L Street
Sacramento, CA 95811
aecom.com

Project name:
Islais Creek Bridge Project

Project ref:
2022-000112ENV

To: Historic Preservation Commission

CC: Justin Greving, San Francisco Environmental Planning;

Chelsea Fordham, San Francisco Environmental Planning

Michael Kay, AECOM

From:
Chandra Miller, AECOM Architectural Historian

Date:
May 2023

Preservation Alternatives Memorandum – Islais Creek Bridge Project (2022-000112ENV)

Introduction

The San Francisco Planning Department and the Project Sponsor, San Francisco Public Works (Public Works), are requesting review and comment before the Historic Preservation Commission (HPC) regarding the proposed Preservation Alternative for the project at the Islais Creek Bridge (officially named the Levon Hagop Nishkian Bridge) along Third Street in the City and County of San Francisco (CCSF) (proposed project). The Planning Department is in the process of preparing an Initial Study and Draft Environmental Impact Report (EIR) to evaluate the related physical environmental effects of the proposed project.

This memorandum has been prepared to provide:

- a description of the Islais Creek Bridge and project objectives;
- information on the eligibility, integrity, and character-defining features of the bridge;
- a summary of the potential impacts to the historical resource by the proposed project;
- a description of how the Preservation Alternative was developed;
- the potential feasibility of the Preservation Alternative relative to the project objectives;
- and a description of alternatives that were considered but rejected.

Physical Description

The Islais Creek Bridge is a built-up steel double-leaf bascule bridge[1] constructed in 1949-50 on Third Street over the Islais Creek Channel (the channel) in the Bayview neighborhood of San Francisco (Figure 1). The bridge is approximately 1,700 feet east of Interstate 280, and approximately 3,300 feet west of San Francisco Bay (the bay). The bascule arms, which open to allow boats to pass on the channel, consist of riveted steel box girders

[1] A bascule is type of bridge with a pivoting section that is raised and lowered using counterweights typically used over waterways.

supporting an open grid steel grate roadway. There are three joints of the open grid steel deck where the bascule leaves separate during bridge operations. The bridge is approximately 100 feet wide and spans 114 feet over the channel which is a United States Coast Guard (USCG) regulated navigable waterway. Each leaf consists of three built-up steel box girders, with transverse floor beams, longitudinal stringers, and an open grid steel deck. Each leaf carries four lanes of traffic, two light rail transit tracks, and two cantilevered sidewalks. The leaves are supported by concrete abutments on either side of the channel. The bridge control tower, which houses the controls which the operator uses to raise and lower the leaves, is on the northeast side and immediately adjacent to the bridge. The control tower is a structure consisting of two elevated concrete floors, a basement level, and a steel/wood roof supported by steel pipe columns. The control room on the second floor of the control tower is surrounded by large plate glass windows canted slightly outward. A balcony with metal pipe railings surrounds the second-floor control room. The control tower foundation consists of concrete grade beams that are 3-feet wide by 1-foot-6-inches deep. The grade beams are supported by eight precast concrete piles that are 18-inches square.

As originally designed in 1949, the bridge carried only vehicular traffic and pedestrians. In 2007, the San Francisco Municipal Transportation Agency (SFMTA, or MUNI) retrofitted the bridge to carry two light rail tracks with overhead electric wires and poles to provide power to light rail vehicles. The two light rail tracks have a double "S" curve over the bridge to go around the existing center bascule crossing the three rail joints of the open grid steel deck where the bascule leaves separate during bridge operations. The retrofit added five 48 inch cast-in-steel-shell (CISS) piles at each abutment (Figure 2).

In 2013, following regular inspection, the bridge with control tower was given a National Bridge Inventory Rating of 20 out of 100 ("poor"), with its structural system scoring 0.[2]

[2] The National Bridge Inspection Standards are the standards established by the U.S. Secretary of Transportation over the safety inspections of highway bridges on public roads throughout the United States, following federal policy that periodic and thorough inspections of U.S. bridges are necessary to maintain safe bridge operation and prevent structural and functional failures and to allow bridge owners to make informed investment decisions as part of an asset management program (see *MAP-21*, Public Law 112-141, 126 Stat. 405).

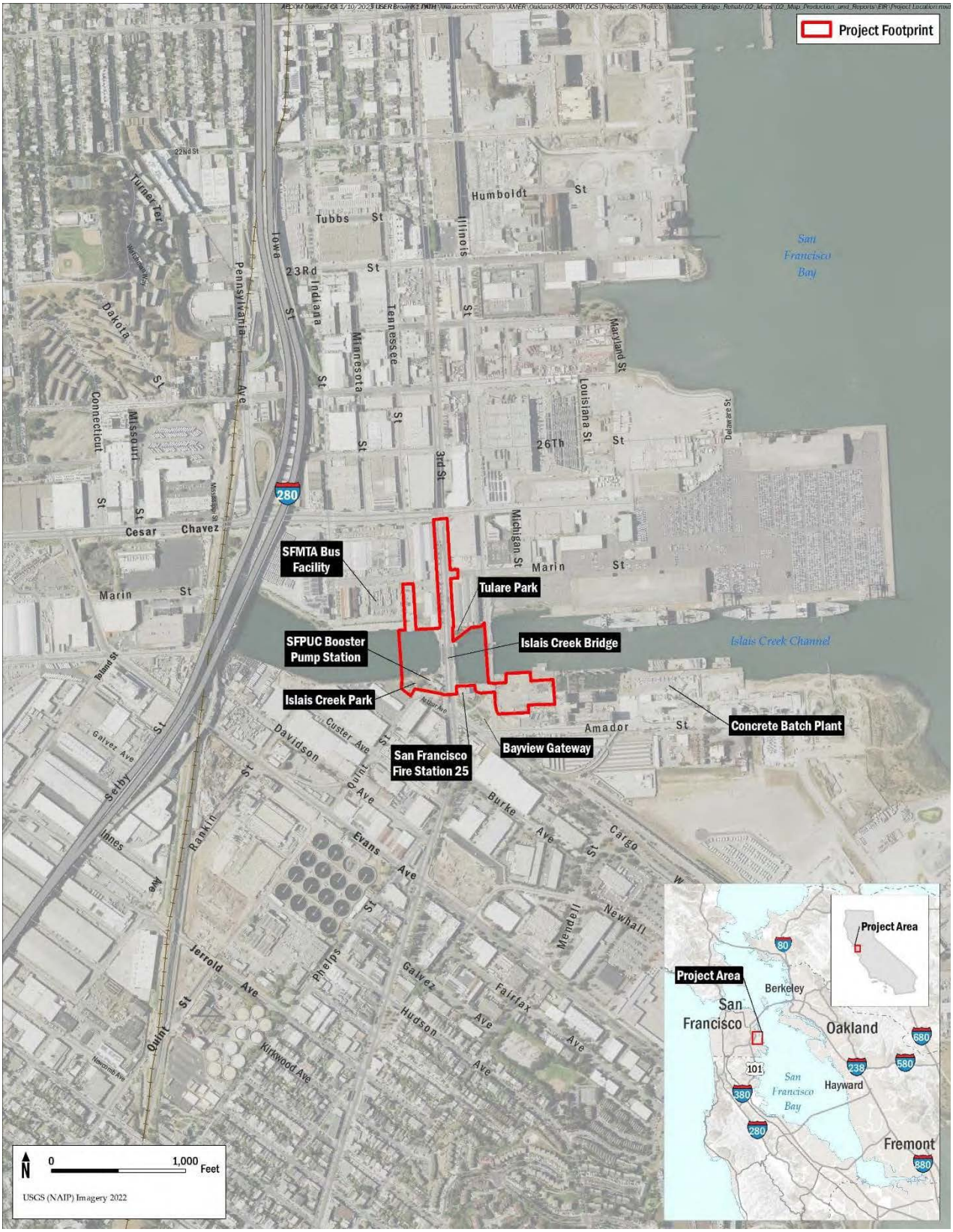


Figure 1. Project Location

Figure 2. Islais Creek Bridge East Elevation

Historical Significance

A California Department of Transportation (Caltrans) evaluation for historic significance in 2004 determined that the Islais Creek Bridge was eligible for listing in the National Register of Historic Places (National Register) at the local level of significance under Criterion C for its distinctive design qualities as an example of Art Moderne-style applied to a bridge. The State Historic Preservation Officer (SHPO) concurred with the finding of eligibility on December 7, 2005. The bridge's period of significance is 1950, its date of completion. Because the bridge was formally determined to be eligible for listing in the National Register it is automatically listed in the California Register of Historical Resources (California Register) under Criterion 3 and is therefore considered to be a historical resource for the purposes of the California Environmental Quality Act (CEQA).

Integrity

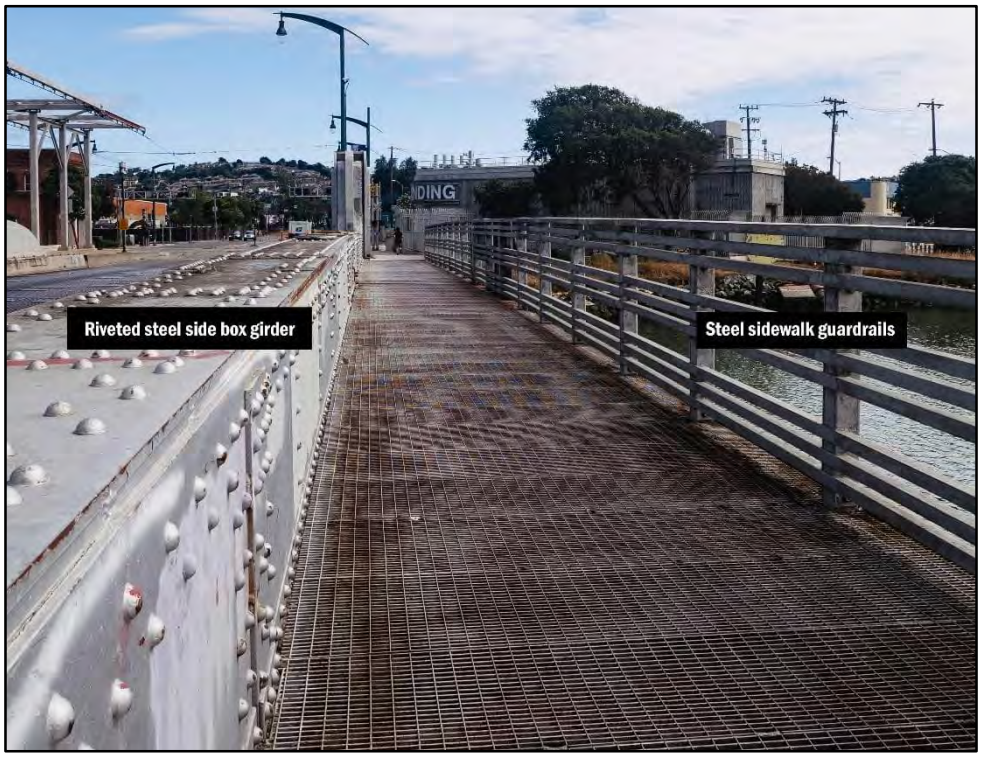
The bridge retains historic integrity to its period of significance, 1950, its date of completion. The integrity of the bridge was diminished with the alterations required for adding the light rail features in 2006; however, these constitute relatively minor changes to its overall integrity. The removal of two lanes of traffic, addition of rails, overhead wires, catenary poles, and barrier between the rails and automobile lanes have diminished the integrity of materials, design, workmanship, and feeling. However, the integrity of those aspects largely remain intact, as most of the bridge's character-defining features were not altered by that project. The bridge also retains integrity of location, setting, and association because it has not been moved, the bridge's surrounding built environment remains largely industrial in nature, and the bridge continues to be used as a bridge crossing Islais Creek.

Character-Defining Features

The character-defining features that make it eligible for the National and California Register under Criterion C/3 for its distinctive design qualities include the following (see Photographs 1-4):

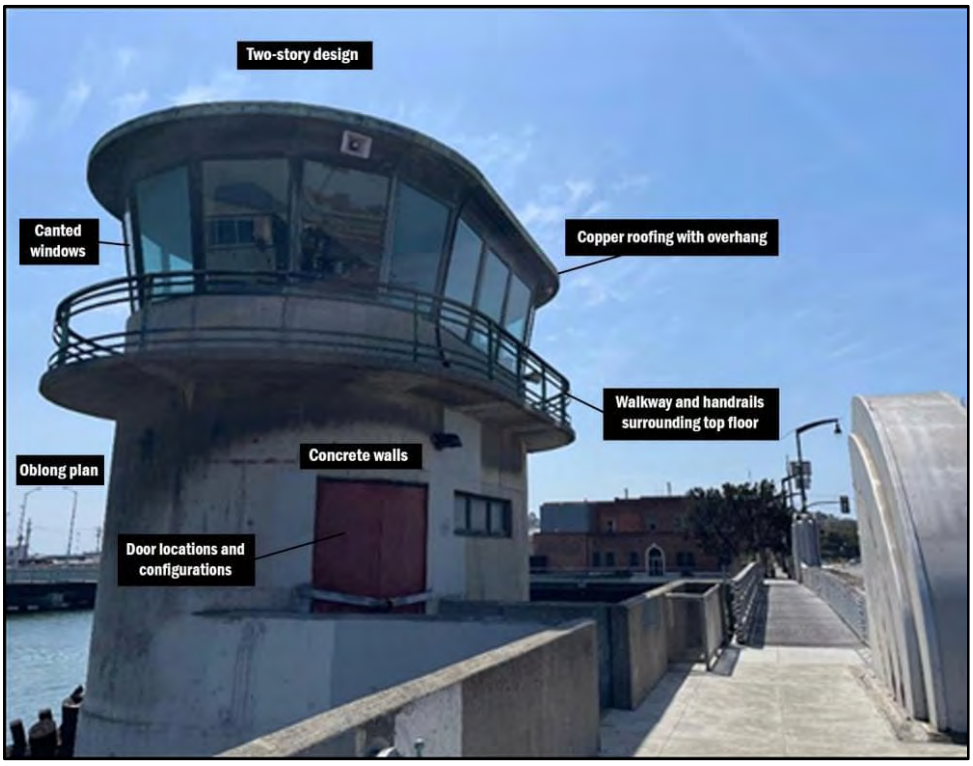
- bridge type (i.e., bascule type bridge with two spans and concrete abutments);
- above-deck detailing elements on top of, or associated with, the bascule leaves, including:
  - above-deck visible elements of riveted steel side and center box girders;
  - quarter-round and teardrop bascule girder housing units with Art Moderne styling;
  - steel sidewalk guardrails with Art Moderne styling, including the guardrails for the staircase leading to the abutment machinery pit entrance on southeast corner.
- steel hatch door on the east side of the south machinery pit;
- control tower location, design, and materials, including:
  - the oblong plan;
  - two-story (with basement) design;
  - concrete walls;
  - canted window configuration, size, and materials;
  - copper roofing with overhang;
  - walkway and handrails surrounding the top floor; and
  - door locations and configurations.

Photograph 1. Above-deck character-defining features including quarter-round and teardrop girder housing units with Art Moderne styling and riveted steel center box girder, facing southeast



Photograph 2. Above-deck character-defining features including riveted steel side box girder and steel sidewalk guardrails with Art Moderne styling, facing south

Photograph 3. Character-defining steel staircase leading to abutment machinery pit and sidewalls of concrete abutments at southeast corner leading to steel hatch door, facing northwest



Photograph 4. Control tower character-defining features include the oblong plan, two-story design, concrete walls, canted windows, copper roofing with overhang, walkway and handrails surrounding top floor, and door locations and configurations, facing south

Project Description and Need

The proposed project would replace the existing bridge superstructure of the Islais Creek Bridge with a new bridge. The project area is very susceptible to seismic liquefaction and the condition of the bridge's structural system is poor. The bridge originally carried only vehicular traffic, but now additionally carries MUNI light-rail tracks. The deteriorated condition of the bridge makes the bridge deck susceptible to vibration induced by heavy vehicles, trucks, and light-rail vehicles crossing the span.

The areas surrounding Islais Creek are at risk of flooding from heavy rainfall events, coastal storm surge, and wave hazards, which will be exacerbated by sea-level rise and rising groundwater. The steel sections of the bridge are increasingly subject to the deleterious effects of corrosion and saltwater intrusion.

The proposed project would remove the existing drawbridge leaves, which have not been opened for navigation for over ten years, and all other drawbridge features. These will be replaced by a single-span concrete through-girder bridge[3] with a concrete deck at a higher elevation to improve freeboard[4] for flood flows and to accommodate sea-level rise (Figure 3).

In addition to dedicated light-rail-vehicle trackways and two 11-foot travel lanes in each direction, the bridge will support a 12-foot-wide pedestrian path on its eastern side and a 16-foot-wide Class I shared pedestrian/bicycle path on its western side (see Figures 4 and 5). The reconstructed trackway and roadway will be designed to convey surface runoff to the existing combined sewer/stormwater system. The control tower would be demolished down to the sidewalk level and the remaining portion will be used to create a public observation platform.

[3] A through girder bridge design is where the road deck is supported by the bottom flange of a girder and traffic travels between the supporting girders that project above the deck.
[4] Freeboard is the vertical clearance between the lowest bridge member and the existing channel water elevation.

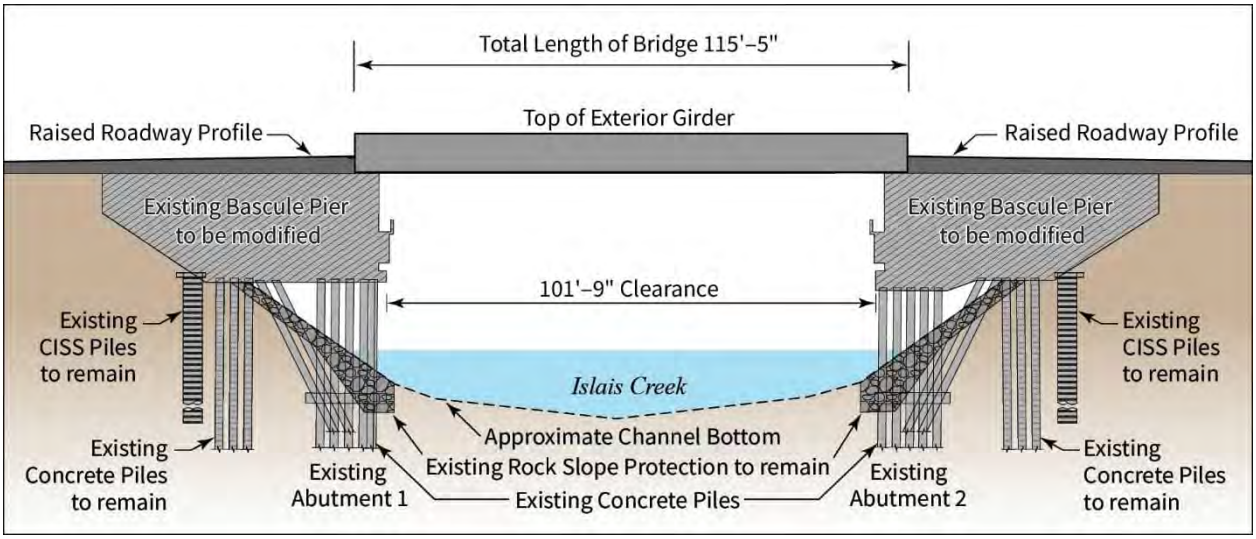


Figure 3. Proposed Through-Girder Bridge Longitudinal Section

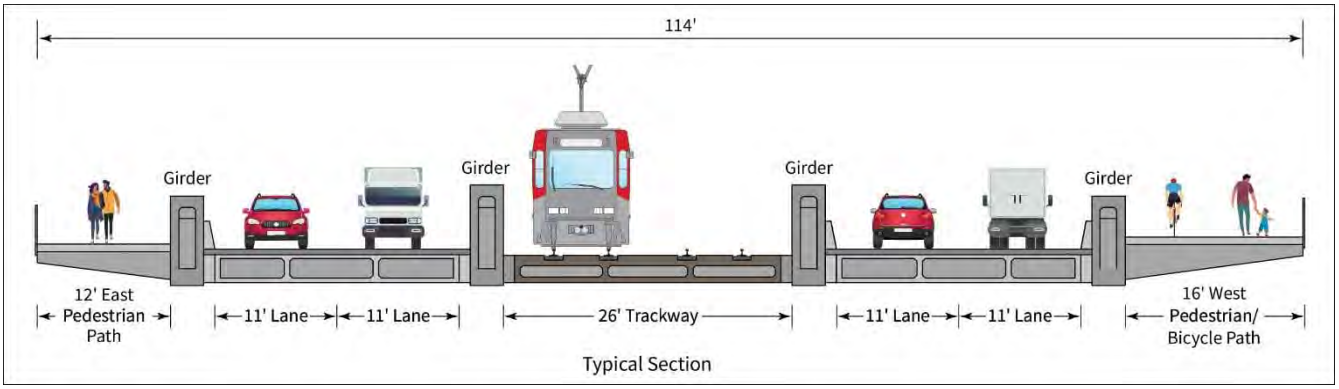


Figure 4. Proposed Through-Girder Bridge Cross Section

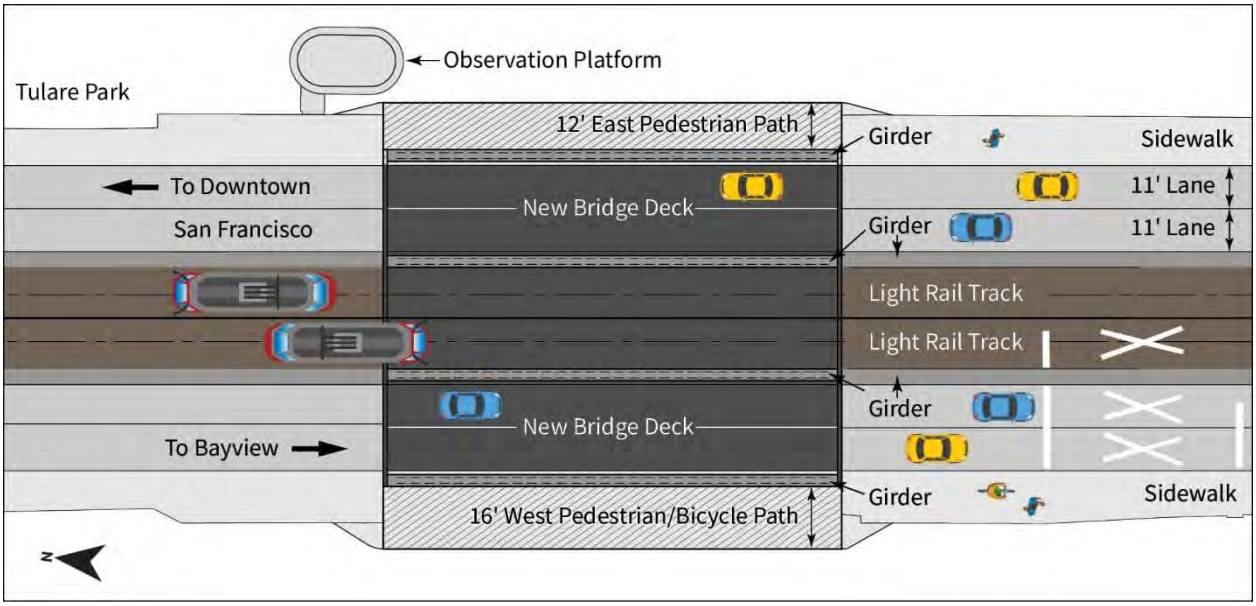


Figure 5. Proposed Through-Girder Bridge Plan View

The project's accommodation of a shared bicycle/pedestrian facility (Class I or Class IV) is based on advanced planning between the San Francisco Public Utilities Commission, Port of San Francisco, and the San Francisco Municipal Transportation Agency in response to opportunities presented by the removal of the bridge's drawbridge function per the City's *Islais Creek Southeast Mobility Adaptation Strategy*. Although not yet officially designated a bicycle facility, the Islais Creek Bridge and portion of Third Street connecting to Cargo Way will be adopted as part of the updated San Francisco Bicycle Network and citywide Active Communities Plan[5] that is currently under way and expected to be completed in 2024.

The structure would consist of four through-girders. As shown in Figure 4, through-girder refers to a bridge type in which girders protrude above the deck and traffic passes between them. The two exterior girders would support the combined pedestrian/bicycle path and half of the vehicle lanes, while the interior girders would support the other half of the vehicle lanes and the light rail trackway. Approximately 3 feet 9 inches of the overall girder depth would be below the deck surface, with 4 feet 9 inches (exterior, facing the sidewalks) and 5 feet 9 inches (interior, facing the roadway) above the deck surface. The portions of the girders above the deck surface would serve as barriers between the trackway, Third Street, and the pedestrian/bicycle paths.

Project Objectives

As the Project Sponsor, Public Works seeks to achieve the following objectives:

- Increase distance between the bridge's lowest point and existing channel's water elevation to the maximum extent practicable. This will extend the useful life of the bridge by improving the bridge's resilience to the impacts of sea-level rise, avoiding the current recurring submersion of the bridge underdeck and flooding of the machine rooms, and reducing the bridge's exposure to seawater and sustained moisture.

- Address the existing bridge's seismic deficiencies by replacing it with a new bridge that is seismically adequate.

- Minimize the project's construction times to the maximum practicable to reduce impacts to Bayview Hunters Point residents. The Bayview Hunters point neighborhood has substantially larger percentage of Black/African American and Latinx residents when compared to the San Francisco as a whole and the per capita income is less than half of the City average.[6] The road and trackway over the bridge provides a vital connection between the San Francisco's downtown and Mission Bay areas and Bayview Hunters Point, who would disproportionately experience transit delays and detours during project construction.

- Increase the serviceability of the bridge to improve multi-modal transportation safety and increase operational utility to Muni light rail operations.

- Maintain current geometric, construction, and structural standards required for the types and volume of projected traffic on the bridge over its design life to ensure continued access from the Bayview Hunters point neighborhood to the rest of the City and the region. This is intended to ensure that the bridge is operationally and structurally adequate, for its entire design life.[7]

- Provide a bicycle facility that can be incorporated into City bicycle route planning as part of the proposed project.

[5] SFMTA. Active Communities Plan. https://www.sfmta.com/projects/active-communities-plan
[6] San Francisco Neighborhoods Socio-Economic Profiles: American Community Survey 2012–2016. San Francisco Planning Department, September 2018.
[7] Design life is the period of time as intended by the bridge designers after which the bridge may need to be replaced.

Preservation Alternatives

This section describes the overall process the San Francisco Planning Department staff and Public Works (the project sponsor) took to develop the preservation alternatives for the proposed project.

Development of Preservation Alternatives

Alternatives were explored to identify strategies that would address the significant and unavoidable impact of the proposed project while still accomplishing most of the project objectives. In preparing the preservation alternatives, the Planning Department and Public Works explored several different approaches while considering the project objectives, character-defining features, and feasibility. Some of the design constraints discussed included the existing location and height of the control tower. Because the proposed project raises the height of the bridge and widens the sidewalk, it would affect the bridge's relationship and connection to the tower, which is a character-defining feature. Some early alternative explorations included cutting the tower at the basement level to relocate the tower onto the shore, or raising the tower to match the elevated height of the bridge, or demolishing and rebuilding the tower in the same location but at a higher elevation to match the new elevation of the bridge.

Another existing design constraint discussed included the current double "S" curve over the bridge to go around the existing center bascule. Currently, light-rail vehicles must slow considerably to safely pass through the horizontal alignment reverse curve at the approaches and across the three rail-joints of the open grid steel deck where the bascule leaves separate during bridge operations. The proposed replacement bridge has four girders, and to replicate the center girder including the rivetted steel center box girder and Art Modern-style teardrop bascule girder housing units, was considered in the development of alternatives. However, retention of a center girder would not increase operational utility to MUNI light rail operations because it would replicate the existing jog in the rail tracks that slows trains. Retention of an additional center girder, which would require a total of five girders, would also result in a thicker deck structure making the bridge more susceptible to sea level rise because the space between the bottom of the bridge and the channel water elevation would be reduced (also known as freeboard). Inclusion of a faux center girder would also require a wider bridge which may in turn require the narrowing of the proposed pedestrian/bicycle paths to conform to the bridge approaches. To avoid widening the bridge to accommodate a center girder, a three-girder bridge was considered. However, this design would require a thicker bridge deck to support the increased span between the girders. Again, a thicker bridge deck would reduce bridge freeboard compared to the proposed project and be more susceptible to sea level rise.

As described in more detail below under the Alternatives Considered and Rejected section, the planning department and project sponsor explored the feasibility of including rehabilitation of the existing bridge as an alternative. This rehabilitation alternative was determined to be infeasible for a number of reasons including the bridge's susceptibility to sea level rise, the fact that the drawbridge function is no longer necessary, and inefficiency of Muni operations on the bridge, and is no longer under consideration.

Planning Department staff and Public Works ultimately identified two alternatives: a Preservation Alternative that meets most of the project objectives while still retaining the majority of the bridge's character defining features, and a no project alternative that would include no demolition, construction, or any improvements to the Islais Creek Bridge. Both alternatives are described below.

Preservation Alternative- New Bridge and Retain Control Tower in Place

Under the Preservation Alternative, the bridge would be replaced at a higher elevation, the same as the proposed project, but would include salvage, rehabilitation, and reinstallation of as many of the character-defining features of the original bridge as feasible (Figures 6 and 7). For comparison purposes, Figures 8 and 9 depict the proposed project. If it is determined that any of the character-defining features are not salvageable for reinstallation, these elements would be replicated with substitute materials to recreate the historic appearance and reproduce historic paint colors and finishes based on physical evidence, per the Secretary of the Interior's Standards for the Treatment of Historic Properties.

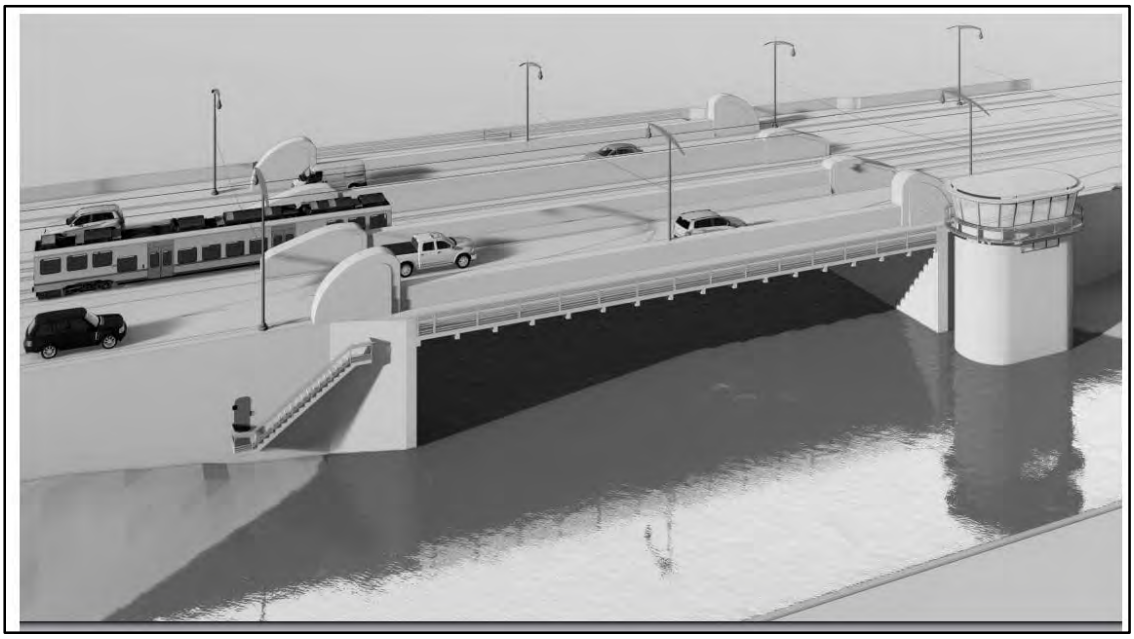


Figure 6. Oblique view of Preservation Alternative

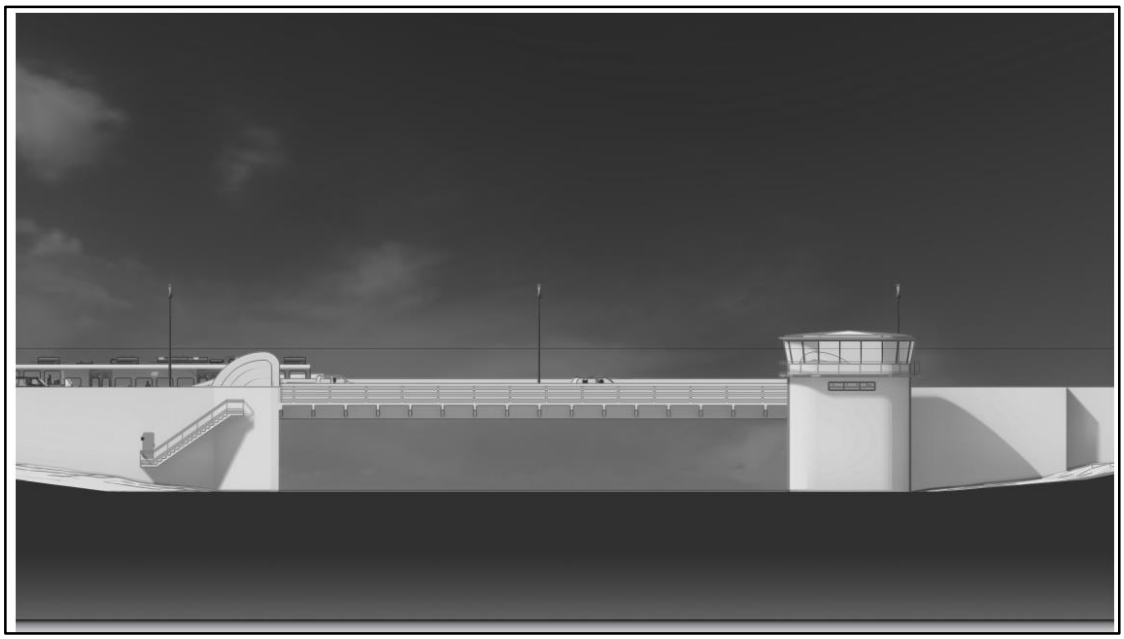


Figure 7. View of east elevation of Preservation Alternative

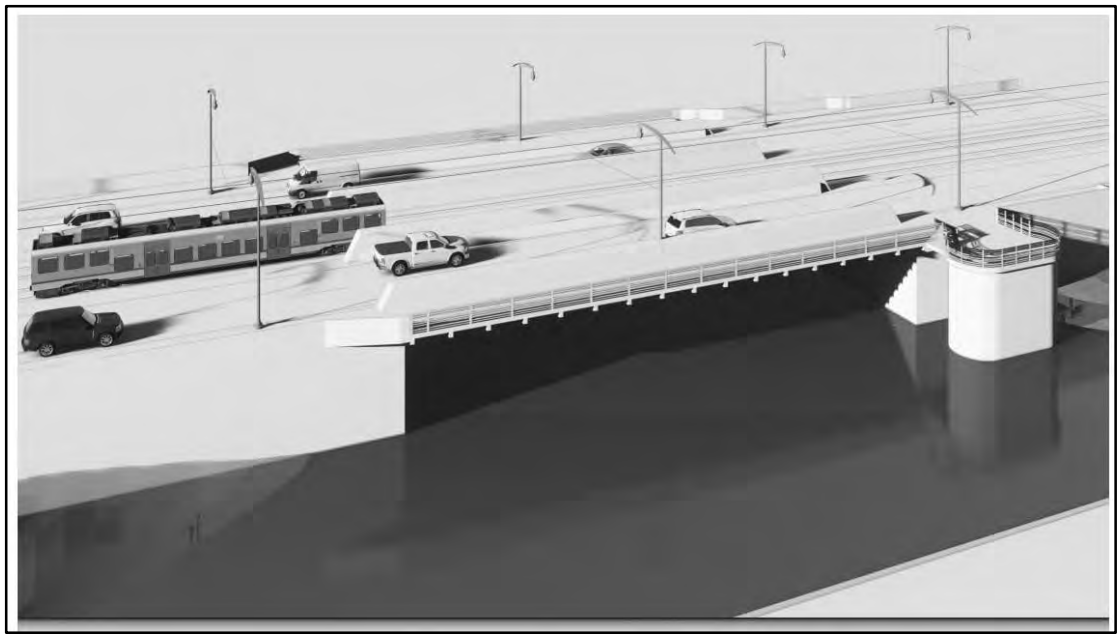


Figure 8. Oblique view of Proposed Project

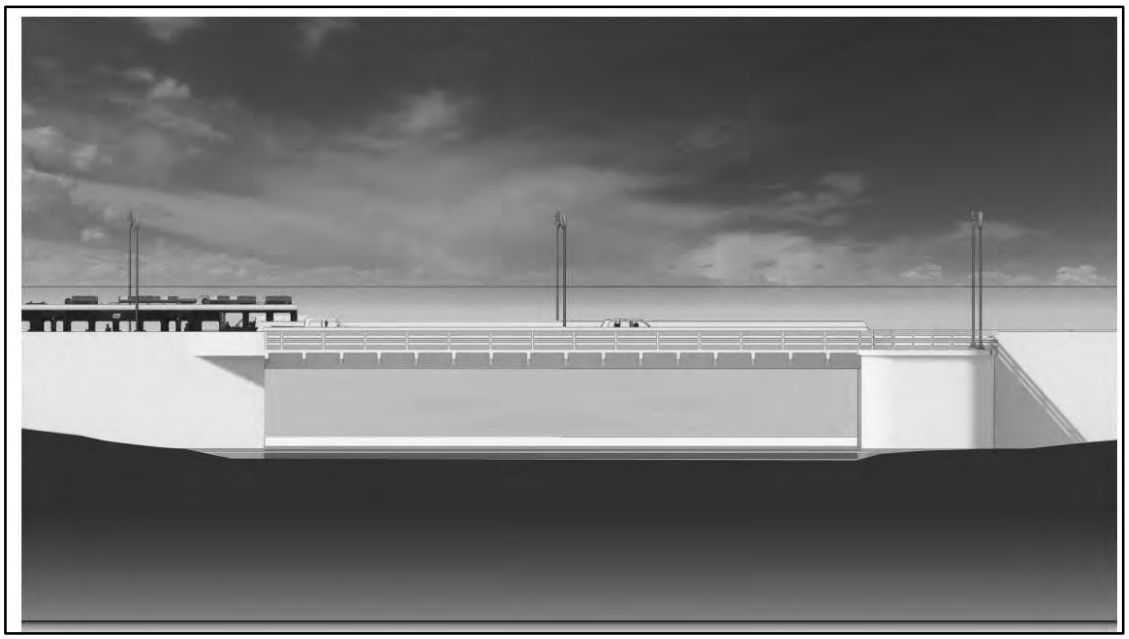


Figure 9. View of east elevation of Proposed Project

Under the Preservation Alternative, the Control Tower would be retained. As feasible structurally and economically, the control tower room with canted window configuration, copper roofing with overhang, walkway and handrails surrounding the top floor, door locations and configurations, and the electrical and mechanical equipment inside the control tower room would be retained. Spalled and damaged concrete would be repaired and window systems replaced as feasible. The extent of the retention of the tower features listed above is dependent on further condition assessments and economic analysis, which would be conducted once the full extent of structural deterioration of the tower and of the corresponding extent of repairs needed are known.[8]

[8] Foundation work is currently assumed to consist of adding four five-foot-diameter, in-water Cast in Drilled Hole (CIDH) piles to the four corners of the existing control tower foundation, and increasing the size of the grade beams.

Whether access into the tower can be maintained and the extent of retrofit needed to address the Americans with Disabilities Act to enable the rehabilitation of the tower would be included in this assessment. This retention would maintain the overall relationship of the bridge and the control tower by retaining its location, design, and materials as a character-defining feature; however, the bridge would be at a higher elevation.

The existing bridge sidewalks do not meet the Americans with Disabilities Act or City and County of San Francisco requirements because the sidewalks contain gaps and vertical displacements greater than requirements allow. The Preservation Alternative would provide a 12 foot-wide Class I pedestrian path on the eastern side of the bridge, and a 16 foot-wide Class I shared pedestrian/bicycle path on the western side of the bridge. Both paths would be cantilevered off the exterior girders and would include a pedestrian/bicycle railing. The 12-foot-wide Class I pedestrian path on the eastern side of the bridge would maintain its width and transition to the width of the approach walkway/path as it passes the retained tower. However, the distance between the face of the tower and the edge of the path would be about approximately 2.5 feet and because the walkway would be at approximately the same elevation as the new bridge deck, or about 4.5 feet up the door from the existing walkway surface, the existing access to the door into the tower would not be functional and the possibility of moving the access door will be considered in the conditions assessment discussed above. The existing Art Moderne-style sidewalk guardrails on the original bridge include horizontal gaps larger than allowed by current safety requirements, therefore, the sidewalk railings will be replaced with replicated railings meeting current gap opening requirements. These railings would be fabricated out of painted aluminum and will reproduce the finish of the existing railings based on physical evidence.

The existing Art Moderne-style quarter-round and teardrop bascule girder housing units would be removed from the bridge for salvage, rehabilitation, and reinstallation. Upon removal, inspection, and evaluation regarding the deterioration of materials and/or lead paint contamination, these elements would be assessed for reuse. Only if it is determined the elements are not salvageable for reinstallation, the elements would be replicated with substitute materials to recreate the historic appearance and reproduce historic paint colors and finishes based on physical evidence.

The concrete abutment of the original bridge would remain in place under this alternative. The doorway void behind the steel hatch door on the east side of the south machinery pit of the abutment would be infilled with concrete to prevent water intrusion and the steel hatch door would be re-installed.

The riveted steel side box girders would also be removed and replaced with four new concrete through-girders. Although the new girders are slightly wider and would rise higher above the bridge deck than the existing girders, their overall shape and details would be replicated so as to imitate the appearance of the original girders. Form liners would be used such that the new concrete girders would recreate the historic appearance of the riveted steel girders and historic paint colors and finishes would be used based on physical evidence, per the Secretary of the Interior's Standards for the Treatment of Historic Properties.

The Preservation Alternative would meet most of the basic objectives of the proposed project while retaining some of the character-defining features, where feasible, and replication where necessitated by reasons of safety, operational functionality, and accessibility. While the Preservation Alternative would not retain the bascule bridge type, the above deck elements such as the riveted steel box girders with Art Moderne quarter-round and teardrop bascule girder housing units would be retained/replicated, the Art Moderne steel sidewalk and machinery pit guardrails would be replicated, the steel hatch door on the south machinery pit in the concrete abutment would be sealed and retained in place, and the control tower would remain in place though closer in relation to the bridge. Therefore, the Preservation Alternative reduces the impact on the bridge. Preservation measures such as salvaging original above-deck character-defining features for retention would require additional time to remove the elements from the bridge and work to rehabilitate the features for retention and re-use would require removal of lead paint, repair of any inadvertent damage to the features during removal with like and in-kind materials and finishes. In addition, for features that are determined to be unsalvageable for re-use and require replication, the process to fabricate these replicated features would also increase project construction time. Therefore, these measures as part of the Preservation Alternative would increase the total construction time beyond the proposed project, thus impacting residents with transit delays and detours for a longer time period. The Preservation Alternative would increase the elevation of the bridge from the existing channel to address sea level rise and

moisture issues, address the seismic deficiencies with a seismically adequate bridge, would increase the serviceability of the bridge to improve multi-modal transportation safety and increase operational utility to Muni light rail operations, and would maintain current geometric, construction, and structural standards required for the types and volume of projected traffic on the bridge over its design life to ensure continued access from the Bayview Hunters Point neighborhood to the rest of the City and the region. Overall, the Preservation Alternative partially meets the project objectives.

No Project Alternative

As required by CEQA, a no project alternative was also evaluated by the planning department and the project sponsor. The No Project Alternative would involve no demolition, construction, or any improvements to the Islais Creek Bridge; therefore, all of the character-defining features of the historical resource would be retained. However, the No Project Alternative would not meet the project objectives which generally revolve around reconstruction of the bridge to address safety, transportation, and climate change goals.

Retention of Character-defining Features

The following table compares the retention of character-defining features of Islais Creek Bridge in the proposed project and the two alternatives.

Character-Defining Features of Islais Creek Bridge	Proposed Project	No Project Alternative	Preservation Alternative
Bascule type bridge	Demolished	Retained	Demolished
Above deck element - Riveted steel center box girder	Demolished	Retained	Demolished. Original center girder will be replicated as two girders to flank light rail tracks along center of bridge
Above deck element - Riveted steel side box girders	Demolished	Retained	Replicated
Above deck element - Art Moderne quarter-round and teardrop bascule girder housing units	Demolished	Retained	Retained if feasible, Replicate if not. Replication of teardrop units for girder housing
Above deck element - Art Moderne steel sidewalk guardrails	Demolished	Retained	Replicated with modifications to meet current safety standards.
Steel hatch door on the east side of the south machinery pit	Demolished	Retained	Retained
Control tower design and materials	Demolished	Retained	Retained and Rehabilitated if feasible
Control tower location	Demolished	Retained	Retained but somewhat diminished with the increase in bridge deck width

Ability of Alternatives to Meet Project Objectives

The following table lists the objectives of the proposed project and whether the objective would be met in the proposed project, the No Project Alternative, or the Preservation Project. Overall, the preliminary assessment is that the Preservation Alternative meets the project objectives with the exception of reducing construction impacts.

Project Objectives	Proposed Project	No Project Alternative	Preservation Alternative
Increase bridge freeboard (i.e., the distance between the bridge's lowest point and existing channel's water elevation) to the maximum extent practicable.	Meets	Does Not Meet	Meets
Address the existing bridge's seismic deficiencies by replacing it with a new bridge that is seismically adequate.	Meets	Does Not Meet	Meets
Minimize the project's construction times to the maximum practicable to reduce impacts to Bayview Hunters Point residents.	Meets	N/A	Does Not Meet
Increase the serviceability of the bridge to improve multi-modal transportation safety and increase operational utility to Muni light rail operations.	Meets	Does Not Meet	Meets
Maintain current geometric, construction, and structural standards required for the types and volume of projected traffic on the bridge over its design life to ensure continued access to the City and the region.	Meets	Does Not Meet	Meets
Provide a bicycle facility that can be incorporated into City bicycle route planning as part of the proposed project.	Meets	Does Not Meet	Meets

Alternatives Considered but Rejected

Full Preservation Alternative - Bridge Rehabilitation

Public Works previously proposed a Full Preservation Alternative (the Islais Creek Bridge Rehabilitation – Federal Aid Project No. BHLO-5934(168) and Planning Department Case No. 2017-006843ENV). This project was developed through 65% design and obtained both NEPA and CEQA approvals; however, the project was paused for several months due to "significant increases in design cost and scope, ballooning construction cost estimates, and concern regarding unresolved coordination and constructability risks," (see attachment).[9] In addition, new information regarding sea-level rise at the site, budget constraints, and stakeholder interests resulted in a re-examination of the project objectives and functional need for continued drawbridge operability. Public Works concluded a fixed-span bridge "aligns better with the interests of the department and the City as a whole, addresses sea-level rise concerns, and would be more economical to construct to reduce future maintenance needs and costs."

The Full Preservation Alternative, where possible, would repair deteriorated features of the bridge rather than replace them. If the severity of the deterioration required replacement, new materials would match the original in design, color, texture, and materials, where possible, and would be substantiated by documentary and physical evidence. The bridge's design would remain largely unchanged, including the structure's movable leaves, its

[9] San Francisco Public Works. 2021. Memorandum re: Islais Creek Bridge Rehabilitation – Federal Aid Project No. BHLO-5934(168) Public Works Authorization to Change to a "Fixed-Span" Bridge Design. August 18.

machinery pit, and control tower. The Full Preservation Alternative would replace in-kind the bascule leaves, including the structural steel girders, transverse floor beams, and longitudinal stringers. The new bascule leaves would be fabricated with higher-grade steel and would match the original in dimensions and shape with button head or capped bolts that mimic the appearance of rivets on the existing structure. The structure would remain a bascule bridge, the movable leaves and open grate roadway deck would be replaced in kind, and the Art Moderne-style elements on top of the bridge would be rehabilitated in a manner consistent with the Secretary of the Interior's Standards.

The existing railings do not meet current safety and code requirements and cannot be repaired in a manner that does not substantially diminish the historic or structural integrity of the railings. The railing would be replaced with railings that are historically appropriate and retain their Art Moderne design. The new railings would match the existing to the extent possible.

The bridge's Art Moderne-style teardrop and quarter-round girder housings, which are attached to the abutment machinery pits, would be removed, and repaired or replaced in kind.

The Full Preservation Alternative would retrofit the control tower window system, control tower foundation, and repair spalled and damaged concrete on the control tower. Four, 5-foot Cast in Drilled Holed (CIDH) piles would be added to the four corners of the existing tower foundation and the existing grade beams would be increased in size to seismically retrofit the foundation. The new CIDH piles would need to be structurally connected in the east-west and north-south direction with a concrete infill wall to increase lateral strength. The bridge abutments would only require minor repairs for spalled concrete on the exterior of the abutments.

The Full Preservation Alternative also proposed to add alternative power feed, install vehicle and pedestrian safety gates, remove lead paint, and repaint the bridge.

Public Works evaluated the Full Preservation Alternative's design to determine if there was capacity to adapt to future sea level rise. The existing lowest point of entry to the counterweight pits at the girder slots of the Islais Creek bridge is currently at approximately 9.9 feet NAVD88, meaning that it is below the base floodplain elevation. The existing top of deck is at 15.7 feet. This means if the current deck configuration were maintained, the machinery pits and bottom of steel girders that support the deck would be submerged between 1.8 feet and 4.2 feet during flooding by 2075.

Islais Creek Bridge Charette

On February 10, 2022, a planning charette was conducted with representatives from several CCSF departments to discuss possible design options to increase the flood resilience of the Islais Creek Bridge Project.[10] The primary objective of the charette was to deepen the collective understanding of constraints, benefits, and opportunities of different bridge design concepts, and to better understand the needs and uses of the concepts relative to each CCSF department. As part of the charette, 22 different bridge configuration combinations were used to facilitate an initial screening process. The options were then narrowed to four options plus a "No Build" option for more detailed analysis. The options analyzed included construction of a new bascule bridge[11], construction of a new through girder bridge[12] at the same elevation of the existing bridge, construction of a new standard girder bridge[13] at a raised elevation and construction of a new through girder bridge at a higher elevation. The latter is the option that was advanced in the proposed project. The No Build option was deemed to pose an excessive safety risk and thus eliminated from the charette discussion. The rehabilitation of the existing bridge is described as the Full Preservation Alternative. The remaining three options carried forward for further analysis and discussion during the charrette, as well as the reasons these options were rejected, are described below. None of these options would avoid the removal of all the character-defining features of the bridge.

[10] CH2MHill/Arcadis. 2022. Memorandum. Islais Creek (Third Street) Bridge Charette. Prepared for Port of San Francisco. April 12.
[11] Bascule is type of bridge with a pivoting section that is raised and lowered using counterweights typically used over waterways.
[12] A through girder bridge design is where the road deck is supported by the bottom flange of a girder and traffic travels between the supporting girders that project above the deck. See Figure 4.
[13] A standard girder bridge design includes a road deck supported by two or more horizontal girders built upon piers or abutments that support the bridge span.

Option 1: New Bascule Bridge

Under this alternative, a new bascule bridge (with either operable or non-operable draw bridge functions) would be constructed to replace the existing bridge. The new bascule bridge would be constructed at the same elevation of the existing bridge and would include a center dedicated light rail trackway, two travel lanes in each direction, and a shared pedestrian/bicycle path on both sides of the bridge. The street work included in this alternative would be minimal and would include the abutments or approaches and street deck over the bascule pier on both sides of the bridge.

While replacing the bridge as is has potential schedule and budget benefits, it was eliminated from future consideration for reasons similar to the Rehabilitation Alternative. Because this alternative would be constructed at the same elevation as the existing bridge, it would not increase freeboard or the lifespan of the bridge relative to sea level rise. It would retain the same flood risk as the existing bridge despite being a new replacement bridge. The operable bridge option would be more vulnerable to flood risk due to the low elevation of the mechanical equipment. The seismic performance of this alternative is likely inferior to the fixed-bridge alternative. Therefore, this option has a higher risk of bridge closure after an earthquake, which would impede disaster response functions that require bridge throughput. This alternative would also have a higher construction cost due to the type and material of the bridge, as well as higher operations and maintenance cost under the operable bridge option. This increase in cost would be hard to justify when considering the alternative's inherent flood risk. The proposed project would better address additional City needs, including sea-level rise resilience.

In addition, the draw bridge was operated regularly for large ships to pass through the Islais Creek channel to access the copra cranes upstream of Third Street. That industry ceased operations in the mid-1970s after which there was no longer any maritime functions necessitating drawbridge access. Review of the past 10 years of logs from the Bridge Stationary Engineer indicate no requests for drawbridge lifts other than used for routine inspection of the drawbridge function itself.

Option 2: New Through-Girder Bridge, Same Elevation

This alternative would include the construction of a new through-girder bridge similar to the proposed project, but with the same length and elevation as the existing bridge. Similar to the proposed project, the new bridge would include a center dedicated light rail trackway, two travel lanes in each direction, and a shared pedestrian/bicycle path on both sides of the bridge. However, the new cross section of the bridge would allow for a wider roadway than the existing bridge. The street work for this alternative would include the abutment modifications to support the new girders at both sides of the bridge, as well as a haunch to support the additional width of the new cross section. While the bridge under this alternative would be constructed at the same elevation as the existing bridge, it would have a higher clearance due to the use of through girders.

While this alternative would increase freeboard and the lifespan of the bridge relative to sea level rise and increase the structural seismic resiliency and serviceability of the bridge, it was eliminated from future consideration because it would not increase bridge freeboard to the maximum extent feasible when compared to the proposed project.

Option 3: New Standard-Girder Bridge, Raised

This alternative would include the construction of a new standard-girder bridge at a higher elevation than the existing bridge. Similar to the proposed project, the new bridge would include a center dedicated two light rail trackway, two travel lanes in each direction, and a shared pedestrian/bicycle path on both sides of the bridge. However, the cross section of the proposed bridge would be wider than the existing bridge. The street work included in this alternative would include abutment modifications to support the new girders, and to strengthen the deck over the existing bascule pier to support the fill at both sides of the bridge. Because the bridge would be raised, the approaches would also need to be regraded.

While this alternative would increase freeboard and the lifespan of the bridge relative to sea level rise and increase the structural seismic resiliency and serviceability of the bridge, it was eliminated from future consideration because it would not increase bridge freeboard to the maximum extent practicable when compared to the proposed project.

Conclusion

A wide variety of alternatives were explored for the Islais Creek Bridge Project. The proposed project would remove all the character-defining features of the bridge; however, it would meet all of the project objects including addressing sea-level rise, structural and seismic deficiencies, increase the serviceability of the bridge to improve safety and operational facilities of light rail operations, among other objectives. The Preservation Alternative would retain or replicate the majority of bridge's character-defining features while meeting the majority of project objectives.

Attachments

San Francisco Public Works. 2021. Memorandum re: Islais Creek Bridge Rehabilitation – Federal Aid Project No. BHLO-5934(168) Public Works Authorization to Change to a "Fixed-Span" Bridge Design. August 18.

San Francisco Planning

49 South Van Ness Avenue, Suite 1400
San Francisco, CA 94103
628.652.7600
www.sfplanning.org

MEMO FROM THE HISTORIC PRESERVATION COMMISSION

HEARING DATE: May 17, 2023

Date:	June 12, 2023
Case Number:	2022-000112ENV
To:	Thomas Roitman, Project Coordinator, San Francisco Department of Public Works
From:	Historic Preservation Commission
Cc:	Allison Vanderslice, CEQA Cultural Resources Team Manager, (628) 652-7505 Allison.Vanderslice@sfgov.org Justin Greving, Senior Preservation Planner, (628)652-7553 Justin.Greving@sfgov.org
Re:	Meeting Notes from Review and Comment at the May 17, 2023 HPC Hearing for Preservation Alternatives for the Islais Creek Bridge Project Draft EIR

Background

The Planning Department ("Department") and the Project Sponsor ("Sponsor") requested review and comment regarding the proposed Preservation Alternatives for the Islais Creek Bridge Project ("the project") during the May 17, 2023 Historic Preservation Commission (HPC) hearing.

On March 18, 2015, the HPC adopted Resolution No. 0746 to clarify expectations for the evaluation of significant impacts to historic resources and the preparation of preservation alternatives in environmental impact reports (EIR). Although the resolution does not specify Architectural Review Committee (ARC) review of proposed preservation alternatives, the HPC, in their discussions during preparation of the resolution, expressed a desire to provide feedback earlier in the environmental review process – prior to publication of the Draft EIR – particularly for large projects. After passing of the resolution, preservation alternatives were presented to the ARC for their feedback but were not reviewed by the full HPC until after publication of the Draft EIR. Several years ago, the HPC expressed interest in having all members of the HPC review and provide guidance on the alternatives. Alternatives are now brought to the full HPC for their consideration prior to publication of the Draft EIR. The Department and the Sponsor sought the HPC's input on the preservation alternatives to address the likely significant impact the Islais Creek Bridge Project will have on a historic resource.

HPC Comments

Adequacy of the Alternatives

- The HPC found the preservation alternative to be adequate and did not have any comments on the preservation alternative presented.

- Commissioner Wright asked if the sponsor had explored the feasibility of building a new bridge nearby and retaining the existing historic bridge as a possible preservation alternative.

General Project Comments

- Commissioners were supportive overall of the proposed project and understood the importance of this infrastructure upgrade.
- Commissioners did have questions about how the proposed bridge replacement project fit within the City's larger approach for addressing sea level rise in the neighborhood.
- Commissioners Nageswaran and Wright suggested the proposed project incorporate public interpretation of the historical significance of the bridge, which could include salvage and reinstallation of some elements of the existing bridge.
- Commissioners So and Foley expressed the importance of the T-line in providing essential transportation for residents and the need to provide a better transit connection for Bayview residents.
- Commission President Matsuda requested additional information about any community outreach that has been done as part of development of the proposed project. Commission President Matsuda expressed concern that the surrounding community needed to know about implications of the proposed project and related efforts to address sea level rise along Islais Creek.

BHLO 5934 (168) Islais Creek Bridge_FAE_FINAL_092724

Final Audit Report 2024-09-30

Created:	2024-09-30
By:	Kelli Alahan (s146323@dot.ca.gov)
Status:	Signed
Transaction ID:	CBJCHBCAABAAjPv8DhzUn7SBCBoRGjy52vtcvUb9y6oR

"BHLO 5934 (168) Islais Creek Bridge_FAE_FINAL_092724" History

Document created by Kelli Alahan (s146323@dot.ca.gov)
2024-09-30 - 10:35:27 PM GMT- IP address: 149.136.25.249

Document e-signed by Kelli Alahan (s146323@dot.ca.gov)
Signature Date: 2024-09-30 - 10:37:10 PM GMT - Time Source: server- IP address: 149.136.25.249

Document emailed to Thomas Holstein (s137362@dot.ca.gov) for signature
2024-09-30 - 10:37:28 PM GMT

Email viewed by Thomas Holstein (s137362@dot.ca.gov)
2024-09-30 - 11:04:41 PM GMT- IP address: 149.136.25.253

Document e-signed by Thomas Holstein (s137362@dot.ca.gov)
Signature Date: 2024-09-30 - 11:05:39 PM GMT - Time Source: server- IP address: 149.136.25.253

Agreement completed.
2024-09-30 - 11:05:39 PM GMT