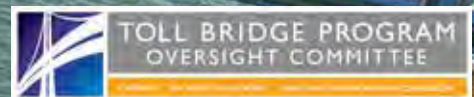


An aerial photograph of a cable-stayed bridge. A tall, white, rectangular tower stands prominently on the left side. Numerous stay cables fan out from the tower to support the bridge deck. The deck is a multi-lane highway with several vehicles, including cars and trucks, visible. In the background, a large body of water is visible, with several large ships and port cranes in the distance. The sky is clear and blue. The overall scene suggests a major infrastructure project in progress.

# San Francisco Bay Area Toll Bridge Seismic Retrofit and Regional Measure 1 Programs

2015 First Quarter  
Project Progress  
and Financial Update



Released: May 2015



Aerial Photo of Yerba Buena Island Looking West with the Demolition of the Former Bay Bridge on the left and Looking toward Yerba Buena Island and Downtown San Francisco





Toll Bridge Program Oversight Committee  
Department of Transportation  
Office of the Director  
1120 N Street  
P.O. Box 942873  
Sacramento, CA 94273-0001

May 15, 2015

Mr. Gregory Schmidt  
Secretary of the Senate  
State Capitol, Room 3044  
Sacramento, CA 95814

Mr. E. Dotson Wilson  
Chief Clerk of the Assembly  
State Capitol, Room 3196  
Sacramento, CA 95814

Dear Messrs. Schmidt and Wilson:

The Toll Bridge Program Oversight Committee (TBPOC) is pleased to submit the 2015 First Quarter Project Progress and Financial Update for the San Francisco Bay Area Toll Bridge Seismic Retrofit and Regional Measure 1 Programs (TBSRP and RM1), prepared pursuant to California Streets and Highways Code Section 30952.

The TBPOC was established by Assembly Bill 144 in 2005 to oversee the delivery of the TBSRP and consists of the Executive Director of BATA, the Director of Caltrans, and the Executive Director of the California Transportation Commission. With the opening of the new East Span of the San Francisco-Oakland Bay Bridge to traffic on September 2, 2013, all seven state-owned toll bridges in the Bay Area have now achieved seismic safety, either via retrofit or replacement of existing structures.

On the Self-Anchored Suspension Span, contract completion is pending resolution of the discovery of water at the base of the tower. The tower foundation was constructed under two separate contracts. Fabrication and installation of the foundation box, including the tower anchor rods, was performed by contractor Kiewit/FCI/Manson Joint Venture (KFM) under the E2/T1 Foundation contract and completed in January 2008. Grouting and final loading of the rods, along with the rest of the Self-Anchored Suspension Span, was performed by contractor American Bridge/Fluor Joint Venture (ABFJV), which is still under contract. As reported in late 2014, Caltrans has been investigating and testing both the rods and grout.

Two tower anchor rods have been extracted from the foundation for testing. Some micro-cracking was observed during inspection of the second rod by a scanning electron microscope. Testing has not yet been completed to determine the significance of these microscopic results. All remaining tower anchor rods have been measured using non-destructive ultrasonic testing to determine their status. Out of the 422 remaining rods, one rod measured six inches shorter than expected. The short rod was recently tested and did not hold load. It will now be extracted and subjected to further testing.

Initial tests performed in 2014 on water taken from around the anchor rods did not show any significant levels of chloride indicating the presence of fresh water. More recent tests of water have shown elevated levels of chloride. While the tested chloride levels have not reached the level of sea or bay water, they suggest the possibility of salt water intrusion at some rod locations. Caltrans has commenced a program to test and monitor all foundation rod locations where water is present – approximately 100 out of 424 locations.

At our meeting on May 11th, the TBPOC directed Caltrans to develop a comprehensive testing plan and protocol for the tower foundation rods, in cooperation with the independent bolt review team, the Seismic Safety Peer Review Panel, and steel fastener and marine foundation experts from the Federal Highway Administration. The TBPOC has authorized \$4 million for these testing activities. We will provide reports on this investigation at our regular public meetings, and will provide a detailed update in our next quarterly report.

On dismantling of the old span, Caltrans is proceeding on a number of contracts to remove the old bridge. The main cantilever truss and Yerba Buena Island detour structures are almost completely removed and construction of the new eastbound on-ramp and bicycle/pedestrian path from the island is on-going. Caltrans recently awarded a \$69.5 million low-bid contract to dismantle the 504' and 288' trusses back to the Oakland shoreline. The awarded contract was \$23.5 million less than the engineer's estimate.

Caltrans has been in discussions with environmental regulatory agencies to remove the Pier E3 footing. Caltrans is recommending that the footing above water be removed by conventional means (i.e. jack hammers), while the below water hollow caisson be imploded in place to a point below the mud line of the bay. This process is anticipated to have the least amount of impact to the environment and to be the least costly. The implosion process will first be demonstrated on Pier E3 and, if successful, repeated on the remainder of the bridge.

The program contingency is currently \$135 million in accordance with the TBPOC approved budget. As of the end of the first quarter of 2015, the 50 percent probable draw on program contingency is \$232 million. The potential draw ranges from about \$160 million to \$300 million. The potential draw curve includes all currently identified risks in the risk registers. It does not include costs that may result from possible future decisions to alter the projects from their current scope and construction methods. Possible material changes to a project are not placed in a risk register according to best practices. A materially changed project differs substantially from its predecessor and requires a new risk register.

The removal of marine foundations is a project that may undergo material changes later this year. The TBPOC assumes that the implosion method of removal will be used on all foundations from Pier E3 east to the Oakland shore. If the project was forced to revert to conventional methods of removal, it could increase the project cost by up to \$94 million. This possibility is not in the risk register for the reasons given above, and its cost is not reflected in the draw curve. However, we include a chart at the top of the next page that depicts the dramatic difference in forecasted cost between the implosion and conventional demolition alternatives to emphasize the importance of using the former method to complete demolition of the old east span of the bridge.

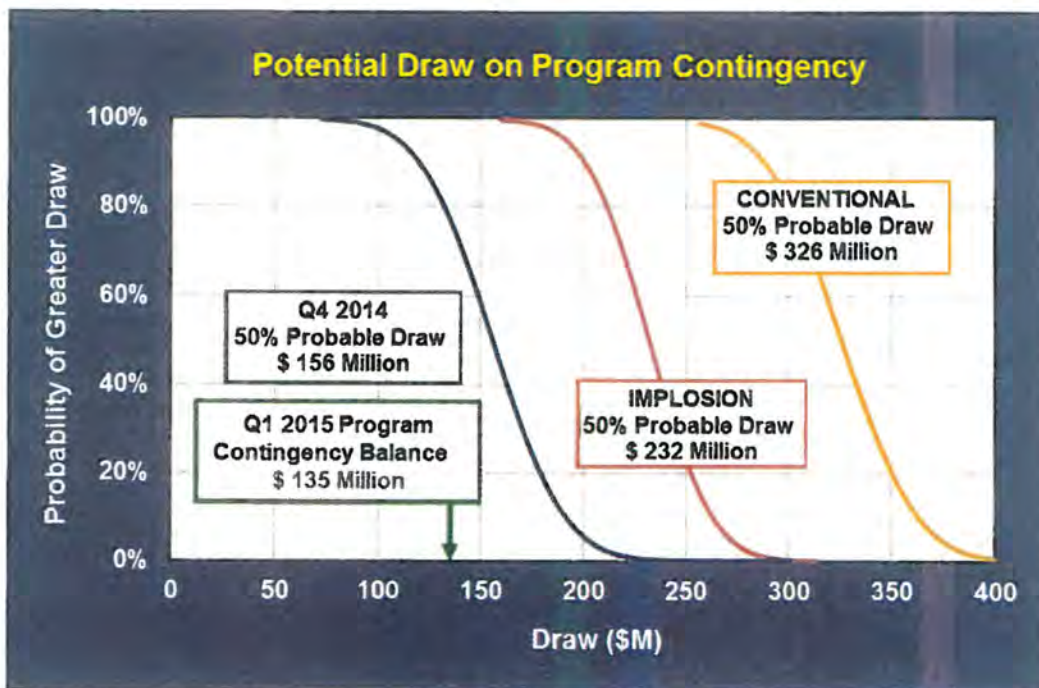



Figure 1 – Potential Draw on Program Contingency

Even if we are successful in implementing the implosion alternative for the marine foundations, the 50% probable draw this quarter of \$232 million is \$76 million higher than the fourth quarter of 2014. This reflects two principal factors: (1) increased risk that capital outlay support (COS) costs will grow due to the tower foundation rod investigation and (2) increased risk that even the lower capital outlay (CO) cost of the implosion demolition alternative will be more expensive than was assumed in prior estimates of the marine foundation work. As a result, the 50% probable draw for the first quarter of 2015 now exceeds the program contingency balance by \$97 million. We are mindful that this is the largest gap between the risk forecast and the program contingency balance that we have reported in the nearly 10 years that the TBPOC has existed. We are actively exploring various strategies to reduce both the COS and CO cost for the remaining work on both the new and old east spans, in order to bring the risk forecast and contingency balance back into better alignment.

The TBPOC is committed to providing the Legislature with comprehensive and timely reporting on the TBSRP. If there are any questions, or if any additional information is required, please do not hesitate to contact the members of the TBPOC.

Sincerely,

  
 STEVE HEMINGER  
 TBPOC Chair  
 Executive Director  
 Bay Area Toll Authority

  
 MALCOLM DOUGHERTY  
 Director  
 California Department of  
 Transportation

  
 WILL KEMPTON  
 Executive Director  
 California Transportation Commission



Toll Bridge Program Oversight Committee  
Department of Transportation  
Office of the Director  
1120 N Street  
P.O. Box 942873  
Sacramento, CA 94273-0001

May 15, 2015

Mr. Carl Guardino, Chair  
California Transportation Commission  
1120 N Street, Room 2221  
Sacramento, CA 95814

Ms. Lucetta Dunn, Vice-Chair  
California Transportation Commission  
1120 N Street, Room 2221  
Sacramento, CA 95814

Dear Mr. Guardino and Ms. Dunn:

The Toll Bridge Program Oversight Committee (TBPOC) is pleased to submit the 2015 First Quarter Project Progress and Financial Update for the San Francisco Bay Area Toll Bridge Seismic Retrofit and Regional Measure 1 Programs (TBSRP and RM1), prepared pursuant to California Streets and Highways Code Section 30952.

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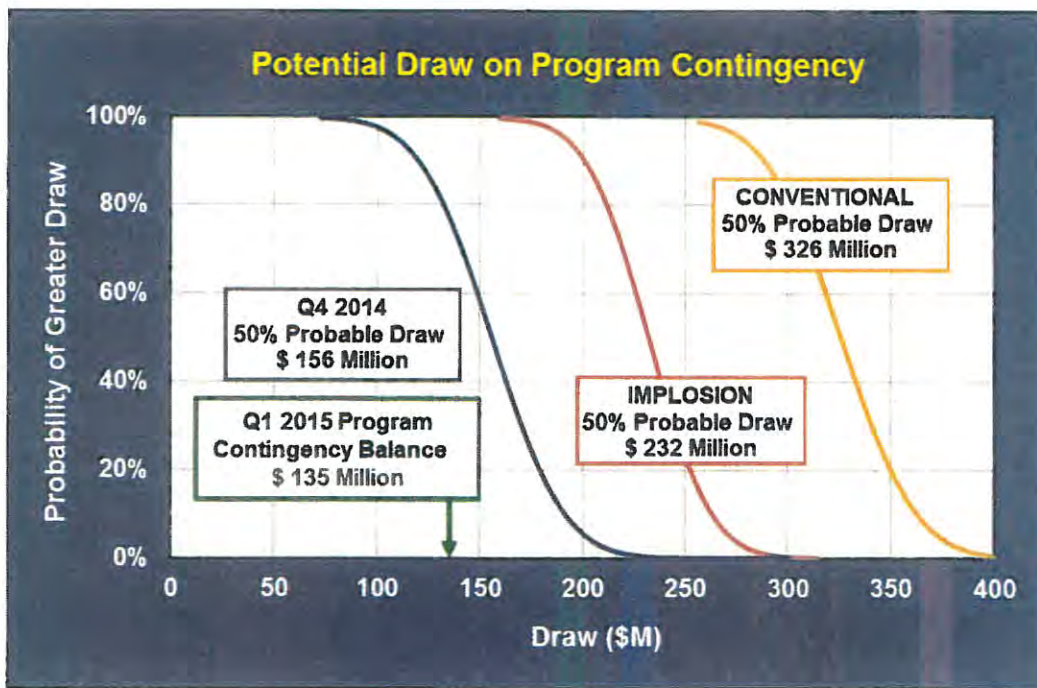


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STEVE HEMINGER  
TBPOC Chair  
Executive Director  
Bay Area Toll Authority

MALCOLM DOUGHERTY  
Director  
California Department of  
Transportation

WILL KEMPTON  
Executive Director  
California Transportation Commission

A nighttime photograph of a large cable-stayed bridge under construction. The bridge's concrete deck and steel truss structure are illuminated from below, creating a strong contrast against the dark sky. The bridge spans across a body of water, with a city skyline visible in the distance. In the foreground, a barge with construction equipment is positioned near the bridge's support structure. The overall scene conveys a sense of large-scale engineering and infrastructure development.

**The Program Management Team (PMT):**

**Andrew Fremier**  
Bay Area Toll Authority  
Metropolitan Transportation Commission

**Stephen Maller**  
California Transportation Commission

**Dan McElhinney**  
Caltrans District 4 - Bay Area

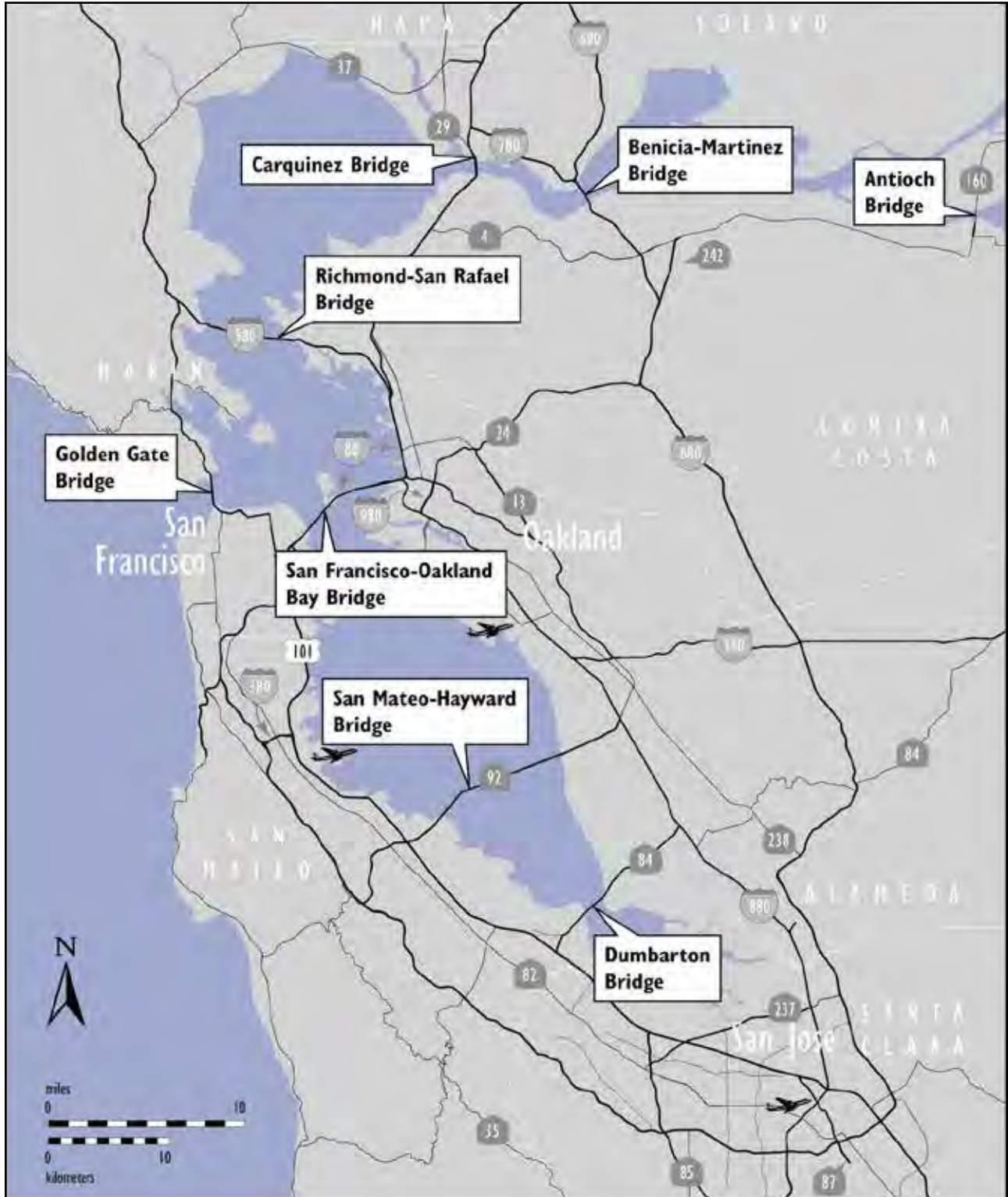
**Chief Engineer:**  
**Brian Maroney**

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Cover photos, inside cover photos, table of contents photo and photos on  
pages 5, 8-9, 15, 17, 30-31, 36-37, 45, 46, 47-55 and 58-59.

# Map of Bay Area Toll Bridges



\* The Golden Gate Bridge is owned and operated by the Golden Gate Bridge, Highway and Transportation District.

## Introduction

In July 2005, Assembly Bill (AB) 144 (Hancock) created the Toll Bridge Program Oversight Committee (TBPOC) to implement a project oversight and project control process for the new Benicia-Martinez Bridge and State Toll Bridge Seismic Retrofit Program (TBSRP) projects. The TBPOC consists of the Director of the California Department of Transportation (Caltrans), the Executive Director of the Bay Area Toll Authority (BATA) and the Executive Director of the California Transportation Commission (CTC). The TBPOC's project oversight and control processes include, but are not limited to, reviewing bid specifications and documents, reviewing and approving significant change orders and claims in excess of \$1 million (as defined by the TBPOC), and keeping the Legislature and others apprised of current project progress and status. In January 2010, Assembly Bill (AB) 1175 (Torlakson) amended the TBSRP to include the Antioch and Dumbarton Bridges seismic retrofit projects. The current TBSRP is as follows:

Toll Bridge Seismic Retrofit Projects	Seismic Safety Status
Dumbarton Bridge Seismic Retrofit	Complete
Antioch Bridge Seismic Retrofit	Complete
San Francisco-Oakland Bay Bridge East Span Replacement	Construction*
San Francisco-Oakland Bay Bridge West Approach Replacement	Complete
San Francisco-Oakland Bay Bridge West Span Seismic Retrofit	Complete
San Mateo-Hayward Bridge Seismic Retrofit	Complete
Richmond-San Rafael Bridge Seismic Retrofit	Complete
1958 Carquinez Bridge Seismic Retrofit	Complete
1962 Benicia-Martinez Bridge Seismic Retrofit	Complete
San Diego-Coronado Bridge Seismic Retrofit	Complete
Vincent Thomas Bridge Seismic Retrofit	Complete

*\*The seismic safety opening of the bridge occurred in September 2013. The project will be fully opened when the permanent Yerba Buena Island on ramp and bicycle/pedestrian path are completed.*

The New Benicia-Martinez Bridge was part of a larger program of toll-funded projects called the Regional Measure 1 (RM1) Toll Bridge Program under the responsibility of BATA and Caltrans. The RM1 program included:

Regional Measure 1 Projects	Open to Traffic Status
Interstate 880/State Route 92 Interchange Reconstruction	Open
1962 Benicia-Martinez Bridge Reconstruction	Open
New Benicia-Martinez Bridge	Open
Richmond-San Rafael Bridge Deck Overlay Rehabilitation	Open
Richmond-San Rafael Bridge Trestle, Fender & Deck Joint Rehabilitation	Open
Westbound Carquinez Bridge Replacement	Open
San Mateo-Hayward Bridge Widening	Open
State Route 84 Bayfront Expressway Widening	Open
Richmond Parkway	Open

## SUMMARY OF MAJOR PROJECT HIGHLIGHTS, ISSUES, AND ACTIONS



Self-Anchored Suspension Bridge Bike Path Construction

### Toll Bridge Seismic Retrofit Program Risk Management

A major element of the 2005 AB 144, the law creating the TBPOC, was legislative direction to implement a more aggressive risk management program. Such a program has been implemented in stages over time to ensure development of a robust and comprehensive approach to risk management. A comprehensive risk assessment is performed for each project in the program on a quarterly basis.

Based upon those assessments, a forecast is developed using the average cost of risk. These forecasts can increase or decrease as risks are identified, resolved or retired. The program contingency is currently \$135.2 million in accordance with the TBPOC approved budget. As of the end of the first quarter of 2015, the 50 percent probable draw on program contingency is \$232.1 million. The potential draw ranges from about \$160 million to \$300 million (refer to Figure 3 on page 27).

Although the current program contingency forecast balance is lower than the cost of currently identified forecast risks, it is important to understand that the risks identified in each of the contracts are not yet mitigated. Various teams will be working to further define these risks and potential mitigations to reduce the probability of these risks occurring and preparing responses to minimize their impact should they occur. In accordance with the approved TBSRP Risk Management Plan, risk mitigation actions are to be developed and implemented to reduce the potential draw on the program contingency.



Self-Anchored Suspension Bridge Lowering Crane



*Bridge Inspection Trip  
November 10, 1936*

*Left to right:  
Charles Derleth, Jr.,  
Glenn B. Woodruff,  
Leon S. Moisseiff, H. J.  
Brunnier,  
C.H. Purcell,  
Carlton S. Proctor,  
Ralph Modjeski,  
Chas. E. Andrew*



*Bridge Inspection Trip  
April 15, 2015*

*Left to right:  
Malcolm Dougherty,  
Will Kempton and  
Steve Heminger  
of the Toll Bridge Program  
Oversight Committee*

## San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Replacement Project

### Self-Anchored Suspension (SAS) Bridge Superstructures Contract

The seismically safe replacement eastern span of the San Francisco-Oakland Bay Bridge opened to traffic on the morning of September 2, 2013. On the Self-Anchored Suspension Span, contract acceptance is pending resolution of three issues. First, is the discovery of water and inadequate grouting around anchor rods at the base of the tower. Caltrans has determined that the water is either wash or rain water and not water from the bay. Caltrans and its contractor are now determining the best means for re-grouting the rods. The maintenance elevator is now fully operational. Finally, the contractor needs to complete final project fabrication and maintenance reports and documentation.

To review, in early 2013, within days after tensioning was performed, the anchor bolts in the shear keys directly below the eastbound and westbound orthotropic box girder (OBG) structures (known as shear keys S1 and S2) began to fail. The function of the broken rods were replaced by the steel saddle retrofit that was completed in December 2013.

As far as the remaining A354 Grade BD high strength steel rods used on the bridge, the TBPOC completed a comprehensive testing program. On September 30, 2014, a bolt review committee of nine experts in the areas of fasteners, corrosion, and metallurgy presented the TBPOC with the findings of the test results. Those results found that the 2008 bolts broke from hydrogen embrittlement due to specific combination of susceptible material properties and challenges during fabrication and installation. The remaining A354 grade BD high strength steel bolts used on the bridge were fabricated and installed in a definitively different manner than the broken 2008 bolts. The bolt review committee has determined that the remaining bolts are safe, meet the design requirements of the bridge, and will not be a long term problem as long as the corrosion protection of the bolts is maintained in accordance with maintenance requirements. Their report and test results can be found at [www.baybridgeinfo.org](http://www.baybridgeinfo.org).



Dismantling Progress of the Old San Francisco-Oakland Bay Bridge



Dismantling Progress of the Old San Francisco-Oakland Bay Bridge



Aerial View of New Bridge as Old Bridge Continues to be dismantled

## San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Replacement Project



Superstructure Dismantling Progress



Superstructure Dismantling Progress



Superstructure Dismantling Progress

### Oakland Touchdown #2 Contract

Flatiron West, Inc. is the prime contractor that is constructing the Oakland Touchdown #2 project, which completes the remaining portions of the Oakland Touchdown approach structures from the existing toll plaza to the new span. This work included the entire westbound structure and portions of the eastbound structure (not in conflict with the existing span) which were constructed under the Oakland Touchdown #1 contract. The OTD #2 construction contract started on June 25, 2012, and was substantially completed in September 2014. Plant establishment work is ongoing. Maintenance and SWPPP will continue on the OTD #2 project until the end of September 2015.

### Yerba Buena Island Transition Structure (YBITS) #2 and Cantilever Dismantling Contract

The YBITS #2 and Cantilever Dismantling contract is dismantling the main cantilever truss and detour viaduct and will construct the new eastbound on-ramp and bicycle/pedestrian pathway to the bridge in its place. The contract was awarded to California Engineering Contractors Inc/Silverado Contractors Inc. Joint Venture on November 28, 2012. Initial startup activities and submittals began in March 2013. The main cantilever truss was cut into two independent east and west structures on April 2, 2014. Cantilever removal is on-going. The majority of the cantilever should be removed by this summer and the east bound on-ramp and bicycle/pedestrian path from the island should be completed by the end of the calendar year.

There is now a potential 6-month delay for completion of the bike path to the landing and eastbound on-ramp, due to delays in column demolition of the YBI detour structure, delays to the pile driving for the removal of the cantilever temporary supports, and potential re-sequencing of the on ramp construction due to Coast Guard access restrictions to the work area.

### 504/288 Superstructure Dismantling Contract

Caltrans has finalized plans for the dismantling of the 504 and 288 trusses and supports. The 504 and 288 trusses make up the approach structures from the toll plaza to the main cantilever. Bids for the 504/288 contract opened in March 2015, and the contract was awarded to California Engineering Contractors, Inc./ Silverado Contractors Inc., JV.





The San  
Francisco-  
Oakland  
Bay Bridge  
Self-Anchored  
Suspension  
Bridge Tower

## Toll Bridge Seismic Retrofit Program Cost Summary (Millions)

	Contract Status	AB 144/SB 66 Budget (Sept. 2005)	TBPOC Approved Changes	Current TBPOC Approved Budget (March 2015)	Cost to Date (March 2015)	Current Cost Forecast (March 2015)	Cost Variance	Cost Status
		a	b	c = a + b	d	e	f = e - c	
<b>SFOBB East Span Seismic Replacement</b>								
<b>Capital Outlay Construction</b>								
Skyway	Completed	1,293.0	(55.8)	1,237.2	1,237.3	1,237.2	-	●
SAS Marine Foundations	Completed	313.5	(38.7)	274.8	274.8	274.8	-	●
SAS Superstructure	Construction	1,753.7	293.1	2,046.8	1,987.2	2,047.8	1.0	●
YBI Detour	Completed	131.9	341.4	473.3	473.3	473.3	-	●
YBI Transition Structures (YBITS)		299.3	0.1	299.4	255.4	328.5	29.1	
YBITS 1	Completed			203.7	195.4	202.9	(0.8)	●
YBITS 2 Cantilever Dismantling	Construction			92.4	60.1	122.3	29.9	●
YBITS Landscaping	Design			3.3	-	3.3	-	●
Oakland Touchdown (OTD) <sup>(1)</sup>		283.8	46.8	330.6	313.3	332.0	1.4	●
OTD 1	Completed			205.3	205.3	205.3	-	●
OTD 2	Construction			72.6	60.0	76.0	3.4	●
Detour	Completed			47.0	42.2	46.8	(0.2)	●
OTD Electrical Systems	Construction			-	-	-	-	●
Submerged Electric Cable	Completed			5.7	5.7	5.7	-	●
Existing Bridge Dismantling		239.2	7.3	246.5	23.6	359.8	113.3	●
Cantilever Section <sup>(2)</sup>	Construction			69.0	23.6	68.4		●
504/288 Sections	Construction			-	-	111.7		●
Marine Foundations	Design			-	-	179.7		
Pier-3 Demonstration Project					-	20.0		●
Remaining Marine Foundations					-	159.7		●
Stormwater Treatment Measures	Completed	15.0	3.3	18.3	16.9	17.3	(1.0)	●
Other Completed Contracts	Completed	90.4	(0.5)	89.9	89.9	90.5	0.6	●
Capital Outlay Support		959.3	346.2	1,305.5	1,263.9	1,373.0	67.5	●
Right-of-Way and Environmental Mitigation		72.4	-	72.4	51.9	69.0	(3.4)	●
Other Budgeted Capital		35.1	(32.8)	2.3	0.7	2.3	(0.0)	●
<b>Total SFOBB East Span Replacement</b>		<b>5,486.6</b>	<b>910.4</b>	<b>6,397.0</b>	<b>5,988.2</b>	<b>6,605.5</b>	<b>208.5</b>	
<b>Antioch Bridge Seismic Retrofit</b>								
Capital Outlay Construction and Mitigation	Completed		47.0	47.0	47.0	47.0	-	●
Capital Outlay Support			23.8	23.8	23.6	23.8	-	●
<b>Total Antioch Bridge Seismic Retrofit</b>		<b>-</b>	<b>70.8</b>	<b>70.8</b>	<b>70.6</b>	<b>70.8</b>	<b>-</b>	<b>●</b>
<b>Dumbarton Bridge Seismic Retrofit</b>								
Capital Outlay Construction and Mitigation	Completed		68.2	68.2	63.8	68.2	-	●
Capital Outlay Support			46.0	46.0	44.8	45.4	(0.6)	●
<b>Total Dumbarton Bridge Seismic Retrofit</b>		<b>-</b>	<b>114.2</b>	<b>114.2</b>	<b>108.6</b>	<b>113.6</b>	<b>(0.6)</b>	<b>●</b>
Other Program Projects		2,268.4	(63.6)	2,204.8	2,164.4	2,170.5	(34.3)	
Miscellaneous Program Costs		30.0	-	30.0	25.5	30.0	-	●
Net Programmatic Risks		-	-	-	-	58.5	58.5	●
Program Contingency		900.0	(764.8)	135.2	-	(96.9)	(232.1)	●
<b>Total Toll Bridge Seismic Retrofit Program <sup>(3)</sup></b>		<b>8,685.0</b>	<b>267.0</b>	<b>8,952.0</b>	<b>8,357.2</b>	<b>8,952.0</b>	<b>-</b>	

(1) Construction administration of the OTD Detour was under the YBITS#1 contract.

(2) Construction administration of the cantilever segment is under the YBITS#2 contract.

(3) Figures may not sum up to totals due to rounding effects.

(4) Forecast for the removal of the remaining marine foundations with the conventional method is estimated to be \$254.3 million. (Due to the rounding of numbers, the totals above are shown within \$0.02).

## Toll Bridge Seismic Retrofit Program Schedule Summary

	AB 144/SB 66 Project Completion Schedule Baseline (July 2005)	TBPOC Approved Changes (Months)	Current TBPOC Approved Completion Schedule (March 2015)	Current Completion Forecast (March 2015)	Schedule Variance (Months)	Schedule Status	Remarks/ Notes
	g	h	i = g + h	j	k = j - i	l	
<b>SFOBB East Span Seismic Replacement</b>							
<b>Contract Completion</b>							
Skyway	Apr 2007	8	Dec 2007	Dec 2007	-	●	See Page 18
SAS Marine Foundations	Jun 2008	(5)	Jan 2008	Jan 2008	-	●	See Page 16
SAS Superstructure	Mar 2012	33	Dec 2014	Aug 2015	(8)	●	See Page 17
YBI Detour	Jul 2007	39	Oct 2010	Oct 2010	-	●	See Page 13
YBI Transition Structures (YBITS)	Nov 2013	36	Nov 2016	Nov 2016	-		See Page 14
YBITS 1			Feb 2014	Feb 2014	-	●	See Page 14
YBITS 2			Nov 2016	May 2017	(6)	●	See Page 14
Oakland Touchdown	Nov 2013	10	Sep 2014	Sep 2014	-		See Page 19
OTD 1			Jun 2010	Jun 2010	-	●	
OTD 2			Sep 2014	Sep 2014	-	●	
Submerged Electric Cable			Jan 2008	Jan 2008	-	●	
Existing Bridge Dismantling	Sep 2014	42	March 2018	July 2018	(4)	●	
Cantilever Section <sup>(2)</sup>						●	See Page 14
504/288 Sections			March 2018			●	See Page 14
Marine Foundations						●	See Page 14
Stormwater Treatment Measures	Mar 2008		Mar 2008	Mar 2008	-	●	
<b>SFOBB East Span Bridge Opening and Other Milestones</b>							
Westbound Seismic Safety Open	Sep 2011	24	Sep 2013	Sep 2013	-	●	
Eastbound Seismic Safety Open	Sep 2012	12	Sep 2013	Sep 2013	-	●	
Bike/Ped Pathway Open to YBI Landing			Jun 2015	Dec 2015	(6)	●	
Permanent Eastbound On Ramp Open			Jun 2015	Jun 2015	-	●	
<b>Antioch Bridge Seismic Retrofit</b>							
Contract Completion			Jul 2012	Jul 2012	-	●	See Page 25
Seismic Safety Completion			Apr 2012	Apr 2012	-		
<b>Dumbarton Bridge Seismic Retrofit</b>							
Contract Completion			Mar 2013	Mar 2013	-	●	
Seismic Safety Completion			Mar 2013	Jan 2013	-	●	

● Within approved schedule and budget

● Identified potential project risks that could significantly impact approved schedules and budgets if not mitigated

● Known project impacts with forthcoming changes to approved schedules and budgets



The New San Francisco-Oakland Bay Bridge on left and Demolition Progress of the Old Bridge on right



# TOLL BRIDGE SEISMIC RETROFIT PROGRAM

## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### San Francisco-Oakland Bay Bridge Seismic Retrofit Strategy

When a 250-ton section of the upper deck of the East Span collapsed during the 7.1-magnitude Loma Prieta Earthquake in 1989, it was a wake-up call for the entire Bay Area. While the East Span quickly reopened within a month, a critical question lingered: How could the Bay Bridge - a vital regional lifeline structure - be strengthened to withstand the next major earthquake? Seismic experts from around the world determined that to make each separate element seismically safe on a bridge of this size, the work must be divided into numerous projects. Each project presents unique challenges. Yet there is one common challenge - the need to accommodate the more than 280,000 vehicles that cross the bridge each day.



The San Francisco-Oakland Bay Bridge West Approach Overview

#### West Approach Seismic Replacement Project

**Project Status: Completed 2009**

Seismic safety retrofit work on the West Approach in San Francisco, bounded on the west by Fifth Street and on the east by the anchorage of the west span at Beale Street, involved completely removing and replacing this one-mile stretch of Interstate 80, as well as six on-and off-ramps within the confines of the West Approach's original footprint.

#### West Span Seismic Retrofit Project

**Project Status: Completed 2004**

The West Span lies between Yerba Buena Island and San Francisco and is made up of two complete suspension spans connected at a center anchorage. Retrofit work included adding massive amounts of steel and concrete to strengthen the entire West Span, along with new seismic shock absorbers and bracing.



San Francisco-Oakland Bay Bridge West Span



## East Span Seismic Replacement Project

### Project Status: 99% Complete as of March 2015

Rather than a seismic retrofit, the two-mile long East Span has been completely rebuilt. The new East Span consists of several different sections, yet appears as a single streamlined span. The eastbound and westbound lanes of the East Span no longer include upper and lower decks. The lanes are side-by-side, providing motorists with expansive views of the bay. These views are also enjoyed by bicyclists and pedestrians, thanks to a new

bicycle/pedestrian path on the south side of the bridge that will extend all the way to Yerba Buena Island. The new span features the world's longest Self-Anchored Suspension (SAS) bridge that connects to an elegant roadway supported by piers (Skyway), which gradually slopes down toward the Oakland shoreline (Oakland Touchdown).



Eastern Span of the San Francisco-Oakland Bay Bridge Bicycle/Pedestrian Path Construction in Progress

# TOLL BRIDGE SEISMIC RETROFIT PROGRAM

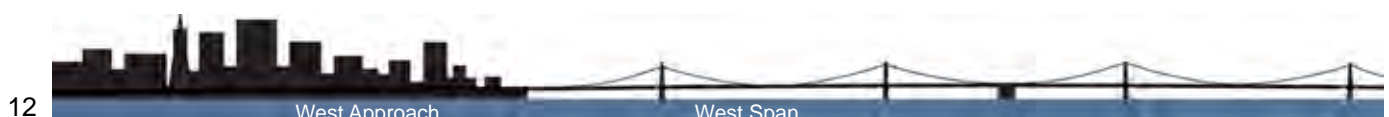
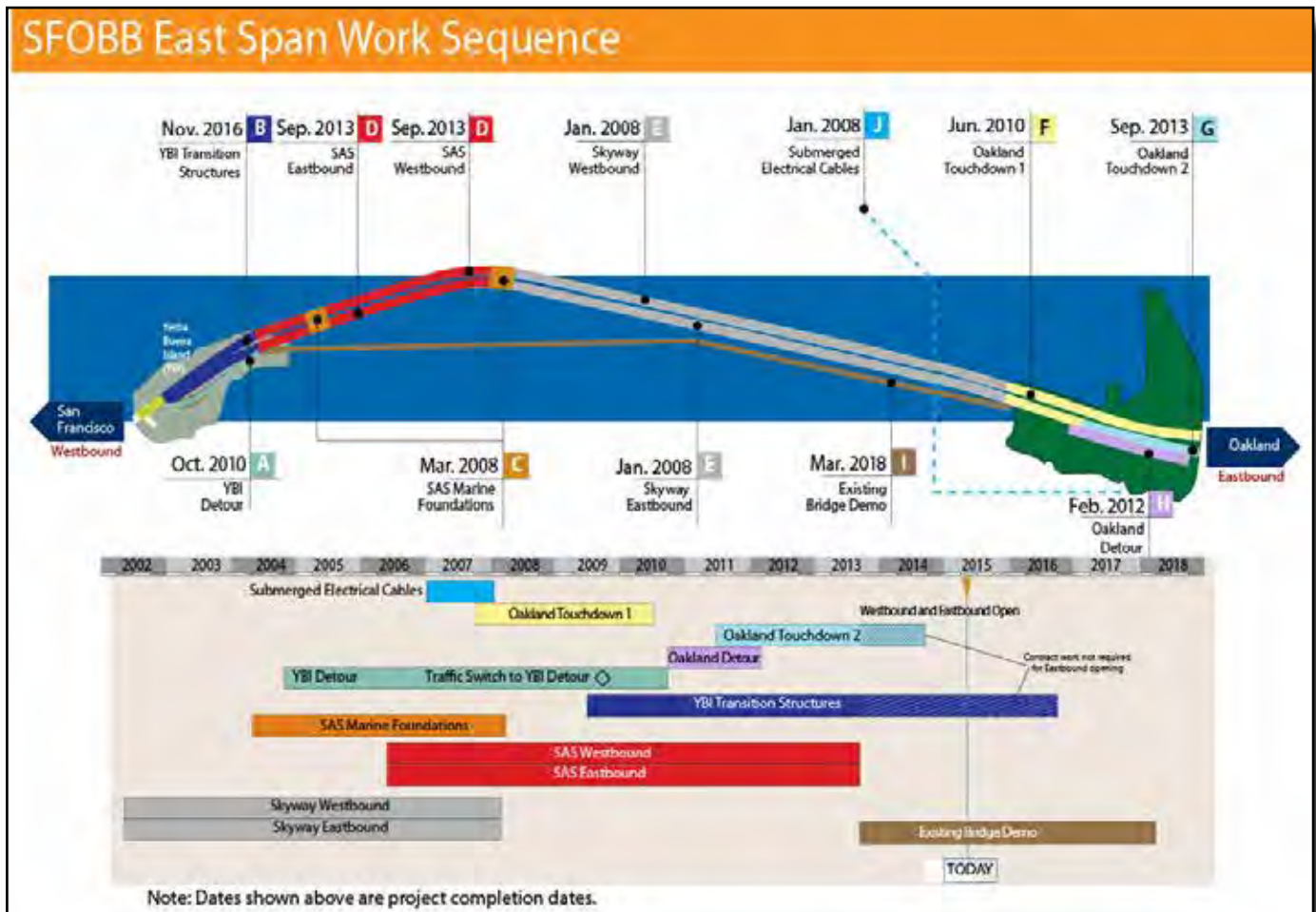
## San Francisco-Oakland Bay Bridge East Span Replacement Project Summary

The new East Span bridge is split into four major components - the Skyway, the Self-Anchored Suspension bridge in the middle, the Yerba Buena Island Transition Structures and Oakland Touchdown approaches. Each component has been constructed by one to three separate contracts that were sequenced together to reduce schedule risk.

Highlighted below are the major East Span contracts and their schedules. The letter designation before each contract corresponds to contract descriptions in the report.



The New San Francisco-Oakland Bay Bridge East Span Bicycle/Pedestrian Path Construction in Progress





## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### San Francisco-Oakland Bay Bridge East Span Replacement Project Yerba Buena Island Detour (YBID)

As with all of the Toll Bridge Seismic Retrofit Program's projects, crews built the Yerba Buena Island Detour (YBID) structure without disrupting traffic. To accomplish this task, YBID eastbound and westbound traffic was shifted off the existing roadway and onto a temporary detour over Labor Day weekend 2009. Drivers used this detour, just south of the original roadway, until traffic was moved onto the new East Span.

#### A YBID Contract

Contractor: C.C. Myers, Inc.

Approved Capital Outlay Budget: \$473.3 M

Status: Completed October 2010

This contract was originally awarded in early 2004 to construct the detour structure for the planned 2006 opening of the new East Span. Because of a lack of funding, the SAS Superstructure contract was re-advertised in 2005 and the opening was rescheduled to 2013. To better integrate the contract into the current East Span schedule and to improve seismic safety and mitigate future construction risks, the TBPOC approved a number of changes to the contract, including adding the deck replacement work near the tunnel that was rolled into place over the Labor Day 2007 weekend advancing future transition structure foundation work and making design enhancements to the temporary detour structure. These changes increased the budget and forecast for the contract to cover the revised project scope and to reduce project risks.



YBID East Tie-In Rolled in on Labor Day Weekend 2009



West Tie-In Phase # 1 Rolled in on Labor Day Weekend 2007

## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### San Francisco-Oakland Bay Bridge East Span Replacement Project Yerba Buena Island Transition Structures (YBITS)

The new Yerba Buena Island Transition Structures contract (YBITS) connects the new SAS bridge span to the existing Yerba Buena Island Tunnel, transitioning the new side-by-side roadway decks to the upper and lower decks of the tunnel. The new structures are cast-in-place reinforced concrete structures that look very similar to the already constructed Skyway structures. While some YBITS foundations and columns were advanced by the YBID contract, the remaining work was completed under three separate YBITS contracts.

#### **B** YBITS #1 Contract

Contractor: MCM Construction, Inc.

Approved Capital Outlay Budget: \$203.7

Status: 100% Complete as of December 2014

MCM Construction, Inc. is the prime contractor that constructed the Yerba Buena Island Transition Structure #1 (YBITS #1) contract. Their work included completing the remaining foundations and the bridge deck structure from the existing double deck Yerba Buena Island Tunnel to the SAS bridge.

Status: Completed.

#### YBITS Landscaping Contract

Contractor: TBD

Approved Capital Outlay Budget \$3.3 M

Status: In Design

Upon completion of the YBITS #2 work, a follow-on landscaping contract will be executed to replant and landscape the area.

#### YBITS #2 Cantilever Dismantling Contract

Contractor: CEC & Silverado (JV)

Approved Capital Outlay Budget: \$92.4 M

Status: 60% Complete as of March 2015

The YBITS #2 contract is dismantling the detour viaduct now that the traffic has been switched to the new bridge and will construct a new eastbound on-ramp to the bridge in its place. The contract also includes the cantilever truss dismantling, and the bicycle/pedestrian pathway construction.

The contract was awarded to California Engineering Contractors Inc/Silverado Contractors Inc. Joint Venture on November 28, 2012. Initial startup activities and submittals began in March 2013, with actual dismantling starting after the seismic safety opening on Labor Day weekend 2013.

**Status:** Cantilever removal is on-going. There is now a potential 6-month delay for completion of the bicycle/pedestrian path to the landing and eastbound on-ramp, due to delays in column demolition of the YBI detour structure, delays to the pile driving for the removal of the cantilever temporary supports, and potential re-sequencing of the on-ramp construction due to Coast Guard access restrictions to the work area. Caltrans plans on opening bids for the dismantling of the remaining 504' and 288' trusses in early March, 2015.

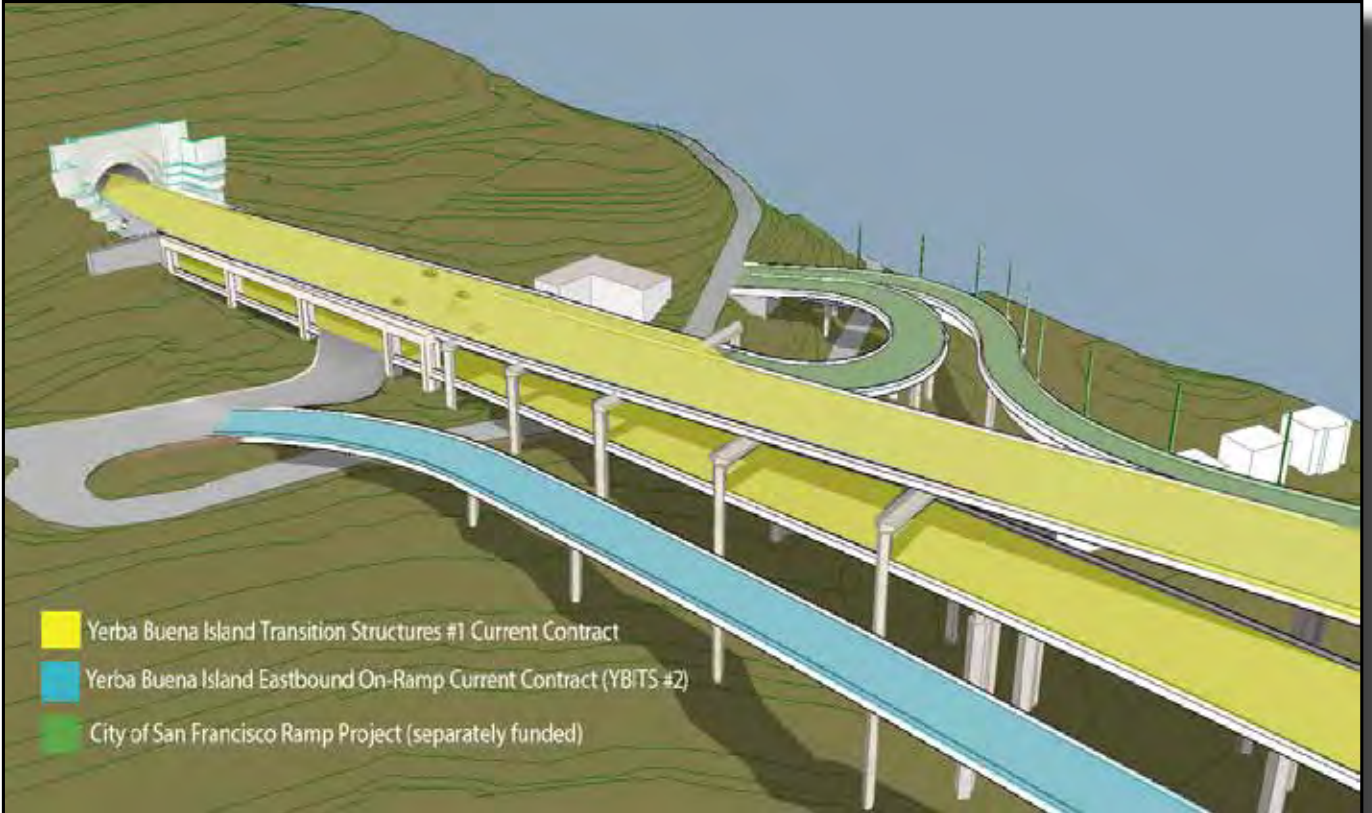


Birds-Eye View Simulation of the Yerba Buena Island Transition Structures and the New San Francisco-Oakland Bay Bridge Eastbound On Ramp and Bicycle Path after Dismantling of the Existing Structure





Aerial View of the Old Bridge and Demolition and the Transition Structure



## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### San Francisco-Oakland Bay Bridge East Span Replacement Project Self-Anchored Suspension (SAS) Bridge

If one single element bestows world class status on the new Bay Bridge East Span, it is the Self-Anchored Suspension (SAS) section of the bridge. This engineering marvel is the world's largest SAS span at 2,047 feet in length, as well as the first bridge of its kind built with a single tower.

The SAS was separated into three separate contracts - construction of the land-based foundations and columns at pier W2, construction of the marine-based foundations and columns at piers T1 and E2, and construction of the SAS steel superstructure, including the tower, roadway and cabling. Construction of the foundations at pier W2 and at piers T1 and E2 was completed in 2004 and 2007, respectively.

#### SAS Land Foundation Contract

Contractor: West Bay Builders, Inc.  
Approved Capital Outlay Budget: \$26.5 M  
Status: Completed October 2004

The twin W2 columns on Yerba Buena Island provide essential support for the western end of the SAS bridge, where the single main cable for the suspension span will extend down from the tower and wrap around and under the western end of the roadway deck. Each of these huge columns required massive amounts of concrete and steel and are anchored 80 feet into the island's solid bedrock.



SAS Marine E2 and the Skyway Westbound Foundation and Columns

#### C SAS Marine Foundations Contract

Contractor: Kiewit/FCI/Manson, Joint Venture  
Approved Capital Outlay Budget: \$274.8 M  
Status: Completed January 2008

Construction of the piers at E2 and T1 required significant on-water resources to drive the foundation support piles down, not only to bedrock, but also through the bay water and mud.

The T1 foundation piles extend 196 feet below the waterline and are anchored into bedrock with heavily reinforced concrete rock sockets that are drilled into the rock. Driven nearly 340 feet deep, the steel and concrete E2 foundation piles were driven 100 feet deeper than the deepest timber piles of the existing east span in order to get through the bay mud and reach solid bedrock.



## D SAS Superstructure Contract

Contractor: American Bridge/Fluor Enterprises, Joint Venture

Approved Capital Outlay Budget: \$2.05 B

Status: 99% Complete as of March 2015

The self-anchored suspension span of the bridge is not just another suspension bridge. Rising 525 feet above mean sea level and embedded in bedrock, the single-tower SAS span is designed to withstand a massive earthquake. Traditional main cable suspension bridges have twin cables with smaller suspender cables connected to them. While there appears to be two main cables on the SAS, it is actually a single continuous cable. This single cable is anchored within the eastern end of the roadway, carried over the tower and then wrapped around the two side-by-side decks at the western end.

The single-steel tower is made up of four separate legs connected by shear link beams, which function much like a fuse in an electrical circuit. These beams will absorb most of the impact from an earthquake, preventing damage to the tower legs.

**Status:** On the Self-Anchored Suspension Span, contract completion is pending resolution because of the discovery of water and adequacy of grouting around anchor

rods at the base of the tower. Two tower anchor rods have been extracted from the foundation for testing. Some micro-cracking was observed during inspection by a scanning electron microscope. Testing has not yet been completed to determine the significance of these microscopic results. All remaining tower anchor rods have been measured using non-destructive ultra-sonic testing to determine their status. Out of the 422 remaining rods, one rod measured six inches shorter than expected. The short rod was recently tested and did not hold load. Further testing is under way.



The Self-Anchored Suspension Bridge Span

## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### San Francisco-Oakland Bay Bridge East Span Replacement Project Skyway

The Skyway, which comprises much of the new East Span, drastically changes the appearance of the Bay Bridge. Replacing the gray steel that used to cage the drivers on the old bridge, a graceful, elevated roadway supported by piers is now providing sweeping views of the bay.

#### **E** Skyway Contract

**Contractor:** Kiewit/FCI/Manson, Joint Venture

**Approved Capital Outlay Budget:** \$1.24 B

**Status:** Completed April 2008

Extending for more than a mile across Oakland mudflats, the Skyway is the longest section of the East Span. It sits between the new Self-Anchored Suspension (SAS) span and the Oakland Touchdown (OTD). In addition to incorporating the latest seismic-safety technology, the side-by-side roadway decks of the Skyway feature shoulders and lane widths built to modern standards.

The Skyway's decks are composed of 452 pre-cast concrete segments (standing three stories high), containing approximately 200 million pounds of structural

steel, 120 million pounds of reinforcing steel, 200 thousand linear feet of piling and about 450 thousand cubic yards of concrete. These are the largest segments of their kind ever cast and were lifted into place by custom-made winches.

The Skyway marine foundation consists of 160 hollow steel pipe piles measuring eight feet in diameter and dispersed among 14 sets of piers. The 365-ton piles were driven more than 300 feet into the deep bay mud. The new East Span piles were battered or driven in at an angle, rather than vertically, to obtain maximum strength and resistance.

Designed specifically to move during a major earthquake, the Skyway features several state-of-the-art seismic safety innovations, including 60-foot-long hinge pipe beams. These beams allow deck segments on the Skyway to move, enabling the deck to withstand greater motion and to absorb more earthquake energy.

**Status:** Opened to traffic on September 2, 2013.



The New San Francisco-Oakland Bridge Skyway and Self-Anchored Suspension Bridge Looking West toward Yerba Buena Island



## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### San Francisco-Oakland Bay Bridge East Span Replacement Project

#### Oakland Touchdown

The Oakland Touchdown (OTD) structures connects Interstate 80 in Oakland to the side-by-side decks of the new East Span. For westbound drivers, the OTD is their introduction to the graceful new East Span. For eastbound drivers from San Francisco, this section of the bridge carries them from the Skyway to the East Bay, offering unobstructed views of the Oakland hills.

The OTD approach structures to the Skyway was constructed in three phases. The first phase, constructed under the OTD #1 contract, built the new westbound approach structure. Due to physical constraints with the existing bridge, the OTD #1 contract was only able to construct a portion of the eastbound approach. To facilitate opening the bridge in both directions at the same time, the second phase of work, performed by the Oakland Detour contractor, included widening the upper deck of the Oakland end of the existing bridge to allow for a traffic shift to the north that removes the physical constraint to completing the eastbound structure. This phase was completed in April 2012. The third phase, constructed by an OTD #2 contract, completed the eastbound lanes and provided the traffic switch to the new structure in both directions and allowed for the bridge to open simultaneously in both directions.

#### **F** Oakland Touchdown #1 Contract

Contractor: MCM Construction, Inc.  
Approved Capital Outlay Budget: \$205.3 M  
Status: Completed June 2010

The OTD #1 contract constructed the entire 1,000-foot-long westbound approach from the toll plaza to the Skyway. The westbound approach structure provides direct access to the westbound Skyway. In the eastbound direction, the contract constructed a portion of the eastbound structure and all of the eastbound foundations that are not in conflict with the existing bridge.

#### **G** Oakland Touchdown #2 Contract

Contractor: Flatiron West, Inc.  
Approved Capital Outlay Budget: \$72.6 M  
Status: 100% Complete as of September 2014

Flatiron West, Inc. is the prime contractor constructing the Oakland Touchdown #2 contract that completed the remaining portions of the Oakland Touchdown approach structures from the existing toll plaza to the new span. The contractor is also responsible for the construction of the bicycle/pedestrian path and final landscaping of the area.

**Status:** Landscaping and installation of the irrigation system continues with plant establishment beginning in October 2014 and forecasting to be completed in October of 2015.



Aerial View of Oakland Touchdown

# TOLL BRIDGE SEISMIC RETROFIT PROGRAM

## San Francisco-Oakland Bay Bridge East Span Replacement Project

### Existing East Span Bridge Dismantling

#### Existing SFOBB Dismantling Contracts

Approved Capital Outlay Budget: \$246.5 M  
 Contractor: CEC and Silverado JV

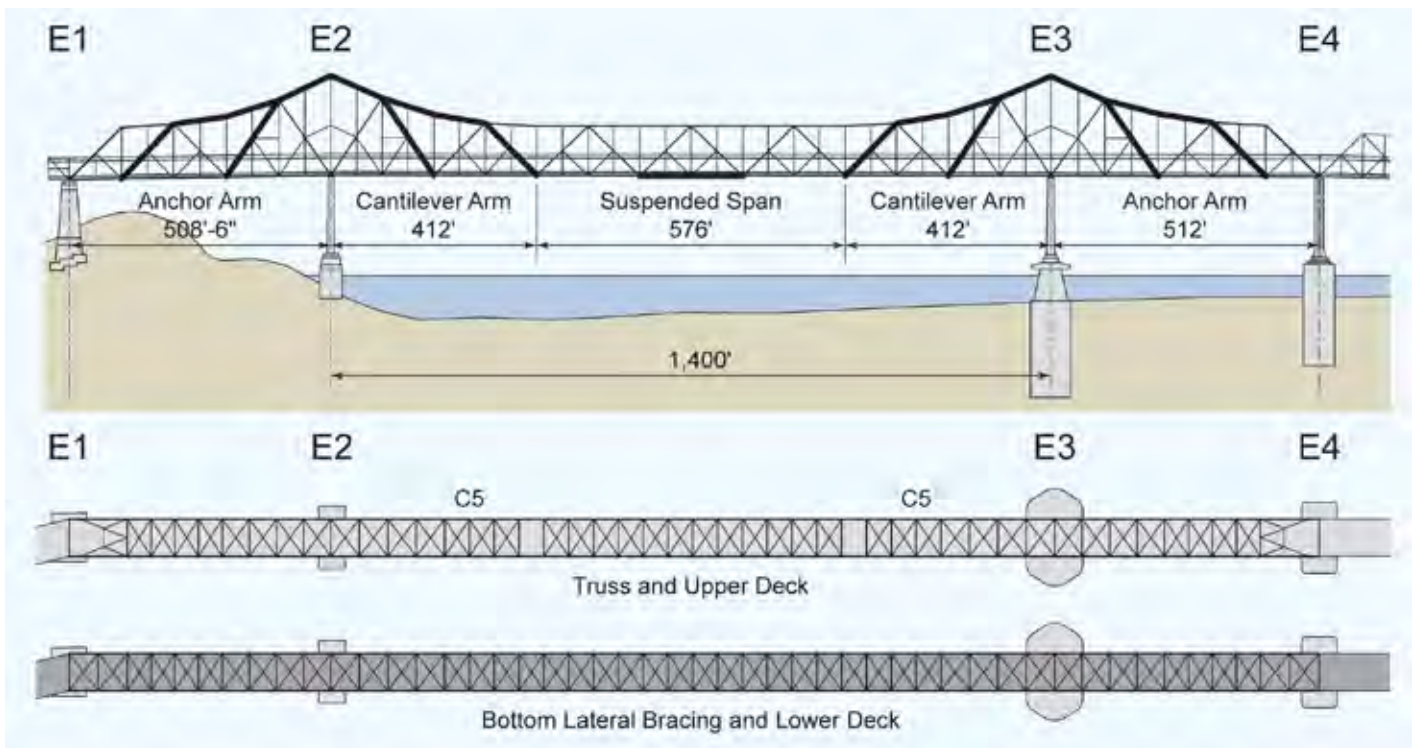
To expedite the opening of a new eastbound on ramp and the bike/pedestrian pathway from Yerba Buena Island to the SAS and to maximize contractor efficiencies, the TBPOC split the dismantling of the existing bridge into multiple contracts. The dismantling of the superstructure of the main cantilever section of the existing bridge has been incorporated into the YBITS #2 contract.

The dismantling of the remaining portion of the superstructure (above water) will be performed under a separate contract, the bid opening date for this contract is scheduled for March 4th, 2015.

The marine foundation removal is a CMGC (Construction Manager / General Contractor) contract and theselected CMGC contractor is a Kiewit Manson team. work is currently under design,

**Status:** (See diagrams #1 and #2) The cantilever portion of the dismantling contract was awarded to CEC and Silverado (JV) on November 28, 2012. Construction start-up activities began in March 2013. Cantilever and YBI detour dismantling continues.

### Demolition Diagrams

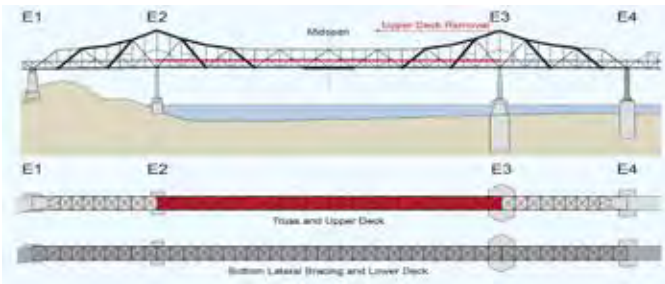


### GENERAL LAYOUT

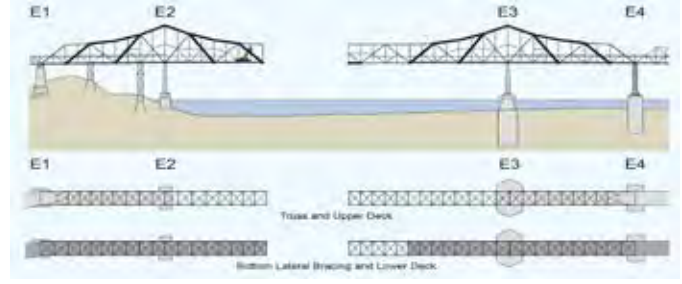




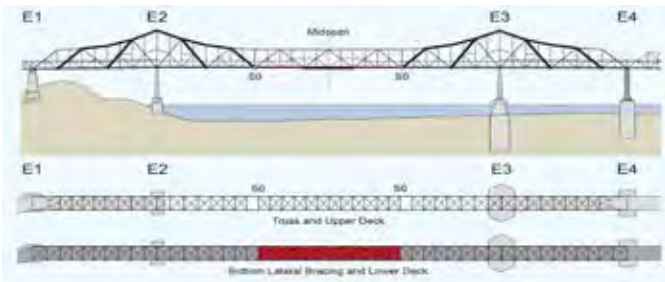
1. Remove Upper Deck from Pier E3 to Pier E2



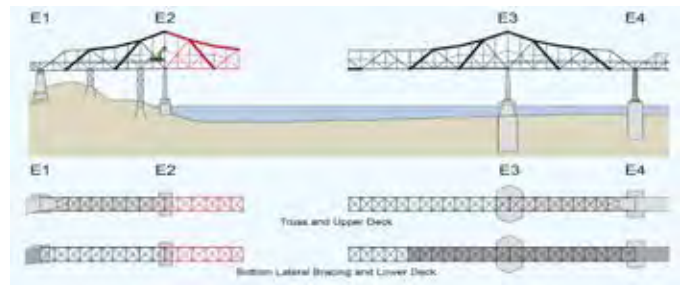
5. Install West Falsework Supports



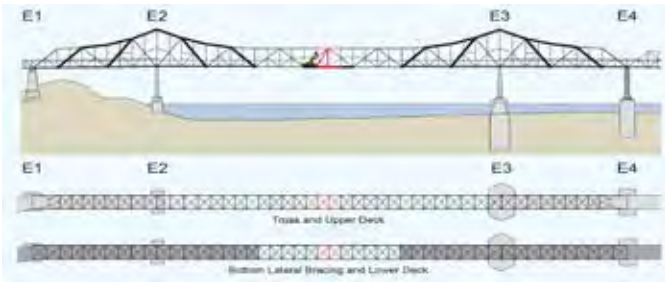
2. Remove Lower Deck from Suspended Span Replace with Timber Mat



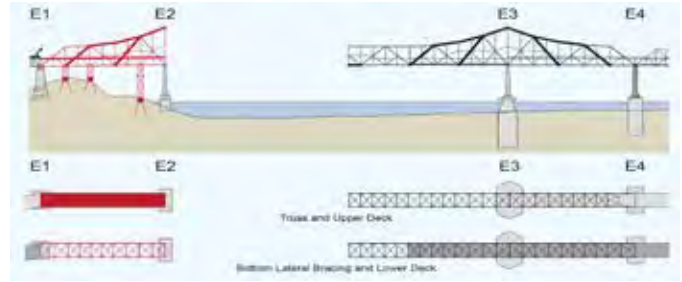
6. Remove Remaining West Cantilever Arm



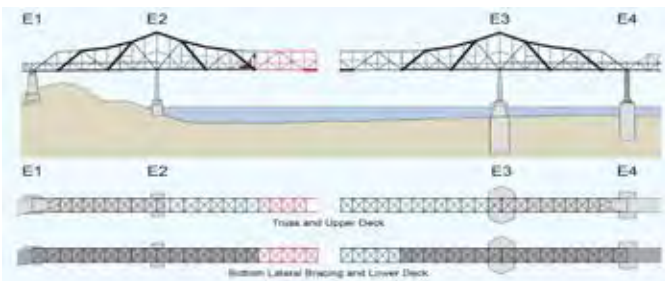
3. Disconnect Bridge at Midspan



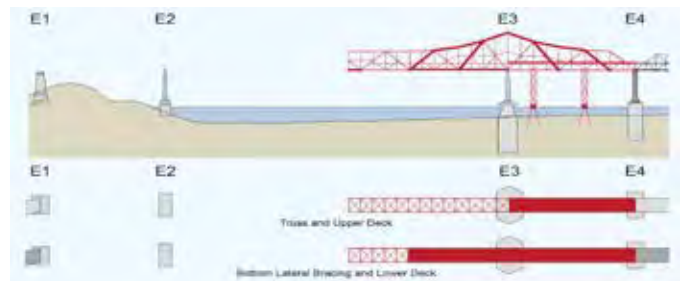
7. Remove West Anchor Arm - Remove Falsework Supports



4. Remove West Suspended Span



8. Remove East Spans Similarly



## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### San Francisco-Oakland Bay Bridge East Span Replacement Project

#### Other Contracts

A number of contracts needed to relocate utilities, clear areas of archeological artifacts and prepare areas for future work have already been completed. The last major contract is in progress, which is the dismantling and removal of the existing bridge, which has served the Bay Area for nearly 80 years. Following is a status of some the other East Span contracts.

#### **J** Electrical Cable Relocation

Contractor: Manson Construction  
Approved Capital Outlay Budget: \$5.7 M  
Status: Completed January 2008

A submerged cable from Oakland that is close to where the new bridge touches down supplies electrical power to Treasure Island. To avoid any possible damage to the cable during construction, two new replacement cables were run from Oakland to Treasure Island. The extra cable was funded by the Treasure Island Development Authority.

#### Yerba Buena Island Substation

Contractor: West Bay Builders  
Approved Capital Outlay Budget: \$11.3 M  
Status: Completed May 2005

This contract relocated an electrical substation just east of the Yerba Buena Island Tunnel in preparation for the new East Span.



Archeological Investigations



New YBI Electrical Substation



## Stormwater Treatment Measures

Contractor: Diablo Construction, Inc.  
 Approved Capital Outlay Budget: \$18.3 M  
 Status: Completed December 2008

The Stormwater Treatment Measures contract implemented a number of best practices for the management and treatment of stormwater runoff. Focused on the areas around and approaching the toll plaza, the contract added new drainage and built new bio-retention swales and other related constructs.



Stormwater Retention Basin

## East Span Interim Seismic Retrofit

Contractors: 1) California Engineering  
 2) Balfour Beatty  
 Approved Capital Outlay Budget: \$30.8 M  
 Status: Completed October 2000

After the 1989 Loma Prieta Earthquake, and before the final retrofit strategy was determined for the East Span, Caltrans completed an interim retrofit of the existing bridge to prevent a catastrophic collapse of the bridge should a similar earthquake occur before the East Span was completely replaced. The interim retrofit was performed under two separate contracts that lengthened pier seats, added some structural members, and strengthened areas of the bridge so they would be more resilient during an earthquake.



The existing East Span Cantilever Section of the San Francisco-Oakland Bay Bridge Being Dismantled

## Pile Installation Demonstration

Contractor: Manson and Dutra, Joint Venture  
 Approved Capital Outlay Budget: \$9.2 M  
 Status: Completed December 2000

While large-diameter battered piles are common in offshore drilling, the new East Span is one of the first bridges to use them in its foundations. To minimize project risks and build industry knowledge, a pile installation demonstration project was initiated to prove the efficacy of the proposed technology and methodology. The demonstration was highly successful and helped result in zero contract change orders or claims for pile driving on the project.



Battered Pile Installation Demonstration

## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### Other Completed Projects

In the 1990s, the State Legislature identified seven of the nine state-owned toll bridges for seismic retrofit. In addition to the San Francisco-Oakland Bay Bridge, these included the Benicia-Martinez, Carquinez, Richmond-San Rafael and San Mateo-Hayward bridges in the Bay Area, and the Vincent Thomas and Coronado bridges in Southern California. Other than the East Span of the Bay Bridge, the retrofits of all of the bridges have been completed as planned.

### San Mateo-Hayward Bridge Seismic Retrofit Project

#### Project Status: Completed 2000

The San Mateo-Hayward Bridge seismic retrofit project focused on strengthening the high-rise portion of the span. The foundations of the bridge were significantly upgraded with additional piles.



High-Rise Section of San Mateo-Hayward Bridge

### 1958 Carquinez Bridge Seismic Retrofit Project

#### Project Status: Completed 2002

The eastbound 1958 Carquinez Bridge was retrofitted in 2002 with additional reinforcement of the cantilever thru-truss structure.



1958 Carquinez Bridge (foreground) with the 1927 Span (middle) under Demolition and the New Alfred Zampa Memorial Bridge (background)

### 1962 Benicia-Martinez Bridge Seismic Retrofit Project

#### Project Status: Completed 2003

The southbound 1962 Benicia-Martinez Bridge was retrofitted to “Lifeline” status with the strengthening of the foundations and columns and the addition of seismic bearings that allow the bridge to move during a major seismic event. The Lifeline status means the bridge is designed to sustain minor to moderate damage after a seismic event and to reopen quickly to emergency response traffic.



1962 Benicia-Martinez Bridge (right)

### Richmond-San Rafael Bridge Seismic Retrofit Project

#### Project Status: Completed 2005

The Richmond-San Rafael Bridge was retrofitted to a “No Collapse” classification to avoid catastrophic failure during a major seismic event. The foundations, columns, and truss of the bridge were strengthened, and the entire low-rise approach viaduct from Marin County was replaced.

## Los Angeles-Vincent Thomas Bridge Seismic Retrofit Project

### Project Status: **Completed 2000**

The Vincent Thomas Bridge is a 1,500-foot long suspension bridge crossing the Los Angeles Harbor in Los Angeles that links San Pedro with Terminal Island. The bridge was one of two state-owned toll bridges in Southern California (the other being the San Diego-Coronado Bridge). Opened in 1963, the bridge was seismically retrofitted as part of the TBSRP in 2000.



Los Angeles-Vincent Thomas Bridge

## San Diego-Coronado Bridge Seismic Retrofit Project

### Project Status: **Completed 2002**

The San Diego-Coronado Bridge crosses over San Diego Bay and links the cities of San Diego and Coronado. Opened in 1969, the 2.1-mile long bridge was seismically retrofitted as part of the TBSRP in 2002.

## Antioch Bridge Seismic Retrofit Project

### Project Status: **Completed 2012**

Serving the Delta region of the Bay Area, the Antioch Bridge takes State Route 160 traffic over the San Joaquin River, linking eastern Contra Costa County with Sacramento County. The current 1.8-mile-long steel plate girder bridge was opened in 1978 with one lane in each direction. The major retrofit measure for the bridge includes installing seismic isolation bearings at each of the 41 piers, strengthening piers 12 through 31 with steel cross-bracing between column bents, and installing steel casings at all columns located at the Sherman Island approach slab bridge.



Antioch Bridge

## Dumbarton Bridge Seismic Retrofit Project

### Project Status: **Completed 2013**

The current Dumbarton Bridge was opened to traffic in 1982 linking the cities of Newark in Alameda County and East Palo Alto in San Mateo County. The 1.6-mile long bridge has six lanes (three in each direction) and an eight-foot-wide bike/pedestrian pathway. The bridge is a combination of three bridge types; reinforced concrete slab approaches supported on multiple pile extension columns, precast-prestressed concrete delta girders and steel box girders supported on reinforced concrete piers. The current retrofit strategy for the bridge included superstructure and deck modifications and installation of isolation bearings.



Dumbarton Bridge

## TOLL BRIDGE SEISMIC RETROFIT PROGRAM Risk Management Program Update

### POTENTIAL DRAW ON PROGRAM RESERVE (PROGRAM CONTINGENCY)

The program contingency is currently \$135.2 million in accordance with the TBPOC approved budget. As of the end of the first quarter of 2015, the 50 percent probable draw on program contingency is \$232.1 million. The potential draw ranges from about \$160 million to \$300 million (refer to Figure 3).

The potential draw curve includes all currently identified risks in the risk registers. It does not include costs that may result from possible future decisions to alter the projects from their current scope and construction methods. Possible material changes to a project are not placed in a risk register according to best practices. A materially changed project differs substantially from its predecessor and requires a new risk register. The removal of marine foundations is a project that may undergo material changes later this year. The project assumes that the implosion method of removal will be used. However, depending on the results of the Pier E3 demonstration project later this year, the project may have to revert to conventional methods of removal, which could increase the project cost by up to \$94 million. This possibility is not in the risk register for the reasons given above, and its cost is not reflected in the draw curve. This potential increase in cost may be considered as an amount reserved from the program contingency or an amount that may need to be added to the program contingency if sufficient reserves are not available.

Over half of the \$232.1 million 50% probable draw is on account of two major risks: Additional capital outlay support (COS) and capital outlay (CO) may be needed in case the implosion method of dismantling the marine structures has to be replaced by more expensive conventional dismantling methods.

Among the other risks, 20 are 100% probable to have a cost impact having a most likely total of \$134 million. These risks include known issues, future contract change orders (CCOs), cost uncertainty in pending CCOs, and uncertainty in the capital cost estimates of unawarded contracts.

In view of the above, the \$135.2 million current program contingency balance is insufficient to cover the cost of currently identified risks. Risk mitigation actions are continuously developed and implemented to reduce the potential draw on the program contingency

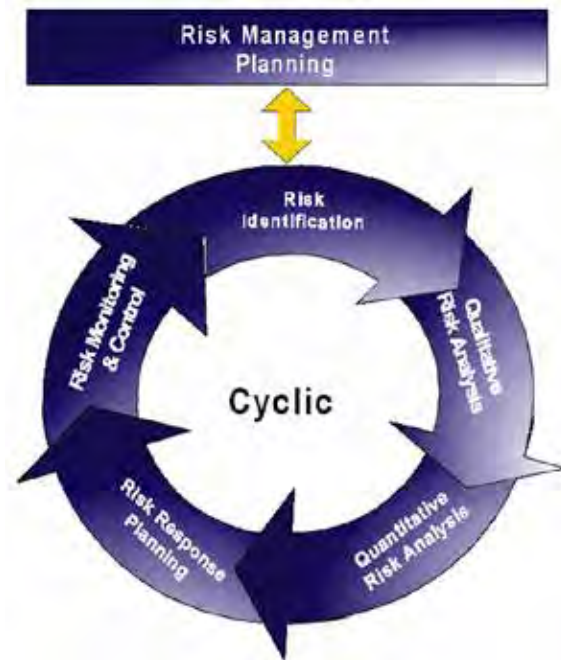


Figure 2 – Risk Management Planning Cycle

### RISK MANAGEMENT DEVELOPMENTS

#### Self-Anchored Suspension Span Contract

The project team continues to perform tests on two rods extracted from the tower base. The scope of the testing is still under discussion and could increase or decrease as new information is obtained. The cost of the testing is primarily a capital outlay support effort, however there could be some capital costs used in ongoing or new construction contracts to ensure there is sufficient information to close the issue.

#### Oakland Touchdown #2 Contract

Minimal change order work remains and is expected to be complete in the second quarter of 2015. Project closeout is underway. The landscaping is approximately a quarter of the way through a one year plant establishment period.

#### Yerba Buena Island Transition Structure #2 Contract

The contractor continues to remove the cantilever portion of the existing bridge along with the temporary detour structure. Work is scheduled to be completed in the fourth quarter of 2015. Construction of the new eastbound on-ramp began in the first quarter of 2015.

The team continues to cooperate and coordinate with the adjacent project. This contract builds on and off ramps on the north side of the new bridge and is administered by the City of San Francisco.

**504/288 (Superstructure Removal)**

Bid for this contract opened with the low bid under the engineer’s estimate. An executed contract is expected early next quarter. Work in the field is expected to begin in the third quarter with planning operations starting earlier.

**Pier E3 Demonstration (Superstructure Removal)**

Caltrans intends to validate the feasibility of controlled implosion as a removal method. This contract is expected to be awarded early next quarter. Conventional construction operations are expected to begin in June 2015. Implosion of the pier would take place in November provided a permit to do so is obtained. Permit information submitted to agencies and an answer is expected in August 2015.

The removal of all of the foundations is procured using the Contract Manager/General Contractor (CM/GC) delivery method. This scope of work will be the first delivered to the construction phase.

**Foundation Removal**

The Team is awaiting the results of the Pier E3 demonstration to confirm the means and methods to

remove the remaining piers. Cost estimates have been revised and updated to reflect the current understanding of the removal effort.

**RISK MANAGEMENT LOOK AHEAD**

**Self-Anchored Suspension Span Contract**

The contractor continues work in the field to remove water from holes made to verify proper grouting of the tower rods. It is unlikely that this contractor will be able to remove all of the water without installing a de-humidification system. The contract delivery method to design and install this system is uncertain.

**Oakland Touchdown #2 Contract**

The project team will continue closing out the contract.

**Yerba Buena Island Transition Structure #2 Contract**

The resolution of time issues related to on-ramp and bike path opening is underway. This could delay the opening until April 2016, although December 2015 remains a possibility.

**Dismantling Contracts**

Award of the 504/288 and Pier E3 demonstration will transition the projects from the design phase to the construction phase. Little work is expected over the second quarter.

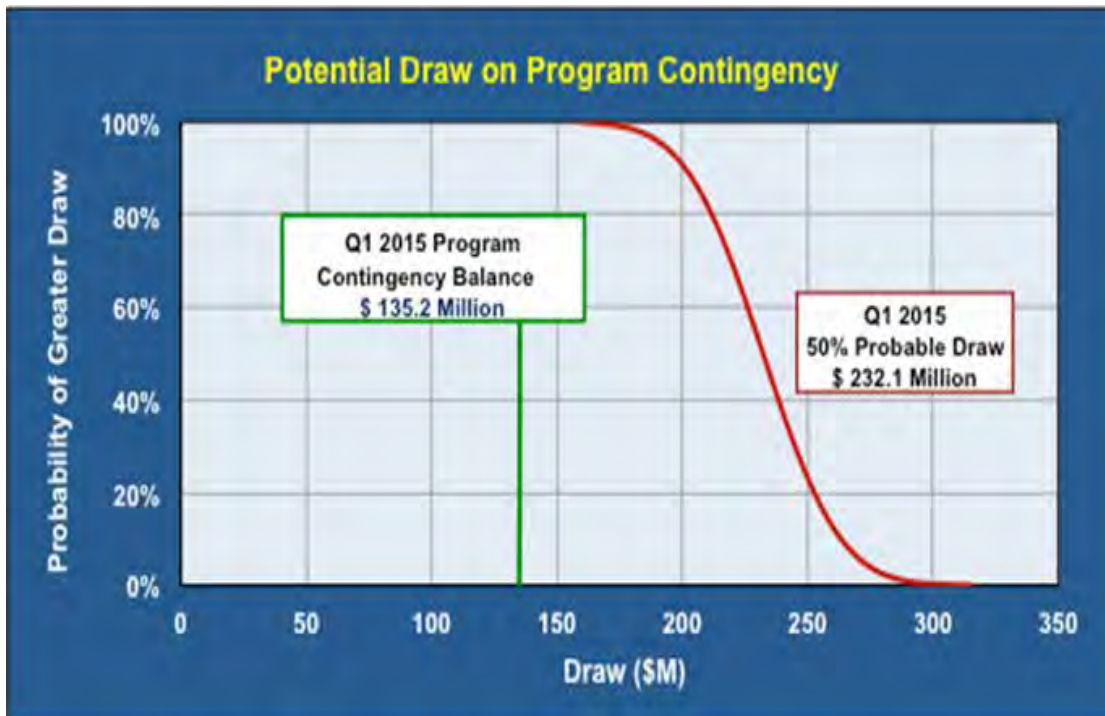


Figure 3 – Potential Draw on Program Contingency, Excluding Conventional Demolition Options for Marine Foundation Removal

\*Figure 3 Notes:

- 1. Proposed architectural enhancements and project improvements are excluded unless approved by the TBPOC.

## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### Program Funding Status

AB 144 established a funding level of \$8.685 billion for the TBSRP. As of December 31, 2010, seismic retrofitting of Antioch and Dumbarton Bridges became part of the Toll Bridge Seismic Retrofit Program with the passage of AB 1175, which provided another \$750 million bringing the total funding to \$9.435 billion. The program funding sources are shown in Table 1- Program Budget.

**Table 1—Program Budget as of March 31, 2015 (\$ Millions)**

	<b>Budgeted</b>	<b>Funding Available &amp; Contribution</b>
Financing		
Seismic Surcharge Revenue AB 1171	2,282.0	2,282.0
Seismic Surcharge Revenue AB 144	2,150.0	2,150.0
Seismic Surcharge Revenue AB 1175 <sup>(2)</sup>	750.0	750.0
BATA Consolidation	820.0	820.0
Subtotal - Financing	6,002.0	6,002.0
Contributions		
Proposition 192	790.0	789.0
San Diego Coronado Toll Bridge Revenue Fund	33.0	33.0
Vincent Thomas Bridge	15.0	6.9
State Highway Account <sup>(1)</sup>	745.0	745.0
Public Transportation Account <sup>(1)</sup>	130.0	130.0
ITIP/SHOPP/Federal Contingency <sup>(3)</sup>	448.0	448.0
Federal Highway Bridge Replacement and Rehabilitation (HBRR) <sup>(3)</sup>	642.0	642.0
SHA - East Span Dismantling	300.0	300.0
SHA - "Efficiency Savings"	130.0	130.0
Redirect Spillover	125.0	125.0
Motor Vehicle Account	75.0	75.0
Subtotal - Contribution	3,433.0	3,423.9
<b>Total Funding</b>	<b>9,435.0</b>	<b>9,425.9</b>
Encumbered to Date		8,548.4
<b>Remaining Unallocated</b>		<b>877.5</b>
Expenditures :		
Capital Outlay		6,533.9
State Operations		1,811.2
Antioch and Dumbarton Expenditures by BATA		12.2
	<b>Total Expenditures</b>	<b>8,357.2</b>
Encumbrances :		
Capital Outlay		183.3
State Operations		7.9
	<b>Total Encumbrances</b>	<b>191.2</b>
<b>Total Expenditures and Encumbrances</b>		<b>8,548.4</b>



## Summary of the Toll Bridge Oversight Committee (TBPOC) Expenses

Pursuant to Streets and Highways Code Section 30952.1 (d), expenses incurred by Caltrans, BATA, and the California Transportation Commission (CTC) for costs directly related to the duties associated with the TBPOC are to be reimbursed by toll revenues. Table 3 -Toll Bridge Program Oversight Committee Estimated Expenses: July 1, 2005, through March 31, 2015, shows expenses through March 31, 2015, for TBPOC functioning, support, and monthly and quarterly reporting.

**Table 2—CTC Toll Bridge Seismic Retrofit Program Contributions Adopted December 2005  
Schedule of Contributions to the Toll Bridge Seismic Retrofit Program (\$ Millions)**

Source	Description	2005-06 (Actual)	2006-07 (Actual)	2007-08 (Actual)	2008-09 (Actual)	2009-10 (Actual)	2010-11 (Actual)	2011-12 (Actual)	2012-13 (Actual)	2013-14 (Actual)	Total
AB 1171	SHA	290									290
	PTA	80	40								120
	Highway Bridge Replacement and Rehabilitation (HBRR)	100	100	100	42						342
	Contingency				1	99	100	100	148		448
AB 144	SHA*	2	8				53	50	17		130
	Motor Vehicle Account (MVA)	75									75
	Spillover		125								125
	SHA**									300	300
	<b>Total</b>	<b>547</b>	<b>273</b>	<b>100</b>	<b>43</b>	<b>99</b>	<b>153</b>	<b>150</b>	<b>165</b>	<b>300</b>	<b>1830</b>

\* Caltrans Efficiency Savings

\*\* SFOBB East Span Dismantling Cost. The last contribution of \$300 million from SHA was made in October 2013 as scheduled.

**Table 3—Toll Bridge Program Oversight Committee  
Estimated Expenses: July 1, 2005 through March 31, 2015 (\$ Millions)**

Agency/Program Activity	Expenses
<b>BATA</b>	<b>3.0</b>
<b>Caltrans</b>	<b>3.1</b>
<b>CTC</b>	<b>3.2</b>
<b>Reporting</b>	<b>5.8</b>
<b>Total Program</b>	<b>15.1</b>

TOLL BRIDGE SEISMIC RETROFIT PROGRAM  
**Quarterly Environmental Compliance Highlights**



Overall environmental compliance for the San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Safety Project (SFOBB Project) has been a success during the first quarter of 2015. The tasks for the current quarter are focused on mitigation, monitoring, and environmental permitting. Key successes in this quarter are as follows:

Marine-based bird monitoring was conducted weekly from a consultant boat. The goal of this monitoring is to document potential impacts to birds from construction activities. Monitors did not observe any indication that birds were disturbed due to the east span construction activities. Installation of nesting bird impact avoidance management measures for the 2015 nesting season occurred during the first quarter of 2015 for the Yerba Buena Island (YBI) Transition Structure 2 (YBITS 2) construction contract.

The YBITS 2 contractor performed maintenance on deterrents installed for the 2014 nesting season and installed new bird nesting deterrents on Pier E4. Hardware cloth was installed over the outer cubbies on the tower legs of Pier E4 to prevent peregrine falcon nesting. Nesting bird monitoring is being conducted six days per week. Meetings continue to be held one day per week between the Department and YBITS 2 contractor to discuss nesting bird monitoring and deterrence maintenance for the 2015 nesting season. Peregrine falcon monitoring occurred throughout

the first quarter of 2015. The pair was observed perching throughout the project site, primarily east of E4, throughout this time. Hard incubation has yet to be observed, and it is thought that the pair may have tried to nest offsite. Monitoring will continue throughout the second quarter of 2015 to determine if the pair will return to their 2014 nesting site at Pier E8.

Nesting bird surveys continue to be performed at least once per month for vegetation removal activities at storm water basins that are located around the Bay Bridge toll plaza.

SFOBB environmental compliance and storm water pollution prevention plan (SWPPP) inspections were conducted weekly at all active project sites. The project team continues to work closely with construction to ensure compliance with environmental permits and regulations and to improve best management practices. During dismantling activities of the original east span, the contractor uses debris containment structures to capture and collect debris. Structures are installed on the traveler system under the lower deck of the original east span are used to collect demolition debris.

The environmental team now prepares a monthly Look Ahead and SFOBB Environmental Status Report for dissemination to district management as well as other interested parties. These reports detail that month's environmental events and future action items.

Monthly Compliance Reports were submitted to CDFW in January, February, and March 2015.



Richmond-San Rafael Bridge



## REGIONAL MEASURE 1 TOLL BRIDGE PROGRAM

## REGIONAL MEASURE 1 PROGRAM

### Completed Projects

In November 1988, Bay Area voters approved Regional Measure 1 (RM 1), which authorized a standard auto toll of \$1 for all seven state-owned Bay Area toll bridges to be used to reduce congestion in the bridge corridor.

#### Richmond Parkway Construction Project

##### Project Status: **Completed 2001**

The final connections to the Richmond Parkway from Interstate 580 near the Richmond-San Rafael Bridge were completed in May 2001.

#### San Mateo-Hayward Bridge Widening Project

##### Project Status: **Completed 2003**

This project expanded the low-rise concrete trestle section of the San Mateo-Hayward Bridge to allow for three lanes in each direction to match the existing configuration of the high-rise steel section of the bridge.

#### New Alfred Zampa Memorial (Carquinez) Bridge Project

##### Project Status: **Completed 2003**

The new western span of the Carquinez Bridge, which replaced the original 1927 span, is a twin-towered suspension bridge with three mixed-flow lanes, a new carpool lane, shoulders and a bicycle/pedestrian pathway.

#### Bayfront Expressway (State Route 84) Widening Project

##### Project Status: **Completed 2004**

This project expanded and improved the roadway from the Dumbarton Bridge touchdown to the US 101/ Marsh Road interchange by adding additional lanes and turn pockets and improving bicycle/pedestrian access in the area.

#### Richmond-San Rafael Bridge Rehabilitation Projects

##### Project Status: **Completed 2006**

Three major rehabilitation projects for the Richmond-San Rafael Bridge were completed. In 2001, the final connections to the Richmond Parkway were completed. In 2005, seismic retrofit, trestle and fender system replacement work was completed. In 2006, the bridge was resurfaced along with deck joint repairs.



Widening of the San Mateo-Hayward Bridge Trestle on left



New Alfred Zampa Memorial (Carquinez) Bridge Soon after Opening to Traffic, with Crockett Interchange Still under Construction



New Richmond-San Rafael Bridge West Approach Trestle under Construction

## Benicia-Martinez Bridge Project

### Project Status: **Completed 2007**

The new Congressman George Miller Bridge opened to traffic in August 2007, taking its place alongside the existing 1962 Benicia-Martinez Bridge, which is named for Congressman Miller's father, the late George Miller, Jr. The new bridge carries five lanes of northbound Interstate 680 traffic, while the existing bridge was upgraded to carry four lanes of southbound traffic and a new bicycle/pedestrian pathway.



The New Congressman George Miller Bridge (New Benicia-Martinez Bridge)

## Benicia-Martinez Bridge Rehabilitation Project

### Project Status: **Completed 2009**

A two-year project to rehabilitate and reconfigure the original Benicia-Martinez Bridge began shortly after the opening of the new Congressman George Miller Bridge. The existing 1.2-mile roadway surface on the steel deck truss bridge was modified to carry four lanes of southbound traffic (one more than before) - with shoulders on both sides - plus a bicycle/pedestrian path on the west side of the span that connects to Park Road in Benicia and to Marina Vista Boulevard in Martinez. Reconstruction of the east side of the bridge and approaches was completed in August 2008. Reconstruction of the west side of the bridge and its approaches and construction of the bicycle/pedestrian pathway were completed in August 2009.



Benicia-Martinez Bridge Bicycle/Pedestrian Path

## Interstate 880/State Route 92

### Project Status: **Completed 2011**

This corridor was consistently one of the Bay Area's most congested during the evening commute. This was due in part to the lane merging and weaving that was required by the then-existing cloverleaf interchange. The new interchange features direct freeway-to-freeway connector ramps that now increase traffic capacity and improve overall safety and traffic operations in the area. With the new direct-connector ramps, drivers coming off of the San Mateo-Hayward Bridge can access Interstate 880 without having to compete with traffic headed onto east Route 92 from south Interstate 880.



Aerial View of Completed 880/92 Interchange Project







**APPENDICES**

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## Appendix A-1: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through March 31, 2015 (\$ Millions)

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (03/2015)	Cost to Date (03/2015)	Cost Forecast (03/2015)	At- Completion Variance
a	c	d	e = c + d	f	g	h = g - e
<b>SFOBB East Span Replacement Project</b>						
Capital Outlay Support	959.3	346.2	1,305.5	1,263.9	1,373.0	67.5
Capital Outlay Construction	4,492.2	597.0	5,089.2	4,723.6	5,230.2	141.0
Other Budgeted Capital	35.1	(32.8)	2.3	0.7	2.3	-
<b>Total</b>	<b>5,486.6</b>	<b>910.4</b>	<b>6,397.0</b>	<b>5,988.2</b>	<b>6,605.5</b>	<b>208.5</b>
<b>SFOBB West Approach Replacement</b>						
Capital Outlay Support	120.0	(1.0)	119.0	119.4	119.3	0.3
Capital Outlay Construction	309.0	41.7	350.7	332.0	338.1	(12.6)
<b>Total</b>	<b>429.0</b>	<b>40.7</b>	<b>469.7</b>	<b>451.4</b>	<b>457.4</b>	<b>(12.3)</b>
<b>SFOBB West Span Retrofit</b>						
Capital Outlay Support	75.0	(0.2)	74.8	74.9	74.8	-
Capital Outlay Construction	232.9	(5.5)	227.4	227.4	227.4	-
<b>Total</b>	<b>307.9</b>	<b>(5.7)</b>	<b>302.2</b>	<b>302.3</b>	<b>302.2</b>	<b>-</b>
<b>Richmond-San Rafael Bridge Retrofit</b>						
Capital Outlay Support	134.0	(7.0)	127.0	126.8	127.0	-
Capital Outlay Construction	780.0	(90.5)	689.5	667.5	667.5	(22.0)
<b>Total</b>	<b>914.0</b>	<b>(97.5)</b>	<b>816.5</b>	<b>794.3</b>	<b>794.5</b>	<b>-</b>
<b>Benicia-Martinez Bridge Retrofit</b>						
Capital Outlay Support	38.1	-	38.1	38.1	38.1	-
Capital Outlay Construction	139.7	-	139.7	139.7	139.7	-
<b>Total</b>	<b>177.8</b>	<b>-</b>	<b>177.8</b>	<b>177.8</b>	<b>177.8</b>	<b>-</b>
<b>Carquinez Bridge Retrofit</b>						
Capital Outlay Support	28.7	0.1	28.8	28.8	28.8	-
Capital Outlay Construction	85.5	(0.1)	85.4	85.4	85.4	-
<b>Total</b>	<b>114.2</b>	<b>-</b>	<b>114.2</b>	<b>114.2</b>	<b>114.2</b>	<b>-</b>
<b>San Mateo-Hayward Retrofit</b>						
Capital Outlay Support	28.1	-	28.1	28.1	28.1	-
Capital Outlay Construction	135.4	(0.1)	135.3	135.3	135.3	-
<b>Total</b>	<b>163.5</b>	<b>(0.1)</b>	<b>163.4</b>	<b>163.4</b>	<b>163.4</b>	<b>-</b>
<b>Vincent Thomas Bridge Retrofit (Los Angeles)</b>						
Capital Outlay Support	16.4	-	16.4	16.4	16.4	-
Capital Outlay Construction	42.1	(0.1)	42.0	42.0	42.0	-
<b>Total</b>	<b>58.5</b>	<b>(0.1)</b>	<b>58.4</b>	<b>58.4</b>	<b>58.4</b>	<b>-</b>
<b>San Diego-Coronado Bridge Retrofit</b>						
Capital Outlay Support	33.5	(0.3)	33.2	33.2	33.2	-
Capital Outlay Construction	70.0	(0.6)	69.4	69.4	69.4	-
<b>Total</b>	<b>103.5</b>	<b>(0.9)</b>	<b>102.6</b>	<b>102.6</b>	<b>102.6</b>	<b>-</b>

## Appendix A-1: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through March 31, 2015 (\$ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (03/2015)	Cost to Date (03/2015)	Cost Forecast (03/2015)	At- Completion Variance
a	c	d	e = c + d	f	g	h = g - e
<b>Antioch Bridge</b>						
Capital Outlay Support	-	23.8	23.8	17.4	23.8	-
Capital Outlay Support by BATA				6.2		
Capital Outlay Construction	-	47.0	47.0	47.0	47.0	-
Total	-	70.8	70.8	70.6	70.8	-
<b>Dumbarton Bridge</b>						
Capital Outlay Support	-	46.0	46.0	38.8	45.4	(0.6)
Capital Outlay Support by BATA				6.0		
Capital Outlay Construction	-	68.2	68.2	63.8	68.2	-
Total	-	114.2	114.2	108.6	113.6	(0.6)
Subtotal Capital Outlay Support	1,433.1	407.6	1,840.7	1,797.9	1,907.9	67.2
Subtotal Capital Outlay	6,286.8	657.0	6,943.8	6,533.1	7,050.2	106.4
Subtotal Other Budgeted Capital	35.1	(32.8)	2.3	0.7	2.3	-
Miscellaneous Program Costs	30.0	-	30.0	25.5	30.0	-
Subtotal Toll Bridge Seismic Retrofit Program	7,785.0	1,031.8	8,816.8	8,357.2	8,990.4	173.6
Net Programmatic Risks*	-	-	-	-	58.5	58.5
Program Contingency	900.0	(764.8)	135.2	-	(96.9)	(232.1)
<b>Total Toll Bridge Seismic Retrofit Program <sup>1</sup></b>	<b>8,685.0</b>	<b>267.0</b>	<b>8,952.0</b>	<b>8,357.2</b>	<b>8,952.0<sup>2</sup></b>	<b>-</b>

<sup>1</sup> Figures may not sum up to totals due to rounding effects.

<sup>2</sup> Total program cost forecast assumes mitigation of risks.

## Appendix A-2: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through March 31, 2015 (\$ Millions)

Bridge	AB 144 Baseline Budget	TBPOC Current Approved Budget	Expenditures to date and encumbrances as of (03/2015) see Note (1)	Estimated costs not yet spent or encumbered as of (03/2015)	Total Forecast as of (03/2015)
a	b	c	d	e	f = d + e
<b>Other Completed Projects</b>					
Capital Outlay Support	144.9	144.6	144.6	-	144.6
Capital Outlay	472.6	471.8	471.9	(0.2)	471.7
<b>Total</b>	<b>617.5</b>	<b>616.4</b>	<b>616.5</b>	<b>(0.2)</b>	<b>616.3</b>
<b>Richmond-San Rafael</b>					
Capital Outlay Support	134.0	127.0	126.8	0.2	127.0
Capital Outlay	698.0	689.5	667.5	-	667.5
Project Reserves	82.0	-	-	-	-
<b>Total</b>	<b>914.0</b>	<b>816.5</b>	<b>794.3</b>	<b>0.2</b>	<b>794.5</b>
<b>West Span Retrofit</b>					
Capital Outlay Support	75.0	74.8	74.8	-	74.8
Capital Outlay	232.9	227.4	227.4	-	227.4
<b>Total</b>	<b>307.9</b>	<b>302.2</b>	<b>302.2</b>	<b>-</b>	<b>302.2</b>
<b>West Approach</b>					
Capital Outlay Support	120.0	119.0	119.4	(0.1)	119.3
Capital Outlay	309.0	350.7	332.2	5.9	338.1
<b>Total</b>	<b>429.0</b>	<b>469.7</b>	<b>451.6</b>	<b>5.8</b>	<b>457.4</b>
<b>SFOBB East Span - Skyway</b>					
Capital Outlay Support	197.0	181.2	181.2	-	181.2
Capital Outlay	1,293.0	1,237.2	1,237.3	(0.1)	1,237.2
<b>Total</b>	<b>1,490.0</b>	<b>1,418.4</b>	<b>1,418.5</b>	<b>(0.1)</b>	<b>1,418.4</b>
<b>SFOBB East Span - SAS - Superstructure</b>					
Capital Outlay Support	214.6	483.0	501.5	14.4	515.9
Capital Outlay	1,753.7	2,046.8	2,048.2	(0.4)	2,047.8
<b>Total</b>	<b>1,968.3</b>	<b>2,529.8</b>	<b>2,549.7</b>	<b>14.0</b>	<b>2,563.7</b>
<b>SFOBB East Span - SAS - Foundations</b>					
Capital Outlay Support	62.5	37.6	37.6	-	37.6
Capital Outlay	339.9	301.3	301.3	-	301.3
<b>Total</b>	<b>402.4</b>	<b>338.9</b>	<b>338.9</b>	<b>-</b>	<b>338.9</b>
<b>Small YBI Projects</b>					
Capital Outlay Support	10.6	10.2	10.2	0.4	10.6
Capital Outlay	15.6	15.2	15.2	0.5	15.7
<b>Total</b>	<b>26.2</b>	<b>25.4</b>	<b>25.4</b>	<b>0.9</b>	<b>26.3</b>
<b>YBI Detour</b>					
Capital Outlay Support	29.5	87.7	87.9	(0.2)	87.7
Capital Outlay	131.9	473.3	473.3	-	473.3
<b>Total</b>	<b>161.4</b>	<b>561.0</b>	<b>561.2</b>	<b>(0.2)</b>	<b>561.0</b>
<b>YBI- Transition Structures</b>					
Capital Outlay Support	78.7	127.5	125.0	8.1	133.1
Capital Outlay	299.4	299.4	290.8	37.7	328.5
<b>Total</b>	<b>378.1</b>	<b>426.9</b>	<b>415.8</b>	<b>45.8</b>	<b>461.6</b>

## Appendix A-2: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through March 31, 2015 (\$ Millions) Cont.

Contract	AB 144 Baseline Budget	TBPOC Current Approved Budget	Expenditures to date and encumbrances as of (03/2015) see Note (1)	Estimated costs not yet spent or encumbered as of (03/2015)	Total Forecast as of (03/2015)
a	b	c	d	e	f = d + e
<b>Oakland Touchdown</b>					
Capital Outlay Support	74.4	118.5	117.7	5.7	123.4
Capital Outlay	283.8	330.6	321.8	10.2	332.0
Total	358.2	449.1	439.5	15.9	455.4
<b>East Span Other Small Projects</b>					
Capital Outlay Support	212.3	197.9	197.9	(0.1)	197.8
Capital Outlay	170.8	141.3	117.4	19.5	136.9
Total	383.1	339.2	315.3	19.4	334.7
<b>Existing Bridge Dismantling</b>					
Capital Outlay Support	79.7	61.9	12.7	73.0	85.7
Capital Outlay	239.2	246.5	101.2	258.6	359.8
Total	318.9	308.4	113.9	331.6	445.5
<b>Antioch Bridge</b>					
Capital Outlay Support	-	23.8	17.4	0.2	17.6
Capital Outlay Support by BATA	-	-	6.2	-	6.2
Capital Outlay	-	47.0	47.0	-	47.0
Total	-	70.8	70.6	0.2	70.8
<b>Dumbarton Bridge</b>					
Capital Outlay Support	-	46.0	38.9	0.5	39.4
Capital Outlay Support by BATA	-	-	6.0	-	6.0
Capital Outlay	-	68.2	64.6	3.6	68.2
Total	-	114.2	109.5	4.1	113.6
Miscellaneous Program Costs	30.0	30.0	25.5	4.5	30.0
Total Capital Outlay Support	1,463.2	1,870.7	1,831.3	106.6	1,937.9
Total Capital Outlay	6,321.8	6,946.1	6,717.1	335.4	7,052.5
Program Total <sup>1</sup>	7,785.0	8,816.8	8,548.4	442.0	8,990.4

(1) Total Capital Outlay Support includes program indirect costs.

(2) BSA provided a distribution of program contingency in December 2004 based on Bechtel Infrastructure Corporation input. This column is subject to revision upon completion of Caltran's risk assessment update.

(3) Construction administration of the OTD Detour is under the YBITS1 contract. Encumbrance is included in YBITS1 contract.

(4) Construction administration of the cantilever segment is under the YBITS2 contract. Encumbrance is included in YBITS2 contract.

(Due to the rounding of numbers, the totals above are shown within \$0.02)

<sup>1</sup> Figures may not sum up to totals due to rounding effects.

## Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through March 31, 2015 (\$ Millions)

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (03/2015)	Cost to Date (03/2015)	Cost Forecast (03/2015)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
San Francisco-Oakland Bay Bridge East Span Replacement Project						
East Span - SAS Superstructure						
Capital Outlay Support	214.6	268.4	483.0	496.8	515.9	32.9
Capital Outlay Construction	1,753.7	293.1	2,046.8	1,987.2	2,047.8	1.0
Total	1,968.3	561.5	2,529.8	2,484.0	2,563.7	33.9
SAS W2 Foundations						
Capital Outlay Support	10.0	(0.8)	9.2	9.2	9.2	-
Capital Outlay Construction	26.4	0.1	26.5	26.4	26.5	-
Total	36.4	(0.7)	35.7	35.6	35.7	-
YBI South/South Detour						
Capital Outlay Support	29.4	58.3	87.7	87.9	87.7	-
Capital Outlay Construction	131.9	341.4	473.3	473.3	473.3	-
Total	161.3	399.7	561.0	561.2	561.0	-
East Span - Skyway						
Capital Outlay Support	197.0	(15.8)	181.2	181.2	181.2	-
Capital Outlay Construction	1,293.0	(55.8)	1,237.2	1,237.3	1,237.2	-
Total	1,490.0	(71.6)	1,418.4	1,418.5	1,418.4	-
East Span - SAS E2/T1 Foundations						
Capital Outlay Support	52.5	(24.1)	28.4	28.4	28.4	-
Capital Outlay Construction	313.5	(38.7)	274.8	274.8	274.8	-
Total	366.0	(62.8)	303.2	303.2	303.2	-
YBI Transition Structures (see notes below)						
Capital Outlay Support	78.7	48.8	127.5	122.9	133.1	5.6
Capital Outlay Construction	299.3	0.1	299.4	255.4	328.5	29.1
Total	378.0	48.9	426.9	378.3	461.6	34.7
* YBI- Transition Structures						
Capital Outlay Support			16.4	16.4	16.4	-
Capital Outlay Construction			-	-	-	-
Total			16.4	16.4	16.4	-
* YBI- Transition Structures Contract No. 1						
Capital Outlay Support			72.1	70.6	72.1	-
Capital Outlay Construction			203.7	195.4	202.9	(0.8)
Total			275.8	266.0	275.0	(0.8)
* YBI- Transition Structures Contract No. 2						
Capital Outlay Support			38.0	35.8	43.6	5.6
Capital Outlay Construction			92.4	60.1	122.3	29.9
Total			130.4	95.8	165.9	35.5
* YBI- Transition Structures Contract No. 3 Landscape						
Capital Outlay Support			1.0	0.1	1.0	-
Capital Outlay Construction			3.3	-	3.3	-
Total			4.3	-	4.3	-

## Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through March 31, 2015 (\$ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (03/2015)	Cost to Date (03/2015)	Cost Forecast (03/2015)	At- Completion Variance
a	c	d	e = c + d	f	g	h = g - e
Oakland Touchdown (see notes below)						
Capital Outlay Support	74.4	44.1	118.5	117.3	123.4	4.9
Capital Outlay Construction	283.8	46.8	330.6	313.3	332.0	1.4
Total	358.2	90.9	449.1	430.6	455.4	6.3
* OTD Prior-to-Split Costs						
Capital Outlay Support			21.7	20.0	21.7	-
Capital Outlay Construction			-	-	-	-
Total			21.7	20.0	21.7	-
* OTD Submarine Cable(1)						
Capital Outlay Support			0.9	0.9	0.9	-
Capital Outlay Construction			5.7	5.7	5.7	-
Total			6.6	6.6	6.6	-
* OTD No. 1 (Westbound)						
Capital Outlay Support			51.3	51.2	51.3	-
Capital Outlay Construction			205.3	205.3	205.3	-
Total			256.6	256.5	256.6	-
* OTD No. 2 (Eastbound)						
Capital Outlay Support			35.0	36.5	37.9	2.9
Capital Outlay Construction			72.6	60.0	76.0	3.4
Total			107.6	96.5	113.9	6.3
* OTD Touchdown 2 Detour(2)						
Capital Outlay Support			8.1	7.9	8.4	0.3
Capital Outlay Construction			47.0	42.2	46.8	(0.2)
Total			55.1	50.1	55.2	0.1
* OTD Electrical Systems						
Capital Outlay Support			1.5	0.8	1.5	-
Capital Outlay Construction			-	-	-	-
Total			1.5	0.8	1.5	-
Existing Bridge Dismantling						
Capital Outlay Support	79.7	(17.8)	61.9	12.1	85.7	23.8
Capital Outlay Construction	239.2	7.3	246.5	23.6	359.8	113.3
Total	318.9	(10.5)	308.4	35.7	445.5	137.1
* Bridge Dismantling Prior-to-Split Cost						
Capital Outlay Support			3.9	3.9	3.9	
Capital Outlay Construction			-	-	-	
Total			3.9	3.9	3.9	
* Cantilever Section						
Capital Outlay Support			17.0	1.4	17.0	
Capital Outlay Construction			69.0	23.6	68.4	
Total			86.0	25.0	85.4	
* 504/288 Sections						
Capital Outlay Support			21.0	3.9	27.2	
Capital Outlay Construction			103.5	-	111.7	
Total			124.5	3.9	138.9	

## Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through March 31, 2015 (\$ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (03/2015)	Cost to Date (03/2015)	Cost Forecast (03/2015)	At- Completion Variance
a	c	d	e = c + d	f	g	h = g - e
<b>*Marine Foundations</b>						
Capital Outlay Support			20.0	2.8	37.6	
Capital Outlay Construction			-	-	179.7	
Total			20.0	2.8	217.3	
Sunk Cost for Marine Foundation			-	2.8	2.8	
<b>Pier-3 Demonstration Project</b>						
Capital Outlay Support			-	-	3.7	
Capital Outlay Construction			-	-	20.0	
Total			-	-	23.7	
<b>Remaining Marine Foundations<sup>2</sup></b>						
Capital Outlay Support			-	-	31.1	
Capital Outlay Construction			-	-	159.7	
Total			-	-	190.8	
<b>YBI/SAS Archeology</b>						
Capital Outlay Support	1.1	-	1.1	1.1	1.1	-
Capital Outlay Construction	1.1	-	1.1	1.1	1.1	-
Total	2.2	-	2.2	2.2	2.2	-
<b>YBI - USCG Road Relocation</b>						
Capital Outlay Support	3.0	(0.3)	2.7	2.7	3.0	0.3
Capital Outlay Construction	3.0	(0.2)	2.8	2.8	3.0	0.2
Total	6.0	(0.5)	5.5	5.5	6.0	0.5
<b>YBI - Substation and Viaduct</b>						
Capital Outlay Support	6.5	(0.1)	6.4	6.4	6.5	0.1
Capital Outlay Construction	11.6	(0.3)	11.3	11.3	11.6	0.3
Total	18.1	(0.4)	17.7	17.7	18.1	0.4
<b>Oakland Geofill</b>						
Capital Outlay Support	2.5	-	2.5	2.5	2.5	-
Capital Outlay Construction	8.2	-	8.2	8.2	8.2	-
Total	10.7	-	10.7	10.7	10.7	-
<b>Pile Installation Demonstration Project</b>						
Capital Outlay Support	1.8	-	1.8	1.8	1.8	-
Capital Outlay Construction	9.3	(0.1)	9.2	9.3	9.3	-
Total	11.1	(0.1)	11.0	11.1	11.1	-
<b>Stormwater Treatment Measures</b>						
Capital Outlay Support	6.0	2.2	8.2	8.2	8.2	-
Capital Outlay Construction	15.0	3.3	18.3	16.9	17.3	(1.0)
Total	21.0	5.5	26.5	25.1	25.5	(1.0)
<b>Right-of-Way and Environmental Mitigation</b>						
Capital Outlay Support	-	-	-	-	-	-
Capital Outlay & Right-of-Way	72.4	-	72.4	51.9	69.0	(3.4)
Total	72.4	-	72.4	51.9	69.0	(3.4)

<sup>1</sup> Figures may not sum up to totals due to rounding effects.

<sup>2</sup> The forecast shown for the remaining marine foundation contract is the implosion alternative. For the conventional alternative, the forecast is \$254.3 million.



## Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through March 31, 2015 (\$ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (03/2015)	Cost to Date (12/ 03/2015))	Cost Forecast (03/2015)	At- Completion Variance
a	c	d	e = c + d	f	g	h = g - e
<b>Sunk Cost - Existing East Span Retrofit</b>						
Capital Outlay Support	39.5	-	39.5	39.5	39.5	-
Capital Outlay Construction	30.8	-	30.8	30.8	30.8	-
Total	70.3	-	70.3	70.3	70.3	-
<b>Other Capital Outlay Support</b>						
Environmental Phase	97.7	0.1	97.8	97.8	97.7	(0.1)
Pre-Split Project Expenditures	44.9	-	44.9	44.9	44.9	-
Non-Project Specific Costs	20.0	(16.8)	3.2	3.2	3.2	-
Total	162.6	(16.7)	145.9	145.9	145.8	(0.1)
Subtotal Capital Outlay Support	959.3	346.2	1,305.5	1,263.9	1,373.0	67.5
Subtotal Capital Outlay Construction	4,492.2	597.0	5,089.2	4,723.6	5,230.2	141.0
Other Budgeted Capital	35.1	(32.8)	2.3	0.7	2.3	-
<b>Total SFOBB East Span Replacement Project</b>	<b>5,486.6</b>	<b>910.4</b>	<b>6,397.0</b>	<b>5,988.2</b>	<b>6,605.5</b>	<b>208.5</b>



Demolition Worker on an a Section of the East Span  
Of the Former Oakland-San Francisco Bay Bridge



**Project  
Photos**

## Appendix E: Project Progress Photographs

### Self-Anchored Suspension Bridge (SAS)



Bike Path Construction Progress



Dismantling Progress



Lowering of Crane from Old San Francisco-Oakland Bay Bridge



Aerial View of Dismantling Progress



Lowering the Crane from the Dismantling Project



WAGG 2-B  
430

7' 10" 100

VALVE

## Appendix E: Project Progress Photographs

### Oakland Touchdown (OTD)



Aerial View of Oakland Touchdown Construction





## Appendix E: Project Progress Photographs

### Yerba Buena Island Transition Structure (YBITS)



Yerba Buena Island Transition Structures Demolition Progress



## Appendix F: Glossary of Terms

# Glossary of Terms

**AB 144/SB 66 BUDGET:** The planned allocation of resources for the Toll Bridge Seismic Retrofit Program, or subordinate projects or contracts, as provided in Assembly Bill 144 and Senate Bill 66, signed into law by Governor Schwarzenegger on July 18, 2005, and September 29, 2005, respectively.

**AB 144/SB 66 PROJECT COMPLETE BASELINE:** The planned completion date for the Toll Bridge Seismic Retrofit Program or subordinate projects or contracts.

**APPROVED CHANGES:** For cost, changes to the AB 144/SB 66 Budget or BATA Budget as approved by the Bay Area Toll Authority Commission. For schedule, changes to the AB 144/SB 66 Project Complete Baseline approved by the Toll Bridge Program Oversight Committee, or changes to the BATA Project Complete Baseline approved by the Bay Area Toll Authority Commission.

**AT COMPLETION VARIANCE or VARIANCE (cost):** The mathematical difference between the Cost Forecast and the Current Approved Budget.

**BATA BUDGET:** The planned allocation of resources for the Regional Measure 1 Program, or subordinate projects or contracts as authorized by the Bay Area Toll Authority as of June 2005.

**BATA PROJECT COMPLETE BASELINE:** The planned completion date for the Regional Measure 1 Program or subordinate projects or contracts.

**COST FORECAST:** The current forecast of all of the costs that are projected to be expended so as to complete the given scope of the program, project, or contract.

**COST TO DATE:** The actual expenditures incurred by the program, project or contract as of the month and year shown.

**CURRENT APPROVED BUDGET:** The sum of the AB 144/SB 66 Budget or BATA Budget and Approved Changes.

**HINGE PIPE BEAMS:** Pipes between roadway sections designed to move within their sleeves during expansion or contraction of the decks during minor events, such as changes in temperature. The beams are designed to absorb the energy of an earthquake by deforming in their middle or “fuse” section. Hinge pipe beams are also found at the western piers where the SAS connects to the YBITS (Hinge “K” pipe beams).

**PROJECT COMPLETE CURRENT APPROVED SCHEDULE:** The sum of the AB 144/SB 66 Project Complete Baseline or BATA Project Complete Baseline and Approved Changes.

**PROJECT COMPLETE SCHEDULE FORECAST:** The current projected date for the completion of the program, project, or contract.

**SCHEDULE VARIANCE or VARIANCE (schedule):** The mathematical difference expressed in months between the Project Complete Schedule Forecast and the Project Complete Current Approved Schedule.

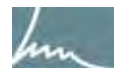
**% COMPLETE:** % Complete is based on an evaluation of progress on the project, expenditures to date, and schedule.



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*The information in this report is provided in accordance with California Government code Section 755. This document is one of a series of reports prepared for the Bay Area Toll Authority (BATA)/Metropolitan Transportation Commission (MTC) on the Toll Bridge Seismic Retrofit and Regional Measure 1 Programs. The contract value for the monitoring efforts, technical analysis, and field site works that contribute to these reports, as well as the report preparation and production is \$1,574,873.73.*



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New San Francisco-Oakland Bay Bridge on left and Temporary Detour Dismantling and Dismantling of Old Bay Bridge on right

