

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

## 2013 Second Quarter Project Progress and Financial Update



TOLL BRIDGE PROGRAM  
OVERSIGHT COMMITTEE

CALTRANS BAY AREA TOLL AUTHORITY CALIFORNIA TRANSPORTATION COMMISSION

Released: August 2013



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

LEFT

EXIT 4

Treasure Island  
Yerba Buena Island

1/2 MILE





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

August 15, 2013

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 2013 Second 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 is tasked to perform project oversight and control over the TBSRP and comprises 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). This second quarter report includes project progress and activities for the TBSRP through June 30, 2013, with more recent progress and actions addressed in this letter.

Recently, much focus has been placed on failed anchor rods on the new self-anchored suspension (SAS) span of the San Francisco-Oakland Bay Bridge. On July 8, 2013, the TBPOC released our investigative report that laid out length the chronology of events and assigned proper responsibility as warranted for the rod failures. The report made the following determinations:

- The rods failed due to near-term hydrogen embrittlement. The failed rods were fabricated in 2008, separate from other similar rods used on the project. The 2008 rods exhibited a material susceptible to hydrogen embrittlement with a heterogeneous structure and high surface hardness.
- It is safe to open the new East Span after replacing the clamping capacity lost by the failed 2008 rods with a steel saddle retrofit. The retrofit is currently being fabricated with completion forecast for early December 2013.
- Caltrans has performed an extensive review of the remaining rods of similar type to the failed rods on the bridge and has determined that risk of failure by near-term hydrogen embrittlement has passed for these rods. However, there is a potential for longer-term (years and decades) stress corrosion cracking on certain rods. This potential risk can be managed safely and effectively after the bridge is placed into service.

Because of the superior strength of the new East Span design compared to the old East Span, the Toll Bridge Seismic Safety Peer Review Panel (TBSSPRP) supported a proposal for an interim fix at Pier E2 that could be installed prior to completion of the steel saddle retrofit. The TBPOC asked the Federal Highway Administration (FHWA) and two preeminent bridge engineers from the firms of Buckland & Taylor, Ltd., and Modjeski and Masters to review this recommendation. All reviews have reached the same unequivocal conclusion that the interim retrofit will adequately protect and allow for the opening of the new East Span while the permanent retrofit is under construction.

As a result, on August 15<sup>th</sup>, the TBPOC met in public session to approve the five-day closure over the Labor Day weekend from the evening of August 28, 2013 through the morning of September 3, 2013 to move traffic onto the new East Span.

As of the end of the second quarter of 2013, the 50 percent probable draw on program contingency is \$103 million. The potential draw ranges from about \$25 million to \$175 million. The current \$329 million program contingency balance can be used to cover the costs of these identified risks. In accordance with the approved TBSRP Risk Management Plan, risk mitigation actions are continuously developed and implemented to reduce the potential draw on the program contingency.

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,



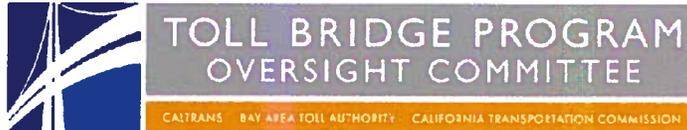
STEVE HEMINGER  
TBPOC Chair  
Executive Director  
Bay Area Toll Authority



ANDRE BOUTROS  
Executive Director  
California Transportation Commission



MALCOLM DOUGHERTY  
Director  
California Department of Transportation



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

August 15, 2013

Mr. James C. Ghielmetti, Chair  
California Transportation Commission  
1120 N Street, Room 2221  
Sacramento, CA 95814

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

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TBPOC Chair  
Executive Director  
Bay Area Toll Authority



ANDRE BOUTROS  
Executive Director  
California Transportation Commission



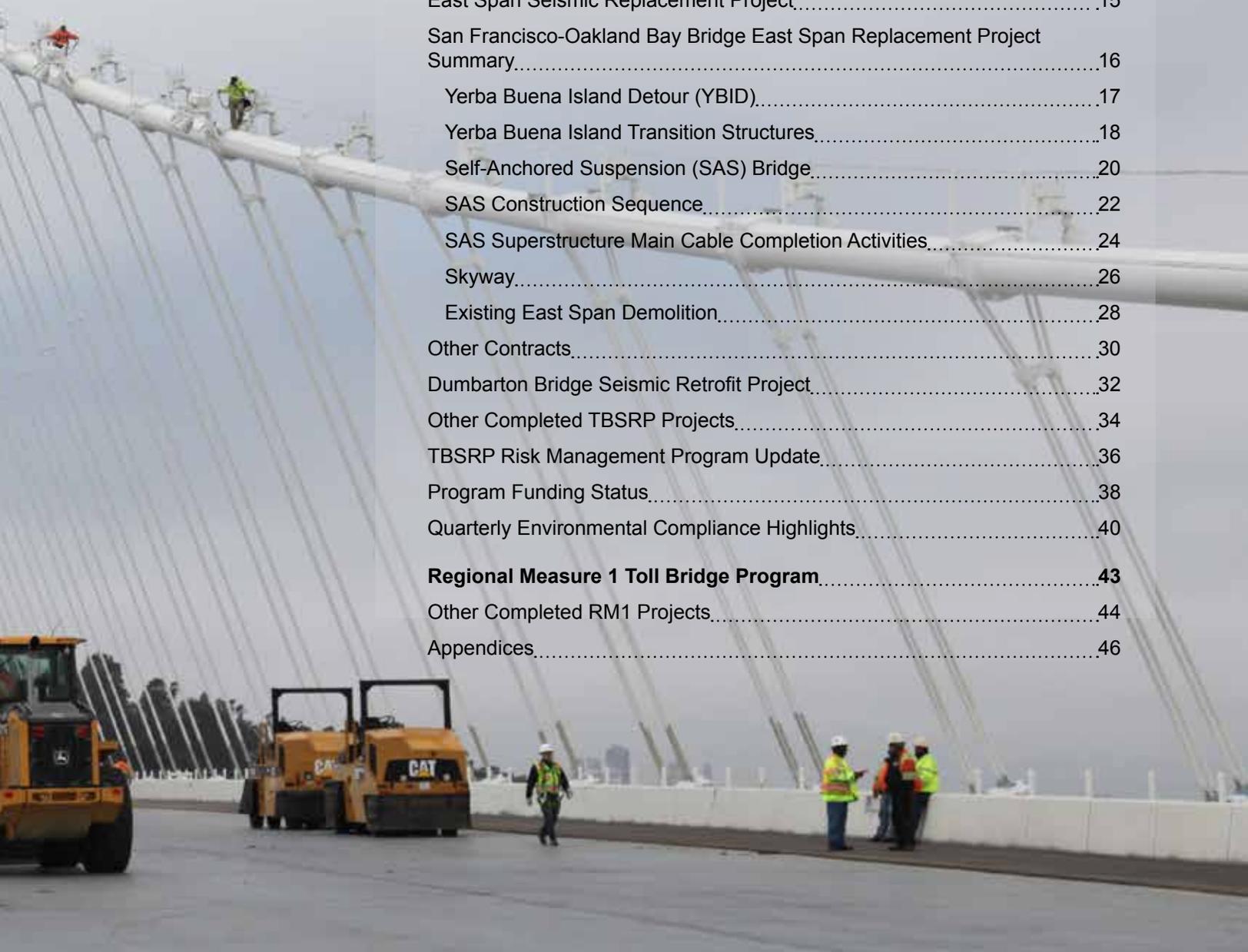
MALCOLM DOUGHERTY  
Director  
California Department of Transportation

The New San Francisco-Oakland Bay Bridge  
Self-Anchored Suspension Bridge Epoxy Asphalt  
Concrete Being Placed

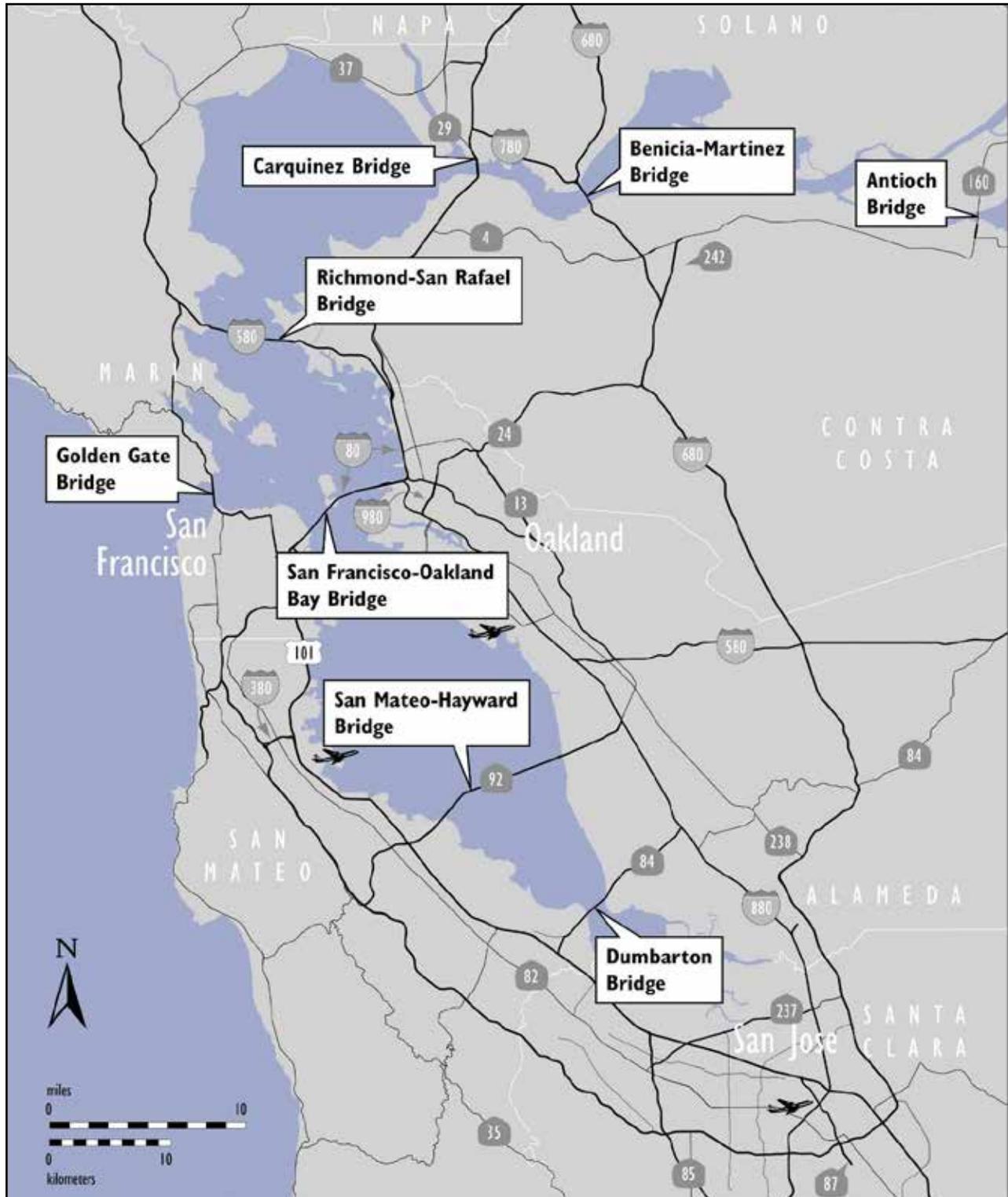


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## Map of Bay Area Toll Bridges



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

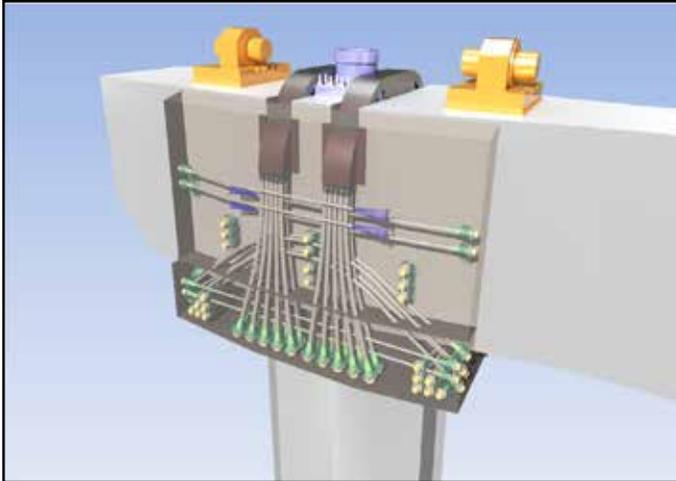
## Introduction

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 Committee), 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 New Benicia-Martinez Bridge is 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. While the rest of the projects in the RM1 program are not directly under the responsibility of the TBPOC, BATA and Caltrans will continue to report on their progress as an informational item. The RM1 program includes:

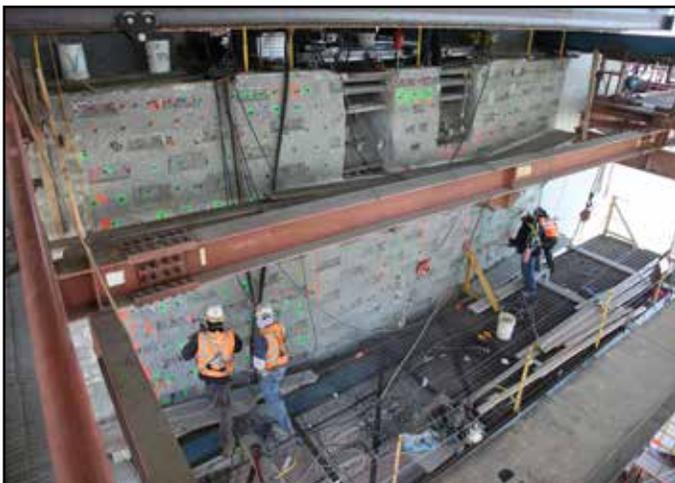
Regional Measure 1 Projects	Open to Traffic Status
Interstate 880/State Route 92 Interchange Reconstruction	Open
1962 Benicia-Martinez Bridge Reconstruction	Open
New Benicia-Martinez Bridge	Open
Richmond-San Rafael Bridge Deck Overlay Rehabilitation	Open
Richmond-San Rafael Bridge Trestle, Fender & Deck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



Rendering of E2 Saddle Retrofit Strategy



Cross Section of an E2 Shear Key Broken Bolt



E2 Saddle Retrofit Construction in Progress

## The San Francisco-Oakland Bay Bridge Bolt Issues

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. A total of 32 out of the 96 anchor bolts broke before Caltrans directed the contractor to reduce the anchor bolt tension to prevent further failures.

A forensic metallurgic examination was jointly performed with both the contractor's and Caltrans' Materials Engineering and Testing Services' (METS) metallurgical experts. It was determined that while the failed bolts' material properties did meet the contract specifications, the hardness properties were at the upper limit and the ductility and toughness properties were at the lower limit. Taking this high-end hardness and low-end ductility into account and combining it with a high tensile stress (0.70 Fu) makes this material more susceptible to the effects of hydrogen cracking (also known as hydrogen embrittlement). The metallurgical examination indicated that the bolts were susceptible to hydrogen embrittlement due to a lack of uniformity in the microstructure of the rods.

The anchor bolts at shear keys S1 and S2 are uniquely different from the anchor bolts at the remaining shear keys and bearings (known as shear keys S3 and S4 and bearings B1, B2, B3, and B4) in that they were manufactured in 2008 as opposed to the remaining ones in 2010. In addition, due to physical limitations, the anchor bolts at shear keys S1 and S2 have their anchors fully cast into the pier E2 cap and are not replaceable, as opposed to the remaining shear keys and bearings which are through bolted and thus replaceable. As such, shear keys S1 and S2 will require an alternate anchorage solution.

On July 8, 2013, the TBPOC released its investigative report that laid out the chronology of events and assigned proper responsibility as warranted for the rod failures. The report made the following determinations:

- The rods failed due to near-term hydrogen embrittlement. The failed rods were fabricated in 2008, separate from other similar rods used on the project. The 2008 rods exhibited a material susceptible to hydrogen embrittlement with a heterogeneous structure and high surface hardness.

- It is safe to open the new East Span after replacing the clamping capacity lost by the failed 2008 rods with a steel saddle retrofit. The retrofit is currently being fabricated with completion forecast for early December 2013.
- Caltrans has performed an extensive review of the remaining rods of similar type to the failed rods on the bridge and has determined that risk of failure by near-term hydrogen embrittlement has passed for these rods. However, there is a potential for longer-term (years and decades) stress corrosion cracking on certain rods, though this potential risk can be managed safely and effectively after the bridge is placed into service.



Bolt Hardness Testing

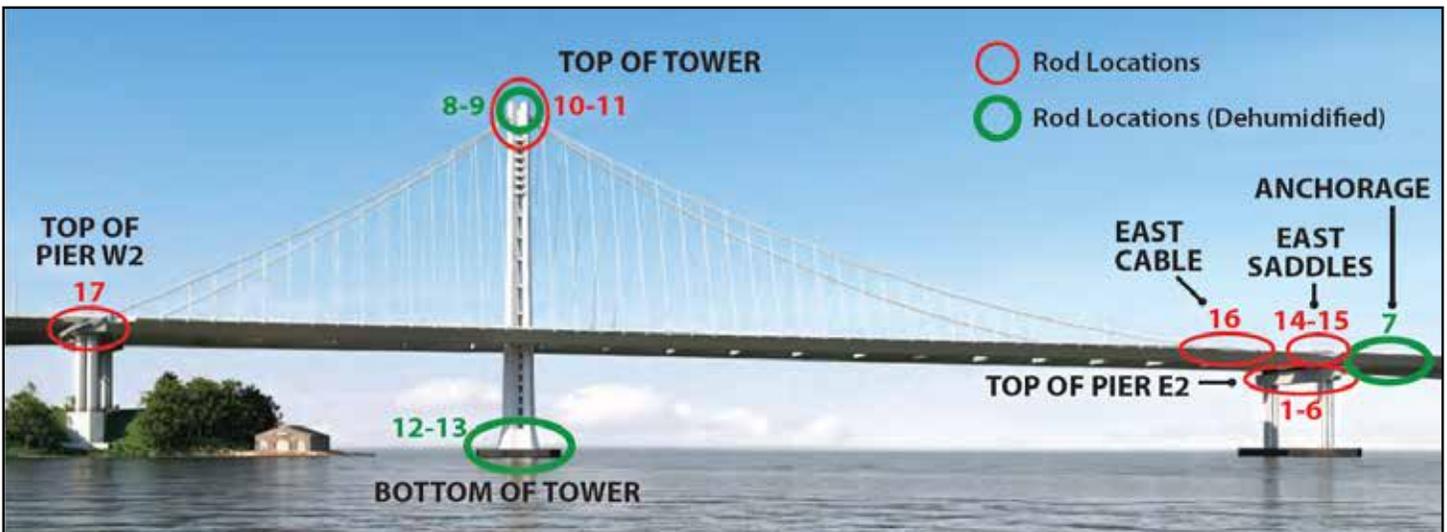
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Drilling Holes at the north Face of Shear Key S2 Base

As a result, on August 15th, the TBPOC met in public session to approve the five-day closure over the Labor Day weekend from the evening of August 28, 2013 through the morning of September 3, 2013 to move traffic onto the new East Span.

## A354 Grade BD Rod Locations on the SAS Bridge



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



The New San Francisco-Oakland Bay Bridge Self-Anchored Suspension Bridge Pedestrian/Bike Path Belvedere under Construction



The New San Francisco-Oakland Bay Bridge Self-Anchored Suspension Bridge Milling the north Face of Shear Key S1 Base



Self-Anchored Suspension Bridge Sandblasting of the East Span Deck in Preparation for Epoxy Asphalt Concrete Overlay

### 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 both increase and decrease as risks are identified, resolved or retired. The program contingency is currently \$329 million in accordance with the TBPOC approved budget. As of the end of the second quarter of 2013, the 50 percent probable draw on program contingency is \$161 million. The potential draw ranges from about \$75 million to \$250 million (refer to Risk Management on page 36).

The current program contingency balance is sufficient to cover the cost of currently identified risks. In accordance with the approved TBSRP Risk Management Plan, risk mitigation actions are continuously being developed and implemented to reduce the potential draw on the program contingency.

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

A joint venture of American Bridge/Fluor (ABF) is constructing the signature Self-Anchored Suspension (SAS) section of the new east span of the San Francisco-Oakland Bay Bridge. The SAS is a self anchoring suspension span with one main cable that anchors to the eastern end of the roadway deck, rather than to the ground anchorages. All major bridge components are now in place – the tower, roadway deck, and main cable and suspenders – and the weight of the span has been transferred from the temporary supports to the main cable.

Aside from the aforementioned replacement of the broken rods, remaining critical activities include painting, paving, striping, and installing and testing of the bridge's mechanical, electrical and plumbing systems. The goal of the TBPOC is to open the bridge to traffic in both directions over the 2013 Labor Day weekend.

## Yerba Buena Island Transition Structure (YBITS) #1 Contract

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

MCM has substantially completed both the eastbound and westbound transition structures from the tunnel to Hinge K and is currently working on the completion of service platforms, lighting poles, signage, retaining walls and slope restoration.

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

The YBITS #2 contract will demolish the detour viaduct after all traffic is shifted 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 demolition, eastbound on ramp and pedestrian/bike path 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 to start after the planned seismic safety opening of the new bridge.

## Oakland Touchdown #2 Contract

Flatiron West, Inc. is the prime contractor constructing the Oakland Touchdown #2 contract that will complete the remaining portions of the Oakland Touchdown approach structures from the existing toll plaza to the new span. The westbound structure and portions of the eastbound structure (not in conflict with the existing span) were constructed under the Oakland Touchdown #1 contract. The OTD #2 construction contract started on June 25, 2012. The mainline structure work is now substantially complete and the contractor is currently concentrating on the eastbound approach to the OTD structure, installation of ductbank conduits and wiring installation, and removal of falsework. After bridge opening, the contractor will complete landscaping of the area and will construct the remaining portion of the permanent bicycle/ pedestrian pathway that is in conflict with the existing bridge by 2014.



The New San Francisco-Oakland Bay Bridge Self-Anchored Suspension Span

## Existing SFOBB Dismantling Contracts

To expedite the opening of a new eastbound on ramp and the pedestrian/bicycle pathway from Yerba Buena Island, the TBPOC decided to split the bridge dismantling project into at least two contracts. The dismantling of the superstructure of the main cantilever section of the existing bridge has been incorporated into the YBITS #2 contract, while the remaining portions of the existing bridge will be removed by separate contracts still in design. Caltrans plans on advertising the demolition of the 504 and 288 superstructures in late 2013. Marine foundation demolition will follow at a later time.



The existing San Francisco-Oakland Bay Bridge Cantilever Section to Be Dismantled as Part of the YBITS #2 Contract

## Antioch Bridge Seismic Retrofit

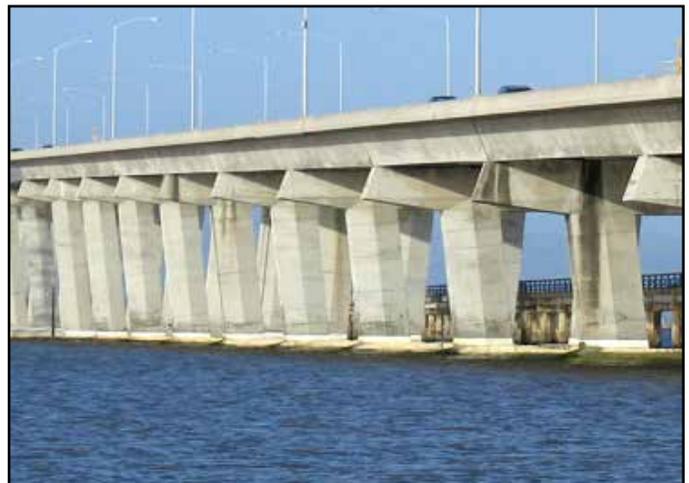
The major retrofit strategy for the bridge includes installing seismic isolation bearings at each of the 41 piers, strengthening piers 12 through 31 with steel cross-bracing between column bents, and installing steel casings at all columns located at the Sherman Island approach slab bridge. Seismic safety opening was achieved on April 12, 2012, and contract was completed on July 13, 2012.



Antioch Bridge

## Dumbarton Bridge Seismic Retrofit

The Dumbarton Bridge is a combination of three bridge types; reinforced concrete slab approaches supported on multiple pile extension columns, and precast pre-stressed concrete girders and steel box girders supported on reinforced concrete piers. The retrofit strategy for the bridge included superstructure and deck modifications and installation of isolation bearings. Seismic safety opening was achieved on January 16, 2013, and the contract was completed on May 15, 2013.



Dumbarton Bridge



The New San Francisco-Oakland Bay Bridge on the left and the Existing Bridge on the right

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

	Contract Status	AB 144/SB 66 Budget (September 2005)	TBPOC Approved Changes	Current TBPOC Approved Budget (June 2013)	Cost to Date (June 2013)	Current Cost Forecast (June 2013)	Cost Variance	Cost Status
		a	b	c = a + b	d	e	f = e - c	
<b>SFOBB East Span Seismic Replacement</b>								
Capital Outlay Construction								
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	278.6	3.8	●
SAS Superstructure	Construction	1,753.7	293.1	2,046.8	1,823.1	2,081.3	34.5	●
YBI Detour	Completed	131.9	334.2	466.1	466.1	473.3	7.2	●
YBI Transition Structures (YBITS)		299.3	(3.9)	295.4	192.7	315.1	19.7	●
YBITS 1	Construction			199.7	182.8	214.1	14.4	●
YBITS 2 Cantilever and Demo	Awarded			92.4	9.9	97.7	5.3	●
YBITS Landscaping	Design			3.3	-	3.3	-	●
Oakland Touchdown (OTD)		283.8	39.9	323.7	259.7	330.1	6.4	●
OTD 1	Completed			205.0	204.8	203.3	(1.7)	●
OTD 2	Construction			62.0	21.5	73.4	11.4	●
Detour	Completed			51.0	27.7	43.8	(7.2)	●
OTD Electrical Systems	Design			-	-	-	-	●
Submerged Electric Cable	Completed			5.7	5.7	9.6	3.9	●
Existing Bridge Demolition	Design	239.2	(0.1)	239.1	-	233.3	(5.8)	●
*Cantilever Section	Awarded			-	-	59.9		●
*504/288 Sections	Design			-	-	88.4		●
*Marine Foundations	Design			-	-	85.0		●
Stormwater Treatment Measures	Completed	15.0	3.3	18.3	16.9	18.3	-	●
Other Completed Contracts	Completed	90.4	(0.5)	89.9	90.0	90.5	0.6	●
Capital Outlay Support		959.3	262.3	1,221.6	1,148.0	1,287.8	66.2	●
Right-of-Way and Environmental Mitigation		72.4	-	72.4	51.7	80.4	8.0	●
Other Budgeted Capital		35.1	(32.8)	2.3	0.7	7.7	5.4	●
<b>Total SFOBB East Span Replacement</b>		<b>5,486.6</b>	<b>801.0</b>	<b>6,287.6</b>	<b>5,561.0</b>	<b>6,433.6</b>	<b>146.0</b>	
<b>Antioch Bridge Seismic Retrofit</b>								
Capital Outlay Construction and Mitigation	Completed		51.0	51.0	47.0	50.3	(0.7)	●
Capital Outlay Support			31.0	31.0	23.5	23.8	(7.2)	●
<b>Total Antioch Bridge Seismic Retrofit</b>		<b>-</b>	<b>82.0</b>	<b>82.0</b>	<b>70.5</b>	<b>74.1</b>	<b>(7.9)</b>	●
<b>Dumbarton Bridge Seismic Retrofit</b>								
Capital Outlay Construction and Mitigation	Completed		92.7	92.7	63.1	68.2	(24.5)	●
Capital Outlay Support			56.0	56.0	43.7	45.4	(10.6)	●
<b>Total Dumbarton Bridge Seismic Retrofit</b>		<b>-</b>	<b>148.7</b>	<b>148.7</b>	<b>106.8</b>	<b>113.6</b>	<b>(35.1)</b>	●
Other Program Projects		2,268.4	(63.6)	2,204.8	2,164.3	2,192.5	(12.3)	
Miscellaneous Program Costs		30.0	-	30.0	25.5	30.0	-	●
<b>Net Programmatic Risks</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>70.7</b>	<b>70.7</b>	●
<b>Program Contingency</b>		<b>900.0</b>	<b>(571.1)</b>	<b>328.9</b>	<b>-</b>	<b>167.5</b>	<b>(161.4)</b>	●
<b>Total Toll Bridge Seismic Retrofit Program<sup>2</sup></b>		<b>8,685.0</b>	<b>397.0</b>	<b>9,082.0</b>	<b>7,928.1</b>	<b>9,082.0</b>	<b>-</b>	

## 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 (June 2013)	Current Completion Forecast (June 2013)	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 26
SAS Marine Foundations	Jun 2008	(5)	Jan 2008	Jan 2008	-	●	See Page 20
SAS Superstructure	Mar 2012	29	Aug 2014	Aug 2014	-	●	See Page 21
YBI Detour	Jul 2007	39	Oct 2010	Oct 2010	-	●	See Page 17
YBI Transition Structures (YBITS)	Nov 2013	27	Feb 2016	Feb 2016	-		See Page 18
YBITS 1			Dec 2013	Dec 2013	-		
YBITS 2			Feb 2016	Feb 2016	-	●	
Oakland Touchdown	Nov 2013	10	Sep 2014	Sep 2014	-	●	See Page 27
OTD 1			Jun 2010	Jun 2010	-	●	
OTD 2			Sep 2014	Sep 2014	-	●	
Submerged Electric Cable			Jan 2008	Jan 2008	-	●	
Existing Bridge Demolition	Sep 2014	18	Dec 2015	March 2017	15	●	
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	27	Dec 2013	Sep 2013	(3)	●	
Eastbound Seismic Safety Open	Sep 2012	15	Dec 2013	Sep 2013	(3)	●	
Bike/Ped Pathway Open to YBI			Sep 2015	Sep 2015	-	●	
Permanent Eastbound On Ramp Open			Sep 2015	Sep 2015	-		
Oakland Detour Eastbound Open			May 2011	May 2011	-	●	
Oakland Detour Westbound Open			Feb 2012	Feb 2012	-	●	
OTD Westbound Access			Aug 2009	Aug 2009	-	●	
YBI Detour Open			Sep 2009	Sep 2009	-		See Page 17
<b>Antioch Bridge Seismic Retrofit</b>							
See Page 35							
Contract Completion			Jul 2012	Jul 2012	-		
Seismic Safety Completion			Apr 2012	Apr 2012	-	●	
<b>Dumbarton Bridge Seismic Retrofit</b>							
See Page 32							
Contract Completion			Sep 2013	Mar 2013	(6)	●	
Seismic Safety Completion			Sep 2013	Jan 2013	(6)		

● 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

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

<sup>(2)</sup> Construction administration of the OTD Detour is under the YBITS#1 contract.

<sup>(3)</sup> Construction administration of the Cantilever segment will be under the YBITS#2 contract.

## Regional Measure 1 Program Cost Summary (Millions)

	Contract Status	BATA Baseline Budget (July 2005)	BATA Approved Changes	Current BATA Approved Budget (June 2013)	Cost to Date (June 2013)	Current Cost Forecast (June 2013)	Cost Variance	Cost Status
		a	b	c = a + b	d	e	f = e - c	
<b>Interstate 880/Route 92 Interchange Reconstruction</b>								
Capital Outlay Construction	Complete	94.8	68.4	163.2	150.2	163.2	-	●
Capital Outlay Support		28.8	35.8	64.6	62.2	64.6	-	●
Capital Outlay Right-of-Way		9.9	7.3	17.2	15.4	17.2	-	●
Project Reserve		0.3	(0.3)	-	-	-	-	
<b>Total I-880/SR-92 Interchange Reconstruction</b>		<b>133.8</b>	<b>111.2</b>	<b>245.0</b>	<b>227.8</b>	<b>245.0</b>	-	
Other Completed Program Projects		1,978.8	182.6	2,161.4	2,089.4	2,161.4	-	
<b>Total Regional Measure 1 Toll Bridge Program <sup>1</sup></b>		<b>2,112.6</b>	<b>293.8</b>	<b>2,406.4</b>	<b>2,317.2</b>	<b>2,406.4</b>	-	

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

## Regional Measure 1 Program Schedule Summary

	BATA Baseline Completion Schedule (September 2005)	BATA Approved Changes (Months)	Current BATA Approved Completion Schedule (June 2013)	Current Completion Forecast (June 2013)	Schedule Variance (Months)	Schedule Status	Remarks/Notes
	g	h	i=g+h	j	k=j-i	l	
<a href="#">Interstate 880/Route 92 Interchange Reconstruction</a>							
Contract Completion							
Interchange Reconstruction	Dec 2010	9	Sep 2011	Sep 2011	-	●	See Page 45



The New Self-Anchored Suspension Bridge Shear Key Saddle Retrofit Strategy Construction in Progress



**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

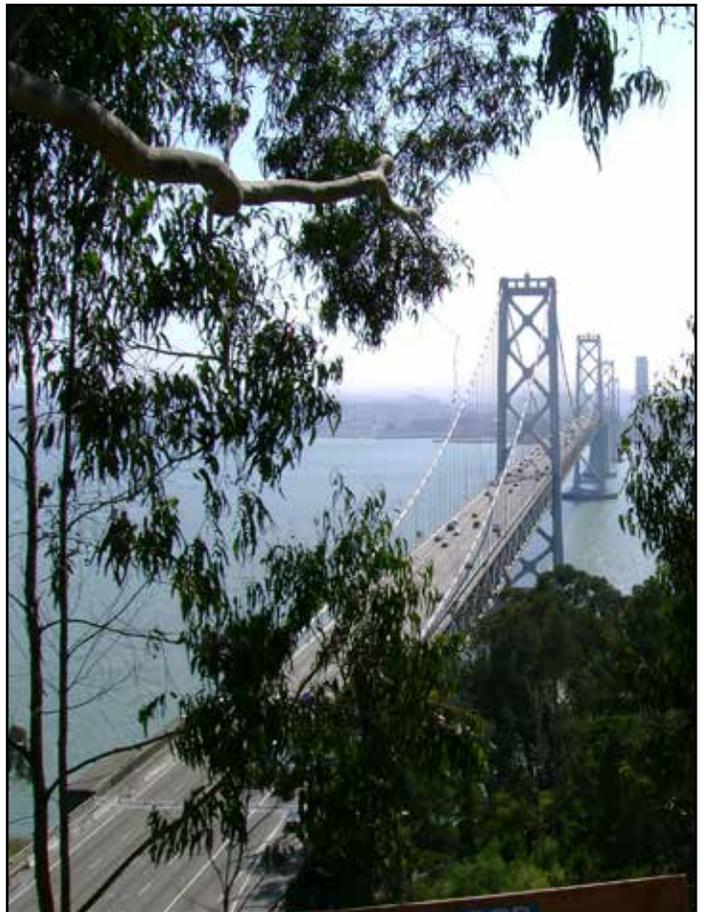
**Project Status: Completed 2009**

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. This project was completed on April 8, 2009.

#### 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: **In Construction**

Rather than a seismic retrofit, the two-mile long East Span is being completely rebuilt. When completed, the new East Span will consist of several different sections, but will appear as a single streamlined span. The eastbound and westbound lanes of the East Span will no longer include upper and lower decks. The lanes will instead be side-by-side, providing motorists with expansive views of the bay. These views will also be enjoyed by bicyclists and pedestrians, thanks to a new bike/pedestrian path on the south side of the bridge that will extend all the way to Yerba Buena Island. The new span is aligned north of the existing bridge to allow traffic to continue to flow on the existing bridge as crews build the new span.

The new span will feature the world's longest Self-Anchored Suspension (SAS) bridge that will be connected to an elegant roadway supported by piers (Skyway), which will gradually slope down toward the Oakland shoreline (Oakland Touchdown). A new transition structure on Yerba Buena Island (YBI) will connect the SAS to the YBI Tunnel and will transition the East Span's side-by-side traffic to the upper and lower decks of the tunnel and West Span.

When construction of the new East Span has been completed and vehicles have been safely rerouted to it, the original East Span will be demolished.



The New Self-Anchored Suspension Bridge and YBITS Eastbound Roadway Deck Construction Complete with Lighting Poles Installed

# TOLL BRIDGE SEISMIC RETROFIT PROGRAM

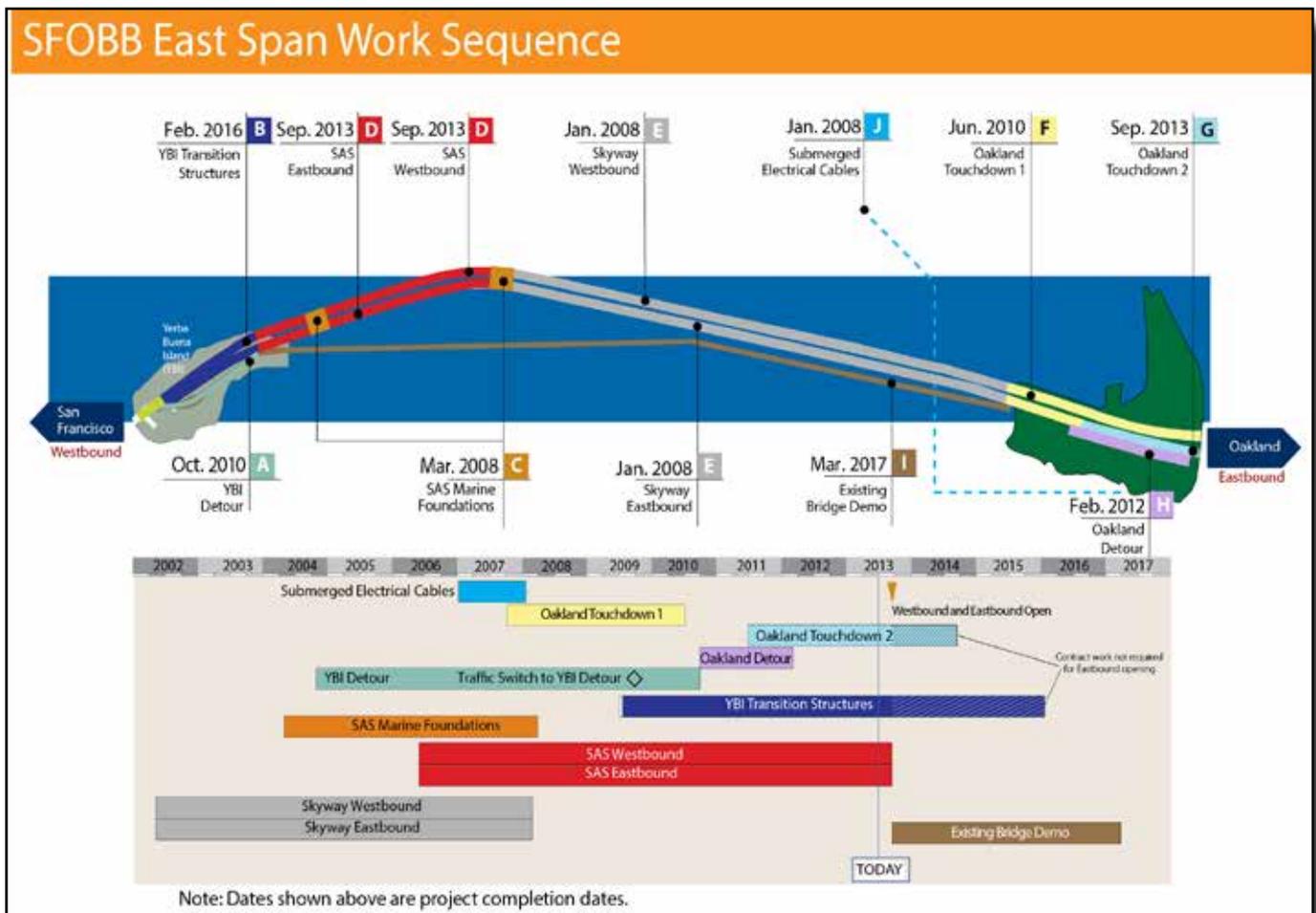
## San Francisco-Oakland Bay Bridge East Span Replacement Project Summary

The new East Span bridge can be 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 is being constructed by one to three separate contracts that have been 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.



Overview of the New San Francisco-Oakland Bay Bridge East Span Construction 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 will use this detour, just south of the original roadway, until traffic is moved onto the new East Span.

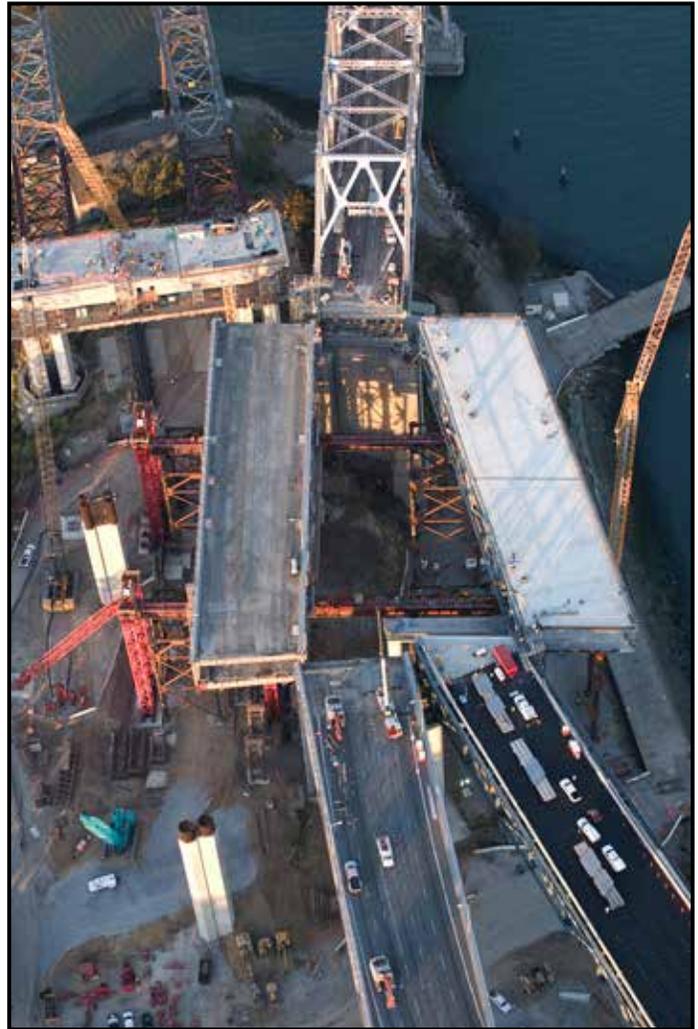
#### A YBID Contract

Contractor: C.C. Myers, Inc.

Approved Capital Outlay Budget: \$466.1 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 reduce project risks.



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



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) will connect 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 will be cast-in-place reinforced concrete structures that will look very similar to the already constructed Skyway structures. While some YBITS foundations and columns were advanced by the YBID contract, the remaining work is being completed under three separate YBITS contracts.

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

Contractor: MCM Construction, Inc.

Approved Capital Outlay Budget: \$199.7 M

Status: 86% Complete as of June 2013

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

**Status:** The contractor is working on the backfilling of the retaining wall and restoration of the slope. MCM installed the sign structures for the west and eastbound roadway decks and continues to work on the bike path support, lighting poles, service platforms, conduits and wiring installation for lighting.

#### YBITS #2 and Cantilever Demolition Contract

Contractor: CEC & Silverado (JV)

Approved Capital Outlay Budget: \$92.4 M

Status: Contract Awarded

The YBITS #2 contract will demolish the detour viaduct after all traffic is shifted 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 demolition, and bike path 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 to start after the planned seismic safety opening of the new bridge.

**Status:** The contractor is in the process of preparing RFIs, CCOs, SWPPP and a bird nesting monitoring program.

#### YBITS Landscaping Contract

Contractor: TBD

Approved Capital Outlay Budget \$3.3 M

Status: In Design

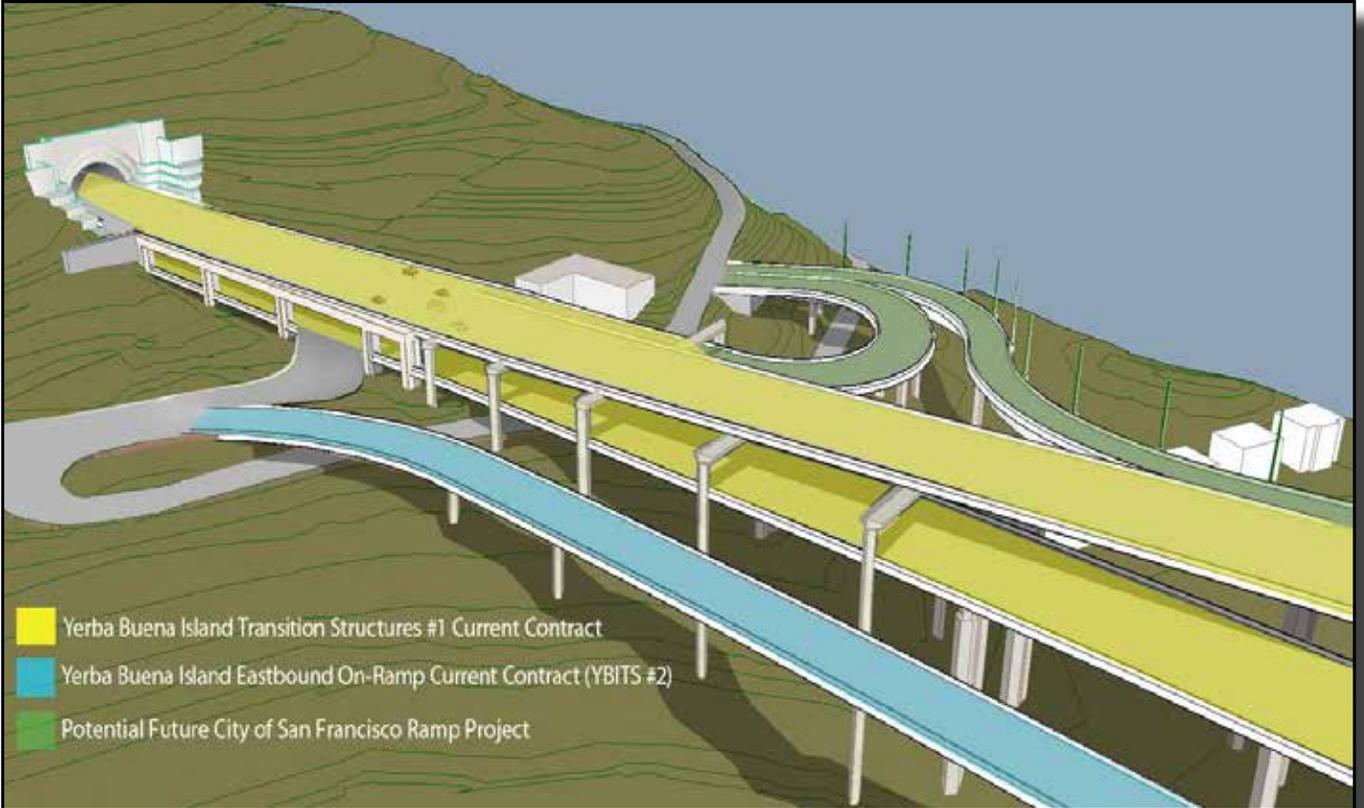
Upon completion of the YBITS #2 work, a follow-on landscaping contract will be executed to replant and landscape the area.



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



Aerial View of the Yerba Buena Island Transition Structures and the YBID Detour Structure



## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

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

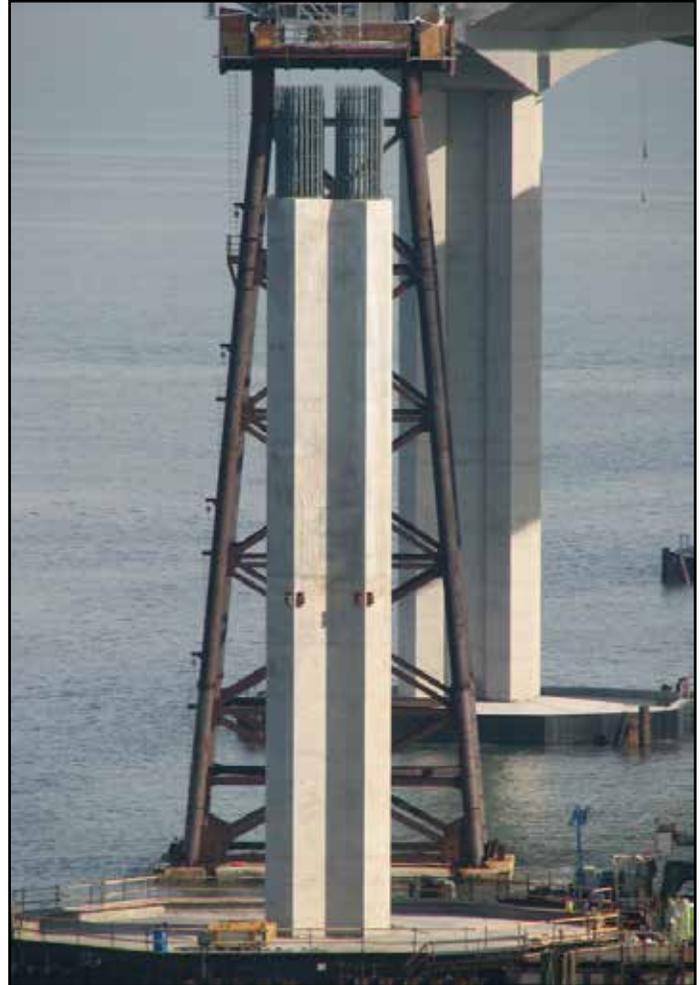
If one single element bestows world class status on the new Bay Bridge East Span, it is the Self-Anchored Suspension (SAS) bridge. This engineering marvel will be the world's largest SAS span at 2,047 feet in length, as well as the first bridge of its kind built with a single tower.

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 (see rendering on facing page) 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: 93% Complete as of June 2013

The SAS 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 will appear to be two main cables on the SAS, it is actually a single continuous cable. This single cable will be 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.

Two hundred steel wire suspender ropes attached to 100 cable bands along the single main cable did the heavy lifting during load transfer. Sets of suspender ropes were gradually tensioned using hydraulic jacks. As each cable

band carries two ropes, there are four hydraulic jacks (each exerting as much as 400 tons of force) at each corresponding location along the outside of the road decks tensioning and pulling the ropes into position. Following load transfer, remaining critical activities include wrapping of the main cable, painting, paving, striping, and installing and testing of the bridge's mechanical, electrical, and plumbing systems. The TBPOC's goal is to open the bridge to traffic in both directions by September 2013.

**Status:** The SAS eastbound deck epoxy asphalt concrete overlay placement began on June 21, 2013 and will be completed in July 2013. The travelers have been installed and are being tested. PWS cable painting, suspender cleaning, caulking and touch-up painting is ongoing. Hinge A pipe beam installation was completed in May 2013. Electrical, mechanical and piping installation is ongoing. Lighting pole and barrier installation is ongoing.



Architectural Rendering of New Self-Anchored Suspension Span and Skyway

## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### Self-Anchored Suspension (SAS) Construction Sequence

#### STEP 1 - CONSTRUCT TEMPORARY SUPPORT STRUCTURES

All temporary support foundations and structures were completed between the Skyway and Yerba Buena Island by September 2010 to support the westbound and eastbound roadway box erections.

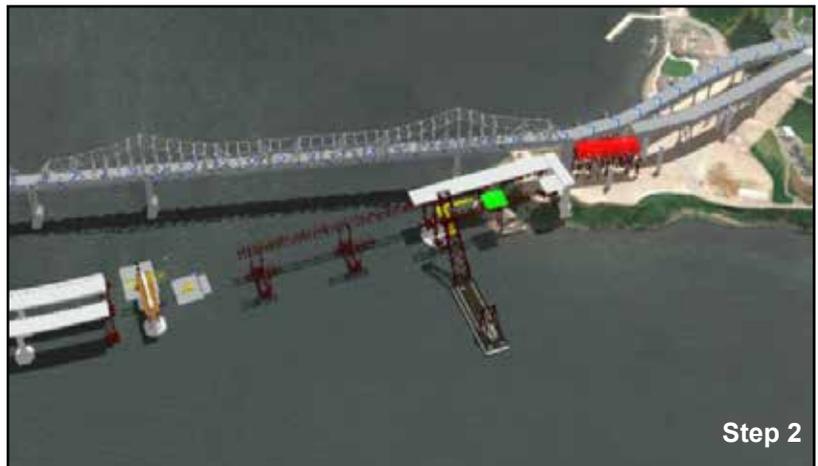
**Status:** Removal of the westbound and eastbound temporary support structures and foundations continue.



#### STEP 2 - INSTALL ROADWAYS

All of the 28 steel roadway boxes and 17 crossbeams have been erected as of the end of October 2011.

**Status:** The SAS roadway mechanical, electrical and piping installation continues. Installation of Hinge A eastbound and westbound seismic joints was completed in May. Installation of the eastbound bike path railing continues and sandblasting and primer installation in preparation for epoxy asphalt concrete overlay started on June 21, 2013, and will be completed in July 2013. Installation of the wind vortex continues under the roadway bridge decks. Lighting poles are being installed on the deck and traveler installation and testing is ongoing.



#### STEP 3 - INSTALL TOWER

All tower legs, tower grillage, tower saddle and tower head were erected using the self-rising crane as of mid-August 2012.

**Status:** Tower base shear-plate electroslag welding and NDT continues and is scheduled for completion in July 2013. Electrical conduit and wiring installation continues for various electrical equipment both in and on the exterior of the tower.



**STEP 4 - MAIN CABLE AND SUSPENDER INSTALLATION**

The main cable haul started from the east end of the westbound roadway deck moving over the tower saddle, wrapping around pier W2 west deviation saddles and returning to the tower saddle to the east end of eastbound roadway deck where it is anchored. The cable band and suspender cables were then installed to lift the roadway deck off the temporary support structure.

**Status:** Cleaning, caulking and painting of the suspenders continues. Main cable touch-up painting is ongoing.



**STEP 5 - WESTBOUND AND EASTBOUND SEISMIC SAFETY OPENING**

The new bridge is expected to open simultaneously in both westbound and eastbound directions.

**Status:** The SAS, YBITS#1 and OTD#2 and the OTD approach construction activities are ongoing in support of the seismic safety opening.



# TOLL BRIDGE SEISMIC RETROFIT PROGRAM

## Self-Anchored Suspension (SAS) Superstructure Main Cable Completion Activities

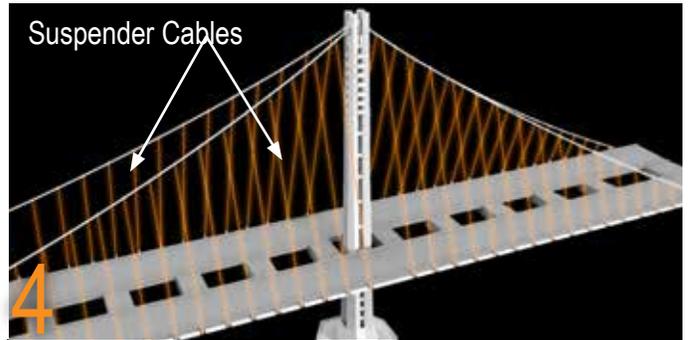


1

### CABLE STRAND HAULING

Crews haul the 137 individual steel wire strands that comprise the nearly 1-mile long single main cable. The strands are adjusted and then anchored into the east end of the SAS.

**Status: Complete**

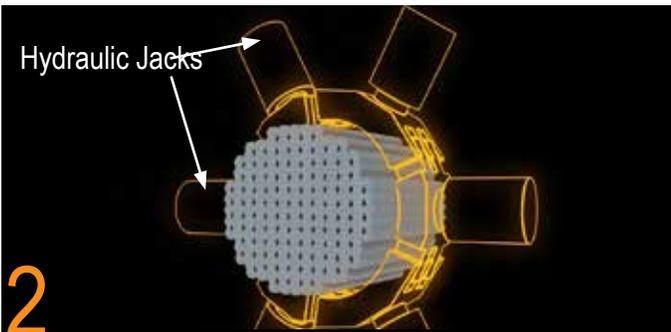


4

### SUSPENDER CABLES INSTALLATION

Workers begin placing the suspender cables that connect the main cable to the road-decks. Not all of the suspender cables need to be attached before load transfer begins.

**Status: Complete**

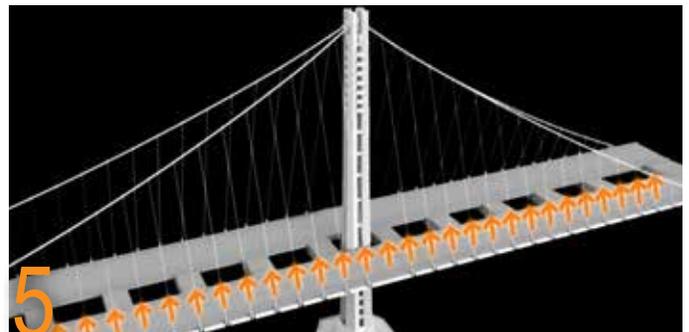


2

### CABLE STRAND COMPACTING

Four compacting machines containing hydraulic jacks are used to compress the 137 steel wire strands into the shape of the main cable. Temporary bands are placed to maintain the shape.

**Status: Complete**

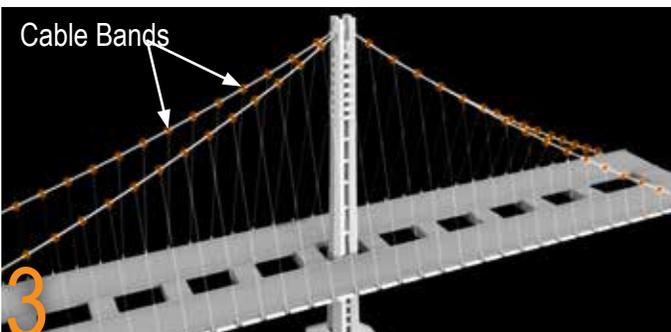


5

### LOAD TRANSFER (see facing page)

Using the attached suspender cables, crews begin the process of transferring the weight of the span from the temporary supports under the bridge to the main cable.

**Status: Complete**

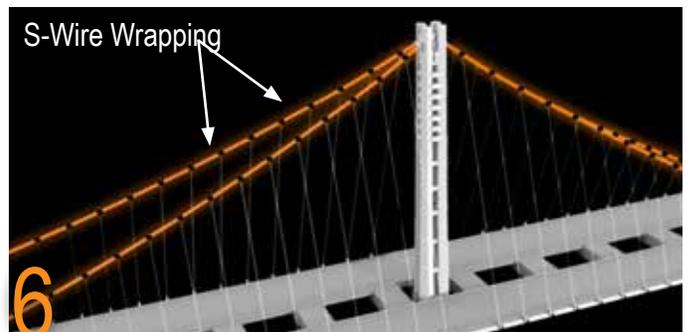


3

### CABLE BANDS INSTALLATION

Crews installed 114 permanent steel cable bands along the main cable. These bands maintain the shape of the cable, and serve as anchor points for the suspender cables.

**Status: Complete**



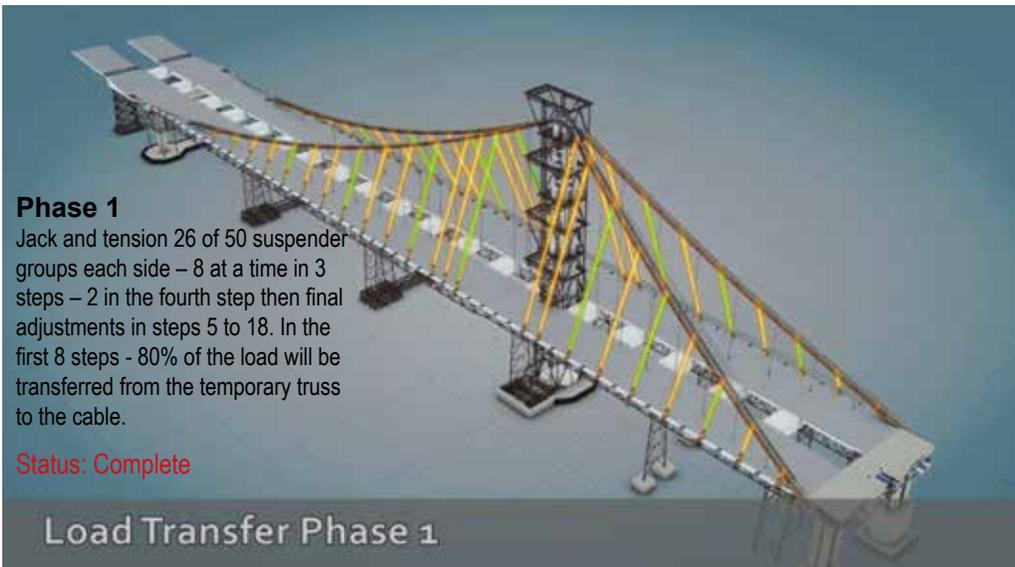
6

### S-WIRE WRAP

After load transfer, the main cable is wrapped in S-wire to protect the cable against corrosion. After the cable is wrapped, it is painted.

**Status: Complete**

# Load Transfer Sequence



## 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, will drastically change the appearance of the Bay Bridge. Replacing the gray steel that currently cages drivers, a graceful, elevated roadway supported by piers will provide 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. 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 will allow deck segments on the Skyway to move, enabling the deck to withstand greater motion and to absorb more earthquake energy.

**Status:** All remaining light poles will be delivered to the job site in August 2013 and installed by seismic safety opening.



Rendering of the New San Francisco/Oakland Bridge Skyway and Self-Anchored Suspension Bridge

## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

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

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

The OTD approach structures to the Skyway will be 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, to be constructed by a future OTD #2 contract, will complete the eastbound lanes and provide the traffic switch to the new structure in both directions, thus allowing the bridge to open simultaneously in both directions.

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

Contractor: MCM Construction, Inc.

Approved Capital Outlay Budget: \$205.0 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. When open to traffic, the westbound approach structure will provide 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: \$62.0 M

Status: 54% Complete as of June 2013

Flatiron West, Inc. is the prime contractor constructing the Oakland Touchdown #2 contract that will complete 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 bike path and final landscaping of the area.

**Status:** The contractor completed construction of the roadway deck structure and is currently working on the approach roadway backfill from the toll plaza to the deck. Duct bank conduit excavation and installation was completed in June 2013. Deck seismic joints between the Skyway and approach were installed in May 2013. All other remaining civil work will be completed in support of the seismic safety opening.



Aerial View of the Eastbound Oakland Touchdown #2 Construction Progress

# TOLL BRIDGE SEISMIC RETROFIT PROGRAM

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

### Existing East Span Bridge Demolition

#### Existing SFOBB Dismantling Contracts

Approved Capital Outlay Budget: \$239.1 M

To expedite the opening of a new eastbound on ramp and the pedestrian/bicycle pathway from Yerba Buena Island to the SAS and to maximize contractor efficiencies, the TBPOC has decided to 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 portions of the bridge will likely be performed under separate superstructure (above water) removal and marine foundation (below water) contracts. These contracts are still in design and may change in scope over time.

**Status:** The cantilever portion of the demolition contract was awarded to CEC and Silverado (JV) on November 28, 2012. Construction start-up activities began in March 2013, with actual dismantling to begin after seismic safety opening of the new east span of the bridge. The contractor is



Cantilever section of the Existing eastbound Bridge Section Included in the YBITS #2 Contract for Removal

in the process of preparing RFIs and submittals. The contractor is monitoring and installing bird deterrence measures on the cantilever bridge.





The Cantilever Section of the Existing Bridge and the New San Francisco-Oakland Bay Bridge in the background

# 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 will be the eventual demolition and removal of the existing bridge, which by that time will have 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: \$9.6 M  
 Status: Completed January 2008

A submerged cable from Oakland that is close to where the new bridge will touch 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.

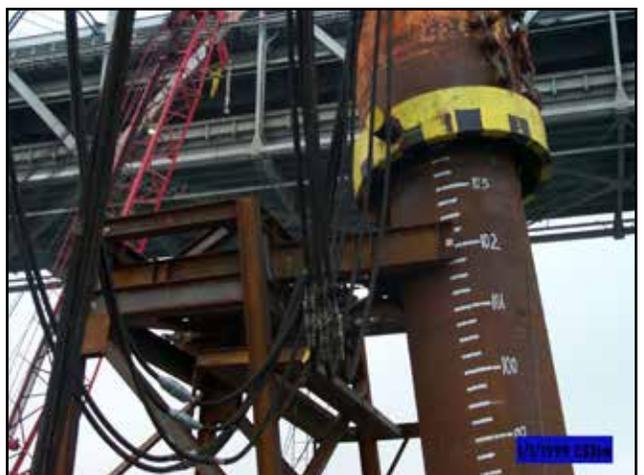


The existing East Span Cantilever Section of the San Francisco-Oakland Bay Bridge to be Demolished after Seismic Safety Opening of the New Bridge

## 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

### Dumbarton Bridge Seismic Retrofit Project

Contractor: Shimmick Construction Company, Inc.

Approved Capital Outlay Budget: \$92.7 M

Status: 100% Complete as of May 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 bicycle/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 includes superstructure and deck modifications and installation of isolation bearings.

**Status:** The main bridge structure between piers 16 through 31 was raised approximately five inches in order for isolation bearings to be installed to separate the superstructure from the substructure during seismic events. The bridge piers were widened with reinforced concrete to accommodate the new bearings.

Along the reinforced concrete slab approaches, the bent caps have been extended and tied to new 48-inch diameter steel piles that have been installed to strengthen the bridge. Bent cap extensions along the east and west trestle approach are now complete.

Concrete has been placed and installation of jacking frames is complete at all of the 16 piers. The isolation bearing installation is complete at all piers. The bridge is now fully supported by the new bearings at all locations.

Work at the pumping plant is complete as well as the fender rehabilitation work at piers 23 and 24. Pier footing overlay concrete was placed at piers 17 through 30. Removal of all 63 spans of the Ravenswood Pier has been completed.

The Dumbarton Bridge was closed to traffic for the second time in 2012 during the Labor Day weekend. A full bridge closure was necessary in order for crews to replace the existing expansion joint on the eastern side of the bridge at Pier 31 with a state-of-the-art seismic joint. Seismic retrofit of hinge 21 and 25 is complete.

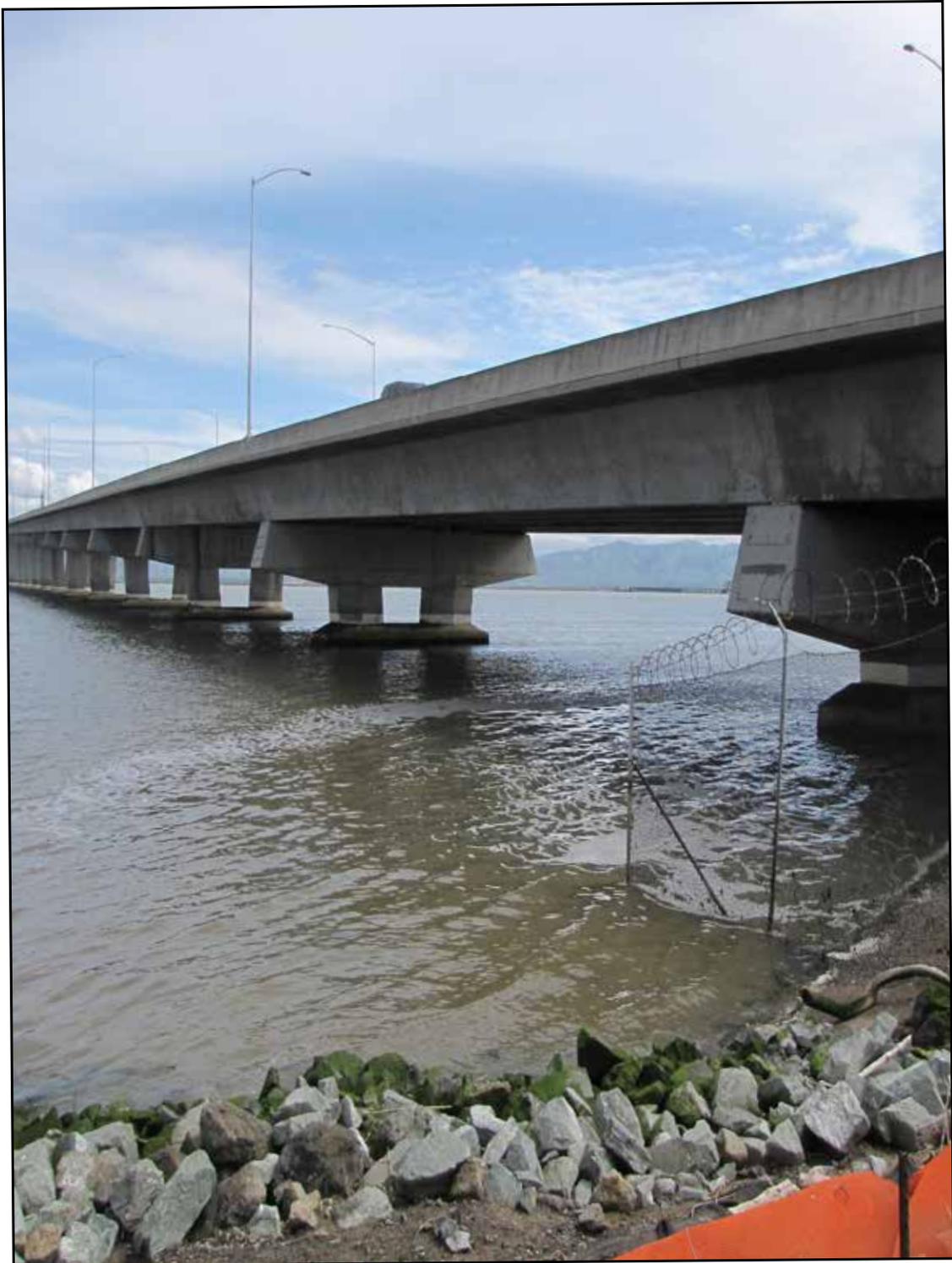
Installation of the Seismic Monitoring System and the rerouting of all electrical systems at pier 31 is complete. New curb, gutter and paving of the frontage roads along the bridge approach is complete.



Ravenswood Pier Pile Removal



Bollards around Pump Station



Dumbarton Bridge

## 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.

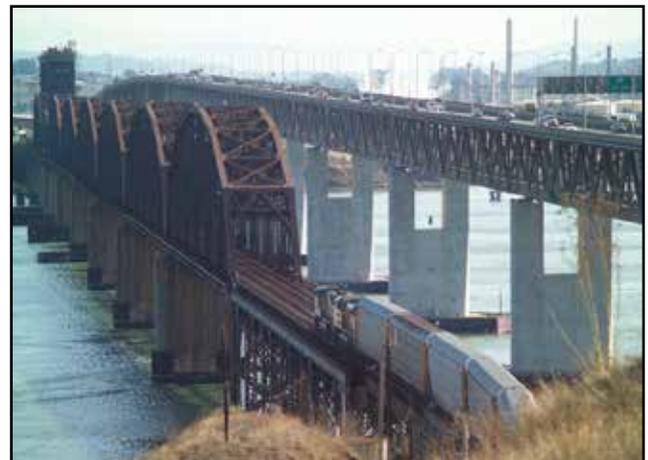


1958 Carquinez Bridge (foreground) with the 1927 Span (middle) under Demolition and the New Alfred Zampa Memorial Bridge (background)

#### 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.



Richmond-San Rafael Bridge

## 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

## 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.

## TOLL BRIDGE SEISMIC RETROFIT PROGRAM Risk Management Program Update

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

The program contingency is currently \$329 million in accordance with the TBPOC approved budget. As of the end of the second quarter of 2013, the 50 percent probable draw on program contingency is \$161 million. The potential draw ranges from about \$75 million to \$250 million (refer to Figure 1).

The current program contingency balance is sufficient to cover the cost of currently identified risks. In accordance with the approved TBSRP Risk Management Plan, risk mitigation actions are continuously developed and implemented to reduce the potential draw on the program contingency.

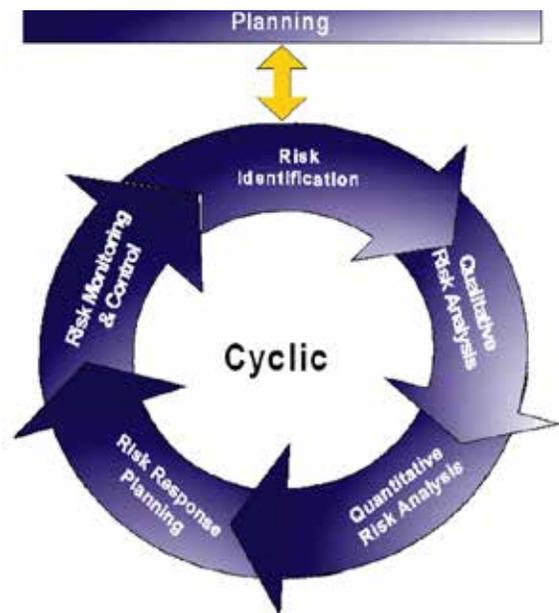
### RISK MANAGEMENT DEVELOPMENTS

The teams are continuing to execute work and plan for the Labor Day 2013 Seismic Safety Opening (SSO). At this point, it is likely that all work except the retrofit of the bolts at Pier E2 will be completed on time. Options to temporarily provide sufficient seismic capacity at the E2 bearings are being investigated. If the options prove unfeasible, bridge opening will be delayed until the retrofit of the bolts at Pier E2 is completed in late 2013. Much of the work at the Oakland Touchdown (OTD) required to transfer traffic to the new bridge involves paving and striping that are weather and temperature dependent. This makes it difficult to plan for an exact weekend to complete the traffic transfer. A longer bridge closure may also be required if night time temperatures fall below the limits allowed for paving. It may be necessary to postpone the opening until such time when weather conditions are more favorable for the required work.

Planning is under way for the weekend work with coordination of the work zones, access/egress to the work sites and obtaining commitments from suppliers and sub-contractors. The risk team has developed a preliminary hourly schedule for the SSO weekend work and continues to update it as information becomes available.

### RISK MANAGEMENT LOOK AHEAD

The on-going risk analysis of the SSO weekend schedule will include duration uncertainties of planned activities, as well as weather risks that affect certain activities. The team will use the schedule risk model to mitigate risks and recommend the number of days to close the bridge so that there is a high probability of completing on time.



### After Seismic Safety Opening

After SSO, construction of the new bridge will continue. The OTD #2 contractor will need to complete the eastbound roadway and permanent bike path that are in conflict with the current upper westbound bridge and maintenance roads. When the contract was advertised there were no plans for the temporary bike path. Now that plans for the temporary bike path have been finalized, the project team recognizes that there are conflicts, impacts and added risks to the OTD #2 contract completion. Discussions about the impacts continue and alternate staging plans are being developed to address contract completion.

The SAS contractor will have work to complete after SSO, some of which will have to be performed using lane closures. This may create inefficiencies in the work, with a potential delay risk beyond the contractor's planned completion. Changes to the tower fender pile-driving requirements and cleaning of fender embeds may also extend the contract completion time.

The Yerba Buena Island Transition Structures (YBITS) #2 contract anticipated SSO as Labor Day 2013, with access to certain areas on Yerba Buena Island and in the Bay by January 1, 2014. While planning for the demolition of the existing bridge cantilever section and the temporary bypass structure continues, minimal field work can proceed until access is granted and traffic is transferred to the new bridge. Any delays to SSO will have a significant impact to the YBITS #2 contractor's schedule. The OTD #2 contract also anticipated the Labor Day 2013 SSO date. Any delays beyond Labor Day 2013 will impact the OTD #2 contract completion.

**Dismantling Projects**

Aggressive planning continues for dismantling the marine foundations and trusses of the East Span. For the marine structures dismantling contract, the TBPOC approved a demonstration project that would remove the deep foundations using micro blasting. If this means and method gets approved, it would result in substantial cost and schedule savings and a significant reduction in risks. Obtaining permits for the marine structures removal will be the most challenging portion of this contract, because it involves underwater work in the San Francisco Bay. Caltrans has engaged various environmental, hydro-acoustic, and water quality experts to prepare the permitting documents, and assist in mitigating the identified risks.

The presence of lead paint on the steel superstructure poses potential risks to worker safety and air quality. Caltrans is consulting with Cal-OSHA and the Bay Area Air Quality Management board to determine whether the Caltrans standard engineering controls used on other Bay Area projects in the past will provide sufficient risk mitigation.

The steel superstructure removal contract's environmental team has developed a strategy for moving the bridge's cormorant colony from its existing location to the new platforms erected on the Skyway structure. The strategy was reviewed and approved by the permitting agencies and the plan is being implemented. This action will reduce the risk of bird nesting delaying the steel superstructure dismantling work.

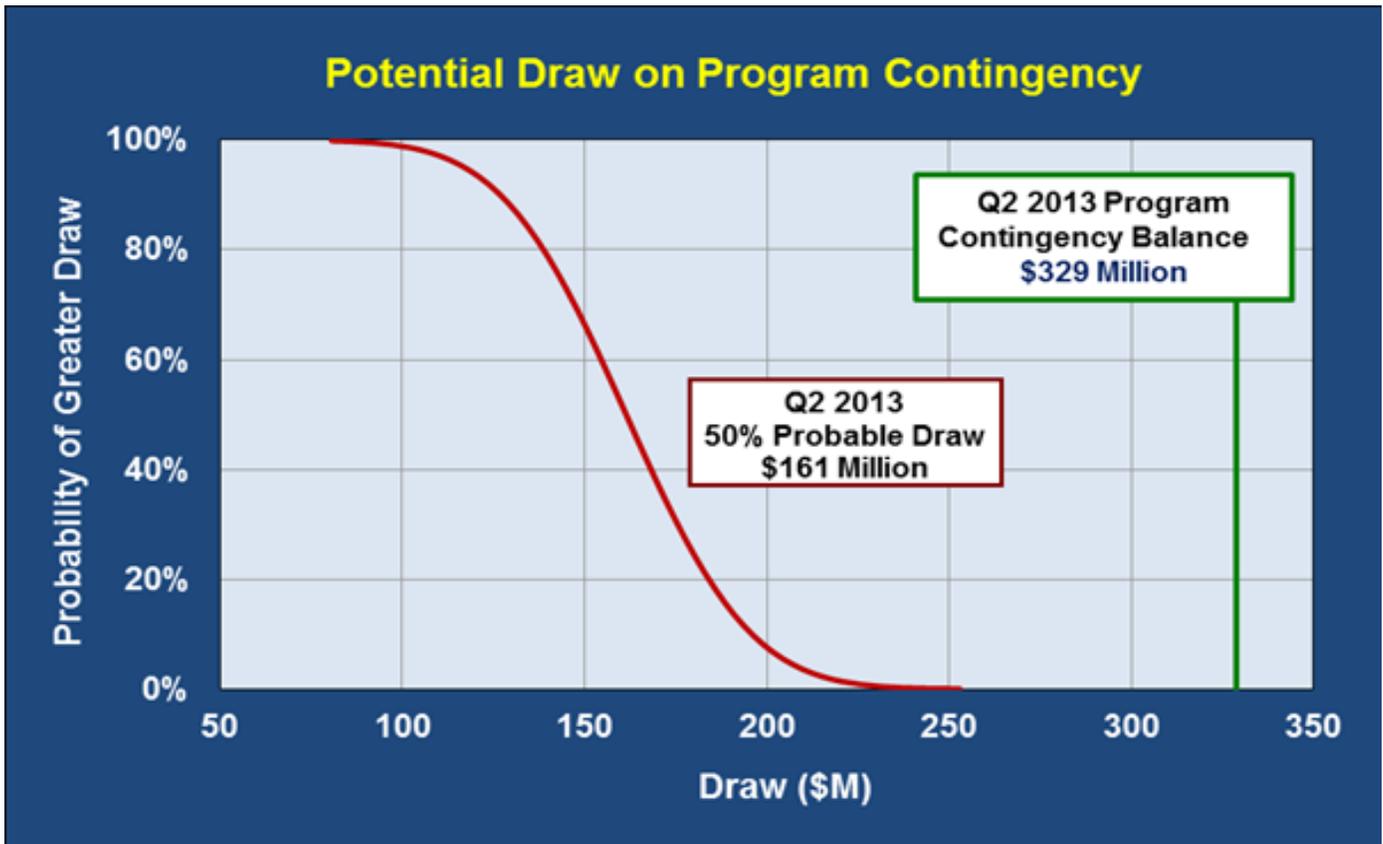


Figure 1 – Potential Draw on Program Contingency\*

\*Figure 1 Notes:

1. Proposed architectural enhancements and project improvements are excluded unless approved by the TBPOC.
2. Program Contingency may be used for other beneficial purposes than to cover risks. Therefore, the potential draw chart may not necessarily represent a forecast of the future balance of program contingency funds.

## 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 June 30, 2013 (\$ Millions)**

	Budgeted	Funding Available & Contribution
<b>Financing</b>		
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	750.0	750.0
BATA Consolidation	820.0	820.0
<b>Subtotal - Financing</b>	<b>6,002.0</b>	<b>6,002.0</b>
<b>Contributions</b>		
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)(2)</sup>	745.0	745.0
Public Transportation Account <sup>(1)(3)</sup>	130.0	130.0
ITIP/SHOPP/Federal Contingency <sup>(4)</sup>	448.0	448.0
Federal Highway Bridge Replacement and Rehabilitation (HBRR)	642.0	642.0
SHA - East Span Demolition	300.0	0.0
SHA - "Efficiency Savings" <sup>(5)</sup>	130.0	130.0
Redirect Spillover	125.0	125.0
Motor Vehicle Account	75.0	75.0
<b>Subtotal - Contribution</b>	<b>3,433.0</b>	<b>3,123.9</b>
<b>Total Funding</b>	<b>9,435.0</b>	<b>9,125.9</b>
<b>Encumbered to Date</b>		<b>8,232.6</b>
<b>Remaining Unallocated</b>		<b>893.3</b>
<b>Expenditures :</b>		
Capital Outlay		6,221.8
State Operations		1,694.1
Antioch and Dumbarton Expenditures by BATA		12.2
	Total Expenditures	<b>7,928.1</b>
<b>Encumbrances :</b>		
Capital Outlay		298.8
State Operations		5.7
	Total Encumbrances	<b>304.5</b>
<b>Total Expenditures and Encumbrances</b>		<b>8,232.6</b>
1) The California Transportation Commission adopted a new schedule and changed the PTA/SHA split on December 15, 2005.		
2) As of January 1, 2010, seismic retrofitting of Antioch and Dumbarton Bridges became part of the Toll Bridge Seismic Retrofit Program with the passage of AB 1175.		

## 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 June 30, 2013 shows expenses through June 30, 2013 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	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 Demolition Cost

**Table 3—Toll Bridge Program Oversight Committee  
Estimated Expenses: July 1, 2005 through June 30, 2013 (\$ Millions)**

Agency/Program Activity	Expenses
<b>BATA</b>	<b>2.7</b>
<b>Caltrans</b>	<b>2.8</b>
<b>CTC</b>	<b>2.8</b>
<b>Reporting</b>	<b>5.4</b>
<b>Total Program</b>	<b>13.7</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 second quarter of 2013. 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 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.

Peregrine falcon monitoring for the 2012/2013 nesting season began on December 6, 2012 and continued through June 2013. This year, the resident pair nested in their traditional nest site in trapezoid-shaped alcove on the north side of existing Pier E2. Four eggs were laid and all of them (two males and two females) hatched in the period from April 24 to April 29, 2013. All four juveniles successfully fledged in the period from June 6 to June 9, 2013.

During the bird nesting season (February – August) the Skyway, the Self-Anchored Suspension Span (SAS), the Oakland Touchdown (OTD) and the Yerba Buena Island Transition Structure (YBITS) Contract 1 and 2 project areas are being surveyed five days a week for nesting birds. The goal of this monitoring is to prevent both impacts to nesting birds and delays to construction. Based on the observations of birds within the project areas adaptive nesting deterrence measures are recommended. The frequency and duration of monitoring may be adjusted based on monitoring results.

During the double-crested cormorant nesting season (March – August), monitoring is conducted twice a week to evaluate the effectiveness of enticements installed on the new bridge. Bird monitors have observed cormorants loafing amongst the decoys installed on the marine foundations of the new east span.

During the double-crested cormorant nesting season, surveys of cormorant nesting activity on the existing bridge are performed twice a month. This consists of one survey from the Skyway and

one survey from a boat. The goal of this monitoring is to expand our understanding of the timing and location of cormorant nesting. Results of this monitoring will help us develop effective strategies for managing these birds during bridge dismantling. Monitoring results support the assumption that early nesting is centered around Pier E9, and that the colony expands from the center as the season progresses. A boat survey conducted in June during the peak of cormorant nesting season determined that the 2013 breeding colony comprises 413 nests.

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.

On May 10, 2013, Caltrans met with San Francisco Bay Conservation and Development Commission (BCDC) to discuss multiple SFOBB permitting items. During the meeting, BCDC concurred that the cooperative agreement between Caltrans and National Marine Fisheries Service (NMFS) for the transfer of eelgrass mitigation funds satisfied BCDC permit conditions. A follow-up letter confirming this determination was submitted by BCDC to Caltrans on May 15, 2013.

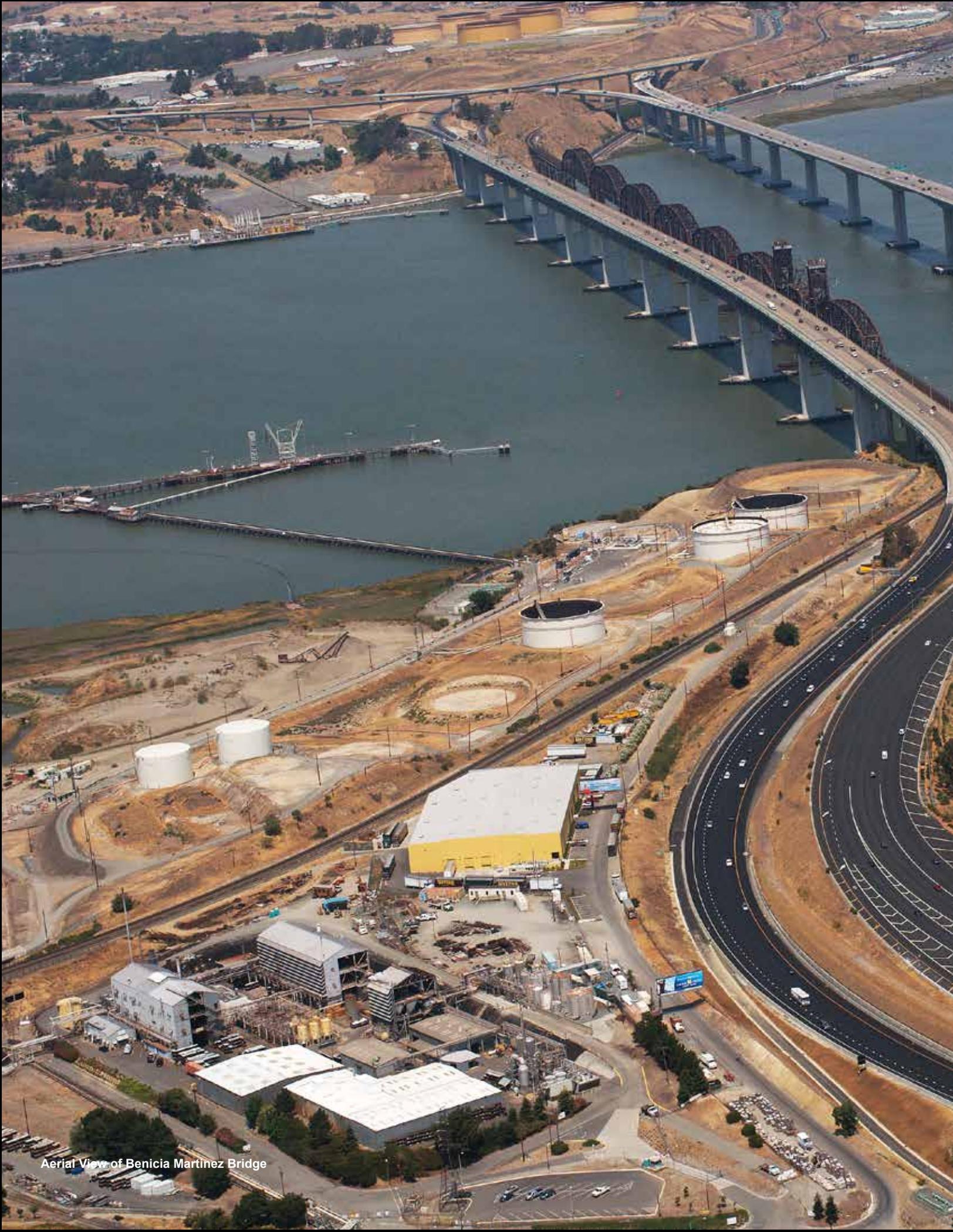
On May 21, 2013, Caltrans submitted an application to the U.S. Fish and Wildlife Service (USFWS) for a Migratory Bird Treaty Act (MBTA), Special Purpose Miscellaneous Permit. The permit would authorize Caltrans to remove occupied nests (i.e., nests containing eggs and/or young) from the SFOBB Project area. This authorization is critical to avoiding construction delays during remaining construction of the new bridge and dismantling of the existing bridge. Eggs and young removed from the project site would be transferred to wildlife care facilities for fostering and release back into the wild.

On June 19, 2013, Caltrans submitted an application to the USFWS for a special purpose miscellaneous permit authorizing the removal of young from a western gull nest located on falsework for the Self-anchored suspension bridge (SAS) and received the permit on June 27, 2013.

During removal of a work platform below the SAS, a house finch nest containing four nestlings was discovered on a steel beam under the plywood floor when the platform was lowered to the ground.

The environmental team rescued the nestlings and took them to the Lindsay Wildlife Museum Hospital for fostering, at the direction of the U.S. Fish and Wildlife Service (USFWS). All four nestlings survived and were successfully released back into the wild.





Aerial View of Benicia Martinez 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 is being 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



San Francisco-Oakland Bay Bridge Self-Anchored Suspension Span E2 Bolt Adjustment in Progress



## APPENDICES

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## Appendix A-1: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2013 (\$ Millions)

Contract a	AB 144 / SB 66 Budget (07/2005) c	Approved Changes d	Current Approved Budget (06/2013) e = c + d	Cost to Date (06/2013) f	Cost Forecast (06/2013) g	At- Completion Variance h = g - e
<b>SFOBB East Span Replacement Project</b>						
Capital Outlay Support	959.3	262.3	1,221.6	1,148.0	1,287.8	66.2
Capital Outlay Construction	4,492.2	571.5	5,063.7	4,412.3	5,138.1	74.4
Other Budgeted Capital	35.1	(32.8)	2.3	0.7	7.7	5.4
<b>Total</b>	<b>5,486.6</b>	<b>801.0</b>	<b>6,287.6</b>	<b>5,561.0</b>	<b>6,433.6</b>	<b>146.0</b>
<b>SFOBB West Approach Replacement</b>						
Capital Outlay Support	120.0	(1.0)	119.0	119.3	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>451.3</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	689.5	-
<b>Total</b>	<b>914.0</b>	<b>(97.5)</b>	<b>816.5</b>	<b>794.3</b>	<b>816.5</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 June 30, 2013 (\$ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (06/2013)	Cost to Date (06/2013)	Cost Forecast (06/2013)	At- Completion Variance
a	c	d	e = c + d	f	g	h = g - e
<b>Antioch Bridge</b>						
Capital Outlay Support	-	31.0	31.0	17.3	23.8	(7.2)
Capital Outlay Support by BATA				6.2		
Capital Outlay Construction	-	51.0	51.0	47.0	50.3	(0.7)
Total	-	82.0	82.0	70.5	74.1	(7.9)
<b>Dumbarton Bridge</b>						
Capital Outlay Support	-	56.0	56.0	37.7	45.4	(10.6)
Capital Outlay Support by BATA				6.0		
Capital Outlay Construction	-	92.7	92.7	63.1	68.2	(24.5)
Total	-	148.7	148.7	106.8	113.6	(35.1)
Subtotal Capital Outlay Support	1,433.1	340.9	1,774.0	1,680.8	1,822.7	48.7
Subtotal Capital Outlay	6,286.8	660.0	6,946.8	6,221.1	6,983.4	36.6
Subtotal Other Budgeted Capital	35.1	(32.8)	2.3	0.7	7.7	5.4
Miscellaneous Program Costs	30.0	-	30.0	25.5	30.0	-
Subtotal Toll Bridge Seismic Retrofit Program	7,785.0	968.1	8,753.1	7,928.1	8,843.8	90.7
Net Programmatic Risks*	-	-	-	-	70.7	70.7
Program Contingency	900.0	(571.1)	328.9	-	167.5	(161.4)
Total Toll Bridge Seismic Retrofit Program <sup>1</sup>	8,685.0	397.0	9,082.0	7,928.1	9,082.0	-

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

## Appendix A-2: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2013(\$ Millions)

Bridge	AB 144 Baseline Budget	TBPOC Current Approved Budget	Expenditures to date and encumbrances as of 06/2013 see Note (1)	Estimated costs not yet spent or encumbered as of 06/2013	Total Forecast as of 06/2013
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	471.9	472.3	(0.5)	471.8
<b>Total</b>	<b>617.5</b>	<b>616.5</b>	<b>616.9</b>	<b>(0.5)</b>	<b>616.4</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	22.0	689.5
Project Reserves	82.0	-	-	-	-
<b>Total</b>	<b>914.0</b>	<b>816.5</b>	<b>794.3</b>	<b>22.2</b>	<b>816.5</b>
<b>West Span Retrofit</b>					
Capital Outlay Support	75.0	74.8	74.9	(0.1)	74.8
Capital Outlay	232.9	227.4	227.4	-	227.4
<b>Total</b>	<b>307.9</b>	<b>302.2</b>	<b>302.3</b>	<b>(0.1)</b>	<b>302.2</b>
<b>West Approach</b>					
Capital Outlay Support	120.0	119.0	119.3	-	119.3
Capital Outlay	309.0	350.7	332.6	5.5	338.1
<b>Total</b>	<b>429.0</b>	<b>469.7</b>	<b>451.9</b>	<b>5.5</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	419.0	430.6	49.2	479.8
Capital Outlay	1,753.7	2,046.8	1,963.6	117.7	2,081.3
<b>Total</b>	<b>1,968.3</b>	<b>2,465.8</b>	<b>2,394.2</b>	<b>166.9</b>	<b>2,561.1</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	3.8	305.1
<b>Total</b>	<b>402.4</b>	<b>338.9</b>	<b>338.9</b>	<b>3.8</b>	<b>342.7</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	466.1	466.2	7.1	473.3
<b>Total</b>	<b>161.4</b>	<b>553.8</b>	<b>554.1</b>	<b>6.9</b>	<b>561.0</b>
<b>YBI- Transition Structures</b>					
Capital Outlay Support	78.7	106.4	98.4	15.2	113.6
Capital Outlay	299.4	295.4	332.9	(17.8)	315.1
<b>Total</b>	<b>378.1</b>	<b>401.8</b>	<b>431.3</b>	<b>(2.6)</b>	<b>428.7</b>

## Appendix A-2: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2013 (\$ Millions) Cont.

Contract	AB 144 Baseline Budget	TBPOC Current Approved Budget	Expenditures to date and encumbrances as of 06/2013 see Note (1)	Estimated costs not yet spent or encumbered as of 06/2013	Total Forecast as of 06/2013
a	b	c	d	e	f = d + e
<b>Oakland Touchdown</b>					
Capital Outlay Support	74.4	112.9	104.4	18.8	123.2
Capital Outlay	283.8	323.7	271.9	58.2	330.1
<b>Total</b>	<b>358.2</b>	<b>436.6</b>	<b>376.3</b>	<b>77.0</b>	<b>453.3</b>
<b>East Span Other Small Projects</b>					
Capital Outlay Support	212.3	206.6	197.9	8.7	206.6
Capital Outlay	170.8	141.3	117.1	37.6	154.7
<b>Total</b>	<b>383.1</b>	<b>347.9</b>	<b>315.0</b>	<b>46.3</b>	<b>361.3</b>
<b>Existing Bridge Demolition</b>					
Capital Outlay Support	79.7	59.9	5.2	42.3	47.5
Capital Outlay	239.2	239.1	-	233.3	233.3
<b>Total</b>	<b>318.9</b>	<b>299.0</b>	<b>5.2</b>	<b>275.6</b>	<b>280.8</b>
<b>Antioch Bridge</b>					
Capital Outlay Support	-	31.0	17.3	0.3	17.6
Capital Outlay Support by BATA			6.2	-	6.2
Capital Outlay	-	51.0	47.0	3.3	50.3
<b>Total</b>	<b>-</b>	<b>82.0</b>	<b>70.5</b>	<b>3.6</b>	<b>74.1</b>
<b>Dumbarton Bridge</b>					
Capital Outlay Support	-	56.0	37.9	1.5	39.4
Capital Outlay Support by BATA			6.0	-	6.0
Capital Outlay	-	92.7	68.4	(0.2)	68.2
<b>Total</b>	<b>-</b>	<b>148.7</b>	<b>112.3</b>	<b>1.3</b>	<b>113.6</b>
Miscellaneous Program Costs	30.0	30.0	25.5	4.5	30.0
<b>Total Capital Outlay Support</b>	<b>1,463.2</b>	<b>1,803.9</b>	<b>1,711.9</b>	<b>140.8</b>	<b>1,852.7</b>
<b>Total Capital Outlay</b>	<b>6,321.8</b>	<b>6,949.2</b>	<b>6,520.7</b>	<b>470.4</b>	<b>6,991.1</b>
<b>Program Total <sup>1</sup></b>	<b>7,785.0</b>	<b>8,753.1</b>	<b>8,232.6</b>	<b>611.2</b>	<b>8,843.8</b>

(1). Funds allocated to project or contract for Capital Outlay and Support needs includes Capital Outlay Support total allocation for FY 06/07.

(2). BSA provided a distribution of program contingency in December 2004 based in Bechtel Infrastructure Corporation input.

This Column is subject to revision upon completion of Department's risk assessment update.

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

<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 June 30, 2013 (\$ Millions)

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (06/2013)	Cost to Date (06/2013)	Cost Forecast (06/2013)	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	204.4	419.0	427.8	479.8	60.8
Capital Outlay Construction	1,753.7	293.1	2,046.8	1,823.1	2,081.3	34.5
Total	1,968.3	497.5	2,465.8	2,250.9	2,561.1	95.3
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	26.5	26.5	-
Total	36.4	(0.7)	35.7	35.7	35.7	-
YBI South/South Detour						
Capital Outlay Support	29.4	58.3	87.7	87.9	87.7	-
Capital Outlay Construction	131.9	334.2	466.1	466.1	473.3	7.2
Total	161.3	392.5	553.8	554.0	561.0	7.2
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	278.6	3.8
Total	366.0	(62.8)	303.2	303.2	307.0	3.8
YBI Transition Structures (see notes below)						
Capital Outlay Support	78.7	27.7	106.4	96.8	113.6	7.2
Capital Outlay Construction	299.3	(3.9)	295.4	192.7	315.1	19.7
Total	378.0	23.8	401.8	289.5	428.7	26.9
* 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			57.0	61.9	64.0	7.0
Capital Outlay Construction			199.7	182.8	214.1	14.4
Total			256.7	244.7	278.1	21.4
* YBI- Transition Structures Contract No. 2						
Capital Outlay Support			32.0	18.5	32.2	0.2
Capital Outlay Construction			92.4	9.9	97.7	5.3
Total			124.4	28.4	129.9	5.5
* YBI- Transition Structures Contract No. 3 Landscape						
Capital Outlay Support			1.0	-	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 June 30, 2013 (\$ Millions) Cont.

Contract a	AB 144 / SB 66 Budget (07/2005) c	Approved Changes d	Current Approved Budget (06/2013) e = c + d	Cost to Date (06/2013) f	Cost Forecast (06/2013) g	At- Completion Variance h = g - e
<b>Oakland Touchdown (see notes below)</b>						
Capital Outlay Support	74.4	38.5	112.9	103.7	123.2	10.3
Capital Outlay Construction	283.8	39.9	323.7	259.7	330.1	6.4
<b>Total</b>	<b>358.2</b>	<b>78.4</b>	<b>436.6</b>	<b>363.4</b>	<b>453.3</b>	<b>16.7</b>
<b>* OTD Prior-to-Split Costs</b>						
Capital Outlay Support			21.7	20.0	21.7	-
Capital Outlay Construction			-	-	-	-
<b>Total</b>			<b>21.7</b>	<b>20.0</b>	<b>21.7</b>	<b>-</b>
<b>* OTD Submarine Cable(1)</b>						
Capital Outlay Support			0.9	0.9	0.9	-
Capital Outlay Construction			5.7	5.7	9.6	3.9
<b>Total</b>			<b>6.6</b>	<b>6.6</b>	<b>10.5</b>	<b>3.9</b>
<b>* OTD No. 1 (Westbound)</b>						
Capital Outlay Support			51.3	51.2	51.3	-
Capital Outlay Construction			205.0	204.8	203.3	(1.7)
<b>Total</b>			<b>256.3</b>	<b>256.0</b>	<b>254.6</b>	<b>(1.7)</b>
<b>* OTD No. 2 (Eastbound)</b>						
Capital Outlay Support			22.5	23.8	40.6	18.1
Capital Outlay Construction			62.0	21.5	73.4	11.4
<b>Total</b>			<b>84.5</b>	<b>45.3</b>	<b>114.0</b>	<b>29.5</b>
<b>* OTD Touchdown 2 Detour(2)</b>						
Capital Outlay Support			15.0	7.0	7.2	(7.8)
Capital Outlay Construction			51.0	27.7	43.8	(7.2)
<b>Total</b>			<b>66.0</b>	<b>34.7</b>	<b>51.0</b>	<b>(15.0)</b>
<b>* OTD Electrical Systems</b>						
Capital Outlay Support			1.5	0.8	1.5	-
Capital Outlay Construction			-	-	-	-
<b>Total</b>			<b>1.5</b>	<b>0.8</b>	<b>1.5</b>	<b>-</b>
<b>Existing Bridge Demolition</b>						
Capital Outlay Support	79.7	(19.8)	59.9	4.9	47.5	(12.4)
Capital Outlay Construction	239.2	(0.1)	239.1	-	233.3	(5.8)
<b>Total</b>	<b>318.9</b>	<b>(19.9)</b>	<b>299.0</b>	<b>4.9</b>	<b>280.8</b>	<b>(18.2)</b>
<b>* Bridge Demolition Prior-to-Split Cost</b>						
Capital Outlay Support			-	3.9	-	
Capital Outlay Construction			-	-	-	
<b>Total</b>			<b>-</b>	<b>3.9</b>	<b>-</b>	
<b>* Cantilever Section</b>						
Capital Outlay Support			-	0.2	17.6	
Capital Outlay Construction			-	-	59.9	
<b>Total</b>			<b>-</b>	<b>0.2</b>	<b>77.5</b>	
<b>* 504/288 Sections</b>						
Capital Outlay Support			-	0.6	13.9	
Capital Outlay Construction			-	-	88.4	
<b>Total</b>			<b>-</b>	<b>0.6</b>	<b>102.3</b>	
<b>*Marine foundations</b>						
Capital Outlay Support			-	0.2	16.0	
Capital Outlay Construction			-	-	85.0	
<b>Total</b>			<b>-</b>	<b>0.2</b>	<b>101.0</b>	

## Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2013 (\$ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (06/2013)	Cost to Date (06/2013)	Cost Forecast (06/2013)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
<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	-
<b>Total</b>	<b>2.2</b>	<b>-</b>	<b>2.2</b>	<b>2.2</b>	<b>2.2</b>	<b>-</b>
<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
<b>Total</b>	<b>6.0</b>	<b>(0.5)</b>	<b>5.5</b>	<b>5.5</b>	<b>6.0</b>	<b>0.5</b>
<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
<b>Total</b>	<b>18.1</b>	<b>(0.4)</b>	<b>17.7</b>	<b>17.7</b>	<b>18.1</b>	<b>0.4</b>
<b>Oakland Geofill</b>						
Capital Outlay Support	2.5	0.1	2.6	2.5	2.5	(0.1)
Capital Outlay Construction	8.2	-	8.2	8.2	8.2	-
<b>Total</b>	<b>10.7</b>	<b>0.1</b>	<b>10.8</b>	<b>10.7</b>	<b>10.7</b>	<b>(0.1)</b>
<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	-
<b>Total</b>	<b>11.1</b>	<b>(0.1)</b>	<b>11.0</b>	<b>11.1</b>	<b>11.1</b>	<b>-</b>
<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	18.3	-
<b>Total</b>	<b>21.0</b>	<b>5.5</b>	<b>26.5</b>	<b>25.1</b>	<b>26.5</b>	<b>-</b>
<b>Right-of-Way and Environmental Mitigation</b>						
Capital Outlay Support	-	-	-	-	-	-
Capital Outlay & Right-of-Way	72.4	-	72.4	51.7	80.4	8.0
<b>Total</b>	<b>72.4</b>	<b>-</b>	<b>72.4</b>	<b>51.7</b>	<b>80.4</b>	<b>8.0</b>
<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	-
<b>Total</b>	<b>70.3</b>	<b>-</b>	<b>70.3</b>	<b>70.3</b>	<b>70.3</b>	<b>-</b>
<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	(8.0)	12.0	3.2	12.0	-
<b>Total</b>	<b>162.6</b>	<b>(7.9)</b>	<b>154.7</b>	<b>145.9</b>	<b>154.6</b>	<b>(0.1)</b>
<b>Subtotal Capital Outlay Support</b>						
	959.3	262.3	1,221.6	1,148.0	1,287.8	66.2
<b>Subtotal Capital Outlay Construction</b>						
	4,492.2	571.5	5,063.7	4,412.3	5,138.1	74.4
<b>Other Budgeted Capital</b>						
	35.1	(32.8)	2.3	0.7	7.7	5.4
<b>Total SFOBB East Span Replacement Project</b>						
	5,486.6	801.0	6,287.6	5,561.0	6,433.6	146.0

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

## Appendix C: Regional Measure 1 Program Cost Detail (\$ Millions)

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (06/2013)	Cost to Date (06/2013)	Cost Forecast (06/2013)	At- Completion Variance
a	c	d	e = c + d	f	g	h = g - e
<b>New Benicia-Martinez Bridge Project</b>						
<b>New Bridge</b>						
Capital Outlay Support						
BATA Funding	84.9	7.2	92.1	92.0	92.1	-
Non-BATA Funding	-	0.1	0.1	0.1	0.1	-
Subtotal	84.9	7.3	92.2	92.1	92.2	-
Capital Outlay Construction						
BATA Funding	661.9	94.6	756.5	753.7	756.5	-
Non-BATA Funding	10.1	-	10.1	10.1	10.1	-
Subtotal	672.0	94.6	766.6	763.8	766.6	-
<b>Total</b>	<b>756.9</b>	<b>101.9</b>	<b>858.8</b>	<b>855.9</b>	<b>858.8</b>	<b>-</b>
<b>I-680/I-780 Interchange Reconstruction</b>						
Capital Outlay Support						
BATA Funding	24.9	5.2	30.1	30.1	30.1	-
Non-BATA Funding	1.4	5.2	6.6	6.3	6.6	-
Subtotal	26.3	10.4	36.7	36.4	36.7	-
Capital Outlay Construction						
BATA Funding	54.7	26.9	81.6	77.1	81.6	-
Non-BATA Funding	21.6	-	21.6	21.7	21.7	0.1
Subtotal	76.3	26.9	103.2	98.8	103.3	0.1
<b>Total</b>	<b>102.6</b>	<b>37.3</b>	<b>139.9</b>	<b>135.2</b>	<b>140.0</b>	<b>0.1</b>
<b>I-680/Marina Vista Interchange Reconstruction</b>						
Capital Outlay Support	18.3	1.9	20.2	20.2	20.2	-
Capital Outlay Construction	51.5	4.9	56.4	56.1	56.4	-
<b>Total</b>	<b>69.8</b>	<b>6.8</b>	<b>76.6</b>	<b>76.3</b>	<b>76.6</b>	<b>-</b>
<b>New Toll Plaza and Administration Building</b>						
Capital Outlay Support	11.9	3.8	15.7	15.7	15.7	-
Capital Outlay Construction	24.3	2.0	26.3	25.1	26.3	-
<b>Total</b>	<b>36.2</b>	<b>5.8</b>	<b>42.0</b>	<b>40.8</b>	<b>42.0</b>	<b>-</b>
<b>Existing Bridge &amp; Interchange Modifications</b>						
Capital Outlay Support						
BATA Funding	4.3	13.7	18.0	18.0	18.0	-
Non-BATA Funding	-	0.9	0.9	0.8	0.9	-
Subtotal	4.3	14.6	18.9	18.8	18.9	-
Capital Outlay Construction						
BATA Funding	17.2	32.8	50.0	37.2	50.0	-
Non-BATA Funding	-	9.5	9.5	-	9.5	-
Subtotal	17.2	42.3	59.5	37.2	59.5	-
<b>Total</b>	<b>21.5</b>	<b>56.9</b>	<b>78.4</b>	<b>56.0</b>	<b>78.4</b>	<b>-</b>
<b>Other Contracts</b>						
Capital Outlay Support	11.4	(0.9)	10.5	9.7	10.5	-
Capital Outlay Construction	20.3	3.3	23.6	18.6	23.6	-
Capital Outlay Right-of-Way	20.4	(0.1)	20.3	17.0	20.3	-
<b>Total</b>	<b>52.1</b>	<b>2.3</b>	<b>54.4</b>	<b>45.3</b>	<b>54.4</b>	<b>-</b>

## Appendix C: Regional Measure 1 Program Cost Detail (\$ Millions) Cont.

Contract a	AB 144 / SB 66 Budget (07/2005) c	Approved Changes d	Current Approved Budget (06/2013) e = c + d	Cost to Date (06/2013) f	Cost Forecast (06/2013) g	At- Completion Variance h = g - e
New Benicia-Martinez Bridge Project continued...						
Subtotal BATA Capital Outlay Support	155.7	30.9	186.6	185.7	186.6	-
Subtotal BATA Capital Outlay Construction	97.5	16.4	113.9	107.0	113.9	-
Subtotal Capital Outlay Right-of-Way	158.1	22.0	180.1	165.9	180.2	0.1
Subtotal Non-BATA Capital Outlay Support	52.1	2.3	54.4	45.3	54.4	-
Subtotal Non-BATA Capital Outlay Construction	115.5	32.3	147.8	147.3	147.8	-
Project Reserves	765.5	163.8	929.3	899.8	929.4	0.1
<b>Total New Benicia-Martinez Bridge Project</b>	<b>1,059.9</b>	<b>212.6</b>	<b>1,272.5</b>	<b>1,209.5</b>	<b>1,272.5</b>	<b>-</b>
Notes:	Includes EAs 00601_,00603_,00605_,00606_,00608_,00609_,0060A_,0060C_,0060E_,0060F_,0060G_,0060H_, and all Project Right-of-Way					
Carquinez Bridge Replacement Project						
New Bridge						
Capital Outlay Support	60.5	(0.3)	60.2	60.2	60.2	-
Capital Outlay Construction	253.3	2.7	256.0	255.9	256.0	-
Total	313.8	2.4	316.2	316.1	316.2	-
Crockett Interchange Reconstruction						
Capital Outlay Support	32.0	(0.1)	31.9	31.9	31.9	-
Capital Outlay Construction	73.9	(1.9)	72.0	71.9	72.0	-
Total	105.9	(2.0)	103.9	103.8	103.9	-
Existing 1927 Bridge Demolition						
Capital Outlay Support	16.1	(0.3)	15.8	15.8	15.8	-
Capital Outlay Construction	35.2	-	35.2	35.1	35.2	-
Total	51.3	(0.3)	51.0	50.9	51.0	-
Other Contracts						
Capital Outlay Support	15.8	0.9	16.7	16.5	16.7	-
Capital Outlay Construction	18.8	(1.2)	17.6	16.5	17.6	-
Capital Outlay Right-of-Way	10.5	(0.1)	10.4	9.9	10.4	-
Total	45.1	(0.4)	44.7	42.9	44.7	-
Subtotal BATA Capital Outlay Support	124.4	0.2	124.6	124.4	124.6	-
Subtotal BATA Capital Outlay Construction	381.2	(0.4)	380.8	379.4	380.8	-
Subtotal Capital Outlay Right-of-Way	10.5	(0.1)	10.4	9.9	10.4	-
Project Reserves	12.1	(9.7)	2.4	-	2.4	-
<b>Total Carquinez Bridge Replacement Project <sup>1</sup></b>	<b>528.2</b>	<b>(10.0)</b>	<b>518.2</b>	<b>513.7</b>	<b>518.2</b>	<b>-</b>
Notes	Other Contracts include EAs 01301_,01302_,01303_,01304_,01305_,01306_,01307_,01308_,01309_,0130A_,0130C_,0130D_,0130F_,0130G_,0130H_,0130J_,00453_,00493_,04700_,00607_,2A270_,and 29920_ and all Project Right-of-Way					

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

## Appendix C: Regional Measure 1 Program Cost Detail (\$ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (06/2013)	Cost to Date (06/2013)	Cost Forecast (06/2013)	At- Completion Variance
a	c	d	e = c + d	f	g	h = g - e
<b>Richmond-San Rafael Bridge Trestle, Fender, and Deck Joint Rehabilitation</b>						
Capital Outlay Support						
BATA Funding	2.2	(0.8)	1.4	1.4	1.4	-
Non-BATA Funding	8.6	1.8	10.4	10.4	10.4	-
Subtotal	10.8	1.0	11.8	11.8	11.8	-
Capital Outlay Construction						
BATA Funding	40.2	(6.8)	33.4	33.3	33.4	-
Non-BATA Funding	51.1	-	51.1	51.1	51.1	-
Subtotal	91.3	(6.8)	84.5	84.4	84.5	-
Project Reserves	-	0.8	0.8	-	0.8	-
Total	102.1	(5.0)	97.1	96.2	97.1	-
<b>Richmond-San Rafael Bridge Deck Overlay Rehabilitation</b>						
Capital Outlay Support						
BATA Funding	4.0	(0.7)	3.3	3.3	3.3	-
Non-BATA Funding	4.0	(4.0)	-	-	-	-
Subtotal	8.0	(4.7)	3.3	3.3	3.3	-
Capital Outlay Construction	16.9	(0.6)	16.3	16.4	16.3	-
Project Reserves	0.1	0.3	0.4	-	0.4	-
Total	25.0	(5.0)	20.0	19.7	20.0	-
<b>Richmond Parkway Project (RM 1 Share Only)</b>						
Capital Outlay Support	-	-	-	-	-	-
Capital Outlay Construction	5.9	-	5.9	4.3	5.9	-
Total	5.9	-	5.9	4.3	5.9	-
<b>San Mateo-Hayward Bridge Widening</b>						
Capital Outlay Support	34.6	(0.5)	34.1	34.1	34.1	-
Capital Outlay Construction	180.2	(6.1)	174.1	174.1	174.1	-
Capital Outlay Right-of-Way	1.5	(0.9)	0.6	0.6	0.6	-
Project Reserves	1.5	(0.5)	1.0	-	1.0	-
Total	217.8	(8.0)	209.8	208.8	209.8	-
<b>I-880/SR-92 Interchange Reconstruction</b>						
Capital Outlay Support	28.8	35.8	64.6	62.2	64.6	-
Capital Outlay Construction						
BATA Funding	85.2	68.4	153.6	150.2	153.6	-
Non-BATA Funding	9.6	-	9.6	-	9.6	-
Subtotal	94.8	68.4	163.2	150.2	163.2	-
Capital Outlay Right-of-Way	9.9	7.3	17.2	15.4	17.2	-
Project Reserves	0.3	(0.3)	-	-	-	-
Total	133.8	111.2	245.0	227.8	245.0	-
<b>Bayfront Expressway Widening</b>						
Capital Outlay Support	8.6	(0.2)	8.4	8.4	8.4	-
Capital Outlay Construction	26.5	(1.5)	25.0	24.9	25.0	-
Capital Outlay Right-of-Way	0.2	-	0.2	0.2	0.2	-
Project Reserves	0.8	(0.3)	0.5	-	0.5	-
Total	36.1	(2.0)	34.1	33.5	34.1	-

## Appendix C: Regional Measure 1 Program Cost Detail (\$ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (06/2013)	Cost to Date (06/2013)	Cost Forecast (06/2013)	At- Completion Variance
a	c	d	e = c + d	f	g	h = g - e
US 101/University Avenue Interchange Modification						
Capital Outlay Support	-	-	-	-	-	-
Capital Outlay Construction	3.8	-	3.8	3.7	3.8	-
Total	3.8	-	3.8	3.7	3.8	-
Subtotal BATA Capital Outlay Support	358.3	64.7	423.0	419.5	423.0	-
Subtotal BATA Capital Outlay Construction	1,569.8	217.5	1,787.3	1,754.1	1,787.3	-
Subtotal Capital Outlay Right-of-Way	42.5	6.2	48.7	43.1	48.7	-
Subtotal Non-BATA Capital Outlay Support	14.0	4.0	18.0	17.6	18.0	-
Subtotal Non-BATA Capital Outlay Construction	92.4	9.5	101.9	82.9	102.0	0.1
Project Reserves	35.6	(8.1)	27.5	-	27.4	(0.1)
Total RM1 Program	2,112.6	293.8	2,406.4	2,317.2	2,406.4	-
Notes:	1 Richmond-San Rafael Bridge Trestle, Fender, and Deck Joint Rehabilitation Includes Non-TBSRP Expenses for EA 0438U_ and 04157_					
	2 San Mateo-Hayward Bridge Widening includes EAs 00305_,04501_,04503_,04504_,04504_,04505_,04506_,04507_,04508_,04509_,27740_,27790_,04860_					



Juvenile Falcon under the San Francisco-Oakland Bay Bridge



The Self-Anchored Suspension Bridge Shear Key Saddle Construction in Progress at E2 Pier Cap

# Project Photos



## Appendix E: Project Progress Photographs

### Self-Anchored Suspension (SAS) Bridge Field Work



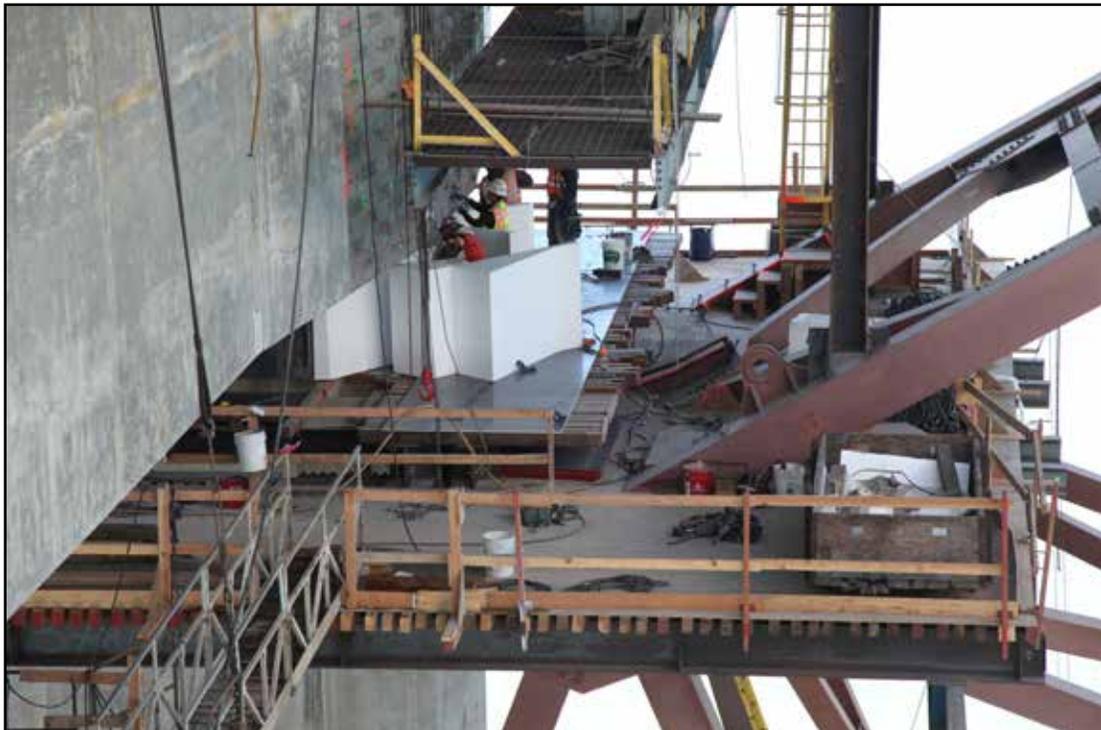
E2 Shear Key Saddle Formwork Installation in Progress



SAS Traveler Rail Installation in Progress



E2 Shear Key Saddle Anchor Drilling in Progress



E2 Shear Key Saddle Formwork Installation in Progress



Self Anchored Suspension Bridge Looking West to San Francisco with the New Yerba Buena Transition Structure on the right and the Existing Bay Bridge on the left



# Appendix E: Project Progress Photographs

## Oakland Touchdown (OTD)

### Before Opening to Traffic



# After Opening to Traffic and Current Eastbound Oakland Touchdown Progress



## Appendix E: Project Progress Photographs

### Oakland Touchdown (OTD)



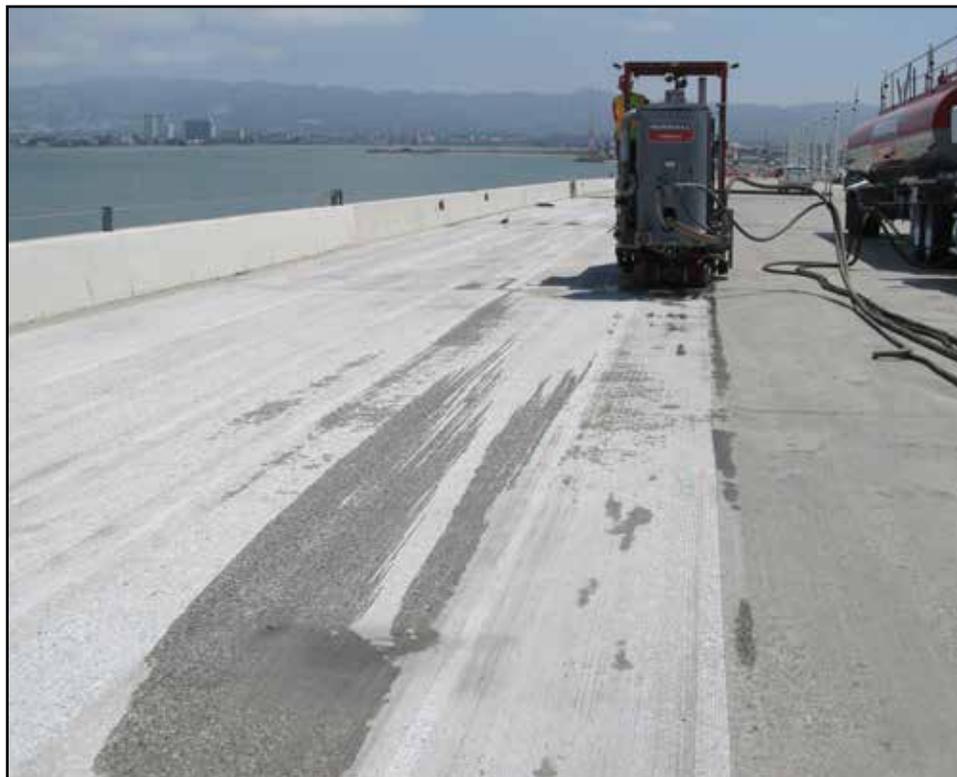
OTD #2 Service Platform Being Installed



OTD #2 Construction Progress Overview and the OTD Detour to the Existing eastbound Bridge



OTD #1 and #2 Lighting Poles Installed and Median Planter Area Constructed



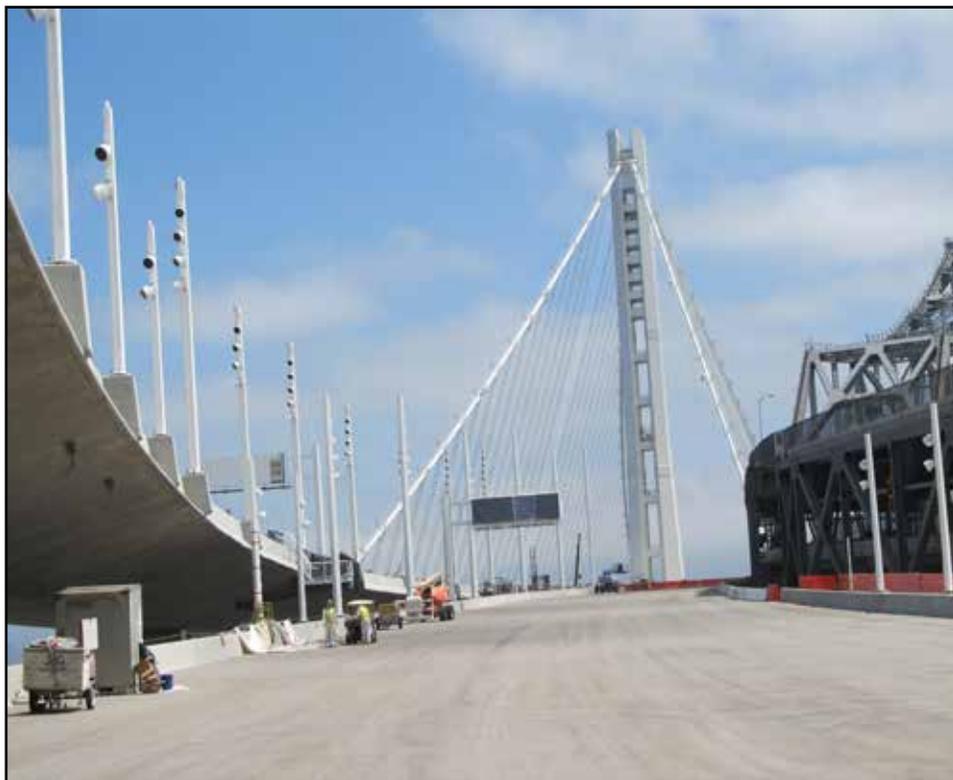
OTD #1 Roadway Deck Being Prepared for the Methacrylate Overlay

## Appendix E: Project Progress Photographs

### Yerba Buena Island Transition Structure (YBITS) #1 Westbound



YBITS eastbound Steel Counterweight Installed



YBITS Sign Structures and Lighting Poles Installed on eastbound and westbound Roadway Decks



YBITS Support Columns below westbound Deck Looking east toward SAS and the Existing Cantilever Bridge



YBITS westbound and eastbound Lighting Poles Installed

## Appendix E: Project Progress Photographs

### Antioch Bridge



Antioch Bridge - Pier 41 Girders on Temporary Jacks prior to Installation of Isolation Bearings



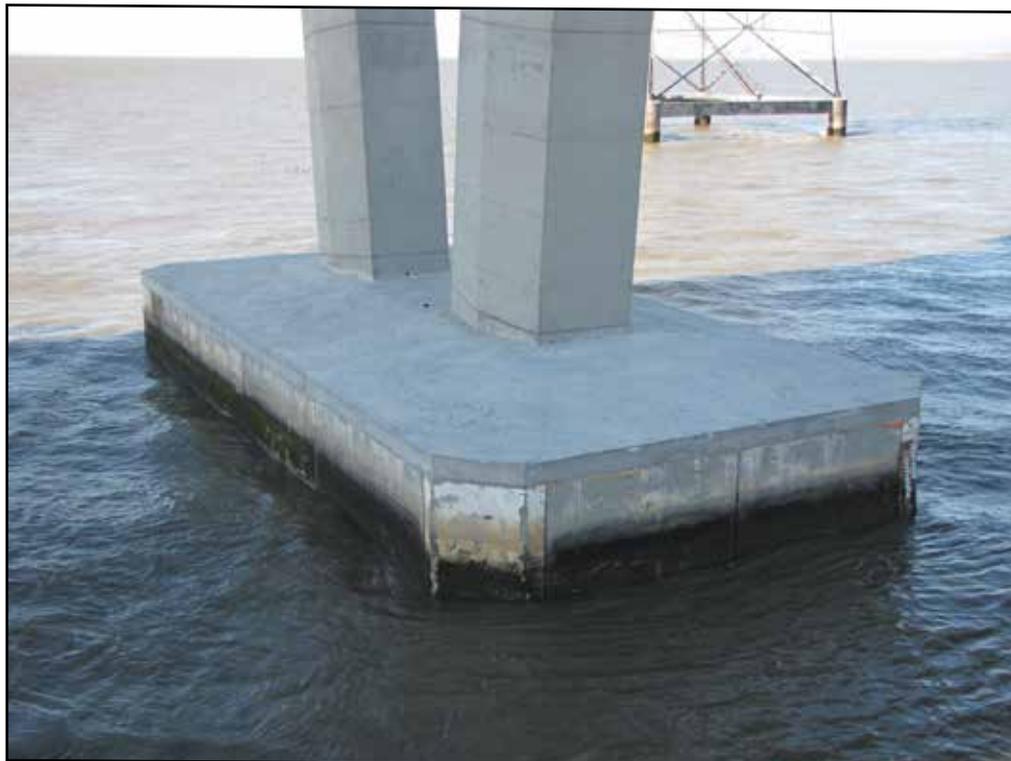
Antioch Bridge - Welding of Jacking Stiffeners at Existing Girder Web

## Appendix E: Project Progress Photographs

### Dumbarton Bridge



Dumbarton Bridge - Ravenswood Pier Staging for Footing Overlay Work



Dumbarton Bridge - Pier 26 Footing Overlay - All Footing Overlay Completed Except Piers 23 & 24

## 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.*





Pulling Electrical Wires at East Main Span

