Memorandum

To: CHAIR AND COMMISSIONERS

CTC Meeting: October 8, 2014

Reference No.: 3.12
Information

From: Andre Boutros
Executive Director

Subject: **San Francisco Bay Area Toll Bridge Seismic Retrofit Program - 2014 Second Quarter Project Progress and Financial Update**

Summary: With the September 2, 2013 opening of the new east span of the San Francisco-Oakland Bay Bridge to traffic, all seven state-owned toll bridges in the Bay Area have achieved seismic safety, via either retrofit or replacement of structure.

Self Anchored Suspension (SAS) span –

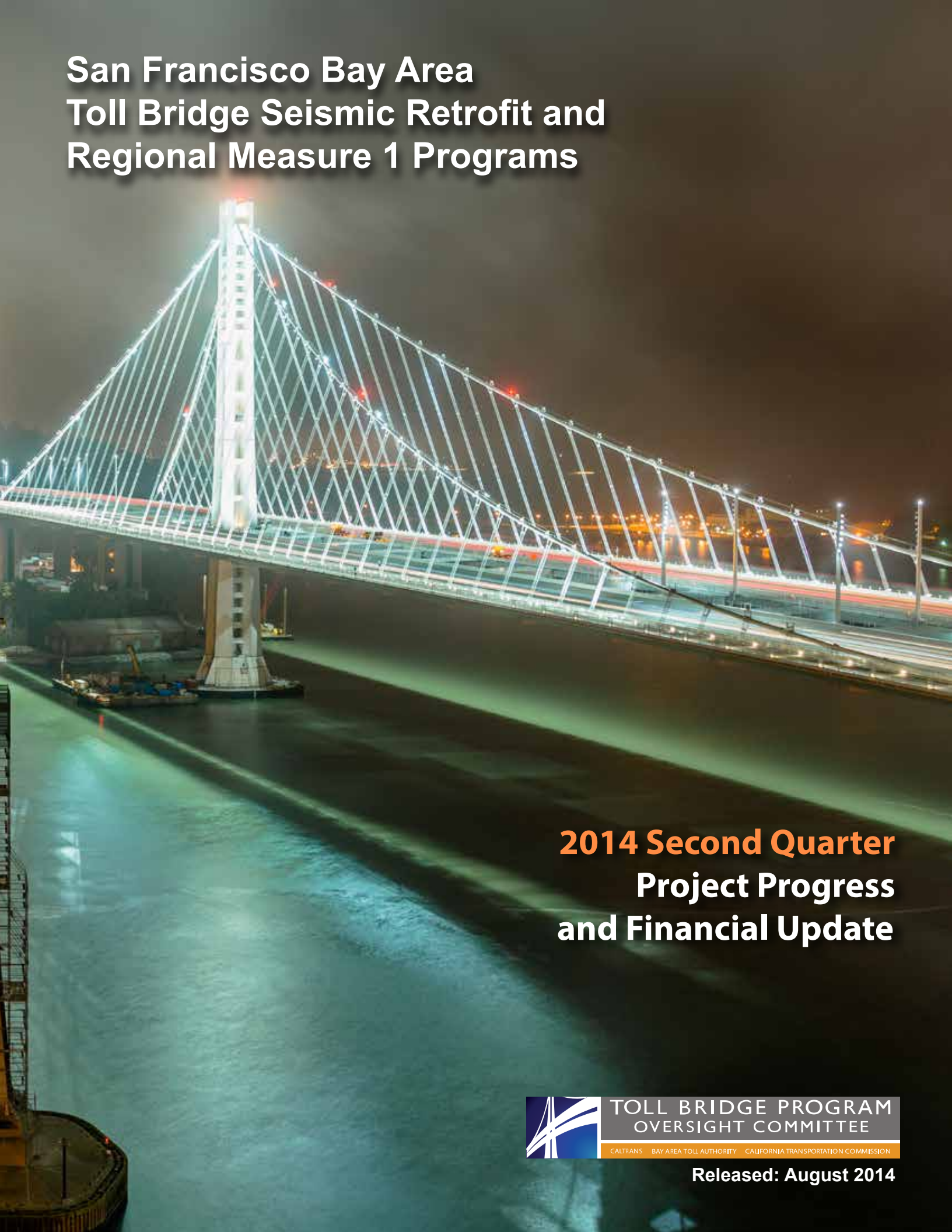
- American Bridge/Flour (ABF) the prime contractor is working through punch-list items as it demobilizes and will achieve SAS construction contract acceptance by the end of the year.
- At the August 2014 Toll Bridge Program Oversight Committee (TBPOC) meeting, the A354BD Rod Review Team presented preliminary findings from the testing program on the A354BD steel rods utilized in the construction of the SAS. The preliminary findings indicate that the remaining SAS rods are consistent with the bridge's design requirements, assuming certain proper corrosion protection is maintained.
- The A354BD Rod Review Team report is planned for distribution at the TBPOC's September 30, 2014 meeting and the TBPOC is expected to take action on the disposition on the rods at its November 4, 2014 meeting.

Dismantling of the old span -

- The main cantilever truss section was cut in half and continues to be disassembled along with the Yerba Buena Island (YBI) Detour S-curve. Once the cantilever truss and S-curve are removed, the eastbound YBI on-ramp and bicycle/pedestrian pathway will be constructed.
- A construction manager general contractor (CMGC) contract to implode the main cantilever foundation as a test program was awarded this past July. If successful, the implosion technique will be utilized to remove other similar bridge marine foundations in the marine foundation demolition contract.
- The 504/288 superstructure demolition contract is planned for advertisement by the end of the year to be followed by the marine foundation demolition contract.

Background: Assembly Bill 144 (Statutes of 2005, Hancock) created the Toll Bridge Program Oversight Committee (TBPOC) to exercise project oversight and control over the Toll Bridge Seismic Retrofit Program. The TBPOC is comprised of the Director of the 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 program oversight and control activities include review and approval of contract bid documents, contract change orders and resolution of major project issues.

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

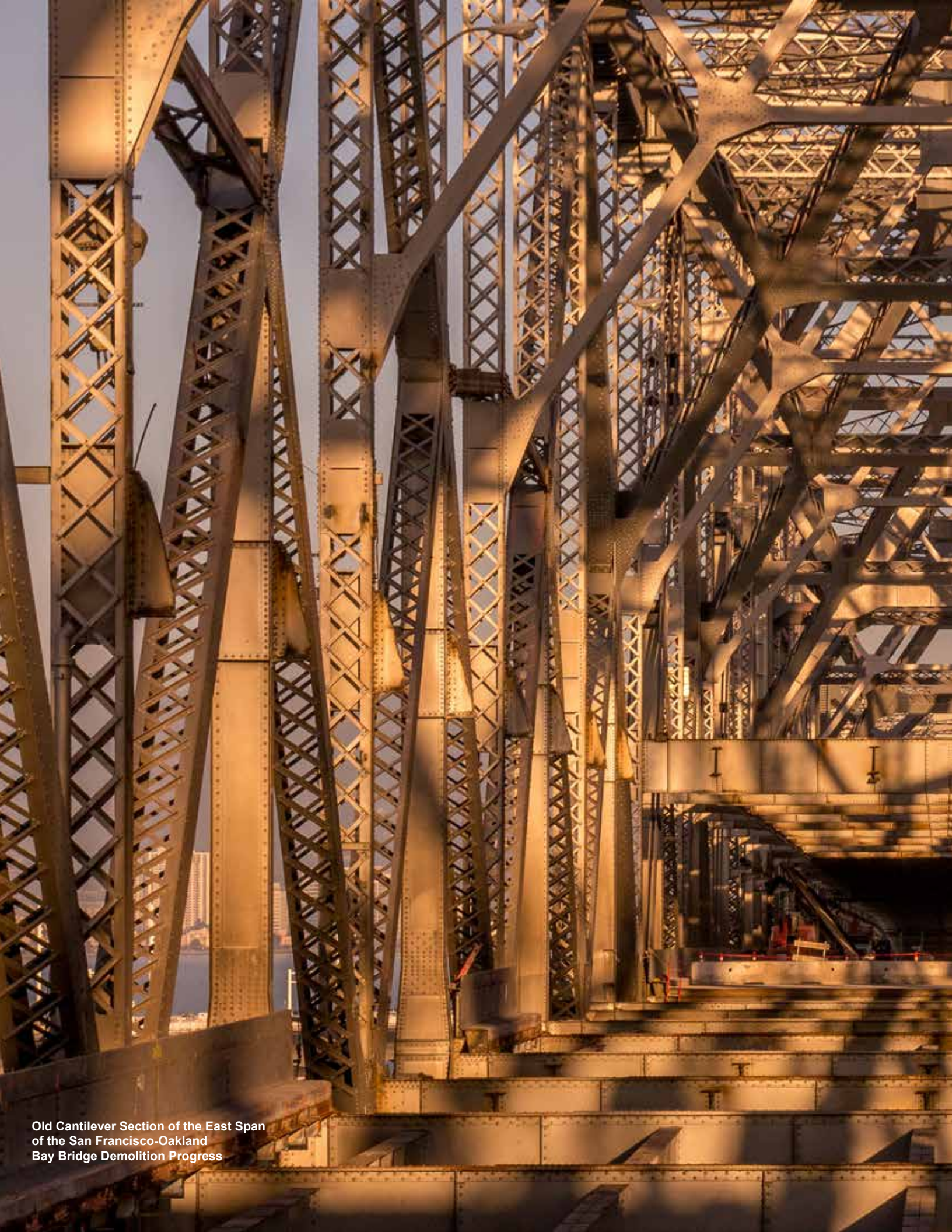


2014 Second Quarter Project Progress and Financial Update

TOLL BRIDGE PROGRAM OVERSIGHT COMMITTEE

CALTRANS BAY AREA TOLL AUTHORITY CALIFORNIA TRANSPORTATION COMMISSION

Released: August 2014



Old Cantilever Section of the East Span
of the San Francisco-Oakland
Bay Bridge Demolition Progress

CAUTION
DANGER

TOLL BRIDGE PROGRAM
OVERSIGHT COMMITTEE

CALTRANS · BAY AREA TOLL AUTHORITY · CALIFORNIA TRANSPORTATION COMMISSION

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

August 14, 2014

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 2014 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 was established by Assembly Bill 144 in 2005 to oversee the delivery of the TBSRP and consists of the Executive Director of BATA, the Director of Caltrans, and the Executive Director of the California Transportation Commission.

With the opening of the new east span of the San Francisco-Oakland Bay Bridge to traffic on September 2, 2013, all seven state-owned toll bridges in the Bay Area have now achieved seismic safety, either via retrofit or replacement of existing structures.

On July 24, 2014, the TBPOC was presented with the preliminary findings of the test results for the A354BD bolts utilized on the new Self-Anchored Suspension span of the Bay Bridge. Those preliminary results were positive and the remaining A354BD bolts exhibit superior material properties and were fabricated and installed differently than the 2008 bolts that broke last year. The bolt review committee has determined that the remaining bolts meet the design requirements of the bridge and are not likely to be a long term problem as long as the corrosion protection of the bolts is maintained in accordance with maintenance requirements. The TBPOC expects to take final actions related to our bolt investigation in September 2014.

On August 5, 2014, Caltrans testified at an informational hearing of the Senate Transportation and Housing Committee on "Bay Bridge Lessons Learned." A number of topics were discussed including transparency, project management, risk management, peer reviews, and specific technical concerns. Caltrans' response to those concerns can be found at the Committee's website at http://stran.senate.ca.gov/informationalhearings.

While the new east span of the Bay Bridge has been opened to traffic, construction activities continue. Dismantling of the old span continues with the removal of the upper and lower concrete decks of the main cantilever section of the bridge. The main cantilever truss was cut in half on April 2, 2014, and continues to be disassembled. The permanent eastbound bicycle/pedestrian pathway approach from the toll plaza to the new east span was opened on March 25, 2014. Completion of the permanent pathway at Yerba Buena Island is forecast for June 2015.

A comprehensive risk assessment continues to be performed for each project in the program on a quarterly basis. Based upon those assessments, a forecast is developed using the average cost of risk. These forecasts can increase or decrease as risks are identified, resolved or retired. The program contingency is currently $89.5 million in accordance with the TBPOC approved budget.

As of the end of the second quarter of 2014, the 50 percent probable draw on program contingency is $115.5 million. The potential draw ranges from about $50 million to $180 million. We are mindful that the 50 percent probable draw exceeds the program contingency, and are working to identify additional cost-saving strategies to bring the two amounts into better balance.

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 14, 2014

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

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

Dear Mr. Guardino and Ms. Dunn:

The Toll Bridge Program Oversight Committee (TBPOC) is pleased to submit the 2014 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 was established by Assembly Bill 144 in 2005 to oversee the delivery of the TBSRP and consists of the Executive Director of BATA, the Director of Caltrans, and the Executive Director of the California Transportation Commission.

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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

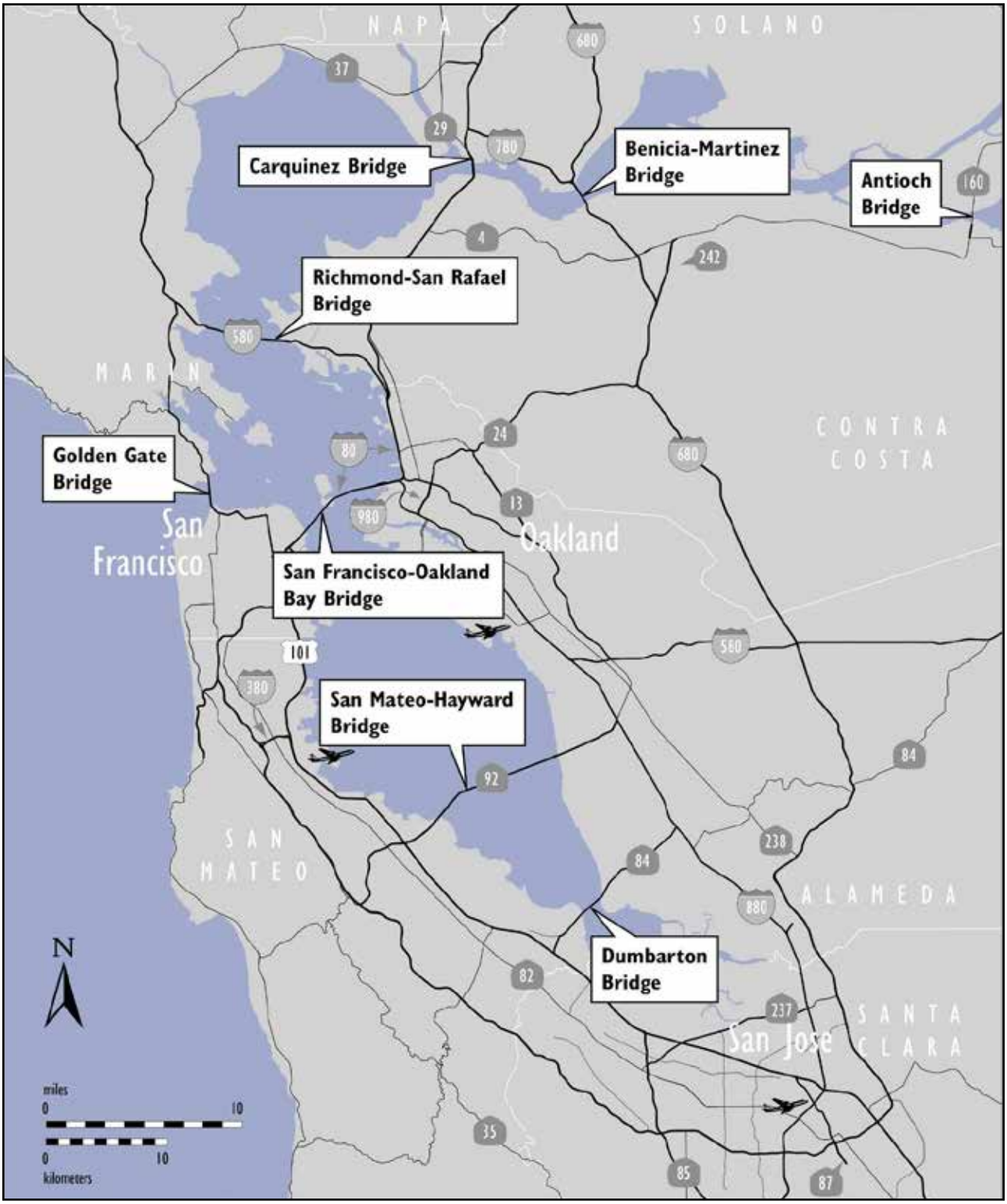
Demolition Progress of the Old San Francisco-Oakland Cantilever Structure between Yerba Buena Island and Oakland

Table of Contents

Introduction **1**

- Summary of Major Project Highlights, Issues and Actions 2
- The San Francisco-Oakland Bay Bridge Bolt Issues 4
- Toll Bridge Seismic Retrofit Program Cost Summary 6
- Toll Bridge Seismic Retrofit Program Schedule Summary 7
- San Francisco-Oakland Bay Bridge Seismic Retrofit Strategy 10
- East Span Seismic Replacement Project 11
- San Francisco-Oakland Bay Bridge East Span Replacement Project Summary 12
  - Yerba Buena Island Detour (YBID) 13
  - Yerba Buena Island Transition Structures 14
  - Self-Anchored Suspension (SAS) Bridge 16
  - Skyway 18
  - Oakland Detour 19
  - Existing SFOBB East Span Dismantling 20
  - Existing East Span Dismantling 21
  - Other Contracts 22
  - Other Completed TBSRP Projects 24
- TBSRP Risk Management Program Update 26
- Program Funding Status 28
- Quarterly Environmental Compliance Highlights 30
- Regional Measure 1 Toll Bridge Program 33
- Other Completed RM1 Projects 34
- Appendices 36

Map of Bay Area Toll Bridges



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

Introduction

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

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

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

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

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

SUMMARY OF MAJOR PROJECT HIGHLIGHTS, ISSUES, AND ACTIONS

Self-Anchored Suspension Bridge Cover Plate Installation at Bearing B4

Self-Anchored Suspension Bridge and Demolition of Old Bridge

Oakland Touchdown #2 Permanent Bike Path Progress Looking west

Toll Bridge Seismic Retrofit Program Risk Management

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

Based upon those assessments, a forecast is developed using the average cost of risk. These forecasts can increase or decrease as risks are identified, resolved or retired. The program contingency is currently $89.5 million in accordance with the TBPOC approved budget. As of the end of the second quarter of 2014, the 50 percent probable draw on program contingency is $115.5 million. The potential draw ranges from about $50 million to $180 million (refer to Figure 1 on page 27).

The current program contingency balance may not be sufficient to cover the cost of currently identified risks. It is important to understand that the risks identified in each of the contracts are as yet unmitigated. Various teams are working to mitigate these risks by working diligently to reduce the probability of these risks occurring and preparing responses to minimize their impact should they occur. In accordance with the approved Toll Bridge Seismic Retrofit Program's (TBSRP) Risk Management Plan, risk mitigation actions are continuously 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

The seismically safe replacement eastern span of the San Francisco-Oakland Bay Bridge opened to traffic on the morning of September 2, 2013. Ongoing work includes completion of punchlist and close-out work on the Self-Anchored Suspension Span, completion of the eastbound on-ramp and bicycle/pedestrian pathway from Yerba Buena Island, and the dismantling of the old span.

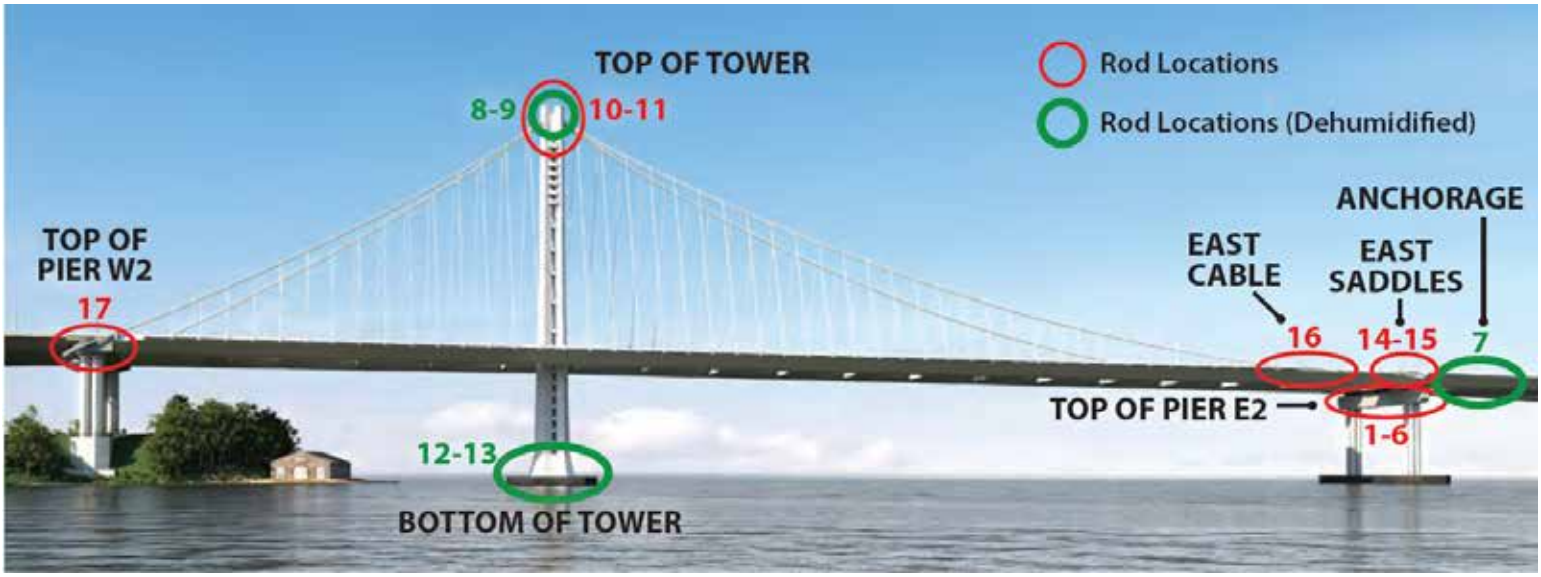
The San Francisco-Oakland Bay Bridge Bolt Issues

In early 2013, within days after tensioning was performed, the anchor bolts in the shear keys directly below the eastbound and westbound orthotropic box girder (OBG) structures (known as shear keys S1 and S2) began to fail. 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.

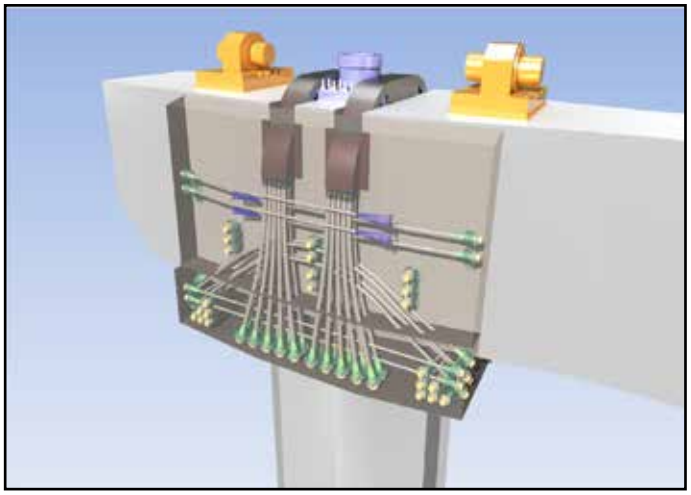
A forensic metallurgic examination was jointly performed with both the contractor's and Caltrans' Materials Engineering and Testing Services' (METS) metallurgical experts. It was determined that while the failed bolts' material properties did meet the contract specifications, the hardness properties 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 anchor bolts at shear keys S1 and S2 and at other locations on the span are made from an A354 grade BD material. However, the broken bolts are uniquely different from the other anchor bolts at the remaining shear keys and bearings in that they were manufactured in 2008 as opposed to the remaining ones in 2010. In addition, the anchor bolts at shear keys S1 and S2 have their anchors fully cast into the pier E2 cap and are not replaceable. The remaining Pier E2 shear keys and bearings are through bolted and thus replaceable. As such, shear keys S1 and S2 required an alternate anchorage solution.

A354 Grade BD Rod Locations on the SAS Bridge



The San Francisco-Oakland Bay Bridge Bolt Issues (cont.)



Rendering of E2 Saddle Retrofit Strategy

Cross Section of an E2 Shear Key Broken Bolt

Rebar Installation at the west Face of E2E Cap Beam

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 within a short period of time after tensioning the bolts due to 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.

- The broken embedded anchor bolts holding down shear keys S1 and S2 at Pier E2 were abandoned by Caltrans. The clamping force of the broken bolts were replaced first by an interim retrofit that allowed the bridge to be opened in September 2013 and permanently by a steel saddle retrofit that was completed on December 18, 2013.

- The TBPOC 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.

The interim retrofit was extensively peer reviewed by the Toll Bridge Seismic Safety Peer Review Panel (TBSSPRP), the Federal Highway Administration (FHWA), and two preeminent bridge engineers from the firms of Buckland & Taylor, Ltd., and Modjeski and Masters. All reviews reached the same unequivocal conclusion that the interim retrofit will adequately protect the bridge seismically and allow for the seismic safety opening of the new East Span while the permanent retrofit is under construction. As a result, the TBPOC met in public session to approve opening the bridge over the Labor Day 2013 weekend. The permanent steel saddle retrofit was completed on December 18, 2013.

On February 26, 2014, the TBPOC held a public technical briefing about the current A354 grade BD rod testing program and invited technical professionals and others who have expressed opinions or an interest in this issue. The testing

program is ongoing to determine the long-term disposition of the remaining A354 grade BD anchor rods on the bridge. This program is expected to continue through the summer of 2014.

Oakland Touchdown #2 Contract

Flatiron West, Inc. is the prime contractor that is constructing the Oakland Touchdown #2 project, which completes the remaining portions of the Oakland Touchdown approach structures from the existing toll plaza to the new span. This work included the entire westbound structure and portions of the eastbound structure (not in conflict with the existing span) which were constructed under the Oakland Touchdown #1 contract. The OTD #2 construction contract started on June 25, 2012. The contractor is in the process of landscaping the area and recently completed the remaining portion of the permanent bicycle/pedestrian pathway off the new span to the toll plaza area.

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

The YBITS #2 and Cantilever Dismantling contract is dismantling the main cantilever truss and detour viaduct and will construct the new eastbound on-ramp and bicycle/pedestrian pathway to the bridge in its place. The contract was awarded to California Engineering Contractors Inc/Silverado Contractors Inc. Joint Venture on November 28, 2012. Initial startup activities and submittals began in March 2013. Significant portions of the upper and lower roadway decks have been removed to lighten the span for dismantling. The main cantilever truss was cut into two independent east and west structures on April 2, 2014, and will be dismantled in pieces. Truss members are currently being removed.

504/288 Superstructure Dismantling Contract

Caltrans is currently finalizing plans for the dismantling of the 504 and 288 trusses and supports. The 504 and 288 trusses make up the approach structures from the toll plaza to the main cantilever. The contract is scheduled to be advertised in July 2014.

A View of the west Face of Pier E2W with S1 Shear Key Hold-Down Retrofit Complete

Patching E2W Cap Beam Concrete Face - Conduits and Enclosures in Place

Toll Bridge Seismic Retrofit Program Cost Summary (Millions)

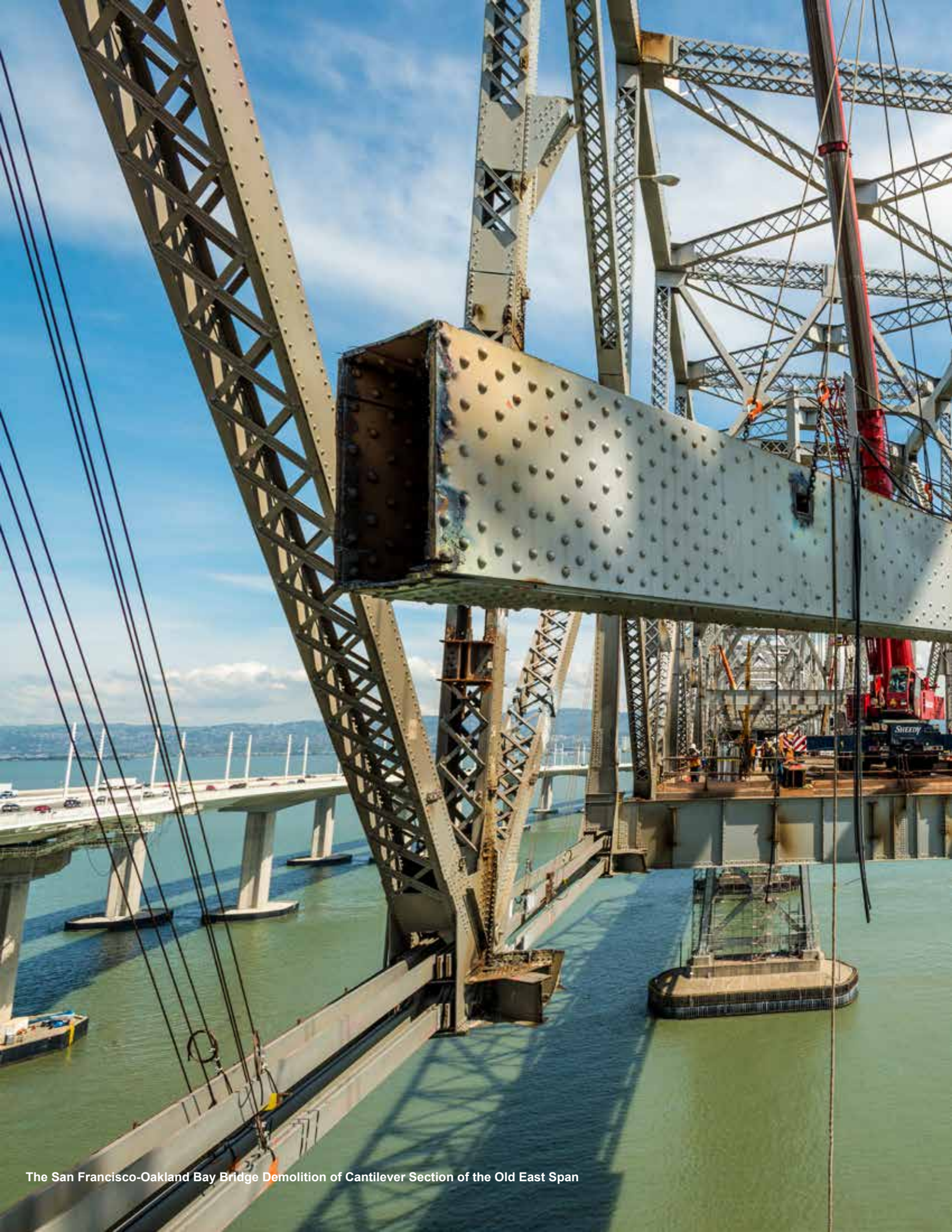
	Contract Status	AB 144/SB 66 Budget (September 2005)	TBPOC Approved Changes	Current TBPOC Approved Budget (June 2014)	Cost to Date (June 2014)	Current Cost Forecast (June 2014)	Cost Variance	Cost Status
		a	b	c = a + b	d	e	f = e - c	
SFOBB East Span Seismic Replacement								
Capital Outlay Construction								
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	1,961.5	2,055.5	8.7	
YBI Detour	Completed	131.9	341.4	473.3	473.3	473.3	-	
YBI Transition Structures (YBITS)		299.3	0.1	299.4	228.8	332.5	33.1	
YBITS 1	Completed			203.7	203.6	203.6	(0.1)	
YBITS 2 Cantilever Dismantling	Construction			92.4	25.2	125.6	33.2	
YBITS Landscaping	Design			3.3	-	3.3	-	
Oakland Touchdown (OTD)[1]		283.8	46.8	330.6	304.2	333.2	2.6	
OTD 1	Completed			205.3	205.3	205.3	-	
OTD 2	Construction			72.6	55.0	73.7	1.1	
Detour	Completed			47.0	38.1	44.6	(2.4)	
OTD Electrical Systems	Construction			-	-	-	-	
Submerged Electric Cable	Completed			5.7	5.7	9.6	3.9	
Existing Bridge Dismantling		239.2	7.3	246.5	17.0	271.4	24.9	
Cantilever Section [2]	Construction			69.0	17.0	71.8		
504/288 Sections	Design			-	-	92.5		
Marine Foundations	Design			-	-	107.1		
Stormwater Treatment Measures	Completed	15.0	3.3	18.3	16.9	17.0	(1.3)	
Other Completed Contracts	Completed	90.4	(0.5)	89.9	90.0	90.5	0.6	
Capital Outlay Support		959.3	346.2	1,305.5	1,230.4	1,343.5	38.0	
Right-of-Way and Environmental Mitigation		72.4	-	72.4	51.7	62.0	(10.4)	
Other Budgeted Capital		35.1	(32.8)	2.3	0.7	7.7	5.4	
Total SFOBB East Span Replacement		5,486.6	910.4	6,397.0	5,886.6	6,502.3	105.3	
Antioch Bridge Seismic Retrofit								
Capital Outlay Construction and Mitigation	Completed		51.0	51.0	47.0	50.3	(0.7)	
Capital Outlay Support			31.0	31.0	23.6	23.8	(7.2)	
Total Antioch Bridge Seismic Retrofit		-	82.0	82.0	70.6	74.1	(7.9)	
Dumbarton Bridge Seismic Retrofit								
Capital Outlay Construction and Mitigation	Completed		92.7	92.7	63.8	68.2	(24.5)	
Capital Outlay Support			56.0	56.0	44.2	45.5	(10.5)	
Total Dumbarton Bridge Seismic Retrofit		-	148.7	148.7	108.0	113.7	(35.0)	
Other Program Projects		2,268.4	(63.6)	2,204.8	2,164.4	2,192.5	(12.3)	
Miscellaneous Program Costs		30.0	-	30.0	25.5	30.0	-	
Net Programmatic Risks		**-**	**-**	**-**	**-**	**65.4**	**65.4**	
Program Contingency		**900.0**	**(810.5)**	**89.5**	**-**	**(26.0)**	**(115.5)**	
Total Toll Bridge Seismic Retrofit Program [3]		**8,685.0**	**267.0**	**8,952.0**	**8,255.1**	**8,952.0**	**-**	

(1) Construction administration of the OTD Detour was under the YBITS#1 contract.
(2) Construction administration of the cantilever segment is under the YBITS#2 contract.
(3) Figures may not sum up to totals due to rounding effects.

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

● Within approved schedule and budget
● Identified potential project risks that could significantly impact approved schedules and budgets if not mitigated
● Known project impacts with forthcoming changes to approved schedules and budgets



The San Francisco-Oakland Bay Bridge Demolition of Cantilever Section of the Old East Span

TOLL BRIDGE SEISMIC RETROFIT PROGRAM

TOLL BRIDGE SEISMIC RETROFIT PROGRAM

San Francisco-Oakland Bay Bridge Seismic Retrofit Strategy

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

The San Francisco-Oakland Bay Bridge West Approach Overview

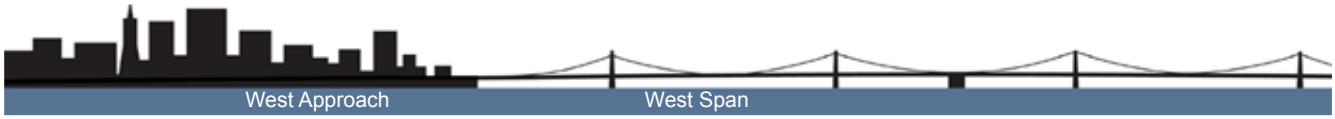
West Approach Seismic Replacement Project
Project Status: Completed 2009

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

West Span Seismic Retrofit Project
Project Status: Completed 2004

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

San Francisco-Oakland Bay Bridge West Span



East Span Seismic Replacement Project
Project Status: 95% Complete as of June 2014

Rather than a seismic retrofit, the two-mile long East Span has been completely rebuilt. The new East Span consists of several different sections, yet appears as a single streamlined span. The eastbound and westbound lanes of the East Span no longer include upper and lower decks. The lanes are side-by-side, providing motorists with expansive views of the bay. These views are also enjoyed by bicyclists and pedestrians, thanks to a new bicycle/pedestrian path on the south side of the bridge that will extend all the way to Yerba Buena Island. The new span features the world's longest Self-Anchored Suspension (SAS) bridge that connects to an elegant roadway supported by piers (Skyway), which gradually slopes down toward the Oakland shoreline (Oakland Touchdown).

Eastern Span of the San Francisco-Oakland Bay Bridge on the left and Demolition Progress of the Old Bay Bridge on the right

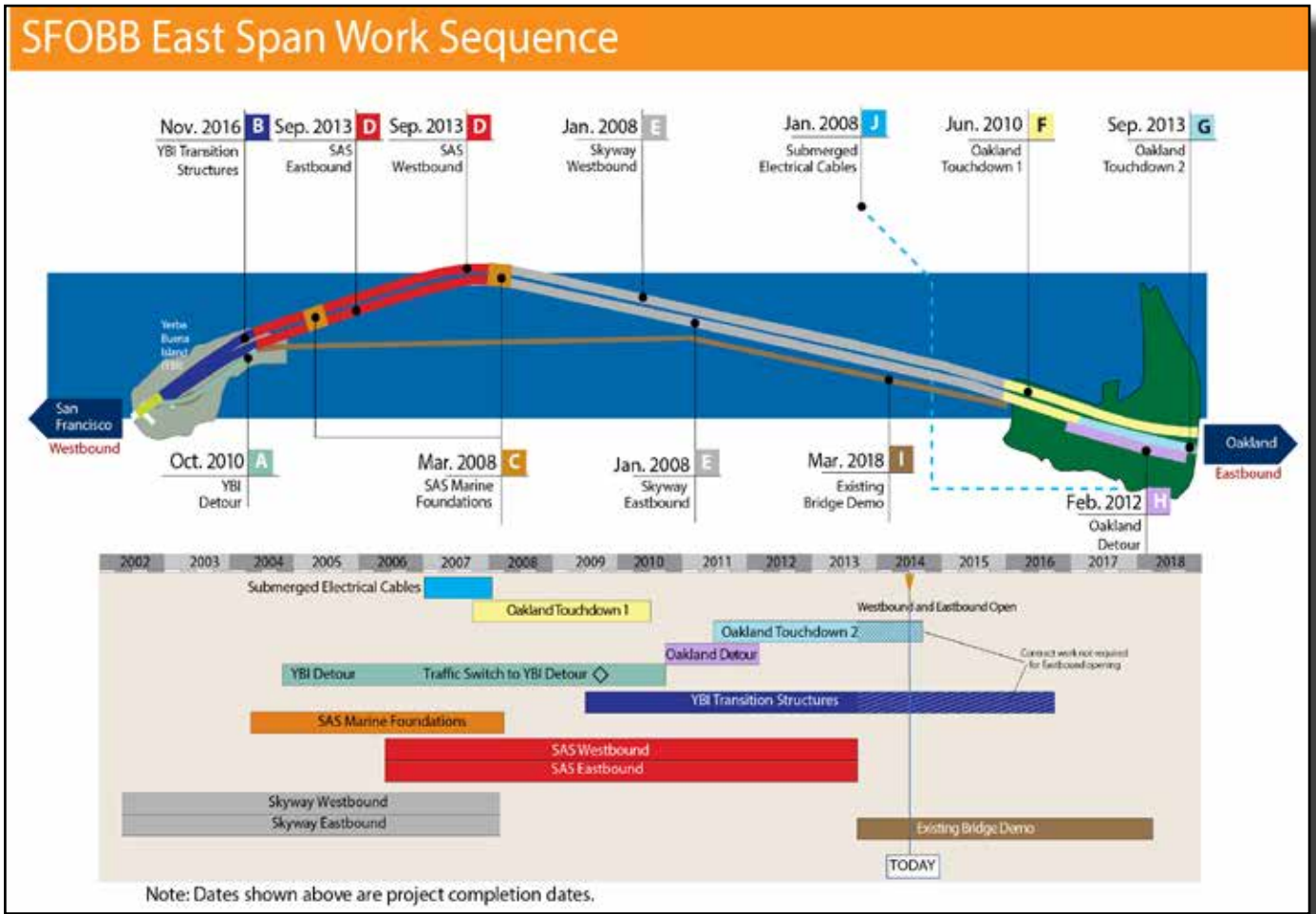
TOLL BRIDGE SEISMIC RETROFIT PROGRAM

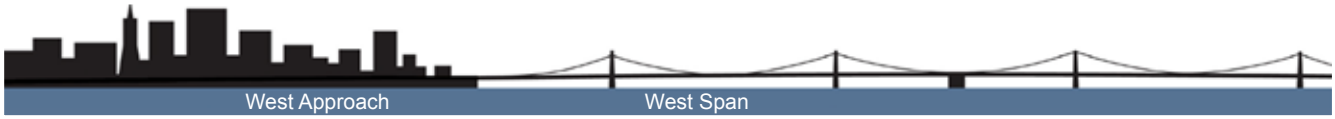
San Francisco-Oakland Bay Bridge East Span Replacement Project Summary

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

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

Overview of the New San Francisco-Oakland Bay Bridge East Span and the Demolition of the Old Bridge





TOLL BRIDGE SEISMIC RETROFIT PROGRAM

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

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

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

A YBID Contract

Contractor: C.C. Myers, Inc.

Approved Capital Outlay Budget: $473.3 M

Status: Completed October 2010

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

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

TOLL BRIDGE SEISMIC RETROFIT PROGRAM

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

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

B YBITS #1 Contract

Contractor: MCM Construction, Inc.

Approved Capital Outlay Budget: $203.7

Status: 100% Complete as of June 2014

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

Status: Completed.

YBITS Landscaping Contract

Contractor: TBD

Approved Capital Outlay Budget $3.3 M

Status: In Design

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

YBITS #2 Cantilever Dismantling Contract

Contractor: CEC & Silverado (JV)

Approved Capital Outlay Budget: $92.4 M

Status: 41% Complete as of June 2014

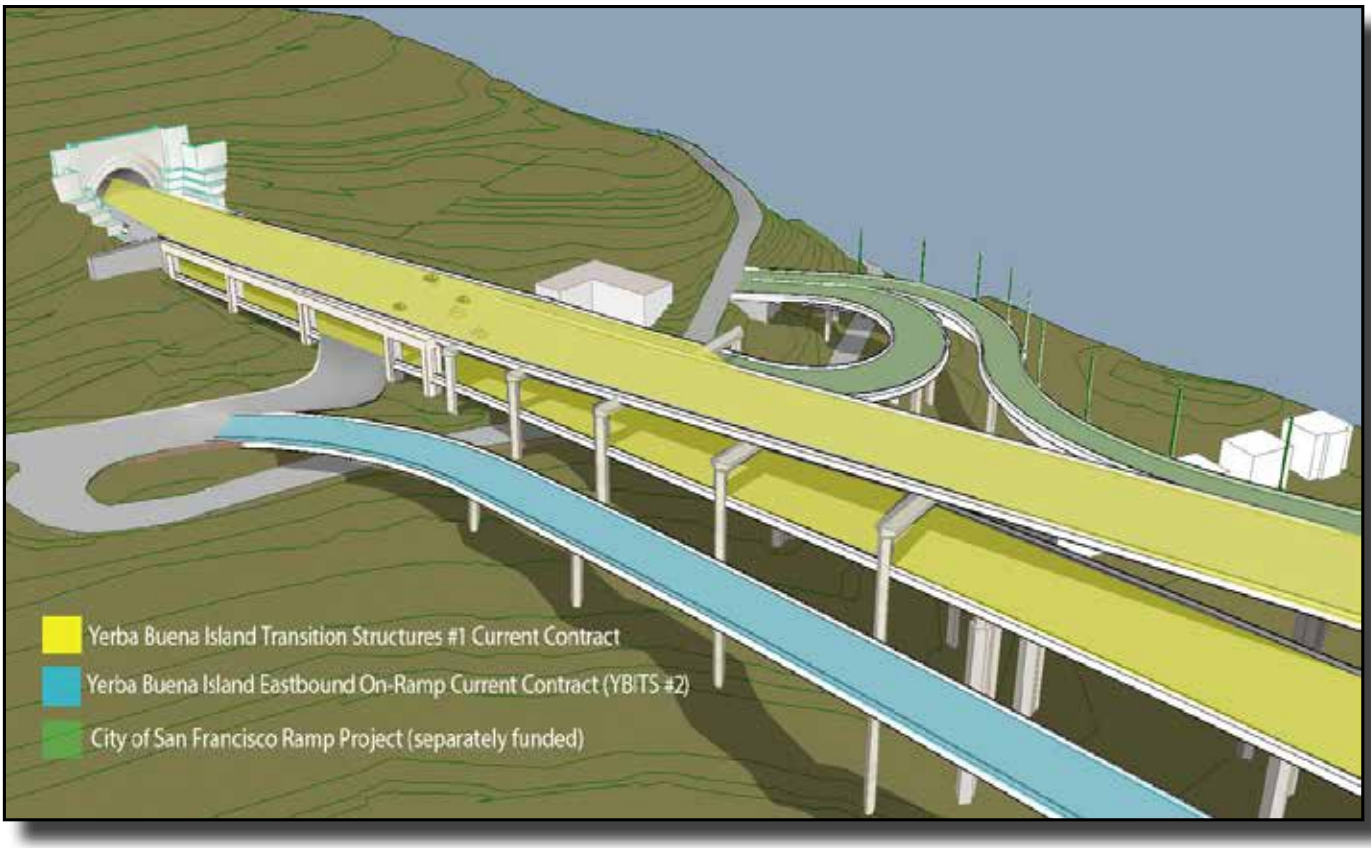
The YBITS #2 contract is dismantling the detour viaduct now that the traffic has been switched to the new bridge and will construct a new eastbound on-ramp to the bridge in its place. The contract also includes the cantilever truss dismantling, and the bicycle/pedestrian pathway construction.

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

Status: Wildlife monitoring and installation of bird protection plans are ongoing. Current cantilever demolition work includes installing temporary members, bridge separation, and truss removal. Temporary supports are being installed on the temporary bypass structure and the temporary access elevator was installed on March 31, 2014.

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

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



TOLL BRIDGE SEISMIC RETROFIT PROGRAM

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

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

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

SAS Land Foundation Contract

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

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

SAS Marine E2 and the Skyway Westbound Foundation and Columns

C SAS Marine Foundations Contract

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

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

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

D SAS Superstructure Contract

Contractor: American Bridge/Fluor Enterprises, Joint Venture
Approved Capital Outlay Budget: $2.05 B
Status: 96% Complete as of June 2014

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

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

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. The S1 and S2 shear key hold-down saddle retrofit was competed on December 18, 2013.

Status: Cleaning and painting on the inside of the steel bridge decks is ongoing. At pier E2, the grease caps installation has been completed and the dust covers for the shear keys is nearly finished. On the tower, elevator cab testing and adjustments continues and painting of the skirt of the tower is now complete.

View Looking East to Oakland from the Tower of the Self-Anchored Suspension Bridge with Cantilever Demolition Progress on the right

TOLL BRIDGE SEISMIC RETROFIT PROGRAM

San Francisco-Oakland Bay Bridge East Span Replacement Project Skyway

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

E Skyway Contract

Contractor: Kiewit/FCI/Manson, Joint Venture
Approved Capital Outlay Budget: $1.24 B
Status: Completed April 2008

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

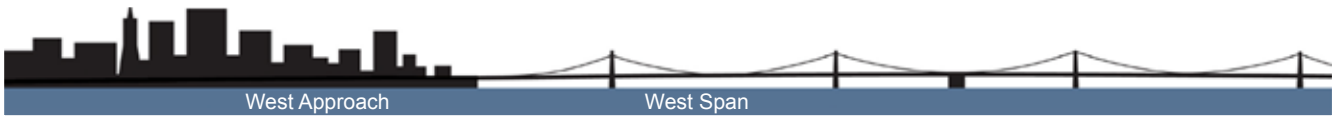
The Skyway's decks are composed of 452 pre-cast concrete segments (standing three stories high), containing approximately 200 million pounds of structural steel, 120 million pounds of reinforcing steel, 200 thousand linear feet of piling and about 450 thousand cubic yards of concrete. These are the largest segments of their kind ever cast and were lifted into place by custom-made winches.

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

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

Status: Opened to traffic on September 2, 2013.

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



TOLL BRIDGE SEISMIC RETROFIT PROGRAM

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

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

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

F Oakland Touchdown #1 Contract

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

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

G Oakland Touchdown #2 Contract

Contractor: Flatiron West, Inc.
Approved Capital Outlay Budget: $72.6 M
Status: 99% Complete as of June 2014

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

Status: Landscaping and installation of the irrigation system continues.

Aerial View of Oakland Touchdown

TOLL BRIDGE SEISMIC RETROFIT PROGRAM

San Francisco-Oakland Bay Bridge East Span Replacement Project
Existing East Span Bridge Dismantling

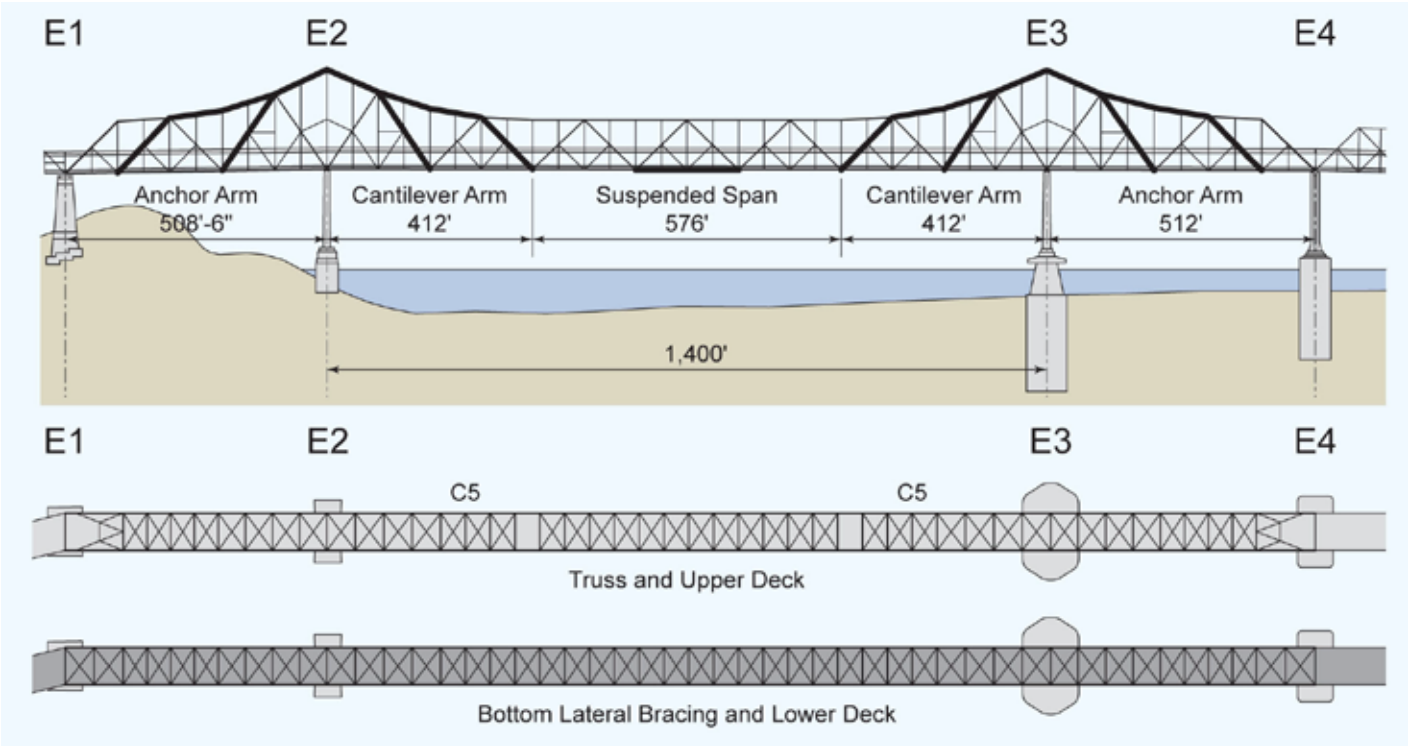
I Existing SFOBB Dismantling Contracts

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

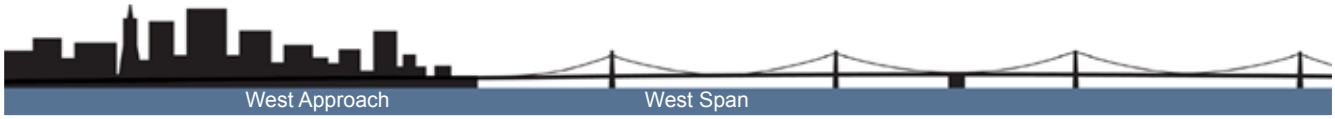
To expedite the opening of a new eastbound on ramp and the bike/pedestrian pathway from Yerba Buena Island to the SAS and to maximize contractor efficiencies, the TBPOC split the dismantling of the existing bridge into multiple contracts. The dismantling of the superstructure of the main cantilever section of the existing bridge has been incorporated into the YBITS #2 contract. The dismantling of the remaining 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: (See diagrams #1 and #2) The cantilever portion of the dismantling contract was awarded to CEC and Silverado (JV) on November 28, 2012. Construction start-up activities began in March 2013. Cantilever and YBI detour dismantling continues.

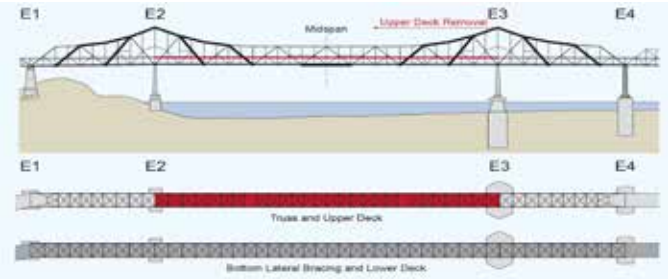
Demolition Diagrams



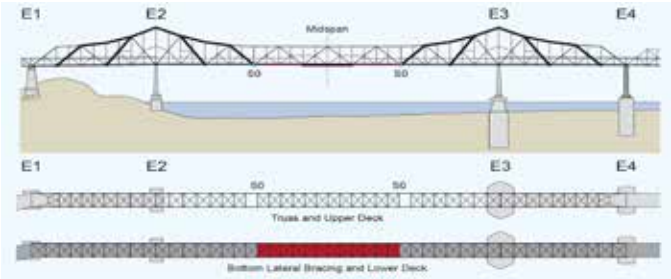
GENERAL LAYOUT



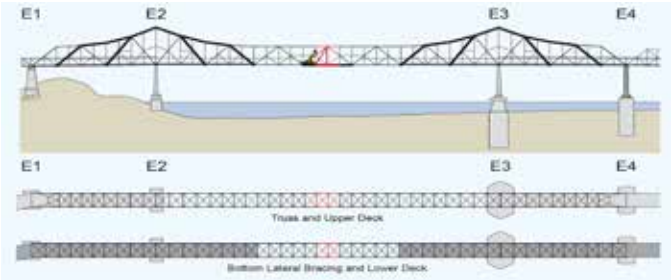
1. Remove Upper Deck from Pier E3 to Pier E2



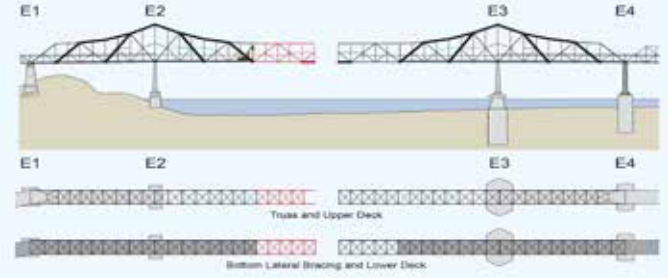
2. Remove Lower Deck from Suspended Span Replace with Timber Mat



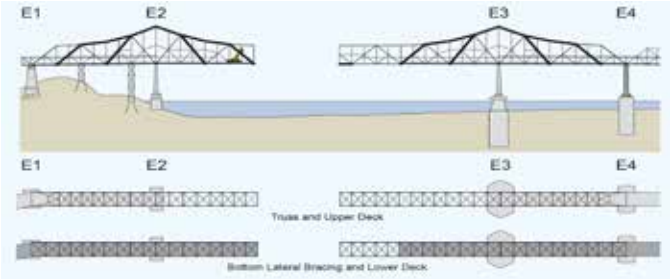
3. Disconnect Bridge at Midspan



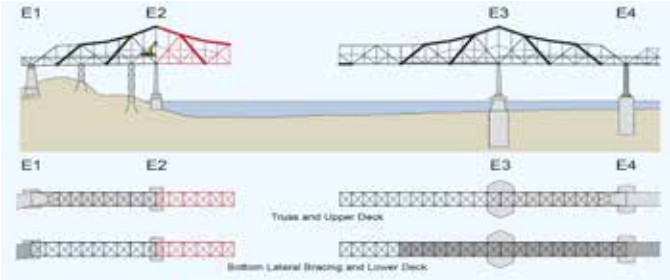
4. Remove West Suspended Span



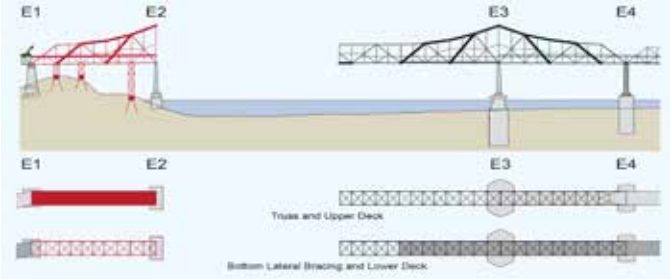
5. Install West Falsework Supports



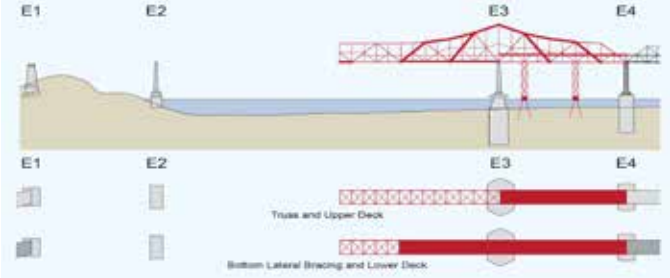
6. Remove Remaining West Cantilever Arm



7. Remove West Anchor Arm - Remove Falsework Supports



8. Remove East Spans Similarly



TOLL BRIDGE SEISMIC RETROFIT PROGRAM

San Francisco-Oakland Bay Bridge East Span Replacement Project
Other Contracts

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

Archeological Investigations

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

New YBI Electrical Substation

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.

Stormwater Treatment Measures

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

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

Stormwater Retention Basin

East Span Interim Seismic Retrofit

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

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

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

Pile Installation Demonstration

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

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

Battered Pile Installation Demonstration

TOLL BRIDGE SEISMIC RETROFIT PROGRAM

Other Completed Projects

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

High-Rise Section of San Mateo-Hayward Bridge

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.

1958 Carquinez Bridge Seismic Retrofit Project
Project Status: Completed 2002

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

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

1962 Benicia-Martinez Bridge Seismic Retrofit Project
Project Status: Completed 2003

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

1962 Benicia-Martinez Bridge (right)

Richmond-San Rafael Bridge Seismic Retrofit Project
Project Status: Completed 2005

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

Los Angeles-Vincent Thomas Bridge Seismic Retrofit Project
Project Status: Completed 2000

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

Los Angeles-Vincent Thomas Bridge

San Diego-Coronado Bridge Seismic Retrofit Project
Project Status: Completed 2002

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

Antioch Bridge Seismic Retrofit Project
Project Status: Completed 2012

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

Antioch Bridge

Dumbarton Bridge Seismic Retrofit Project
Project Status: Completed 2013

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

Dumbarton Bridge

TOLL BRIDGE SEISMIC RETROFIT PROGRAM

Risk Management Program Update

Potential Draw On Program Reserve (Program Contingency)

The program contingency is currently $89.5 million in accordance with the TBPOC approved budget. As of the end of the second quarter of 2014, the 50 percent probable draw on program contingency is $115.5 million. The potential draw ranges from about $50 million to $180 million (refer to Figure 1).

The current program contingency forecast balance may not exceed the cost of currently identified forecast risks. It is important to understand that the risks identified in each of the contracts are not yet mitigated. Various teams are working to mitigate these risks, working diligently to reduce the probability of these risks occurring and preparing responses to minimize their impact should they occur. In accordance with the approved TBSRP Risk Management Plan, risk mitigation actions are continuously developed and implemented to reduce the potential draw on the program contingency.

RISK MANAGEMENT DEVELOPMENTS

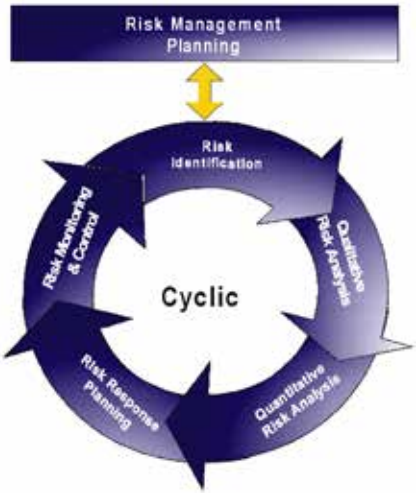
Self-Anchored Suspension Span Contract

All retrofit work at pier E2 has been completed and the work platform has been removed. The team continues to investigate the cause of the failure of the rods at Pier E2 and how that could impact bolts of similar type elsewhere on the bridge. They continue to meet to discuss the testing program and adopt lessons learned. Stress corrosion tests are underway and completion is expected by the end of the third quarter. Other testing is under consideration and, if performed, would continue into 2015.

Installation of mechanical, electrical systems and the tower elevator is continuing. Paint touch-up and other punch list items are being completed. Much of this work is being performed under lane closures. The Toll Bridge Program Oversight Committee (TBOC) approved, in principal, a time extension that would extend the project to the end of the year. Details are being worked out and change orders are expected to be issued in the third quarter of 2014.

Oakland Touchdown #2 Contract

The contractor has completed the permanent bike path structure and at-grade bike path on schedule and thus



mitigated the delay risks associated with the alignment of the temporary bike path. The bike path was closed on March 23, 2014, to allow the completion of the permanent bike path and removal of the temporary bike path. The bike path reopened on March 29, 2014, on its permanent alignment. All field work is expected to be completed by the end of the 3rd quarter of 2014.

Yerba Buena Island Transition Structure #2 Contract

The contractor continues installing temporary supports and dismantling the Yerba Buena Island Detour structure. The contractor has completed removal of a portion of the upper and lower cantilever decks and has successfully separated the bridge into two halves.
The contractor submitted a baseline schedule, which had been accepted, indicating that installation of temporary supports on YBI would begin prior to Seismic Safety Opening. This early work has been constrained by access to the required work zones. The contractor submitted a Time Impact Analysis related to the delayed access to the work zones. The project team and the contractor reached settlement about the time impact and negotiated an acceleration change order to ensure that subsequent dismantling contracts will be able to proceed on schedule.

Dismantling Contracts

Aggressive planning continues for dismantling trusses of the East Span and demolition of the marine foundations. 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 project environmental team began consultation with the environmental agencies in June of

2011. In March 2014, the project team held a workshop with all the regulatory agencies to present an advanced planning study that showed the feasibility of demolishing the deep marine foundations with controlled explosives. The agencies were generally supportive of the plan and agreed to work to resolve permitting issues going forward.

The project team was not able to procure a service contract to install bird nesting deterrence measures prior to construction. Special Provisions are expected to be added to the 504/288 contract that would require the successful contractor to install the deterrents to prevent birds from nesting on the bridge for the duration of the project. Last quarter, the project team also prepared the Request For Qualifications for the procurement of the Marine Foundations Removal project by the CMGC method. A successful candidate is expected to be selected in the beginning of the third quarter of 2014.

RISK MANAGEMENT LOOK AHEAD

Self-Anchored Suspension Span Contract

The SAS contractor has work to complete, some of which will be performed using lane closures. This may create inefficiencies in the work, with a potential delay risk beyond the contractor's planned completion. The project team will quantify the direct and indirect costs of this change in character and will look to mitigate these potential delay costs. The project team will begin to start closing out the contract in the third quarter of 2014.

Oakland Touchdown #2 Contract

Field work is expected to be completed and the project team will begin closing out the contract in the third quarter.

Yerba Buena Island Transition Structure #2 Contract

The contractor will continue to remove the suspended spans on the cantilever and will move to the shorter spans after temporary supports are installed. The project team will continue to work with the contractor to identify areas where the project can recover the delays that occurred in 2013.

Dismantling Contracts

For all dismantling projects, environmental issues have the potential to lengthen the time to project completion. These risks include, bird nesting, hazardous materials, marine environment work windows, and air quality management. They are being closely monitored and mitigated to the greatest extent possible.
The 504/288 contract advertised on July 12, 2014. The project team has scheduled a couple of constructability workshops to obtain contractors' feedback on the project plans, specifications, estimate and schedule. Input from the contractors will be evaluated and changes will be made to the contract if required. The project team will finalize specifications to address the installation of bird nesting deterrents in the 504/288 contract.

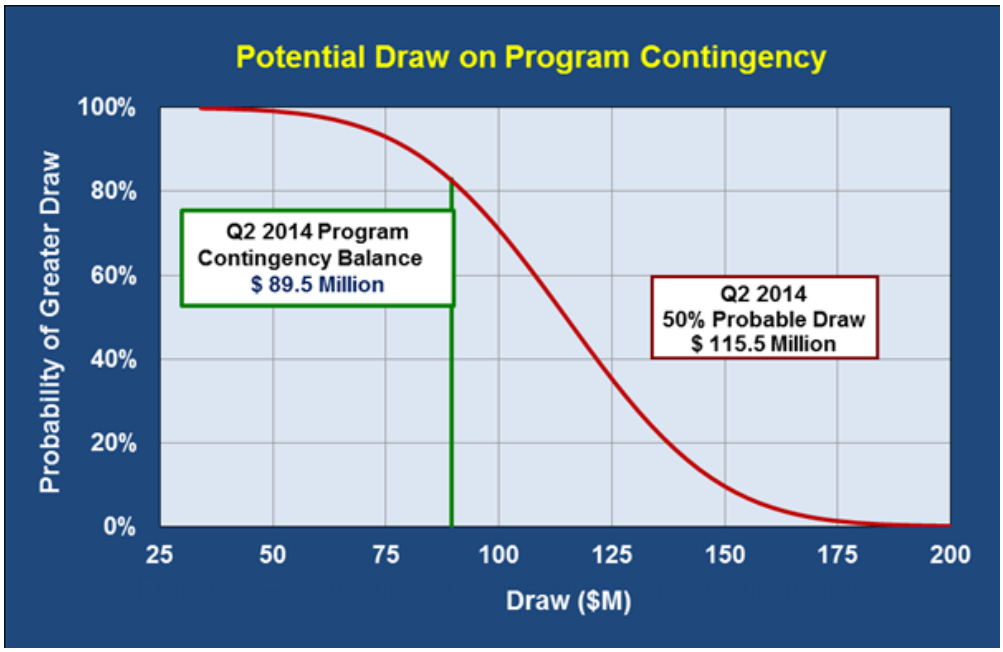


*Figure 1 Notes:
1. Proposed architectural enhancements and project improvements are excluded unless approved by the TBPOC.
2. Program Contingency may be used for other beneficial purposes than to cover risks. Therefore, the potential draw chart may not necessarily represent a forecast of the future 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, 2014 ($ Millions)

	Budgeted	Funding Available & Contribution
Financing		
Seismic Surcharge Revenue AB 1171	2,282.0	2,282.0
Seismic Surcharge Revenue AB 144	2,150.0	2,150.0
Seismic Surcharge Revenue AB 1175 (2)	750.0	750.0
BATA Consolidation	820.0	820.0
Subtotal - Financing	6,002.0	6,002.0
Contributions		
Proposition 192	790.0	789.0
San Diego Coronado Toll Bridge Revenue Fund	33.0	33.0
Vincent Thomas Bridge	15.0	6.9
State Highway Account(1)	745.0	745.0
Public Transportation Account (1)	130.0	130.0
ITIP/SHOPP/Federal Contingency (3)	448.0	448.0
Federal Highway Bridge Replacement and Rehabilitation (HBRR) (3)	642.0	642.0
SHA - East Span Dismantling	300.0	300.0
SHA - "Efficiency Savings"	130.0	130.0
Redirect Spillover	125.0	125.0
Motor Vehicle Account	75.0	75.0
Subtotal - Contribution	3,433.0	3,423.9
Total Funding	9,435.0	9,425.9
Encumbered to Date		8,339.8
Remaining Unallocated		1,086.1
Expenditures :		
Capital Outlay		6,465.8
State Operations		1,777.1
Antioch and Dumbarton Expenditures by BATA		12.2
Total Expenditures		**8,255.1**
Encumbrances :		
Capital Outlay		77.6
State Operations		7.1
Total Encumbrances		84.7
Total Expenditures and Encumbrances		**8,339.8**

(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.

(3) The Skyway contract is the only contract in the San Francisco-Oakland Bay Bridge East Span Seismic Safety Project with ferderal funds. The Federal Aid Project No. is 0801(090) for the amount of $321,645,209.22.

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, 2014, shows expenses through June 30, 2014, for TBPOC functioning, support, and monthly and quarterly reporting.

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

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

* Caltrans Efficiency Savings

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

Table 3—Toll Bridge Program Oversight Committee Estimated Expenses: July 1, 2005 through June 30, 2014 ($ Millions)

Agency/Program Activity	Expenses
BATA	**3.0**
Caltrans	**3.1**
CTC	**3.2**
Reporting	**5.6**
Total Program	**14.9**

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 2014. The tasks for the current quarter are focused on mitigation, monitoring, and environmental permitting. Key successes in this quarter are as follows:

Marine-based bird monitoring was conducted weekly from a consultant boat. The goal of this monitoring is to document potential impacts to birds from construction activities. Monitors did not observe any indication that birds were disturbed due to the east span construction activities. Throughout the 2nd quarter of 2014 installation of nesting bird impact avoidance management measures for the 2014 nesting season continued for the Yerba Buena Island (YBI) Transition Structure 2 (YBITS 2) construction contract.

The YBITS 2 contractor installed bird deterrents throughout the work site, which includes the Temporary Bypass Structure (TBS), Cantilever, and the eastern end of YBI. Scaffolding and netting were installed over the entire Pier E3 tower leg to prevent peregrine falcon, western gull, and house finch nesting. Bird spikes and other deterrents were installed below the lower deck of the TBS and Cantilever. Nesting bird monitoring is being conducted seven days per week. Meetings continue to be held one day per week between Caltrans and YBITS 2 contractor to discuss bird issues and the ongoing strategy for installation of nesting bird impact avoidance management measures for the 2014 nesting season. One active gull nest in the YBITS2 work area was removed under the auspices of the USFWS Special Purpose - Miscellaneous Permit.

Caltrans worked with International Bird Rescue (IBR) to remove Western gull eggs from the SFOBB Project site as part of the conditions of the Special Purpose – Miscellaneous Permit issued by the United States Fish and Wildlife Service (USFWS) on December 2, 2013. Per the USFWS 'Special Purpose – Miscellaneous Permit', the occupied nest contents (i.e., eggs and nestlings) of Western gulls removed from the SFOBB Project site during bridge dismantling must be transferred to an appropriate foster care facility where they can be reared and eventually released back into the wild. In June, two gull eggs were removed from a nest located on the south-facing side of the E2 marine foundation. These eggs were transferred to IBR and successfully hatched at their facility. Deterrence of nesting birds for the 504/288 bridge dismantling contract will be one of the largest environmental undertakings for bridge dismantling. Throughout the 2nd quarter of 2014, the environmental team supported the bidding process for a service contract to manage nesting birds for bridge dismantling as necessary. No bidder was identified and the decision was made to include the bird deterrence work in the 504/288 contract.

Peregrine falcon monitoring occurred throughout the 2nd quarter of 2014. The pair's first nest of 2014 was located on the original east span between Piers E4 and E7. Hard incubation was estimated to start on March 21, 2014. Caltrans' bird monitors determined that this nest failed on March 28, 2014. After the first failed attempt, the pair re-nested on the lowest alcove of the southern tower leg of Pier E8 on approximately April 15, 2014 and started hard incubation on April 18, 2014. Two young hatched in late May. Nesting bird surveys continue to be performed once per month for vegetation removal activities at storm water basins that are located around the Bay Bridge toll plaza.

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

The environmental team continues to prepare a weekly update report for dissemination to District management as well as other interested parties. The report details that week's environmental events and future action items.

The environmental team received BCDC approval of Amendment No. 35 to Permit No. 2001.008 for the removal and restoration of Self-Anchored Suspension (SAS) temporary bent foundations A1, A2, B1, and B2 on April 10, 2014. These foundations supported the temporary A and B falsework towers during construction of the SAS.

To restore these foundations, shotcrete walls were installed with sculpted and stained surface to simulate a rock finish.

BCDC approved the installation of a temporary pedestrian gate at the eastern end of the Self Anchored Suspension span of the new east span in a letter dated April 24, 2014. The purpose of this gate is to prevent the public from accessing portions of the new bridge where they could potentially be exposed to lead from bridge dismantling activities. BCDC approved the cantilever falsework plans for the YBITS 2 contract on May 27, 2014. Falsework installation started in early June, following this approval.

The environmental team submitted an amendment request No. 37 to permit No. 2001.008 to BCDC on June 26th, 2014 for approval for: (1) transferring an existing access trestle at YBI from the SAS project to the YBITS2 project; (2) official approval of fencing to be placed around the bike path as it passes over the coast guard station and; (3) to modify the allocation of H-piles on the permit from a proposed access trestle to a set of falsework foundations at the YBI shoreline.

The environmental team worked with NMFS, CDFW, BCDC, ACOE, and RWQCB throughout the second quarter of 2014 to approve a minor change in the dismantling project description. This change involved swapping the h-pile supported dismantling trestle on YBI, which was approved by all of the agencies for bridge dismantling, with the h-pile supported falsework on YBI. This change was possible due to the fact that the YBITS 2 contractor did not need to construct a trestle on YBI for bridge dismantling.

The environmental team performed biological and water quality monitoring in support of pile driving activities at the YBI shoreline as part of the YBITS2 contract. No issues were noted and reports were sent as necessary to relevant regulatory agencies. The environmental team submitted the Annual Marine Mammal Monitoring Report on April 25, 2014, as required by the project Incidental Harassment Authorization, issued by NOAA.

The environmental team began work on renewing the IHA during the second quarter of 2014. The final permit application is expected to be submitted in the third quarter of 2014 with the permit being issued in the first quarter of 2015. Work began on the final Hydroacoustic and Bird Predation Report for pile driving activities at the YBI shoreline. The report will be submitted in early third quarter 2014. Caltrans continues to work with regulatory agencies to gain approval for the Pier E3 Controlled Blasting Demonstration Project. On April 15, 2014, Caltrans formally requested comments from all the agencies on the Advanced Planning Study (submitted December 27, 2013), Supplemental Biological Resources Evaluation (submitted March 21, 2014), and Water Quality Study (submitted March 21, 2014). As of late June, Caltrans received comments from BCDC, ACOE, CDFW, NMFS, and RWQCB. In addition, multiple meetings have been held with NMFS and CDFW to discuss Caltrans's technical analysis of impacts to listed species resulting from the demonstration project. Meetings have also been held with all the regulatory agencies to discuss the overall permitting strategy and schedule. Caltrans worked on an Alternatives Analysis and design for the attenuation system throughout the second quarter of 2014.

For the Construction Manager General Contractor outreach held on May 1, 2014, the environmental team presented a PowerPoint on the environmental constraints related to the dismantling of the Marine Foundations of the original east span. The environmental team supported the 504/288 Constructability Workshop held on May 22, 2014, via posters and a PowerPoint presentation. Environmental specs for this contract were also reviewed and submitted by the team in late May.

Antioch 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.

Widening of the San Mateo-Hayward Bridge Trestle on left

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.

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

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.

New Richmond-San Rafael Bridge West Approach Trestle under Construction

Benicia-Martinez Bridge Project
Project Status: Completed 2007

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

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

Benicia-Martinez Bridge Rehabilitation Project
Project Status: Completed 2009

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

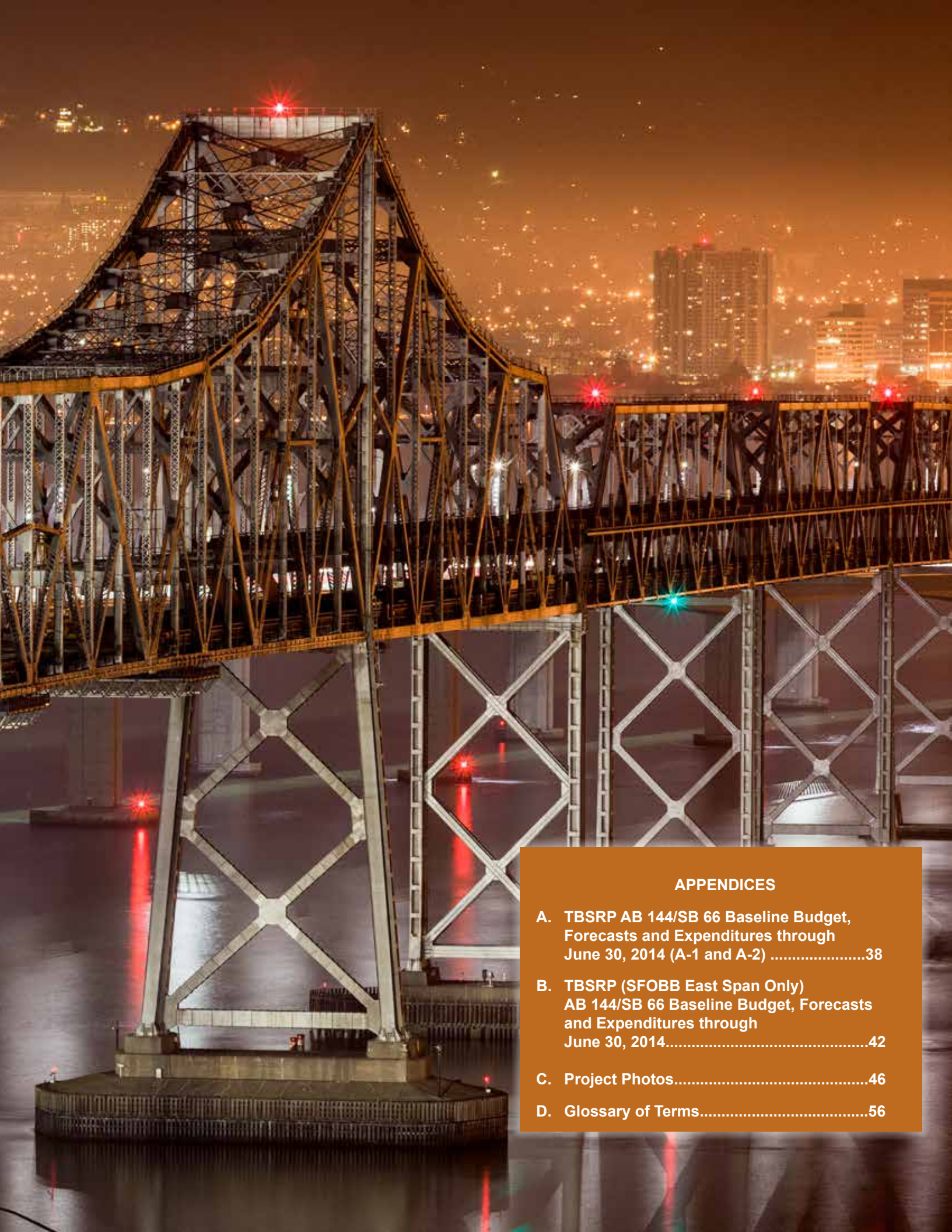
Benicia-Martinez Bridge Bicycle/Pedestrian Path

Interstate 880/State Route 92
Project Status: Completed 2011

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

Aerial View of Completed 880/92 Interchange Project

The Old San Francisco-Oakland Bay Bridge East Span



APPENDICES

A. TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2014 (A-1 and A-2) 38

B. TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2014.....42

C. Project Photos.....46

D. Glossary of Terms.....56

Appendix A-1: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2014 ($ Millions)

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (06/2014)	Cost to Date (06/2014)	Cost Forecast (06/2014)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
SFOBB East Span Replacement Project						
Capital Outlay Support	959.3	346.2	1,305.5	1,230.4	1,343.4	37.9
Capital Outlay Construction	4,492.2	597.0	5,089.2	4,655.5	5,151.2	62.0
Other Budgeted Capital	35.1	(32.8)	2.3	0.7	7.7	5.4
Total	5,486.6	910.4	6,397.0	5,886.6	6,502.3	105.3
SFOBB West Approach Replacement						
Capital Outlay Support	120.0	(1.0)	119.0	119.4	119.3	0.3
Capital Outlay Construction	309.0	41.7	350.7	332.0	338.1	(12.6)
Total	429.0	40.7	469.7	451.4	457.4	(12.3)
SFOBB West Span Retrofit						-
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	-
Total	307.9	(5.7)	302.2	302.3	302.2	-
Richmond-San Rafael Bridge Retrofit						
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	-
Total	914.0	(97.5)	816.5	794.3	816.5	-
Benicia-Martinez Bridge Retrofit						-
Capital Outlay Support	38.1	-	38.1	38.1	38.1	-
Capital Outlay Construction	139.7	-	139.7	139.7	139.7	-
Total	177.8	-	177.8	177.8	177.8	-
Carquinez Bridge Retrofit						
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	-
Total	114.2	-	114.2	114.2	114.2	-
San Mateo-Hayward Retrofit						-
Capital Outlay Support	28.1	-	28.1	28.1	28.1	-
Capital Outlay Construction	135.4	(0.1)	135.3	135.3	135.3	-
Total	163.5	(0.1)	163.4	163.4	163.4	-
Vincent Thomas Bridge Retrofit (Los Angeles)						
Capital Outlay Support	16.4	-	16.4	16.4	16.4	-
Capital Outlay Construction	42.1	(0.1)	42.0	42.0	42.0	-
Total	58.5	(0.1)	58.4	58.4	58.4	-
San Diego-Coronado Bridge Retrofit						
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	-
Total	103.5	(0.9)	102.6	102.6	102.6	-

Appendix A-1: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2014 ($ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (06/2014)	Cost to Date (06/2014)	Cost Forecast (06/2014)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
Antioch Bridge						
Capital Outlay Support	-	31.0	31.0	17.4	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	70.6	74.1	(7.9)
Dumbarton Bridge						
Capital Outlay Support	-	56.0	56.0	38.2	45.5	(10.5)
Capital Outlay Support by BATA				6.0		
Capital Outlay Construction	-	92.7	92.7	63.8	68.2	(24.5)
Total	-	148.7	148.7	108.0	113.7	(35.0)
Subtotal Capital Outlay Support	1,433.1	424.8	1,857.9	1,763.9	1,878.4	20.5
Subtotal Capital Outlay	6,286.8	685.5	6,972.3	6,465.0	6,996.5	24.2
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	1,077.5	8,862.5	8,255.1	8,912.6	50.1
Net Programmatic Risks*	-	-	-	-	65.4	65.4
Program Contingency	900.0	(810.5)	89.5	-	(26.0)	(115.5)
Total Toll Bridge Seismic Retrofit Program [1]	8,685.0	267.0	8,952.0	8,255.1	8,952.0	-

[1] 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, 2014 ($ Millions)

Bridge	AB 144 Baseline Budget	TBPOC Current Approved Budget	Expenditures to date and encumbrances as of (06/2014) see Note (1)	Estimated costs not yet spent or encumbered as of (06/2014)	Total Forecast as of (06/2014)
a	b	c	d	e	f = d + e
Other Completed Projects					
Capital Outlay Support	144.9	144.6	144.6	-	144.6
Capital Outlay	472.6	471.8	471.8	-	471.8
Total	617.5	616.4	616.4	-	616.4
Richmond-San Rafael					
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	-	-	-	-
Total	914.0	816.5	794.3	22.2	816.5
West Span Retrofit					
Capital Outlay Support	75.0	74.8	74.8	-	74.8
Capital Outlay	232.9	227.4	227.4	-	227.4
Total	307.9	302.2	302.2	-	302.2
West Approach					
Capital Outlay Support	120.0	119.0	119.3	-	119.3
Capital Outlay	309.0	350.7	332.2	5.9	338.1
Total	429.0	469.7	451.5	5.9	457.4
SFOBB East Span - Skyway					
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
Total	1,490.0	1,418.4	1,418.5	(0.1)	1,418.4
SFOBB East Span - SAS - Superstructure					
Capital Outlay Support	214.6	483.0	480.0	23.4	503.4
Capital Outlay	1,753.7	2,046.8	1,963.6	91.9	2,055.5
Total	1,968.3	2,529.8	2,443.6	115.3	2,558.9
SFOBB East Span - SAS - Foundations					
Capital Outlay Support	62.5	37.6	37.6	-	37.6
Capital Outlay	339.9	301.3	301.3	3.8	305.1
Total	402.4	338.9	338.9	3.8	342.7
Small YBI Projects					
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
Total	26.2	25.4	25.4	0.9	26.3
YBI Detour					
Capital Outlay Support	29.5	87.7	87.9	(0.2)	87.7
Capital Outlay	131.9	473.3	473.4	(0.1)	473.3
Total	161.4	561.0	561.3	(0.3)	561.0
YBI- Transition Structures					
Capital Outlay Support	78.7	127.5	118.2	18.1	136.3
Capital Outlay	299.4	299.4	299.4	33.1	332.5
Total	378.1	426.9	417.6	51.2	468.8

Appendix A-2: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2014 ($ Millions) Cont.

Contract	AB 144 Baseline Budget	TBPOC Current Approved Budget	Expenditures to date and encumbrances as of (06/2014) see Note (1)	Estimated costs not yet spent or encumbered as of (06/2014)	Total Forecast as of (06/2014)
a	b	c	d	e	f = d + e
Oakland Touchdown					
Capital Outlay Support	74.4	118.5	115.7	7.0	122.7
Capital Outlay	283.8	330.6	304.7	28.5	333.2
Total	358.2	449.1	420.4	35.5	455.9
East Span Other Small Projects					
Capital Outlay Support	212.3	197.9	197.9	(0.1)	197.8
Capital Outlay	170.8	141.3	117.1	17.9	135.0
Total	383.1	339.2	315.0	17.8	332.8
Existing Bridge Dismantling					
Capital Outlay Support	79.7	61.9	8.7	57.4	66.1
Capital Outlay	239.2	246.5	17.0	254.4	271.4
Total	318.9	308.4	25.7	311.8	337.5
Antioch Bridge					
Capital Outlay Support	-	31.0	17.4	0.2	17.6
Capital Outlay Support by BATA			6.2	-	6.2
Capital Outlay	-	51.0	47.0	3.3	50.3
Total	-	82.0	70.6	3.5	74.1
Dumbarton Bridge					
Capital Outlay Support	-	56.0	38.4	1.1	39.5
Capital Outlay Support by BATA			6.0	-	6.0
Capital Outlay	-	92.7	68.5	(0.3)	68.2
Total	-	148.7	112.9	0.8	113.7
Miscellaneous Program Costs	30.0	30.0	25.5	4.5	30.0
Total Capital Outlay Support	1,463.2	1,887.9	1,796.4	112.0	1,908.4
Total Capital Outlay	6,321.8	6,974.6	6,543.4	460.8	7,004.2
Program Total [1]	7,785.0	8,862.5	8,339.8	572.8	8,912.6

(1) Total Capital Outlay Support includes program indirect costs.
(2) BSA provided a distribution of program contingency in December 2004 based on Bechtel Infrastructure Corporation input. This column is subject to revision upon completion of Caltran's risk assessment update.
(3) Construction administration of the OTD Detour is under the YBITS1 contract. Encumbrance is included in YBITS1 contract.
(4) Construction administration of the cantilever segment is under the YBITS2 contract. Encumbrance is included in YBITS2 contract.

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

[1] 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, 2014 ($ Millions)

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (06/2014)	Cost to Date (06/2014)	Cost Forecast (06/2014)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
San Francisco-Oakland Bay Bridge East Span Replacement Project						
East Span - SAS Superstructure						
Capital Outlay Support	214.6	268.4	483.0	476.8	503.4	20.4
Capital Outlay Construction	1,753.7	293.1	2,046.8	1,961.5	2,055.5	8.7
Total	1,968.3	561.5	2,529.8	2,438.3	2,558.9	29.1
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	341.4	473.3	473.3	473.3	-
Total	161.3	399.7	561.0	561.2	561.0	-
East Span - Skyway						
Capital Outlay Support	197.0	(15.8)	181.2	181.2	181.2	-
Capital Outlay Construction	1,293.0	(55.8)	1,237.2	1,237.3	1,237.2	-
Total	1,490.0	(71.6)	1,418.4	1,418.5	1,418.4	-
East Span - SAS E2/T1 Foundations						-
Capital Outlay Support	52.5	(24.1)	28.4	28.4	28.4	-
Capital Outlay Construction	313.5	(38.7)	274.8	274.8	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	48.8	127.5	115.4	136.3	8.8
Capital Outlay Construction	299.3	0.1	299.4	228.8	332.5	33.1
Total	378.0	48.9	426.9	344.2	468.8	41.9
* 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			72.1	70.2	72.1	-
Capital Outlay Construction			203.7	203.6	203.6	(0.1)
Total			275.8	273.8	275.7	(0.1)
* YBI- Transition Structures Contract No. 2						
Capital Outlay Support			38.0	28.8	46.8	8.8
Capital Outlay Construction			92.4	25.2	125.6	33.2
Total			130.4	54.0	172.4	42.0
* 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	-

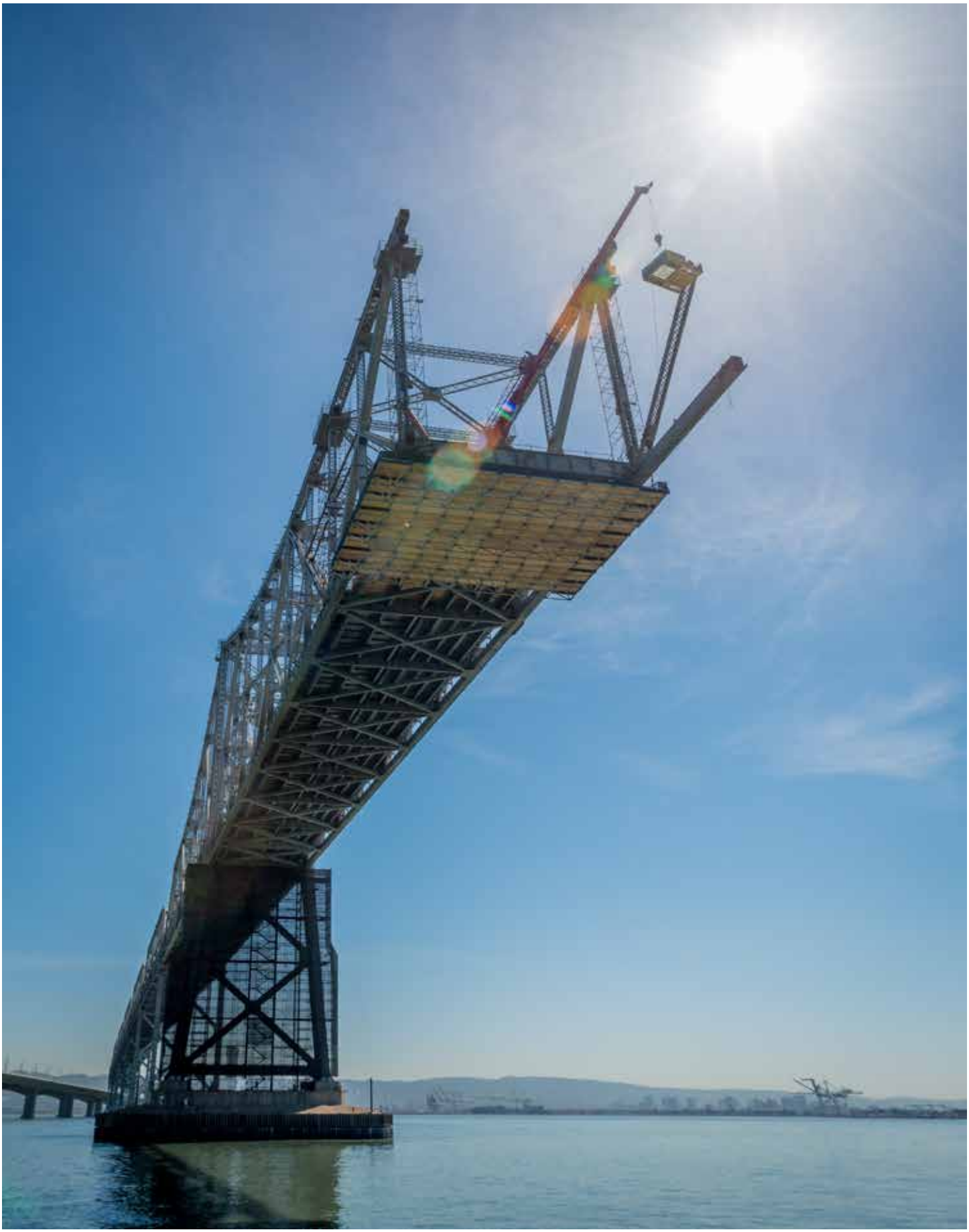
Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2014 ($ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (06/2014)	Cost to Date (06/2014)	Cost Forecast (06/2014)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
Oakland Touchdown (see notes below)						
Capital Outlay Support	74.4	44.1	118.5	114.8	122.7	4.2
Capital Outlay Construction	283.8	46.8	330.6	304.2	333.2	2.6
Total	358.2	90.9	449.1	419.0	455.9	6.8
* OTD Prior-to-Split Costs						
Capital Outlay Support			21.7	20.0	21.7	-
Capital Outlay Construction			-	-	-	-
Total			21.7	20.0	21.7	-
* OTD Submarine Cable(1)						
Capital Outlay Support			0.9	0.9	0.9	-
Capital Outlay Construction			5.7	5.7	9.6	3.9
Total			6.6	6.6	10.5	3.9
* OTD No. 1 (Westbound)						
Capital Outlay Support			51.3	51.2	51.3	-
Capital Outlay Construction			205.3	205.3	205.3	-
Total			256.6	256.5	256.6	-
* OTD No. 2 (Eastbound)						
Capital Outlay Support			35.0	34.1	39.0	4.0
Capital Outlay Construction			72.6	55.0	73.7	1.1
Total			107.6	89.1	112.7	5.1
* OTD Touchdown 2 Detour(2)						
Capital Outlay Support			8.1	7.8	8.3	0.2
Capital Outlay Construction			47.0	38.1	44.6	(2.4)
Total			55.1	45.9	52.9	(2.2)
* OTD Electrical Systems						
Capital Outlay Support			1.5	0.8	1.5	-
Capital Outlay Construction			-	-	-	-
Total			1.5	0.8	1.5	-
Existing Bridge Dismantling						
Capital Outlay Support	79.7	(17.8)	61.9	8.6	66.1	4.2
Capital Outlay Construction	239.2	7.3	246.5	17.0	271.4	24.9
Total	318.9	(10.5)	308.4	25.6	337.5	29.1
* Bridge Dismantling Prior-to-Split Cost						
Capital Outlay Support			3.9	3.9	3.9	
Capital Outlay Construction			-	-	-	
Total			3.9	3.9	3.9	
* Cantilever Section						
Capital Outlay Support			17.0	1.0	17.1	
Capital Outlay Construction			69.0	17.0	71.8	
Total			86.0	18.0	88.9	
* 504/288 Sections						
Capital Outlay Support			21.0	2.8	19.5	
Capital Outlay Construction			-	-	92.5	
Total			21.0	2.8	112.0	
*Marine foundations						
Capital Outlay Support			20.0	0.9	25.6	
Capital Outlay Construction			-	-	107.1	
Total			20.0	0.9	132.7	

Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2014 ($ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (06/2014)	Cost to Date (06/2014)	Cost Forecast (06/2014)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
YBI/SAS Archeology						
Capital Outlay Support	1.1	-	1.1	1.1	1.1	-
Capital Outlay Construction	1.1	-	1.1	1.1	1.1	-
Total	2.2	-	2.2	2.2	2.2	-
YBI - USCG Road Relocation						
Capital Outlay Support	3.0	(0.3)	2.7	2.7	3.0	0.3
Capital Outlay Construction	3.0	(0.2)	2.8	2.8	3.0	0.2
Total	6.0	(0.5)	5.5	5.5	6.0	0.5
YBI - Substation and Viaduct						
Capital Outlay Support	6.5	(0.1)	6.4	6.4	6.5	0.1
Capital Outlay Construction	11.6	(0.3)	11.3	11.3	11.6	0.3
Total	18.1	(0.4)	17.7	17.7	18.1	0.4
Oakland Geofill						-
Capital Outlay Support	2.5	-	2.5	2.5	2.5	-
Capital Outlay Construction	8.2	-	8.2	8.2	8.2	-
Total	10.7	-	10.7	10.7	10.7	-
Pile Installation Demonstration Project						
Capital Outlay Support	1.8	-	1.8	1.8	1.8	-
Capital Outlay Construction	9.3	(0.1)	9.2	9.3	9.3	-
Total	11.1	(0.1)	11.0	11.1	11.1	-
Stormwater Treatment Measures						
Capital Outlay Support	6.0	2.2	8.2	8.2	8.2	-
Capital Outlay Construction	15.0	3.3	18.3	16.9	17.0	(1.3)
Total	21.0	5.5	26.5	25.1	25.2	(1.3)
Right-of-Way and Environmental Mitigation						
Capital Outlay Support	-	-	-	-	-	-
Capital Outlay & Right-of-Way	72.4	-	72.4	51.7	62.0	(10.4)
Total	72.4	-	72.4	51.7	62.0	(10.4)
Sunk Cost - Existing East Span Retrofit						
Capital Outlay Support	39.5	-	39.5	39.5	39.5	-
Capital Outlay Construction	30.8	-	30.8	30.8	30.8	-
Total	70.3	-	70.3	70.3	70.3	-
Other Capital Outlay Support						
Environmental Phase	97.7	0.1	97.8	97.8	97.7	(0.1)
Pre-Split Project Expenditures	44.9	-	44.9	44.9	44.9	-
Non-Project Specific Costs	20.0	(16.8)	3.2	3.2	3.2	-
Total	162.6	(16.7)	145.9	145.9	145.8	(0.1)
Subtotal Capital Outlay Support	959.3	346.2	1,305.5	1,230.4	1,343.4	37.9
Subtotal Capital Outlay Construction	4,492.2	597.0	5,089.2	4,655.5	5,151.2	62.0
Other Budgeted Capital	35.1	(32.8)	2.3	0.7	7.7	5.4
						-
Total SFOBB East Span Replacement Project	5,486.6	910.4	6,397.0	5,886.6	6,502.3	105.3

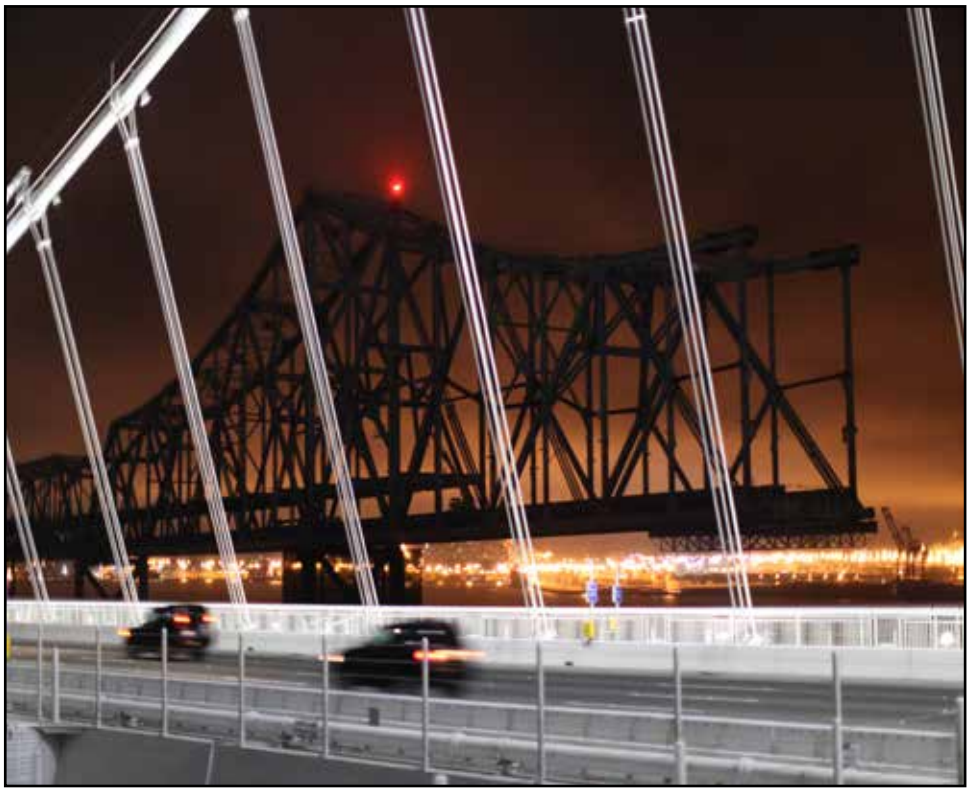
[1] Figures may not sum up to totals due to rounding effects.



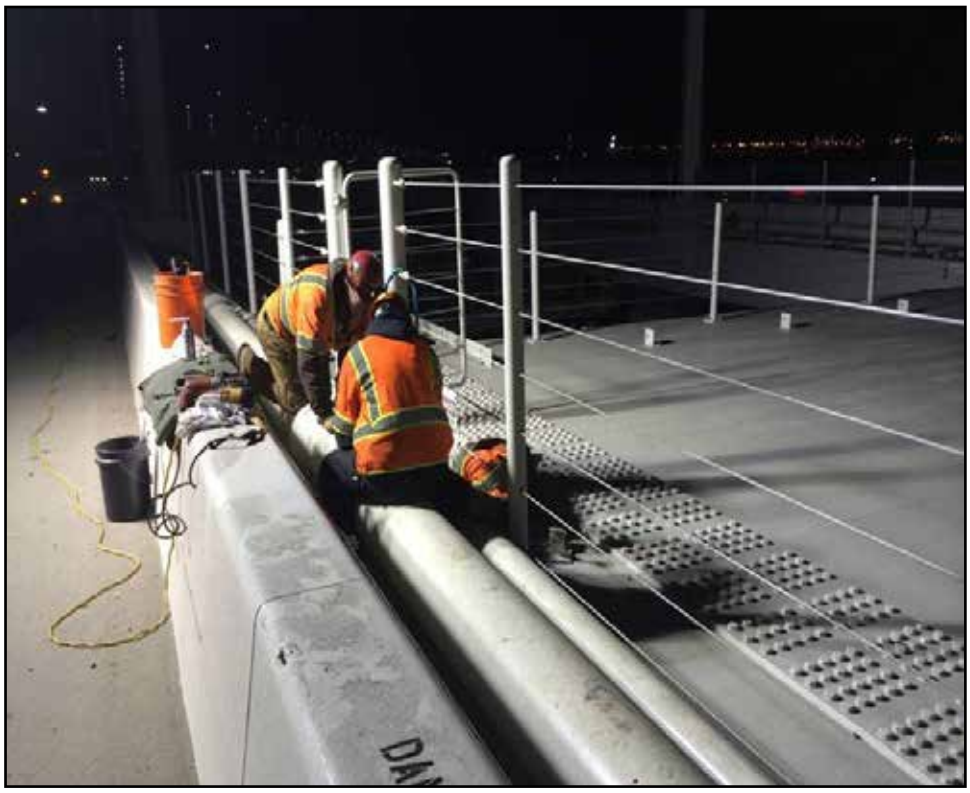
Demolition Progress of the Cantilever Section of the San Francisco-Oakland Bay Bridge Old East Span

Demolition Worker on the Old Cantilever Section of the East Span
Of the Oakland-San Francisco Bay Bridge

Project Photos



Contractors Have Removed over 200 Feet of the Original East Span



AC Unit Installation for Base System Cabinet

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Underneath Cantilever Deck Removal in Progress Looking toward Oakland

Tower Interior Cleaning

Aerial View of the Demolition of the Cantilever Section of the Old San Francisco-Oakland Bay Bridge while the New Bridge Begins to be Revealed and the Golden Gate Bridge in the Distance

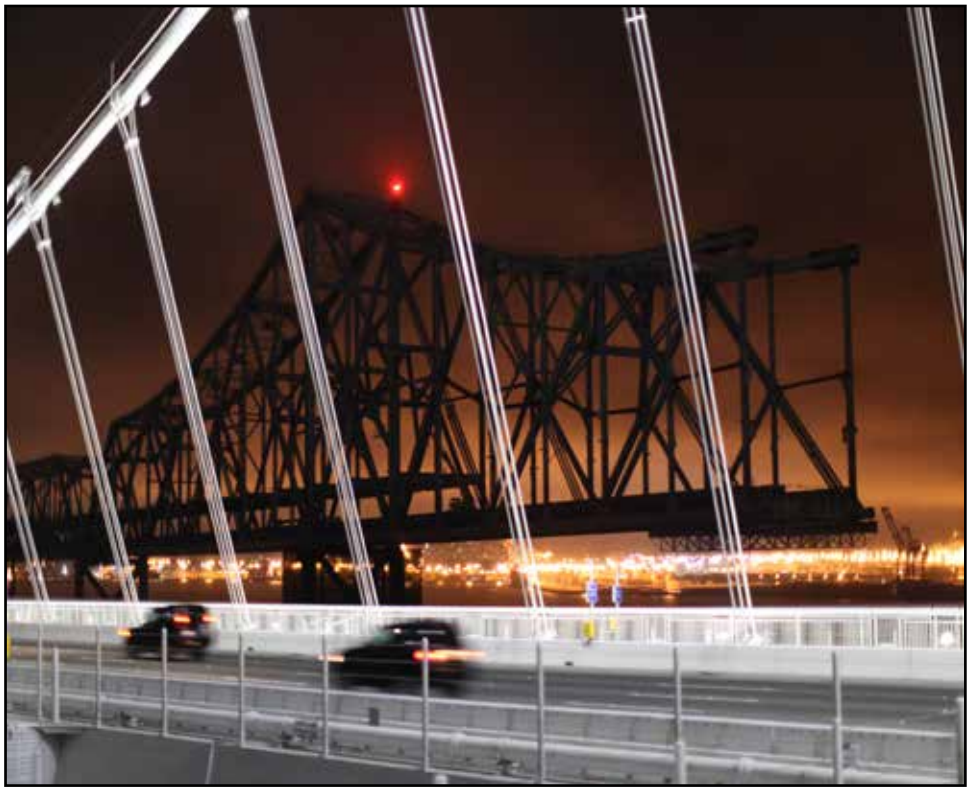
Appendix E: Project Progress Photographs

Oakland Touchdown (OTD)

Aerial View of Oakland Touchdown Construction Progress

Appendix E: Project Progress Photographs

Yerba Buena Island Transition Structure (YBITS)



Contractors Have Removed over 200 Feet of the Original East Span

Demolition Progress of the Cantilever Section

Removing Truss Member from the Cantilever Section

Demolition Progress of the Cantilever Section Looking toward Yerba Buena Island

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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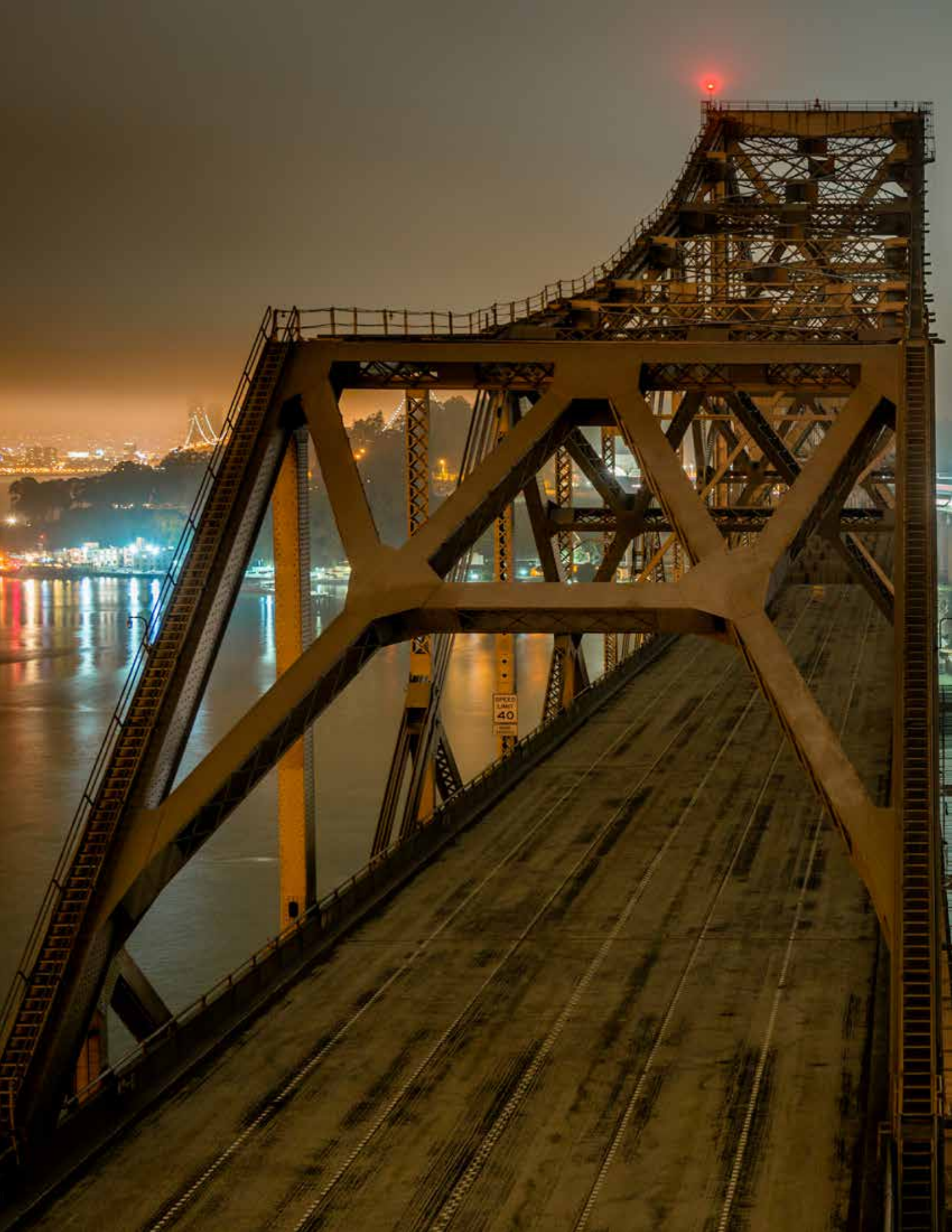
The information in this report is provided in accordance with California Government code Section 755. This document is one of a series of reports prepared for the Bay Area Toll Authority (BATA)/Metropolitan Transportation Commission (MTC) on the Toll Bridge Seismic Retrofit and Regional Measure 1 Programs. 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.

Bay Area Management Consultants
An Association of URS Corporation and Hatch Mott MacDonald

San Francisco-Oakland Bay Bride Cantilever Demolition Progress
Looking West toward Yerba Buena Island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