



IN CASE YOU MISSED IT:

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FOR IMMEDIATE RELEASE

What They Said about the Safety of the Bay Bridge

SACRAMENTO – Last week, the Senate Transportation Committee released two reports, “Technical Review of Design and Construction of New East Span of San Francisco-Oakland Bay Bridge” and “The San Francisco-Oakland Bay Bridge: Basic Reforms for the Future, Final Report.” The reports summarize findings about Bay Bridge design and construction, as well Caltrans’ management practices. Key findings indicate that Caltrans’ design criteria was appropriate, as were the procedures used in design and construction for the Bay Bridge’s Tower Foundation, that Caltrans also conducted proper analyses to address the impact of potential construction defects and that an appropriate repair was implemented on Tower 2 to restore the strength provided by the original design. Caltrans acknowledges there is always room for improvement and will incorporate lessons learned to future mega projects, however, one thing is resoundingly clear – the new east span of the Bay Bridge is safe. In case you missed it, here’s a compilation of what statewide elected officials, Bay Area transportation officials, world-class engineers, geotechnical and welding experts and Quality Assurance and Quality Control expert panel members have said:

“[I]t is very important to state explicitly that **no one in this inquiry has said the bridge is unsafe.” - ROLAND DE WOLK, SAN FRANCISCO-OAKLAND BAY BRIDGE FINAL REPORT FOR CALIFORNIA SENATE TRANSPORTATION & HOUSING COMMITTEE, JULY 2014**

“We the [Quality Assurance and Quality Control] Expert Panel, have reviewed all data for welds of interest... The final submittal of welding data confirms the validity of our recommendations. **Full implementation of these recommendations achieved the expected weld quality acceptance rate.” - JOHN BARSOM, PH.D., ALAN CAVENDISH-TRIBE, C.ENG., F.WELD.I., DAVID MCQUAID, P.E., DONALD RAGER, P.E., QUALITY ASSURANCE AND QUALITY CONTROL TEAM COMMENTING ON A 300-PAGE INVESTIGATION INTO BRIDGE WELDS IN 2011**

“The [Toll Bridge Seismic Safety Peer Review Panel] supports the [Quality Assurance and Quality Control] expert consultants’ and the Project Team’s conclusions that **the [Bay Bridge welds]** are in compliance with the Contract Documents, including the [American Welding Society] AWS D1.5 Bridge Welding Code and therefore **can be expected to perform well.**” - TOLL BRIDGE PROGRAM OVERSIGHT COMMITTEE, APRIL 2011

“The new bridge, even with two of the shear keys on bent E-2 not yet functioning, has already achieved a level of seismic safety that exceeds that of the old bridge by at least a factor of two. Actually, **based on all analyses provided to date, the new bridge... has met the design intent – namely to withstand the 1,500 year event with minimal damage** that will allow traffic operations after inspection and minor repairs as desired for a life line bridge.” - FRIEDER SEIBLE, PH.D., DEAN OF THE JACOBS SCHOOL OF ENGINEERING AND THE UNIVERSITY OF CALIFORNIA, SAN DIEGO AND CHAIR SEISMIC SAFETY PEER REVIEW PANEL, AUGUST 2013

“This is probably one of the most complex steel bridges that we’ve ever built. **I don’t think that anyone should assume that [Shanghai Zhenhua Heavy Industry Co., Ltd.] ZPMC, because they’re in China, is some third-world fabricator** that’s not capable of executing complex work.” - MIKE FLOWERS, P.E., AMERICAN BRIDGE DISCUSSING THE COMPLICATIONS AND COMPLEXITY OF THE BRIDGE FABRICATION, DECEMBER 2009

“It is my professional opinion based on a reasonable degree of engineering certainty that **the expert report accurately describes the condition of the fit-up and welding at the project site, and I recommend that it be accepted.**” - LETTER FROM D.L. MCQUAID & ASSOCIATES TO MIKE FLOWERS OF AMERICAN BRIDGE FLUOR/T.Y. LIN REGARDING THE ORTHOTROPIC BOX GIRDER ANALYSIS, NOVEMBER 2010

“...[A]fter review of the design of the T1 foundation, we find that the foundation design contains **a significant amount of redundancy and has a large margin of safety** against unforeseen events... Thus, we are confident that the design and construction of the T1 foundation piles **fully meet the performance requirements and will provide the required seismic safety.**” - JOSEPH NICOLETTI, P.E., TOLL BRIDGE PROGRAM SEISMIC SAFETY PEER REVIEW CHAIR

“The T1 foundation was designed, constructed, and [non-destructive evaluation] NDE tested in a way that meets or exceeds the state-of-practice; **it will provide the needed support to the bridge and result in a safe and reliable seismic performance.**” - JOHN FISHER, PH.D., P.E., M.S.CE., DR. I.M. IDRIS, PH.D., P.E., G.E., DIST.M.ASCE AND FRIEDER SEIBLE, PH.D., P.E., M.SC., TOLL BRIDGE SEISMIC SAFETY PEER REVIEW PANEL, APRIL 2013

“This portion of the design criteria **is thus at least as stringent as for other bridges in the state, and consistent with the high performance goals for the bridge.**” - JACK BAKER, PH.D., REGINALD DESROCHES, PH.D., ROBERT GILBERT, PH.D., P.E., YOUSSEF HASHASH, PH.D., P.E., ROBERTO T. LEON, PH.D., P.E., SENA KUMARASENA, PH.D., P.E., CALIFORNIA SENATE TRANSPORTATION AND HOUSING COMMITTEE INDEPENDENT REVIEW PANEL, TECHNICAL REVIEW OF DESIGN AND CONSTRUCTION OF NEW EAST SPAN OF SAN FRANCISCO-OAKLAND BAY BRIDGE, JULY 2014

“In addition, sensitivity analyses were conducted by the designers to study the potential effect of damaged piles on the pushover capacity of the tower foundation; **the foundation satisfies ultimate capacity design checks even when assuming one pile is missing.**” - JACK BAKER, PH.D., REGINALD DESROCHES, PH.D., ROBERT GILBERT, PH.D., P.E., YOUSSEF HASHASH, PH.D., P.E., ROBERTO T. LEON, PH.D., P.E., SENA KUMARASENA, PH.D.,

P.E., CALIFORNIA SENATE TRANSPORTATION AND HOUSING COMMITTEE INDEPENDENT REVIEW PANEL, TECHNICAL REVIEW OF DESIGN AND CONSTRUCTION OF NEW EAST SPAN OF SAN FRANCISCO-OAKLAND BAY BRIDGE, JULY 2014

“The panel concludes that **appropriate and generally accepted procedures were followed** in the design and construction of the Tower Foundation (T1).” - JACK BAKER, PH.D., REGINALD DESROCHES, PH.D., ROBERT GILBERT, PH.D., P.E., YOUSSEF HASHASH, PH.D., P.E., ROBERTO T. LEON, PH.D., P.E., SENA KUMARASENA, PH.D., P.E., CALIFORNIA SENATE TRANSPORTATION AND HOUSING COMMITTEE INDEPENDENT REVIEW PANEL, TECHNICAL REVIEW OF DESIGN AND CONSTRUCTION OF NEW EAST SPAN OF SAN FRANCISCO-OAKLAND BAY BRIDGE, JULY 2014

“Separate investigations by Caltrans and the U.S. Department of Transportation ... both concluded that these tests were conducted properly on this project and that there are **no indications of falsified records**. The **actual capacity of the pile foundation is likely greater than what was assumed in design ...**” - JACK BAKER, PH.D., REGINALD DESROCHES, PH.D., ROBERT GILBERT, PH.D., P.E., YOUSSEF HASHASH, PH.D., P.E., ROBERTO T. LEON, PH.D., P.E., SENA KUMARASENA, PH.D., P.E., CALIFORNIA SENATE TRANSPORTATION AND HOUSING COMMITTEE INDEPENDENT REVIEW PANEL, TECHNICAL REVIEW OF DESIGN AND CONSTRUCTION OF NEW EAST SPAN OF SAN FRANCISCO-OAKLAND BAY BRIDGE, JULY 2014

“All available evidence indicates that the construction **quality assurance program for the concrete tower foundation piles was implemented properly.**” - JACK BAKER, PH.D., REGINALD DESROCHES, PH.D., ROBERT GILBERT, PH.D., P.E., YOUSSEF HASHASH, PH.D., P.E., ROBERTO T. LEON, PH.D., P.E., SENA KUMARASENA, PH.D., P.E., CALIFORNIA SENATE TRANSPORTATION AND HOUSING COMMITTEE INDEPENDENT REVIEW PANEL, TECHNICAL

REVIEW OF DESIGN AND CONSTRUCTION OF NEW EAST SPAN OF SAN FRANCISCO-OAKLAND BAY BRIDGE, JULY 2014

“... Caltrans used appropriate methodologies, approaches, and assumptions in the hazard evaluation, design criteria and analysis methods, particularly as it pertains to the seismic performance of the bridge. ... Caltrans used appropriate and generally accepted procedures in the design and construction of the Tower Foundation (T1). ... Caltrans performed appropriate analyses to address the impact of potential construction defects on the Tower Foundation (T1). ... **The approach for the repair implemented by Caltrans ... appears to have restored the strength provided by the original design.**” - JACK BAKER, PH.D., REGINALD DESROCHES, PH.D., ROBERT GILBERT, PH.D., P.E., YOUSSEF HASHASH, PH.D., P.E., ROBERTO T. LEON, PH.D., P.E., SENA KUMARASENA, PH.D., P.E., CALIFORNIA SENATE TRANSPORTATION AND HOUSING COMMITTEE INDEPENDENT REVIEW PANEL, TECHNICAL REVIEW OF DESIGN AND CONSTRUCTION OF NEW EAST SPAN OF SAN FRANCISCO-OAKLAND BAY BRIDGE, JULY 2014

“As engineer of record, I conclude these rods in service are safe,” - MARWAN NADER, PH.D., P.E., T.Y. LIN INTERNATIONAL ENGINEER AND MEMBER OF THE TRANSPORTATION RESEARCH BOARD OF THE NATIONAL ACADEMIES COMMITTEE ON STEEL BRIDGES, JULY 2014

“I won’t argue with what Marwan [Nader of TY Lin] said, his word is as good as they come.” - DON RAGER, P.E., A MEMBER OF THE AMERICAN WELDING SOCIETY’S BRIDGE WELDING STANDARDS BOARD AND AN INDEPENDENT CONSULTANT WHO ASSESSED WELDS ON THE BRIDGE, FEBRUARY 2014

“The Team was impressed with the project team’s documentation on in-depth design and analysis, and the expertise engaged by Caltrans in assisting with the design,

construction and related issues... The Team has reviewed the retrofit system and concurs with the approach as a solution to replace the failed bolts.” - FEDERAL HIGHWAY ADMINISTRATION REVIEW TEAM, MYINT LWIN, P.E., S.E., JOEY HARTMANN, PH.D., P.E., JUSTIN OCEL, PH.D., P.E., WAIDER WONG, P.E., GREG KOLLE, P.E., BRIAN KOZY, PH.D., P.E., REGGIE HOLT, P.E., AUGUST 2013

“The beauty of steel is that it is able to absorb a lot of energy. It is going to yield, but I don't consider that to be catastrophic.”
- JOHN FISHER, PH.D., P.E., M.S.CE., REFERRING TO BAY BRIDGE WELDS, FEBRUARY 2014

“The approach used by the Corrosion Technology Branch of Materials Engineering and Testing Services of Caltrans to estimate the extent of corrosion in tendons with delayed grouting provided a reasonable indication that the pre-grouting mechanical consequences of that corrosion were **generally minor, or otherwise affected only a very small number of tendons.”**
- SAGUES MATERIALS CONSULTING, INC., TRIP REPORT, ALBERTO SAGÜÉS, PH.D., P.E., CORROSION OF POST-TENSIONED STRANDS AT SFOBB SKYWAY REPLACEMENT PROJECT, SEPTEMBER 2007

“I have to say that most of the criticism that we have heard lately about this bridge, I would call phantom problems. They're not real problems. They're just somebody digging deep enough and finding some irregularity and blowing it out of proportion.” - STEVEN HEMINGER, EXECUTIVE DIRECTOR, METROPOLITAN TRANSPORTATION COMMISSION, AUGUST 2013

“Caltrans is going way overboard to make sure everything is inspected and done in the best possible way.” - FRIEDER SEIBLE, PH.D., P.E., M.SC., TOLL BRIDGE SEISMIC SAFETY PEER REVIEW PANEL CHAIRMAN, TO BAY AREA OFFICIALS, JULY 2013

“The first most important question is, and I think this is a responsible question, and you have alluded to it in your interviews with Mr. Roland De Wolk, **you’re not, and none of you are suggesting that the current bridge is in danger of falling down because of these things...** the way I read your testimony and the way I heard things today was you’re concerned about following the process...” - STATE SENATOR MARK DESAULNIER DISCUSSING CONCERNS RAISED BY EMPLOYEES AT A HEARING THAT ARE CURRENTLY UNDER INVESTIGATION BY THE CALIFORNIA HIGHWAY PATROL, JANUARY 2014

“**I've been a structural engineer for over 60 years, and I've never seen a structure designed to a level as high as the Bay Bridge...** that bridge is safer than the old one even with damaged bolts.” - JOSEPH NICOLETTI, P.E., SEISMIC ADVISORY PANEL, REGARDING BRIDGE SAFETY, MAY 2013

“Founded in 1954, T.Y. Lin International (TYLI) has been involved in the design of world-class bridges since our inception. T.Y. Lin International, in a joint venture with Moffatt & Nichol Engineers, is proud to have played an important role in the iconic Bay Bridge project. The design joint venture worked closely with Caltrans, CTC, and MTC to deliver the design for **a critical Lifeline Structure that is safe, seismically-sound and meets the aesthetic and functional demands of Bay Area communities.**” - ALVARO J. PIEDRAHITA, P.E., T.Y. LIN PRESIDENT AND CHIEF EXECUTIVE OFFICER, JULY 2014

“For over 100 years, both American Bridge and Fluor have been leaders in the construction industry sharing core principles that uphold a strong culture to both safety and quality. Our companies have worked with public and private clients around the world to deliver complex and unique projects, such as the Self Anchored Suspension Span. An example close to home of such quality is the existing Bay Bridge, which American Bridge constructed back

in the 1930s and has stood the test of time. Just as with other unique projects we have both successfully delivered, **American Bridge and Fluor are proud of our accomplishments in constructing the iconic Self Anchored Suspension Span and bringing seismic safety to those who now travel the new East Span.** - MIKE FLOWERS, P.E., M.ASCE, PRESIDENT AND CEO OF AMERICAN BRIDGE AND FLUOR, JULY 2014

The Bay Bridge is an iconic structure that will provide Bay Area commuters with a safe, stunning and reliable corridor for years to come. The entire team involved – the owner, oversight committee, design consultants and contractors know the bridge is safe.

Here are links to our responses to the two reports, as well as to more information, reports and fact sheets:

<http://www.dot.ca.gov/hq/paffairs/news/pressrel/14pr071.htm>

<http://www.dot.ca.gov/hq/paffairs/news/pressrel/14pr072.htm>

<http://baybridgeinfo.org/documents>

<http://baybridgeinfo.org/factsheets>

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