

**DEPARTMENT OF TRANSPORTATION**

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*Serious drought.  
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July 30, 2014

The Honorable Mark DeSaulnier  
Chair, Senate Transportation and Housing Committee  
State Capitol, Room 2209  
Sacramento, CA 95814

Dear Senator DeSaulnier:

Thank you for the opportunity to respond to the Senate Consultant Roland De Wolk Report (De Wolk Final Report) being submitted for the August 5<sup>th</sup> Senate Transportation and Housing Committee's (Committee) hearing. Since November, the California Department of Transportation (Caltrans) has worked tirelessly to provide transparent and responsive information to Mr. De Wolk as he reviewed the East Span of the San Francisco-Oakland Bay Bridge project for your committee. This included hundreds of hours of work to compile thousands of documents and participate in more than a dozen interviews.

We agree wholeheartedly with your committee's investigation finding that the bridge is safe: "...it is critical to state that no one involved in this report believes or asserts that the new Bay Bridge is unsafe..."<sup>1</sup> Indeed, everyone involved: the engineer of record TY Lin and Moffatt & Nichol; the bridge builders American Bridge / Fluor (ABF), Kiewit / Flatiron / Manson, and MCM Construction; and the numerous world-class peer review experts, teams of oversight experts, Federal Highway Administration, Toll Bridge Seismic Safety Peer Review Panel and even those individuals interviewed for this report unanimously agree that the East Span is safe. In this response, I will: (I) outline the other areas where we agree with Mr. De Wolk, (II) point out things that are inaccurate or misleading in the report, and (III) explain how various construction issues have been fixed.

As you know, none of the issues raised in the De Wolk Final Report call the safety of the bridge into question. Instead, the report restates the allegations of retaliation that were made in Mr. De Wolk's January Draft Report (De Wolk Draft Report) and articulated during your hearing on January 24, 2014. As you know, the California State Transportation Agency Secretary (CalSTA) Brian Kelly took those allegations seriously and asked the California Highway Patrol (CHP) to gather facts to determine whether the allegations have merit. We have cooperated with the CHP investigators and will continue to do so.

Caltrans has also undertaken its own effort to examine lessons learned on the East Span project. As provided to your staff on July 25, 2014, the Caltrans' Lessons Learned Report represents a post-construction review of the management practices employed throughout the project. It examines

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<sup>1</sup> De Wolk Final Report (2014) at p. 46.

the management of a mega-project, and the successes and challenges of the project for use for future mega-projects. Caltrans looks forward to discussing our report at the August 5<sup>th</sup> hearing.

## **I. AREAS WHERE WE AGREE WITH THE DE WOLK FINAL REPORT**

### **A. Transparency**

The Toll Bridge Program Oversight Committee's (TBPOC) exemption to the Bagley Keene was legislatively granted by Assembly Bill (AB) 144 in 2005 (TBPOC was also created by this legislation) and in hindsight established an overly insulated process to review, consider and resolve complex issues involving large sums of taxpayer funds. We agree with the TBPOC's conclusion that this was not in the public interest. This is one of the lessons we learned and identified in the Caltrans' Lessons Learned Report. TBPOC voted to change this process and all meetings are now held in public.

I wholeheartedly agree that transparency is a vital component to the Department's success, especially on projects of this size and complexity. The Department did not ignore or shy away when challenges or concerns did arise. In fact, the Department met these issues head on and took the extraordinary step to seek outside experts in addition to State staff and consultants to ensure that proper measures were being taken to address any concerns (i.e., welds, anchor rods, and foundations). Allegations that "bridge managers quickly dismissed"<sup>2</sup> these issues are absolutely false because the issues were investigated thoroughly and decisions are well-documented. This is proven by the reports produced, and which have also been provided to the Committee and are available online for anyone to view.<sup>3</sup>

### **B. Records Retention and Production**

We agree that the Department would benefit from a more sophisticated record retention system to ensure timely retrieval of records and better document management. Mega-projects produce potentially overwhelming volumes of records of project documentation that would benefit from dedicated records management and retention personnel. For example, all 900,000 plus welds fabricated overseas required individual inspection reports, testing and follow-up tests, which generated a truly staggering volume of paperwork. Developing electronic databases to track these voluminous records can be quite difficult to implement in the midst of construction. Going forward, we are recommending a formalized records management process and staffing at the beginning of the project that is capable of managing and retaining library-style volumes of construction records throughout the project.

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<sup>2</sup> De Wolk Final Report at p. 9.

<sup>3</sup> Thousands of documents are available on <http://www.baybridgeinfo.org> and on <http://www.dot.ca.gov> regarding the Bay Bridge. Additionally, specific issue Fact Sheets are available on <http://baybridgeinfo.org/factsheets>.

Caltrans has consistently complied with the California Public Records Act (CPRA) and the De Wolk Final Report fails to provide any evidence to the contrary.<sup>4</sup> Due to the sheer volume of documents being requested under the CPRA, it took time for Caltrans to find and compile this information as permitted under State law.

Consistent with other comments in the De Wolk Final Report, we acknowledge that our document retrieval system has deficiencies, and this is captured in the Caltrans' Lesson Learned Report. We need not only a good archival system for construction documents, but also to make the information available to the public. For any mega-project, there should be a robust enough system to not only document all pertinent construction documents but also allow for quick easy retrieval from an enormous set of documents on numerous separate projects. The Department has already begun to evaluate a better system to accomplish all of these expectations.

The Department will continue to look for opportunities to further enhance its transparency through the improvement of online information sources about projects. Caltrans has personally invited critics of the project, including Abullah Astaneh-Asl and Yun Chung, to meet with engineering and management staff in an effort to be fully informed about all perspectives before moving forward.<sup>5</sup>

### C. Fiduciary Responsibility

We agree that early on in the project, a predominance of the cost increases were attributable to many factors that were outside the control of Caltrans: "There can be little argument that the explanations for massive cost overruns until 2005 were directly attributable to time-consuming design changes, political delays, unfavorable market conditions and some world events beyond control."<sup>6</sup>

Public comments over the past months make people believe the East Span project continues to have price increases and that is absolutely false. It is important to note that we reformed management of this project once in 2005 in light of growing cost concerns. We brought in external parties and required quarterly reports to the Legislature. Since that reform was implemented in 2005, the project has been on time and on budget.

The attached chart (Appendix 1) from the Caltrans' Lessons Learned Report shows the cost forecast history from 1997 to 2013 and demonstrates that after legislation was passed in 2005 to create the

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<sup>4</sup> Construction contract payment information has been available online for some time.

Contracts can be searched by prime contractor at <http://www.dot.ca.gov/hq/asc/oap/payments/public/ctors.htm>

Contract can be located by contract number at <http://www.dot.ca.gov/hq/asc/oap/payments/>

Contracts can be searched by District at <http://www.dot.ca.gov/hq/asc/oap/payments/public/ctnums.htm>

<sup>5</sup> On February 26, 2014, Caltrans held an open technical forum about the anchor rods. Chung had the opportunity to question every Caltrans presenter and expert, and was able to provide a presentation to Caltrans Toll Program engineers and Department management. The video of that forum is available here:

<http://baybridgeinfo.org/rods/briefing>. Additionally, thousands of documents are available on

<http://www.baybridgeinfo.org> and on the Caltrans' website regarding the Bay Bridge. We have invited Astaneh-Asl many times to participate in similar public workshops, but he has consistently refused.

<sup>6</sup> De Wolk Final Report at p. 5.

TBPOC, the program was on time and within budget. The project is still operating within the budget, with contingency, as set forth in AB 144. Contingencies are intended for unforeseeable challenges that all projects experience and they are there to cover the risks that materialize during construction.

## II. AREAS WHERE WE DISAGREE WITH THE DE WOLK FINAL REPORT

Our key concern with this report is that it fails to correct the errors from the De Wolk Draft Report or incorporate or acknowledge the eight-page letter and 79 pages of attachments I sent to you on February 4, 2014, which is attached. That information directly contradicts many of the points raised in the De Wolk Final Report and the failure to incorporate that update weakens the report's utility. For example, the De Wolk Final Report continues to allege the welding contractor Shanghai Zhenhua Heavy Industry Co., Ltd. (ZPMC) was given a "contingent pass" by Mr. Merrill, ignoring the passing review he gave after corrective measures were implemented.

Specifically, MACTEC conducted an audit of the facility in February 2006 to ensure that it could handle the monumental task at hand. The De Wolk Final Report continues to discuss a "contingent pass" was given, ignoring my February 4, 2014 letter to you that addressed this exact issue and provided documents showing that MACTEC conducted *another audit* in August 2007 where it gave a "pass" to the ZPMC facility.

This failure to disclose complete information surrounding various issues is a recurring problem with the De Wolk Final Report.

### A. Failure to Recognize the Welding Investigation Report

Welding was discussed extensively five years ago and we agree with the De Wolk Final Report that it was reported in many media accounts and discussed publicly by Caltrans and many others.<sup>7</sup> Unfortunately, the De Wolk Final Report ignores the tremendous effort that was undertaken to investigate the welding work—including a peer-reviewed written investigation—to ensure safety. In particular, the American Welding Code permits the repair or rejection of welding work. Many times the welding inspection teams rejected welds completely or called for repairs.

The De Wolk Final Report ignores the 300 page investigative report published in 2011 that describes how new welding processes were implemented during fabrication. In particular, that investigation found the implemented recommendations improved the fabrication process:

"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*

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<sup>7</sup> See, e.g., Matier and Ross, San Francisco Chronicle, "Questions over welds add to Bay Bridge project's cost," January 2009.

Cuff, Contra Costa Times, "Flawed welds cost Bay Bridge project time and money," January 2009.

AP, "Safety questions delay Bay Bridge construction," January 2009.

*weld quality acceptance rate.* Additionally, the project teams' efforts to implement the recommendations of the Panel has achieved positive results on the quality of fabrication and accelerated the delivery of the [box girders]." (emphasis added).<sup>8</sup>

There is no doubt that there were challenges in the fabrication of the orthotropic box girders, as was widely reported in news accounts five years ago. Indeed, ABF, ZPMC, and Caltrans had disagreements about the best way to achieve an acceptable outcome. But the key point that we made, and that is missing from the De Wolk Final Report, is that experts from the State and private sector from around the world worked together to solve the problems.

Unfortunately, the De Wolk Final Report dismisses the final resolution and the 300 page investigation with a single sentence that has no source document or specific engineering concern: "Critics have since questioned the experts' conclusions..."<sup>9</sup> We understand the De Wolk Final Report is not an engineering assessment, but it is misleading to summarily dismiss an engineering report without citing specific concerns with the research that was conducted and the solution that was found.

Again, the American Welding Society code allows for welds to be repaired rather than being rejected, which is an issue the De Wolk Final Report does not address. In summary, all welding met contract and performance requirements, and if it did not, it was repaired or rejected.

### **B. Failure to Retract Allegation of Retaliation Against Contractor MACTEC**

The De Wolk Draft Report from January alleged retaliation against quality assurance contractor MACTEC, which was responsible for helping ensure weld quality in China. In my February letter to you, I pointed out facts that contradict this allegation, yet the De Wolk Final Report failed to explicitly withdraw the allegation.<sup>10</sup>

As I explained in my letter to you on February 4, 2014, the MACTEC contract ran from April 2005 to March 2009 for \$39 million. The MACTEC contract was amended four times, ultimately increasing the cost to \$67 million and extending work through September 2009.

The MACTEC contract was not terminated, but ended on the agreed-upon date under the terms of the contract, after it was extended, as negotiated. There was nothing sudden about the contract ending in 2009 as MACTEC knew in 2005 that the contract would expire in 2009. The De Wolk Final Report says MACTEC "lost their long-standing quality-assurance contract . . . under controversial circumstances"<sup>11</sup> from the project, when the reality is that MACTEC was unsuccessful in a competitive process for the quality contract/quality assurance contract from 2009 forward, but the

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<sup>8</sup> <http://baybridgeinfo.org/sites/default/files/pdf/SAS%20Weld%20Nov%202011%20Report.pdf>

<sup>9</sup> De Wolk Final Report at p. 14.

<sup>10</sup> The report does, however, concede that records show Mr. Tony Anziano actually sought to retain MACTEC, contradicting the allegation of retaliation lodged in the De Wolk Draft Report.

<sup>11</sup> De Wolk Final Report at p. 25.

expiration of the contract was neither sudden nor linked to anything other than the negotiated terms of the contract.<sup>12</sup>

The De Wolk Final Report also claims that information was withheld regarding the Mayes Testing Report. We provided information regarding the Mayes Testing Report to you on February 4, 2014, yet the De Wolk Final Report says it was “kept draft” to avoid it from being available to the public. Again, we provided a final copy of the report that refutes this allegation, yet the De Wolk Final Report again leaves out critical information that tells the whole story.

Also, as you know, CalSTA Secretary Brian Kelly heard these allegations of retaliation during your hearing in January and called on the CHP to investigate the allegations.<sup>13</sup> We have cooperated with the investigation and will continue to do so.

### **C. Failure to Address the Unique Project and Management Circumstances**

A typical Caltrans construction project has rigid parameters that every engineer can apply across the State regardless of the structure. Ninety-nine percent of these Caltrans projects—things like overpasses, retaining walls and bridges—cost under \$200 million. The Bay Bridge was no standard Caltrans construction project and therefore extraordinary project management techniques were employed (i.e., own program manager, own project organization structure, and the Program Manager reporting directly to the Director).

The management structure for a standard Caltrans project was not designed for a mega-project. Engineers traditionally accustomed to working in a defined hierarchy within the Department were challenged to deal with additional management structure of other external agencies having authority over the project. Simply put, the approach where an engineer “takes pride in ... lock[ing] horns with contractors for as little as \$2,000”<sup>14</sup> makes little practical or financial sense on a mega-project.

Building partnerships with contractors to collaborate and work together—rather than fight in court—is the only way to successfully deliver a project of this magnitude. This was the approach taken in East Span contracts to deliver a safe bridge on time. This approach shared risk between all parties and focused on the State as the owner and ABF (and others) as the contractor operating as a team, rather than pursuing an adversarial approach to contract administration.

It appears to us there could have been better communication amongst the team to ensure that all team members were aware of how decisions were made, and why and how issues were considered, reviewed, and resolved. Failure to do that at a high level on a project this big with this many employees could lead to a sense of isolation in some cases, but that is not retaliation.

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<sup>12</sup> All documentation pertaining to this procurement process which included participants from three agencies (the California Transportation Commission, Caltrans, and the Metropolitan Transportation Commission) were provided to the Senate Transportation and Housing Committee in my February 4, 2014 letter.

<sup>13</sup> <http://www.sacbee.com/2014/03/14/6237922/chp-probes-bay-bridge-welding.html>

<sup>14</sup> De Wolk Final Report at p. 19.

All engineering decisions were made by engineers and have engineering stamps on them and the De Wolk Final Report provides no contrary evidence. As noted numerous times, decisions are supported by multiple engineers with their engineering stamps documenting their responsible decisions. No examples have been given of decisions being made by non-engineers.

#### **D. Failure to Acknowledge Ongoing California Highway Patrol Investigation and Many Other Investigations Past and Present**

The De Wolk Final Report recommends that the State Legislature and the Executive Branch “swiftly investigate the alleged pattern of quashing dissent.”<sup>15</sup> The Executive Branch did exactly that when the CalSTA Secretary Brian Kelly took the allegations of retaliation seriously and asked the CHP to gather facts to determine whether the allegations have merit. We have cooperated with the CHP investigators and will continue to do so. Secretary Brian Kelly has vowed to take appropriate action if anything improper occurred. In addition, as called for in the De Wolk Final Report, an external Review Panel created by the Senate is investigating the safety of the bridge after taking over this work from the Legislative Analyst’s Office.

We have been building structures in California since 1897 when the legislature made its first appropriation for certain state roads. American Bridge, Fluor, T.Y. Lin, Moffat & Nichol and all the other companies that worked on this structure have a collective 275-plus year track record building some of the world’s most iconic and important infrastructure projects. We have committed our lives to building safe projects that benefit the people of California. It is not in our interest, nor is it within our core mission, to ignore safety issues on our projects. Our practice is to consider an issue, educate ourselves, and resolve the problem.

### **III. ALL CONSTRUCTION CHALLENGES RAISED BY MEDIA HAVE BEEN FIXED OR WILL BE FIXED**

The project has had a tremendous level of review regarding design, construction and the many challenges overcome along the way. Again, we agree wholeheartedly with the De Wolk Final Report conclusion that the Bay Bridge is safe. We want the public to continue hearing that message loud and clear. To assist with that effort, here is an update on the various construction challenges publicized over the years and how those were resolved.<sup>16</sup> Additionally, the De Wolk Final Report completely ignores the consensus of the majority involved in the project—engineers who were the ultimate decision makers on the issues and the external experts employed to provide oversight.

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<sup>15</sup> De Wolk Final Report at p. 46.

<sup>16</sup> We have also published concise Fact Sheets documenting how issues were resolved at <http://baybridgeinfo.org/factsheets>

### **A. Quality Welding Delivered to Bay Bridge Construction Site**

Welding and steel fabrication involved in the Self-Anchored Suspension Span (SAS) took place around the world, including locations in the United States, Japan, China, Korea, and the United Kingdom. Standards and rigorous inspection were common to all locations. The tower and orthotropic box girders of the SAS were fabricated at the ZPMC in Shanghai, China.

ZPMC was selected for the work by the SAS prime contractor, ABF. ABF are contractors with international reputations for technical skill and quality. ZPMC is an internationally known steel fabricator that has fabricated massive port container cranes, bridges, offshore oil platforms and wind turbine towers.

ZPMC's work for the SAS involved almost one million individual welds, miles and miles in length, and took place between late 2007 and 2011. The vast majority of this work was completed without issue. Two specific issues were identified during fabrication that required additional attention on a subset of welds that had a higher rate of an "indication" that there might be a defect.

Both issues were carefully analyzed to determine the cause, so as to allow for an improved process moving forward. The team performing this analysis included pre-eminent experts from the welding and engineering community. The result of this analysis was reviewed by the Toll Bridge Seismic Safety Peer Review Panel, a panel of technical experts considered to be at the pinnacle of their respective professions (several members have been elected to the National Academy of Engineering, the highest recognition bestowed on engineers in the United States).

In all cases, rejectable indications in weld areas required for the performance of the structure (performance including both the 150 year life of the bridge as well as the lifeline seismic performance criteria) were removed and repaired. ABF, ZPMC, and the Department stand by the quality of the work.

### **B. Aligning Anchor Rods**

Proper alignment of the rods is a relatively simple thing to achieve and does not represent a long-term safety issue because we will fix it. Caltrans is already working diligently on a straight forward solution to ensure proper alignment of each of the 274 anchor rods as they pass through holes in the anchorage plates and affix themselves to the anchorage grillage.

Our intent is for the anchor rods to be near centered with adequate clearance in the anchorage plate holes. When load transfer took place the anchorage system moved in three dimensions with the anchor rods moving greater than anticipated. Adjustments will be made by moving individual anchor rods a matter of millimeters, and if necessary, additional clearance can be provided by increasing the size of the holes. This work will be complete soon and there are no safety concerns.

The “splay chambers” are dehumidified, which an extraordinary measure is taken in the design of the project to maximize the protection and life-span of the bridge. Dehumidification is additional protection as each wire is already protected from rust and corrosion. We have seen no engineering analysis from any experts raising concerns with the current alignment or our proposed solution.

### **C. Reducing Moisture**

Any metal bridge must be designed and maintained in a way to avoid water from causing corrosion. The presence of water in a steel bridge in a marine environment is expected, limited and managed. Measures were taken and are continuing to be taken to avoid water from entering the bridge deck sections. The presence of water is limited and managed through caulking, drainage channels, and paint priming or galvanization of the interior steel in the event that water does enter the structure. Steps have been taken to reduce or eliminate any water from entering the bridge, but the design addresses any water intrusion and protects the bridge from corrosion in that event. Also, the splay chambers, like other critical areas of the bridge, are a dehumidified environment which is an extraordinary effort employed on very few bridges around the world to insure the ultimate protection against corrosion and the life of the bridge. This is above and beyond the corrosion protection applied to each of the individual 17,399 wires that make up the main cable.

### **D. Solid Foundation Concrete**

The Department has repeatedly provided all documentation of testing and construction oversight efforts regarding the quality and safety of the concrete foundations. Any assertions that the bridge piles have “inferior concrete” contradicts the well-documented quality tests and construction procedures and secondary studies of the concrete foundations. The testing regiment employed on these piles exceeded industry norms and all data confirmed the quality of the concrete.<sup>17</sup>

### **E. Successful Retrofit For 32 Bolts on Pier E2**

Last week, Caltrans notified TBPOC that it has substantially completed thousands of laboratory and field tests on Bay Bridge A354 BD bolts, which continue to show very encouraging signs that all the bolts on the bridge are now sound and the Bay Bridge is safe. We are now providing the test data to a team of world-class experts who will analyze the information, make recommendations, and draft a final report regarding similar bolts on the bridge.

We conducted thousands of scientific tests that generated hard data—not opinions or speculation—showing many differences between the 32 bolts that broke and all the other A354 BD bolts on the bridge that remain intact. Experts from around the world have and are continuing to analyze this encouraging test data in detail and will write a final report for TBPOC.

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<sup>17</sup> See Toll Bridge Seismic Safety Peer Review Panel SAS T1 Foundation Review: <http://baybridgeinfo.org/sites/default/files/pdf/SAS%20Tower%20Base%20Report.pdf> and Peer Review Document: T1 Foundation Review: <http://baybridgeinfo.org/quality-assurance#a1>

In March 2013, 32 high-strength bolts cracked, despite complying with national industry standards, and were later fixed using a giant steel saddle. In July 2013, the TBPOC published a preliminary investigative report that also found important differences between the bolts that broke and all the bolts on the bridge that remain sound after months or years of use. The Federal Highway Administration also independently reviewed the report and findings.

Three separate tests in 2013 showed significant differences in metallurgy and environmental conditions between the bolts that broke and all the other similar bolts on the bridge. The report explained that the 32 bolts that broke succumbed to a phenomenon known as hydrogen embrittlement, in which hydrogen atoms concentrated within the granular structure of the steel and weakened it.

Although all the other 2,000 A354 BD bolts on the bridge remained sound, there was a potential risk of long-term stress corrosion over the coming decades that needed to be investigated. Investigators conducted three more tests in addition to the three already conducted and quality assurance and quality control analysis during manufacture. In general, the test data continues to show many differences between the bolts that broke and all the other similar bolts on the bridge. In particular, all the other similar bolts on the bridge withstood much higher sustained loads and are significantly stronger than the bolts that broke.

#### **F. Strong Steel Tendons in Skyway Deck**

Post tensioning involves the installation of high strength steel tendons inside concrete to provide the structure with additional strength. The strands are installed inside of ducts that are embedded in the concrete. Once installed, the strands are placed under tension to exert force on concrete box girders, and then the ducts are filled with grout to protect the strands from corrosion.

Back in 2006 during site inspections, rust stains were observed near post tensioning ducts and an investigation was initiated to determine the status of the steel tendons in the Skyway. This issue was analyzed extensively, a borescope was employed, input from corrosion experts was utilized, design analysis of the excess capacity was done, and oversight reviews by the Federal Highway Administration and the Seismic Safety Peer Review Panel were conducted. Multiple public reports have been published on this issue and the conclusions were that no strands were severely corroded and overall, given the extreme redundancy present in this element (and in the bridge as a whole) there remains more than sufficient capacity in the tendons for both the service life, as well as the needed seismic performance.<sup>18</sup>

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<sup>18</sup> The final reports are available at:  
<http://baybridgeinfo.org/quality-assurance#corrosionreport1>  
<http://baybridgeinfo.org/quality-assurance#corrosionreport2>  
<http://baybridgeinfo.org/quality-assurance#corrosionreport3>

The Honorable Mark DeSaulnier  
July 30, 2014  
Page 11

There is no question there were significant challenges in construction and management on this structure. We have learned lessons on this project and have welcomed outside review at every step of this project. We are confident this bridge is safe. Thank you again for this opportunity to respond to the De Wolk Final Report. We agree with the report's assessment that the Bay Bridge is safe and want to continue to assure the public about that. I look forward to further discussing these items with you on August 5.

Sincerely,

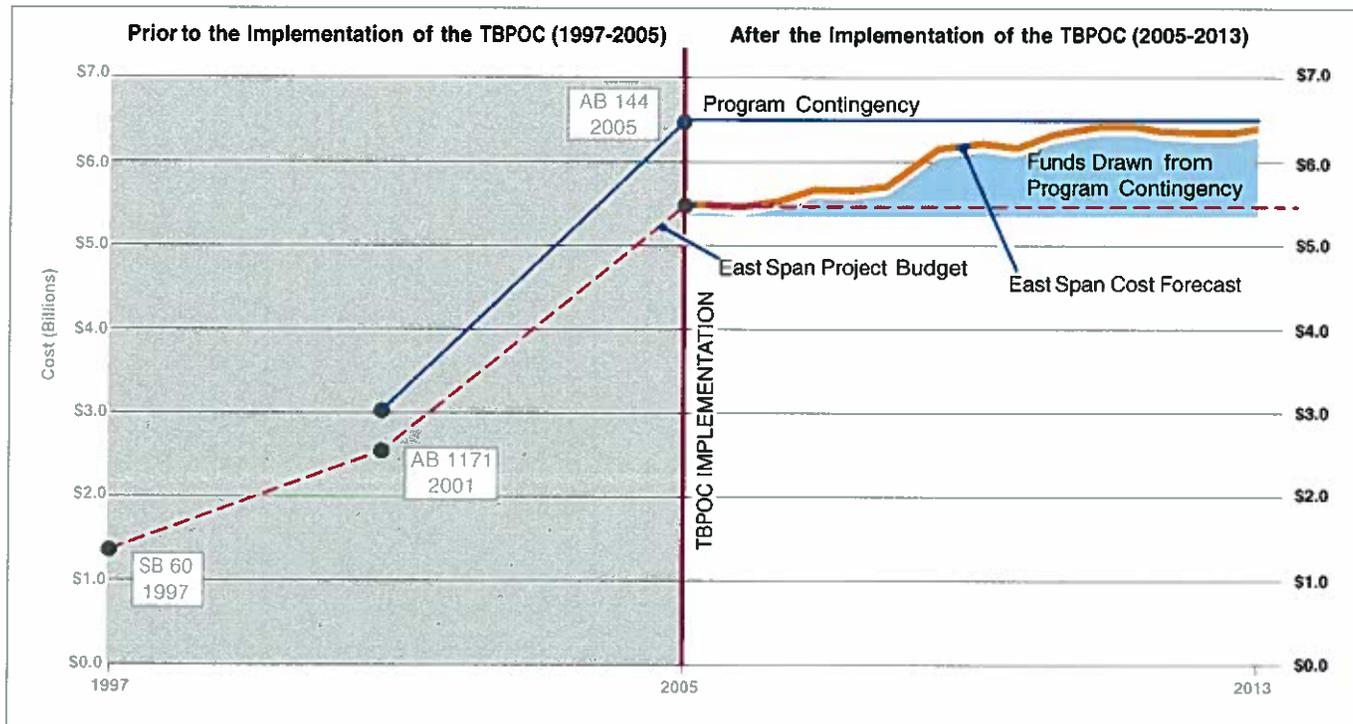


MALCOLM DOUGHERTY  
Director

Enclosure

## APPENDIX 1

Caltrans Lessons Learned Report (2014) at p. 2  
 Exhibit 1: East Span Project - Cost Forecasting History



— East Span Cost Forecast Data: Toll Bridge Seismic Retrofit Program Quarterly Reports, September 2005 through February 2014, <http://bata.mtc.ca.gov/reports.htm>  
 Program Contingency and Drawdown per AB144  
- - - Legislative Approved Budget - East Span Project      —●— Legislative Approved Program Contingency

# **Caltrans' Response Letter**

**February 4, 2014**

**DEPARTMENT OF TRANSPORTATION**

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*Flex your power!  
Be energy efficient!*

February 4, 2014

The Honorable Mark DeSaulnier  
Chair, Senate Transportation and Housing Committee  
State Capitol, Room 5035  
Sacramento, CA 95814

Dear Senator DeSaulnier:

As promised on January 24, the Department of Transportation is submitting documentation regarding items mentioned during the Senate Transportation and Housing Committee hearing. I appreciate the opportunity to clarify and provide additional details about the Bay Bridge project.

Caltrans Process to Address Weld Issues

We agree that there were challenges that had to be overcome with the welding operation on the Self-Anchored-Suspension (SAS) bridge deck components. In 2008, these challenges led to ever-increasing levels of quality assurance. Everyone working on the project knew that issues had to be addressed. Caltrans staff collaborated with the contractor and the fabricator to ensure that specifications were met and that a quality product was produced, which ultimately was the case. Welding issues were never dismissed and were consistently and thoroughly analyzed throughout the project. During early stages of the operation we were experiencing cracks in welds that required repair, and the American Welding Society code allows for that. The contract does reference the American Welding Society code, which makes those standards part of the contract.

To put some context to the weld issue, here is a timeline that shows the issue was widely recognized five years ago, taken seriously and resolved:

- American Bridge/Fluor (ABF) Contract Approved: May 3, 2006
- Shanghai Zhenhua Heavy Industry Company, LTD (ZPMC), ABF's fabricator, started mock panel work: Late 2006
- ZPMC started production work: Fall 2007
- Caltrans Quality Assurance officials begin to see nonconforming products: 2008
- Caltrans Quality Assurance officials intensified inspections: 2008

- Caltrans notifies ABF that products are not conforming and acceptable repair procedures are established: 2008
- MacTec to Caltrop transition: December 2008-September 2009
- ABF sends more quality control personnel to China: 2009
- ZPMC continues to repair the flaws identified by QA and QC inspectors: 2009
- Welding procedures are modified to reduce occurrence of flaws: November 2009
- First shipment left China: December 31, 2009
- Quality Assurance / Quality Control (QA/QC) Expert Panel formed: November 2010
- ZPMC implements a new welding process involving wire and shielding gas for affected welds, which resolves most problems: 2010
- Original Project Team Report produced: March 2011
- Last shipment from China: August 5, 2011
- QA/QC Panel endorses Final Project Team Report: November 3, 2011
- Caltrop to Alta Vista transition: December 2011

#### Caltrans and Contractor Form Team to Reduce the Incidence of Faulty Welds

To address these weld quality issues, Caltrans gathered a team of welding experts—including the chairs of the committees that set national welding standards—and brought in ZPMC and ABF to figure out what was going wrong and how to fix it.

We sought outside expertise to ensure that we have the smartest people helping us review, determine, and conclude the best path forward: On the team were the following individuals:

- Dr. John Barsom (Fracture Mechanics Specialist and Metallurgist)
- Mr. David McQuaid, P.E. (Chair of the American Welding Society Code Committee for Bridge Steel Welding)
- Mr. Don Rager (Chair of the American Welding Society Code Committee for Structural Steel Welding)
- Mr. Alan Cavendish-Tribe, CEng., FWeldI. (Professional Welding Engineer)

The QA/QC Panel reviewed the Caltrans Project Team's report on the welds, and endorsed the Project Team's final report<sup>i</sup> with a letter to the Project Team with their signatures<sup>ii</sup>. After a review of all the data, the investigated welds were found in general to be of high quality and with very low rejection and repair percentages. In all cases, any bad welds were removed and repaired. After this extensive investigation, the steel fabrication advanced and was

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<sup>i</sup> <http://baybridgeinfo.org/sites/default/files/pdf/UpdatedFinal-QAQC-Rpt-2011Nov-v1.pdf>

<sup>ii</sup> Page 303 in the above link

completed in compliance with the American Welding Society bridge welding code, which allows for the repair of welds as an alternative to outright rejection. These American Welding Society code standards were part of the contract. ABF also implemented a new welding process involving wire and shielding gas for affected welds which resolved many of the production problems.

In general, the timeline shows that Caltrans continued to find cracks in welds, ABF continued to fix them and eventually we reached a solution that solved the underlying issues. Getting to that resolution certainly involved a great deal of professional debate. These concerns and differing views were taken seriously and included in the investigation and final report published in November 2011. The review of the welding issue and the resolution of the matter relied on engineering and welding experience. Caltrans engineers did their job and worked with ABF and ZPMC engineers to solve a problem and get the project back on track.

As Caltrans fulfilled its QA role and worked with ABF to improve their QC operations, the team required the repair of all non-conforming cracks in welds and called for changes in welding processes to ensure higher quality welds the first time.

#### Audits of ZPMC Facility

For clarification regarding the ZPMC facility audit, in February 2006, before awarding the SAS bridge contract to ABF, an audit was done by the Caltrans' Materials and Engineering Testing Services (METS) consultant (MacTec) on the ZPMC facility to evaluate the overall capability of ZPMC to fabricate the SAS Orthotropic Box Girder (OBG) and tower. That audit resulted in a "contingent pass" being given to the ZPMC facility. After awarding the contract and prior to the start of fabrication, the METS consultant (MacTec) conducted a follow up audit in August 2007 and ZPMC was given a full "pass". The final audit stated "In a pre-bid audit, METS stated 'ZPMC generally demonstrated to the audit team they have the engineering support and transportation capacity to perform the fabrication of the Orthotropic Box Girder (OBG), cross means, and steel tower (ST)', and 'During our audits the team sensed the company has a strong commitment to producing a quality product.'" This fact was not made clear during the hearing that ZPMC was given a pass to conduct work needed for the Bay Bridge. A copy of the final audit is in Appendix A.

#### MacTec Contract

A statement was made during the hearing, that MacTec was removed from the project for calling out bad welds that were discovered, but that would not be an accurate rendition of events. As with all of our Architectural and Engineering (A&E) contracts, MacTec's contract was awarded through a competitive process and had limits both in time and money. The original contract began on April 1, 2005 was to end on March 31, 2009, and was initially for \$39 million. This

contracted was amended four times; three of the amendments changed the cost which ultimately was increased to a total of \$67 million and one amendment changed the final date from March 31, 2009 to September 30, 2009. It was absolutely appropriate to renew the contract services through a competitive process.

Allegations that Caltrans – and Tony Anziano in particular - sought to get rid of MacTec as a retaliatory act are false, in fact Mr. Anziano drafted a request in 2008 to the Director trying to retain the company by once again extending the schedule and value. Due to the nature of how much the contract scope changed and the continuously increasing cost, the Department's Executive Management Team determined it was prudent for the Department to re-advertise the contract through a competitive process. Appendix B shows the A&E Amendment Pre-Approval document for Amendment Number 2 that was initialed by the Department's Executive Manager's for approval. It should be noted from the document that as early as April 2008, the Executive Managers wanted a new contract in place. However, Mr. Anziano wanted to maintain continuity and minimize disruptions to the operation. In 2008, Mr. Anziano submitted a memorandum to the Caltrans Director recommending the award of a sole source contract to MacTec, thereby allowing for MacTec to continue providing services to the Toll Bridge Program (see Appendix C). As stated above, it was decided by the Executive Management Team that a new contract would be competitively procured.

When the new contract was put out to bid, a selection panel of seven individuals was created for the contract. Members of this panel included the following:

- Andrew Fremier – Bay Area Toll Authority
- Stephen Maller – California Transportation Commission
- Brian Maroney – Caltrans, Toll Bridge Program
- Peter Siegenthaler – Caltrans, Toll Bridge Program
- Prakash Siva – Caltrans, District 4
- Phil Stolarski – Caltrans, Materials and Engineering Testing Services (METS)
- Ken Terpstra – Caltrans, Toll Bridge Program

Mr. Anziano was not a member of the panel and the majority of the panel was outside of the Toll Bridge Program chain of command. The panel selected Caltrop for the new contract with a 4-3 vote (see the voting results of the selection panel in Appendix D).

The decision to re-advertise this work was repeated three years later, after two amendments more than doubled the original contract amount on the Caltrop contract from \$40 million to \$99 million. These decisions were made because of the nature of the work and the continuously increasing costs, not because of any attempt to “get rid of” one of the consultant teams doing quality assurance work on Bay Bridge projects.

Caltrop Personnel Not Qualified

It was also stated that the Mayes Testing Engineers, Inc. evaluation of Caltrop was “kept draft” in order to avoid it being available to the public. This also was not an accurate statement. That finalized document and a subsequent memo internally between METS and District 4 is in Appendix E.

California Public Records Act

Testimony during the hearing discussed that staff were instructed to not put anything in writing to avoid the California Public Records Act. The enclosed documents (see Appendix F) clearly show that Mr. Anziano advised staff to make sure communications were accurate. There are millions of pages of documentation regarding welding in China, which includes discussions of all issues raised at the hearing. Additionally, hundreds of thousands of documents pertaining to the Bay Bridge project can be found on [www.baybridgeinfo.org](http://www.baybridgeinfo.org).

Mr. Anziano’s email was precipitated by an event in which a member of Caltrans staff sent an e-mail stating “cracks” had been found in tower welds at a specific location. In fact, at the time the e-mail was sent, the testing had only indicated the potential for some type of flaw in tower welds. A subsequent joint inspection by the Department and ABF determined that there were NO cracks in the tower welds. In a later conversation back in Oakland, a member of staff who had seen the e-mail, expressed serious concerns about the cracks in the tower welds. That staff member, however, had never been advised that the original e-mail was incorrect. Mr. Anziano followed-up on this inaccuracy by sending an e-mail to the Construction Manager in China, asking that staff be reminded “that words do matter and to make sure we stick to the facts.”

2008 Rods

There was also a discussion during the hearing that METS recommended rejecting the 2008 rods and that Mr. Anziano himself accepted the 2008 rods. In fact, neither of these things happened. The three METS documents referenced by the De Wolk report and presented at the hearing that METS recommended rejection of the 2008 rods make no such statement. These documents note that some of the rods did not meet elongation requirements. One document specifically notes that the rods were accepted by bridge designer James Duxbury of TY Lin / Moffatt & Nichol. (See Appendix G)

There were comments made in the hearing last week regarding the cause of failure of the A354 Grade BD Rods that were manufactured in 2008 and installed on Pier E2 of the SAS Bridge. A statement was confidently made that, contrary to the July 8, 2013 TBPOC Report on the A354 Grade BD High-Strength Steel Rods on the New East Span of the San Francisco-Oakland Bay

Bridge With Finding and Decisions<sup>iii</sup>, the 2008 rods failed because they sat in water and that the failure was due to environmental hydrogen embrittlement. The insinuation was made that Caltrans and the authors of the report completely overlooked this possibility, which is not accurate. While no conclusion has yet been reached regarding the cause of the failure of the 2008 rods, the report states on page 45, "The presence of water may have been a contributing source of hydrogen contamination in the rods."

There was also a statement in the hearing that Caltrans did not have a metallurgist involved in the beginning of the project and still does not have metallurgist expertise at our disposal. This also is incorrect. In fact, Mr. Rosme Aguilar, a licensed Caltrans engineer with expertise in metallurgy, has been involved with the design team since the beginning. Mr. Aguilar holds a Master of Science degree in Metallurgy and a Bachelor of Science degree in Metallurgical Engineering. Also, the design team has been advised as needed by Doug Williams, a welding expert and licensed professional metallurgical engineer, Dr. Alan Pense, an expert in metallurgy, welding and fracture analysis, and Dr. Karl Frank, an expert in design and behavior of structural steel bridges as well as fracture and fatigue behavior of metal structures. Finally, in April 2013, other experts in metallurgy and fracture mechanics were added to the Bay Bridge Design Team to help assess the disposition of A354 Grade BD rods currently in service on the SAS bridge. Those experts include:

- Dr. Herbert Townsend Jr. Ph.D., P.E.  
Expertise: Corrosion performance and testing of coated and low-alloy steels
- Sheldon W. Dean Jr., Sc.D.  
Expertise: Corrosion Engineering
- Dr. Bob Heidersbach, Ph.D., P.E.  
Expertise: Metallurgy and corrosion, failure analysis oil
- Dr. Louis Raymond, Ph.D., P.E.  
Expertise: Failure analysis, fracture mechanics, coated alloy steel fasteners, hydrogen embrittlement testing, corrosion

The department has set a public forum for February 26, 2014 to discuss our process for testing the A354BD bolts and to hear input from outside experts, including Mr. Yun Chung and his team.

### Confidentiality Clauses

A question was raised at the hearing about utilization of confidentiality language in all Caltrans contracts. There is confidentiality language included in our contracts with Architectural and

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<sup>iii</sup>The report can be found at: [http://mtc.ca.gov/projects/bay\\_bridge/A354\\_report.pdf](http://mtc.ca.gov/projects/bay_bridge/A354_report.pdf)

Engineering (A&E) consultants related to communications with the media. The history of this clause revolves around the following four reasons:

1. Caltrans may need to provide personal information to consultant(s) on projects or task orders that may not be disclosed pursuant to the Information Practices Act, Civil Code section 1798 et seq.
2. A&E Consultants and Caltrans may be working together opposing a claim by a construction contractor or on litigation. In these situations, the communications, particularly between the Consultant and the Caltrans attorney, represent an attorney/client work product and as such are protected as an evidentiary privilege.
3. The Consultant's role is an advisor to Caltrans, and so the Consultant may be privy to sensitive information. However, the work product belongs to Caltrans. Therefore, Caltrans needs to have control over the work product and any associated communications.
4. A&E Consultants may be working on part of a project and may not have all or sufficient information to fully inform the media. Communications from Caltrans should be coordinated through one (or a designated few) spokesperson(s) representing all sources to ensure an accurate and consistent message and to avoid any miscommunications.

These clauses are not included in construction contracts, do not prohibit responses to the Legislature, and there may be an opportunity to update the boilerplate language to support the concept of transparency and protect some of the critical issues outlined above. Caltrans is committed to transparency and cooperation with your committee. As we have demonstrated, where questions of confidentiality have been raised as barriers to communicating with the Legislature, we have acted to knock these barriers down.

### Foundations

Testimony during the committee hearing called into question the quality of concrete in some of the foundation piles of the SAS tower. There are documents signed by licensed engineers responsible for the final product which accept the work and attest to its quality. We reviewed all the information pertaining to the quality of the piles in a prior legislative hearing, where I presented documents that show that QC/QA measures exceeded norms, and that materials and construction practices yielded high quality concrete in the foundation piles.

The Honorable Mark DeSaulnier  
February 4, 2014  
Page 8

Constructing a bridge of this scope and complexity is a challenging human endeavor. As with any human undertaking, challenges will arise and mistakes will occur. However, an accurate history of this project should reflect that these challenges and mistakes were not ignored. They were confronted head-on and they were remedied. The decision to open the new span to traffic on September 3, 2013 was a decision made in the interest of public safety. We determined that the new structure was safe and provided a level of protection to travelers on the bridge exponentially higher than that offered by the bridge constructed in 1936. That is a decision I stand by. I assure you it was made based upon sound engineering judgments. I agree with the committee's call for greater transparency going forward on future endeavors and look forward to working with you on this important matter in the days ahead.

Sincerely,

A handwritten signature in blue ink, appearing to read "Malcolm Dougherty", with a long horizontal flourish extending to the right.

MALCOLM DOUGHERTY  
Director

Enclosure