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BATA OVERSIGHT COMMITTEE
Wednesday, April 10, 2013, 9:30 a.m.
Joseph P. Bort MetroCenter
Lawrence D. Dahms Auditorium
101 Eighth Street, 1st Floor
Oakland, CA 94607

The Bay Area Toll Authority Oversight Committee considers matters related to the Toll Bridge Accounts and the Regional Measure 1 (RM 1) Bridge Improvement Program.

Chair: Bill Dodd
Vice Chair: Tom Bates
Members: David Campos, Federal Glover, Joe Pirzynski, Jean Quan, Bijan Sartipi +, Adrienne Tissier, Scott Wiener
Ex-Officio: Amy Rein Worth***, Dave Cortese***
Ad Hoc: All Other Commrs.
Staff Liaison: Andrew B. Fremier

This meeting is scheduled to be audiocast live on MTC's Web site: www.mtc.ca.gov.

AGENDA

	ACTION / STAFF RECOMMENDATION**
1. Roll Call	Confirm Quorum
2. Pledge of Allegiance	
3. Compensation Announcement (Committee Secretary)	Information
4. Consent:	Committee Approval
a) Minutes – Meeting of March 6, 2013.*	
b) BATA Financial Statements – February 2013.* (Eva Sun)	
c) Contract Amendment – Collection Services: Professional Account Management, LLC. ($450,000) (Eva Sun)	
5. March 2013 Project Progress and Financial Update report for the Toll Bridge Seismic Retrofit Program.* (Peter Lee)	Information

Staff will present an update on construction status of the new eastern span of the San Francisco-Oakland Bay Bridge. The progress and financial update report is included in your packet for review.

ACTION / STAFF
RECOMMENDATION**

6. Public Comment / Information / Next Meeting — Information

The next meeting of the BATA Oversight Committee will be May 8, 2013, 9:30 a.m. in the Lawrence D. Dahms Auditorium, First Floor, 101 Eighth Street, Oakland, CA.

* Attachment sent to committee members, key staff and others as appropriate. Copies will be available at the meeting.

** All items on the agenda are subject to action and/or change by the Committee. Actions recommended by staff are subject to change by the Committee.

*** BATA Authority Chair and vice-chair are ex-officio voting members of the BATA Oversight Committee.

\+ Non-voting member.

++ Item will be distributed at the meeting.

Quorum: A Quorum of this committee shall be a majority of its regular non-ex-officio voting members (5).

Public Comment: The public is encouraged to comment on agenda items at committee meetings by completing a request-to-speak card (available from staff) and passing it to the committee secretary. Public comment may be limited by any of the procedures set forth in Section 3.09 of MTC's Procedures Manual (Resolution No. 1058, Revised) if, in the chair's judgment, it is necessary to maintain the orderly flow of business.

Meeting Conduct: If this meeting is willfully interrupted or disrupted by one or more persons rendering orderly conduct of the meeting unfeasible, the Chair may order the removal of individuals who are willfully disrupting the meeting. Such individuals may be arrested. If order cannot be restored by such removal, the members of the committee may direct that the meeting room be cleared (except for representatives of the press or other news media not participating in the disturbance), and the session may continue.

Record of Meeting: MTC meetings are recorded. Copies of recordings are available at nominal charge, or recordings may be listened to at MTC offices by appointment. Audiocasts are maintained on MTC's Web site for public review for at least one year.

Accessibility and Title VI: MTC provides services/accommodations upon request to persons with disabilities and individuals who are limited-English proficient who wish to address Commission matters. For accommodations or translations assistance, please call 510.817.5757 or 510.817.5769 for TDD/TTY. We require three working days' notice to accommodate your request.

可及性和法令第六章：MTC 根據要求向希望來委員會討論有關事宜的殘疾人士及英語有限者提供服務/方便。需要便利設施或翻譯協助者，請致電 510.817.5757 或 510.817.5769 TDD / TTY。我們要求您在三個工作日前告知，以滿足您的要求。

Acceso y el Titulo VI: La MTC puede proveer asistencia/facilitar la comunicación a las personas discapacitadas y los individuos con conocimiento limitado del inglés quienes quieran dirigirse a la Comisión. Para solicitar asistencia, por favor llame al número 510.817.5757 o al 510.817.5769 para TDD/TTY. Requerimos que solicite asistencia con tres días hábiles de anticipación para poderle proveer asistencia.

THE SAN FRANCISCO-OAKLAND
BAY BRIDGE
SEISMIC SAFETY PROJECT

BATA Oversight Committee – April 10, 2013

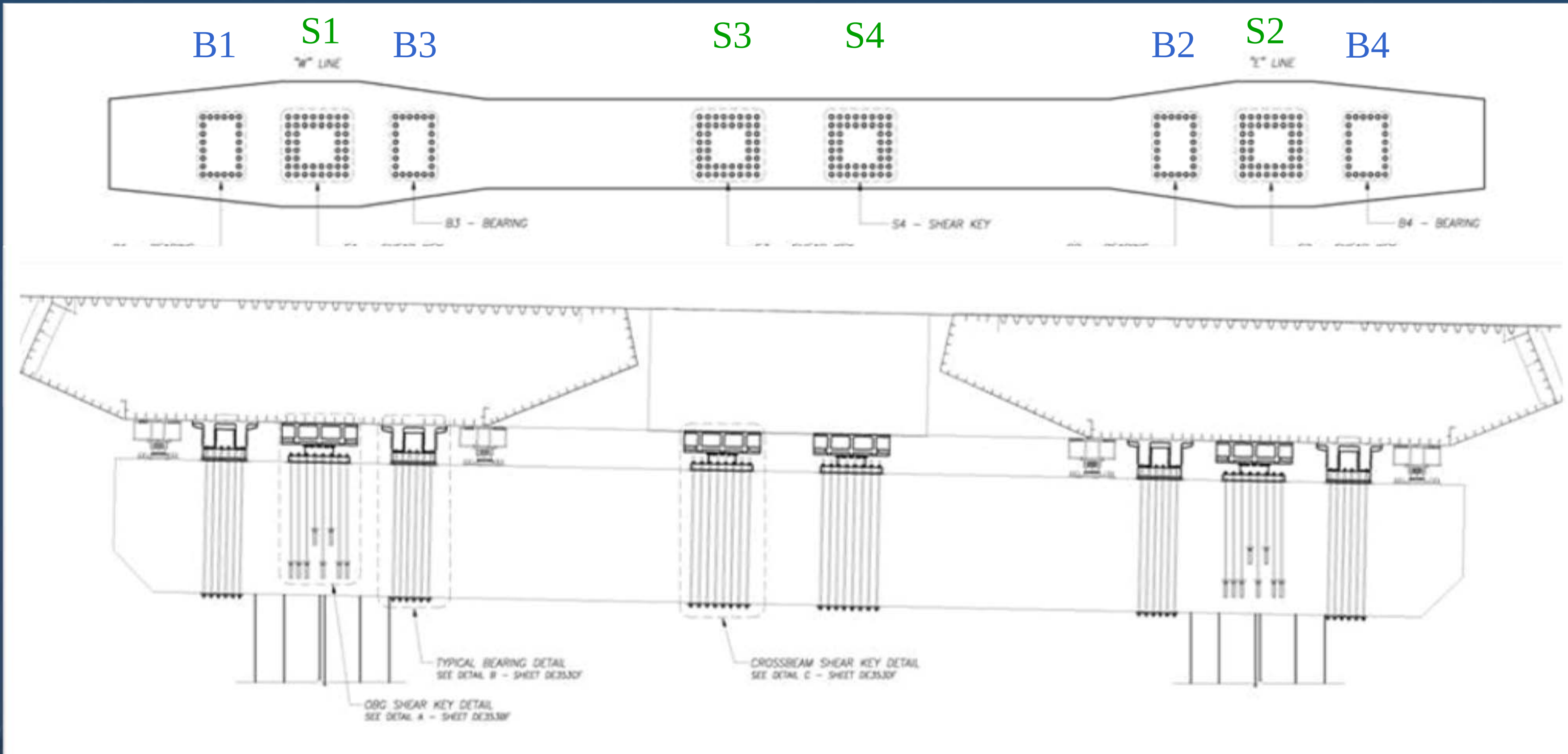
- **AB 144 established the *Toll Bridge Program Oversight Committee*, composed of Director of the California Department of Transportation (Caltrans), and the Executive Directors of the California Transportation Commission (CTC) and the Bay Area Toll Authority (BATA), to be accountable for delivering the SRP.**

MALCOLM DOUGHERTY
Director
California Department of Transportation

STEVE HEMINGER
Executive Director
Bay Area Toll Authority

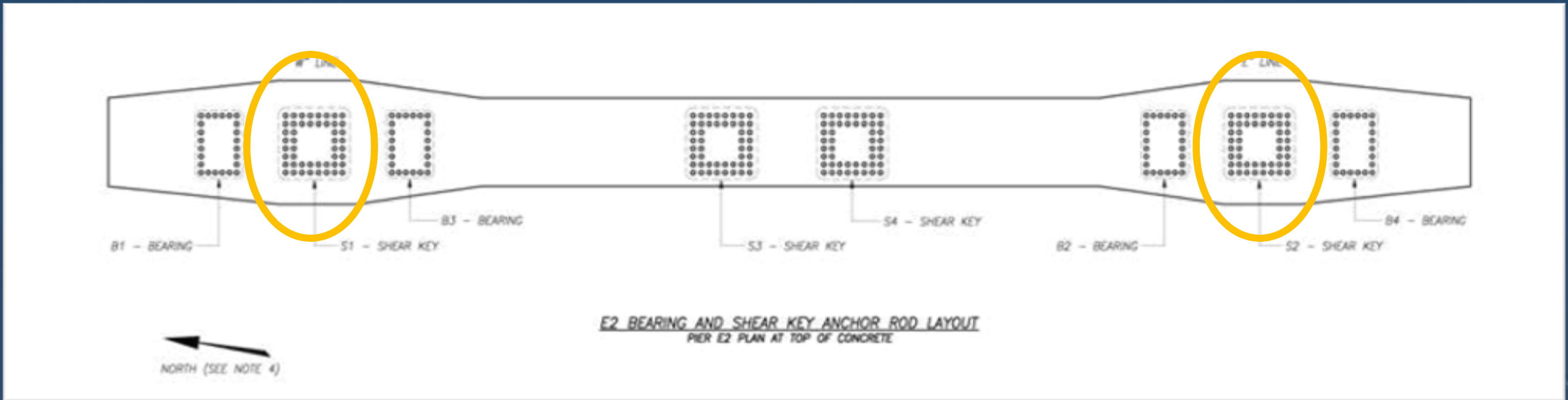
ANDRE BOUTROS
Executive Director
California Transportation Commission

Pier E2



Bearings and shear keys are secured to Pier E2 by 3 inch diameter anchor rods, ranging from 9 feet to 24 feet in length

Each bearing has 24 anchor rods and each shear key has 48 anchor rods for a total of 288 anchor rods



Shear key and bearing anchor rods could not be stressed until completion of load transfer.

Stressing began on March 1 of this year, starting with anchor rods fabricated in 2008 (total of 96 rods) for shear keys S1 and S2.

32 fractured rods were discovered between March 8 and March 15.

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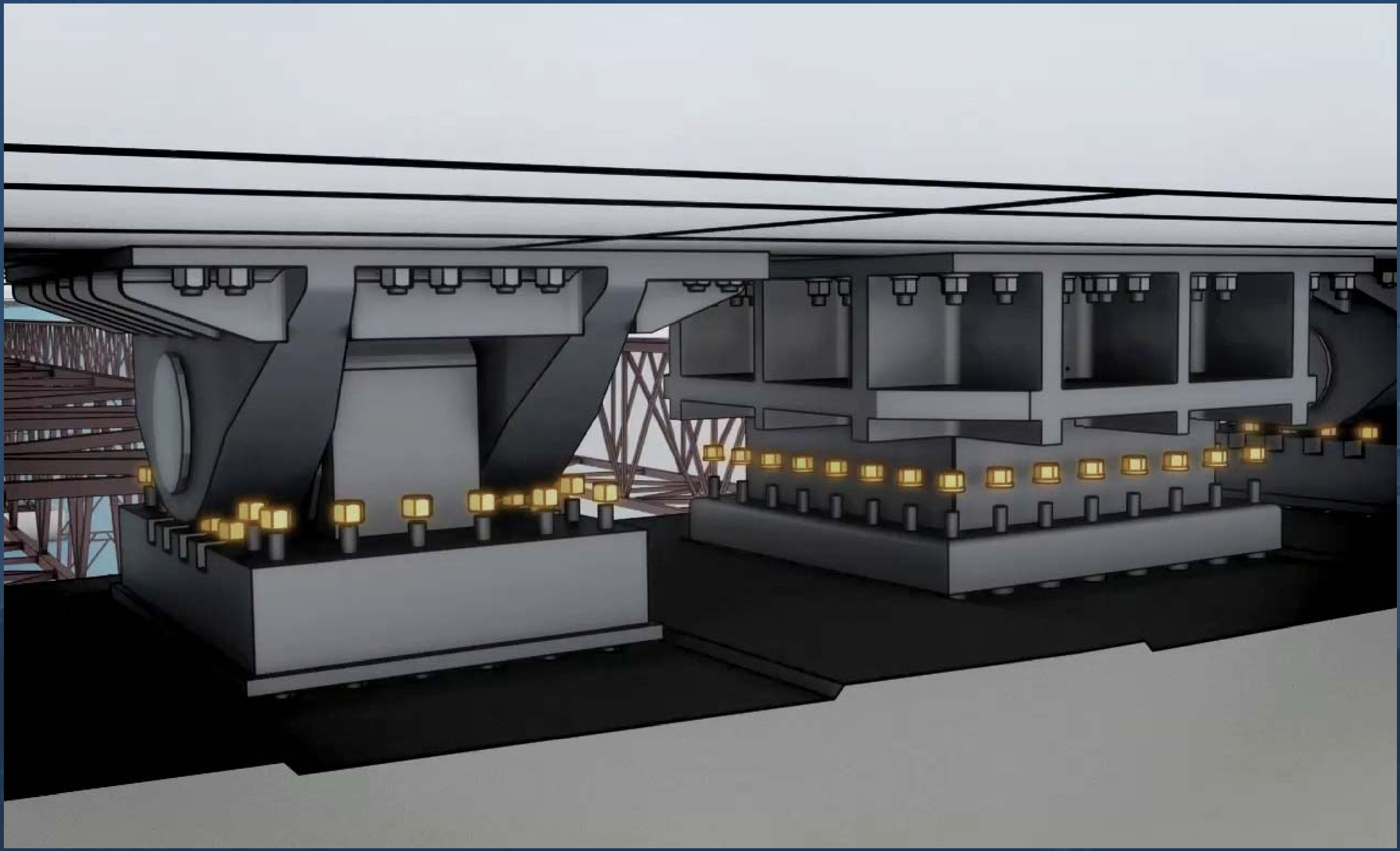
- **Quality Control By Contractor**
  - Mill Certifications
  - Independent Laboratory Testing of Material Properties
  - Certificates of Compliance

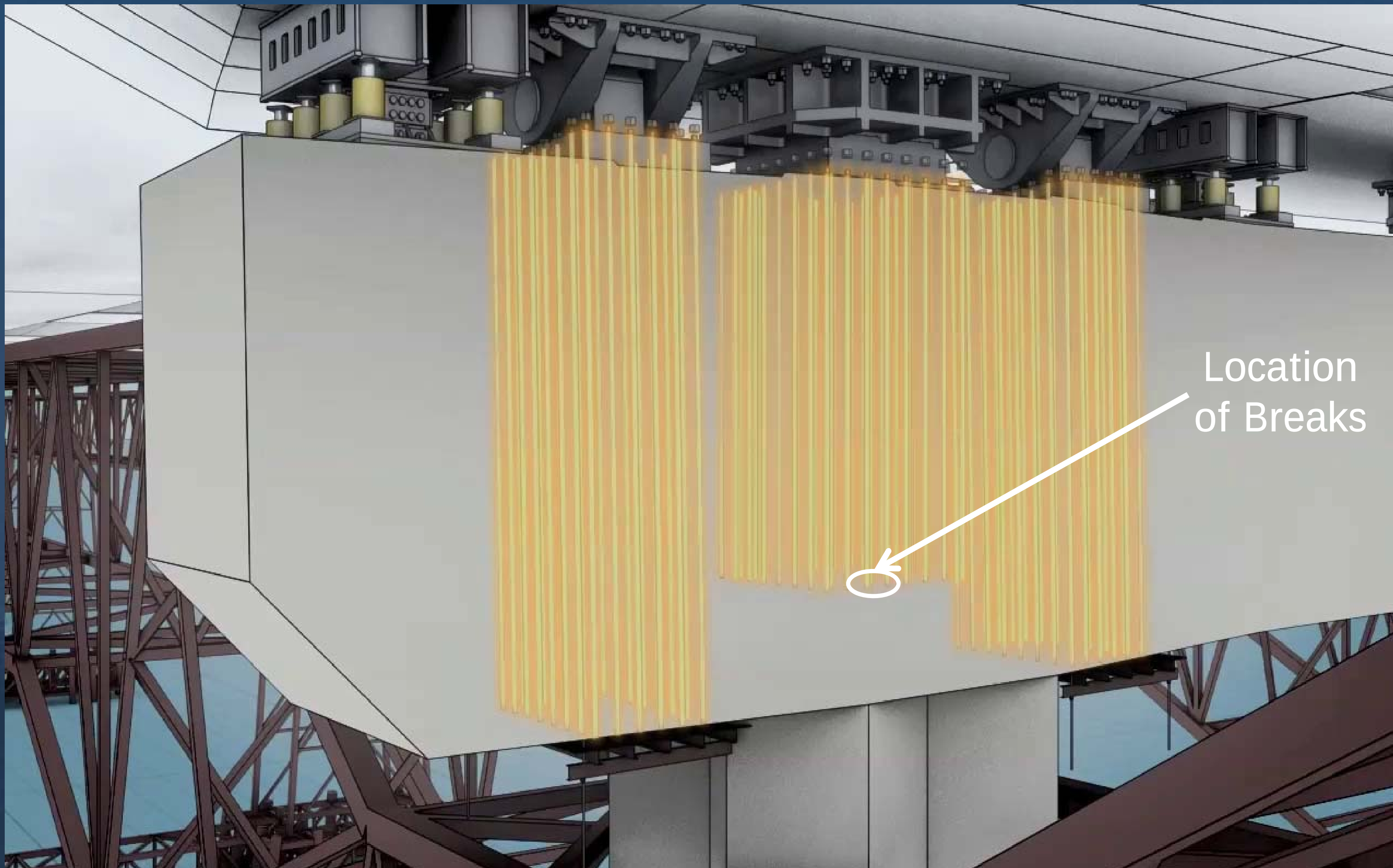
- **Quality Assurance By Caltrans**
  - Pre-fabrication facility audits
  - Regular inspections during fabrication
  - In-house laboratory testing
  - Non-Conformance Reports

- **Non-Conformance Reports (NCR's) are a normal part of Quality Assurance process and reflect variances in process or testing.**
- **Two Non-Conformance Reports were issued for fabrication of the 2008 rods**
- **This level of Non-Conformance is reflective of the thorough Quality Control/Quality Assurance process.**
- **First NCR related to a paperwork issue**
- **Second NCR related to the test results for two components of the 2008 rod assemblies: hardness of the nuts and elongation of the rods.**

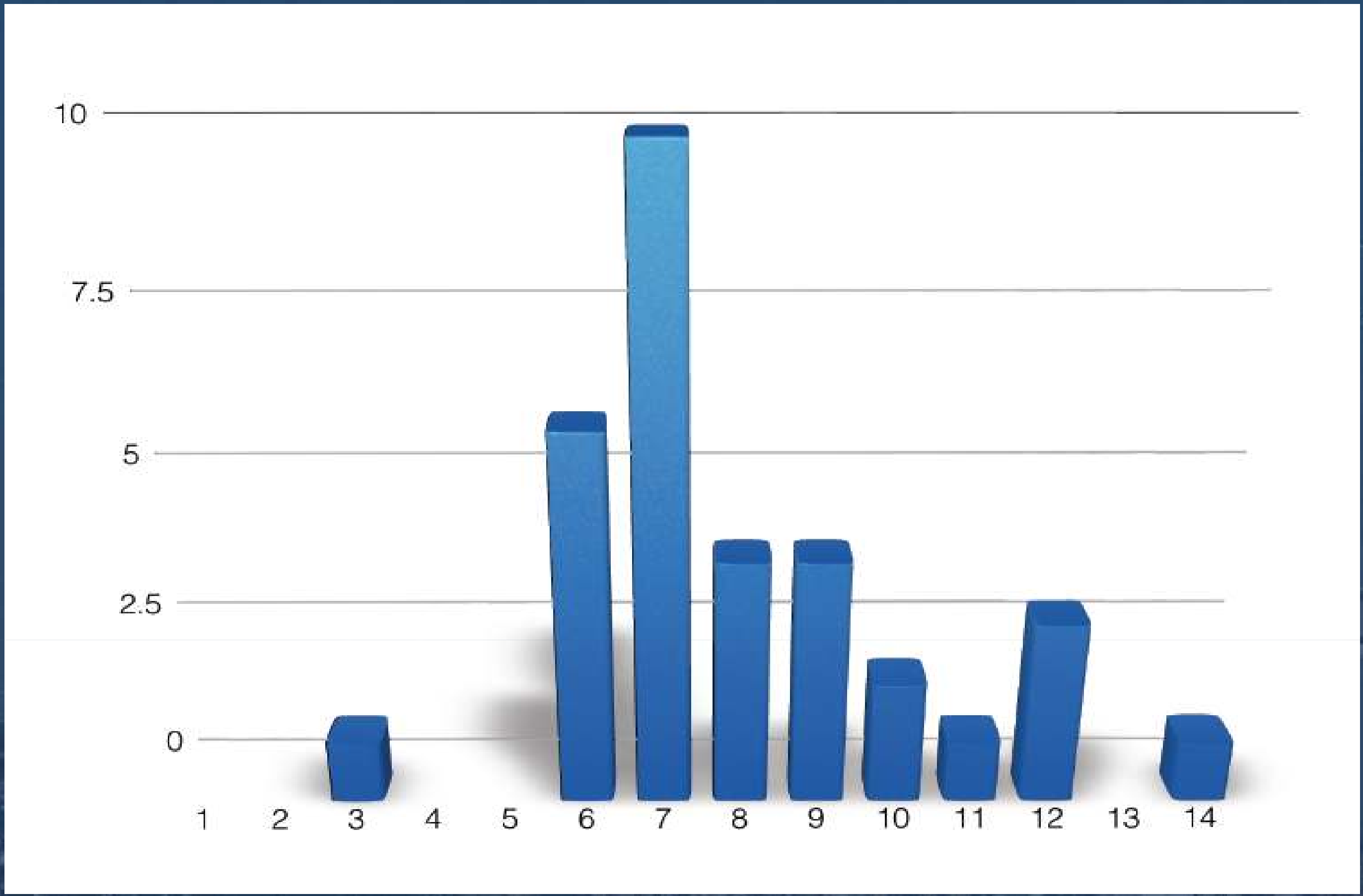
- **Out of over 150 individual results for the rods obtained from both quality control and quality assurance testing; only 5 results were below specifications.**
- **All 5 involved one mechanical property – elongation.**
- **The specification requires a minimum of 14% elongation, and 5 results were in the range of 12.5-13.6%, or 1.5-0.4% below specification.**
- **These results for the rod assemblies were reviewed by design and construction engineers and the material was determined to be suitable for use.**


HORIZON LINES




Location
of Breaks

R O D   F R A C T U R E S

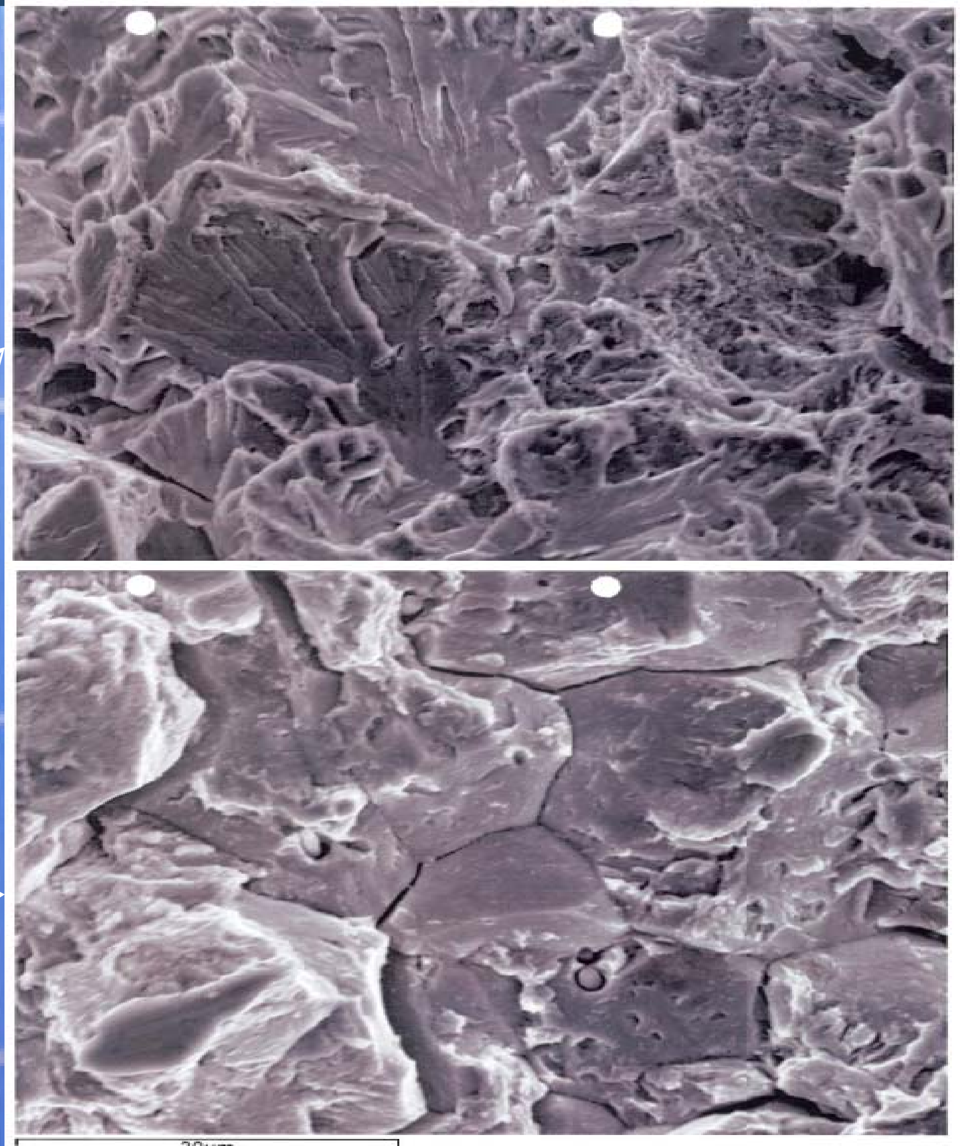


DAYS AFTER STRESSING

- Remaining rods were detensioned after 14 days.

One fractured rod sent to lab for testing

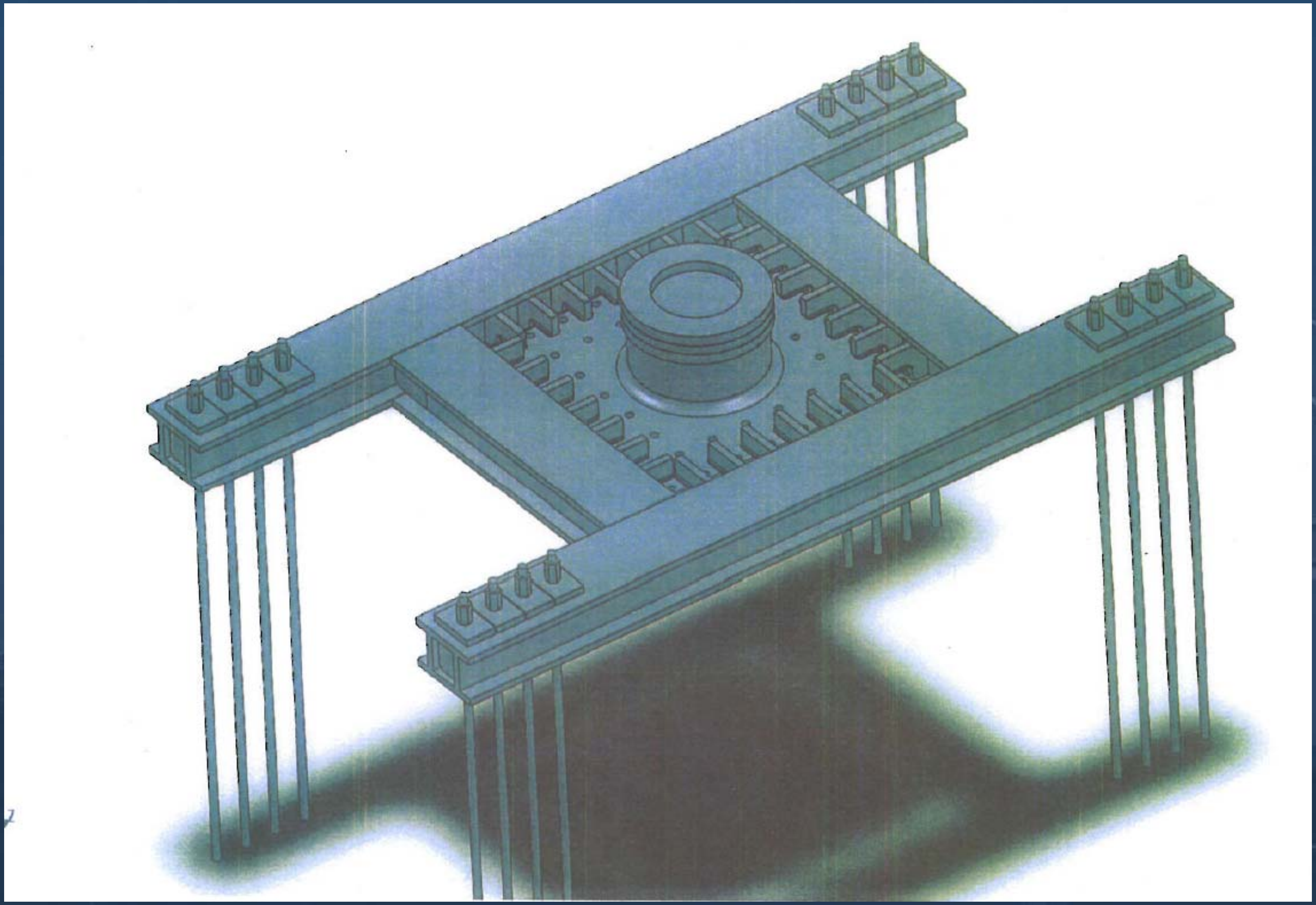
Testing included electron microscopy and mechanical property tests



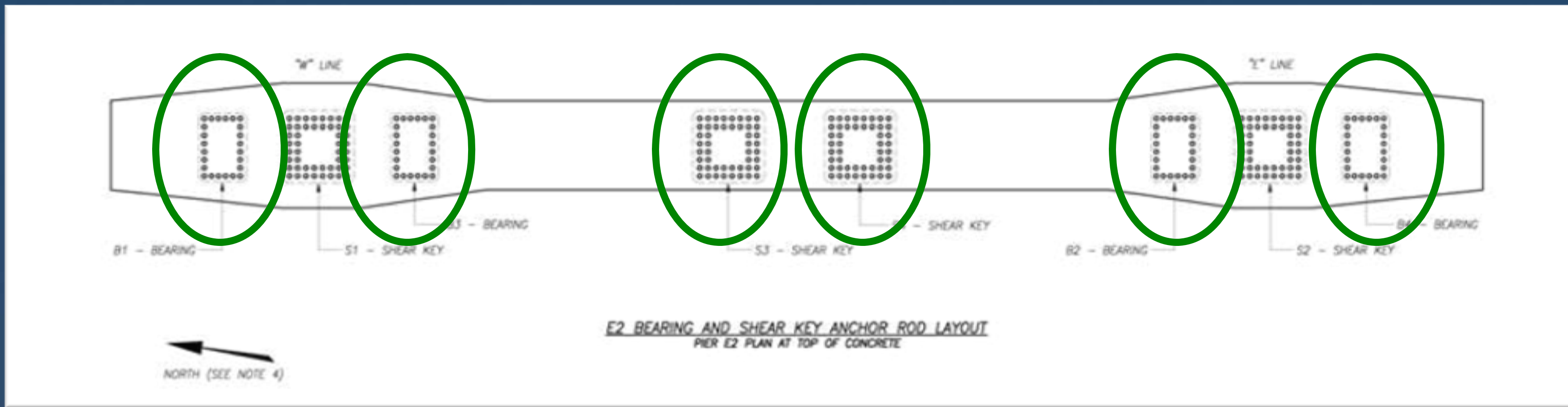
SEM 5

SEM 2

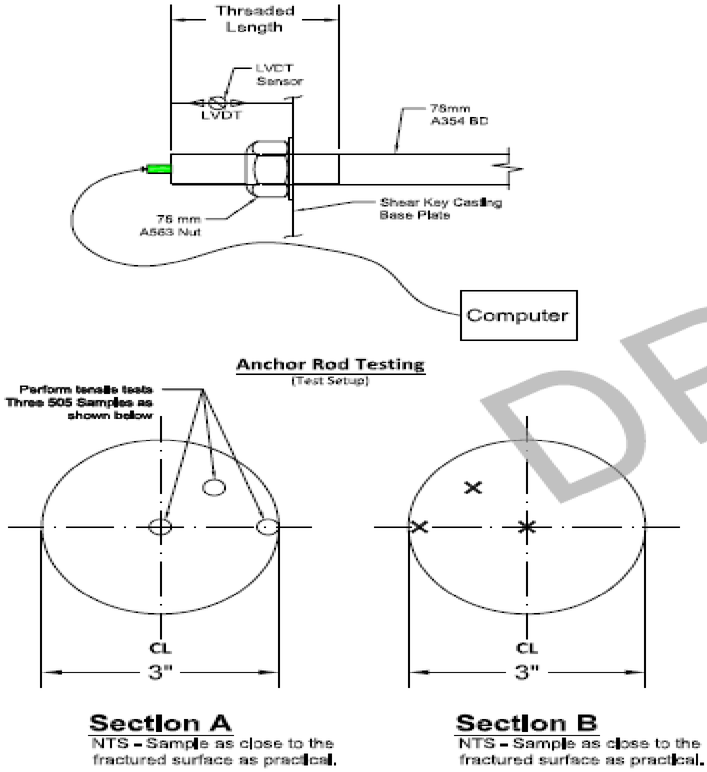
1000X Magnification



Conceptual design – steel collar



- **Remaining 192 anchor rods for other shear keys and bearings were fabricated later in 2010 and installed in 2011.**
- **These rods have passed all Quality Control / Quality Assurance steps and testing.**
- **As of April 9, these rods have all been stressed.**
- **Rods are inspected daily.**
- **To date, no rods have fractured.**



Bay Bridge Anchor Rod Testing (192 Rods)

DRAFT

Sample Selection:

1. In-Situ testing shall be performed on all 192 anchor rods as described below.
2. Select 10 different rods for extended testing. 10 rod sample size (~ 5%) is larger than ASTM F1470 requirements of 7 bars for lot size of 151 to 280 rods.

In-Situ Testing Protocol:

1. Mark the rods selected for extended testing to identify the jacking end.
2. Install acoustic measuring devices on each of the 10 sample rods selected for extended testing.
3. Load all 192 rods up to 0.75Fu (with seating loss expected to bring the final tension in the rods down to the Design load of 0.7Fu).
4. Maintain the applied load for 30 days, during which all rods will be visually inspected daily, checking for failures.
5. METS will monitor the acoustic measuring output on the 10 rods selected for the extended testing.
6. If any rod (of the total lot of 192 rods) fails prior to the 30 day testing period, extract and perform post fracture analysis as detailed below under "Extended Testing Protocol".
7. If no rods fail within the 30 day period, extract the 10 sample rods, transport to a testing facility/load bed.

Extended Testing Protocol:
(Tests listed below to be performed at an independent testing laboratory accredited per ISO 17025 or approved by Caltrans).

1. Load the 10 samples to failure. The rods shall be jacked at the same ends as they were jacked during the in-situ testing.
2. Perform Charpy V-Notch testing of broken rods at room temperature and at 40 degrees F.
3. Perform reduced section tensile tests (.505 diameter) of the broken rods as close to the fracture surface as possible. Tensile tests to be performed as detailed in Section A.
4. Perform hardness Testing (Rockwell C and Knoop Micro-hardness) of broken rods.
5. Perform chemical analysis of broken rods at the threaded area and at the shank. Chemical tests to be performed as detailed in Section B.
6. Perform scanning electron microscopy - examination of fracture features on broken rods.
7. Perform Micro-structural examination of broken rods at the threaded area.

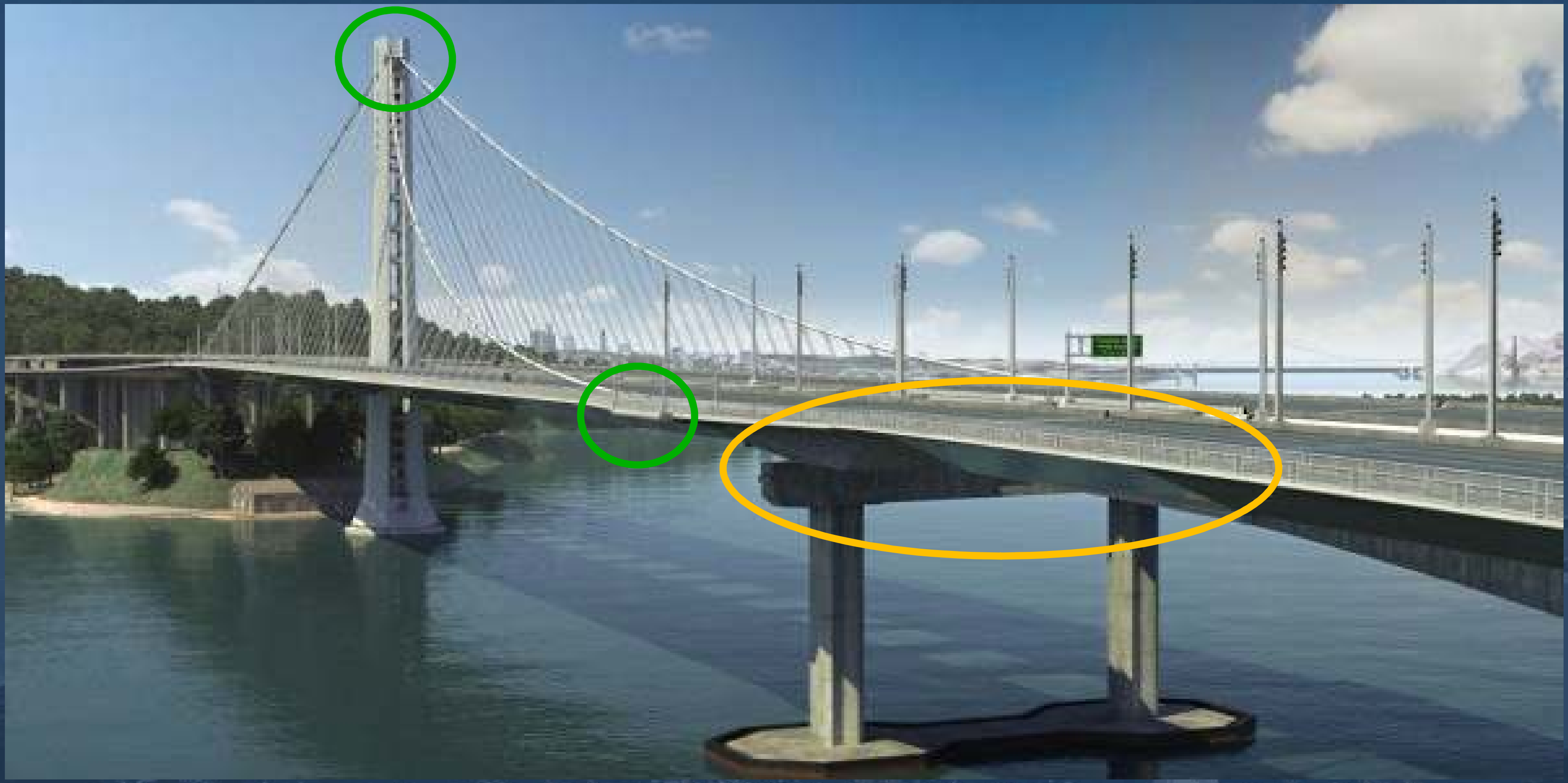
Note: It is expected that loading of the 192 bolts for 30 days will allow any existing hydrogen atoms to propagate in between the grain boundaries of the steel. Therefore, even if the bolts do not fail within the 30 day period, the scanning electron microscopy will provide sufficient information necessary to determine presence of Hydrogen.

Revision No:	By:	Date:	SELF-ANCHORED SUSPENSION BRIDGE			
			E2 Bearings & Shear Keys - Testing Protocol			
			Drawn By:	BD	SHEET NUMBER	SK-01
			Date:	4/1/2013		

10 sample rods selected for instrumentation

All 192 rods stressed per plan

10 sample rods will be removed for destructive testing



- Visual inspections of similar rods by the same manufacturer have been completed with no abnormalities.
- A desk audit of QC/QA results still underway

Summary

Continuing investigation on cause of failure in 2008 anchor rods

Continuing design of shear key retrofit

Tensioning and testing of 2010 anchor rods

Continuing communication at BATA meetings

CHAIR BILL DODD: We go into Item No. 5, Steve Heminger?

STEVE HEMINGER: Thank you, Mr. Chairman. Commissioners, good morning. We're going to interrupt your regular programming today. You're not going to have the people that you typically have. And we're instead going to give you an update on the anchor bolts on the east pier of your new suspension bridge. And, as you recall, these three gentlemen were here two weeks ago to give you the initial reporting on the situation. And what I expect is that we'll probably be doing this every couple of weeks with both this committee and the full board until we wrestle this problem to the ground. So I'd like to introduce Andy Fremier. He'll introduce his colleagues and we'll present the information to you. I would like you, as you did before, to ask as many questions as occur to you. And I also want to assure you, the project team is working on this problem seven days a week. And the Oversight Committee, which I chair, is meeting on a very regular basis every couple of days now, so that we can work our way through these issues and get back on track for Labor Day opening. Andy?

ANDREW FREMIER: Thank you, Steve. There we go. Good morning, Commissioners, Andrew Fremier, Deputy Executive Director of Operations for the Bay Area Toll Authority. As Steve mentioned, we're here to present you with an update on the failed bolts at Pier E2. And I want to introduce to my right what we call the Project Management Team that reports directly to the Toll Bridge Oversight Committee—Tony Anziano, who is the Toll Bridge Program Manager for Caltrans, and then to his right Stephen Maller, the Deputy Executive Director for the California Transportation Commission.

Just as a way of introduction, I want to remind both new commissioners and all of you that under AB144, which was passed in 2005, it established, officially, the Toll Bridge Program Oversight Committee and legislation, and we've been meeting on a regular basis. They established what's called the Project Management Team, which is the three of us to really manage the day-to-day operations of the toll program and make decisions on that. We have typically used this meeting to bring complicated issues forward and address them publicly and offer the opportunity for questions, and this is just another one of those items.

What we'd like to do is walk through really the current status of the work and talk about some of the things that are being done to retrofit the problem and then put some items forward as we continue to talk about this. I want to mention that this project and this problem are going to get resolved over a period of months, so it's not going to be conclusive in a lot of areas today, but we assure you that we'll continue to come back as often as necessary and provide updates as the chapters get written. So, Tony?

TONY ANZIANO: All right. Thank you, Andy. Chair Dodd, Commissioners, good morning. Thank you for the opportunity to provide you with an update on the situations that we're currently working with at the E2 location.

The first slide we have up here, again, is just a reference point to show you the location that we have been talking about. This is what we refer to as Pier E2, the eastern most pier of the main span of the bridge. Next slide.

This is, again, a little bit more detail about the location we're talking about. The top: you're basically looking down on the top of the pier without the bridge deck and crossbeams in place. And the bottom piece there is actually showing you the deck and the pier itself. Just a point of reference—you see the B1, S1, B3, etc., up on the top? The B's are bearings; the S's are the shear keys. And one other point just to note down on the bottom, you notice the long lines that extend down into what we call the cap beam. And one of the main issues we're dealing with is that those rods go through in some locations for all of the bearings and two of the shear keys, but there are two locations where those rods do not go all the way through the capping. They're actually sitting right on top of the column of the pier, which makes access at that location very, very difficult. There are 24 anchor rods installed for each of the bearings and 48 anchor rods for each of the shear keys for a total of 288 anchor rods at this location. Next.

There are two distinct batches, if you will, of anchor rods, some were installed and fabricated in 2008, and it has to do with that access issue. They had to be installed prior to the pouring of the concrete at this location, whereas the rest of the anchor rods could be installed after the pour. So we had on batch that was fabricated and installed in 2008 and another batch that was fabricated and installed between 2010 and 2011. The yellow circles on here show the locations where the 2008 rods installed. Now, we couldn't actually start putting tension on those rods until after load transfer, because we had to get the final geometry of the bridge in place before you could actually secure these down. So once load transfer was complete, and that was right at the end of last year, very early part of this year, we started tensioning these rods. Stressing began on March 1st and it did start with the older batch of the anchor rods, the 2008 batch, which are at shear keys 1 and 2, the areas circled in yellow on this diagram. Within a very short period of time after tensioning, we started discovering fractured rods. We discovered, ultimately, a grand total of 32 fractured rods. Subsequent to the fracture, Director Dougherty issued me a 10-point Action Plan to review and assess the situation, and that plan is currently being used by the Oversight Committee to review progress on this issue. And one of the first things it outlined, basically, was a forensic analysis to be done to determine, you know, what happened here. And one of the first things that we do is we start going back and look at the documentation with respect to the fabrication of the rods in question. The documentation includes a pretty extensive set of documents relating to both quality control and quality assurance. Some of the key points are outlined on this slide. We review the quality control that's performed by the contractor and the supplier, which includes the mill certifications. It show the chemical composition of the steel in question, various independent laboratory tests of material properties that are performed over the life of the fabrication of these items, and, ultimately, certificates of compliance that are provided by the supplier and the contractor for these particular items. In addition to the quality control process, there is a set of quality assurance documentation included in the record. Quality assurance is performed by the department. And we start very early on with quality assurance. We talked about this a little bit last time. We actually go out into the field to visit the facilities where these items are going to be made. We speak to the facilities management. We assess both the staff that they have and the equipment and the materials that they have present to make a determination that they can actually produce the items that have been specified. We also perform regular inspections that are documented during the fabrication process at these facilities. Our inspectors actually go out and observe the process in action. And we do our own in-house laboratory testing at various points in time during the process. There is one step of the process that involves the final bullet on there, Non-Conformance Reports. That is a process issue. It's basically points where we're looking for, any deviations or variance from standard process, or, perhaps, even testing results. Next slide.

Now, in reviewing the documentation on the 2008 rods, we did observe a couple, two, non-conformance reports. It's important to understand that these are a normal part of the quality assurance process and they do simply reflect variances in process or testing. The two non-conformance reports that we observed in the record for these related to two particular issues: The first issue related to what's referenced on one bullet as paperwork. I don't mean to simplify that too much. Basically, there is extensive documentation associated with fabrication of any items like this, and that paperwork is very important for a variety of reasons. It's important right now, because it sort of helps us go back and take a look to see what may have happened in this situation. And if the documentation isn't present, that can be an issue. So we had one situation where actually the materials wound up being sent out for delivery ahead of the documentation. That was subject of one of the non-conformance reports. The documentation did catch up, so we do have the documentation in place. The second non-conformance report related to our final laboratory testing that we performed in-house. Next slide.

In a little bit more detail on that laboratory testing, out of over 150 individual results that were obtained from both quality control and quality assurance testing, we did only see five results that were below specifications, and those five… four of those five results related to one of these non-conformance reports, and all five involved one particular mechanical property that we refer to as elongation. Elongation is one of two measures of what we refer to as ductility. Basically, it's how much does the steel give? That's one of the two valuable properties of steel. Steel is very strong. It also gives a little bit. A lot of people don't realize that, but it does, and that's one of the benefits in using steel. The specification for these particular rods required a minimum of 14% elongation and five results were in the range of 12.5- to 13.6 percent, or 1.5- to 0.4 percent below the specification. Just to give you some context here, you're talking about a fraction of a millimeter difference. These results were reviewed by the design engineers and construction engineers for the project at the request of the contractor to determine if the material was suitable for use, and a determination was made that the material was suitable for use with all of the test results taken as a whole. Next slide.

I've just got a couple of images here to… I think you've seen some of these in the past. But, again, you have an image of the rods at delivery. I've got one piece of one of the fractured rods sitting in front of me here just to give you some sense of the size of these. These things are really big. And, again, they range from about 9-1/2- to 24 feet in length, 3 inches in diameter. These are massive, steel components of the bridge. Next slide.

This shows you one of the shear key assemblies actually in place. This gives you some sense of why the assembly had to be put in place ahead of time. Prior to the concrete pour, you see all the reinforcing steel around the assembly area here. And it's getting ready now for a concrete pour at this point in time. The concrete would have gone in very shortly after this. Next slide.

This shows you kind of the ultimate configuration at this location with a bearing on the left, the shear key on the right. Next slide.

And here we, again, have a slide showing you sort of an x-ray image of the rods in place, again, showing you how those center rods are sitting right on top of the column, which does present some access challenges at this point in time. You also see on this diagram where we have observed the location of the fractures. This is an important forensic piece for us. Again, we've extracted four rods at this point from shear key S1 and S2. We will be extracting more in the future, but with respect to the four that we have extracted, all of the fracture locations are the same. They are all down at the bottom of the rods. They are all occurring right at the first thread immediately above the nut that's located on the bottom portion of the rod. Next slide.

Another piece of information that is of significance: This basically is a histogram showing you when the fractures began to occur. It's reflective of how many days after stressing, where we're at, and how many fractures did we see. And, as you can see on this histogram, the fractures started occurring fairly quickly after these rods were stressed, with the majority of what we observed happening within a fairly condensed period between days 6 and 12. It's important to understand in reviewing this, however, that after day 14, we did detention. We reduced the pressure on these rods significantly, so there was a significant change that occurred at day 14. Next slide.

Another forensic step that was taken, we did take one of the fractured rods, which would have been at the bottom of the rod you're taking a look at in front of me here, and we sent it out for metallurgical examination. So the picture you see here is a picture of the actual fractured surface where the fracture occurred. And one thing of note in this image—it's a little it probably hard to see, displayed up on the screens, but if you look to the right of the actual image, you see a little sort of darker and flatter crescent moon shape that starts right up at the top of the rod fracture area and goes all the way down at the bottom, and goes in for about, oh, maybe, oh, an eighth of the distance inside of the fracture area. That's an important indicator. That tells us that's the area where the fracture began. It also provides us with some additional information that I'll touch on when we go to the next slide.

That sample was then cut into a little wedge and put under a scanning electron microscope. And you can see the actual wedge here and then two images that were taken from the electron microscopy. These are both at a thousand times magnification. The image on the top is a view of the interior portion of the rod, and the view on the bottom is taken from the exterior portion in the area where the fracture began, that little crescent moon area that I referenced in the prior photo. And you notice on that bottom picture, you see basically some geometric shapes with little spaces between them.

Those are the spaces between the actual grains of the material of the steel. And you see that there's a bit of a separation between those grains, whereas you look at the top piece and you do not see that. That is fairly strong evidence at this point that there was hydrogen present in the rods and that that hydrogen initiated the fracture. We do not know at this point what the source of the hydrogen was. Hydrogen can be introduced through production potentially. It can be introduced environmentally potentially after production, and that is a key question that we will continue to look at but it's very important to understand we not have the answer to that question. We're going to continue our examination on that issue.

The other work that's ongoing at this point in time is development of a design solution. And with that, I'm going to hand it off to Stephen Maller from the California Transportation Commission, another member of the Product Management Team, to talk about the various alternatives that are currently under consideration for a fix of the problems that we have at shears keys S1 and 2. Stephen?

STEPHEN MALLER: All right, thank you, Tony. Good morning, Commissioners.

And, as Tony mentioned previously, the rods that have fractured are in a location that it's not very easily accessible to us, so we need to devise a retrofit strategy for the two shear keys where the broken rod are. What you see on the screen is a representation of one of the alternatives that our design engineers are looking at, which is basically a steel option of how to put a collar around the shear key base and connected back up to the pier.

We have other options. We've got about three or four options that we're working on. And another one is a concrete option. Another one is extracting the rods that have broken and trying to install some kind of a new device into the holes, but all of these things are still very much in the conceptual stages. The engineers are working on this. These will be then presented to our pier review committees who will weigh in onto it. Then it will be brought up to the PMT members who will vet this stuff and then the PMT will make a recommendation to the POC, and the POC will make the ultimate decision as to which retrofit strategy we're going to be using. All of this is going to take some time. We probably will not be back to you with an ultimate solution that we'll be presenting to you for probably not another few weeks to a few months.

And with that, I'll turn it over to Andy who will go over the other 190-odd rods that are slightly different location and slightly different situation.

FREMIER: Thank you, Stephen. Going back to the slide that Tony started with, this is the same pier view, so we're looking down on top. The six, green circles represent the remaining two sheer keys… I'm sorry, the four shear keys that are under each of the box sections on the left and the right of the page, and then two more seismic elements in the middle that are similar to the ones that Tony described with the embedded rods. It's important to remember that overall there's 288 rods in this cap that hold the bridge in place and deal with the seismic work. One-hundred and ninety-two of them, while they are similar, are also very different. They were fabricated in 2010. They were installed in 2011. They're what we call through bolts. They go through the entire cap, and so they don't have the problems associated with sitting in water, potentially, that the embedded ones do, and they can also be replaced, in effect, if they have damage at some point in time. In addition, when you go back and look at the quality control and quality assurance records, they don't have any of the non-conformance reports that Tony was talking about and they passed all of their various tests. In addition, as of the beginning of April, the contractor has stressed them all to the same loads that are referred to in the embedded rods—.7… 70% of their ultimate capacity and they have been stressed and are in place. They're being inspected daily to identify whether there's any signs of failure. And, to-date, there has been no failure. So, it is, in effect, an in situ test that is helping us evaluate whether or not they have a similar problem.

The Toll Bridge Oversight Committee has approved a sampling and test method for these bolts to give us a level of assurance that they're fit for their purpose. And so in addition to having them all stressed and visually inspecting them, we are going to… or we have instrumented 10 of them that mechanically, electronically take a look at what's going on inside the rod.

And those electronic measurements can tell us whether or not a crack is growing. So that information will be evaluated over a period of time and then 10 rods will be removed. About 5% will be removed and they will be subjected to complete destructive testing and, obviously, will have to then get replacement bolts for them. But the thought is that by going through these several steps, we'll have a very good indication as to whether or not these bolts have a similar deficiency that was identified in the embedded rods.

One more piece of work that is continuing is the recognition that there are other bolts on the bridge that have been produced and supplied by this manufacturer. The green circles represent where those are, and so they're up on the saddle on the top of the tower and also at the end of the tower… I'm sorry, the cable ends. Those locations have all been visually inspected and there's been no indication of a problem. Part of the ongoing work, though, will be to go back and review all of the various quality control and quality assurance results on those bolts and continue to determine whether or not there's any identified problem with those, and that work will continue on for a period of time and we'll be reporting back as to those findings as we get to them.

In closing, I wanted to point out one thing. We put the memo from Director Dougherty on your desk, and so you've got the points that he has directed Tony and his staff to produce results for. I also want to point out, as Stephen mentioned, not only will the Oversight Committee review the design approval, it will go through our Seismic Pier Review Panel and they will also bless it before it goes to the Oversight Commission. We will be back with more information as the investigation of why the failure happened on the 2008 rods. It's not been determined exactly what the problem is yet. We will also be coming back as the retrofit of the shear key is completed, and then also continue to report on the results of the 2010 testing. It's important to mention that we'll be using this forum, either the BATA full commission or the Oversight Committee meetings to present those updates, and we look forward to answering whatever questions you all have at this time.

CHAIR DODD: Okay, thank you, Andy and Tony and Stephen. We appreciate that report. Any questions or comments from the Commission? Commissioner Haggerty?

COMMISSIONER SCOTT HAGGERTY: Thank you, Mr. Chairman. I'm certainly no structural engineer, so, you know, the thing that keeps going through my mind, and I hear this whole discussion about the hydrogen, and I guess at times I bought into that, but something in today's presentation kind of, you know, made me think twice about this. You said that all the bolts have broken in basically in the same spot. You said that there was certain thread numbers that it had gone up, and it just kind of got me thinking about this whole hydrogen thing. I mean, why would the bolts all break in the same spot? I mean, they're all manufactured at different times. The hydrogen should be located in different places. And then what even makes this a little bit more troubling to me is that it all seems to be where it ties in. And so, I mean, intuitively, it just seems to me like maybe it's just the flat out, the stress on the bolts and that it really has nothing to do with the hydrogen, because they're all breaking in the same spot. Again, not being a structural engineer.

ANZIANO: Understood, Commissioner. Actually, that particular point is, in fact, fairly strong evidence of the presence of hydrogen embrittlement. Hydrogen will begin to attack at the points subject to the highest stresses, and that is exactly the point that we're looking at, that point, that first thread immediately above the nut. So, in fact, that is one of the very strong indications that hydrogen was in play here.

COMMISSIONER: Why would they all break in the same place?

ANZIANO: Because that's… that is the point of the highest stress concentrations for these rods. When they're subject to stress, which is part of the design, that's the location where the highest concentrations occur. The threads… you have a smaller cross-section right where the threads start. And if you think about it, on the other side of the thread, you're outside of the area where the forces are being applied. That clamping force is between basically the nut and the top, and that thread is where you've got a slightly smaller cross-section. You can look at the one in front of me—a bigger diameter here, a slightly smaller diameter here with the grooves in thread, so that point is where your stress is going to focus. If hydrogen is present, it's going to head right for that point, so…

STEVE HEMINGER: Commissioner, I do think you're putting your finger on an important point here. And I know a lot of the media commentary has focused on hydrogen. And I think we do have the evidence based on the limited review we've done that we had a hydrogen problem with the 2008 bolts. Now, it's not clear where it came from. It could have come from the manufacturing process. It could have come from the fact that the bolt locations were embedded and could have collected rainwater or other moisture. And water is H20, right? That's the… The H is hydrogen. So one issue is the source of the hydrogen, and that affects not necessarily what we do with the 2008 bolts, but maybe what we do with the 2010 bolts, because they are present in a location on the pier cap where they go all the way through the cap. And so the water to the extent it's present, drains through.

The second point, as you mentioned, is the tensioning. And these bolts at this location, both 2008 and '10, are subject to a fairly high level of tensioning. In other words, the bolts are really tight. You know, when you take something home and put it together for your kid, you know, they say, 'Snug up the bolt.' These bolts are super snug. And the bolts at other locations on the bridge are tensioned at a much lower level. So as Tony indicated, I think we're focusing on both of those factors. And one of them, at least, is different for the 2010 bolts, because they're not in a location where water can collect. Now, they could have been subject to hydrogen embrittlement in the manufacturing process, but they were manufactured at a different time. The tension level is the same, though, and we really need to sort through both of those potential causes before we figure out what to do with the 2010 bolts, even if we get through a month and we see no failures.

COMMISSIONER DODD: Thanks, Steve. Chairman Worth.

CHAIR AMY REIN WORTH: Thank you. Thank you very much, Chairman Dodd. I just had a couple of questions. I wanted to follow up on, the slides that you presented today, and I wanted to kind of reconcile, you know, the photograph of these rods being installed before the final pours, can you walk us through where that picture is in relation to this other picture that shows sort of the x-ray side view? First of all, that's my first question. Which ones are those? Are those the center, these center ones?

ANZIANO: That's correct. You're looking… the central part… actually, Peter, could you go back to the photo? Yeah, right there, you see sort of the double rows of casings there? That is at one of the shear key locations, so…

CHAIR REIN WORTH: So it's in the center, correct?

ANZIANO: Correct, yes. And you can see the flare out to the bent cap, the cap being there on the sides, so that is one of the… that's either… I can't tell directionally if we're north or south here, but that is either shear key S1 or S2.

CHAIR REIN WORTH: So what you're saying is those were installed in this piece here, and then the final concrete was poured on top of just these pieces? And, you know, I'm trying to reconcile, and then… I guess that's my question, my other question, is where… is the opportunity for water to collect on the top… on the bottom of where these are, and you're saying that the ones on the side, because they're more open, there's a free flow? I want to try to understand the water issue that you raised.

ANZIANO: That's correct. Basically, as you can see in this image here, with the rod assembly sitting right on top of the column, basically you have a bottom that's a concrete bottom. There's nowhere for anything to go once it's in there. We do grout these up, so we do take steps to try and prevent water from getting in there, but water always has a pretty good way of getting in. On the ones that are through, again, they do go all the way through. They have not been finally incased in concrete… in concrete at the bottom, which they finally will be. But as it stands right now they remain open, so it could go… you know, if it’s getting in at the top, it could go all the way through and straight out of the bottom.

CHAIR REIN WORTH: So when you installed the ones on the side, when you put those in, do those come then out from the top where you access them and then you have the bolts? Can you explain how you have installed these other ones that are on inside that are not embedded?

ANZIANO: Sure. They’re… basically you have a through hole that is put into place when you put the concrete. You basically put some post tensioning duct in to preserve the whole, you pour the concrete and, yes, you install them. You can put them in from the bottom to the top. The pre-embedded ones… Peter, could you go back to the image that shows the delivery of the rods? Right here, you see these are the rods that would be embedded. And you see a wire coming out from each of them. Those wires are attached to a very small threaded fastener that threads into the top of one of these. You can actually see it on this one here. And so they’re in place. You pour your concrete. Once the shear key is actually delivered and put on top of that, you use that wire. You thread the wire through the hole that accepts this in the shear key, and the wire is used to pull it up into place and then you put your washer and your nut on top of that and you secure it.

CHAIR REIN WORTH: Okay. Can you talk a little bit more about how the… again, we’ve seen a drawing of a potential solution to reinforcing these embedded rods. Could you explain in a little more detail how that fits with this particular photograph on one of the other drawings? Is it…?

MALLER: What you see in the middle of that rendition is the actual brace of the shear key, itself. And what you see is the bolts around that Peter’s pointing to, those are the ones that have been breaking on us. So what we’re doing here is putting steel members onto the plate itself and around the plate, and then taking… putting new rods through and all the way down to the bottom and clamping these things in place. That’s one of the… That’s the steel alternative that the engineers are looking at.

CHAIR REIN WORTH: So could you just show me a little more closely where that would fit in relation to one of these drawings that shows the whole thing?

MALLER: Where you see the nuts kind of elevated, those are the ones that are failing on us, so we would put the steel elements in those areas and then extend them out to the sides and then put something on the underside and bolt them together.

CHAIR REIN WORTH: Okay. Okay. You know, I recognized that you are looking at a lot of different causes and solutions, and that kind of thing. And you raised a couple of issues about the elongation, you know the flexibility of the metal, and that the ones that seem to be experiencing the most tension are breaking at this point. And you mentioned the percentage, that these are tensioned at a much higher percentage than maybe it's traditionally done in this kind of construction or in other parts of the bridge. So are you looking at potentially other materials, if this rod design is going to be what we are continuing with, other types of materials that could be used for those rods, so that we could be, you know, confident that even over time and weather conditions, they would sustain their both flexibility, as well as, you know, durability?

MALLER: Well, in the steel solution, we're pretty much looking at maybe not the same manufacturer but same types of rod situation. On the concrete solutions and others, it will be a totally different tie-down systems.

FREMIER: Commissioner, if I could maybe add a little bit to that. There are several different ways to do high-strength tensioning. You can use the bolts as we've got here, which are hardened steel that is galvanized. There is also high-strength rods that are actually designed more for this purpose on a more regular basis, and they're used in standard bridge construction all over the place. Also, almost every overpass is done in a pre-cast, pre-stressed manner using strands. And so I think the designers are looking at all three different types of elements. The two that I mentioned, the high-strength rods and the strands, are not typically galvanized, which doesn't subject them to the same type of problem potential.

COMMISSIONER DODD: Commissioner Campos?

COMMISSIONER DAVID CAMPOS: Thank you, Mr. Chair. Thank you for the presentation. I guess my general comment, and maybe it was sort of naiveté on my part, but I'm sort of surprised that we don't know more about what a possible solution would be. You know, that was talked about coming back in a matter of a few weeks, and in a matter of a few months, I think, was said at some point, and I actually was hoping that we would have a better sense of what the solution would be by now. So, I'm wondering if you can talk a little bit about that?

HEMINGER: Well, Commissioner, I think the fact is this is very close quarters, and it's a tight spot. You know, the shear key is where it needs to be, and that's on top of the column, and that does limit our range of motion. And looking back in hindsight, you know, could we have designed a different solution here? Perhaps, we could have. But, you know, embedded rod locations are not atypical in bridge or highway construction, so it's not as if this is a one-of-its-kind kind of approach, but it does limit our options when we try to develop a solution.

Peter, if you could go back to the picture of the one possible fix, you know, the reason it has those extensions on it is we need to get outside of the place where the column is. And I think if you also go back, Peter, to the picture of the pier cap before the concrete pour, one of the real challenges we're facing is all of that… it actually has got a name. It's called 'rebar congestion.' It's all of that rebar that is in the concrete. You know, we put a ton of rebar in concrete these days, and it makes it strong and it gives us a lot of redundancy, but it also doesn't give you a lot of room to maneuver if you've got to come back in and put some holes through that and put some new rods in.

So I think it is the closeness of the quarters that is really giving us a design challenge. And as we've indicated to you, the reason that we are taking this so seriously is that tying down these seismic stabilizing features is a very important function of these rods, Even though they cost a couple of thousand dollars a copy, they've got to work as designed because what they're holding down is very important.

COMMISSIONER CAMPOS: I know it's not the first time we've dealt with congestion management here, so I understand that.

HEMINGER: As a matter of fact, we had this precise problem on the Benicia Bridge, where we had a lot of rebar congestion and the same kinds of issues when we were trying to put the column onto the pier cap. And sometimes the rebar is not quite where you thought the design said it would be, and you run into an actual physical conflict. And so that is, I think, one of the main challenges the designers are confronting is how do you retrofit a solution here, given the constraint of the site.

COMMISSIONER CAMPOS: In light of that, Steve, how do we know that the schedule opening of the East Span is not going to be impacted?

HEMINGER: We don't. Based on what we know today, we think we're going to be okay. But until we have a solution, we don't know what our schedule is, until we have a solution—and I know this is dangerous to say in a room full of reporters—but you can't believe everything you read in the newspapers. And there was something in the papers this morning that said that the solution is a million dollars. Well, we don't know what the solution is, so we don't know what it cost either. So until we have the scope of what we are doing, we don't know schedule, we don't know budget. Now, based on the four or so options we have, we think we're going to be okay on schedule. But until we get to that point, I don't think we can give you a guarantee.

COMMISSIONER CAMPOS: And that's… I mean, that's sort of scary in a way when you think about not having a scope, not having a schedule, having a budget. I mean, is there a target date by which you are hoping to have a solution by which you would know…?

HEMINGER: As, Stephen indicated, you know, our hope is that within the space of the next few weeks, we might be able to bring a design solution to closure. But as he also indicated, we've got a lot of people who have got to get their eyes on that. And one very important step is the Independent Pier Review Panel we have, and they have been invaluable to us throughout this bridge construction in pointing out problems with an approach that we might suggest, or pointing out, 'Why don't you do it this way instead of that way?' And we want to have that independent set of eyes, because sometimes you get so focused on your favorite solution that you don't, perhaps, acknowledge that there's a different one.

COMMISSIONER CAMPOS: And do you have a sense of whether or not that Independent Review Panel is also looking at sort of how this is being approached and whether or not we're missing a step here, or whether or not, you know, we're not thinking up something that's not being considered?

HEMINGER: My impression that I think Tony can perhaps give you the longer answer is that, you know, it's not as if we just go to these guys when we're all done and say, 'Here it is, what do you think?' There's a lot of consultation that occurs.

ANZIANO: And that's absolutely correct. In fact, we've already had conversations with members of the Pier Review Panel to tell them these are things that are being thought about to try and solicit their input, so that we don't just show up and say, 'Here it is, do you like it?' It's very important to get their input as part of the process and they are engaged.

COMMISSIONER CAMPOS: I guess one question I have related to that is… and you know, I appreciate all the work and you guys are the experts—I'm not engineer—but to the extent that you're having some of the same people that have been working on this project looking at sort of what happened, who gets to see whether or not, you know, stepping back, you know, something was actually missing in the… when it comes to quality control which, obviously, was… did happen? So who was looking at that?

HEMINGER: Well, as I think you've heard from all three of these gentlemen, we've got an active investigation underway that is trying to chase that down. And until it's concluded, I don't think we're going to have any definitive answers for you. I know several of you asked at the last meeting about accountability and claims and the rest, and there will be plenty of time to sort all that out, and we will sort all that out. But obviously the answer will depend upon where we think the problem happened. Just using the hydrogen problem as an example, you know, we do think we had a hydrogen embrittlement problem on the 2008 bolts. We're not sure whether it happened at the manufacturer or onsite, and depending upon which one it was, the accountability belongs to a different organization. So we need to finish that work before we get to that point. I think at this point, what we will be doing is we'll be paying to get the solution done and then we'll sort out who's going to help chip in later on.

COMMISSIONER CAMPOS: Are you using any other materials produced by the same manufacturer?

ANZIANO: Commissioner, yes, there is… was highlighted in the slide, there are materials from the same manufacturer located at various locations on the bridge. This manufacturer is a well-established manufacturer. They have been in business for over 100 years. They supply these types of materials throughout the country and they're very, very respected. Short answer: Yes, they do have materials on our bridge, and we've gone back and just had an abundance of caution visually inspected everything. Everything else looks fine.

COMMISSIONER CAMPOS: The reason I say that is because at some point, the other gentleman did say that one of the steel solutions includes the possibility of using a different manufacturer. And so if that's something that's being considered, I'm wondering why we would continue to use some of the same products?

ANZIANO: I think the issue there is more mechanical properties. We're looking potentially for different mechanical properties for different solutions. And, as Andy indicated, solutions may not even necessarily involve large structural bolts. It may involve post-tensioning strands. So, there are different types of materials that will provide different types of solutions, depending upon the alternative that's selected. I mean, it really depends… It's really dependent upon the design of the alternative in this case.

COMMISSIONER CAMPOS: Just a final question. When is the last… When is the next time that we'll hear about sort of the status of this?

HEMINGER: As I think I indicated earlier, but I know some of you have been filtering in, I expect we'll probably be before you every couple of weeks for a little bit a time now before we get this chased to the ground. So that probably means we'll be before the Oversight Committee here and then before the full Authority, and then before the Oversight Committee, and then we'll repeat that cycle until we've got a conclusion on the investigation and a solution that we're going to build for the 2008 bolts, and, potentially, a solution that we may need to pursue to replace the 2010 bolts. Time will have to tell on that third one.

COMMISSIONER CAMPOS: Thank you. Thank you very much.

CHAIRMAN DODD: Commissioner [...unintelligible...]?

COMMISSIONER _________: Hi. Just a quick question. You talked about a couple of different options, and when you talk about the steel options and the steel here you talk about the elongation and how it has some flexibility. You talked about the concrete option. Would that also have the same level of flexibility as sort of the steel collar design?

MALLER: You know, concrete is a different material, but in using concrete, we would be using the different type of mechanism for holding it down. We would be probably be using some kind of strands, which are also a steel material.

COMMISSIONER _________: But… and I guess the reason I'm asking, you're talking about this is really the piece that deals with the seismic and the movement. Would concrete have that same ability to move as well as the steel collar, something that's made more…?

MALLER: Well, the actual tie-downs themselves, you don't want those moving. What you want is… where you have the steel, the steel has some give to it, whereas concrete does not have that much give to it. But, we'll be using the concrete as the tie-down material, not as the give material.

COMMISSIONER _________: Okay, thank you.

FREMIER: Commissioner, maybe just a little bit of additional information, because I think Steve's point earlier was the real difficulty in the engineering is the tightness of the area. This is the dumb end of the seismic element. This is just holding the plate down. There is no concern over the effect of the shear key and how it works. It's just making sure that the beam, the concrete crossbeam, and the steel plate work together as one unit, and you've got to hold it down with significant clamping force. So it's more an issue of how you make sure it all operates as one element and is held on and clamped properly so the shear key engages effectively.

CHAIRMAN DODD: Chairman Worth.

CHAIR REIN WORTH: Thank You. Thank you very much. Thank you very much, and again I appreciate the opportunity to continue to understand these issues. And I just wanted to go back to the green circles, the two other elements, and, Tony, you mentioned that you concluded the visual inspection of these other rods and that you're… could you talk a little bit more about the process that you went through to analyze these particular rods and how are they similar, how are they different? Are you also contemplating some kind of substitution or other fixes if there are, you know, potential issues relative to not only the materials but the stress, the kinds of things you've raised with this other area?

ANZIANO: Certainly, Commissioner. We have performed a visual inspection at these locations, and that's the most key thing. You go look and see is there a fracture or is there not a fracture. One of the things that is known about hydrogen embrittlement is that, again, it's… the term of art is time-dependency. In other words, it doesn't happen immediately, but it usually happens fairly quickly after the steel element in question is subjected to some type of pressure or tension. All of these other locations have been under tension for quite some time, well beyond the period where you would expect to see a problem if hydrogen embrittlement was a factor. In addition, the forces to which these are subjected, they're much, much lower than what we're talking about at the E2 location. There are a number of factors that present a pretty compelling case that these are different situations, but we'll continue to look at it. I think it's prudent at this point in time. There will be questions, and I think we need to be able to answer them, so we'll continue to monitor the locations.

COMMISSIONER DODD: Commissioner Halsted.

COMMISSIONER ANNE W. HALSTED: Quickly, number one, I wish we were all structural engineers and could give you some really serious advice. But I appreciate your attempt to educate us so that we can understand and try to ask the right questions. In Andy's presentation, he talked about the rod fractures and detentioning of the remaining rods after 14 days. I wonder if you could explain a little bit more what that means and what the plan for that in the future is?

FREMIER: Yeah, actually, I think that was in Tony's part, but that's fine.

COMMISSIONER HALSTED: Oh, sorry.

FREMIER: Essentially, the way it works is you pull on the rod to actually 75% of its ultimate capacity and then you tighten the nut. There is some loss in stress once you release the load from that pull and it resides at the 70% of its ultimate capacity which is its final design capacity. What the contractor in the department decided to do on the embedded locations when they started to observe the failures was to loosen the nuts on the remaining bolts, so they're not under the same load as the 192 that had been stressed and are being looked at today.

HEMINGER: If I could add, Commissioner, the reason it's relevant and the reason we've got that bullet down at the bottom of the page is we don't want to leave the impression that after day 14, everything would have been fine.

We're not sure, because they were detentioned. I think that was a proper step to take, but that is what happened. And that's why, for example, on the 2010 bolts, we're going to keep the tension up for quite a bit longer and do some destructive testing to make sure that we're not falling for the fact that after 14 days we're okay. We don't know when that date is, and that's why we want to do it longer and do destructive testing, so that we have a much better sense of the longevity of these bolts after they're tensioned.

COMMISSIONER HALSTED: So it would be helpful to get a report on that in the future, I think. Thank you.

CHAIRMAN DODD: Commissioner Bates.

COMMISSIONER TOM BATES: Thank you very much. A lot of people here have said they're not engineers and I happen to be a social engineer, so I'm interested in what are the real probabilities of us opening on Labor Day? I mean, with these delays… I mean, obviously we could run into some situations and that would delay it beyond that. At what point will we know we have trouble opening on Labor Day?

HEMINGER: Commissioner, I think we need to have a solution on the 2008 bolts, number one. And, number two, we need to have a decision on whether or not we're replacing the 2010 bolts. Until we have those two bits of information, I think it's guesswork, and we owe you better than guesswork. As you know, this bridge should have opened several years ago, if we had been able to avoid mostly the political delays that it was subject to. This is one of the first real construction problems that we've actually had on the project. And we're going to try to lick it and get open on Labor Day. My preference would be to open it sooner than Labor Day, if we could, because we're so late right now. But I think we want to have those two bits of information before we give you some kind of forecast.

COMMISSIONER BATES: Well, I appreciate that, and I appreciate the presentation. I think we're much better informed. My question would be, assuming that… obviously, this is a serious problem and I don't want to diminish the problem, but assuming that we didn't discover this, how threatened would this have made the bridge given some earthquake or some… I mean, would there still be enough support there that we would have been sufficient, have enough sufficient bolts to be able to… with some assurance to be able to say, 'This bridge would be safe, even if we hadn't caught this.'

ANZIANO: What is known about, and I think I referenced earlier, what's known about hydrogen embrittlement is it happens very quickly after you subject these things to tension, so it's not something that would have worked out there for, you know, months and months and years. You're either going to see it or it's not present and you're fine. So this is what we've seen, we've observed it, we know what the problem is, and we'll move on towards a solution. So this is not something that is going to be sitting out there for years to come. We will get it fixed and we'll move on, and the bridge will perform as required in a major event.

COMMISSIONER BATES: So, in other words, with a certain amount of assurance, we can say that once these bolts are… we have determined the problem and once… we haven't determined a problem within a certain period of time, the likelihood of us having a problem in the future is diminished, is that what you are saying?

ANZIANO: Yes.

CHAIRMAN DODD: Commissioner Quan.

COMMISSIONER JEAN QUAN: Just to follow up on Tom's question, shouldn't we set sort of a drop-dead date, though, for the Labor Day, that is, if we don't know by then, it would be wise to push it back? I mean, not only do we have buses, apparently all tied up, but we have hotel reservations. In my city we're planning concerts and we have contracts and things. So I just think, even though we still have time, there has to be a point where pretty much we need to know, otherwise, really, we have millions of dollars of… and tied-up hotel rooms that could go to other groups if we don't know. So I don't know if that drop-dead date is at the end of May, June or whatever, but to be fair to everybody who is involved in the celebrations, we just sort of need to just set a date ourselves for those other commitments.

HEMINGER: Commissioner, I think at this point it's probably too early to set that date, as well, but I do take your point. And at some date in the future, and I think it's quite a bit in the future, we will just be running out a calendar. Again, I'm trying not to give you a sense either way today that we're definitely going to make it or we're definitely going to miss it. We don't know enough to say. I think we have a general range of solutions that we should be able to accomplish. One of the big lead time elements here is how long will it take to get the new bolts, whether for the 2008 locations or 2010. You just can't go down to Ace Hardware for these things. I mean, they have to be fabricated. There's a pretty hot economy out there now and so these shops are busy and you might have to pay a little extra to get your place in line. So a lot of it depends upon the supply chain and how quickly we can acquire these materials. The actual construction element of it shouldn't be that difficult. And as Tony indicated, at the through locations, you can just drop the bolts up and put some new ones in. So it really is the acquisition of the material. And, again, until we know the solution, we don't know what material we're trying to acquire.

COMMISSIONER QUAN: I think we all hear you on that, but as you look into this more already expanded the scope somewhat, so I'm just saying I don't expect it this month, I don't even maybe expect it the next couple of months, but there's at a certain point, if you're still not sure and that you're going to be able to have the final solution and the supplies, then I think we have to release some of these commitments. This is… the Bay Area is a very busy tourist area, so the kind of resources that we're tying up for the Bay Bridge celebration are pretty immense, and if they all get cancelled, you're going to hurt the local economy.

COMMISSIONER DODD: All right, thank you. I'm going to take the last word here and then we're going to move on. First of all, I'd like to thank you gentlemen for coming here and give us the information that… I know you don't have it all, but I also respect my colleagues' need to understand this a little bit more fully. But I'm hearing timing and then I'm hearing safety. And, you know, our primary focus here is, you know, ultimately getting this thing done right. I think that we need to give this committee the time to get this thing done and engineered in a manner that we could all be confident that safety is job one. While we still have some questions that we'd like to have answered, I just want to make it clear that I've been working with this Oversight Committee for almost the very beginning here. I've been over to China with them. We have had issues before on other parts of this bridge, not maybe in the construction but over in China and I've seen how they've responded to challenges and problems that we've had there. We've seen how they've responded to challenges with the foundations and I have complete confidence that we're going to get a solution. And if it means moving the Bridge date back, that's what it means. We're going to construct a first-class bridge here that's going to be safe for the public to be able to, you know, not only move on but also for seismic safety in the future and I think we just need to give the time necessary to solve a problem of this magnitude. So with that, I thank you, gentlemen, for being here and we look forward to your next report.

Oh, we do have one… one speaker, and that would be Rick Hedges. Rick… Rich.

RICH HEDGES: I just wanted to thank you for letting me speak today. Rich Hedges from San Mateo. I think this is good news. I've watched these problems that have come up throughout the bridge, and I think the good news is that we're catching them and that everybody is concerned about the safety. I don't think anybody should feel, outside of the setback and timing, bad about this. It means that we're going to have a very safe bridge.

Marshall Loring also wanted me to include him in these comments just to save time and to say that he is in agreement with the analysis he's heard today—he's an engineer—on the hydrogen problem.

And I would just like to add that I think that you've all done due diligence on this and I hope that the press stops printing the back stories they can't verify and gives this committee and the engineers time to work these problems out to a point where we don't have the public not have confidence in our work. Honestly, report, but stop the rumors.

And just a suggestion and a moment of humor, if we can't make Labor Day, why don't we try for Thanksgiving?

COMMISSIONER DODD: Very good. Well, with that, that's the end of this meeting. The next meeting on the BATA Oversight Committee will be May 8, 2013 at 9:30 right here in this room.