

Minutes of Meeting  
 Thursday October 11, 2007 at 09:00 AM

Location: 1120 N Street, Sacramento CA Room 2116

Subject: Caltrans – Industry Falsework Advisory Team Meeting # 6

**Attendees**

Initials	Name	Representing	Initials	Name	Representing
JFW	John F. Walters	Caltrans OSC	DJ	Duff Joseph	Erreca's, Inc.
JB	John Babcock	Caltrans OSC	JVB	Jake Van Baarsel	Washington G.
SH	Steve Harvey	Caltrans OSC	BM	Brian Mapel	FCI
FG	Frank Gillespie	Skanska USA	PH	Paul Hamilton	Mountain Pacific
NR	Nathan Reiland	Skanska USA	BK	Bill Kidwell	CCMyers
LG	Luke Griffis	DH Charles	JW	John Weldon	FCI Constructors
JR	Jon Re	Kiewit Pacific Co.	JK	Jim Keep	FCI Constructors
MC	Mike Crawford	Kiewit Pacific Co.	SS	Sami Saddik	R&L Brosamer
DS	Dave Sinsheimen	Kiewit Engineering Co.	BH	Bill Hubbard	False & Shoring Designs
PS	Peter Strykers	Caltrans OSC	BS	Bob Smythe	Tutor Saliba Corp
DF	Dale Floyd	Caltrans OSC	MH	Matt Harizal	Caltrans OSC
AL	Anh Luu	Caltrans OSC			

**1. Agenda**

Time	Topic	Speaker
09:00	Welcome	Dolores Valls
09:10	Introductions	All
09:15	1. Falsework Stability a. Recent Incidents b. Bracing c. Connections d. No adjustment of falsework over or adjacent to traffic	John Walters/ Open Discussion
11:30	2. Lunch	On Your Own
12:30	3. "Suspended loads shall not be moved or positioned over public traffic..." a. Use of winch systems in falsework removal	John Walters/ Open Discussion
13:30	4. Recap and Summarize Recommendations a. Assignments	All
14:00	5. Adjourn	All

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## 2. Meeting Notes

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*Italic type indicates Caltrans comments.*

Universal type is invitee comments.

### MORNING SESSION – Falsework Cable Bracing Systems

Cables are not enough for stability

What happened to Towers such as 100K towers?

With cables it's a choice of cost effective system or keeping people alive (we want both)

Cable systems are not complete during erection/removal; it's a procedural problem not the cable system itself. Problems lie in the intermediate stages not in the final product.

Require continuous use pipe bracing during erection, removal, and jacking.

It's a constructability issue, nothing is wrong with cable bracing once the system and falsework is in place. Jacking too much and not having jacks centered is a problem.

Once under concrete dead load it's impossible for the falsework to fail. Have only heard of one incidence where it failed in this instance and that was in Arizona.

*Have heard of a failure under concrete load but this was because a falsework bent was partially removed. Failures can occur during stressing operations or when deflections and load redistribution occur.*

Our company has used cable bracing successfully for 15 years and do not have any problems with this bracing system.

There are many advantages to using the cable bracing system,

- Used as temporary bracing during erection

- Connections are easily visible to verify correct installation.

- Aid the contractor to plumb a falsework bent during erection.

- Collapses occur when they are removed.

- A lot of times the workers ask if a cable could be removed for various reasons.

*That is why cable systems are a problem, can easily be removed by the workers whether they ask you or not. Maybe it's a lack of supervision of the contractor's workers.*

Workers are out there removing cables during falsework adjusting and grading.

*Some use turnbuckles to release and retighten during grading/adjusting, many contractors do not use them. [3-4 Contractors. Confirmed that they use them]*

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Most agree turn buckles not used.

*Due to the lack of load path understanding by workers, maybe require a PE on the job to prevent incidences of workers removing cables at will. Require the bracing to have compression capacity.*

*Colorado requires P.E. onsite for falsework over traffic.*

Use pre-cast to eliminate falsework.

Require P.E. onsite to inspect falsework prior to setting beams over traffic.

*A recent incident on Hwy 4 resulted from a worker removing cables.*

The easiest fix/answer is Caltrans designers should design a bridge that eliminates the need for falsework over traffic. [laughs]

Maybe require a PE to certify that the bracing system has been installed properly once the falsework is 100% complete and after grading/adjusting. Do not see the need to have a PE there 100% of falsework erection/removal.

Loosening of cables is the biggest problem.

Caltrans current requirement to review the falsework prior to concrete placement is too late to do anything about these incidents related to stability.

Agree that maybe a PE to certify that the bracing system has been installed properly once the falsework is 100% complete and after grading/adjusting. Do not see the need to have a PE there 100% of falsework erection/removal.

Traffic closure timeline restrictions (windows) are an issue with erection/removal of falsework, possibly contributing to these current issues related to stability. Short traffic windows put pressure on the crews to hurry and take short cuts.

Falsework is more complicated over traffic. Traffic management issues can control erection and removal of falsework.

The twenty (20) motorist fatalities on one company's project site were all related to traffic closures and detours not falsework over traffic.

Would like to have the longest work window possible. Long traffic windows are few a far between.

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Believe that finding a way to maintain tension in cable systems at all times and mitigate and minimize the amount of necessary jacking of falsework, this would resolve the issues with cable systems.

*It already exists, it's that the approved procedure is not being followed in the field.*

Staff could be appropriately trained. There is no need for a PE/CE to be with them. Agree that should try and limit the amount of grading

Why doesn't Caltrans supply PE onsite? If S.R. doesn't like what he sees then he can shut it down and call designer.

Caltrans and Contractor should work together as one unit when grading; this has proven very successful in reducing falsework adjustments on some jobs. Minimizes risks related to adjustments for everyone.

It's difficult to gauge what qualifies as experience and competent between different contractors. A contractor may use a falsework system totally different from another. If a worker who has lots of experience with one type falsework, goes onto another job that uses a very different system, he has no experience.

Agree that joint grading operations between Caltrans and Contractor would help minimize adjustments to falsework.

Certification program may fix many of the problems.

Training of all Contractor's workers should be universal enough to level the training field for all contractors. Standardize it.

Statewide standards of training workers in falsework construction would be too difficult establish and incorporate all methods used by contractors. It may aid the large companies but the smaller contractors may have to unlearn workers who have gone through the training, if the course does not teach their particular method.

What about a "Best Practices" manual; would also incorporate cases of falsework collapses.

*Maybe that is possible once it's published in 2-3 years, but what can we do now.*

Also, it is suffering a large shortage of qualified PE's and experienced superintendents, statewide!

This is a major problem that we do not see going away soon.

*Why not elaborate erection and removal procedure with more details?*

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Consultant engineer lists his procedures vaguely because it allows the contractor flexibility of constructing. Deals with many different clients, not all construct falsework the same way. See the problem as the contractor NOT constructing the falsework according to the plan due to schedule.

*Erection plans should be resubmitted to match the schedule.*

Some problems of short schedules are due to Caltrans's review process taking longer, if plans are more detailed this will result in Caltrans taking even longer time to review.

Then give Caltrans more time to review.

Maybe require Contractor staff to meet with Caltrans and review erection/removal/adjustment plans.

Experience of erecting falsework is harder than removing it, with this lack of experienced workforce some Contractor engineers are meeting with field personnel and reviewing the erection/removal/adjustment process. It's a new approach that hopefully will be successful and would eventually be able to include Caltrans into these meetings.

A lot of Contractor's know their experienced superintendents, foremen and falsework crews and indirectly already do this in conversation with them.

One Contractor has started requiring that their superintendent and foreman, a week or two prior to erection/removal, to sit down and detail their internal work plan, go over it with their Engineer of Record, modify with them as necessary, then implement it. In the future, hope to include Caltrans.

Find that some SR and Contractor superintendents are rigid and not open to interpretation. Is there a way to go around them to a higher level of authority?

Communication is the key. Best to take care of problems at the ground level.

Another Contractor requires that grades be discussed and agreed upon ahead of time with Caltrans. This prevents several iterations of falsework adjustments and reduces the need for multiple checks between each other. Also, established a falsework guide and training that requires workers to complete and understand before being considered for a falsework crew.

Consistency with Caltrans is a problem.

*If Caltrans staff is not communicating with the Contractor concerning falsework erection/removal/adjustments, then that is a problem that should be escalated by the Contractor.*

How does Caltrans train staff in falsework review? Is it possible for Contractor to attend a class?

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Maybe take the friction transfer capability (FTC) section out of the Falsework Manual (FM).

It does not have to be removed just re-written.

If FTC section is removed what would replace it? The falsework bents still must be stabilized with clamps, cables, bolts, etc.

Friction should have a redundant backup.

How are clamps an issue?

Some foremen see the clamp as a redundancy to the bracing system.

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These notes may be relied upon as the approved record of matters discussed and conclusions reached during the meeting.

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Prepared by: John F. Walters PE

Signed by: John F. Walters

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Date: 02/05/2008

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