



# Caltrans / Industry Falsework Advisory Team

## Meeting Agenda – January 19, 2021 (Tuesday)

### Location: WebEx Meeting

Time	Topic	Speaker
9:00 – 9:05	<p>Welcome and WebEx Overview</p> <p><b>Meeting Minutes:</b></p> <ul style="list-style-type: none"> <li>• Bridge Contractors meeting next fall will have a similar format as the this FWAT meeting</li> </ul>	Jim Nicholls / Steve Harvey
9:05 – 9:10	<p>Follow up from previous meeting (2/11/2020) action items:</p> <ul style="list-style-type: none"> <li>• Limiting distance x/h ratio remains in manual</li> <li>• No additional information on guying systems developed by ASCE</li> <li>• Table and notes for flange bending added to Falsework Manual</li> <li>• Alternate methods of design addressed in Falsework Manual Section 1-3</li> </ul> <p><b>Meeting Minutes:</b></p> <ul style="list-style-type: none"> <li>• Limiting distance x/h was not changed in the current Falsework Manual due to the difficulty in finding an alternate method that would address all situations</li> <li>• No progress on guying systems developed by ASCE</li> <li>• Flange bending tables were added to the Falsework Manual</li> <li>• Additional discussions in the Falsework Manual addressing alternate designs was determined to not be required</li> </ul>	Jim Nicholls



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<p>9:10-9:30</p>	<p>Falsework Manual</p> <ul style="list-style-type: none"> <li>• Online at:           <ul style="list-style-type: none"> <li><a href="https://dot.ca.gov/programs/engineering-services/manuals/falsework-manual">https://dot.ca.gov/programs/engineering-services/manuals/falsework-manual</a></li> </ul> </li> <li>• Winter training 2021 topic is falsework           <ul style="list-style-type: none"> <li>○ Address changes to the manual</li> <li>○ Address changes to the Spec</li> </ul> </li> <li>• First revision already published           <ul style="list-style-type: none"> <li>○ Revised timber pile figures in chapter 8</li> </ul> </li> <li>• Second revision pending           <ul style="list-style-type: none"> <li>○ Section 5-2.04C shear V neglected for all loads a distance D from support revised to agree with NDS 3.4.3 reduce by x/D</li> <li>○ Figure 3-2 revised similar to what was in old manual for clarification</li> <li>○ Section 4-12.05E 150% increased load on post at traffic openings revised to agree with Spec to apply to post only</li> <li>○ Section 6-3.02B combined bending when L&gt;D revise to 4L&gt;D per old manual</li> </ul> </li> </ul> <p><b>Meeting Minutes:</b></p> <ul style="list-style-type: none"> <li>• Caltrans Falsework Academy will be used as a training tool to address changes in the Falsework Manual and Specifications</li> <li>• Suggested by Industry that Section 5-7 <i>Combining Stresses</i>, in the Falsework Manual reference Section 6-3.02B <i>Wood Cross Bracing</i> so application of when to analyze combined stresses is consistent</li> <li>• Caltrans Falsework Check Program currently calculated combined stresses for all post lengths. It was noted the program is currently being revised to agree with the current Falsework Manual and Spec and this issue will be addresses</li> <li>• When revisions to the Falsework Manual are published Caltrans will send an email notice to FWAT members</li> </ul>	<p>Jim Nicholls</p>
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9:30 – 10:00	<p>Specification Changes</p> <ul style="list-style-type: none"><li>• 2020 RSS</li><li>• Section 48-1 expanded</li><li>• NDS for timber design</li><li>• Welding per D1.1</li><li>• Temporary Structure Inspection Report (Attachment 1)<ul style="list-style-type: none"><li>○ During adjustment activities</li><li>○ Submitted prior to opening to traffic</li><li>○ Prior to placing concrete</li></ul></li><li>• Adjustment plan shop drawing (Attachment 1)</li><li>• Section 48-3, Temporary Supports</li><li>• Section 48-5, Jacking</li></ul> <p><b>Meeting Minutes:</b></p> <ul style="list-style-type: none"><li>• Discussed the changes above and reviewed Attachment 1</li><li>• Noted the next Spec change will be published next October</li><li>• Discussed the requirement for Temporary Structure Report during adjustment activities</li><li>• It was noted by industry that for activities such as structure excavation and mass concrete the engineer onsite does not serve any purpose</li><li>• Also noted the engineer onsite does not have the authority to make changes in the contractor's operation</li><li>• Comment was made that better planning would be more effective in providing additional safety</li><li>• Industry commented the requirement to have a PE onsite will add cost to the project. Caltrans responded that management is willing to pay for safety</li><li>• Discussed the limited number of engineers with experience in falsework design and how the new requirements will increase workload on designers</li><li>• Comment was made that local engineers could be used for inspection</li></ul>	Jim Nicholls
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10:00 – 10:30	<p>Welding Requirements of D1.1 for Falsework:</p> <ul style="list-style-type: none"><li>• Certified welders required</li><li>• QC contractor responsibility</li><li>• WPS required<ul style="list-style-type: none"><li>○ Fillet welds are prequalified</li><li>○ Welds not prequalified will require WPS</li></ul></li><li>• Contractor responsible for documentation</li><li>• Requirements of Section 11 not required</li><li>• Caltrans will not request documentation be submitted unless the welder's qualifications or the weld quality come into question</li></ul> <p><b>Meeting Minutes:</b></p> <ul style="list-style-type: none"><li>• Justin Wood presented some of the information that will in the upcoming Falsework Academy training that Caltrans personnel will participate in this winter</li><li>• Comment made that documentation will not need to be submitted to Caltrans unless there is an issue with weld quality</li><li>• Spec change is currently being developed to exclude the requirements of Section 11</li></ul>	Jim Nicholls /Justin Wood
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10:30 – 10:45	<p>Temporary Pedestrian Covers:</p> <ul style="list-style-type: none"><li>• Contract requirements (Attachment 2)<ul style="list-style-type: none"><li>○ 7-1.04, Public Safety</li><li>○ 12-4.03, Falsework Openings</li><li>○ 16-2.02, Temporary Pedestrian Facilities</li></ul></li><li>• Review alternate methods (Attachment 2)</li><li>• Specification change is being developed to limit height and require cover to be an independent structure</li><li>• HQ Safety concurred with need for change</li></ul> <p><b>Meeting Minutes:</b></p> <ul style="list-style-type: none"><li>• Reviewed Attachment 2 and noted deficiencies</li><li>• Comment from industry that in cases where space is limited the ability to attach to falsework post provides flexibility for the designers</li><li>• Comment was made that falsework differs from building construction because falling hazards do not exist once the falsework is complete</li><li>• Comment the pedestrian access could be closed during erection so protective cover would not be required</li><li>• It was noted the Spec requiring the protective covers is a recent addition and it would be interesting what is the history of its development</li><li>• Caltrans will research history of Spec and bring to next meeting</li></ul>	Jim Nicholls
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<p>10:45 – 10:50</p>	<p>Traffic Restraints:</p> <ul style="list-style-type: none"> <li>• Falsework Manual Chapter 7 procedure             <ul style="list-style-type: none"> <li>○ 2000 lb base of each post to footing</li> <li>○ 1000 lb post to cap</li> <li>○ 500 lb stringers to cap</li> </ul> </li> <li>• Footing defined as element of falsework in contact with the ground</li> <li>• When post braced to corbel then connection of corbel to pads must resist the 2000 lb load</li> </ul> <p><b>Meeting Minutes:</b></p> <ul style="list-style-type: none"> <li>• Presented information above and noted that errors in the traffic restraint connections is a common comment recently noted in shop drawings</li> <li>• Industry noted that rebar connections are addressed in the NDS commentary and headed end is not required</li> <li>• Caltrans will research if rebar dowels are addressed in the NDS</li> <li>• Caltrans noted connections that a method for calculating does not exist may need to be load tested</li> </ul>	<p>Jim Nicholls</p>
<p>10:50 – 11:00</p>	<p>Round Table</p> <p><b>Meeting Minutes:</b></p> <ul style="list-style-type: none"> <li>• Discussed projects with temporary support that require the temporary structure engineer to analyze the bridge structure to verify it is not overstressed during construction activities.</li> <li>• Industry will forward shop drawings with the requirements mentioned above to CT so it can research and addressed in the next FWAT meeting.</li> <li>• Group agreed meet again around August. Caltrans will schedule the meeting</li> </ul>	<p>Open Discussion</p>
<p>11:00</p>	<p>Adjourn</p>	<p>All</p>



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## Action Items:

### Items from Meeting on 2/11/20

1. CT will research limiting distance determined by  $x/h$  ratio for falsework adjacent traffic and topic added to future FWAT meetings
2. Information associated with guying systems developed by ASCE will be shared with team members and discussed in future FWAT meeting
3. Table and notes associated with flange bending calculations will be added to the Falsework Manual per todays discussion
4. Note will be added in Falsework Manual that other design methods for pads exist and are acceptable

### Today's Action Items

1. CT will research history of Spec requiring protective pedestrian covers under falsework
2. CT will research requirements for temporary structure engineer to analyze existing bridge structure for next FWAT meeting
3. CT will notify FWAT of future revisions to the Falsework Manual



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## Attachment 1

### **48-1.01C(2), Temporary-Structure Inspection Report**

Temporary-structure inspection reports must be:

1. Prepared daily during jacking and temporary-structure adjustment activities.  
Reports must be submitted:
  - 1.1. By close of business the following business day
  - 1.2. Before opening the roadway on or under the temporary structure to traffic
2. Prepared before placing concrete

The temporary-structure inspection report must be prepared, sealed, and signed by the temporary-structure engineer.

The temporary-structure inspection report must include:

1. Description of the progress of the jacking and adjustment activities
2. Description and evaluation of the condition of the temporary structure and supported structure
3. Inspection findings and the certifications listed in section 48-1.01D(2) that are completed by the temporary-structure engineer

### **48-1.01C(3), Adjustment Plan Shop Drawings**

Submit adjustment plan shop drawings if the falsework or temporary supports are to be adjusted more than 1/2 inch.

The adjustment plan shop drawings and calculations must be sealed and signed by the temporary-structure engineer.

Adjustment plan shop drawings and calculations must include:

1. Methods and sequencing for the adjustment.
2. Descriptions of equipment to be used.
3. Location of jacks or other adjustment equipment.
4. Detailed sequence for releasing of bracing.
5. Details and calculations for the stability and adjustment of the falsework or temporary supports during all stages of the adjustment including any additional required temporary bracing.





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6. Calculations that include stresses, deflections, and loads in all load carrying members, bracing, and equipment as well as any redistributed loads resulting from the adjustment. Calculations must also include the effect of the adjustment sequence.

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## Attachment 2

