



Shop Drawing Review for Temporary Structures

When the contractor submits shop drawings for temporary structures (falsework, trenching and shoring, cofferdams, column guying, and trestles) that require the drawings to be signed by an engineer who is registered as a Civil Engineer in the State of California, it is Structure Construction (SC) practice to perform an independent engineering analysis. The findings of the analysis are to be presented to the contractor in a *Temporary Structure Plan Analysis Report* that has been signed and sealed or stamped by the licensed engineer performing the review. This is in accordance with the *Streets and Highways Code*¹, Section 137.6, and the *Business and Professions Code*², Section 6735. A sample *Temporary Structure Plan Analysis Report* is on pages four and five of this Bridge Construction Memo (BCM).

Upon completion of the review of the temporary structure, the Structure Representative or the licensed engineer performing the review will complete a *Temporary Structure Plan Analysis Report* and transmit it to the contractor using existing processes for transmitting written documentation to the contractor.

Structure Representative Responsibilities:

Rejections:

- Contact the temporary structure design engineer by phone or in person to discuss the reason(s) for rejection of the submittal prior to sending the *Temporary Structure Plan Analysis Report*. Document this discussion in the appropriate *Chronological Log* and *Daily Structure Representative Report*.
- Omissions, inconsistencies and design deficiencies discovered during any review should be noted in red on the drawing(s).

¹ *Streets and Highways Code*, Section 137.6.

The design of, the drafting of specifications for, and the inspection and approval of state highway structures shall be by civil engineers licensed pursuant to the Professional Engineers Act (Chapter 7 (commencing with Section 6700), Division 3, *Business and Professions Code*).

The approval of plans for, and the inspection and approval of, temporary structures erected by contractors in connection with the construction of state highway structures shall also be by such licensed civil engineers.

² *Business and Professions Code*, Section 6735.

All civil (including structural and geotechnical) engineering plans, calculations, specifications, and reports (hereinafter referred to as *documents*) shall be prepared by, or under the responsible charge of, a registered civil engineer and shall include his or her name and license number. The *Business and Professions Code* is available at the following website: http://www.leginfo.ca.gov/html/bpc_table_of_contents.html

- Return the temporary structure shop drawings to the contractor for correction accompanied by a *Temporary Structure Plan Analysis Report* citing the reason(s) the drawings are not acceptable. The report should list the specific deficiencies found (e.g., 6x16 stringers overstressed in bending) but elaboration is unnecessary. Do not suggest any corrective measures; listing the deficiencies is sufficient.

Authorizations:

- Authorize the temporary structure shop drawings when the design meets all contract requirements.
- Authorize each sheet of the temporary structure shop drawings using the following stamp:

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| <p>AUTHORIZED Pursuant to Section 5-1.23 of the Standard Specifications</p> <p>State of California DEPARTMENT OF TRANSPORTATION Division of Engineering Services Offices of Structure Construction</p> <p>Signed _____ Structure Representative</p> <p>Date _____</p> |
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SC authorization stamp for contracts using the 2010 Standard Specifications

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| <p>APPROVED Pursuant to Section 5-1.02 of the Standard Specifications</p> <p>State of California DEPARTMENT OF TRANSPORTATION Division of Engineering Services Offices of Structure Construction</p> <p>Signed _____ Structure Representative</p> <p>Date _____</p> |
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SC approval stamp for contracts using the 2006 Standard Specifications

Each sheet must be signed by the Structure Representative or by the licensed member of his staff who actually reviewed the design.

- Return one set of the authorized³ drawings to the contractor, with the *Temporary Structure Plan Analysis Report*.
- Concurrently with authorization, submit one copy of the authorized drawings and one copy of the engineer's calculations to the SC Headquarters Office in Sacramento as directed in BCM 3-3.0, *Project Record Review*, along with a copy of the *Temporary Structure Plan Analysis Report* sent to the contractor.
- Ensure one set of the authorized drawings, the original calculation sheets, and *Temporary Structure Plan Analysis Report* is retained in the job files.
- Authorizing temporary structure shop drawings for construction that involve railroads will be contingent upon approval of the shop drawings by the railroad company.

The *Temporary Structure Plan Analysis Report* must include the following paragraphs:

- “The temporary structure shop drawings, (*insert type of drawing, i.e. falsework etc.*) dated (*insert date*) for (*insert name of structure*) have undergone an independent engineering review and found acceptable and are authorized to the extent provided in the Standard Specifications, Section 5-1.23, *Submittals*⁴.”
- “Your attention is directed to your responsibilities pursuant to Standard Specifications, Sections 5-1.23, *Submittals*, and 7-1.04, *Public Safety*,⁵ and (*insert appropriate Standard Specification reference, i.e. Standard Specifications, Section 48, Temporary Structures*⁶), and to applicable requirements of the *Construction Safety Orders*.”
- “You are reminded that (*insert type of temporary structure, i.e. falsework, shoring, etc.*) construction must conform to the authorized drawings, that the materials used must be of the quality necessary to sustain the stresses required by the design, and that workmanship must be of such quality that the (*insert type of temporary structure, i.e. falsework, shoring, etc.*) will support the loads imposed without excessive settlement or joint take-up beyond that shown on the (*insert type of temporary structure, i.e. falsework, shoring, etc.*) authorized drawings.”

³ Note 2006 Standard Specifications (SS) uses term *Approved* whereas 2010 Standard Specifications calls it *Authorized*

⁴ 2006 SS, Section 5-1.02, *Plans and Working Drawings*.

⁵ 2006 SS, Section 7-1.09, *Public Safety*.

⁶ 2006 SS, Section 51-1.06, *Falsework*.

The following is a sample *Temporary Structure Plan Analysis Report* that can be used as a template:

Structure Construction Temporary Structure Plan Analysis Report

Insert Date

Project Information

Dist-EA
Dist-Co-Rte-PM
Structure or bridge name
Br. No.

Type of structure reviewed: *(insert falsework, trenching and shoring, column guying)*

Chronology:

Plans were received: *(date)*
Plans rejected: *(date)*
Revision No. 1 received: *(date)*
Revision No. 1 rejected: *(date)*
Revision No. n received: *(date)*
Revision No. n rejected: *(date)*
Review completed: *(date)*
Elapsed review time: _____ days

Introduction:

This report presents the results of an independent engineering review for the *(insert type of review completed, i.e. falsework, trenching and shoring, column guying)* at *(identify specific location i.e. Frame 1, stage 1 etc.)*

Discussion:

Rejection – *This portion of the report would describe specific deficiencies found with the plan that would be cause for rejection i.e. The following members have been found to be overstressed:*

*W36x240 stringer in span FW5-6 is overstressed in bending
Post in bent FW5 overstressed in compression*

For clarity redline clouds may be made on the temporary structure drawings and then described here.

Structure Construction Temporary Structure Plan Analysis Report continued

Authorization – No exceptions were found.

Conclusion:

Rejection:

The *(insert type of review completed, i.e. falsework, trenching and shoring, column guying)* plan for *(identify specific location)* of the *(Bridge name, Br. No.)*, is rejected based upon an independent engineering analysis found the deficiencies listed above.

Authorization:

The *(insert type of review completed, i.e. falsework, trenching and shoring, column guying)* plan for *(identify specific location)* of the *(Bridge name, Br. No.)*, is authorized based upon an independent engineering analysis and found acceptable and is authorized to the extent provided in the Standard Specifications, Section 5-1.23⁷, *Submittals*.

The contractor's attention should be directed to their responsibilities pursuant to the Standard Specifications, Section 5-1.23, *Submittals* 7-1.04, *Public Safety*,⁸ and *(insert appropriate standard specification references as appropriate, i.e. Section 48, Temporary Structures*⁹), as well as the *Construction Safety Orders*.

(insert type of review completed, i.e. falsework, trenching and shoring, column guying) must be constructed to conform to the *(insert type of review completed, i.e. falsework, trenching and shoring, column guying)* authorized shop drawings and the materials used must be of the quality necessary to sustain the stresses required by the *(insert type of review completed, i.e. falsework, trenching and shoring, column guying)* design, and that the workmanship shall be of such quality that the *(insert type of review completed, i.e. falsework, trenching and shoring, column guying)* will support the loads imposed on it without excessive settlement or take up beyond that shown on the *(insert type of review completed, i.e. falsework, trenching and shoring, column guying)* shop drawings.

If you have any questions regarding this report, please contact Structure Representative at (XXX) XXX-XXXX.

Howard Street, P.E.
Structure Representative
Structure Construction



⁷ 2006 SS, Section 5-1.02, *Plans and Working Drawings*.

⁸ 2006 SS, Section 7-1.09, *Public Safety*.

⁹ 2006 SS, Section 51-1.06, *Falsework*.