Chapter 2: Review and Authorization of Temporary Structure Submittals

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2-1 Introduction

This chapter covers Structure Construction (SC) practice with respect to the temporary structure submittal review process. Subsequent chapters cover specific review guidelines, procedures, and explanations where necessary to ensure uniform and impartial contract administration. As noted in Chapter 1, *Introduction*, review and authorization of the Contractor's temporary structure submittal is delegated to SC's Structure Representative in responsible charge of structure work at the project site. While the actual review of the temporary structure submittal may be performed by a qualified member (authorized reviewer) of the project team, the Structure Representative is expected to give their personal attention to the review while it is in progress and provide concurrence before the submittal is authorized.

The contract requirement for submission of temporary structure submittals should be discussed with the Contractor at the preconstruction conference, with emphasis on the need for a complete submittal before the review period begins. If temporary structures are subcontracted, strongly encourage the prime Contractor to have their subcontractor attend the preconstruction conference. The Contractor should be reminded that erection of temporary structures must not begin until the shop drawing is authorized.

2-2 Design Calculations and Shop Drawings

Submittal of shop drawings for review and authorization is required by the contract documents when temporary structures create a hazardous condition to the public. The *Contract Specifications* requires that the design calculations demonstrate design adequacy of the load-supporting members. In the specification context, the term "load-supporting members" will be construed as meaning the design-controlling members. Temporary structures are designed in accordance with *Contract Specifications* Section 48, *Temporary Structures*. The Caltrans *Falsework Manual* is an essential tool in the administration of Section 48, although loading requirements may differ when compared to structures that are not falsework. Temporary structures that are not addressed in Section 48 should be designed using the best industry practice.

The design calculations furnished by the Contractor are for information only; they are not for review and authorization. Any required design or construction details which may be shown in the form of sketches on calculation sheets must be included in the temporary structure shop drawings; otherwise, the plan is incomplete. Temporary structure submittals are not to be authorized in any case where it is necessary to refer to calculation sheets for information needed to complete the independent design review, or where information shown only on the calculation sheets will be needed for construction. In most cases, it is unnecessary to refer to the Contractor's calculations during the design review. However, in the event a load-supporting member is

overstressed or is otherwise determined to be inadequate, reference to the calculations may reveal the reason for the design deficiency.

2-3 Temporary Structure Submittal Review

2-3.01 Initial Review

Immediately upon receipt of a temporary structure submittal, the authorized reviewer will perform an initial review of the documents received. The purpose of the initial review is to ascertain whether the plan and all required supporting data are included in the submittal. Determining whether the submittal is complete involves a certain degree of subjectivity, and the Engineer will be expected to exercise judgment when making this determination. The basic requisite is that the plan contains enough information to enable the Engineer to verify that the design meets the contract requirements. Although the initial review is not a contractual requirement, it is the practice of SC to identify incomplete or deficient submittals early in the review process.

The temporary structure submittal should include the following:

1. Details of associated temporary structure activities, including controlling dimensions.
2. Methods and sequence of construction, including staging and equipment locations.
3. Locations where work is performed over traffic, utilities, or railroad property
4. Protection of people, property, utilities, and improvements.
5. Methods for preventing material, equipment, and debris from falling onto traffic, railroad property, or other protected area.
6. Methods for removing temporary structures.

The initial review is to be completed within two working days following the receipt of the temporary structure submittal. The purpose of this is to ensure timely notification to the Contractor in the event the drawings are not complete. Since the only purpose of the initial review is to discover omissions that would prevent completion of a subsequent design check, neither calculations nor an evaluation of design details is required; thus, completion within two working days is reasonable.

2-3.02 Review

The importance of having a complete plan and thorough review cannot be overstated when it comes to temporary structure submittals, as the effort invested in preparation and review of the temporary structure submittal pays dividends when field work commences.

2-3.02A Procedure when Railroad Company is not Involved

Except for work that is adjacent to or over a railroad, the temporary structure submittal may be authorized when the Structure Representative is satisfied that the submittal meets all contract requirements. Authorization should follow the procedure discussed in Section 2-3.03, *Engineering Analysis*. Each sheet of the shop drawings or the cover sheet of work plans must be signed by the Structure Representative or authorized reviewer. One set of the authorized temporary structure submittal will be returned to the Contractor, with an authorization cover letter signed by the Structure Representative.

2-3.02B Procedure when Railroad Company Approval is Required

In order to expedite the review process of the temporary structure submittal by railroad companies, it is advisable that the drawings submitted by the Contractor adhere to the requirements of the guidelines produced by the associated railroad. The two main railroad guidelines are listed below:

- Union Pacific Railroad – BNSF Railway: *Guidelines for Railroad Grade Separation Projects*
- American Railway Engineering and Maintenance-of-Way Association (AREMA): *Manual for Railway Engineering (MRE).*

Other railroads not mentioned above may have their own specific guidelines and requirements.

The special provisions will also list any clearance requirements that need to be maintained. These measurements are taken from the centerline of the railroad tracks. If there are no clearances included in your contract documents, refer to guidelines produced by the associated railroad.

Where there is a conflict between the *Contract Specifications* and the guidelines issued by the railroad, the *Contract Specifications* must prevail.

2-3.02C Railroad Requirements

Some common requirements are often overlooked and have resulted in submittals being returned by the railroad. The temporary structure submittal must state that all temporary structure construction will comply with the latest railroad guidelines and AREMA. The temporary structure submittal must note how the Contractor will gain access to the site, staging for all materials, equipment locations when working, and staging areas for equipment. Track protection details are outlined in the aforementioned guidelines, and details must be included on the plans.

The temporary structure submittal must note if there are any existing drainage facilities, including drainage ditches, or access roads being affected by the Contractor's

operations. If there are no existing drainage facilities or access roads, the drawings must note this fact. Railroad personnel who are unfamiliar with the site often review the temporary structure submittal.

The above railroad requirements must be discussed at the preconstruction conference with the Contractor. Remind the Contractor that approval of temporary structure submittals over and/or adjacent to railroad tracks will be contingent upon the railroad approving the plans.

2-3.02D Distribution of Temporary Structure Submittals

The Structure Representative will review the temporary structure submittal and if necessary, return it to the Contractor for correction. After the Structure Representative is satisfied that the submittal meets the specification requirements, send the following items to SC Falsework Engineer in SC Headquarters:

1. The Contractor's temporary structure shop drawings or work plan.
2. The Contractor's calculations.
3. The Structure Representative's calculations.
4. Manufacturer's data relative to all manufactured devices.

Note: The Structure Representative must not stamp the temporary structure submittal "Authorized" until SC Falsework Engineer has notified them that the railroad has reviewed and authorized the plans.

2-3.02E Railroad Review and Authorization

Incomplete or unsatisfactory data will be returned to the Structure Representative for correction. Once submitted, the SC Falsework Engineer will review this data. Upon confirming that the plans and calculations are complete and satisfactory, the information will be forwarded to the railroad for their review and acceptance.

Please note that all correspondence with the railroad regarding the status of submittals under their review must be directed to the SC Falsework Engineer. At the railroad's request, under no circumstances should you contact the railroad directly.

When the railroad review is complete and determines the plans to be acceptable, the railroad notifies the SC Falsework Engineer, who will advise the Structure Representative to proceed with authorization of the temporary structure submittal. The Structure Representative will then stamp the plans "authorized" with the date of authorization and return them to the Contractor along with the temporary structures analysis report; note that this is an engineering analysis report. Assuming proper notification has been made to the railroad that their horizontal and vertical clearances will be impaired and that a flagger is required, the Contractor may begin work. Refer to

the Railroad Agreement in the contract *Information Handout* for detailed requirements. Note that the Contractor **must not begin** any operations within the railroad right-of-way until the authorized plans have been issued to the Contractor.

2-3.03 Engineering Analysis

The temporary structure submittal is authorized pursuant to *Contract Specifications* Section 5-1.23, *Control of Work – Submittals,* which includes requirements for the review duration. The review durations provided are for the majority of temporary structure submittals; check the special provisions if there is railroad involvement or other factors (such as a prefabricated modular truss panel) that may necessitate a longer review period.

SC's practice is to perform an independent engineering analysis on temporary structure submittals that are required to be sealed and signed by a civil engineer registered in the State of California. The independent review can be a simple review or a complex analysis with assistance from the Bridge Design Engineer, Bridge Construction Engineer, or the SC Falsework Engineer.

Upon completing the engineering analysis of the temporary structure submittal, the Engineer is to present the findings in an engineering analysis report. The report is to be sealed and signed in accordance with the Professionals Engineers Act (Business and Professions Code), § 6735. Refer to the *Falsework Manual* Section 1-10, *State Statutes,* for further information.

The engineering analysis report is an engineering document and therefore must be sealed and signed by a civil engineer registered in the State of California in responsible charge of the independent engineering analysis.

This report is to be completed for authorized and rejected temporary structure submittals. The report is to contain a brief chronological record of the pertinent dates related to the submission, review, rejection (if applicable) and authorization of the plan, including the number of review days. The Structure Representative is to transmit the report to the Contractor through the project's normal transmittal process. An example of the temporary structure analysis report is provided in Section 2-3.04, *Sample Engineering Analysis Report*.

When the shop drawings or work plan cannot be authorized, complete the engineering analysis report and list the reason(s) that the shop drawings or work plan are rejected. Elaboration is unnecessary and corrective measures should not be suggested. Prior to sending the report to the Contractor, contact the temporary structure engineer of record by phone or in person to discuss the reason(s) for rejecting the submittal. Document this discussion in the chronological record and the daily report.

When the shop drawings or work plan is authorized, complete an engineering analysis report. The report must include the following paragraphs:

1. "The <*insert type of submittal, trestle, scaffold, shop drawings, work plan, etc*> for <*identify specific location*> of the <*bridge name and number*> is found acceptable based on an independent engineering analysis and is authorized to the extent provided in the *Contract Specifications* Section 5-1.23, *Control of Work – Submittals.*"
2. "Your attention is directed to your responsibilities pursuant to *Contract Specifications* Sections 5-1.23, *Control of Work – Submittals*, 7-1.04, *Legal Relations and Responsibility to the Public – Public Safety*, and Section 48, *Temporary Structures,* and to the applicable requirements of the *Construction Safety Orders*."
3. "You are reminded that <*insert type of submittal, trestle, scaffold, shop drawings, work plan, etc.*> construction must conform to the authorized submittal, 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 submittal, trestle, scaffold, shop drawings, work plan, etc.*> will support the loads imposed without excessive settlement or joint take-up beyond that shown on the authorized <*insert type of submittal, trestle, scaffold, shop drawings, work plan, etc.*>."

A sample engineering analysis report is provided below and can be used as a template.

2-3.04 Sample Engineering Analysis Report

Engineering Analysis Report

<Insert Date>

Project Information

Contract Number
Dist-Co-Rte-PM
Bridge Name
Bridge Number

Type of structure reviewed: *<Insert type of temporary structure>*

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>*
Plans authorized: *<date>*
Elapsed review time: *<calendar days>*

Introduction

This report presents the results of an independent engineering analysis of the *<insert type of review completed>* for *<bridge name, bridge number, and specific location >.*

Discussion

Rejection – This portion of the report describes specific deficiencies found with the temporary structure submittal that would be cause for rejection.

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

Authorization – No exceptions were found.

Conclusion

Rejection:

The <*insert type of submittal, trestle, scaffold, shop drawings, work plan, etc.*> for <*identify specific location*> of the <*bridge name and number*>, is rejected based on an independent engineering analysis. The deficiencies are listed above.

Authorization (the paragraphs below must be included):

"The <*insert type of submittal, trestle, scaffold, shop drawings, work plan, etc*> for <*identify specific location*> of the <*bridge name and number*> is found acceptable based on an independent engineering analysis and is authorized to the extent provided in *Standard Specifications* Section 5-1.23, *Control of Work – Submittals*."

"Your attention is directed to your responsibilities pursuant to *Contract Specifications* Sections 5-1.23, *Control of Work – Submittals*, 7-1.04, *Legal Relations and Responsibility to the Public – Public Safety*, and Section 48, *Temporary Structures,* and to the applicable requirements of the *Construction Safety Orders*."

"You are reminded that <*insert type of submittal, trestle, scaffold, shop drawings, work plan, etc.*> construction must conform to the authorized submittal, 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 submittal, trestle, scaffold, shop drawings, work plan, etc.*> will support the loads imposed without excessive settlement or joint take-up beyond that shown on the authorized <*insert type of submittal, trestle, scaffold, shop drawings, work plan, etc.*>."

If you have any questions regarding this report, please contact <*insert Structure Representative or authorized reviewer's name*> at (XXX) XXX-XXXX.

<Signature of reviewer>
Loren N. Bridge, P.E.
Structure Representative
Structure Construction

2-4 Safety and Cal/OSHA Requirements

All construction safety standards apply to temporary structure work.

Cal/OSHA regulations contain many safety requirements associated with temporary structures and it is not the intent of this section to cover all the Cal/OSHA regulations, but rather to remind the Structure Representative of these requirements.

Although the Structure Representative has neither the authority nor the duty to enforce this Article, as a matter of policy, verification that the Contractor has a valid permit will be done before the submittal is authorized in any case where a permit is required. The date of verification should be noted in the project diary.

Pertinent Cal/OSHA requirements should be discussed with the Contractor at the pre-construction conference.

The construction of temporary structures requires attention to fall hazards and possible hazards of working over water. All elevated work is subject to gravity and the stored energy in an elevated mass. Personnel fall hazard protection and falling debris control require planning and are addressed in the authorized temporary structure work plans and supporting documents. The site is frequently changing, noisy, sometimes dusty, and often congested with equipment working at a fast pace. Competent supervision is essential to safely accomplish the construction goals.

2-5 Design Revisions to Authorized Plans

Design revisions to the authorized plans may occur for many reasons including the following: the Contractor decides to change a particular means or method, something is identified during construction that was not known before, an unplanned event occurs, or the temporary structure deviates from what was authorized.

If an unplanned event occurs or the temporary structure deviates from what was authorized, the Contractor must immediately stop work and submit procedures to correct or remedy this occurrence.

Administratively, and as defined in *Contract Specifications* Section 5-1.23B, *Control of Work – Submittals – Action Submittals*, any revision to an authorized temporary structure submittal will be viewed as a new submittal, and as such will be reviewed pursuant to the applicable specification requirements.

The Contractor must show the revision number on the revised temporary structures submittal, uniquely number each revised detail, and describe and date the revisions in a

legend. The revision is to be identified with an inverted triangle or revision cloud. A complete submittal must be provided with each revision to the temporary structures submittal. Refer to *Contract Specifications* Section 5-1.23B(2), *Control of Work – Submittals – Action Submittals – Shop Drawings*.