Structural Steel Working Drawings

Introduction

The procedure for review and approval of structural steel working drawings is a coordinated effort between Design and Construction personnel. The designer, with input from construction, has the primary responsibility for approval of the working drawings. In the case of projects designed by a Local Agency or Consultant the designer of record, in conjunction with Structure Design and the Design Oversight Engineer, has the primary responsibility for approval of the working drawings. However, the Shop Plan Clerk, in the Structure Design Documents Unit, will furnish the Local Agency Designer or Consultant with two copies of the working drawings.

Working Drawings

Attached is Memo to Designers 12-1 (Attachment No. 1) Review of Working Drawings - Steel Structures. The Memo to Designers, which is a cooperative effort of Design and Construction, covers the procedures required for review and approval of working drawings including responsibilities of the Structure Representative on a construction project. The procedure for submittal of plans and working drawings is for the Contractor (subcontractor or fabricator) to submit all documents directly to the Office of Structure Design, Documents Unit, Mail Station 9, 1801 30th Street, Sacramento 95816. The original submittals and any resubmittals shall be submitted to the Documents Unit. The Structure Representative should ensure that the contractor submits all documents to the Documents Unit in a timely manner.

The Documents Unit is responsible for administering the working drawing review and approval procedure during all phases of the approval procedure. The Documents Unit maintains a record of all working drawings submitted and distributes copies to the required individuals. This relieves the Structure Representative of the tedious administrative details required in distributing and coordinating the review and approval process.

The responsibility for checking working drawings is shared by the designer of record and the Structure Representative. The Structure Representative shall make all effort to coordinate directly with the designer. The working drawings shall not be returned to the Contractor until the designer of record has discussed and resolved all comments with the Structure Representative. The comments that are returned to the Contractor must be acceptable to both the Designer and the Structure Representative.

The Structure Representative shall ensure that the final working drawings are submitted by the Contractor to the Documents Units, in accordance with Section 55 of the Standard Specifications, prior to the acceptance of the contract. The Structure Representative can verify the submittal of the final working drawings by contacting the Documents Unit at (916) 227-8252.
MEMO TO DESIGNERS  JULY 1989  12-1

REVIEW OF WORKING DRAWINGS – STEEL STRUCTURES

Procedure:

The instructions in this Memo apply to working drawings for bridges or other major structures. Working drawings for railings, signs, miscellaneous metal, and other minor items are for the use of field personnel and are not routinely reviewed by the designer. See Article 10 for review of projects designed by Local Agencies and Consultants.

To provide uniform treatment in checking steel working drawings, the following procedures shall be followed:

1. The responsibility for checking working drawings is shared by the designer, the Structure Representative and Transportation Laboratory. Working drawings shall not be returned to the contractor until the designer has discussed and resolved the details with the other reviewers. The comments returned to the contractor must be acceptable to all reviewers.

   A brief memo shall be written by the designer to document controversial decisions or when it is necessary to keep other involved parties informed. For example, a memo is required for any changes or clarification of details in the contract plans. A copy of the memo is to be sent to the Structure Representative and two copies are to be sent to the Transportation Laboratory.

2. When the initial drawings, between six and ten sets, are received, the Documents Unit will forward two sets to the Transportation Laboratory, one set with correspondence to the Structure Representative and the reminder with correspondence will be sent to the design section involved. If less than six sets are received, the Documents Unit shall immediately request the missing sets. The Documents Unit will make this distribution.

   In the event drawings are received for review involving prestressing systems, one of the sets will be forwarded to the Chairperson of the Prestressing Committee for check enroute to the design section involved.

3. The Transportation Laboratory will make the sheets as required and return one set to design.

4. The set of drawings sent to the design section will be the work and file set, that is, it will be marked as necessary in yellow to indicate the checking performed, and in red to indicate any changes required.

5. One of the two sets of drawings sent to the Transportation Laboratory will ultimately be returned to the Contractor. It should not be stamped until all details are resolved between the Structure Representative, the Transportation Laboratory and the Designer and compatible comments transferred to the sheet.

Supersedes Memo to Designers 12-1 dated January 1982
6. Subsequent submittals of working drawings will not be routed out to the Structure Representative or the Transportation Laboratory. If there are any significant changes, the Designer will contact both groups and discuss them before the distribution of prints is made.

7. The Documents Unit will keep the latest set of drawings on file and make them available to the Designer as necessary. When corrected or revised drawings are received, the initial prints will be marked with blue and returned to the design section. All superseded sheets may be disposed of unless a claim or change order is anticipated and there may be a need to reconstruct the history of the project.

8. Members of the structural steel committee may be consulted at any time to assist with technical questions concerning shop practices and procedures.

9. Special Procedure for Structures Carrying Railroads
   a. Specifications require an initial submittal of ten sets of drawings. If less than ten are received, the Documents Unit shall immediately request the missing sets.
   b. From two to four sets are sent to the railroad for their review, with a request that they be *expedited*.
   c. At the same time one set is sent to the Structure Representative, two to the Transportation Laboratory, and the remainder to the design section involved.
   d. The design section is not to return an “approved” or “disapproved” set until all comments, including the railroad’s are received.
   e. When the railroad comments are received, the design section will mark the plans accordingly, or resolve differences as necessary.
   f. The set returned to the Contractor will incorporate both State and Railroad comments.

10. Review of projects designed by Local Agencies and Consultants
   a. Review and oversight of projects involving structures, designed and developed by local agencies or private consultants, is the responsibility of Local Assistance or the Externally Financed Projects Branch.
   b. Occasionally, others may be requested to review technical specialty areas such as walls, railings, earth retaining systems or projects having complex seismic concerns.
   c. Coordination and all plan distribution activities during the design phase will be handled by the Local Assistance or Externally Financed Projects Branch.
   d. Coordination of shop plan submittals by consultants will require special handling by the branch
involved.

11. Stamping of Working Drawings

a. Initial Review

1. If they are correct on initial review, the checker shall stamp and date.

Checker shall initial one set of prints only (yellowed check set). This set will be retained in

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the job file by the Documents Unit.

2. If any corrections whatsoever are noted, the sheets in error shall be returned for correction. The sheets with corrections shall be stamped and dated:

Checker shall initial one set of prints only. This set will be retained in the job file by the

Prints Reviewed by State Division of Structures and
RETURNED
JUL 7 1989
FOR CORRECTION

Documents Unit.

b. Second or subsequent review.
1. If stamped “Returned for Correction” on subsequent review, prints will be handled in the same manner as prints for initial review.

If only a few minor corrections are made, all sheets needed for distribution must be marked with the same corrections and all stamped:

Checker shall initial one set of prints only (yellowed check set). This set will be retained in

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MINOR CORRECTIONS SHOWN IN RED

the job file by the Documents Unit.

12. Return to Contractor

After checking and the discussion with all reviewing agencies is completed, all copies of the Working Drawings shall be returned to the Documents Unit. One of the stamped copies will be sent to the Contractor, and additional copies will be requested as needed for rechecking or for distribution.

13. Distribution of Final Approved Drawings

a. Working drawing File – one print

b. Contractor – one print

c. Structure Representative – two prints (one for his use and one for Contractor’s Field Representative).

d. Transportation Laboratory – two prints (additional prints will be furnished where out-of-State
fabricators are involved).

e. Railroads – two prints for each Railroad company involved.

14. Final Disposition of Working Drawings

After completion of a project, the fabricator will furnish 35 mm film of working drawings to the Division of Structures as required by the specifications. These films are checked by the Documents Unit to verify that all required film has been received prior to sending them to file. The films are then filed in roll form by the Documents Unit.

After the films are received the file copies of Working Drawings will be sent to the responsible design section.

15. Guide for Checking Working Drawings

As a means of establishing uniform practice and avoiding omissions, but not as a substitute for common sense, the following outline is submitted as a general guide for checking Structural Steel Working Drawings:

a. Read the Standard Specifications and Special Provisions for the particular job. They may modify the usual procedure. Read the correspondence file; there may have been changes approved by the Office of Structure Construction since the contract was let. Call the Structure Representative to establish a working relationship, and to become familiar with any pending changes or special problems.

b. Changes from the contract plans or specifications, regardless of magnitude, should not be allowed unless they have been discussed and approved by the Structure Representative and Transportation Laboratory. Revisions may be satisfactory structurally but create administrative problems. Changes requiring Contract Change Orders as determined by the Structure Representative need special attention. These change orders could be grouped into two categories:

1. Those involving changes requested by the State and minor changes requested by the fabricator where there is no question on approval of the change order by both parties. The working drawings can be approved but the note “Contract Change Order to be processed” added to each detail sheet involved.

2. Those involving controversial changes requested by the fabricator. These should be returned to the fabricator with the note “Request must be made by the Contractor to the Resident Engineer for Contract Change Order.” The fabricator may ask that the working drawings be held by design pending such negotiation. Design should not hold any plans without such a request.

c. Review the Contractor’s erection procedure to be sure that it will satisfy the assumption for
continuity made in design. If the design assumptions are not met, the contractor must submit calculations for revised cambers and stresses. He may be required to increase plate thicknesses or change types of steel.

d. Check to see that all material shown in the working drawings conforms to the size, thickness and steel type shown on the contractor plans or with the requirements of an approved erection procedure.

e. The amount and method of camber should conform to the contract plans or with values computed to accommodate an approved erection procedure.

f. Check the size of all welds. If a welding sequence or procedure other than that shown is proposed, it should be reviewed by the Transportation Laboratory.

g. Check the direction of rolling of plates where specific orientation is required, and the location of butt splices and details of connections not dimensioned on the plans.

h. In general, check only those items listed above. For example, do not routinely make a detailed check of dimensions or the bill of materials.

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