Steel Structures – General – Submittals

Revision and Approval

Revision	Date	Nature of Changes	Approved By
0	03-02-2023	Original Issue	Rich Foley

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Background

This process establishes Structure Construction (SC) responsibilities and procedures for review and authorization of submittals for structural steel.

Shop drawings for structural steel are reviewed and authorized by the Designer. Structure Construction staff, the Materials Engineering and Testing Services Representative (METS Rep), and representatives of the Railroad (as applicable) assist with the review as described in *Bridge Design Memo* (BDM) 6.12, *Review of Shop Drawings – Steel Structures.*

Quality assurance certifications, test results, and materials documents are reviewed and authorized by the Structure Representative with assistance from the Designer and the METS Rep.

Prior to reviewing this Bridge Construction Memo (BCM), it is essential to review the *Contract Specifications*, Section 55-1.01C, *Steel Structures – General – Submittals*, that this BCM is based on as identified in the title block above. The information in the *Contract Specifications* typically will not be repeated in the text of this BCM.

Process Inputs

1. Shop drawings including camber calculations
2. Form CEM-3101, *Notice of Materials to Be Used*
3. Baseline critical path method (CPM) schedule and updates

4. Copies of mill orders
5. Certified mill test reports
6. Certificates of compliance
7. Calibration certificate for each bolt tension measuring device and calibrated wrench
8. Test reports on fastener components and assemblies
9. Welding and welder qualifications
10. Test samples for check testing
11. Charpy V-notch (CVN) impact test results

Procedure

1. All work associated with this process is charged as Project Direct – Construction.
2. Inspection of field work for this process is: Not applicable, for submittal reviews.
3. Before construction begins:
    a. Review the following:
        i. Contract documents for structural steel and metalwork items. Verify the *Special Provisions* include non-standard items which includes but is not limited to suspender cables, cable anchorages, dampers, ASTM F3125, A490 and other higher strength fasteners.
            1. Consult with the Designer and issue a change order to include a required material if it is not listed.
                a. Note that depending on the type of project, the Designer may refer to the Bridge Design (BD) Structure Project Engineer, Structure Liaison, or the Consultant Designer.
            2. Make appropriate comments in the Plans, Specifications, and Estimates (PS&E) stage during constructability reviews, if possible.
        ii. Bridge Design Memo 6.12, *Review of Shop Drawings – Steel Structures,* for useful guidance on shop drawing reviews.
        iii. Attachment 1, *Overview of the Review Process for Steel Structure Submittals*
        iv. *Contract Specifications*:
            1. Section 55-1.01D, *Steel Structures – General – Quality Assurance*
            2. Section 55-1.02, *Steel Structures – General – Materials*
            3. Section 55-1.02E, *Steel Structures – General – Materials – Fabrication*

b. Verify the Contractor submits shop drawings to Bridge Design (BD) through the SC Office Associates for review and authorization as outlined in the *Contract Specifications*, Section 5-1.23B(2), *Control of Work – Submittals – Action Submittals – Shop Drawings*. Some contracts may require the office of the Resident Engineer (RE) to handle the processing of submittals.

c. Discuss structural steel submittals, shop drawing requirements, procedures and roles and responsibilities with the Designer and the METS Rep. Discuss the requirements of BDM 6.12, *Review of Shop Drawings – Steel Structures*.

d. Review the Resident Engineer (RE) Pending File and discuss any discrepancies discovered with the Designer.

   i. Note that the SC components of the RE Pending File can be found in VISION, under the "Files" tab, once a specific project is selected.

e. Discuss structural steel submittal requirements with the Contractor during the preconstruction conference or in a separate meeting.

4. During construction:

   a. Work with the RE to ensure that sufficient review times and activities are included in the Contractor's critical path method (CPM) schedule for:

      i. Activities that may include but are not limited to submittals, fabrication, delivery, and erection of components.

      ii. The sequencing of shop drawings submittals providing time for review and authorization prior to fabrication.

      iii. Monitoring of materials delivery according to approved CPM schedule.

   b. Verify that the Contractor submits the following documents when applicable:

      i. Form CEM-3101, *Notice of Materials to be Used*

      ii. Copies of mill orders

      iii. Camber calculations

      iv. Certified mill test reports including:

         1. Charpy V-notch (CVN) impact test if specified

         2. Grain size if specified

      v. Certificates of compliance for materials used in the work

      vi. Welding and welder certifications

      vii. Calibration certificate for each bolt tension measuring device and calibrated wrench

      viii. Test reports on fastener components and assemblies including rotational capacity (RoCap) testing

ix. For high strength (HS) connections, during or after completion of work, a record of which lots are used in each joint.

c. Coordinate with the METS Rep to:

i. Verify that test samples for check testing are provided to METS.

ii. Provide notification to the Contractor of acceptance.

d. Coordinate the review of shop drawings through the SC Falsework Engineer when the railroad is involved. For questions regarding railroad submittal procedures contact the SC Falsework Engineer; see SC Headquarters Contacts for information.

e. Coordinate review of the welding sequences and procedures and the distortion control plans with the METS Rep and the Designer.

f. Review action and informational submittals with the Designer and the METS Rep as follows:

i. Perform a review for completeness and return incomplete submittals.

ii. Confirm submittals meet the requirements of the contract documents.

iii. Review and authorize or reject submittals and provide written notification to the Contractor.

g. Coordinate BD review and authorization of shop drawings submitted by the Contractor to the SC Office Associates as follows:

i. Verify that the Contractor has submitted shop drawings by checking with the SC Office Associates.

ii. Review these submittals and provide comments to the BD Structure Project Engineer. BD compiles comments and returns the submittals to the Contractor through the SC Office Associates.

h. The Consultant Designer used on Department or oversight contracts will have the responsibility for the review and authorization of submittals normally performed by BD. Coordinate with the Structures & Engineering Services Liaison Engineer and the SC Office Associates on these contracts.

i. Monitor and track the allotted review time for all submittals to prevent delays.

j. If required by the contract, the Contractor submits Bridge Information Models, 3-D modelling, or integrated shop drawings. Coordinate review and authorization with BD.

k. Distribute copies of authorized submittals and shop drawings to SC project staff and the METS Rep.

l. Document activities pertinent to this BCM in the daily reports per BCM C-7, *Daily and Weekly Reports.*

5. After construction:
    a. Review as-built shop drawings for accuracy.
    b. Verify the Contractor submits as-built shop drawings to the SC Office Associates in a timely manner; see guidance in Attachment 3, *Guidance for Completing As-Built Project Plans,* in BCM C-6, *Required Documents to be Submitted During Construction*.
6. File all project documentation (correspondence, materials acceptance, submittals, daily reports, etc.) in the appropriate category in the project records as specified in the *Construction Manual,* Chapter 5, *Contract Administration*, Section 5-102, *Organization of Project Documents.*

Process Outputs

1. Authorized shop drawings and submittals
2. Authorized materials certifications and documentation

Attachments

1. Attachment 1, *Overview of the Review Process for Steel Structure Submittals*