

Bridge Welding Code AWS D1.5 OSC Contract Administration Guide

KNOWLEDGE

Review the requirements in the Special Provisions, the Contract Plans, and the Standard Specifications Section 55-1 .02, "Welding".

Review the following sections of the Bridge Welding Code AWS D1.5:

- Chapter 3, "Workmanship"
- Chapter 4, "Technique"
- Chapter 5, "Qualification"
- Chapter 6, "Inspection"
- All other sections are to be reviewed as needed.

COORDINATION WITH METS

Prior to meeting with the Contractor at the start of the project, make arrangements to meet with a METS representative to discuss the contract and the welding requirements. This will help establish the roles and responsibilities regarding Caltrans quality assurance inspection.

Refer to the "METS Quality Assurance Manual" for clarification on roles and responsibilities of METS Quality Assurance (QA) personnel. (See Attachment No. 5)

Remember, the Structure Representative has the technical control over all structure work including welding. The Structure Representative is responsible to ensure that the welding is done properly, QA inspection is performed adequately, and the work is fully documented in the project files. METS personnel will provide assistance to OSC for QA inspection of welding work. However, due to limited staffing and difficulties in scheduling statewide METS inspection, OSC personnel must assist METS with QA inspection of welding.

NOTICE TO CONTRACTOR

At the preconstruction conference, schedule a pre-welding meeting with the Contractor. Suggest that they invite to the meeting, the appropriate Sub-Contractors (Welding, Fit up & Erection, Steel Fabricator, etc.) and the Quality Control Welding Inspector(s). Prior to the meeting, provide a copy of the meeting agenda to the contractor and suggest that they bring along their quality control plan, all welders qualification papers, testing information, and any other related welding documents.

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PRE-WELDING MEETING

Conduct the meeting with the Prime Contractor, Sub-Contractor(s), Contractor's Quality Control Welding Inspector and Materials Engineering and Testing Services (METS) representative to discuss the following:

Review specific welding requirements noted on the Contract Plans and Special Provisions.

Section 55-1.02 of the Standard Specifications requires the contractor to submit a "Quality Control Program" listing methods and personnel to satisfy the requirements of Part 6 of AWS D1.5. Review the Contractor's quality control program (plan) and discuss any deficiency.

The Contractor is responsible for Quality Control (QC) and must appoint a Quality Control Welding Inspector(s). The Contractor's QC Inspector is responsible to review all of the welds and related work performed in the field and to verify that the work is in conformance with the approved Welding Procedure Specifications (WPS) on a continuous basis. Review the qualifications, and responsibilities for the contractors proposed QC Welding Inspectors. (AWS D1.5, Part 6).

Review the requirements of the Welding Procedure Specifications (WPS), Procedure Qualification Record (PQR), Welder(s), Welding Operator and Tack Welder qualifications. (AWS D1.5, Part 5, "Qualification"). (METS should cover this portion of discussion).

Suggest the Contractor submits a welding schedule identifying all contract welding work. This will assist field inspection of welds and allow proper lead time for identifying the proper weld test to be performed. Time frames for all test results submittals and methods of reporting should be addressed.

Discuss AWS D1.5, Section 3.3 "Assembly", to review tolerance and proper positioning of members. Incorrect fit-up will normally result in deficient welds.

Review all documents to be submitted before during and after each portion of welding is performed. (Refer to Attachment No. 2, "Checklist for Compliance with Bridge Welding Code, AWS D1.5 ")

Discuss corrective measures when welds are not in conformance with the contract documents. (AWS D1.5, section 3.7)

All conversations regarding welding should be documented in writing by the Structure Representative (SR) or SR Assistant. Include a list of all attendees.

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FIELD OFFICE FILE

Documents related to welding work are to be filed in the contract's Project Record Files under the following categories:

Category 5 : Copies of all Correspondence

Category 37: Test results for all field tests

Category 41: Certifications for electrodes

Category 42: (New Category) Contractor's submittals (copies of approved Quality Control Program, approved WPS & PQR, welders qualifications, certified welder reports, nondestructive testing (NDT) qualification, certified test reports, calibration reports for NDT equipment, QC Inspector diaries, etc.)

Category 45: Structure Rep. Diaries (including meeting notes)

Category 46: Assistant Structure Rep. And METS diaries

The use of sub-categories should be utilized to keep the welding documents together.

INSPECTION

The Contractors Quality Control Inspector shall meet the inspection personnel qualifications as discussed in AWS D1.5, section 6.1.3.

The welding inspector from METS should be present on the first day of welding, unless other arrangements are made in the pre-welding meeting.

The Contractor's QC Inspector is responsible for all welding operations in the field and is required to monitor the fabrication, set up, root opening, groove angle, equipment settings, and welding papers, etc. on a regular basis. All procedures for welding, testing and documentation must be in accordance with the approved WPS. (AWS D1.5, section 6, "Inspection").

Check the welders welding conditions and verify that the welding tolerances are meeting the contract requirements established in AWS D1.5, Section 3.

The welders, weld operators, and tack welders shall meet the qualifications and use techniques that conform to the approved WPS (consult METS for assistance).

The surface preparation shall be cleaned as necessary to produce sound welds (AWS D1.5, Section 3).

Production rates should be monitored, as needed, to ensure WPS compliance. Production rate fluctuations, especially increases, may indicate non-conformance with the Specifications.

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TESTING

Complete joint penetration groove welds in main members shall be QC tested by nondestructive testing. Personnel performing nondestructive testing shall be qualified in accordance with the American Society of Nondestructive Testing's (ASNT) Recommended Practice No. SNT-TC-1A, or equivalent (AWS D1.5, Section 6.1.3.4). METS personnel will provide assistance for all testing matters.

Radiographic Testing (RT) shall be used for examination of complete joint penetration groove welds in butt joints subject to calculated tension or reversal of stress. See Contract Plans to identify the type of stress in members. If the stresses are not identified on the Contract Plan, contact the Designer.

Ultrasonic Testing shall be used for examination of all complete joint penetration groove welds in T- and comer joints. See Contract Plans to identify the type of stress in members. If the stresses are not identified on the Contract Plan, contact the Designer.

When required, RT and UT may be used to test all complete joint penetration groove welds in butt joints in compression or shear.

Requirements of RT and UT testing are found in AWS D1.5 Section 6.7.1.2.

Weld tabs (extension bars and run off plates) shall be removed prior to testing (AWS D3.12.2.)

Magnetic-particle Testing (MT) shall be used for examination of fillet welds and partial penetration groove welds joining primary components of main members (e.g. web to flange, diaphragm connection plates to web or flange, etc.). Magnetic-particle inspection of fillet welds is not required for secondary members. Consult with designer for verifications.

Requirements of magnetic-particle testing is found in AWS D1.5, section 6.7.2.

Per AWS D1.5 Section 6.5 "Inspection of Work and Records", The Contractors QC Inspector shall keep a record of all WPS qualifications or other tests that are made. The Engineer should get copies of all certified test results and place in the field office files.