REINFORCING STEEL CHECKLIST

Prior to Beginning Any Welding Work

The following items are in addition to those listing in Attachment 2 and are intended to assist you with the inspection of reinforcing steel welding on your project. Therefore, before starting any welding, review the section entitled Prior to Beginning any Welding Work within the Welding Quality Control Checklist (attachment 2).

Specific References:

Standard Specifications Sections:
- 52-1.08B, Butt Welded Splices
- 52-1.08D, Qualifications of Welding and Mechanical Splices

Structural Welding Code - Reinforcing Steel, AWS D1.4 (appropriate year)
- Welding Procedure Qualification
- Welder Qualification
- Direct Butt Joints - Figure 3.2
- Inspection

An approved WQCP is required before any welding is allowed. Review the requirements outlined in form QCP-1, contract documents and AWS D-1.4. AWS D 1.4 does not provide for prequalified welds; therefore, all WPS’s and welders must be qualified by testing. You will need a copy of the PQR for each WPS that will be used on the project and the qualification test for the welder(s). The PQR and the welder qualification test must be witnessed by either a lab approved by OSM or by OSM personnel. This should be discussed at the meeting with the OSM representative and also related to the contractor at the pre-welding meeting.

Project Record Files

In addition to those items listed in Attachment 2, the following items also need to be filed in Category 9 for reinforcing steel welding:

1. The contractor's QCM and OSM QA reports. These reports shall also include the following information when rebar welding and NDT is being performed:
   a) Evidence showing at least 25% of all butt welds were radiographed by the Contractor.
   b) Evidence the Contractor evaluated the results, corrected deficiencies, radiographed repaired welds and radiographed additional welds as required (review your Special Provisions for specific details on additional testing requirements when welds are rejected).
   c) If more than two repairs of any weld are required, the Contractor must submit a repair plan detailing the problem and their proposed solution. This will prevent excessive heat damage to the reinforcing steel in the vicinity of the weld (heat affected zone).
REINFORCING STEEL CHECKLIST

Project Record Files, (Cont.)

2. A summary sheet recording when radiographs were submitted to and reviewed by OSM personnel and the response to the contractor.

3. Test reports of destructive testing performed for resistance butt welds. OSM will review the testing and perform QA.

During Weld Production

In addition to Attachment 2, the following items shall also be reviewed by the Structure Representative and/or their Assistant:

1. Preheat and interpass temperatures. Ensure the proper temperatures are being used for the grade of steel or Carbon Equivalent (CE) being used. Refer to the Special Provisions and AWS D-1.4-92 table 5.2 or contact OSM personnel.

2. Bar alignment is within allowable tolerances. For example, AWS D-1.4-92 Section 4.2.3 states, for bars No. 10 or smaller the allowable offset is 1/8 inch. Additionally, Section 52-1.08 of the Standard Specifications states, the deviation in alignment of reinforcing bars at a welded splice shall not be more than 1/4 inch over a 3-1/2 foot length of bar.

3. When specified, a minimum of 6 inches on either side of the welded splice is covered with an insulated wrapping to control the rate of cooling after welding is complete. The method of protecting the weld area from heat loss shall be addressed in the approved WQCP.

4. Randomly select welds to be radiographed (for the random selection process, see BCM 145-16). Verify radiographs are being taken on at least 25% of the randomly selected production lot. If welds or radiographs are rejected, verify additional welds are being radiographed and re-shots of the repaired welds are taken in accordance with the Special Provisions.

5. Verify tests are being performed properly in accordance with the Special Provisions and other contract documents (assistance from OSM is required). Radiographs are to be taken at zero degrees from the top of the weld and perpendicular to the root of the weld as shown below.
REINFORCING STEEL CHECKLIST

Weld Acceptance

The Contractor should be encouraged to submit radiographs in a timely manner. This will allow the Contractor the opportunity to make corrections if necessary before the work progresses too far. Since the quality of the welding and the radiographing is the responsibility of the Contractor, the Contractor may choose to continue the work without waiting for OSM review and comment. If so, the contractor proceeds at his own risk and should be informed in writing.

The following items and those in Attachment 2 need to be obtained before accepting any reinforcing steel welding.

1. The contractor shall evaluate the radiographic film and the weld for acceptability and make any necessary repair to the weld and perform additional testing per the contract documents if required.

2. All radiographs, approved, reshot and/or rejected by the QC Inspector, must be reviewed by OSM. When the film is delivered to the Structure Representative, the Structure Representative should prepare a cover memo (attach to the radiograph film) requesting a review by OSM personnel. Before sending your memo and the film, check with your local OSM office for direction and proper sending instructions. On the memo, please include the Structure Representative’s name, telephone number and fax number. Each piece of film shall include the contractor’s name, date of radiograph, name of NDT firm, initials of the radiographer, contract number, part number, and weld number. The letter “R” and repair number shall be placed directly after the weld number to designate a radiograph of a repaired weld.
REINFORCING STEEL CHECKLIST

Weld Acceptance (Cont.)

3. OSM personnel will review radiographs submitted by the contractor and phone the results to the Structure Representative within seven (7) calendar days after the review or as stated in the contract documents. A written report will follow within 10 working days. To ensure a complete review of the contractor’s QC inspection, the radiographs of welds rejected by the contractor’s QC Inspector will be reviewed by OSM. OSM will report their findings or the rejections to the Structure Representative as information only. These findings will be reported as either:

   a) “Reviewed film and interpretations submitted by the Contractor are consistent with the Office of Structural Materials findings.

   Or

   b) "Reviewed film and interpretations submitted by the Contractor are inconsistent with the Office of Structural Materials findings and we recommend the Contractor review the QC procedures currently in use."

4. The Structure Representative can accept welds if both the QC Inspector and the QA Inspector agree the welding quality is acceptable by visual inspection and NDT in accordance with AWS D1.4.

5. In addition to the inspection, the contractor shall furnish to the Engineer, in accordance with Section 6-1.07, Certificate of Compliance, of the Standard Specifications and Section 8 of the Special Provisions, a Certificate of Compliance for each item of work for which welding was performed. This certificate shall state that all of the materials and workmanship incorporated in the work, and all required tests and inspections of this work, have been performed in accordance with the details shown on the plans, and the requirements of the Standard Specifications and the Special Provisions.

   Project Close Out

1. The location of all splices need to be shown on the as build drawings per BCM 9-1.1.

2. Met with the OSM representative to confirm all NCR and any other details are resolved before accepting the project.