Quality Assurance
Procedure QAP 5916

Method of Test For

Visual Inspection of Joint Fit-Up

1. SCOPE

1.1 The purpose of this procedure is to assure that weld joint fit-up meets the criteria of AASHTO/AWS D1.5M/D1.5 current edition.

2. PERSONNEL

2.1 Visual inspection shall be performed by an AWS CWI or an assistant under the CWI's supervision, all as defined by the Bridge Welding Code.

3. REFERENCE

3.1 The latest edition of AASHTO/AWS D1.5M/D1.5 current edition.

4. PROCEDURE

4.1 Randomly inspect the following items during / after fit-up and prior to welding:

4.1.1 Weld edge preparation in accordance with AASHTO/AWS D1.5M/D1.5 current edition - 3.2.

4.1.2 Gaps in accordance with D1.5 – Section 3.

4.1.3 Alignment, groove angle, root opening and root face D1.5 - 3.3.

4.2 Inspect the following areas:

4.3.1 Bearing (flange tilt or warp in the areas of bearing, including bearing stiffeners).

4.3.2 Intermediate stiffeners shall be checked for fit. Welding under force fit conditions may induce subsurface cracks in the start and stop-start termini.

4.3.3 Splices shall be checked for offset, re-entrant corners, gap, edge to centerline hole clearance, and parallelism.

5. ACCEPTANCE CRITERIA

5.1 Fit -up for welding shall meet the following criteria:

5.1.1 Root openings (gap) of complete joint penetration welds with or without backup bars shall be in accordance with the plans, shop drawings, accepted Welding Procedure Specifications and within the tolerances shown on in AASHTO/ AWS D1.5M/D1.5 current edition – Section 3 Figures.

5.1.2 Root openings (gap) between parts to be fillet welded shall not exceed 3/16 in., except in cases involving plates 3 in. or greater in thickness. If, after straightening and in assembly, the root opening (gap) can not be closed to meet this tolerance, then a maximum root opening (gap) of 5/16 in. is permissible, if a backing weld or backup bar is used.

For root openings (gap) in fillet welds greater than 1/16 in., the leg of the fillet weld must be by the root opening (AASHTO/AWS D1.5 - current edition Section 3.3)

5.1.3 No fillers shall be used (AASHTO/AWS D1.5M/D1.5 current edition -2.5), unless approved by the Engineer.

5.1.4 The faying surfaces of plug and slot welds, and butt joints landing on a backing, shall not exceed 1/16 in (AASHTO/AWS D1.5M/ D1.5 current edition Section 3.3).

5.1.5 Misalignment (offset) of butt welded joints shall not exceed 10% of T (where T is the thickness of the thinner plate), but in no case shall misalignment exceed 1/8 in. However, when ultrasonic testing is the method used for subsurface evaluation, intimate coupling shall be required to evaluate the joint in Leg I (AASHTO/AWS D1.5M/D1.5 current edition - 6.19, 1st Note of Table 6.2). If the shop cannot fabricate joints to meet this criteria, QC radiography shall be required. Misalignment shall be based on the center line of the parts. Correction of misalignment in such cases shall be accomplished by drawing the parts together such that a slope no greater than 1/2 in. in 12 in. results 1:24 ratio (AASHTO/ AWSD1.5 current edition - 3.3.3).

5.2 Bearings and stiffeners fit-up shall meet the following criteria:

5.2.1 Where tight fit of stiffeners is required, a gap not greater than 1/16 in. is allowed (AASHTO/AWS D1.5M/D1.5 current edition - 3.5.1.10) Gaps greater than 3/32 in. shall be corrected by shimming underneath the stiffener and welding the stiffener to the shim. The shim shall be of sufficient thickness to preclude fusion to the flange and provide the required fillet weld size. This shim base metal shall be an approved base metal (AASHTO/AWS D1.5M/ D1.5 current edition - 1.2.2) and the weld shall meet the requirements of D1.5. The foregoing is a requirement of the Bridge Welding Code. However, Colorado specifications may include provision for maintaining a gap. This reduces restraint cracking in the start and stop- start termini regions.

5.2.2 Intermediate stiffeners shall be straight to within 1/2 inch (AASHTO/AWS D1.5M/ D1.5 - 3.5.1.11).

5.2.3 Bearing at the bearing stiffener-flange interface surface shall have 75% of their area in contact with the flange, or no more than a 0.10 in. gap.

5.2.4 When contact surface tolerances at the bearings are not specified, the remaining 25% shall have no gap greater than 1/32 in. The intent is clear that the flange maintain bearing (AASHTO/AWS D1.5M/D1.5 current edition- 3.5.1.9), however, no tolerance is stated. Inform the Engineer of gaps of greater than 1/16 in.

5.2.5 Bearing stiffeners shall be straight within 1/4 in. where the length of the stiffener is up to 6 ft. in length. Bearing stiffeners greater than 6 ft. in length shall be straight within 1/2 in. The centerline of the stiffener shall lie within the thickness of the stiffener (AASHTO/AWS D1.5M/ D1.5 current edition - 3.5.1.12)

5.3 Field splices (welded or bolted) shall meet the following criteria:

5.3.1 The offset of bolted splices of main members shall show no offset of greater than 1/16 in.(after any fillers are in place) and all surfaces shall lie in a parallel plane.

5.3.2 The rolling direction of main members shall be as indicated in the plans.

5.3.3 The corresponding surfaces of secondary members at bolted splices shall show no offset greater than 1/8 in (AASHTO/AWS D1.5M/D1.5 current edition - 3.5.1.15).

5.3.4 Members that are to be field welded shall have dimensions which are accurate to a template to be used in the field, or shall be shop assembled (AASHTO/AWS D1.5M/ D1.5 current edition -3.5.2).

5.3.5 The ends of members (flanges and webs) shall be finished in the same plane precluding re-entrant corners.