

Continuous beam and plate girders including sections adjacent to hinged, pin connected, sliding or rocker bearing joints shall have at least three adjacent segments assembled and holes reamed or drilled while assembled.

The fit-up of field welded connections shall be checked by similar shop assembly.

Longitudinal or transverse beams and girders to which diaphragms and floor beams frame or connect shall be shop assembled to check fit-up of connections to be field welded or to ream or drill holes for bolted connections. Trusses shall be assembled in lengths not less than three abutting panels before field connections are drilled or reamed while assembled.

Deck expansion devices shall be shop assembled after fabrication to check fit-up, straightness and roadway cross slope changes. Where a phased construction sequence is a mandatory part of the contract plans, part-width deck segments may be fabricated without the required shop assembly if shop drawings have incorporated a laydown, similar to 863.08, defining vertical offset dimensions from a full length common baseline to all roadway changes including sidewalks, roundings, crowns and field splice points of the expansion device.

Parts not completely assembled in the shop shall be secured by bolts, as far as practicable, to prevent damage in handling and shipping. Field splice plates shall be bolted in their final position in the shop or shifted laterally with respect to their final position so that the ends of the plates are flush with the ends of the member. Welding or tacking will not be permitted on bolted assemblies unless by written acceptance from OSE. Welding authorized shall be performed according to 863.23. The QCFS shall document that shop assembly has been performed per specification.

**863.27 Nondestructive Testing.** Nondestructive testing (NDT) shall conform to the AASHTO/AWS Bridge Welding Code, as amended by Supplement 1011, and this item. Welded repairs in main members for thick scabs, deep kerfs or nicks and similar gross flaws shall be subject to ultrasonic or radiographic inspection as directed by OSE or Engineer (field repairs). All examined welds and base metal adjacent to a welded joint shall be subject to the quality requirements specified in 863.23. Welds requiring nondestructive testing shall be allowed to cool before they are tested.

Where controversy may arise, regarding the interpretation of radiographs, magnetic particle indications or the acceptability of welds, OSE shall have the final authority to approve the welds. Field radiographic inspection shall be accepted by OSE prior to subsequent construction activities that would make weld repair inaccessible.

1. Radiographic Inspection of Welds. Radiographic inspection shall be made of the following welds:

- (a) The full length of all butt welds in flange material of plate girders or rolled beams.
- (b) The top and bottom one-third of transverse web splices in plate girders or rolled beams including the cope holes, if any.

- (c) Butt welds in longitudinal stiffeners attached to tension areas of webs.
- (d) Twenty-five percent of each longitudinal web splice as selected by the inspector.
- (e) Full length of field flange cut repairs.
- (f) Any other weld specified by the plans.

The radiograph identification mark shown on the shop drawing layout shall be steel stamped in the area marked "Weld Identification" of Figures 6.1A thru 6.1D of the AASHTO/AWS Bridge Welding Code in a manner to make it visible in the radiograph of the area without resorting to superimposed like markings. Steel Stamped identification marks on flange plates shall be placed so that after assembly of girders, they will be on the inside of flange, but out of the area to which the web will fasten. Films of repaired welds shall also be identified by the letter "R". Steel Stamped identification numbers shall not be placed within the weld area. Other required markings shall be made by using superimposed characters. Where areas being radiographed are adjacent to the edge of the plate, the film shall be located and a technique employed which will include the top and bottom images of the plate edge. Films 114 by 432 mm (4 ½ by 17 inches) shall be used where practicable. The minimum film size shall be 114 by 254 mm (4 ½ by 10 inches).

Whenever an unacceptable weld occurs in the web sections enumerated, an adjoining 300 mm (12 inch) length of weld not previously examined shall be radiographed. If unacceptable flaws are found in this adjoining segment, the remainder of the weld (if any) shall be examined.

Radiographs shall be submitted to OSE for acceptance and shall be accompanied by certification from the Contractor or Fabricator that the radiographic examination was performed in conformance to these specifications, field sketches and by two copies of the radiographic technician's analysis report listing unacceptable defects and causes for rejection. The technician's report shall include identification and energy level or source strength in becquerels of the radiation source, film to source distance, film type, and exposure time for each radiograph as well as the signature of the technician and his NDT level. The contact films shall become the property of the Department. Field main material repairs shall have sketches which clearly show specific locations, lengths and depths of field cuts or damages repaired by field welding.

2. Magnetic Particle Inspection of Welds. All welding required in the fabrication of each beam or girder shall be completed and all visual defects shall be corrected prior to the examination by magnetic particle inspection. Dry powder magnetic particle inspection shall be made of at least 0.3 m (1 foot) of each 3.0 m (10 feet) or fraction thereof for each size of weld in the following:

- (a) Flange-to-web welds
- (b) Moment plate to flange welds
- (c) Bearing stiffener welds
- (d) Other welds designated by the plans.