Guidance Note 5.02

Post-weld dressing

Scope

This Guidance Note provides advice as to where and when post-weld dressing may be necessary. It applies to all routine welding made in the fabrication of steel bridgework and applies to the weld surface itself and the immediately adjacent platework (up to about 50 mm from the weld toe).

Background

Post-weld dressing is usually carried out by the fabricator in the workshop. It usually involves grinding of the weld and adjacent surfaces, and blending the weld into the parent metal on either side of the joint. It can be carried out by a disc or stone grinder, by a straight grinder with a tungsten-tipped cutter, or by continuous belt hand-held or trolley-mounted grinding machines.

Relevant clauses in the Standards

- BS EN 1011 [1]: Parts 1 and 2.

Many of the clauses in both parts state requirements either for post-weld dressing to comply with the design specification or to facilitate appropriate inspection and testing concerning temporary attachments, arcing, quality requirements, correction of non-conformity, post-weld cleaning plus surface finish and weld profile.

General

The surface of a weld made in a correctly aligned joint, in accordance with an approved welding procedure, by a competent welder, should not need any post-weld dressing (except as noted in situation 5).

Situations that may require post-weld dressing

Post weld dressing may be necessary for a number of reasons, as given below.

1. To make good a misalignment at a butt weld. Local unfused edges and/or out-of-tolerance steps in a butt-weld may be able to be made acceptable by local dressing.

   If the extent of such misalignment is extensive (more than 10% of the length of the joint), it may be necessary to remake the weld (not preferred unless there is a critical design or aesthetic reason for doing so). Otherwise, it may be possible to build up locally by additional welding and dressing. (This can lead to further distortions if not performed with great care).

2. To deal with small laminations adjacent to the weld.

   Extensive, deeper laminations will have to be dealt with on their merits.

3. To remove weld spatter and/or the result of stray arc strikes on or adjacent to the weld.

4. To assist or permit the performance of non-destructive testing if the weld surface and/or fusion into the parent metal is uneven.

   When undercut is within the permissible limits of the application standard, it may lead to spurious indications when Magnetic Particle or Dye Penetrant inspection is used in an attempt to detect surface-breaking defects.

5. To achieve and confirm a high fatigue classification of welds assumed in the design.

   These high classifications are not usually used in the class of highway bridge work covered by the scope of the Guidance Notes, but in particular circumstances it may be appropriate to do so.

However, high classifications are needed in railway bridges, where, if post weld dressing is required, the final grinding should be done so as to leave the grinding marks in the direction of the principal stress, to avoid forming stress raisers.

6. To provide a flush surface where required for reasons of design, execution or appearance.

   Examples are:

   - fitting of other elements (the use of cope holes where welds intersect is no longer mandatory).
   - flushing the bottom of the bottom flange of a girder when the bridge is erected by launching over rollers.
   - flushing the top of the bottom flange butt welds of weathering steel girders to avoid ponding of water.·
   - flushing of a web butt weld in exposed faces of girders - this is not recommended as a general practice and often leaves a more obvious joint than the as-finished butt weld.
   - flushing of in-line joints in hollow sections, although it should be noted that in BS EN 1090-2 [2], this is not permitted on single sided butt welds executed without backing, unless otherwise specified.

7. To ensure that the remnants of temporary attachment welds are completely removed and that the area is free of defects.

8. To assist in the effective cleaning, degreasing and other preparation for subsequent protective treatment.

   In some instances, the smooth weld surface that results from particular welding processes, needs roughening to provide an adequate key for metal-sprayed coatings to adhere properly. In some such cases, even grit-blasting is not effective in this respect, and may be an indication of a faulty weld procedure leading to an excessively hard weld surface.

9. To blend small local repairs of poor profile in long welds into the adjacent profile. Similarly, to blend crater cracked and/or poorly shaped stop-starts and to remove or blend out defects at the ends of any weld.

Apart from 5 and 6, the above reasons are considered normal requirements for the quality of workmanship specified for bridge steelwork. If a full penetration flush butt weld is required for reasons of strength, fatigue or appearance, this must be made clear on the drawings or in the project specification.

References

[1] BS EN 1011, Welding. Recommendations for welding of metallic materials
Part 1: 2009, General guidance on arc welding
Part 2: 2001, Arc welding of ferritic steels.

[2] BS EN 1090-2: 2018+A1:2024, Execution of steel structures and aluminium structures.
Part 2: Technical requirements for steel structures