

SECTION 5.08 SHEAR CONNECTORS

5.08.01--Description: This item shall consist of furnishing, placing and welding stud shear connectors to the top of structural steel supporting members to induce composite action with the concrete slab. The shear connectors shall conform to the details, size and quantity shown on the plans for the designated locations.

5.08.02--Materials: Stud shear connectors shall conform to the requirements of Subarticle M.06.02-12.

5.08.03--Construction Methods: The surface on which the shear connectors are to be welded shall be thoroughly cleaned of mill scale, rust, dirt, paint, grease or other materials which would reduce the quality of the weld. The stud shear connectors shall be free from rust scale, rust pits and oil at the time of welding.

Before welding any stud shear connectors, the Contractor shall submit for the Engineer's approval a notarized laboratory qualification from the manufacturer certifying that each shipment of material meets the minimum requirements. Each separate container shall be clearly tagged or marked by the manufacturer for identification with the certified laboratory qualification.

Stud shear connectors shall be end welded with automatically timed stud welding equipment connected to a recommended power source. If two or more stud welding guns are to be operated from the same power source, they shall be interlocked so that only one gun can operate at a time and so the power source has fully recovered from making one weld before another weld is started. Studs may be stacked to meet heights greater than the 200 mm maximum for individual studs.

Welding, either in the shop or field, will not be permitted when the air temperature is below 2° C, except with the special permission of the Engineer, and in no case will welding be permitted when air temperature is below -3° C; or when surfaces to be welded are wet from condensation, rain, snow or ice, when rain or snow is falling on the surfaces to be welded, or during periods of high wind, unless the welding operation and the work are properly protected. The minimum requirement for preheat tabulated elsewhere herein and in the current "ANSI/AASHTO/AWS D1.5 Bridge Welding Code" shall apply, except where the requirements noted above shall take precedence. While in operation, the welding gun shall be held in position without movement until the weld metal has solidified. After cooling, the ferrules shall be removed from each stud. Two successive studs on each beam or girder shall be welded and withstand the test of being bent to 45° by striking with a hammer (without weld or stud failure) before proceeding with further stud welding. The Engineer shall be promptly informed of any changes in the welding procedure at any time during construction. If the reduction in the height of studs as they are welded becomes less than normal, welding shall be stopped immediately and not resumed until the cause has been determined and corrected.

When so directed by the Engineer, the Contractor shall test additional studs by bending. Studs exhibiting no signs of failure after bending shall be left in the bent position.

Before welding a new stud where a defective one has been removed, the area shall be ground smooth and flush; or in the case of a pullout of metal, the pocket shall be filled with weld metal using the shielded metal-arc process with low-hydrogen welding electrodes and then ground flush. Where a stud is defective or does not have a full 360° weld, a new stud may be welded adjacent to the defective stud. However, this may be done only in areas of compression or where permitted by the Engineer.

The Engineer may at any time require the Contractor to supply sample studs for a requalification test without additional compensation.

5.08.04--Method of Measurement: Shear connectors, being paid for on a lump sum basis, will not be measured for payment.

5.08.05--Basis of Payment: This work will be paid for at the contract lump sum price for "Shear Connectors," which price shall include all materials, tools, equipment and labor incidental thereto for all work under this item on the project.

Pay Item
Shear Connectors

Pay Unit
L.S.