

ITEM 446

STRUCTURAL WELDING

446.1 Description. This item shall govern for the field welding of structural steel and reinforcing steel.

446.2 General. All welding operations, processes, equipment, materials, workmanship and inspection shall conform to the requirements of the latest Specifications for Welded Highway & Railway Bridges as published by the American Welding Society.

Certification of welders will be required. If no weld splices of main stress-carrying members are involved, the tests shall consist of the performance of a few sample welds by the welder and the fracture and visual inspection thereof by the Engineer. If splices of main stress-carrying members are involved, certification procedures shall conform to the latest Specifications for Welded Highway & Railway Bridges as published by the American Welding Society. The expense of certification tests shall be borne by the contractor.

446.3 Classifications of Electrodes permitted for Field Welds.

Table No. 1

| Type of Steel | Main Members<br>Groove & Fillet Welds |         | Secondary Members<br>Groove & Fillet Welds |        |
|---------------|---------------------------------------|---------|--|--------|
| Steel Piling  | E6010                                 | E60T-8  | E60XX                                      | E60T-8 |
| A53 Pipe      | E6011                                 | E70S-1B | E70XX                                      | E7XT-1 |
| A500          | E7016                                 | ER70S-2 | E70S-1B                                    | E7XT-5 |
| A501          | E7018                                 | ER70S-3 | E70S-2                                     | E7XT-6 |
| Armor Joints  |                                       | ER70S-6 | E70S-3                                     | E7XT-8 |
|               |                                       | ER70S-7 | E70S-6                                     |        |
|               |                                       |         | E70U-1                                     |        |

| Type of Steel          | Main Members          |         | Secondary Members     |         |
|------------------------|-----------------------|---------|-----------------------|---------|
|                        | Groove & Fillet Welds |         | Groove & Fillet Welds |         |
| A36                    | E7016                 | ER70S-2 | E7016                 | ER70S-2 |
| A441                   | E7018                 | ER70S-3 | E7018                 | ER70S-3 |
| A572,<br>Grade 50      | E7XT-1                | ER70S-6 | E7XT-1                | ER70S-6 |
| A588                   | E7XT-5                | ER70S-7 | E7XT-5                | ER70S-7 |
| A242<br>Deck Plate     | E7XT-6                |         | E7XT-6                |         |
| API Pipe               | E7XT-8                |         | E7XT-8                |         |
| Reinforc-<br>ing Steel | E7016                 | E7018   |                       |         |

446.4 Reinforcing Steel. Provisions made herein for the welding of reinforcing steel are by the shielded metal-arc process. Other processes may be permitted with the specific approval of the Engineer.

Splicing of reinforcing steel, by welding, shall be done only at the locations shown on the plans.

Reinforcing steel to be welded shall be new billet steel conforming to ASTM Designation A615 and shall also conform to the following chemical composition.

|                   |              |
|-------------------|--------------|
| Maximum Carbon    | 0.40 Percent |
| Maximum Manganese | 1.30 Percent |

Low hydrogen electrodes, as specified in Table No. 1, will be required for all welding of reinforcing steel.

For all bars #8 and larger, butt splices will be required. For #7 bars and smaller, lap splices will be required.

Fillet welds in lap splices shall be a minimum of 4 inches in length and shall be welded on each side of the lap joint. For bars #5 and smaller, welding from one side of the lap will be permitted by the Engineer, when it is impractical to weld from both sides of the joint, but in this case, the weld shall be a minimum of 6 inches in length.

446.5 Measurement & Payment. No measurement or payment will be made under this item for the work prescribed, but shall be considered subsidiary to the various other bid items called for in the contract.

There are line code(s), description(s), and unit(s) for this item.

END OF ITEM 446

SUMMARY SHEET

ITEM 446 - STRUCTURAL WELDING

Other Specifications Required

Item 442 - Metals for Structures

Item 85 - Reinforcing Steel

Reference Standards

1. AWS Specifications for Welded Highway & Railway Bridges
2. ASTM A615

Description:

Give requirements for the field welding of structural steel and reinforcing steel.

Payment:

None

DO NOT INCLUDE THIS SHEET IN THE CONTRACT SPECIFICATIONS