703-R-792 REINFORCING BARS

*(Adopted 01-16-25)*

The Standard Specifications are revised as follows:

SECTION 703, BEGIN LINE 52, INSERT AS FOLLOWS:

**703.06 Placing and Fastening**

***(a) General Requirements***

Reinforcing bars shall not be ordered for piers or bents to be founded on soil or rock until the foundation conditions have been investigated. The bottom elevations of such footings will then be determined. Written permission will then be given to order such reinforcing bars. Sufficient excavation and all necessary soundings shall be made as directed so that exact bottom elevations of footings may be determined.

All dimensions shown on the plans for spacing of reinforcing bars apply to centers of bars unless otherwise noted. All bars shall be accurately placed and, during placing of the concrete, held firmly in the position as shown on the plans. Distances from the forms shall be maintained by means of chairs, ties, hangers, or other approved support devices. All reinforcing bars shall be wired rigidly or fastened securely at sufficient intervals to hold the bars in place. *Welding of reinforcing bars shall not be performed except as noted in 703.06(c).* Epoxy coated reinforcing bars shall be tied with epoxy coated or plastic coated tie wire. ~~Chairs and supports holding upper layers of reinforcing bars shall support the transverse bars.~~ The upper layer and lower layer of reinforcing bars in RCBAs and bridge floors shall be tied or fastened at a minimum of every other intersection of the longitudinal and transverse bars to prevent an upward or a lateral movement of a bar from the planned position.

Layers of reinforcing bars shall be separated by ~~spacers~~*support devices in accordance with 910.01(b)11 or epoxy coated reinforcing bars. Epoxy coated reinforcing bars used to separate and support layers of reinforcing bars shall be shop bent to the dimensions required to secure the layers of reinforcing bars in the positions shown on the plans. The size and spacing of support devices or epoxy coated reinforcing bars used as supports shall be such that the plan reinforcing bars are not displaced by the weight of the concrete, upper layers of reinforcing bars, or construction loads, but in no case shall the spacing exceed 4 ft in any direction*. Reinforcing bars shall be separated from horizontal surfaces by being suspended or supported on approved ~~chairs and spacers~~*support devices* capable of supporting the designed loads. Supports and spacers shall be of such shape as to be easily encased in concrete. That portion which is in contact with the forms shall be non-corrosive and non-staining material. They shall be of an approved type. ~~Vertical stirrups shall always pass around main tension members and shall be securely attached thereto.~~ The use of pebbles, pieces of broken stone or bricks, metal pipe, wooden blocks, and similar devices for holding bars in position will not be allowed.

After being placed, reinforcing bars will be inspected and approved before the concrete is deposited. The positions of the reinforcing bars shall not be disturbed both during and after depositing the concrete. All concrete placed in violation of this requirement may be rejected and its removal will be required. Where reinforcing bars project from construction joints, all mortar clinging to the reinforcing bars from previous

pours shall be removed before the next enveloping pour is made.

***(b) Splicing and Lapping***

***1. Reinforcing Bars***

All reinforcing bars shall be furnished in the full lengths shown on the plans unless splices are indicated. No other splicing will be allowed except with written permission. Unless otherwise shown on the plans, reinforcing bars shall be lapped ~~32~~*64* diameters to make a splice. Construction joints shall not be made within the limits of lapped bars. For lapped splices, reinforcing bars shall be placed in contact and rigidly clamped or wired in an approved manner. Insofar as possible, splices shall be staggered and well distributed or located at points of low tensile stress. Splices will not be allowed at points where the section does not provide a distance of at least 2 in. between the splice and the nearest adjacent bar or surface of the concrete.

When splicing is indicated or allowed, an appropriate splice system on the QPL of Reinforcing Bar Splicing Systems may be used in lieu of lapped bars. The splicing system shall be installed in accordance with the manufacturer's recommendations. If an offset splicing system is selected, it shall only be used on spiral, hoop, or ring-type reinforcement.

~~WWR, when required, shall be placed as shown on the plans or as otherwise directed. The sheets shall overlap sufficiently to maintain uniform strength and shall be securely fastened at lapped ends and edges. The laps shall be no less than one mesh in width.~~

***2. Spiral Reinforcement***

Spiral reinforcement, consisting of evenly spaced continuous spirals, shall be held firmly in place by attachment to vertical reinforcement. The spirals shall be held true to line by vertical spacers. Anchorage for spiral reinforcement shall be provided with 1 1/2 extra turns of the spiral rod or wire at each end of the spiral unit. Splices in spiral rods or wire shall be made with a lap of 1 1/2 turns.

***3. Threaded Tie Bar Assemblies***

Threaded tie bar assemblies may be used in lieu of spliced reinforcing bars shown on the plans. Threaded tie bar assemblies shall achieve the minimum strength in accordance with 910.01(b)2. The Contractor shall coat any exposed part of threaded bar assemblies in accordance with 910.01(b)2.

***(c) Tack Welding Reinforcing Bars in Precast Concrete Products***

*In lieu of tying or using WWR in accordance with 737, reinforcing bars used in the precast concrete products listed below may be tack welded in accordance with the following:*

1. *Reinforcing bars to be tack welded shall be in accordance with 910.01(b)1.*

2. *All welding procedures shall be qualified to AWS D1.4. All weld procedures shall be approved by an AWS Certified Welding*

*Inspector prior to any production welding. Welds shall have a satisfactory appearance. Reinforcing bars that exhibit notching, undercutting, or a loss of cross-section shall be replaced.*

3. *Tack welding shall only be performed at intersections of reinforcing bars. Reinforcing bars shall not be spliced by welding.*

4. *Tack welding of reinforcing bars shall only be used when manufacturing the following precast concrete products:*

   *a. manhole lids,*
   *b. manhole cone sections,*
   *c. basins, including top and bottom slabs,*
   *d. inlets, including top and bottom slabs,*
   *e. square, rectangular, and round grade extensions,*
   *f. median barriers.*

5. *Mats or sheets of reinforcing bars created by tack welding the intersections of a grid of reinforcing bars shall be made continuous by providing lap splices in accordance with AASHTO LRFD Bridge Design Specifications and 703.06.*

6. *Epoxy-coated reinforcing bars that are to be tack welded shall have the epoxy coating removed in the vicinity of the weld. Once the welded area has cooled below 90°F and before visible oxidation appears, the welded area and surrounding bare metal shall be cleaned and recoated in accordance with 910.01(b)9.*

SECTION 703, BEGIN LINE 157, INSERT AS FOLLOWS:

The cost of ~~metal chairs~~*support devices or epoxy coated reinforcing bars used as supports*, spacers, clips, wire, or other mechanical means used for fastening or holding reinforcement in place, and laps shall be included in the cost of reinforcing bars. The cost of coating materials and repair of damaged or removed coating materials on reinforcing bars and on metal chairs, spacers, clips, or other mechanical means used for fastening or holding reinforcement in place, and laps shall be included in the cost of epoxy coated reinforcing bars. If threaded tie bar assemblies are used in lieu of spliced reinforcing bars as shown on the plans, the cost of such assemblies shall be included in the cost of reinforcing bars.

If WWR is required, the cost of furnishing and placing shall be included in the cost of the concrete in which it is placed.

SECTION 707, BEGIN LINE 84, INSERT AS FOLLOWS:

**707.04 Steel and Concrete Requirements**

**(a) Reinforcing Bars**

A tight coat of concrete grout extending 1/2 in. maximum from the top of precast concrete and precast prestressed concrete structural members will be allowed to remain on

reinforcing bars extending from precast concrete and precast prestressed concrete structural members. All loose and flaky material on these reinforcing bars shall be removed. Lap splices shall be in accordance with 703.06. *In lieu of tying or using WWR in accordance with 737, reinforcing bars used in precast or precast prestressed concrete structural members may be welded in accordance with 703.06(c).*

SECTION 707, AFTER LINE 565, INSERT AS FOLLOWS:

*All costs associated with the welding of weldable reinforcing bars, including but not limited to welding consumables, qualifying procedures and welders to AWS D1.4, other AWS D1.4 documents, QC inspection and approval by an AWS certified welding inspector, and all other items incidental to this work shall be included in the cost of the pay items of this section.*

The cost of tensioning rods and steel plates shall be included in the cost of the pay items of this section.

SECTION 910, BEGIN LINE 22, INSERT AS FOLLOWS:

**(b) Specific Requirements**

**1. Billet Steel Bars**

Billet steel bars shall be in accordance with ASTM A615 *or ASTM A706*.

*When the specifications allow for welding of bars, and the Contractor chooses to weld, only bars produced in accordance with ASTM A706 and marked with a W or both an S and W shall be welded. Bars produced in accordance with ASTM A615 and marked only with an S shall not be welded.*

SECTION 910, BEGIN LINE 93, INSERT AS FOLLOWS:

**8. Steel Spiral Reinforcement**

Steel spiral reinforcement shall be either:

a. deformed billet steel, ASTM A615 *or ASTM A706*, ~~g~~*G*rade 60, or

b. cold drawn steel wire, ASTM A1064.

SECTION 910, BEGIN LINE 135, INSERT AS FOLLOWS:

**10. Dowel Bars**

Dowel bars shall be plain billet steel in accordance with ASTM A615~~,~~ ~~g~~*G*rade 40 or higher, *or ASTM A706 Grade 60 or higher,* except that the bend test and elongation requirements will not apply. The dowel bar area and weight for the nominal bar diameter shall be as follows: