Utah Department of Transportation

2017 Standard Specifications

For Road and Bridge Construction

January 1, 2017

Implementation 01-09-2017

SECTION 03211

REINFORCING STEEL AND WELDED WIRE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Reinforcing steel, steel welded wire reinforcement, dowelled anchors, T-headed bars, mechanical couplers, and grouted splice couplers.

B. Coating for reinforcing steel, steel welded wire reinforcement, and dowelled anchors.

1.2 RELATED SECTIONS Not Used

1.3 REFERENCES

A. AASHTO M 31: Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

B. AASHTO M 55: Steel Welded Wire Reinforcement, Plain, for Concrete

C. AASHTO M 111: Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

D. AASHTO M 235: Epoxy Resin Adhesives

E. AASHTO T 106: Compressive Strength of Hydraulic Cement Mortar (Using 50-mm or 2-in Cube Specimens)

F. ASTM A 108: Steel Bar, Carbon and Alloy, Cold-Finished

G. ASTM A 493: Stainless Steel Wire and Wire Rods for Cold Heading and Cold Forging

H. ASTM A 706: Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement

I. ASTM A 767: Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement

J. ASTM A 775: Epoxy-Coated Steel Reinforcing Bars

K. ASTM A 934: Epoxy-Coated Prefabricated Steel Reinforcing Bars

b. Members 10 to 20 inches in thickness
   1) Cover: ±¼ inch.
   2) Longitudinal spacing for individual bars, stirrups, or ties: ±1 inch.
      a) Clear spacing between bars: not less than the greater of 1½ inches, 1½ bar diameters, and 1½ times the maximum aggregate size.
   3) Average spacing for 10 bars: $+^{1}/_{16}$ inch.
      a) Do not use tolerance to decrease number of bars or increase bar spacing.

c. Members greater than 20 inches in thickness
   1) Cover: -¼ inch, + ½ inch.
   2) Spacing for stirrups or ties: ±3 inches.
      a) Clear spacing between bars: not less than the greater of 1½ inches, 1½ bar diameters, and 1½ times the maximum aggregate size.
   3) Longitudinal bar spacing ±3 inches.
      a) Clear spacing between bars: not less than the greater of 1½ inches, 1½ bar diameters, and 1½ times the maximum aggregate size.
   4) Average spacing for 20 bars: +¼ inch.
      a) Do not use tolerance to decrease number of bars or increase bar spacing.

d. Length of bar laps -1 inch

e. Embedment length -1 inch

D. Tie bars together with ties at intersections except when spacing is less than 9 inches in each direction, in which case tie at alternate intersections.
   1. Tie bundled bars together at not more than 6 ft centers.

E. Maintain the required distance from the forms and between layers of reinforcement with prefabricated chairs, ties, hangers, or other devices.

F. Use precast concrete block bar supports only when the concrete is placed in contact with the soil and then only as the support for the bottom mat of bars.

G. Do not tack weld reinforcing bars in place.

H. Overlap at least one panel of welded wire reinforcement sheets to each other and fasten at the ends and edges.

I. Support reinforcing steel for concrete "T" beams, pier caps, approach slabs, and deck slabs on metal chairs or bar supports according to this Section, Article 2.6.

J. Space chairs for supporting the top steel and bolsters for supporting the bottom steel not more than 4 ft on center of the bar in each direction.

K. Tie deck steel to beams or forms at regular intervals of not more than 5 ft on center along the beams to prevent steel movement during concrete placement.

L. Support reinforcing steel for slabs on grade on metal chairs attached to a sand plate or use precast concrete block supports according to this Section, Article 2.6.

M. Do not place concrete until the Engineer has verified the reinforcement placement and fastening.

N. Place stainless steel reinforcement so that it does not come in contact with carbon steel.
   1. Do not tie stainless steel to uncoated or coated carbon steel reinforcement, galvanized attachments, or galvanized conduits.
      a. Maintain at least 1 inch clearance between the metals using nylon or polyethylene spacers when stainless steel reinforcing or dowels must be near coated or uncoated reinforcing, or galvanized metals. Bind using nylon cable ties.
         1) Maintain at least 1inch clearance unless insufficient space exists.
            a) Either bar may be sleeved with a 1/8 inch minimum thick insulator material, such as polyethylene, nylon or rubber tube, extending at least 1 inch in either direction past the point of closest contact between the two dissimilar bars.
            b) Sleeves are not allowed for bars that run parallel to each other.

3.3 FIELD CUTTING

A. Saw or shear coated bars that are specified to be cut in the field. Do not flame cut.

B. Repair the coating at the sawed or sheared end using the specified patching or repair material.

3.4 SPLICING

A. Furnish all reinforcing steel in the lengths shown.