

REINFORCEMENT BARS (Illinois Tollway)

Effective: February 12, 2020

Revised: February 25, 2022

Description. The work shall consist of furnishing, providing additional material for testing and placing reinforcement bars as required by Section 508 of the Standard Specifications except as modified herein. For work outside the limits of bridge approach pavement, all references in the IDOT Highway Standards and Standard Specifications for reinforcement shall be epoxy coated, unless noted on the plans. This includes dowel bars and tie bars in all pavements, shoulders, curb, gutter, combination curb and gutter and median; and chair supports for CRC pavement.

Reinforcement for IDOT Highway Standard drainage structures shall be as shown on the Standards, unless otherwise noted on the plans.

Materials. Materials shall be according to Article 508.02 of the Standard Specifications except as modified herein.

Add the following to Article 1006.10 of the Standard Specifications.

- d) **Stainless Steel Reinforcement Bars.** Furnish reinforcement bars meeting the requirements of ASTM A955-19. Stainless steel bars shall be UNS S24000, S24100, S31653, S31803, S32101, S32205, or S32304 as defined in ASTM A955. The reinforcement bars shall be a minimum of Grade 60. The manufacturer of the stainless steel reinforcing bar shall be National Transportation Product Evaluation Program (NTPEP) compliant.

Unless otherwise noted, all metal hardware cast into concrete in the portion of the structure using stainless steel reinforcement, such as inserts, brackets, cable clamps, metal casings and other miscellaneous items, shall be ASTM A955-19 stainless steel and finished according to the requirements of ASTM A380. This includes the following items:

- (1) Mechanical and Bar Splicers.
- (2) Chairs and Supports. Chairs and continuous supports shall be stainless steel or plastic. Stainless steel chairs and supports used above steel beams shall have plastic coated feet.
- (3) Concrete Inserts. Furnish concrete inserts with closed-back ferrule threaded to receive UNC threaded bolts or rods. Article 1006.13 proof loading shall apply.
- (4) Dowels.
- (5) Tie Wire. Tie wire shall be in a dead soft annealed condition.

Sacrificial, non-structural elements used in the bridge deck construction may be galvanized steel but must be separated from the stainless steel reinforcement as required by this specification. All non-stainless steel items shall meet the approval of the Engineer.

CONSTRUCTION REQUIREMENTS

Add the following to Article 508.03 of the Standard Specifications.

General. All reinforcement bars or bar bundles delivered to the project site shall be clearly identified with tags bearing identification information. The tags shall also include the bar

description, UNS designation, heat number and sufficient identification to track each bar bundle to the appropriate mill report. All bundles delivered to the jobsite shall have a tag and mill report provided to the Engineer. Bundles without tags and mill reports shall be rejected.”

Training. The Contractor shall provide for technical support and training by the supplier in the unloading, storage, handling, placing and tying of the reinforcement bars and bar splicers.

Reinforcement Bar Sampling. The Material Engineering Consultant (MEC) representative will select jobsite samples in accordance with IDOT Policy Memorandum, “Reinforcement Bar and/or Dowel Bar Plant Certification Procedure”. The MEC representative will track quantities from each source, and in accordance with Section 7.4.1, will obtain one sample from each source every 400,000 pounds or once per year, whichever comes first. The Contractor shall assist the MEC representative in obtaining the required sample from the jobsite.

If necessary, the MEC representative will contact the Supplier to include extra bar in their next shipment. The Contractor will be advised of the bar description and shipment via email. When the shipment arrives, the Contractor shall advise the MEC representative who will arrange to visit the project to make a random selection from the bars delivered to the project.

Revise the first paragraph of Article 508.03 with the following.

“Storage, Protection, and Handling. Reinforcement bars shall be stored off the ground using platforms, skids, or other supports; and shall be protected from injury and from deterioration or contamination. Stainless steel bars shall be delivered and stored so that they are not touching other types of metal. Epoxy coated and stainless steel reinforcement bars shall be stored on wooden or padded steel cribbing and all systems for handling shall have padded contact areas. The bars or bundles shall not be dragged or dropped.”

Revise the third paragraph of Article 508.05 of the Standard Specifications with the following.

Epoxy coated reinforcement bars shall be tied with plastic coated wire, epoxy coated wire, or molded plastic clips. Uncoated wire or molded plastic clips may be used to secure reinforcement bars except epoxy coated reinforcement bars and stainless steel reinforcement bars. Molded plastic clips may be used in lieu of wire to secure bar intersections but shall not be permitted in horizontal bar mats subject to construction foot traffic or to secure contact lap splices. Plastic clips shall adequately secure the reinforcement bars and shall permit the concrete to flow through and fully encase the reinforcement. Plastic clips may be recycled plastic and shall meet the approval of the Engineer. Metal items used to complete the installation of stainless steel reinforcement bars (such as mechanical or bar splicers, chairs and supports, inserts, dowels, tie wire, and concrete beam stirrups) must be fabricated with stainless steel, as detailed in the above Article 1006.10(d). Do not tie stainless steel reinforcement to uncoated steel reinforcement. Direct contact is not acceptable. Stainless steel reinforcing bars may be in direct contact with undamaged epoxy coated reinforcing bars. If construction conditions require contact with another type of steel that will remain in the structure, insulation shall be provided between the different steels in the form of dielectric material such as plastic coating, polyethylene tubing, electrical tape or other method approved by the engineer.

Revise the second paragraph of Article 508.06 of the Standard Specifications with the following.

“Metal bar supports shall be made of cold-drawn wire or other metal products, and shall be either ASTM A955 stainless steel, epoxy coated, galvanized or plastic tipped. When the reinforcement

bars are epoxy coated, the metal supports shall be epoxy coated. Plastic supports may be recycled plastic. Supports for stainless steel reinforcement bars shall be according to Article 1006.10(d)(2). Supports shall be provided in sufficient number and spaced to provide the required clearances. Supports shall adequately support the reinforcement bars and shall permit the concrete to flow through and fully encase the reinforcement. The legs of supports shall be spaced to allow an opening that is a minimum 1.33 times the nominal maximum aggregate size used in the concrete. Nominal maximum aggregate size is defined as the largest sieve which retains any of the aggregate sample particles.”

Method of Measurement. Method of Measurement shall be according to Article 508.10 of the Standard Specifications except as modified herein.

Insert the following after the second paragraph of Article 508.10(b) of the Standard Specifications.

Stainless steel reinforcement bars will be measured in pounds as computed for the sizes and lengths of bars shown on the Plans or as authorized by the Engineer. This shall include all lap lengths show in the plans and any additional bars required for independent testing. In computing the quantity to be paid for, the quantity of bars of the cross section shown on the Plans, or authorized, will be used. These weights are given in the following table based on an assumed density of 495 pounds per cubic foot.

English Bar Size	Weight, lb/ft
No. 3	0.378
No. 4	0.686
No. 5	1.058
No. 6	1.511
No. 7	2.059
No. 8	2.713
No. 9	3.441
No. 10	4.358
No. 11	5.352
No. 14	7.72
No. 18	13.72

Basis of Payment. Revise Article 508.11 of the Standard Specifications with the following.

“Reinforcement bars in special reinforced pavement designs and in reinforced concrete structures where the concrete is paid for at a unit price per cubic yard, will be paid for at the contract unit price per pound for REINFORCEMENT BARS, REINFORCEMENT BARS, EPOXY COATED or REINFORCEMENT BARS, STAINLESS STEEL.

Bar splicer assemblies will be paid for at the contract unit price per each for BAR SPLICERS or BAR SPLICERS, STAINLESS STEEL.

Mechanical splicers will be paid for at the contract unit price per each for MECHANICAL SPLICERS or MECHANICAL SPLICERS, STAINLESS STEEL.

Any technical support to be provided to the Contractor by the stainless steel supplier shall be included in the cost of each stainless steel item.

Pay Item Number	Designation	Unit of Measure
50800105	REINFORCEMENT BARS	POUND
50800205	REINFORCEMENT BARS, EPOXY COATED	POUND
50800515	BAR SPLICERS	EACH
50800530	MECHANICAL SPLICERS	EACH
JT508010	REINFORCEMENT BARS, STAINLESS STEEL	POUND
JT508020	BAR SPLICERS, STAINLESS STEEL	EACH
JT508030	MECHANICAL SPLICERS, STAINLESS STEEL	EACH