

# STATE OF MAINE



## Department of Transportation Standard Specifications

November 2014 Edition

***MaineDOT***

	(placed under water)	
502.23	Structural Concrete Piers	Cubic Yard
502.239	Structural Concrete Piers	Lump Sum
502.24	Structural Concrete Piers (placed under water)	Cubic Yard
502.249	Structural Concrete Piers (placed under water)	Lump Sum
502.25	Structural Concrete Superstructure Slab	Lump Sum
502.26	Structural Concrete Roadway and Sidewalk Slab on Steel Bridges	Lump Sum
502.261	Structural Concrete Roadway and Sidewalk Slab on Concrete Bridges	Lump Sum
502.27	Structural Concrete Superstructure T-beam Type	Lump Sum
502.28	Structural Concrete Rigid Frame Structures	Cubic Yard
502.289	Structural Concrete Rigid Frame Structures	Lump Sum
502.29	Structural Concrete Wearing Surface on Bridges	Lump Sum
502.291	Saw Cut Grooving	Lump Sum
502.30	Structural Concrete Box Culvert	Lump Sum
502.31	Structural Concrete Approach Slab	Lump Sum
502.32	Structural Concrete Culvert End wall	Cubic Yard
502.33	Structural Concrete Culvert End wall	Lump Sum
502.40	Structural Concrete Box Culvert	Cubic Yard
502.41	Structural Concrete Superstructure Slab	Cubic Yard
502.42	Structural Concrete Roadway and Sidewalk Slab on Steel Bridges	Cubic Yard
502.43	Structural Concrete Superstructure T-beam Type	Cubic Yard
502.44	Structural Concrete Wearing Surface on Bridges	Cubic Yard
502.45	Structural Concrete Approach Slab	Cubic Yard
502.46	Structural Concrete Culvert Connection	Cubic Yard
502.48	Low Permeability Concrete	Cubic Yard
502.49	Structural Concrete Curbs and Sidewalks	Lump Sum
502.565	Concrete Fill	Cubic Yard

## SECTION 503 - REINFORCING STEEL

**503.01 Description** This work shall consist of furnishing and placing reinforcing steel bars (plain, galvanized, stainless, epoxy-coated, zinc and epoxy dual-coated, or low-carbon chromium), welded wire fabric and mechanical/welded reinforcing steel splices in accordance with these specifications and other applicable Contract Documents.

**503.02 Materials** Materials shall meet the requirements of the following Sections of Division 700, Materials:

Reinforcing Steel	709.01
Welded Steel Wire Fabric	709.02

galvanized after fabrication. Bending of galvanized bars in the field shall not be allowed unless approved by the Resident. Damage to the zinc coating as a result of field-bending shall be repaired in accordance with Section 9 of ASTM A767.

The Contractor shall furnish a written certification from the galvanizer that the material was manufactured and tested in accordance with ASTM A767, together with the report of the test results, at the time of shipment.

503.054 Packaging and Handling of Epoxy-Coated and Zinc-Coated (Galvanized) Bars All handling of epoxy-coated, dual-coated, and galvanized reinforcing bars by mechanical means shall be done by equipment having padded contact areas, or by the use of nylon webbing slings. The use of chains or wire rope slings shall not be allowed, even when used with padding. All bundles of coated bars shall be lifted with a strong-back, spreader bar, multiple supports or a platform bridge to prevent bar-to-bar abrasion from sags in the bundles. Support points during lifting or transporting of bundled coated bars shall be spaced at a maximum of 15 feet.

Bundled bars shall be strapped together with non-metallic or padded straps in a manner to prevent bar-to-bar abrasion due to relative movement between bars.

Bars loaded for transport shall be loaded and strapped down in a manner that will prevent damage from motion and vibration, to the greatest extent possible. Bundles of bent bars shall be transported strapped to wooden platforms or shall be crated. All individual bundles and layers of bundles shall be separated, and supported by dunnage.

Individual bars shall be handled in a manner that prevents damage to the coating due to abrasion or impact, and at no time shall any bar be moved by dragging over any surface, including other reinforcing bars. Sufficient personnel shall be assigned to assure that there is compliance with the above.

All packaging and handling related guidelines in ASTM A775, A1055, or A767, Section X1, Guidelines for Job-Site Practices, shall be considered mandatory where not already covered by this specification.

503.06 Placing and Fastening All steel reinforcement shall be accurately placed in the positions shown on the Plans and shall be firmly held there during the placing and setting of the concrete. Immediately before placing concrete, steel reinforcement shall be free from all foreign material, which could decrease the bond between the steel and concrete. Such foreign material shall include, but not be limited to, dirt, loose mill scale, excessive rust, paint, oil, bitumen and dried concrete mortar.

Bars shall be fastened together at all intersections except where spacing is less than 1 foot in either direction, in which case, fastening at alternate intersections of each bar with other bars will be permitted, providing this will hold all the bars securely in position. This fastening may be done using tightly twisted wire or by welding, when permitted by the Fabrication Engineer. All welding shall be done in accordance with this specification. Welders must be qualified by

passing qualification tests for the process and position to be used in accordance with AWS D1.4 Structural Welding Code – Reinforcing Steel. Welding shall only be done when performed in accordance with a welding procedure approved by the Fabrication Engineer. Weld area preheat shall comply with AWS D1.4. Weld areas shall be free of cracks, undercut or other deficiencies injurious to the reinforcing steel. Welds are not permitted within two bar diameters of a bend, if the bend radius is less than 16 bar diameters. Welds must comply with testing and sampling requirements in the Fabrication and Mechanical Properties sections of AASHTO M 54 (ASTM A184). Welds shall be able to withstand a static load of 150 pounds applied perpendicular to the reinforcing grid. Tension specimens must meet the material requirements of the type bar used when tested with a welded joint approximately at the center of the specimen. Frequency of testing shall be for every 75,000 square feet, or fraction thereof, of reinforcing grid fastened by welding. No welding for fastening or supporting reinforcing steel in areas of high tensile stresses will be permitted. Welding on epoxy-coated or dual-coated reinforcing steel will not be permitted under any condition.

In general, no welding will be permitted on the main reinforcing steel of superstructures.

Proper distances from the forms shall be maintained by means of chairs, stays, blocks, ties, hangers or other approved means. Chairs used for this purpose shall be plastic, plastic coated, epoxy coated or plastic tipped. Where stainless steel reinforcement is specified, the plastic tipped chairs shall be made of stainless steel conforming to the requirements of ASTM A493, Type 316 or 316L. Blocks used for this purpose shall be precast portland cement mortar blocks of approved shape and dimensions. Blocks shall not be used in cases where the blocks will be visible in the finished product. Layers of bars may be separated by precast portland cement mortar blocks or other approved devices. The use of pebbles, pieces of broken stone or brick, metal pipe or wooden blocks shall not be permitted. The placing of reinforcement as concrete placement progresses, without definite and secure means of holding the steel in its correct position, shall not be permitted except in the case of welded steel wire fabric or reinforcing bar grids.

Epoxy-coated, dual-coated, or galvanized reinforcing bars supported on formwork shall rest on coated wire bar supports, or on bar supports made of dielectric material or other acceptable materials. Wire bar supports shall be coated with dielectric material for a minimum distance of 2 inches from the point of contact with the reinforcing bars. Reinforcing bars used as support bars shall be epoxy-coated or zinc-coated as applicable. In walls, spreader bars shall be epoxy-coated or zinc-coated as applicable.

Tie wire for epoxy-coated, zinc and epoxy dual-coated, galvanized, stainless, or low-carbon chromium reinforcing steel shall be soft annealed wire that has been nylon, epoxy or plastic coated. Tie wire for stainless steel reinforcement may also be uncoated stainless steel conforming to the requirements of ASTM A493, Type 316 or 316L. 16 gauge (or heavier) black-annealed ferrous metal wire may also be used for low-carbon chromium or plain reinforcement.

Stainless steel reinforcement shall not be tied to any other type of reinforcement, galvanized attachments or conduits, or any other dissimilar metal including concrete formwork hardware.