

700 MATERIAL DETAILS

Materials shall conform to the stated requirements and/or the requirements of the referenced specifications including modifications as noted.

Copies of all Supplemental Specifications referenced in this section are on file with the City of Columbus Transportation Division.

709 - REINFORCING STEEL

709.00 General. All reinforcing steel furnished under this specification shall be free of excessive rust, grease, oil and paint.

709.01 Epoxy Coated Reinforcing Steel. ASTM A 775, with the following exceptions and additions:

4.1 Steel reinforcing bars to be coated shall meet the requirements of 709.01, 709.03, or 709.05.

4.2 The coating material shall meet the requirements listed in Annex A1 and shall be a color that facilitates inspection of the installed bar. The color shall be subject to approval of the Director.

4.2.1 and 4.3 In addition, written certification and samples mentioned in these sections shall be required.

7.3.1 The adhesion of the coating shall be evaluated by bending production coated bars around a mandrel of specified size as prescribed in bending tables in ASTM A 615, ASTM A 616 or ASTM A 617 as applicable. The bend test for adhesion of the coating shall be made at a uniform rate and shall take up to 90 seconds to complete. The two longitudinal deformations shall be placed in a plane perpendicular to the mandrel radius, and the test specimens shall be at thermal equilibrium between 68°F and 86°F (20°C and 30°C).

11. Delete last sentence. Replace with: Tests, inspection and sampling, shall be made at a site as specified by the Director. Sampling for testing shall require three 30 inch (762 mm) samples for each bar size, for each coating lot, and for each heat of steel reinforcing bars.

12.1 All damaged coating areas greater than 1/4 inch (6 mm) square or 1/4 inch (6 mm) diameter; approximately 1/8 inch (3 mm) square or 1/8 inch (3 mm) diameter if the opening is within 1/4 inch (6 mm) of an equal or larger opening; or, a length of 6 inches (152 mm) regardless of area, shall be repaired with a patching material.

12.2 Coating damage due to fabrication or handling need not be repaired in cases where the damaged area is less than 12.1.

12.4 The patching material shall be of the same composition and quality as the original coating. The surface preparation shall be as per section 5.1 (SSPC-SP10 near white metal blast) or a surface preparation approved by Engineer.

14. Certification shall be required.

Where reinforcing bar cages for prestressed concrete beams are fabricated by tack welding, the areas damaged by the tack welding shall be patched as outlined above.

709.02 Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

ASTM A 615, with the exceptions and additions:

Test Specimens, 12.1. Tension test specimens shall be the full section of the bar as rolled.

Number of Tests, 13.1. Where positive identification of a heat can be made, one tension test and one bend test shall be made from each bar designation number of each heat in the lot. Where identification of the heat is not practical, one tension test and one bend test shall be made for each bar designation number in each lot of 10 tons (9 metric tons) or fraction thereof.

Inspection, 15.1. Inspection shall be done at the project site. Random samples shall be obtained from material delivered to the project site or at other locations designated by the Laboratory.

709.03 Rail Steel Deformed and Plain Bars for Concrete Reinforcement.

ASTM A 616, with the following exceptions and additions:

Test Specimens, 11.1. Tension test specimens shall be the full section of the bar as rolled.

Inspection, 14.1. Inspection shall be done at the project site. Random samples shall be obtained from material delivered to the project site or at other location designated by the Laboratory.

709.05 Axle Steel Deformed and Plain Bars for Concrete Reinforcement.

ASTM A 617, with the following exceptions and additions:

Test Specimens 12.1. Tension test specimens shall be the full section of the bar as rolled.

Inspection 15.1. Inspection shall be done at the project site. Random samples shall be obtained from material delivered to the project site or at other locations designated by the Laboratory.

709.08 Cold-Drawn Steel Wire for Concrete Reinforcement. ASTM A 82, with the following exceptions:

Finish 8.2. Galvanized wire shall be completely covered in a workmanlike manner with a coating of pure zinc of uniform thickness, so applied that it will adhere firmly to the surface of the wire. The minimum weight of zinc coating shall be 0.8 ounces of zinc per square foot (244 g/m²) of surface as determined by ASTM A 90.

Inspection 11. Inspection shall be done at the project site. Random samples shall be obtained from material delivered to the project site or at other locations designated by the Laboratory.

709.09 Fabricated Steel Bar or Rod Mats for Concrete Reinforcement. ASTM A 184, with the following exceptions:

4. **Materials.** Bars shall be deformed.
 - (a) **Welded Bar Mats.** Longitudinal bars shall conform to 709.01 Grade 60. Transverse bars shall conform to 709.01.
 - (b) **Clipped Bar Mats.** Longitudinal bars shall conform to Grade 60 of 709.01, 709.03, or 709.05.

9.1 Inspection. Inspection shall be done at the project site. Random samples shall be obtained from material delivered to the project site or at other locations designated by the Laboratory.

709.10 Welded Steel Wire Fabric for Concrete Reinforcement. ASTM A 185, with the following exceptions:

Inspection 13. Inspection shall be done at the project site. Random samples shall be obtained from material delivered to the project site or at other locations as designated by the Laboratory.

709.11 Deformed Steel Wire for Concrete Reinforcement. ASTM A 496, with the following exceptions:

Inspection 13. Inspection shall be done at the project site. Random samples shall be obtained from material delivered to the project site or at other locations designated by Laboratory.

709.12 Welded Deformed Steel Wire Fabric for Concrete Reinforcement. ASTM A 497, with the following exceptions:

Inspection 13. Inspection shall be done at the project site. Random samples shall be obtained from material delivered to the project site or at other locations designated by the Laboratory.

709.13 Coated Dowel Bars. AASHTO M 254, with the following exceptions:

3.1 The core material shall be of steel meeting 709.01, 709.03, or 709.05.

4.2 Is waived. The thickness of the coating shall be that approved under 2.5 and shall be within manufacturer's stated tolerance.

5.3.1 Dowel bars shall have all surfaces coated. Dowel bars that are cut to length after coating or have not had the uncoated ends coated during manufacturing or fabrication shall have those uncoated areas suitably recoated.

Surface preparation and patching of those uncoated bar ends shall be done with material equivalent to the original epoxy coating.

If the Contractor elects to use basket supports for positioning of the above dowel bars as per 451.08(b) or plan requirements, the basket dowel bar assembly shall be fusion bonded epoxy coated. Any uncoated areas created by interference between basket and dowel bar shall be repaired with surface preparation and patching material equivalent to the equivalent to the original epoxy coating.

Coating or patching of dowel bar ends or baskets shall be shop applied.

Coating on the dowel bars or baskets damaged during installation shall be suitably repaired.

709.14 Epoxy-Coated Steel Wire and Welded Wire Fabric for Reinforcement. ASTM A 884, with the following exceptions:

4.1 Plain or deformed steel wire or welded wire fabric to be coated shall meet the requirements of one of the applicable specifications: 709.08, 709.10, 709.11, and 709.12 and shall be free of surface contaminants such as oil, grease, or paint, when received at the manufacturer's plant and prior to cleaning and coating.

4.2.1 The written certification in this section shall be required.

7.1 Thickness of Coating shall conform to Type A. Dry film thickness of 5 mils. to 12 mils (0.13 to 0.31 mm).

7.4 Place of Testing. Testing of coated steel wire or welded wire fabric shall be done at the manufacturer's plant prior to shipment or at other sites as designated by the Laboratory.

14 Certification. The manufacturer shall furnish written certification that the coated steel wire and welded wire fabric meets the requirements of the specification. A copy of the manufacturer's quality control tests, the epoxy powder certifications and the wire certifications shall be submitted.