

## SECTION 605—ENDWALLS, INLETS, MANHOLES, AND SPRING BOXES

**605.1 DESCRIPTION**—This work is construction of endwall, inlet, manhole, and spring box structures of the type indicated.

### 605.2 MATERIAL—

**(a) Inlet Grates and Frames.** As shown on the [Standard Drawings](#) RC 34M, either structural steel, [Section 1105.02\(a\)3.c](#), or gray, malleable, or ductile iron as specified in [Section 1105.02\(h\)](#). Certify as specified in [Section 106.03\(b\)3](#).

Coat structural steel grates with bituminous paint in the shop or in the field, before placement. Coat structural steel frames with bituminous paint when placing in the concrete inlet top. Cover frames and grates completely with no pin holes or voids. As an alternative to bituminous paint, hot dip galvanize structural steel grates and frames as specified in [Section 1105.02\(s\)](#).

**(b) Manhole Frames and Covers.** As shown on the [Standard Drawings](#), either gray malleable or ductile iron, as specified in [Section 1105.02\(h\)](#). Machine-grind the metal-bearing contact areas to fit in pairs. Matchmark each pair with notches to ensure satisfactory seating.

**(c) Manhole Steps.** Certify as specified in [Section 106.03\(b\)3](#). As shown on the [Standard Drawings](#), conforming to the vertical design load and the horizontal pull out design load requirements of [ASTM C 478M](#); and made of one of the following materials:

- Corrosion-resistant steel alloy bars containing 1.65% to 1.85% nickel and 0.8% to 0.9% copper, having a minimum tensile strength of 345 MPa (50,000 pounds per square inch) and a minimum yield strength of 255 MPa (37,000 pounds per square inch), with a minimum elongation of 30% over a 50 mm (2-inch) gage length.
- Deformed Wire, [ASTM A 496](#), Epoxy-Coated according to [ASTM A 934/A 934M-95](#), encased in a co-polymer polypropylene shell that conforms to [ASTM D 4101](#), Table PP, Group 03, Class 4, Table B Designation B44744.
- Deformed reinforcement bars, AASHTO M 31/M 31M, Grade 300 (Grade 40), galvanized after bending, according to [ASTM A 787/A 787M](#).
- Deformed reinforcement bars, [ASTM A 615/A 615M](#), Grade 400 (Grade 60), coated with copolymer polypropylene plastic that conforms to [ASTM D 4101](#); Table PP; Group 03 Copolymer or Impact Modified; Class 2, 3, or 4; any of grades 1 through 9.
- Gray, malleable or ductile cast iron, as specified in [Section 1105.02\(h\)](#).
- Aluminum alloy [ASTM B 221M](#), [6061-T6](#), [6005-T5](#), or [6351-T6](#), with a protective coat applied to the portion to be embedded in the concrete.
- Fiberglass-reinforced polyester, [ASTM D 2444](#) and [D 635](#).
- Fabricate manhole steps free from sharp edges, burrs, and hazardous projections.

#### (d) Other Material.

- Class A Cement Concrete—[Section 704](#)
- Brick—[Section 713.1](#)

- Reinforcement—[Section 709](#)
- Mortar—[Section 705.7](#)
- Precast Concrete Units—[Section 714](#)
- Concrete Curing Compounds—[Section 711.2\(a\)](#)
- Curing and Protecting Covers—[Section 711.1](#)
- Bituminous Paint—AASHTO M140 (emulsified asphalt) meeting the requirements listed in Bulletin 25 and from a supplier listed in Bulletin 15, Section 702-EM. Certify as specified in Section 106.03(b)3.
- Zinc Chromate Primer—Federal Specification TT-P-645. Certify as specified in [Section 106.03\(b\)3](#).

**605.3 CONSTRUCTION**—As shown on the [Standard Drawings](#) and as follows:

- Cement Concrete Structures—As specified in the applicable parts of [Section 1001.3](#).
- Brick Masonry—[Section 663.3](#)

Excavate for the structure as required.

Place concrete foundations and walls monolithically, except if otherwise allowed.

Carefully remove existing castings that are to be reused. Clean and transport to the new location.

Construct new inlet or manhole walls and bottoms to accommodate the dimensions of the existing castings.

Set frames, concrete top units, and grade adjustment rings (if required for inlets and manholes) in full mortar beds.

Set pipes in inlets and manholes, flush with the inside structure face. For pipes protected by endwalls, set flush with the exposed structure face.

If constructing structures in conjunction with existing pipe culverts and drains, provide for satisfactory connections, as specified for new construction of a similar type.

Backfill excavated spaces around the structure, with acceptable embankment material, as specified in [Section 206.3\(b\)4](#). Satisfactorily dispose of unsuitable and surplus materials.

Coat all aluminum surfaces to be embedded in concrete with one coat of zinc chromate primer, or a coat of bituminous paint. Allow to dry completely before placing concrete.

**605.4 MEASUREMENT AND PAYMENT**—

**(a) Inlets and Manholes.** Each

The price for the inlet includes Inlet Box and Inlet Top Unit. The price for the manhole includes manhole cover, frame, and steps.

**(b) Inlets and Manholes Using Existing Frames and Grates or Covers.** Each

**(c) Concrete for Miscellaneous Drainage.** [Section 601.4\(c\)](#)

**(d) Inlet Boxes.** Each

**(e) Inlet Top Units.** Set

The price includes frames, grates, and grade adjustment rings, if required.

**(f) Spring Boxes.** Each

The price includes reinforcement, if required.

**(g) Endwall Excavation.** Cubic Meter (Cubic Yard)  
For the Class of excavation, as indicated.

**(h) Manhole Covers and Frames.** Set includes grade adjustment rings, if required.

**(i) Endwalls.** Each  
For the type indicated.