

III. TECHNICAL SPECIFICATIONS

DIVISION 11

CATCH BASINS, MANHOLES, CONFLICT MANHOLES, DROP INLETS AND JUNCTION BOXES

- 11.01 SCOPE:** The Contractor shall furnish all materials, equipment and labor necessary to construct catch basins, manholes, conflict manholes, and drop inlets in accordance with the applicable construction details of Volume II of the City of Chesapeake Public Facilities Manual and the materials and construction methods of Section 302 of the VDOT Road and Bridge Specifications.
- 11.02 MATERIALS:** All materials shall be new and shall be furnished as per Section 302.02 of the VDOT Road and Bridge Specifications, with the following additional requirements:
- A. Brick: ASTM C-32, GRADE MA
 - B. Frames and Covers: Shall be of good quality cast iron of uniform grade, Federal Spec. QQ1-652. Manhole frames to be in accordance with VDOT Standard MH-1. Drop inlet and catch basin frames shall be as per Richards Foundry J-1010 and H-109 designations respectively or approved equal.
 - C. Steps: Shall be #6 galvanized rebar, #3 grade 60 rebar encased in a corrosion resistant rubber or aluminum in accordance with ASTM B22, Alloy 6005-75 and within the dimensions and guidelines of the Chesapeake Standard ST-1.
 - D. CONCRETE FOR INVERT SLABS: Air entrained Portland Cement Concrete (A3) having a minimum twenty-eight (28) day compressive strength of 3000 psi in accordance with Section 216 Class A3 Concrete.
 - E. Mortar:
 - 1. Portland Cement: ASTM C50, Type 1.
 - 2. Sand: Clear, sharp, graded from fine to coarse, ASTM C-144.
 - 3. Water: Clean and potable.
 - 4. Mixture: One (1) part cement, two (2) parts sand.
 - F. Reinforced Precast Structures: Shall be manufactured in accordance with ASTM Des. C-478 with an eccentric or concentric cone or flat slab tops. Shop drawings must be

submitted for approval to the Engineer or certified as conforming to current City standards. Joints shall be water-tight. Precast sections shall be fabricated to provide a tongue and groove joint sealed with performed flexible plastic sealing compound, Butyl Mastic Rope Sealer - 1" size, "EZ Stick" as manufactured by Concrete Products Supply or an approved equal. Joints shall be plastered inside and outside of the manhole with a cement grout. (Grout mixture shall be as per Mortar above.)

- G. Curing Materials: Shall consist of waterproof paper, polyethylene sheeting, liquid membrane seal or water in accordance with VDOT Sections 220.
- H. Reinforcing Steel: Shall be grade 40 or 60 and conform to VDOT Section 223.
- I. Portland Cement Concrete: Shall be class A-3 concrete and in accordance with AASHTO M-85 and AASHTO M-154 for air-entraining admixtures.

11.03 EXECUTION:

- A. The Contractor shall provide such excavation, sheeting backfill, bracing, dewatering equipment and operations, and other materials, labor, or equipment needed to properly install the structure in accordance with the Specifications and good construction practice, without any separate payment for such.
- B. Drainage structures will be constructed in accordance with the applicable standard in Volume II of the Public Facilities Manual with the following exceptions where brick may be used in lieu of concrete.
 - 1. CB-1, MCB-1, SDI-1 and SDI-2 where depth is less than or equal to six (6) feet.
 - 2. CB-2, MCB-2, MH-1 where neither depth exceeds six (6) feet or any incoming pipe diameter exceeds forty-eight inches.
- C. The base or invert slab for manholes may be cast-in-place or monolithic with precast concrete sections.
- D. All drainage structures inverts are required to be shaped in accordance with City Standard IS-1 and such cost will be considered incidental to the cost per structure.
- E. Prior to ordering precast structures, the Contractor shall verify the required depth. Precast concrete bottom sections, risers, and top sections shall be fabricated such that when assembled, they provide a manhole conforming to the depth required. If the Contractor chooses, an additional adjustment ring to be either cast-in-place or precast may be provided for construction tolerances as long as vertical dowels of 12" c/c are provided. The Contractor shall be responsible for the furnishing and constructing manholes with tops that are flush with the finished grade.
- F. Sections are to be assembled to provide a plumb structure with uniform bearing at all

joints and base slab. Joints shall be thoroughly cleaned and plastic cement sealer shall be applied immediately before assembly. Joints shall be water-tight. Where pipes enter the manhole, they shall be mechanically sealed with a neoprene molded device. The device and method of installation shall be "Kor-N-Seal" or an approved equal.

- G. All brick shall be thoroughly cleaned and saturated with water immediately before being laid. The brick shall be laid radially in header courses with the joint broken by staggering each successive course. Brick shall be laid with cement mortar made of one (1) part Portland cement to two (2) parts of approved sand to which may be added lime that shall not exceed twenty-five percent (25%) by volume of the cement. The outside of the manhole shall be plastered with one-half (½) inch of cement mortar. The inside of the manhole shall be rubbed with a cloth in lieu of striking the joint.
- H. Excavation for Structures: Excavation shall conform to the lines and grades as shown, established, or necessary. Where the bottom of the excavation is in unstable material, such material shall be excavated to a depth of one foot below the bottom of the structure and replaced with gravel as per the applicable standard. All sheeting, bracing, and shoring required for safety shall be installed in conformity with applicable rules and ordinances so as to meet with the approval of the Engineer.
- I. Backfill for Structures: Around and adjacent to structures, backfill shall be of material of suitable stability and perviousness as determined by the Engineer. Backfill shall be placed in 12 inch layers, each layer being compacted pneumatically. No backfill shall be placed against a structural wall until all connecting structural members are in place. It shall be the Contractor's responsibility to provide compaction to such a degree that the resulting subsidence within six (6) months after placing shall not be detrimental to the stability or appearance of the structure or adjacent areas. The Contractor shall provide adequate protection to all structures during backfilling and shall use every precaution to avoid damaging or defacing them.
- J. Compaction Tests: The City, or its authorized representatives, reserve the right to perform compaction tests on any or all portion(s) of backfill placed at no costs to the Contractor. However, in the event the compaction of this backfill is not in compliance with the above requirements, the Contractor shall take corrective measures at no costs to the City to bring the backfill within the limits of these Specifications. The Contractor shall then be responsible for reimbursing the City all costs associated with the performance of compaction test(s) in those sections of the backfill that failed the compaction test(s).

11.04 MEASUREMENT AND PAYMENT:

- A. Catch basins and drop inlets will not be measured but will be paid for at the contract price per each for the type as specified in the Unit Price Table.
- B. Manholes will be paid for at the contract unit price per each at the depth increments as

follows:

Less than 5'
5' – 7'
7' – 9'
9' – 11'
11' – 13'
Greater than 13'

No separate payment will be made for frames and covers, which will be considered incidental to the contract price per each as specified in the Unit Price Table.

- C. Payment for Conflict manholes shall include the cast iron pipe passing through the manholes. Conflict manholes shall be measured and paid at the contract price per each specified in the Unit Price Table.
- D. All materials, equipment, and labor required to conform with Division 11.03 A & D will be considered incidental to the several contract prices for storm drainage structures as specified in the Unit Price Table.
- E. Junction boxes will not be measured but will be paid for at the contract price for each as per the Unit Price Table.
- F. No adjustment in the unit bid price is allowed for increases or decrease of less than one (1) foot in the depth of the structure from that shown on the plans.