

SECTION 027202
MANHOLES

1. DESCRIPTION

This specification shall govern the furnishing of all materials and construction of manholes composed of a concrete base and concrete walls as shown on the drawings, to the lines, grades and dimensions shown on drawings or otherwise established by the OAR.

2. MATERIALS

Concrete for cast-in-place storm water manholes and storm water junction boxes shall be Class C (3,600 psi at 28 days). Manholes for wastewater shall be made from fiberglass only, in accordance with City Standard Specification Section 027205 "Fiberglass Manholes".

Mortar for plastering shall be 1 part Portland cement to 3 parts clean hard and sharp mortar sand, free of all foreign substances or injurious alkalis.

Reinforcing steel, where used, shall conform to the requirements of Section 032020 "Reinforcing Steel". All wastewater manhole rings (frames) for streets shall be East Jordan Iron Works, Inc. product V1420, all wastewater manhole covers shall be V1430 (standard) or V1480 (tall), or pre-approved equal, and shall have the seating surface of ring and cover machined to secure a snug fit per the City Standard Wastewater Details. All storm water manholes shall be East Jordan Iron Works, Inc. product V1168 assembly, and for school zones shall be a bolted assembly per the City Standard Storm Water Details. Steps are not required for wastewater and storm water manholes.

Joint material for precast concrete manholes shall be Ram-Nek Flexible Plastic Gaskets as manufactured by K. T. Snyder Company, Houston, Texas, or an approved equal.

3. EXCAVATION

The Contractor shall do all necessary excavation for the various manholes, conforming to size and dimensions shown on plans plus a maximum of 4' working room. Excavation shall not be carried to greater depth than required. Subgrade under manhole footings shall be compacted to not less than 95% Standard Proctor density. Shoring shall be the responsibility of the Contractor and shall be installed as necessary. Shoring shall not be removed or backfilled around until entire manhole is completed, unless authorized by the OAR. Shoring shall remain in place at least 24 hours after concrete work has been completed.

4. CONCRETE MANHOLES (STORM WATER ONLY)

(1) Formed-in-Place Manholes:

Where formed concrete is used, forms shall be built to dimensions shown on the standard details. Inserts and openings shall be formed so concrete will not be injured during process of stripping forms. Forms shall be braced and tied to prevent spreading or bulging and shall meet approval of the OAR prior to placing concrete. Forms shall remain in place for minimum of 24 hours and shall be removed within a maximum time of 7 days after completion of concrete work. Reinforcing steel, if required, shall be as shown on the plans.

The bottom of manholes shall be carefully formed and inverted smoothly when finished, with pipes cut to fit inside surface of walls.

(2) Precast Manholes

Precast manholes shall allow unobstructed view of all pipes connected to the manhole. Precast manholes shall be designed to support HS-20 traffic loading and designed by a Texas licensed professional engineer. The upper 18" of the corbel shall be brick to facilitate subsequent grade adjustment. Either concentric or eccentric cones may be required. Where not specified, concentric cones shall be used. Manhole designs shall be submitted for approval to the OAR and Engineer. The Contractor shall perform preliminary exploratory excavations as needed to verify all tie-ins, sizes, connections, and related utility adjustments prior to ordering precast structures.

5. GENERAL CONSTRUCTION METHODS

All items shall be installed as the work progresses and as shown on the standard details. Work shall be completed and finished in a careful workmanlike manner, with special care being given to sealing joints around all pipe extending through walls of the manholes. After finishing walls, the bottom of the manhole shall be completed by adding sufficient concrete to shape the bottom in conformity with requirements on the plans. Where existing manholes are adjusted to meet new lines and grades, all old masonry or concrete shall be thoroughly cleaned and wetted before joining new masonry or concrete to it. HDPE adjustment rings are to be used to match roadway grade. A maximum of 18" of adjustment rings may be utilized.

6. BACKFILLING/LEAKAGE TESTING

Backfilling around the manholes shall commence as soon as concrete or masonry has been allowed to cure the required time and forms and shoring have been removed. Backfill shall be placed in layers of not more than 6" and compacted to a minimum of 95% Standard Proctor density before next layer is installed. Wastewater manholes shall withstand a leakage test not to exceed the values stated in City Standard Specification Section 027205 "Fiberglass Manholes", except that an additional 10% of loss will be permitted for each additional 2' head over a basic 2' internal head.

7. MEASUREMENT AND PAYMENT

Unless otherwise specified on the Bid Form, manholes shall be measured by each individual structure built, and paid for at the unit price bid per each, of the size, type and depth specified, complete in-place, and meeting the approval of the OAR. "Complete in-place" shall mean all labor, materials, tools, equipment and incidentals necessary to furnish and install the manholes, excavation, compaction, backfilling, dewatering, concrete foundation, connections, adjustment rings, ring and cover, concrete work, leakage testing, video inspection, and adjust the manholes to finish grade.

Extra depth for wastewater manholes over 6' in depth shall be measured by the vertical foot and shall be paid for at the price bid per vertical foot for "Extra Depth for Manholes".

Rehabilitation of existing manholes with fiberglass inserts shall be measured by each individual structure rehabilitated and paid for at the unit price bid per each, of the size, type and depth specified, complete in-place, and meeting the approval of the OAR. "Complete in-place" shall mean all labor, materials, tools, equipment and incidentals necessary to furnish and install the rigid fiberglass manhole inserts, make connections, grout the annular space, backfilling, adjustment rings, ring and cover, concrete work, leakage testing, and adjust the manholes to finish grade.

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