

## SECTION 02607

### MANHOLES AND COVERS

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Modular precast concrete manhole sections with tongue-and-groove joints covers, anchorage, and accessories.

##### 1.02 RELATED SECTIONS

##### 1.03 REFERENCES

- A. AASHTO M-105: Gray Iron Castings.
- B. AASHTO M-199: Precast Reinforced Concrete Manhole Sections.
- C. ASTM C-923: Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes.

##### 1.04 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Indicate manhole locations, elevations, piping, and sizes and elevations of penetrations.
- B. Product Data: Provide manhole covers, component construction, features, configuration, and dimensions.

##### 1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

##### 1.06 GENERAL REQUIREMENTS

- A. The Contractor shall furnish and install watertight cast-in-place or precast concrete manholes at the locations shown on the Drawings approved by the City Engineer. All new manholes shall be precast unless the manhole is being installed on an existing line. All precast manholes shall have flexible watertight pipe-to-manhole boot connectors,
- B. Manholes shall be furnished complete with cast iron rings and covers.
- C. Manhole spacing shall not exceed 400 lineal feet unless approved by City Engineer.
- D. Manholes shall be installed at the end of each line exceeding 15 feet in length.
- E. Cleanouts shall not be substituted for manholes nor installed at the end of lines.
- F. Cleanouts on sewer laterals shall be placed every 100 feet and at all bends.

G. Flow Channels:

1. The flow channel through manholes shall conform to the inlet and outlet pipe.
2. The depth of flow channels should be up to one-half to three-quarters of the diameter of the pipe.

PART 2 PRODUCTS

2.01 MATERIALS

A. Manufacturers:

1. Amcor Model.
2. Geneva Pipe Model.
3. W.R. White Model.
4. Materials and Equipment: Product options and substitutions. Substitutions: Permitted.

B. Manhole Sections: Reinforced precast concrete in accordance with AASHTO M-199 with gaskets in accordance with ASTM C-923.

C. Mortar and Grout: Type S.

2.02 COMPONENTS

A. Wall and Cone Sections:

1. Manhole walls shall be constructed of 48" I.D. precast sectional, reinforced concrete pipe.
2. For pipelines of 18" diameter or larger, the manholes shall be 60" minimum I.D. Both cylindrical and taper sections shall conform to all requirements of AASHTO Designation M-170 for Reinforced Concrete Culvert Pipe with the following exceptions:
  - a. The throat section of the manhole shall be adjustable by use of pipe sections up to 18 inches in height.
  - b. The taper section shall be a maximum of 3 feet in height, shall be of eccentric conical design, and shall taper uniformly from 48 inches to 30 inches inside diameter.
  - c. The 48-inch inside diameter pipe used in the base section shall be furnished in section lengths of 1, 2, 3 and 4 feet as required.
  - d. Reinforcing steel shall consist of a circular cage with a minimum cross sectional area of three-tenths (0.3) of a square inch of steel per foot in both directions.
  - e. 18" space maximum between cone and lid.
3. All joint surfaces of precast sections and the face of the manhole base shall be thoroughly cleaned and wet prior to setting precast sections.
4. All manhole joints, including grade rings, shall be sealed with a rubber gasket manufactured for the manhole or with a butyle rubber sealant (mastic) that is permanently flexible and non-shrinking, similar to Brandt No. 95 Cold Weather Vault Sealant.

5. Mortar can be used for repairs and additional sealing of joints including grade rings and manhole rings. The mortar shall consist of 1 part cement and 1 1/2 parts sand with sufficient water added to bring mixture to workable consistency.
- B. Manhole Steps:
1. 12" Copolymer Polypropylene Plastic Steps.
  2. Reinforcement: 1/2" grade 60 steel reinforcement.
  3. Steps must meet requirements outlined in ASTM 2146-68 under Type II, Grade 16906 and AASHTO M-31.
- C. Concrete Base Pad:
1. Except as noted below, manhole bases shall be pre-cast concrete conforming to the requirements of Section 03310 of these Specifications.
  2. Where sewer lines pass through or enter manholes the invert channels shall be smooth and semi-circular in cross section.
  3. Changes of direction of flow within the manholes shall be made with a smooth curve with as long a radius as possible and a minimum of 0.2 feet of fall.
  4. The floor of the manhole outside the flow channels shall be smooth and slope toward the channel at not less than 1/2 inch per foot.
  5. For high ground water areas, precast manholes and bases shall be required.
- D. Lid and Frame:
1. All iron castings shall conform to the requirements of AASHTO M-105 for grey iron castings.
  2. Rings and covers shall have machined bearing surfaces and a minimum cover weight of 150 pounds and minimum ring weight of 233 pounds.
  3. The foundry name, year of manufacture, and "SEWER", "STORM DRAIN", or "IRRIGATION" shall be marked on the cover.
  4. All manhole rings shall be carefully set to the grade shown on the approved drawings or as directed by the City Engineer.
  5. The manhole covers shall be so installed to be within 1/4" from the asphalt surface.
  6. A concrete ring 18" wide and 8" thick will be poured around lid in accordance with Section 03304.
  7. All manhole lids should be vented unless directed otherwise by the city engineer.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify items provided by other sections of Work are properly sized and located.
- B. Verify that built-in items are in proper location and ready for roughing into Work.
- C. Verify excavation for manholes is correct.

### 3.02 PREPARATION

- A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other sections.

### 3.03 PLACING MANHOLE SECTIONS

- A. Place base pad, with top surface level.
- B. Place manhole sections plumb and level, trim to correct elevations, anchor to base pad.
- C. Cut and fit for pipe as required.
- D. Grout vase of shaft sections to achieve slope to exit piping. Trowel smooth. Contour as required.
- E. Set cover frames and covers level without tipping, to correct elevations.

### 3.04 DROP TYPE MANHOLES

- A. A drop pipe should be provided for a sewer entering a manhole at an elevation of 24 inches or more above the manhole invert.
- B. Where the difference in elevation between the incoming sewer and manhole invert is less than 24 inches, the invert shall be filleted to prevent solids deposition.
- C. Drop manholes should be constructed with an outside wye drop connection. If an inside drop connection is necessary, it shall be secured to the interior wall of the manhole and provide access for cleaning.
- D. Due to the unequal earth pressures that would result from the backfilling operation in the vicinity of the manhole, the entire outside drop connection shall be encased in concrete.

### 3.05 SCHEDULES

- A. Storm Sewer Manholes: Precast concrete sections, copolymer polypropylene plastic steps, 48 inch inside dimension, to depth indicated, with bolted lid.

END OF SECTION

