

# CHAPTER 300 - WASTEWATER TECHNICAL REQUIREMENTS

## 301 PIPES AND FITTINGS

### 301.01 DESCRIPTION

### 301.02 MATERIALS

### 301.03 CONSTRUCTION

### 301.04 MEASUREMENT AND PAYMENT (NOT APPLICABLE TO PRIVATELY FINANCED PUBLIC IMPROVEMENTS)

## 302 MANHOLES AND CONCRETE STRUCTURES

### 302.01 DESCRIPTION

### 302.02 MATERIALS

#### 302.02.01 BASE ROCK

#### 302.02.02 FORMS

#### 302.02.03 CONCRETE AND REINFORCING STEEL

#### 302.02.04 CEMENT MORTAR

#### 302.02.05 MANHOLES

##### 302.02.05A STANDARD PRECAST MANHOLE SECTIONS

##### 302.02.05B STANDARD POLYMER MANHOLE SECTIONS

At the discretion of the City, for capital improvement projects when there is a need for superior corrosion resistance, commonly associated with larger trunk lines or higher acidity levels of effluent, polymer based manholes, meeting the following criteria may be specified for use:

1. Polymer Concrete structure risers, cones, flat lids, grade rings and manhole base sections shall be designed by manufacturer to meet or exceed AASHTO H-20 loading requirements of ASTM C 478, ASTM C 857 and ACI 350-06 as modified for polymer concrete structure design as follows:
  - a. Polymer Concrete Mix Design shall consist of thermosetting resin, sand, and aggregate. No Portland cement shall be allowed as part of the mix design matrix. All sand and aggregate shall be inert in an acidic environment.
  - b. Reinforcement – Shall use acid resistant reinforcement (FRP Bar) in accordance with ACI 440.1R-06 as applicable for polymer concrete design.
  - c. The wall thickness of polymer concrete structures shall not be less than that prescribed by the manufacturer's design by less than 95% of stated design thickness.

- d. Each polymer concrete structure component shall be free of all defects that, due to their nature and degree or extent, detrimentally affect the strength and serviceability of the component part. Cosmetic defects shall not be cause for rejection. The nominal internal diameter of structure components shall not vary more than 2%. Variations in height of two opposite sides of risers and cones shall not be more the 5/8 inch. The under run in height of a riser or cone shall not be more than 3/8 inch.
  - e. Marking and Identification - Each structure shall be marked with the following information - Manufacturer's name or trademark, Manufacturer's location and Production Date.
  - f. Structure joints shall be assembled with a bell/spigot or shiplap butyl mastic and/or gasketed joint so that on assembly, manhole base, riser and top section make a continuous and uniform manhole. External joint sealants can be utilized as well in areas of high groundwater or needing additional containment. Joint sealing surfaces shall be free of dents, gouges and other surface irregularities that would affect joint integrity.
  - g. Minimum clearance between wall penetrations and joints shall be per manufacturer's design.
  - h. Construct invert channels to provide smooth flow transition with minimal disruption of flow at pipe-manhole connections. Invert slope through manhole is as indicated on drawings. All precast base sections to be cast monolithically. Polymer concrete structure bench and channel are to be constructed with all polymer concrete material.
  - i. Extended ballast slab for buoyancy collars can be addressed with cementitious concrete material.
  - j. Provide resilient connectors conforming to requirements of ASTM C 923 or other options as available. All connectors are to be watertight. Install approved resilient connectors at each pipe entering and exiting manholes in accordance with manufacturer's instructions.
2. Thermosetting Resin - The resin shall have a minimum deflection temperature of 158° F when tested at 264 psi (1.820 mPa) following Test Method D 648. The resin content shall not be less than 7% of the weight of the sample as determined by test method D 2584. Resin selection shall be suitable for applications in the corrosive conditions to which the polymer concrete manhole structures will be exposed.
3. All materials needed for grouting and patching will be a polyester mortar compound provided by the manufacturer or an approved equal.

4.4. Manufacturer shall be Armorock LLC or approved equal.

- 302.02.05B05C PRECAST CONCRETE BASES
- 302.02.05C05D POURED-IN-PLACE MANHOLE BASES
- 302.02.05D05E MANHOLE GRADE RINGS
- 302.02.05E05F JOINTING MATERIALS
- 302.02.05F05G MANHOLE STEPS

## 302.02.06 MANHOLE AND CLEANOUT FRAMES AND COVERS

302.02.07 NON-SHRINK GROUT

302.02.08 DROP ASSEMBLIES

302.02.09 CONCRETE ENCASEMENT

302.03 CONSTRUCTION

302.04 MEASUREMENT AND PAYMENT (NOT APPLICABLE TO PRIVATELY FINANCED PUBLIC IMPROVEMENTS)

**303 WORK ON EXISTING SANITARY SEWER PIPES**

303.01 DESCRIPTION

303.02 MATERIALS

303.03 CONSTRUCTION

303.04 MEASUREMENT AND PAYMENT (NOT APPLICABLE TO PRIVATELY FINANCED PUBLIC IMPROVEMENTS)