

CHAPTER 300 - WASTEWATER TECHNICAL REQUIREMENTS

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302 MANHOLES AND CONCRETE STRUCTURES

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302.02.05A STANDARD PRECAST MANHOLE SECTIONS

Precast manhole sections, cones, flat slab tops, and grade rings shall conform to the Standard Details and be in conformance with ASTM C478. Minimum wall thickness shall be 5-inches. Top and bottom of all sections shall be parallel. Tongue and groove manhole sections will not be allowed.

Provide eccentric cones for all manholes over 4-feet from crown of pipe to rim. Eccentric cone sections shall conform to all the requirements of ASTM C478, with the exception of the steel reinforcement requirement, and shall have same wall thickness and reinforcement as the riser manhole sections. Eccentric cones shall be designed to withstand AASHTO H-20 loadings.

Flat slab tops with precast grooves reinforced to withstand AASHTO H-20 loadings shall be provided for manholes 4 or fewer feet deep from crown of pipe to rim. Manholes with 2 to 4-feet from crown of pipe to rim shall have eccentric access flat slab tops. Manholes with less than 2-feet from crown of pipe to rim shall have concentric access flat slab tops.

Prior to the delivery on the job site of any size of precast manhole section, yard permeability tests may be conducted at the point of manufacture. The precast sections to be tested will be selected at random from the stockpiled material that is to be supplied for the job. All test specimens will be mat tested and shall meet the permeability test requirements of ASTM C14 and ASTM C497.

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. Manufacturer shall be Armorock LLC or approved equal.

302.02.05B PRECAST CONCRETE BASES

302.02.05C POURED-IN-PLACE MANHOLE BASES

302.02.05D MANHOLE GRADE RINGS

302.02.05E JOINTING MATERIALS

302.02.05F 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)