

San Antonio Water System Standard Specifications for Construction

**ITEM NO. 850
SANITARY SEWER STRUCTURES**

850.1 **DESCRIPTION:** This item shall govern for the construction of all concrete sanitary sewer structures other than standard sanitary sewer manholes (Item No. 852). All plans, materials and specifications shall be in accordance with the Texas Administrative Code (TAC) rules to include: Design Criteria for Sewerage Systems 30 TAC § 217, or any revisions thereto as applicable. All structures shall be watertight and coated with a SAWS approved sewer structural coating. An approved list of sewer structural coating manufactures may be found on the SAWS website.

850.2 **MATERIALS:**

1. Concrete: All concrete shall conform to the provisions of "Concrete (Class A)", Item No. 300, of the City of San Antonio Specifications or shall be of the class as noted on the plans.
2. Reinforcing Steel: All reinforcing steel shall conform to the provisions of "Reinforcing Steel", Item No. 301, of the City of San Antonio Specifications.
3. Membrane Curing Compound: All membrane curing compound shall conform to the provisions of "Membrane Curing", Item No. 305, of the City of San Antonio Specifications.
4. Manhole Rings and Covers: All manhole rings and covers shall conform to the provisions of "Sanitary Sewer Manholes", Item No. 852, or as designated by the plans and specifications. If concrete throat rings are to be installed they must be used in conjunction with a UV stabilized polyethylene liner and I/I barrier. I/I barrier must meet the following ASTM standards: ASTM D-790/1505 Density of Polyethylene Materials, ASTM D1238 Melt Flow index, ASTM 638 Tensile Strength @ Yield (50mm/mm), ASTM 790 Flexural Modulus, ASTM 648 Heat Deflection temperature @ IGEPAL, ASTM 1693 EsCR, 100% IGEPAL/10% IGEPAL.
5. Coating: All structures and non-structures shall be watertight and the interior walls coated with a SAWS approved sewer structural coating. Note: *Check SAWS website for updates on approved materials.*

San Antonio Water System Standard Specifications for Construction

For existing and rehabilitated structures, apply a combination of both products with the cementitious coating first, followed by the epoxy coating. Lafarge SewperCoat 2000 HR regular, with the required one inch thick application, is the only product yet approved which satisfies the requirement of applying the combination of both the cementitious coating and epoxy coating. Approved materials are as follows:

Cementitious coating: With required one inch thick application.

- Permacast CR-5000
- Strong - Seal MS-2C
- Standard Cement Material Inc. Reliner
- Quadex Aluminaliner

Epoxy coating: With specified thickness application.

- Raven 405 Series High Build Epoxy Liner: Required thickness 125 mils
- Spray Wall polyurethane System: Required thickness 150 mils

850.3 CONSTRUCTION: All concrete sanitary sewer structures shall be constructed in accordance with the specifications herein outlined and in conformity with the required lines, grades, sections, and details shown on the plans or as directed by the Engineer.

Construction methods shall conform to all applicable terms of "Concrete Structures", Item No. 307, of the City of San Antonio Specifications. Where portions of structures are shown on the plan details to be paid per Item No. 404C, such portions shall be constructed in accordance with applicable provisions of "Sanitary Sewer Manholes", Item No. 852. Sanitary sewer structures constructed to function as manholes or maintenance access appurtenances to gravity sewer systems shall be constructed to accommodate influent and effluent pipes greater than 24" in diameter as shown in Standard Drawing DD-850-01.

850.4 TESTING:

1. Hydrostatic Testing: Hydrostatic testing shall be conducted by plugging with approved plugs all influent and effluent pipes in the structure and filling the structure to the top of the structure cone with water. Additional water may be added over a 24 hour period to compensate for absorption and evaporation losses. At the conclusion of the 24 hour saturation period

San Antonio Water System Standard Specifications for Construction

the structure shall be filled to the top of the manhole cone and observed. A loss within a 30 min. period shall be considered an unsuccessful test.

2. Vacuum Testing:

- a. General: Structures shall be tested after installation and prior to backfilling with all connections (existing and/or proposed) in place. Lift holes shall be plugged with an approved non-shrink grout prior to testing. Drop-connections and gas sealing connections shall be installed prior to testing.
- b. Test Procedure: The lines entering the manhole shall be temporarily plugged with the plugs braced to prevent them from being drawn into the manhole. The plugs shall be installed in the lines beyond drop connections, gas sealing connections, etc. The test head shall be inflated in accordance with the manufacturer's recommendations. A vacuum of 10 inches of mercury shall be drawn, and the vacuum pump will be turned off. With the valve closed, the level vacuum shall be read after the required test time. If the drop in the level is less than 1 inch of mercury (final vacuum greater than 9 inches of mercury), the manhole will have passed the vacuum test. The required test time is determined from Table 852-1.
- c. Acceptance: Manholes will be accepted with relation to vacuum test requirements if they meet the criteria above. Any manhole which fails the initial test must be repaired with a non-shrink grout or other suitable material based on the material of which the manhole is constructed. Manholes shall be repaired on the exterior surface only prior to backfilling. The manhole shall be retested as described above until a successful test is made. After a successful test, the temporary plugs will be removed.
- d. Repairs to existing manholes: Any existing manhole which fails to pass the vacuum test shall be closely examined by the Owner and the Contractor to determine if the manhole can be repaired. Thereafter, the Contractor shall either repair or remove and replace the manhole as directed. The manhole shall then be retested and coated with an approved SAWS sewer structural coating as stated above. The Owner may elect to simply remove and replace the existing manhole with a new manhole. Any manhole excavated for repairs or excavated for tie in shall be backfilled with flowable fill up to 1 foot below the cone.

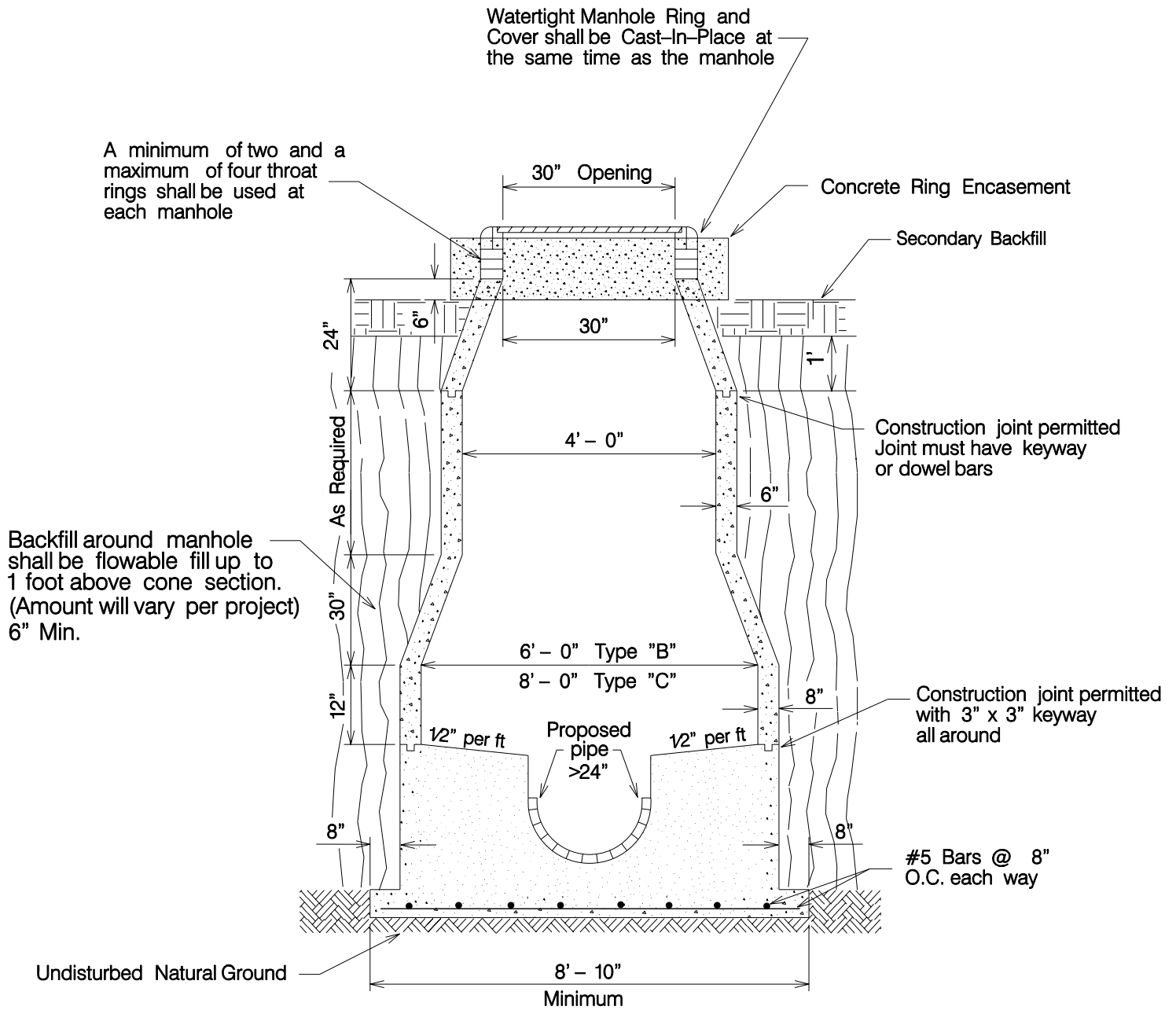
San Antonio Water System Standard Specifications for Construction

- e. **Measurement and Payment:** Vacuum testing of new manholes will not be a pay item. The cost of this work will be included in the bid price for the new manhole. Each vacuum test of an existing manhole shall be a separate pay item. Repairs to existing manholes shall be a separate pay item when authorized.

850.5 **MEASUREMENT:** Sanitary Sewer Structures will be measured as each structure complete in place.

850.6 **PAYMENT:** The work, as prescribed by this item, will be paid for at the unit price bid per each for "Sanitary Sewer Structures," which price shall be full compensation for furnishing and placing all materials, manipulations, bases with pipe cradles, rings and covers, cones, throat rings, I/I barrier, testing precast sections, concrete, flowable fill, manhole ring encasement, mortar, diversion of flows within structure installation, labor, tools, equipment and incidentals necessary to complete the work. Note: No separate payment for structural coating.

Concrete cradles for pipes entering and leaving a manhole shall be measured and paid for at the price bid as provided for in "Concrete Encasement, Cradles, Saddles and Collars", Item No. 858.



SANITARY SEWER STRUCTURE
6' & 8' STRUCTURE TYPE "B" & "C"

Notes:

The channel depth shall be at least equal to the largest pipe diameter.
Structures shall be designed and installed on all mains greater than 24" in diameter.