

SAN ANTONIO RIVER AUTHORITY  
UTILITIES DEPARTMENT

SECTION 33-31-00  
SANITARY SEWERS

**PART 1 GENERAL**

1.1 DESCRIPTION:

A. RELATED WORK SPECIFIED ELSEWHERE:

Section 01-33-00 – Submittals  
Section 33-05-05 - Sewer Excavation, Trenching and Backfilling  
Section 33-01-31 - Sewer Main TV Inspection  
Section 33-05-06 - Sanitary Sewer Testing  
Section 33-05-07 - Jacking, Boring or Tunneling Pipe  
Section 33-05-61 - Standard Sanitary Sewer Manholes  
Section 33-05-63 - Sanitary Sewer Structures  
SAWS ITEM NO. 550 Trench Excavation Safety Protection

v

B. SCOPE:

This item shall govern the furnishing and installation of sanitary sewer pipe as specified by the project plans and specifications.

All sanitary sewer mains and laterals shall be constructed in accordance with these specifications and in conformity with the required lines, grades and details shown on the plans and as directed by the OWNER.

All plans, materials and specifications shall be in accordance with the *Texas Administrative Code (TAC)* rules including *Chapter 217 Design Criteria for Domestic Wastewater Systems*, and any revisions as applicable.

Tie-ins or shutdowns of existing force mains of any size must be coordinated with the river authority inspector at least five business days in advance of shutdown. Contractor shall provide a sequence of as related to tie-ins at no additional cost to river authority or project.

C. SUBMITTALS:

Prior to the start of construction, CONTRACTOR shall submit to OWNER submittals with the type of pipe being proposed for construction for approval. Submittals shall include size, pressure class and material type, manufacturer product data and all other information required to fully evaluate pipe. CONTRACTOR shall also submit the name and qualifications of the independent testing lab that will be used for construction materials testing.

**PART 2 PRODUCTS**

All products shall conform to the OWNER'S Approved Products List. It is the CONTRACTOR'S responsibility to request this list from the OWNER. The CONTRACTOR should review this list prior to start of construction.

2.1 CONCRETE PIPE

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Concrete pipe will not be permitted for use as a sanitary sewer transmission line.

2.2 ASBESTOS-CEMENT PIPE

Asbestos-cement pipe will not be permitted for use as sanitary sewer transmission line.

2.3 POLYVINYL CHLORIDE (PVC) PIPE

- A. No fillers or extenders shall be added to the PVC resin other than those ingredients normally required for lubrication, ultraviolet light protection, stabilization, resin modification and pigments essential for processing, property control or coloring. The PVC sewer pipe shall have elastomeric gasket joints conforming to ASTM D3212 and gaskets to ASTM F477.
- B. All plastic pipes shall be continuously and permanently marked with the following information: manufacturer's name, pipe size (nominal), schedule size, type of material, code number and the ASTM designation with which the pipe complies.
- C. Polyvinyl chloride (PVC) exposed ribbed open profile gravity sewer pipe will not be permitted for use as a sanitary sewer transmission line.

2.4 POLYVINYL CHLORIDE (PVC) PRESSURE PIPE

- A. Polyvinyl chloride (PVC) pressure pipe used for force mains or other use as specified in the plans shall conform to C900 DR14 or C905 DR18 pipe with a minimum pressure class of 200 psi and 235 psi, respectively.
- B. PVC pressure pipe shall be hydrostatically tested at the lowest point to a pressure equal to 2 times the sum of the design hydrostatic head of the water column plus the total friction loss with a maximum of 150 psi.

2.5 CAST IRON PIPE

Cast iron pipe will not be permitted for use as a sanitary sewer transmission line.

2.6 DUCTILE IRON PIPE AND FITTINGS

Ductile iron pipe will not be permitted for use as a sanitary sewer transmission line.

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2.7 PRESTRESSED CONCRETE CYLINDER PIPE

Prestressed concrete cylinder pipe will not be permitted for use as a sanitary sewer transmission line.

2.8 FIBERGLASS REINFORCED PIPE

Fiberglass pipe may be used upon OWNER approval. See *Section 33-05-37 – Fiberglass Reinforced Polymer Mortar Gravity Sewer Pipe*.

2.9 GENERAL

- A. Mechanical or compression joints, concrete jointing collars, or non-reinforced rubber adaptors shall be used only as approved by the OWNER.
- B. All sanitary sewer pipe shall be tested by a manufacturer-approved laboratory at the source of supply. All shipments of pipe shall be accompanied by a certificate of compliance to these specifications prepared by an independent testing laboratory and signed by a Texas registered professional engineer.
- C. Allow 400 feet maximum space between manholes to provide access for cleaning. A 16-foot wide gate with a lock shall be supplied and installed by the contractor for accessing the sanitary sewer line in easements.

**PART 3 EXECUTION**

3.1 GENERAL

- A. All sanitary sewer lines shall be constructed in accordance with the specifications herein outlined and in conformity with the required lines, grades and details shown on the plans and as directed by the OWNER. Successful passage of the hydrostatic, mandrel and air test, as required by TCEQ shall be required for the acceptance of all pipes. Sanitary sewer lines shall be defined as new installation, replacement of existing infrastructure, or repair of infrastructure.
- B. For single family dwelling, lateral size shall be a six (6) inch minimum. House laterals shall be installed so that cleanouts shall have a two (2) foot separation from driveways, shall have a nine (9) foot separation from the water service.
- C. A minimum of four (4) feet of cover is to be maintained over the sanitary sewer main and laterals at grade, otherwise concrete encasement is required.
- D. Multiple units, apartments, local retail and commercial facilities shall have six (6) inch minimum laterals, manufacturing and industrial facilities shall have eight (8) inch minimum laterals, or larger as required.
- E. All excavation and trenching shall conform to *Section 31-50-00 - Trench Excavation Protection*.

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- F. Subgrade filler: When installing pipe in unstable materials, refer to *Section 330505 - Sewer Excavation, Trenching and Backfilling*.
- G. OWNER will inspect all pipe before it is placed in the trench and will reject any sections found to be damaged or defective to a degree that would affect the function of the pipe. Rejected pipe shall be immediately removed from the site of the work. The CONTRACTOR shall be required to commence construction and laying of pipe at the downstream end of the sanitary sewer outfall line and proceed in an upstream direction unless otherwise noted on the plans.
- H. No pipe shall be laid within 10 feet of any point where excavation is in progress. Pipe laying shall proceed upgrade with the tongue or spigot pointing in the direction of flow. Pipe shall be lowered into the trench without disturbing the prepared foundation and trench sides. The drilling of lifting holes in the field will not be permitted.
- I. Pipe shall be pulled in a straight line with all parts of the pipe on grade at all times. No side movement or up and down movement of the pipe will be permitted during or after the pulling operation. Should coupled joints of pipe be out of line or off grade, they shall be removed one joint at a time and brought to the proper line and grade. The lifting or moving of several joints of coupled pipe at one time to close a partially open joint or to find grade under laid joints of pipe will not be permitted. Pulling or pushing a joint of pipe in place by using a crane, bulldozer or backhoe will not be permitted.
- J. No pipe shall be installed in tunnels except as provided on the plans, or with the permission of the OWNER. If the CONTRACTOR finds it necessary to install pipe in tunnels not provided on the plans, he shall submit to the OWNER, prior to commencement of work a detailed outline of procedures, methods and use of materials depending on existing soil conditions.
- K. No pipe alignment deflection shall be allowed. All pipe runs shall be installed in a straight line.
- L. Before leaving the work unattended, the upper ends of all pipelines shall be securely closed with a tight-fitting plug or closure. The interior of laid pipe shall be kept free from dirt, silt, gravel, or foreign material at all times. The interior of pipe shall be cleaned of all foreign material prior to final acceptance of the line. Stockpiled materials shall be stacked to minimize entrance of foreign matter. All pipe in place must be approved before backfilling.
- M. Pipe shall be cut from measurements taken at the site and not from the plans. Necessary provisions shall be taken in laying pipe to provide for expansion and contraction.
- N. The use of laser beams for vertical control shall be required. The CONTRACTOR shall retain a licensed surveyor to verify elevations of all manholes and grades of all sanitary sewer lines installed. The CONTRACTOR will make available to the OWNER, when requested, a level and rod of sufficient sensitivity to accurately determine differences in elevation between points 300 feet apart with one instrument set-up.

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- O. When replacing an existing system in place, the CONTRACTOR shall maintain screens to prevent the entrance of construction debris into the sewer system.
- P. Inductive Tracer Detection Tape shall be placed directly above the centerline of all pipes. The tracer tape shall be encased in a protective, inert, plastic jacket and color coded according to American Public Works Association Uniform Color Code. Except for minimum depth of cover, the tracer tape shall be placed according to manufacturer's recommendations.

### 3.2 WASTEWATER CONNECTIONS

- A. Branch connections of new main lines shall be made by use of manholes.
- B. Connections made to existing mains shall be made at manholes with the crown of the inlet pipe installed at the same elevation as the crown of the existing pipe.
- C. When connections to existing mains are made, a temporary plug approved by the OWNER must be installed downstream in the manhole to prevent water and debris from entering the existing system before Field Acceptance. These plugs shall be removed after the castings are adjusted to finish grade or prior to Field Acceptance.
- D. Where a service connection to a main is made, a wye, tee or double wye shall be installed.
- E. Where not otherwise indicated, wastewater service connections shall be installed so that the outlet is at an angle of not more than 45 degrees above horizontal at the main line.
- F. Sanitary sewer cleanouts shall not be installed in driveways. If unable to install outside of driveway limits, the CONTRACTOR shall submit a variance request to OWNER.
- G. Cleanouts shall be covered and protected to eliminate debris from entering the sanitary sewer system.

### 3.3 SEPERATION DISTANCES

The term sewer line, as referenced in this specification, shall apply to all sanitary sewer infrastructure, including, but not limited to, sanitary sewer mains, laterals, and appurtenances. The term water line references all potable water infrastructure, including service laterals and water mains.

- A. All sewer lines constructed will conform to the Separation Distance requirements of the *TCEQ Chapter 217 Design Criteria for Domestic Wastewater Systems*.
- B. Where 9-foot horizontal separation distance between water lines and sewer lines cannot be maintained, the sewer line shall be constructed of extra stiff pipe SDR 26 PVC (ASTM D2241) with a minimum pressure rating of 160 psi and be placed two feet below the water line.
- C. At all waterline and stormwater crossings and where water and sewer lines are parallel and separation distance cannot be achieved as per TCEQ Chapter 217.53, use extra stiff pipe SDR

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26 PVC (ASTM D2241) with a minimum pressure rating of 160 psi. Pipe shall be encased in grout 6" minimum thickness and 10' beyond both sides of crossing.

- D. When the depth of cover over the top of the pipe is 0 – 14 feet, polyvinyl chloride (PVC) sewer pipe and fittings shall conform to ASTM D3034 SDR 26 (6" – 15") or ASTM F679 PS 115 (18" – 27") with a minimum stiffness of 115 psi.
- E. When the depth of cover over the top of the pipe is greater than 14 feet, pipe shall have a minimum pressure class of 160 psi.

### 3.4 TRAPS AND INTERCEPTORS

- A. Traps and interceptors must be included in design plans and in accordance with current plumbing code.
- B. Traps and interceptors shall be inspected by the local City government.
- C. The OWNER requires a 6-inch or larger sample well and will perform hydrostatic testing for all traps and interceptors.

### 3.5 QUALITY CONTROL

- A. Pipes and manholes shall be tested in accordance with *Section 33-05-06 - Sanitary Sewer Testing*.
- B. All pipes shall be televised in accordance with *Section 33-01-31 - Sewer Main TV Inspection*.
- C. No pipe installation will be accepted until all known leaks have been identified and repaired, regardless if leakage is within the allowable limits. Locating and repairing of leaks shall be performed by the CONTRACTOR at no additional cost.
- D. The INSPECTOR will certify that all required pressure and leakage tests have been successfully completed before the pipe is accepted. The INSPECTOR'S records will include the rate of leakage of all final leakage tests. Passage of a test does not relieve the CONTRACTOR of his responsibilities to meet the requirements of the specifications.
- E. CONTRACTOR shall submit record drawings on a flash drive at the end of the project. CONTRACTOR shall also submit CCTV on a flash drive and compaction density reports for the sewer line and all service laterals. Warranty letters on materials and workmanship shall be for 24 months after final acceptance.
- F. Deflection tests shall be performed on all flexible pipe in accordance with *TCEQ Chapter 217 - Design Criteria for Domestic Wastewater Systems*.
- G. Pipe wall thickness and outside diameter shall meet the requirements established in the respective ASTM standards.

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- I. Pipe wall thickness and outside diameter for AWWA-C905 pipe shall meet the requirements established by the AWWA-C905 standard.

**PART 4 MEASUREMENT AND PAYMENT**

Sanitary sewer construction pipe length will be measured from edge of manhole to edge of manhole. The sanitary sewer line item will be paid for at the contract bid price per linear foot complete in place for the size of line to be constructed. Said price shall be full compensation for furnishing all materials, trenching, bedding, backfill, pumping, haunching, concrete plugs, seepage retainage, laying and jointing, tamping, water, vertical stacks, air testing, line cleaning, television inspection, labor, tools equipment and other incidentals necessary to complete the work. Full payment shall not be issued until all testing requirements are satisfied and result in passing.

**END OF SECTION**