STANDARD SPECIFICATIONS

SECTION 02710

VITRIFIED CLAY PIPE

PART 1 - GENERAL

A. Description

This section describes materials, testing, and installation of vitrified clay pipe (VCP) and fittings for sanitary sewers.

B. Related Work Specified Elsewhere

1.	Trenching, Backfilling and Compacting:	02223
2.	Jacked Casing:	02315
3.	Installation of Gravity Sewer Pipelines:	02701
4.	Concrete:	03300
5.	Precast Concrete Manholes and Manhole Bases:	03461

C. Submittals

1. Provide certificates of compliance with all standards referenced in this section to the District.

2. Provide copies of the manufacturer's required tests to the following conducted on project pipe:

   a. Crushing test

   b. Record of retests and rejections

D. Inverted Siphons (For Piping with Diameter of 10-inches and Under)

Inverted siphons, where not shown on the plans, will be allowed only at locations approved by the District.

PART 2 - MATERIALS

A. Vitrified Clay Pipe

1. General: All VCP and fittings shall be of one class; designated extra strength; of the best quality; vitrified; homogenous in structure; thoroughly burned through their entire thickness; impervious to moisture; sound; and free from cracks, checks, blister, broken extremities, or other imperfections. Pipe shall be bell and spigot pipe unless otherwise specified. Pipe ends shall be square with the longitudinal axis, and sockets shall be true,

circular, and concentric with the barrel of the pipe. The thickness of the shell, the depth of the socket, and the dimension of the annular space shall be within the limits of permissible variation to dimension standards of the specifications of ASTM C700, for the size of pipe indicated on the plans.

2. Pipe Marking: All pipe or fittings shall be clearly marked with the name of the manufacturer or with a trademark and with the size and strength of the pipe as shown on the plans and as herein specified.

3. Testing: Before being used in any work under these specifications, pipe shall be subjected to and shall meet the requirements of the following hydrostatic pressure test and loading test; these tests shall be witnessed by a reputable testing laboratory. Pipe selected for testing shall be delivered to the place and at the time designated by the testing laboratory. All costs of furnishing, transporting, and handling the pipe for testing and conducting the tests shall be borne by the contractor.

   In lieu of witnessing by a testing laboratory, a certified statement from the pipe manufacturer may be furnished stating that all prescribed tests have been made and the pipe to be used on the project has met all requirements of the specifications.

   The testing laboratory shall select, at random, for testing as herein specified, no less than 1% of the number of pipe sections in each size of pipe furnished.

   The specimens selected for testing shall be sound pipe having dimensions consistent with these specifications. The lot or lots from which the tests samples are taken shall be sufficient to fill the entire order for that size of pipe used in the work under the contract and, if they pass the tests, shall be so designated and marked.

   All pipe shall be subject to inspection at the factory, trench, or other point of delivery by the District representative. The purpose of the inspection shall be to cull and reject any pipe that, independent of the physical tests herein specified, fails to conform to the requirements of these specifications or that may have been damaged during transportation or in subsequent handling.

   In lieu of the standard ASTM absorption test, the ASTM C301 hydrostatic pressure test shall be substituted. The hydrostatic pressure test shall precede the loading test by not less than one hour or more than three hours and shall be applied to all the specimens received for test in each size of pipe.

   The loading test shall be the 3-edge bearing test. The loading tests shall conform to the applicable provisions of ASTM C301 and shall be applied to all specimens selected for testing, except that loading to test ultimate strength will not be required.

   If all of the minimum designated percentage or number of the specimens tested meet the requirements of the test, then all of the pipe in the lot, shipment, or delivery corresponding to the sizes and classes so tested shall be considered as complying with the test. If, however, 10% or more of the specimens tested fail to meet the requirements of the test or if more than one specimen fails to meet the requirements of the test when the number to be tested is less than ten, then a second selection of pipe shall be made for that test. The number of specimens to be tested in the second selection of pipe shall be five for each specimen of the first selection that failed to meet the requirements.

If 90% or more of the specimens tested, including those first tested, meet the requirements of the test, all the pipe in the lot, shipment, or delivery corresponding to the sizes and classes so tested shall be considered as complying with that test, otherwise all pipe of these sizes and classes shall be rejected.

4. Causes for Rejection: The following imperfections in a pipe or special fitting shall be considered injurious and cause for rejection without consideration of the test results specified above.

   A single crack in the barrel of the pipe will cause rejection.

   Surface imperfections, such as lumps, blisters, pits or flakes, on the interior surface of a pipe or fitting shall cause rejection.

   When the bore or socket of the pipe varies from a true circle more than 3% of its nominal diameter, it shall be rejected.

   The pipe or fitting shall be rejected if it is designated to be straight and it deviates from a straight line more than 1/16-inch per lineal foot. The deviation shall be measured from a straight edge at a point midway between the ends of the pipe.

   A joint of pipe with a piece broken from either the socket or spigot end shall be rejected.

   Pipe joints that have tramp clays, grog or other foreign matter flushed permanently to the exterior or interior surface of the pipe or fittings shall be rejected.

5. Joints: All VCP fittings shall be furnished with compression joints equal to "Wedge-Lock" manufactured by Pacific Clay Products or "Speed Seal" manufactured by Pacific Coat Building Projects, or approved equal. The compression joint on the spigot and bell ends of the pipe shall be factory made of plastisol, polyurethane elastomer, or other approved resilient element bonded onto the outside of the spigot and the inside of the bell to the pipe and molded and cured to a uniform hardness and compressibility to form a tight compression coupling when assembled. Materials for compression joints shall conform to ASTM C425.

   Where pipe from different manufacturers is to be jointed together, an adapter pipe with the proper matching joint on each end for the respective manufacturer or an adapter with bushing or sleeves and stainless steel bands, matching each pipe end shall be used. Hot poured joints or concrete encasement of plain end joints shall not be permitted.

6. Branches: Branches of the type shown on the plans shall be furnished with connections of the sizes specified and shall be securely and completely fastened to the barrel of the pipe in the process of manufacture. Tee branches shall have their axis perpendicular to the longitudinal axis of the pipe. Wye branches shall have their axis approximately 45 degrees (unless otherwise specified on the plans) to the longitudinal axis of the pipe, measured from the socket end. All branches shall terminate in sockets and the barrel of the branch shall be of sufficient length to permit making a proper joint.

7. Stoppers: The stoppers for all pipe 8-inches in diameter and smaller, in which a sealing component for a flexible compression-type joint is cast, shall be neoprene, polyethylene, or polyurethane. Stoppers in all other cases shall be discs of the same material as the pipe, equal in diameter to the outside of the pipe barrel, and made and installed as approved by the District representative.

Neoprene stoppers shall be manufactured from a compound containing not less than 50 percent neoprene by volume, which shall be the sole elastomer. Stoppers shall not be adversely affected when exposed to the chemical and bacteriological environments normally found in wastewater sewers.

When installed and braced in place in branch spurs, stoppers shall withstand a hydrostatic pressure test of 10 psi with no leakage. When unbraced, stoppers shall remain in place when subject to a maximum air pressure test of 5 psi.

8. Manufacturers: Vitrified clay pipe shall be as manufactured by Gladding McBean, Pacific Clay, Mission Clay Products, or approved equal.

B. Precast Concrete Manholes

Precast concrete manholes shall conform with Section 03461, Precast Concrete Manholes and Manhole Bases.

C. Epoxy Resin

All approved saddle connections to District VCP sewer mains shall be accomplished with an approved epoxy resin. Epoxy resin shall be Epibond 157 as manufactured by Furane Plastics, Inc., WR633 A&B as manufactured by Wyndham Chemicals, Inc., EPON 828 as manufactured by Shell Chemical Corporation, or approved equal. The epoxy resin shall be used in strict accordance with the manufacturer's specifications.

PART 3 - EXECUTION

A. Related Installation Specification

VCP pipe shall be installed in accordance with the requirements of Section 02701, Installation of Gravity Sewer Pipelines.

END OF SECTION