S-82

STANDARD SPECIFICATIONS FOR MATERIALS AND INSTALLATION OF SANITARY SEWER PIPELINES IN THE CITY OF SANTA MARIA, CALIFORNIA

SECTION 1. GENERAL REQUIREMENTS

The work herein provided for is to be done in accordance with the plans, profiles, cross-sections, the general conditions and special provisions on file in the Engineering Division office of the Department of Public Works of the City of Santa Maria. These specifications are intended to cover all items necessary for the complete installation and construction of public sanitary sewer pipeline systems, including manhole structures, wyes, connections and other details and appurtenances thereto. All plans must signed by the City Engineer prior to construction activities. Upon request of the City Engineer, all proposed equipment schedules and material lists shall be submitted and approved prior to installation. Where the term "Standard Specifications" is used herein, it shall mean the Standard Specifications of the State of California, Department of Transportation, most recent edition, unless otherwise noted. Also, in specifically identified areas, the most recent edition of the Standard Specifications for Public Works Construction (“Green Book”) (APWA) is referenced.

SECTION 2. MATERIALS REQUIREMENTS

A. SANITARY SEWER PIPE

1. General

Sanitary sewer pipe shall be vitrified clay pipe with approved factory manufactured compression joint (VCP), polyvinyl chloride pipe (PVC) or other material approved for the specific application by the City Engineer. Unless approved by the City Engineer, the minimum pipe size for sanitary sewer pipelines installed within the public right-of-way shall be 6” for residential and 8” for multi-family, commercial and industrial uses. The minimum size lateral connection shall be 4” and the ongoing maintenance responsibility of each lateral connection is the owner of the property for which service is provided.

Sanitary sewer pipe shall be free from defects, cracks, spalls, or other damage. Causes for rejection are listed in APWA Standard Specifications Section 207. Joint materials shall be newly manufactured and shall be the correct material for the application. If the City Engineer determines that the pipe or joint materials are inadequate, the materials shall be removed from the project site and replaced with new materials acceptable to the City Engineer.

2. Vitrified Clay Pipe (VCP)

VCP installed within public or private streets and public easements shall be per APWA Standard Specifications Section 207.

3. Polyvinyl Chloride Pipe (PVC)

PVC installed within public or private streets and public easements shall be per APWA Standard Specifications Section 207.

4. Other Pipe Materials

The City Engineer shall approve use of other pipe materials for installation as sanitary sewer conveyance facilities.

B. PIPE JOINTS

1. Vitrified Clay Pipe Joints

VCP pipe joints shall be per APWA Standard Specifications, Section 208.

2. Polyvinyl Chloride Pipe Joints

PVC pipe joints shall be per APWA Standard Specifications, Section 208.

3. Other Pipe Joints

Joints for other pipe materials shall be made in compliance with the recommendations of the pipe and joint manufacturers and approved for the specific application by the City Engineer.

Installation and/or repair of sewer lines utilizing couplings/joints shall furnish and install stainless steel shielded sewer couplings, as manufactured by Mission Rubber Company, or approved equal, gasket to meet ASTM C-425-91 Table 2, 300 series stainless steel shear ring with a minimum thickness of .012”, 316 series stainless steel clamps with nut & bolt take up, shear ring and clamps to meet all requirements of ASTM A-167, transitional sizes to utilize a one piece gasket.

C. MANHOLE MATERIALS INCLUDING FRAMES AND COVERS

1. General

All manholes shall be constructed of Portland Cement Concrete, shall conform to Standard Specification S-109, and shall be a minimum of 48" in diameter. Larger diameter manholes may be used to accommodate large pipe sizes. All manhole frames and covers shall conform to APWA

Standard Plan 630-1, or approved equal. Eccentric cones shall be installed unless otherwise noted.

Manholes and appurtenances thereto shall be of the type shown on plans and constructed complete in every detail. Projecting ends of pipe shall be adequately supported to prevent displacement from line-to-grade during construction of the base.

When shown on the drawings, the Contractor shall furnish and install branch pipe(s) projecting clear of the manhole wall. These stub ends shall be plugged with discs of the proper size and cemented in place.

The Contractor shall finish the bottom of the manhole to create an open concave channel to the required cross-section, unless otherwise noted on the plans. Every precaution shall be taken by the Contractor to insure a watertight construction of all manholes.

The tops of the covers shall be set flush with the finish grade as shown on the construction drawings.

Bearing surfaces of the covers and bearing surfaces of the frames shall be smooth and even so as to prevent rocking or clattering by passing vehicles.

The City Engineer shall approve the use of cast-in-place manholes.

2. PreCast Manholes

Precast concrete manhole pipe shall conform to ASTM C-478. Precast concrete manhole materials shall be in accordance with City of Santa Maria Standard Drawing Standard Manhole & Details, with the exception that the manhole cover shall be marked "sewer". The use of precast manhole bases shall require the approval of the City Engineer.

Precast concrete manhole pipe on sewer trunk lines 12” or larger shall be T-lock with factory installed PVC liner or approved equivalent by the City Engineer.

3. Pressure Manholes

Pressure manholes shall be constructed per City of Santa Maria Standard Drawing Standard Manhole & Details and APWA Standard Plan 211-0 and 212-0.

SECTION 3. CONSTRUCTION METHODS

A. LAYOUT

1. Setting Stakes

The Contractor shall be responsible for the establishment of the lines and grades for the work as shown on the plans. Contractor shall employ licensed surveyors or engineers to set line and grade stakes. The Contractor shall preserve all stakes set for the lines, grades or measurements of the work in their proper places until authorized to remove them by the City Engineer. Any expense incurred in replacing said stakes which the Contractor or his subordinates may have failed to preserve, shall be borne by the Contractor.

2. Preservation of Monuments

The Contractor shall not disturb any monuments or stakes found on the line of the improvement without permission from the City Engineer and shall bear the expense of resetting any monuments or stakes which have been disturbed by its forces.

B. TRENCHING

1. Trench Methods

Excavation for laying pipes shall be made in open cut. All trenches shall have vertical sides from pavement or street surface to bottom of trench, conforming to OSHA requirements. Where there is no pavement surface, or where soil conditions dictate (flowing sands, groundwater, etc.), trenches may be sloped from the top of the trench to a line six inches (6") above the top of the pipe upon approval of City Engineer.

That portion of the trench from the bottom to the top of the pipe shall not exceed the exterior diameter of the pipe more than eight inches (8") on each side or a total of sixteen inches (16") greater than the overall diameter of the pipe, exclusive of bells.

Trenching shall conform to the provisions of Section 19 of the Standard Specifications and City Standard Drawing for trench repair.

The bottom of the trench shall be prepared by hand tools to fully and uniformly support the bottom quadrant of the pipe.

Trench bottoms shall be prepared immediately preceding the installation of the pipe. Bell, or joint, holes shall be carefully excavated at proper intervals so that the bells or joints support no part of the load.

Any excavation in excess of that required to support the bottom quadrant of the pipe shall be replaced and machine tamped to form a supporting surface equal to the undisturbed trench bottom.

C. PIPE BEDDING

1. General

Bedding shall consist of the bedding foundation and the bedding backfill.

Bedding foundation shall be carefully and accurately shaped and rounded to conform to the lower quarter of the pipe. The bedding foundation shall provide a uniform density throughout the entire length of the pipe. Where it becomes necessary to remove boulders, unsuitable materials, or other interfering objects at subgrade for bedding, any void below such subgrade shall be filled with the bedding foundation material designated on the plans and in these specifications.

The bedding backfill shall be defined as that material supporting and surrounding the pipe, and extending to 12" above the top of the pipe. Where concrete is specified to cover the pipe, the top of the concrete shall be considered as the top of the bedding.

2. Vitrified Clay Pipe

Bedding foundation for vitrified clay pipe installations shall be shaped bedding, and shall conform to the requirements of Section 19, Earthwork, of the Standard Specifications. Bedding backfill shall comply with City Standard Drawing for trench repair.

3. Polyvinyl Chloride Pipe

Bedding foundation and bedding backfill for polyvinyl chloride pipe installations shall be identical to that specified for VCP above.

4. Other Pipes

If other than PVC or VCP is specified and/or approved, bedding foundation and bedding backfill shall be installed in compliance with the instructions of the pipe manufacturer and approved by the City Engineer.

D. PIPE LAYING

1. Sanitary Sewer Pipe

Sanitary sewer pipe shall be laid to the lines and grades as shown on the plans. A straight line and grade shall run from manhole to manhole (i.e.

no break in line or grade between manholes), unless approved by the City Engineer.

Pipe shall not be placed in water or when the trench or weather is unsuitable for such work.

The pipe shall be installed without grade breaks upgrade with the bell end upstream, unless otherwise authorized, and shall be adjusted to grade by cutting or scraping a trough in the bottom of the trench to conform to the bottom quadrant of the pipe.

All pipes will be laid to grade and line according to stakes set at regular intervals to establish grade by a licensed surveyor or engineer. Pipe grades and alignment shall be established in the trench by conventional survey techniques, or by use of a laser. A laser or string line shall be established in the trench along the centerline of the proposed pipeline, said line being used to determine the horizontal and vertical location of each joint of pipe.

Final pipe placement shall vary in line or grade no more than one-eighth inch (1/8") in ten feet (10') on either side of the centerline or grade line established by the surveyor.

The pipe shall be carefully cleaned, particular attention being paid to spigot and bell ends before joining. The spigot end of the pipe shall be brought into contact with the shoulder in bell and the pieces shall be matched so as to provide an even flow line along the inside lower half of the pipe.

Whenever the work of laying pipe is discontinued for any reason, the end of the pipe shall be securely closed with a tight-fitting plug. The pipe shall be left clean upon completion.

Pipe laying shall conform to the provisions of Section 207 of the APWA Standard Specifications.

The sewer line shall be carefully cleaned through its entire length by the use of a swab. The swab shall be of sufficient diameter to remove all foreign material that may accumulate in the pipe during construction. The swabbing shall progress with the work of jointing and be completely removed from the pipe and again inserted into the pipe, at least once every fifty feet (50') of length of the sewer.

When installing the pipe, the bell and spigot surfaces shall be wiped clean of dirt and foreign matter; then an approved lubricant shall be applied to the joint surfaces and no further sealing element shall be required. With joint surface properly lubricated, position the spigot inside the bell, and shove the joint home. For small diameter pipe, this operation may be

done by hand, but on large diameter, a lever attachment or bar cushioned with a wooden block will be necessary to shove the joint into place.

2. Other Pipes

If other than PVC or VCP is specified and/or approved, it shall be laid in compliance with the instructions of the pipe manufacturer and approved by the City Engineer.

E. TRENCH BACKFILL

1. General

Trench backfill shall be defined as that material extending from the top of bedding backfill to subgrade. All trench backfill shall conform to the requirements of structural backfill as indicated in Section 19 of the Standard Specifications.

The trench shall be backfilled in compliance with City Standard Drawing for trench repair.

Sanitary sewers, where trench backfill is less than three feet, shall have an approved alternate pipe material and/or an approved encasement designed.

F. LATERALS

Laterals shall be constructed with the same material used for sewer line. Connection shall be made through the use of wye or a wye-tee combination with the appropriate degree bend. Tees are not permitted.

For connecting a new lateral to an existing main, connection shall be made by cutting out section of the main line and installing a factory-made replacement section with wye with smooth ends and connecting same with the main line using two (2) Mission Rubber Co. [Mission Flex-Seal Adjustable Repair Coupling (ARC)] or approved equal. Lateral joints between the main line and property line shall be push on type with gasket; no glue. Cut-in to an existing line shall be made in conformance with City Standard Drawing for sewer lateral installation.

G. TESTING/TIGHTNESS

Prior to testing the appropriate assurance must be provided to the City Engineer that the sewer lines were constructed to the line and grade shown on the plans.

The sewer installation will be tested to insure it is water tight and free from infiltration or ex-filtration as far as is possible. Immediately after the pipe has been cleaned by propelling a snug fitting rubber ball through the pipe with water, it shall be tested by the air test procedure identified in Section 306-1.4.4 of the APWA Standard Specifications.

If a leak is determined to exist, the Contractor shall locate it by a means of his own choosing and make necessary repairs, after which the test will be repeated until found to be satisfactory. The Contractor will furnish the equipment necessary for the performance of this test, with the exception of the gauges, which will be furnished by the City Engineer. The air test equipment shall be maintained on the job site at all times.