

ITEM 10603.9308 M - POLYVINYL CHLORIDE (PVC) SEWER PIPE & FITTINGS – 8 NPS

DESCRIPTION

The work shall consist of furnishing, installing and testing a polyvinyl chloride gravity sanitary sewer pipe and fittings and making necessary connections to the existing gravity sanitary sewer pipe and manhole with polyvinyl chloride couplings and adapters or special manufactured adapters for connecting unlike materials at the location indicated on the plans, or as directed by the engineer.

MATERIALS

The Contractor shall be responsible for all material furnished under this item and shall replace, at his expense, all material found defective in manufacture or damaged in handling. Material shall be as follows:

Polyvinyl Chloride (PVC) Sewer Pipe

The pipe and fittings furnished shall meet the requirements of AWWA C900 which are current on the date of advertisement for bids for the class of pipe to be specified by the owning agency.

Fittings

All fittings and accessories shall be as manufactured and furnished by the pipe supplier and have bell and/or spigot configurations identical to that of the pipe to which they are connected. Information available indicates the existing pipe appears to be transite. This is to be field-verified by the Contractor.

Sanitary Sewer Marking Tape

The Contractor shall furnish and install an underground marking tape along all sewer lines, force main and house connections. The material is a PVC tape that must be green in color, three-inch minimum width, marked with the words "Caution - Sanitary Sewer." The warning must be repeated every 16 to 36 inches.

CONSTRUCTION DETAILS

- A. Excavation - Excavation shall conform to the requirements of Section 206, Trench, Culvert and Structure Excavation, except as modified herein and the limits as shown in the Contract Plans.
- B. Backfilling - General - Backfilling shall conform to the requirements of Section 206, Trench, Culvert and Structure Excavation. No trench, pit or other excavation shall be backfilled until the pipe or appurtenant structures contained therein shall have been completely installed and inspected and approved by the Engineer. In backfilling around and over pipes, stone bedding material shall be spread in layers not over 150 mm in depth on both sides of the pipe and thoroughly spaded and tamped around the pipe so that no displacement of the pipe results. Backfill for a minimum distance of 600 mm above the top of the pipe shall be of the same material and shall be spread in layers not to exceed 150 mm in thickness or depth and each

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layer shall be thoroughly compacted by spading and tamping before further refilling is done. In all cases, the backfill above the top of the pipe shall be placed to a minimum of 450 mm before compaction is begun directly over the pipe. All backfill material adjacent to the pipe requires hand compaction.

After partially backfilling and leveling the trenches to a height of 18 to 24 inches above the crown of the pipe, the sanitary sewer marking tape is spread above the prepared surface as straight as possible. The tape is held in position by adding backfill with hand shovels before finishing the backfill. When a roll is finished, a second roll must overlap the end of the first roll by not less than three feet. If the sewer line or house connection does not end into a manhole, the tape must be extended at least three feet beyond the plugged end of line. Payment for the marking tape will be included in the price bid for the pipe.

- C. Laying Sewer Pipe - The sewer pipe shall be bedded on a minimum of 150 mm of stone bedding material. Excavation of trenches for sewer pipe shall be made to line and grade established or as directed by the Engineer and shall be made straight and true with no deviations from a straight line or grade between manholes. The sewer pipe must be laid upgrade on a continuous foundation and not on blocks.

The trench bottom shall be flat. Holes for bells or couplings shall be dug so that no portion of the bell or coupling will contribute to the support of the pipe. The barrel of the pipe shall be uniformly supported throughout the entire length. Should over digging occur, all loosened material shall be removed and the trench bottom brought back to grade with stone bedding material. Bedding material shall be according to specifications and shall be placed and tamped in a manner satisfactory to the Engineer. Bedding material in such instances shall be placed at the sole expense of the Contractor.

In areas where unstable trench bottoms are encountered, the trench shall be excavated to an additional depth below the layer of stone bedding material and a layer of stone foundation material placed and graded so as to properly support the bedding material, pipe, and backfill. The depth shall vary according to actual conditions. Payment for such foundation material shall be as hereinafter specified.

Before joining the pipes, the joints shall be coated with a lubricant recommended by the manufacturer which shall be brushed on the surface to be coated. The spigot shall be positioned in the bell of the preceding pipe and pushed home by hand or with a metal bar. If a metal bar is used, the bell of the entering pipe shall be protected with a block of wood to prevent damage to the pipe. The pipe layer will assure that the joint has been "pushed home."

The inside of each pipe shall be inspected and all foreign matter, joint material that squeezed through, etc., shall be removed before backfilling. Care shall be taken in placing backfill so that the joints are not loosened or sprung. The backfill shall be packed and tamped into place under the pipe. All loosened or broken joints shall be removed and replaced.

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- D. Continuity of Operation and Scheduling - It is essential that the work be performed so that continuity of service is maintained at all times. Interruption of normal flow will be permitted only after approvals therefor have been given in writing by the engineer and only for specific situations enumerated herein. Such interruptions shall extend over a minimum period of time; and overruns of the permitted time, as well as unauthorized interruptions, will subject the Contractor to the payment of liquidated damages of \$500 per day to compensate the Suffolk County D.P.W. for damages it may sustain as a result of such overruns or unauthorized interruptions.

The Contractor shall cooperate with the Suffolk County D.P.W. and shall coordinate all his or her activities so as to prevent interruptions in normal service and operating procedure.

It is mandatory that, except for any scheduled interruption of normal service, the service shall be kept in continuous operation. Should the Contractor cause an unauthorized interruption of normal service or overrun the scheduled period for an authorized interruption, the engineer shall have and is hereby expressly given the right to deduct and retain out of such moneys as may be due or may become due and payable to the Contractor for the work, for damages the Suffolk County D.P.W. may sustain by reason of such overrun or unauthorized interruption of normal service, and in no way consider such sum as a penalty.

- E. Deflection Test - Each section of sewer line shall, unless otherwise ordered by the Engineer, be tested for deflection and/or flattening. Such test shall be made by the Contractor only after backfilling operations have been completed.

The test shall be made by pulling a Go No-Go device of matching diameter, such as a sewer cleaning bucket, through the pipe. Any section of pipe not able to pass the device shall be replaced and the test repeated until successful. The type of device used shall be previously approved by the Engineer.

- F. Leakage Tests - Unless otherwise ordered by the Engineer, all sewers, service connections and sewer laterals, shall be tested for leakage and shall satisfactorily meet the test requirements. No connections to existing sewer laterals shall be made until the leakage requirements are met. The Contractor shall furnish labor, materials and equipment and shall perform the tests. The Contractor shall make all necessary repairs or replacements and shall repeat the final leakage test(s), until the minimum leakage requirements are met.

1. Exfiltration Test - This leakage test consists of an exfiltration test where in the main sewer, sewer laterals and manholes are filled with clear water to provide a head of at least 1.5 meters above the top of the pipe or 1.5 meters above the level of the groundwater table, whichever is higher, at the highest point of the sewer line under test, and measuring the loss of water from the line by the amount which must be added to maintain the original level. In this test the line must remain filled with water for at least 24 hours prior to taking measurements, and the actual test period shall not be less than two hours.

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For purposes of determining the elevation of the top of the groundwater table, the Contractor shall furnish and install an open-end standpipe of perforated pipe. The standpipe shall be installed at least 24 hours before the line is filled with water. One standpipe shall be installed for each section of sewer line tested. A section of sewer is defined as the length of main sewer, including sewer laterals, between two consecutive manholes. Following successful completion of the leakage tests, the standpipe shall be filled with approved material and the top cut off at least 0.6 meters below finished grade.

Exfiltration shall be measured by the drop of water level in a standpipe or in one of the sewer manholes. When a standpipe and plug arrangement is used in the upper manhole of a line under test, there must be some positive method of releasing entrapped air in the sewer prior to taking measurements. In the case of sewers laid on steep grades, the length of line to be tested at any one time may be limited by the maximum allowable internal pressure on the pipe and joints at the lower end of the line. The recommendations of the pipe manufacturer shall be followed.

When the level of the groundwater table is of such height that the manholes cannot be used for convenient measuring, or if the vertical distance between the top of the pipe and the manhole rim is less than 1.5 meters, the Contractor shall test the pipe separately from the manholes utilizing the stand-pipe method including plugs, hoses, etc., to establish the required head of water. Manholes shall then be tested separately.

The total leakage of any section tested shall not exceed the rate of 1400 liters per km of pipe per 24 hours.

2. Infiltration Test - This test shall be made on a section or sections of sewer as directed by the Engineer, after back-filling has been completed and after a sufficient interval of time has elapsed to permit the ground-water to rise up to its normal level.

Normal ground water level, as herein referred to, shall be the elevation to which the groundwater rises when unaffected by any dewatering operations within the area of influence.

The Contractor shall furnish and install an approved type low head measuring weir or other approved - measuring device in the invert at the downstream end of the section together with all other necessary facilities as may be required to properly perform the test. It is intended that the test will be made as soon thereafter as the ground water has risen to its normal level to the satisfaction of the Engineer and all necessary facilities for conducting the test are in position.

A continuous 24-hour test period will be required except where, in the opinion of the Engineer, a longer test period is necessary. The maximum allowable quantity of infiltration or leakage into the portion of sewer under test shall not exceed 100 liters per hour per km of pipe. Tributary house connections shall not be included with the sewer pipe in determining infiltration allowances. There will be no separate infiltration allowance

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for manholes except that Manholes will not be deducted from the length of pipe used in computing the total infiltration allowance for the section under test.

METHOD OF MEASUREMENT

The quantity to be paid for under these items will be the number of meter of new sewer pipe (including all necessary connections and fittings) furnished and installed in accordance with the plans, specifications and as ordered by the engineer.

BASIS OF PAYMENT

The unit prices bid per meter for these items shall include the cost of furnishing all labor, materials and equipment necessary to satisfactorily complete the work including fittings, connections, and tests. Excavation, sheeting and backfill material will be paid for separately under their respective items.