ITEM 10603.9520 M - DUCTILE IRON SEWER PIPE, 200 mm DIA.

DESCRIPTION

Work under this item shall consist of furnishing and installing Ductile Iron Sewer Pipe of the size indicated, in accordance with this specification, at the locations shown on the contract plans or as ordered by the Engineer.

MATERIALS

Pipe - Ductile Iron Pipe shall be centrifugally cast, conforming to the requirements of ANSI A21.51 (AWWA C151). Pipe and fittings shall be pressure Class 1034 kPa.

Eittings - Fittings shall be cast iron or ductile iron conforming to the requirements of ANSI A21.10 (AWWA C110).

Joints - All pipe joints shall be either mechanical joint or push-on joints. Joints for fittings may be flanged.

Mechanical joints, push-on joints and gaskets shall conform to the requirements of ANSI A21.11 (AWWA CIII). All gaskets for mechanical joints shall be lead tipped gaskets.

Flanged joints shall conform to the requirements of ANSI A21.15 (AWWA C115) and ANSI B16.1.

Lining - All pipe and fittings shall be cement lined in accordance with ANSI A21.4 (AWWA C104). The lining shall be centrifugally applied and have a bituminous sealer. The cement lining shall be standard thickness.

All pipe and fittings shall be coated on the outside at the point of manufacture in accordance with the provisions of AWWA C151.

Pipe and fittings shall be encased in polyethylene tubes or sheets in accordance with ANSI A21.5 (AWWA C105).

Quality Assurance - All pipe delivered to the job site shall be clearly marked at the factory with size, type, class of pipe, lot number, date of manufacture and manufacturers identification. Additional markings, as required, shall also be included.

Each coupling, fitting and special shall be similarly marked by the manufacturer and also marked with the size and class of pipe which it is to be used.

Omission of the above information may be cause of rejection of the materials.

Basis of Acceptance - Ductile Iron Pipe shall be accepted on the basis of the Manufacturer's certification that the material conforms to this specification. The certification shall accompany the material delivery at the job site. The Department reserves the right to sample and test this material subsequent to delivery to the project site.

CONSTRUCTION DETAILS

Inspection - All pipe, specials and fittings shall be carefully inspected for defects immediately prior to laying. No cracked, broken or defective materials shall be used in the work. If any defective piece shall be discovered after having been laid, it shall be removed and replaced with a sound one in an acceptable manner by the Contractor, at no cost to the State.

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Excavation - The requirements specified in Section 206, Trench, Culvert and Structure Excavation, that apply to sewer pipe shall govern, except for modifications on the plans, the standard sheets or as directed by the Engineer.

Pipe Laying - All pipe shall be laid accurately to the line and grade shown on the plans. The pipe shall be bedded in a firm, stable, earth foundation. Backfilling shall be in accordance with the details shown on the plans for drainage pipe. Pipe and fittings shall be installed in accordance with the best modern practice. Manufacturers recommendations on installation shall be followed.

Pipes and fittings shall be thoroughly cleaned before they are laid and shall be kept clean until they are accepted in the completed work. All lines shall be kept absolutely clean during construction, shall be stopped off with wooden bulkheads after each day's work, and shall be blown out as directed by the Engineer. Exposed ends of uncompleted lines shall be capped or otherwise temporarily sealed at all times when pipe laying is not actually in progress. The laying of pipe shall begin at the downstream end and progress in the upstream direction. Pipe with bell and spigot type joints shall be laid with the bells upstream. All ductile iron pipe and fittings shall be encased in polyethylene tubes or sheets in accordance with ANSI A21.5 (AWWA C105). The polyethylene shall have a minimum thickness of 0.203 mm. All pipe joints and connections shall be made watertight and shall meet the test requirements for "Leakage Test".

Leakage Test - An exfiltration test shall be performed on the ductile iron sewer pipe. The Contractor shall test each section of pipe between manholes individually, and no continuous sections will be tested simultaneously. The minimum positive head of water for exfiltration testing shall be 0.6 meters above the exterior crown of the pipe at the highest point of the line under test. After the line has been plugged and filled with water, a one (1) hour stabilization period shall be permitted prior to the start of the test. The test shall be conducted for a period of sixty (60) minutes. The Engineer will, after the stabilization period, take three (3) readings of the water level in the manhole barrel, and one (1) hour thereafter another three (3) readings of the water level. The average of the readings will be used by the Engineer to calculate any leakage. The maximum allowable quantity of exfiltration from any section of sewer under test shall not exceed 463 liters per 25 mm of internal diameter per kilometer of pipe per day (0.965 liters/50 m/25 mm/hour). The length of tributary house connections shall not be included with the sewer in determining the allowable leakage. There will be no separate exfiltration allowance for manholes except that they will not be deducted from the length of pipe used in computing the total allowable leakage for the section under test.

Repair and Retest - Should a section or sections of pipe fail to meet the leakage criteria, the Contractor shall at no cost to the State, locate the leaks and repair the pipe as necessary until leakage is within the permitted allowance. Prior to making any repairs, the Contractor shall submit to the Engineer for approval the proposed method of repair. The Engineer shall be the

sole judge as to whether the pipe shall be repaired or replaced. All tests shall be repeated as many times as necessary, at no cost to the State, until the requirements of this specification have been met.

METHOD OF MEASUREMENT

This work will be measured as the number of linear meters (laying length) of pipe, including fittings, furnished and incorporated in the work in accordance with the plans, specifications and as directed by the Engineer.

BASIS OF PAYMENT

The unit price bid per meter shall include the cost of furnishing all labor, materials and equipment necessary to complete the work including pipe, fittings, joints, leakage tests, and breaking into existing sanitary manhole to connect new pipe.

Excavation, granular fill and backfill, cost of adding water for compaction and the necessary sheet piling will be paid for separately under their respective items.