



**SPECIAL PROVISIONS
FOR
TWO INCH FORCE MAIN SEWER PIPE AND FITTINGS**

**Mills County
NHSX-534-1(81)--3H-65**

**Effective Date
July 19, 2011**

THE STANDARD SPECIFICATIONS, SERIES OF 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

Note: manufacturers' names listed in this specification are to illustrate the material requirements for this work. The names are for reference only and do not signify a preference. The Contractor shall submit shop drawings for all materials used for the sanitary force main regardless if the manufacturer's name is listed in this document.

090126.01 DESCRIPTION.

- A.** Furnish and install all pipe, fittings, structures required for sewer construction as shown on plans and/or specified herein.
- B.** Before installation of new sewer facilities, verify sizes, measurements, type and location of existing piping and appurtenances at points of connection to existing system.
- C.** Do work in accordance with best present-day installation and construction practices.
- D.** After award of Contract, submit following information and drawings for Engineer's approval:
 - 1.** Manufacturer's specifications and/or catalog data listing for pipe, fittings and other special items.
 - 2.** Such other information as Engineer may request.
- E.** Incorporate no materials in work until mill and/or factory test certifications, as requested by Engineer, have been furnished which show that materials comply with specifications.

090126.02 MATERIALS.

- A. Sanitary Sewer - Force Main.**

Plastic pipe and fittings shall be laid and joined in accordance with these specifications and the manufacturers' recommendations. PVC pipe shall have a Pressure Rating (PR) and Standard

Thermoplastic Pipe Dimension Ratio (SDR) as defined by ASTM D 2241, as shown on the bid proposal and located as shown on the plans:

$$\text{PR 250} = \text{SDR-17} \quad = \quad \text{CL 250 (2 inch and Larger)}$$

No PVC pipe with a wall thickness less than 0.09 inches will be allowed.

1. PVC Pipe. The PVC pipe shall be manufactured of Type 1, Grade 1, 200 PSI design stress for water at 73.4°F. and designated as PVC 1120 and shall conform to ASTM D 1784 compound specifications. Pipe shall bear the NSF seal of approval and shall conform with the requirements of ASTM D 2241. The pipe shall be precision extruded from new PVC material and shall be homogeneous throughout and free from cracks, holes, foreign inclusions or other defects. The pipe shall be extruded in strict accordance with the raw material manufacturers' recommendations and specifications. Force main pipe shall be solvent weld coupled end pipe.
2. PVC pipe shall be supplied in standard laying lengths of 20 or 40 feet. However, 40 foot lengths of pipe will be approved upon adequate demonstration by the Contractor that they have equipment capable of fully supporting the pipe while being transported and distributed over the project. The Engineer reserves the right to reject pipe with cracks, holes or foreign inclusions, or other potential defects.
3. The manufacturer shall deliver the pipe to the job site by means which will adequately support it and not subject it to undue stresses. The load shall be so supported that the bottom rows of pipe are not damaged by crushing. The pipe shall be carefully unloaded and stored on the project or a site prepared and furnished by the Contractor.
4. Coupled end pipe shall meet previous manufacturing requirements and shall be shipped with one coupling factory applied. Couplings shall be from extruded or molded stock. The couplings furnished shall provide a minimum contact length of one diameter of the pipe each side of the center. The entrance to the coupling shall be beveled to prevent wiping off of the solvents on the male end. Uncoupled ends shall have a ring painted around the end in such a manner as to allow field checking of the setting depth of pipe in the socket.
5. PVC pipe shall be marked with the following: pipe size, material code designation, standard dimension ration (SDR), pressure rating, manufacturer's name or trade mark, NSF seal, and appropriate ASTM designation numbers.

B. Pipe joints.

1. PVC Pipe 2 Inch Diameter.

Joints shall be solvent welded. Solvents for PVC welding shall be purchased from the pipe manufacturer. PVC welding solvent shall be compounded to conform to the socket fit and the weather conditions at the time of installation. At no time shall solvent weld be made when the temperature conditions do not meet the manufacturer's recommendations.

2. Joint Protection and Inspection.

- a. Carefully protect joints from injury while handling and storing pipe.
- b. Use no deformed, gouged or otherwise impaired joints.
- c. Clean bell and spigot surface of dirt and foreign matter before jointing pipe.
- d. Make joints in strict accordance with manufacturer's recommendations.

C. Valves.**1. Gate Valves.**

Gate valves shall be resilient-seated, manufactured in accordance with AWWA C509.

- a. Nonrising stem; "O" ring stem seal; 2 inches operating nut; iron body, bronze mounted.
- b. Valves 12 inches and smaller: Designed for 150-psi water working pressure.
- c. Open counter-clockwise.
- d. Valve ends shall be mechanical joint unless otherwise specified.

2. Valve Boxes.

Use valve boxes for all buried valves unless shown otherwise on the plans.

- a. Cast iron, screw type; with cast iron drop cover.
- b. Inside diameter: 5 1/4 inches
- c. Extension Stems. Buried valves shall be furnished with extension stems and stem guides. Extension stems shall be solid steel and shall be not smaller in diameter than the stem of the valve shaft. Extension stems shall be connected to the valve actuator by means of a Lovejoy "Type D" single universal joint with grease-filled protective boot. All stem connections shall be pinned.
- d. Extension stems shall extend to within 6 inches of the ground surface. Spacers shall be installed to center the stem in the box. Stems shall be equipped with a wrench nut complying with AWWA C500, Section 3.16.

3. Air Release Valves.

Air Release Valves shall be in accordance with Section 2504 of the Standard Specifications and as shown on the plans and Standard Road Plan SW-202.

D. Concrete Thrust Blocks.

1. Required where piping changes direction or dead ends.
2. Carry to undisturbed edge of trench for bearing.
3. No bolts, joints or drain holes shall come into contact with the concrete thrust block. If necessary, a sheet of 4 mil plastic shall be used to protect these areas before the concrete is placed.
4. Size and location of thrust blocking to conform to detail as shown on plans.
5. Thrust blocks shall be poured in place concrete. Precast concrete thrust blocks shall not be used.

090126.03 CONSTRUCTION.**A. Pipe installation.**

1. Before laying pipe, verify all measurements at site; make necessary field measurements to accurately determine sewer make-up lengths or closures.

2. Begin at lowest point in line.
3. Use no defective pipe; check each length for defects and hairline cracks at ends prior to lowering into trench.
4. Lower pipe carefully into trench; lay true to line and grade.
5. Provide a smooth and uniform invert.
6. Pull joints together with equipment recommended by pipe manufacturer. Do not use backhoe to push joints together.
7. Force main shall be installed at a minimum of 5 feet of depth from the finished grade to crown of the pipe.
8. Available information regarding location and depth of existing utilities is shown on plans. Exercise extreme care to avoid damaging existing installations.
9. Shape bell holes at each pipe joint to allow barrel of pipe to support trench load.
10. Valves and valve boxes shall be installed in accordance with the requirements of Section 2435 of the Standard Specifications.

B. Structures.

1. Sanitary Sewer Utility Accesses - Precast Concrete and Cast in Place Concrete.
2. Refer to Section 2435 of the Standard Specifications.

C. Utility markings.

1. Underground-Type Plastic Line Markers.

Manufacturer's standard permanent, bright colored, continuous-printed plastic tape, intended for direct-burial service; not less than 6 inches wide by 4 inches thick. Provide green tape with black printing reading "CAUTION SEWER LINE BURIED BELOW." Marker tape shall be placed in the sanitary sewer pressure main excavation 1 foot above the crown of the pipe.

2. Underground Locator Wire.

Apply Article 2554.03, A, 6 of the Standard Specifications.

3. Surface Markers.

Subject to compliance with requirements, manufactures offering identification markers, which may be incorporated in the work, include, Carsonite Utility Posts & Markers, PRO-MARK Utility Supply Inc., PRO-KOTE, or approved equal. Surface markers shall be installed at locations and indicated on the plans.

D. Pressure Test - Force Main Sewer.

Pressure testing the Force Main Sewer shall be in accordance with Article 2504.03, L, 6 of the Standard Specifications.

090126.04 METHOD OF MEASUREMENT.

A. Pipe and Fittings.

The quantity of sanitary sewer force main pipe and fittings will be measured in linear feet, to the nearest tenth of a foot. Measurements will be made for each linear foot of pipe installed,

measured along the top of pipe from center of structure (or coupling) to center of structure (or coupling). Measurement will not be made for each elbow, thrust block, reducer, or other fitting.

B. Utility Markings.

The quantity of utility markings will be measured in the quantity of each sign placed as indicated in the plans.

090126.05 BASIS OF PAYMENT.

A. Pipe and Fittings.

The Contractor will be paid the contract unit price for Pipe, PVC, 2-IN. Dia., Solvent Weld Pipe per linear foot used and measured as provided above. Payment is full compensation for:

1. Furnishing and installing the pipe, fittings with thrust blocks and solvent weld material,
2. Trench excavation, dewatering, furnishing bedding material, placing bedding and backfill material,
3. Installation of buried pipeline tape along the entire length of pipeline placed,
4. Placement of tracer wire system,
5. Testing and inspection, and,
6. Flushing and abandoning old 2 inch force main.

B. Utility Markings.

The Contractor will be paid the contract unit price for Pipeline Markers for each marker installed and measured as provided above. Payment is full compensation for furnishing and installing the pipeline marker sign and post or post with appropriate decal marking.