

## **APPENDIX B**

# **Technical Specifications for Sanitary Sewer Work**

**Item 753550 – Installing Sanitary (Force Main), DIP, 18"**

SECTION 02530

## SANITARY SEWERAGE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.
- B. Products must be manufactured in the USA in accordance with the Buy America Provisions of the Contract.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Pipe, valves, and fittings.
  - 2. Nonpressure and pressure couplings.
  - 3. Detectable warning tape.
  - 4. Temporary force main bypass. N/A
  - 5. Encasement for piping.

#### 1.3 SUBMITTALS

- A. Product Data: For the following:
  - 1. Pipe, valves, line stops, fittings and couplings.
  - 2. Encasement.
  - 3. Temporary force main bypass N/A: Including, but not limited to: Pipe taps, drilling apparatus, line stops, tapping valves, and all other equipment and materials necessary to complete work.
  - 4. Detectable warning tape.
  - 5. Tapping sleeve and valve, tapping assembly and valve: Must be approved before main is tapped. N/A
- B. Shop Drawings: For temporary force main bypass, include plans, elevations, sections and details. For permanent main transmission and bypass transmission lines, include certified dimensional drawings and pipe laying schedules of all pipes, valves, fittings, and appurtenances showing deflections, lengths, types of joints, type of fitting and type of accessories recommended. The proposed pipe laying schedule must be approved prior to installation of pipe, fittings, and accessories.

- C. Field quality-control reports.
- D. Testing procedures, equipment, and test reports.
- E. Qualifications of Tapping Contractor: Minimum of five years of experience conducting pressure taps and line stop installation on ductile iron (DI) and prestressed concrete cylinder pipe (PCCP) material equal in size to the mains on this project.
- F. As-Built Pipe Laying Schedule and Drawing: Include coordinates for all valves, fittings and appurtenances, deflections, lengths, and elevations at each joint.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect valves against damage to threaded ends and flange faces. Set valve in best position for handling. Protect from weather and support off ground in watertight enclosure maintaining temperature higher than ambient dew-point temperature. Do not use handwheels or stems as lifting or rigging points.
- B. Protect pipe, flanges, pipe fittings, and seals from dirt and damage. Store off ground and maintain factory applied end caps until installation to prevent dirt, debris or moisture from entering.
- C. Engineer and County to inspect materials on site before installation.

#### 1.5 PROJECT CONDITIONS

- A. Interruption of Existing Sanitary Sewerage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
  - 1. Notify Owner no fewer than seven days in advance of proposed interruption of service.
  - 2. Do not proceed with interruption of service without Owner's written permission.\
  - 3. In accordance with information in the contract plans.
- B. Conduct a pre-installation meeting for the temporary force main bypass and all other tie in tasks, to ensure all work is coordinated with County, affected utilities, and other state officials.
- C. All tie in configurations and elevations shall be field verified prior to installation.

## PART 2 - PRODUCTS

### 2.1 DUCTILE-IRON, PRESSURE PIPE AND FITTINGS

#### A. Push-on-Joint Piping:

1. Pipe: Pressure Class 250, ANSI/AWWA – C151/A21.51. Protecto 401 ceramic epoxy lined. Outside surface bituminous coated.
2. All Fittings: 350psi rated, ANSI/AWWA – C153/A21.53, ductile or gray iron. Protecto 401 ceramic epoxy lined
3. Gaskets: AWWA C111, rubber, of shape matching pipe and fittings.
4. Pipe to Pipe Joint restraints shall be as manufactured by Megalugs, TR FLEX, or approved equal and be able to be deflected as required on the plans.

#### B. Mechanical-Joint Piping:

1. Pipe: Pressure Class, C 250, ANSI/AWWA – C151/A21.51Protecto 401 ceramic epoxy lined. Outside surface bituminous coated.
2. All Fittings: 350psi rated, ANSI/AWWA – C153/A21.53, ductile or gray iron, with bolt holes in bell. Protecto 401 ceramic epoxy lined.
3. Glands: Cast or ductile iron; with bolt holes and high-strength, cast-iron or high-strength, low-alloy steel bolts and nuts.
4. Gaskets: AWWA C111, rubber, of shape matching pipe, fittings, and glands.
5. Joint restraints shall be as manufactured by TR FLEX, Megalugs, or approved equal.

### 2.2 TAPPING SLEEVES FOR EXISTING DUCTILE IRON PIPE 36 INCH AND SMALLER- N/A

- A. Cast from ductile iron or fabricated from Stainless Steel.
- B. Ductile Iron Pipe shall be full sleeve type capable of containing pressure with full volume of sleeve.
- C. Gaskets butt against existing pipe.
- D. Suitable for use with ductile iron for sizes indicated.
- E. Rated at working pressure of pipe.
- F. Capable of withstanding rated working pressure without leakage past side and end gaskets and no leakage at junction of the two.

- G. Provide test plug on sleeve for field pressurization of sleeve, valve and tapping machine assembly before making tap.
  - H. Mechanical Joint:
    - 1. Bolts, hexagonal nuts, rubber gaskets, and other accessories: AWWA C111, except provide only high strength low alloy steel bolts.
  - I. Valve flange: Suitable for connecting to mating end of tapping valve, which has a raised face to ensure true alignment of valve and tapping machine, following Manufacturers Standardization Society (MSS) SP60. Fabricated stainless steel sleeves shall be supplied with Stainless Steel flanges, nuts, and bolts.
  - J. Coatings and linings: Protecto 401 ceramic epoxy lined.
  - K. In addition to cast markings required in AWWA C110, cast or stencil with waterproof paint, the class designation of connecting pipe.
  - L. Approved manufacturers:
    - 1. American Flow Control, Series 2800C and 1004.
    - 2. Mueller Company.
    - 3. United States Pipe and Foundry Co., Ductile Iron T-9.
    - 4. JCM Industries, Inc., Nash, Texas, Number JCM 412 Fabricated Steel Tapping Sleeves or Numbers 432 or 452 for Stainless Steel models.
    - 5. Romal Industries, STS 420
    - 6. Power Seal, Models 3490 AS and 3460 AS
    - 7. Or approved equal.
- 2.3 TAPPING ASSEMBLIES FOR PRESTRESSED CONCRETE CYLINDER PIPE 16-INCH AND LARGER – N/A
- A. Designed to withstand total pressure (operating plus surge).
  - B. Saddle Plates: Manufactured from ASTM A285 Grade C, ASTM A36 or equal.
  - C. Gasket: Broad, flat sealing surface and material suitable for potable water ranging in temperature from 32 degrees F to 110 degrees F.
  - D. Valve flange:
    - 1. Manufactured: AWWA C207, Class E or F (match tapping valve flange).

2. Suitable for connecting to mating end of tapping valve, which has raised male face to ensure true alignment of valve and tapping machine following MSS SP60.
  3. Bolts, nuts and studs: High strength, low alloy, ANSI A21.11.
- E. Welds:
1. Interior lining: Dye-penetrant inspected for water tightness.
  2. Certified welders: AWWA C301, Section 1.9.2.
- F. Interior lined with cement mortar or fusion bonded epoxy: minimum thickness of 15 mils, following AWWA C213.
- G. All other steel coated with shop coat primer.
- H. Sleeve:
1. Provide separate gland, which allows sleeve to be installed and annular space between pipe and sleeve to be grouted, before cutting prestressing wires.
  2. Use foam grouted gaskets and hard rubber spacers, to provide annular space between pipe and sleeve.
  3. Grout after sleeve is installed.
  4. Sleeves furnished with grout horns to facilitate grouting annular space.
- I. Grout: Quick-set cement mortar which does not contain calcium chloride or other material that can contribute to corrosion of existing prestressing wire.
- J. Gland:
1. Equipped with load bearing set screws to transfer thrust from branch to sleeve.
  2. Welding gland to steel cylinder of pipe to provide watertight seal will not be permitted.
- K. Encase sleeve in minimum of 1 inch of cement mortar minimum strength 3000 psi, without calcium chlorides, after tap.
- L. Approved manufacturers:
1. JCM Industries, Inc., Nash, Texas, Number JCM 415, Type 1.
  2. Romac Industries, Inc., Seattle, Washington, Number FTS435, Style 1.
  3. Or approved equal.

## 2.4 PRESSURE-TYPE PIPE COUPLINGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Smith Blair.
  - 2. Ford Meter Box Company, Inc. (The); Pipe Products Div.
  - 3. Romac Industries, Inc.
  - 4. Or approved equal.
- B. Metal, bolted, sleeve-type, reducing or transition adapter coupling, for joining underground pressure piping. Match pressure rating of pipe and include ends of same sizes as piping to be joined.
- C. Gasket Material: Natural or synthetic rubber.
- D. Metal Component Finish: Corrosion-resistant coating or material.

## 2.5 DETECTABLE WARNING TAPE

- A. Acid and alkali resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of "SANITARY SEWER" with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep. Colored green for sewer systems.

## 2.6 ADAPTERS: PCCP TO DIP- N/A

- A. Approved Manufacturer: Price Brothers, Hanson, or approved equal for PCCP to DIP 16 inches through 54 inches diameter.
- B. Construction: AWWA C301.
  - 1. Welding: AWS D1.1.
  - 2. Steel cylinder: Designed to withstand total pressure (working and surge pressure) or 275 psi, whichever is greater, following Barlow Formula.
    - a. Maximum allowable steel stress: 0.50 of steel yield stress.
    - b. Minimum steel cylinder thickness: 1/4 inch.
  - 3. Loads for adapters longer than 3'-0": Designed for external loads following AWWA Manual M-11.

4. Adapter ends: Compatible with mating pipe ends.
5. Required accessories: Complete with bolts, nuts, gaskets, and diaphragms.
6. Flanges: Designed for total pressure or surge of 275 psi, whichever is greater, and matching bolt size, bolt hole diameter, and bolt hole circle of mating flange.

C. Shop Coatings:

1. Machined surface: Coat with one coat of Porter Guard Alkyd Zinc Dust Coating No. 299.
2. Steel surfaces: Coat with liquid epoxy.

D. Shop Surface Preparation and Coating Application: AWWA C210.

1. Liquid epoxy coating systems for interior and exterior of steel component pipelines: AWWA C210.
2. Approved finish coats:
  - a. Tnemec Series 139 Pota-pox II.
  - b. PorterLine 6000.
  - c. Carboline Super Hi-gard 891.
  - d. Tnemec Series N140 Pota-pox Plus.
  - e. Or equal.

## 2.7 CONCRETE

A. General: Cast-in-place and precast concrete complying with ACI 318, ACI 350/350R, DeDOT Standards, and the following:

1. Cement: ASTM C 150, Type II.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.
5. Air Entrained: 5 percent.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.

1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 deformed steel.

C. Buttresses and Ballast: Portland cement design mix, 3000 psi minimum, with 0.50 maximum water/cementitious materials ratio.



## 2.8 LINSTOP

### A. General.

1. Rated at a minimum working pressure of 150 psi and hydrostatic test pressure of 300 psi.
2. Lined waterways with fusion-bonded epoxy, minimum thickness of 12 mils, following AWWA C213.

### B. Tapping Saddle Assembly.

1. Full encirclement, consisting of, at a minimum, an upper saddle plate with anchor neck, lower saddle plate, a tapping flange and nozzle with gland or gasket for pressure tight seal. All components properly shaped and of adequate strength to ensure proper mounting and pressure tight seal around the existing pipe. The contractor shall thoroughly clean the existing pipe and obtain circumference measurements at each tapping location for fabrication of the tapping saddle.
2. Saddle plates manufactured from ASTM A283 Grade C, ATSM A36 or equal steel, clean and sound without defects that impact their service. No plugging or welding of such defects will be allowed.
3. Outlet flange manufactured out of the same material as the tapping saddle assemblies: flat face and drill following ANSI B16.5, Class 150 flange. Provide a suitable independently operating locking device in the periphery of the flange to secure the completion plug.
4. All waterways: Dye-penetrant inspected for water tightness.

### C. Completion Plug:

1. Manufactured from ASTM A283 Grade C, ASTM A36 or equal steel.
2. Equipped with two circumferential grooves; one to receive the locking device from the flange, and the second to contain a compressible "O" ring to seal pressure tight against interior diameter of the nozzle.

### D. Blind Flange:

1. To seal the tapping saddle assembly upon removal of the tapping and linestop equipment.
2. Manufactured from AWWA C207, Class D steel and drilled to match bolt circle of the nozzle of the tapping saddle assembly.

### E. Linestop Machine:

1. Tapping Equipment Fabricator/Installer: Furnish a folding plug head linestop capable of a pressure tight seal against the inside diameter of the existing pipe.
2. Linestop: Advance into and retract from the pipeline by means of a hydraulic or mechanical actuator. When retracted the folding plug head to be housed in a pressure tight chamber between the actuator and the tapping valve.
3. Folding plug: capable of displacing accumulated grit deposits in the interior of the pipe while advancing to its linestopping position and have a molded polyurethane sealing element around its perimeter and supply a workable seal with the interior diameter when fully advanced.

F. Approved Tapping Equipment Fabricator/Installers:

1. T.D. Williamson, Inc.
2. Furmanite.
3. Or Equal.

2.9 GATE VALVES – N/A

A. General

1. Gate valves shall be cast iron body, bonnet and wedge, resilient-seated, non-rising stem, 2-inch square operating nut which shall turn left (counter-clockwise) to open, with ample strength to withstand and operate under a working pressure of 150 psi, unless otherwise noted. The thrust collar shall be effective for both opening and closing. Valves greater than 12” shall be manufactured in accordance with AWWA C 509 or C 515. Valves shall be furnished with mechanical joint ends unless flanged or other type ends are indicated in the Contract Documents.
2. Gate valves through 20-inch diameter shall be vertical type with O-ring stem seals. Gate valves 20-inches and greater shall have gearing as approved by the Owner.
3. The body, bonnet and stuffing plate shall be coated with fusion bonded epoxy, both interior and exterior in accordance with AWWA C550. PIV plates shall be painted black.
4. Buried valves shall be furnished with an extension.
5. Wedge rubber shall be molded in place and bonded to the ductile iron portion, and shall not be mechanically attached with screws, rivets, or similar fasteners. The sealing rubber shall be permanently bonded to the wedge to meet ASTM tests for rubber metal bond per ASTM D249.
6. Waterway shall be smooth and shall have no depressions or cavities in seat area where foreign material can lodge and prevent closure or sealing.

7. Wedge shall be constructed of gray or ductile iron, fully encapsulated in synthetic rubber except for guide and wedge nut areas.
8. Valves shall be supplied with O-Ring seals at all joints. No flat gaskets shall be allowed.
9. Stems for NRS assemblies shall be cast bronze with integral collars in full compliance with AWWA. All stems shall operate with bronze stem nuts, independent of stem (in NRS valves). Stainless steel stems or stem nuts are not allowed. NRS stems shall have 2 O-Rings located above thrust collar and one O-Ring below. All stem O-Rings shall be replaceable with valve fully opened and subjected to full pressure. The NRS stems shall also have 2 low torque thrust bearings located above and below stem collar to reduce friction during operation.
10. Each valve shall have a maker's name, pressure rating, and year in which it was manufactured cast in the body. Prior to shipment from the factory, each valve shall be tested by hydrostatic pressure equal to requirements of both AWWA and UL/FM.
11. All external nuts and bolting materials shall be stainless steel and have hexagonal heads.
12. Valves 30" and larger shall have brass bushings where the stem passes through the bonnet.
13. Valves shall have all component parts cast, machined, assembled and tested in the USA and shall be manufactured by Kennedy Valve Company, Mueller, or approved equal.

## 2.10 ROADWAY BOXES

- A. Screw type roadway valve boxes and covers shall be made of cast iron conforming to the requirements of ASTM A 48, Class 30 B.
- B. Roadway valve boxes shall be centered and plumb over the valve operating nut. Backfill shall be compacted under and around valve boxes to insure that no vertical loads are transmitted to the valve operators Valve Boxes.
- C. Covers shall be "drop in" type and they shall be marked "SEWER" with 1-1/2" letters.

## PART 3 - EXECUTION

### 3.1 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewer piping. Location and arrangement of piping layout take into account design considerations. Install piping as

indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.
- C. Use fittings for branch connections unless direct tap into existing sewer is indicated.
- D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. Install force-main, pressure piping according to the following:
  - 1. Install piping with restrained joints at all joints including fittings and at horizontal and vertical changes in direction. Use corrosion-resistant rods, pipe or fitting per manufacturer's proprietary restraint system. Install cast-in-place-concrete buttresses at all horizontal and vertical changes.
  - 2. Install piping with 36-inch minimum cover unless noted otherwise.
  - 3. Install ductile-iron pressure piping according to AWWA C600 or AWWA M41.
  - 4. Install ductile-iron special fittings according to AWWA C600.
  - 5. The force main shall be installed at a grade which will allow the air to migrate to a high point where air can be released through an air valve. A minimum pipe slope of 1 foot in 500 feet should be maintained.
- F. Clear interior of piping and manholes of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

### 3.2 PIPE JOINT CONSTRUCTION

- A. Join force-main, pressure piping according to the following:
  - 1. Join ductile-iron pressure piping according to AWWA C600 or AWWA M41 for push-on joints.
  - 2. Join ductile-iron special fittings according to AWWA C600 or AWWA M41 for push-on joints.
  - 3. Join dissimilar pipe materials with pressure-type couplings.

- B. Pipe couplings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

- 1. Use pressure pipe couplings for force-main joints.

### 3.3 INSTALLATION - THRUST RESTRAINT FOR DUCTILE IRON PIPELINES

- A. Provide Ductile Iron pressure pipelines with all joints restrained and concrete thrust blocking at bends, tees, and changes in direction; construct concrete thrust blocking in accordance with Drawings.
- B. Valves shall be restrained, supported, and strapped and/or anchored in accordance with the Owner's requirements.

### 3.4 VALVE INSTALLATION – N/A

- A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box, unless specified otherwise in the plans.

### 3.5 CLOSING ABANDONED SANITARY SEWER SYSTEMS

- A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use procedure below:
  - 1. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs. Fill abandoned pipe with flowable fill.

### 3.6 IDENTIFICATION

- A. Arrange for installation of green warning tapes directly over piping.
  - 1. Use warning tape over ferrous piping.
  - 2. Use detectable warning tape over nonferrous piping.

### 3.7 LINSTOP

- A. Before ordering linestop tapping saddle assembly.
  - 1. Clean existing pipe, make circumferential measurement of pipe and check for roundness to verify sleeve will fit.

2. Repair any damage to existing pipe coating with suitable coating material to original line of coating as directed by pipe manufacturer's technical representative at no additional expense before backfilling.

B. Installation of linestop.

1. Excavate around existing pipe so as not to disturb thrust blocking.
2. Clean existing pipe.
3. Check pipe outside diameter and roundness to verify assembly will fit.
4. Provide all materials and equipment, to perform installation of linestop.
5. Provide blocking/support following Drawings.
6. Approved Tapping Equipment Fabricator/Installer to install tapping saddle assembly to pipe and to insert linestop into pipe for line isolation.
7. After linestop is no longer required, approved Tapping Equipment Fabricator/Installer to remove linestop and install completion plug and blind flange.

3.8 CONNECTION TO EXISTING MAIN BY TAPPING ASSEMBLY OR SLEEVE

A. Before Ordering Tapping Assemblies or Tapping Sleeves for Existing Pipe Larger Than 12 inches:

1. Clean existing pipe, make circumferential measurement of pipe and check for roundness to verify sleeve will fit.
2. Repair any damage to existing pipe coating with suitable coating material to original line of coating as directed by pipe manufacturer's technical representative at no additional expense before backfilling.

B. Tapping Assembly and Valve Procedure for PCCP.

1. Before placing assembly:
  - a. Clean existing PCCP.
  - b. Check pipe outside diameter and roundness to verify assembly will fit.
2. Install assembly and valve.
3. Keep center of assembly within middle third of standard nominal length of PCCP.
4. Air test or hydrostatically test assembly following manufacturer's instructions to ensure water tightness in presence of Engineer before making tap.
5. Encase steel saddle and U-bolts in concrete following manufacturer's recommendations.

C. Tapping Sleeve and Valve Procedure for DIP pipe.

1. Before placing sleeve clean existing pipe and check pipe outside diameter and roundness to verify that sleeve will fit.
2. Install sleeve and valve.
3. Keep closest edge of sleeve minimum of 9 inches from face of existing joint bell for ductile iron and gray iron pipe.
4. After tapping sleeve installation is complete on existing gray iron or DIP, field coat tapping sleeve with asphaltic seal coat compatible and equivalent to pipe coating.
5. Air test or hydrostatically test sleeve following manufacturer's instructions to ensure water tightness in presence of Engineer before making tap.

D. Approved Tapping Contractors.

1. TDW Services, Inc., all sizes DI/PCCP.
2. Furmanite DI/PCCP.
3. Or approved equal.

### 3.9 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate report for each system inspection.
2. Defects requiring correction include the following:
  - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
  - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
  - c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
  - d. Infiltration: Water leakage into piping.
  - e. Exfiltration: Water leakage from or around piping.
3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.

2. Test completed piping systems according to requirements of authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate report for each test.
5. Force Main: Perform Hydrostatic testing, in compliance with AWWA C600-10, or latest version, at a minimum of 1.5 times working pressure or 100 PSI, or in accordance with the manufacturer's recommendations, whichever is greater or more restrictive. The contractor shall submit a testing means and methods for approval by the owner and Engineer.

a. Examination:

- 1) Verify piping is ready for testing.
- 2) Verify trenches are backfilled.
- 3) Verify pressure piping concrete reaction support blocking or mechanical restraint system is installed and cured.

b. Piping Preparation:

- 1) Plug outlets, wye-branches and laterals; brace plugs to resist test pressures.

c. Field Quality Control:

- 1) Test pressure sewer piping in accordance with Notes on the Drawings.

- C. Leaks and loss in test pressure constitute defects that must be repaired.
- D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

3.10 CLEANING

- A. Clean dirt and superfluous material from interior of piping. Flush with treated water.

END OF SECTION 02530