

SECTION 02730 - SANITARY SEWERAGE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Sanitary sewerage drainage piping, structures, fittings, accessories and bedding.
- B. Connection of building sanitary drainage system to existing municipal sewer system.

1.02 RELATED DOCUMENTS/SECTIONS

- A. Contract documents and drawings, construction details as shown on the plans, geotechnical engineering report, and Referenced Standards are included herein by reference, latest revision shall apply. Refer to appropriate related sections as applicable.

1.03 REFERENCED STANDARDS

- A. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop.
- B. ANSI/ASTM A74 - Cast Iron Soil Pipe and Fittings.
- C. ANSI/ASTM C12 - Practice for Installing Vitrified Clay Pipe Lines.
- D. ANSI/ASTM C14 - Concrete Sewer, Storm Drain, and Culvert Pipe.
- E. ANSI/ASTM C76 - Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
- F. ANSI/ASTM C425 - Compression Joints for Vitrified Clay Pipe And Fittings.
- G. ANSI/ASTM C443 - Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
- H. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
- I. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

- J. ANSI/ASTM D2321 - Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
- K. ANSI/ASTM D2729 - Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- L. ANSI/ASTM D2751 - Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.
- M. ANSI/ASTM D3033 - Type PSP Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- N. ANSI/ASTM D3034 - Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- O. ASTM A746 - Ductile Iron Gravity Sewer Pipe.
- P. ASTM C564 - Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
- Q. ASTM C700 - Vitriified Clay Pipe, Extra Strength, Standard Strength and Perforated.
- R. ASTM D1785 - Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.
- S. ASTM D2922 - Test Methods for Density of Soil and Soil- Aggregate in Place by Nuclear Methods (Shallow Depth).
- T. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.
- U. Shall conform to Local authority standards and specifications.
- V. ASTM C478 - Specification for Precast Reinforced Concrete Manhole Sections

1.04 DEFINITIONS

- A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations. Cut trenches sufficiently wide to enable installation and inspection. The minimum bedding for all pipes is Class B as shown on the plans unless specified otherwise.

1.05 SUBMITTALS

- A. Provide data indicating pipe, pipe accessories, and manufacturer's warranties.
- B. Manufacturer's Installation Instructions: Indicate special procedures required to install products specified.
- C. Manufacturer's Certificate: Certify that products meet or exceed specifications and/or referenced standards.

1.06 PROJECT RECORD DOCUMENTS

- A. Submit complete, detailed as built drawings to Owner, Developer, and Architect upon completion of the work showing vertical and horizontal location. As built drawings shall be based on field run survey(s) and be sealed and signed by a registered surveyor in the State where the project is located. Provide three sets of original hard copies and one digital file in AutoCad or other acceptable digital format. Contractor is responsible for approval and verification of acceptable digital format. **As-built drawings will be required at a minimum 45 days prior to substantial completion.**
- B. Accurately record actual locations of pipe runs, taps, connections, valves, tees, mechanical joints, connections, pipes, manholes, structures, sub-surface drain fields, septic tanks, lift stations, service taps or stubouts, type and size of material, and top and invert elevations of all structures.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities or other structures. All such uncharted utilities or structures shall be shown on as built drawings.

1.07 REGULATORY REQUIREMENTS

- A. Conform to all applicable Federal, State, County, City, or local jurisdiction requirements concerning sanitary sewer construction and safety.
- B. **WARNING:
NO PERSON(S) SHALL ENTER MANHOLES, CONFINED SPACES, OR OTHER UNDERGROUND STRUCTURES, TRENCHES, OR EXCAVATIONS WITHOUT PROTECTIVE BREATHING APPARATUS AND AT LEAST ONE OTHER PERSON PRESENT FOR SAFETY AND ABOVE GROUND MONITORING AT ALL TIMES. CONTRACTOR SHALL PROVIDE AND ENSURE USE OF SAFETY KITS, HELMETS, GLOVES, EMERGENCY OXYGEN RESUSCITATOR KITS, AND AIR QUALITY AND GAS DETECTORS FOR VOLATILE, TOXIC, OR EXPLOSIVE GASES OR SUBSTANCES. VERIFY SAFE OXYGEN**

CONTENT PRIOR TO ENTERING MANHOLES, CONFINED SPACES, OR OTHER UNDERGROUND STRUCTURES.

1.08 FIELD MEASUREMENTS

- A. Verify that field measurements and elevations are as indicated by the manufacturer.

1.09 COORDINATION

- A. Coordinate work with other underground utilities, both existing and proposed. Verify all existing utilities concerning type, size, location and depth prior to start of construction.
- B. Coordinate the Work with termination of sanitary sewer connection outside building.

PART 2 - PRODUCTS

2.01 SANITARY SEWER PIPE MATERIALS

- A. All sanitary sewer structures, piping, materials and installation shall conform to the local authorities having jurisdiction standards and specifications. In the absence of local authority standards and specifications, all materials and construction shall conform, at a minimum, to the current Georgia Department of Transportation (GDOT) standards and specifications, and as specified herein, whichever is greater. The Contractor is responsible for verification of current applicable standards and specifications prior to construction.
- B. Ductile Iron Pipe: Shall conform to Local authority standards and specifications.
- C. Ductile Iron Pipe Joint Device: Shall conform to Local authority standards and specifications.
- D. Plastic Pipe: Shall conform to Local authority standards and specifications.
- E. PVC Pipe: Shall conform to Local authority standards and specifications, minimum SDR 35.

2.02 PIPE ACCESSORIES

- A. Pipe Joints: Mechanical clamp ring type, stainless steel expanding and

contracting sleeve, neoprene ribbed gasket for positive seal.

- B. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.
- C. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Sewer Service" in large letters shall be placed for underground piping.
- D. All pipe joints shall provide a permanent, secure watertight seal.

2.03 BEDDING MATERIALS

- A. Bedding: Fill materials must be approved by Soils Engineer prior to placement and compaction.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify all existing utility structures regarding location and elevation prior to construction. Verify that trench is graded and prepared according to plans and specifications prior to pipeline construction.

3.02 PREPARATION

- A. Hand trim excavations to required elevations. Correct over-excavation with fine aggregate or as directed by the soils engineer. Verify all fill material as suitable with the soils engineer prior to placement and compaction.
- B. Remove large stones, debris, rock, roots, organic material, or other hard matter which could damage piping or impede consistent backfilling or compaction.

3.03 BEDDING

- A. Excavate pipe trench in accordance with Section 02200 for work of this section. Hand trim excavation for accurate placement of pipe to elevations indicated. Cut trenches sufficiently wide to enable installation and inspection. The minimum bedding for all pipes is Class B as shown on the plans unless specified otherwise.
- B. Place bedding material at trench bottom, level materials in continuous

layers not exceeding 6 inches compacted depth. Minimum compaction for pipe trenches is 95% of standard proctor or as directed by the soils engineer.

- C. Maintain optimum moisture content of bedding material to attain required compaction.

3.04 INSTALLATION - PIPE

- A. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. All joints shall be permanent, secure, and watertight.
- B. Lay pipe to slope gradients noted on drawings, with maximum variation from true slope of 1/8 inch in 10 feet, non cumulative.
- C. Install pipe bedding aggregate at bottom, sides and over top of pipe where required and as shown on the drawings. Provide top cover to minimum compacted thickness of 12 inches, compact to minimum 95% standard proctor.
- D. Refer to Section 02200 for trenching requirements. Do not displace or damage pipe when compacting.
- E. Refer to Section 02200 for field testing requirements for fill materials.
- F. Install tracer wire on all pipe runs, drain field tiles, and underground piping.

3.05 INSTALLATION – MANHOLES, JUNCTIONS, STRUCTURES

- A. All manholes, junctions, or structures shall be precast reinforced concrete. All grout shall be nonmetallic, non-shrink type conforming to ASTM C 1107, with minimum 28 day compressive strength of 6500 psi. Set all manholes plumb. Install per manufacturer's specifications.
- B. Manhole, junction, or structure riser sections shall be watertight and sealed per manufacturer's specifications and reference standards using preformed resilient gaskets. Joints between manholes or structures and base sections shall be grouted on the inside to provide a smooth surface. Manhole sections shall grouted to ring and covers on the inside. Comply fully with ASTM C478.
- C. All pipe or other penetrations into manholes, structures, or junctions shall be sealed watertight. Provide resilient connectors manufactured for use in contact with sanitary sewer conforming to ASTM C923 and the local authority having jurisdiction specifications. All penetrations shall be

fully sealed, permanent, and watertight.

3.06 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 02200.
- B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest, until the work meets specified requirements.
- C. Frequency of Tests: As directed by the soils engineer.

3.07 PROTECTION

- A. Protect finished Work from damage during construction. Damaged work shall be replaced at the expense of the contractor.
- B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

END OF SECTION 02730