

SECTION 33 41 00

STORM SEWER SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Site storm sewer drainage piping, fittings, accessories, and bedding.
- B. Connection of site and/or building storm water drainage system to municipal storm sewers.

1.2 RELATED REQUIREMENTS

- A. Section 31 23 33 - Excavation, Backfill, and Compaction for Utilities
- B. Section 33 44 00 – Storm Drainage Structures
- C. Local governing authority and code requirements
- D. Construction Drawings

1.3 PUBLIC WORK

- A. Comply with the City of Centerton, AR, stormwater management and drainage manual. If conflict should be found between this section and city standards for public utilities, city standards shall be the priority. It shall be the Contractor's responsibility to obtain city standard water and sewer specifications and comply with the minimum requirements.

1.4 REFERENCE STANDARDS

- A. American Association of State Highway and Transportation Officials (AASHTO) latest edition
 - M 36 Metallic (Zinc or Aluminum) Coated Corrugated Steel Culverts and Underdrains
 - M 198 Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets
 - M 252 Corrugated Polyethylene Drainage Tubing
 - M 274 Pure Aluminum Type 2 Coated Corrugated Steel Culverts and Underdrains
 - M 294 Polyvinyl Chloride (PVC) Pipe and Fittings
- B. American Society for Testing and Materials (ASTM) latest edition
 - A 760 Spiral Rib Metal Pipe (Type 1 R)
 - C 14 Concrete Sewer, Storm Drain, and Culvert Pipe
 - C 76 Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
 - C 443 Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
 - D 2321 Underground Installation of Flexible Thermoplastic Sewer Pipe
 - D 3034 Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings

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- F 477 Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- F 794 Polyvinyl Chloride (PVC) Pipe and Fittings
- F 2306 2in. to 60in. Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Non-Pressure Gravity-Flow Storm Sewer and Subsurface Drainage Applications
- F 2648 2in. to 60in. Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications

1.6 SUBMITTALS

- A. Product Data: Provide data on pipe materials, pipe fittings, and accessories.
- B. Manufacturer's Certificate: Certify that products meet or exceed specified local requirements.

1.7 PROJECT RECORD DOCUMENTS

- A. Accurately record actual locations of pipe runs, connections, catch basins, cleanouts, and invert elevations.
- B. Identify and describe unexpected variations to subsoil conditions and location of uncharted utilities.

1.8 PROJECT CONDITIONS

- A. Coordinate work with storm sewer connections to structures and to municipal storm sewer system.

PART 2 PRODUCTS

2.1 SEWER PIPE MATERIALS AND ACCESSORIES

- A. Reinforced Concrete Pipe: Comply with requirements of ASTM C 76, Class III unless another class type is indicated on Construction Drawings, installed with flexible plastic, bitumen gaskets at joints. Gaskets shall comply with AASHTO M 198 75I, Type B, and shall be installed in strict accordance with pipe manufacturer's recommendations.
- B. Corrugated Steel Pipe: Galvanized, aluminized, or bituminous coated as specified on Construction Drawings. Only permitted when specifically indicated on Construction Drawings and shall comply with requirements of ASTM A 760; 16 gauge unless another gauge is indicated on Construction Drawings. Install with matching band connectors. Install sleeve gaskets in accordance with pipe manufacturer's recommendations. Corrugated steel pipe may be round pipe, arch pipe, or slotted drain pipe as indicated on Construction Drawings. Slotted drain pipe shall have 1.75-in. wide drain waterway openings and 6-in. minimum height drain guide.

- C. Spiral Rib Metal Pipe Type 1R: Galvanized, aluminized, or bituminous coated as specified on Construction Drawings. Only permitted when specifically indicated on Construction Drawings. Pipe ends shall be re-corrugated and installed with semi-corrugated Hugger-type bands and "O" ring gaskets in accordance with pipe manufacturer's installation requirements. Spiral Rib metal pipe must comply with ASTM A 760 Type 1R. Acceptable manufacturer: CONTECH, INC. "ULTRA FLO or ULTRA FLO II", Caldwell Culvert Co. "Smooth Rib", or approved alternate.
- D. Corrugated Polyvinyl Chloride smooth interior storm sewer pipe and fittings shall comply with ASTM F949-93A, meet all requirements of AASHTO M304-91 (H-20 Loading) and be marked with manufacturers name, pipe size, cell classification and ASTM F 949 classification. Pipe must be installed per manufacturers installation requirements. Acceptable manufacturer: CONTECH, INC. "D-2000" PVC storm sewer pipe or approved alternate.
- E. Corrugated Polyethylene Pipe (CPP) Smooth Interior: Only permitted when specifically indicated on Construction Drawings and shall conform with AASHTO Designation M 252 and M 294. Pipe must be installed in accordance with pipe manufacturer's installation Guidelines for Culvert Storm Drainage Applications. Acceptable manufacturers: Advanced Drainage Systems, Inc. "ADS N-12", HANCOR, INC. "Hi-Q", or approved alternate.
- F. Polyvinyl Chloride (PVC) large diameter closed profile gravity sewer pipe, UNI-B-9: Only permitted when specifically indicated on Construction Drawings. Pipe and fittings shall comply with ASTM F 794. Pipe must be installed in accordance with pipe manufacturer's installation guidelines. Acceptable manufacturer: Carlon "Vylon H.C." or approved alternate.
- G. Polyvinyl Chloride (PVC) 8-in. through 30-in. diameter, smooth interior, open profile gravity sewer pipe. Only permitted when specifically indicated on Construction Drawings. Pipe and fittings shall comply with ASTM F 794 and Uni-Bell UNI-B-9. Pipe must be installed in accordance with pipe manufacturer's installation guidelines. Acceptable manufacturer: Extrusion Technologies, Inc. "Ultra-Rib" or approved alternate.
- H. Corrugated Polyvinyl Chloride smooth interior sanitary sewer pipe and fittings shall comply with ASTM F 949-93A and be marked with manufacturers name, pipe size, cell classification and ASTM F 949 classification. Pipe must be installed per manufacturers installation requirements. Acceptable manufacturer: CONTECH, INC. "A-2000" PVC sanitary sewer pipe or approved alternate.
- I. Polyvinyl Chloride Storm Sewer Truss Pipe and fittings shall comply with ASTM D 2680 and be marked with manufacturers name, pipe size, cell classification and ASTM D 2680 classification. Acceptable manufacturer: CONTECH, INC. "Contect PVC Storm Sewer Truss Pipe" or approved alternate.
- J. High Density Polyethylene Pipe (HDPE): 4-in. through 30-in. diameter, smooth interior gravity flow. Pipe and bell and spigot joint shall comply with ASTM F2648. Gaskets for diameters 12-in though 30 in. shall meet the requirements of ASTM F477. Fittings shall conform to ASTM F2306.

2.2 INLETS, CATCH BASINS AND JUNCTION BOXES

- A. Lid and frame per details shown on Construction Drawings.
- B. Structure construction shall be in accordance with details shown on Construction Drawings and in accordance with Section 33 44 00.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify items specified in other sections are properly sized and located.
- B. Verify that trench cut and excavation is ready to receive work and excavations, dimensions, and elevations are as indicated on Construction Drawings.

3.2 PREPARATION

- A. Hand trim excavations to required elevations. Correct over excavation with bedding material.
- B. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.
- C. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by licensed land surveyor and replaced, as necessary, by same.

3.3 BEDDING

- A. Excavate pipe trench and place bedding material in accordance with Section 31 23 33.

3.4 INSTALLATION - PIPE

- A. Install pipe, fittings, and accessories in accordance with ASTM C 14, ASTM D 2321, or manufacturer's instructions and state or local requirements.
- B. Install pipe on bedding in accordance with Section 31 23 33.
- C. Lay pipe to slope gradients noted on Construction Drawings.
- D. Refer to Section 31 23 33 for trenching requirements. Do not displace or damage pipe when backfilling and compacting.

3.5 INSTALLATION - CATCH BASINS, INLETS, AND JUNCTION BOXES

- A. Form bottom of excavation clean and smooth to correct elevation.

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- B. Form and place cast-in-place concrete base pad in accordance with section 03 30 00, with provision for storm sewer pipe to be placed at proper elevation.
- C. Form and place cast-in-place concrete walls, sleeved at proper elevation to receive storm sewer pipe in accordance with section 03 30 00 and details shown on Construction Drawings.
- D. Form and place cast-in-place top of structure in accordance with details shown on Construction Drawings.

END OF SECTION

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