

SECTION 33 41 00
STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. The Work of this Section includes gravity site storm sewerage drainage piping, fittings and accessories, and bedding; connection of drainage system to on-site area drains, and existing on-site outlets.

1.2 RELATED SECTIONS

- A. Section 03 30 00 - Cast in Place Concrete: Pads Collars, and bases.
- B. Section 31 20 00 - Earth Moving: Aggregate, Trenching and Backfill, Fill.
- C. Section 33 49 00 -Storm Drainage Structures: Manholes and Drainage Inlets.

1.3 REFERENCES

- A. ASTM C 76 - Reinforced Culvert, Storm Drain, and Sewer Pipe.
- B. ASTM C 443 - Joints for Circular Sewer and Culvert Pipe, Using Rubber Gaskets.
- C. AASHTO M 294 Interim, Type S: Corrugated, Polyethylene (HDPE) Plastic Pipe and Fittings.
- D. ASTM D 2321 - Underground Installation of Flexible Sewer Pipe.
- E. ASTM D 2729 - Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

1.4 SUBMITTALS

- A. Product Data: Submit data indicating pipe and pipe accessories.
- B. Manufacturer's Installation Instructions: Submit special procedures required to install Products specified.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Project Record Documents:
 - 1. Accurately record actual locations of pipe runs, connections, drainage inlets, catch basins, and invert elevations.
 - 2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.
- E. Operation and Maintenance Data: Procedures for submittals.

1.5 COORDINATION

- A. Coordinate Work with termination of storm sewer connection to existing drainage system.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Drain Pipe Materials:

1. Plastic Pipe: Corrugated, Polyethylene (HDPE) Plastic Pipe and Fittings: AASHTO M 252 Interim, Type S, with smooth waterway for coupling joints.
 - a. Soiltight Couplings: AASHTO M 252 Interim, corrugated, matching pipe and fittings to form soiltight joints.
2. Plastic Pipe: Corrugated, Polyethylene (HDPE) Plastic Pipe and Fittings NPS 12 to NPS 60: AASHTO M 294, Type S, with smooth waterway for coupling joints.
 - a. Soiltight Couplings: AASHTO M 294, corrugated, matching pipe and fittings

2.2 ACCESSORIES

- #### **A. Pipe Joints: Mechanical clamp ring type, stainless steel expanding and contracting sleeve, neoprene ribbed gasket for positive seal.**
1. Corrugated PE Plastic Pipe: Soil tight joints shall conform to requirements in AASHTO HB-17, Division II, for soil tightness and shall be as recommended by the manufacturer.
- #### **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.**

2.3 BEDDING AND COVER MATERIALS

- #### **A. Bedding: Granular Fill, as specified in Section 31 20 00.**
- #### **B. Cover: Granular Fill as specified in Section 31 20 00.**

PART 3 - EXECUTION

3.1 EXAMINATION

- #### **A. Verify that trench cut is ready to receive Work and excavations, dimensions, and elevations are as indicated on layout drawings.**

3.2 PREPARATION

- #### **A. Hand trim excavations to required elevations. Correct over excavation with Aggregate base materials.**
- #### **B. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.**

3.3 BEDDING

- A. Excavate pipe trench in accordance with Section 31 20 00 for Work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated.
- B. Place bedding material at trench bottom, level materials in continuous layer not exceeding 6 inches compacted depth.
- C. Maintain optimum moisture content of bedding material to attain required compaction density.

3.4 INSTALLATION - PIPE

- A. Install pipe, fittings, and accessories as indicated on the Construction Documents. Seal joints soiltight.
- B. Place pipe on granular fill per Construction Documents.
- C. Lay pipe to slope gradients noted on Construction Documents with maximum variation from true slope of 1/8-inch in 10 feet.
- D. Install Aggregate at sides and over top of pipe. Provide top cover to compacted thickness indicated on Construction Documents in maximum lifts of 8 inches, compact to 100 percent.
- E. Install small area drains, Drain Inlets and Manholes where indicated.
- F. Refer to Section 31 20 00 for backfilling and compacting requirements. Do not displace or damage pipe when compacting.
- G. Refer to Section 33 49 00 for manhole and drain inlet requirements.
- H. Connect to collection point, outfalls, and manholes.

3.5 JOINT CONSTRUCTION AND INSTALLATION

- A. General: Join and install pipe and fittings according to the following.
- B. High Density Polyethylene (HDPE) Plastic Pipe and Fittings: As follows:
 - 1. Join pipe, tubing, and fittings with couplings for soiltight joints according to manufacturer's written instructions.
 - 2. Install according to ASTM D 2321 and manufacturer's written instructions.
- C. System Piping Joints: Make joints using system manufacturer's couplings, except where otherwise specified.
- D. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and fit both systems' materials and dimensions.

3.6 FIELD QUALITY CONTROL

- A. Request inspection prior to and immediately after placing Aggregate cover over pipe.

- B. Compaction testing will be performed in accordance with ASTM D698, ASTM D6938/D2937, and ASTM D 3017.
- C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest.
- D. Frequency of Tests: Per Section 01 45 29 Testing Laboratory Services - Retained by Contractor.
- E. Test: Visually inspect pipe installation for line, grade, and joint tightness. Test for deflection using mandrel per manufacturer's specifications and recommendations.

3.7 PROTECTION OF FINISHED WORK

- A. Protect pipe and Aggregate cover from damage or displacement until backfilling operation is in progress.
 - 1. Take care not to damage or displace installed pipe and joints during construction of pipe supports, backfilling, testing, and other operations.
 - 2. Where pipe is damaged or displaced, take remedial measures as directed by the COTR including, but not limited to, retesting of joints, relaying pipe or replacing pipe. Provide remedial measures at no additional cost to the VA.

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