

**SECTION 33 41 00**  
**FACILITY STORM DRAINAGE PIPING (Storm Drain Pipe)**

**PART 1 GENERAL****1.1 DESCRIPTION**

- A. The work of this section includes, but is not limited to:
1. Storm sewer pipelines
- B. Related Work Specified Elsewhere:
1. Earth Moving: Trenching, Backfilling and Compacting): Section 31 20 00.02
  2. Erosion and Sedimentation Controls: Section 31 25 00
  3. Concrete (Trench Paving and Restoration): Section 32 13 13.02
  4. Facility Storm Drainage Piping: (Inlets, CB, EW) Section 33 05 16.13
  5. Concrete (Cement Concrete for Utility Construction): Section 32 13 13.03
- C. Definitions:
1. Polyethylene pipe Type C - full circular cross-section with corrugated surface both inside and outside.
  2. Polyethylene pipe Type S - full circular cross-section with outer corrugated pipe wall and smooth inner wall.
- D. Applicable Standard Details: NONE

**1.2 QUALITY ASSURANCE**

- A. Reference Standards:
1. Pennsylvania Department of Transportation (PennDOT), latest revision:  
Publication 408, Specifications  
Publication 72M, Standards for Roadway Construction
  2. American Society for Testing and Materials (ASTM):  
C76 Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe  
C507 Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe  
D2241 Specification for Poly (Vinyl Chloride) (PVC) Pressure Rated Pipe (SDR series)  
D2321 Practice for Underground Installation of Thermoplastic Pipe for Sewers and other Gravity-Flow Applications.  
F405 Specification for Corrugated Polyethylene (PE) Tubing and Fittings  
F667 Specification for Large Diameter Corrugated Polyethylene Tubing and Fittings
  3. American Association of State Highway Transportation Officials (AASHTO):  
M36 Metallic (zinc or aluminum) coated corrugated steel culverts and underdrains  
M246 Precoated galvanized steel sheet for culverts and underdrains  
M252 Corrugated Polyethylene Drainage Tubing  
M278 Class PS50 Polyvinyl Chloride (PVC) Pipe  
M294 and MP6-95 Corrugated Polyethylene Pipe, 12" to 36" Diameter

**1.3 SUBMITTALS**

- A. Certificates:
1. Submit two copies of manufacturer's certification attesting that the pipe, fittings, and joints meet or exceed specification requirements.

- B. Manufacturer's Literature:
  - 1. Submit two copies of the manufacturer's recommendations on installation, handling, and storage of materials.

**1.4 JOB CONDITIONS:** Section not utilized.

**1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING**

- A. During loading, transporting, and unloading, exercise care to prevent damage to materials.
- B. Do not drop pipe or fittings. Avoid shock or damage at all times.
- C. Do not place materials on private property without permission from the property owner.

**PART 2 PRODUCTS**

**2.1 CORRUGATED GALVANIZED STEEL PIPE AND PIPE ARCH**

- A. Pipe and Coupling Bands:
  - 1. Section 601.2, Publication 408 Specifications.
  - 2. AASHTO M36, Type I or AASHTO M218, Type I or AASHTO M274, Type II.
  - 3. Metal sheet thickness and corrugation size as indicated on the Contract Drawings.

**2.2 REINFORCED CONCRETE PIPE**

- A. Pipe and Fittings:
  - 1. ASTM C76, Minimum Class II
- B. Joints:
  - 1. Tongue and groove or bell and spigot.

**2.3 ELLIPTICAL REINFORCED CONCRETE PIPE**

- A. Pipe and Fittings:
  - 1. ASTM C76, Minimum Class II

**2.4 CORRUGATED POLYETHYLENE PIPE**

- A. Tubing and Fittings - 3" to 6"
  - 1. AASHTO M252
  - 2. ASTM F405
- B. Pipe and Fittings - 12" to 48"
  - 1. Integrally formed smooth interior.
  - 2. AASHTO M294 and MP6-95
  - 3. ASTM F667
- C. Pavement Base Drains - 4", 6"
  - 1. AASHTO M304

**2.5 POLY (VINYL CHLORIDE) PIPE 3" TO 6"**

- A. Pipe and Fittings
  - 1. AASHTO M278
  - 2. ASTM D3034

**PART 3 EXECUTION****3.1 PREPARATION**

- A. Perform trench excavation and associated work as specified in Section 31 20 00.02.
- B. Provide pipe bedding as specified in Section 31 20 00.02. Place aggregate so that the pipe can be laid to the required tolerances.

**3.2 LAYING PIPE IN TRENCHES**

- A. Give ample notice to the ENGINEER in advance of pipe laying operations, minimum twenty-four hours.
- B. Lower pipe into trench using handling equipment designed for the purpose to assure safety of personnel and to avoid damage to pipe. Do not drop pipe.
- C. Lay pipe proceeding upgrade with the bell or groove pointing upstream.
- D. Lay pipe to a true uniform grade with the barrel of the pipe resting solidly in bedding material throughout its length. Excavate recesses in bedding material to accommodate joints, fittings and appurtenances. Do not subject pipe to a blow or shock to achieve solid bearing or grade.
- E. Lay each section of pipe in such a manner as to form a close concentric joint with the adjoining section and to avoid offsets in the flow line.
- F. Clean and inspect each pipe and fitting before joining. Align pipe with previously laid sections. Assemble to provide tight, flexible joints that permit movement caused by expansion, contraction, and ground movement. Assemble joints in accordance with the pipe manufacturer's instructions.
- G. Check each pipe installed as to line and grade in place. Correct deviation from line and grade immediately. A deviation from the designed line or grade as shown on the Contract Drawings will be cause for rejection.
- H. Place and compact sufficient backfill to hold each section of pipe firmly in place as the pipe is laid.

**3.3 PAVEMENT BASE DRAINS AND PIPE UNDERDRAINS**

- A. Backfill pipeline trenches only after examination of pipe by the ENGINEER.
- B. Backfill and compact trenches as specified in Section 31 20 00.02.

**3.4 PAVEMENT BASE DRAINS AND PIPE UNDERDRAINS**

- A. Construct drains of the size and type indicated on the Contract Drawings in accordance with the requirements set forth in Section 610, Publication 408 Specifications and as shown on Standard Drawing RC-30, Publication 72M.

**3.5 SURFACE RESTORATION**

- A. Restore unpaved areas in accordance with Section 31 20 00.02.
- B. Restore other areas in accordance with Section 32 13 13.02.

**END OF SECTION**