

DIVISION 33: UTILITIES

33 4000 STORM DRAINAGE UTILITIES

33 4116 SITE STORM UTILITY DRAINAGE PIPING

33 4117 SUBSURFACE STORMWATER MANAGEMENT SYSTEM

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SECTION 33 4116**SITE STORM UTILITY DRAINAGE PIPING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Perform excavating and backfilling required for work of this Section.
 - 2. Furnish and install storm drainage system using concrete pipe or PVC Polyethylene Pipe and fittings as described in Contract Documents from point of water collection to terminating point.
- B. Related Requirements:
 - 1. Section 31 2316: 'Excavation' for criteria for performance of excavation.
 - 2. Section 31 2323: 'Fill' for criteria for performance of backfill and compaction.

1.2 REFERENCES

- A. Reference Standards:
 - 1. American Association Of State Highway And Transportation Officials:
 - a. AASHTO M 252-18, 'Standard Specification for Corrugated Polyethylene Drainage Pipe'.
 - b. AASHTO M 294-18 'Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter'.
 - 2. ASTM International:
 - a. ASTM A74-17, 'Standard Specification for Cast Iron Soil Pipe and Fittings'.
 - b. ASTM A536-84(2014), 'Standard Specification for Ductile Iron Castings'.
 - c. ASTM A929/A929M-18, 'Standard Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe'.
 - d. ASTM C14-15a, 'Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe'.
 - e. ASTM C14M-15a, 'Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe (Metric)'.
 - f. ASTM C76-19, 'Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe'.
 - g. ASTM C564-14, 'Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings'.
 - h. ASTM D2321-18, 'Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications'.
 - i. ASTM D3034-16, 'Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings'.
 - j. ASTM D3212-07(2013), 'Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals'.
 - k. ASTM F794-03(2014), 'Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter'.
 - l. ASTM F1336-15, 'Standard Specification for Poly (Vinyl Chloride) (PVC) Gasketed Sewer Fittings'.
 - 3. Cast Iron Soil Pipe Institute:
 - a. CISPI 301-12, 'Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications'.
 - b. CISPI 310-12, 'Standard Specification for Couplings for use in connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications'.
 - c. CISPI Handbook. 'Cast Iron Soil Pipe and Fittings Handbook' (2006).
 - 4. International Code Council:
 - a. ICC IPC, '2015 International Plumbing Code'.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Materials:

1. Bedding Material: 3/8 inch (9.5 mm) crushed gravel.
2. Catch Basins, Curb Inlets, Etc:
 - a. Concrete where shown on drawings as concrete:
 - 1) Construct of 5000 psi (34.47 MPa) minimum concrete.
 - 2) Include cover inlet with cast iron frame and grate as shown on Drawings.
 - b. PVC where shown on drawings as PVC:
 - 1) Comply with requirements of ASTM D3212, ASTM F794, and ASTM F1336.
 - 2) Metal grates, Frames, and hoods shall comply with ASTM A536, Grade 70-50-05.
 - 3) Type One Acceptable Products:
 - a) Nyloplast-ADS, Buford, GA (866) 888-8479. www.nyloplast-us.com.
 - b) Equal as approved by Architect before bidding. See Section 01 6200.
3. PVC Pipe And Fittings:
 - a. Meet requirements of ASTM D3034, SDR 35.
 - b. Fittings: Slip Joint type with elastomeric seals.
4. Fittings: Slip Joint type with elastomeric seals.
5. Adapters: As recommended by pipe manufacturer.
6. Corrugated Polypropylene (PP) Pipe And Fittings for pipes 12 inches diameter and above.
 - a. Meet requirements of ASTM F2881.
 - 1) Corrugated, helical or annular, exterior with smooth interior and gasketed connectors.
 - 2) Corrugated, annular, with silt and watertight joints for storm sewers.
7. Corrugated Polyethylene Pipe And Fittings for pipes 11 inch diameter and smaller:
 - a. Meet requirements of AASHTO M 252 or AASHTO M 294, Type S.
 - 1) Corrugated, helical or annular, exterior with smooth interior and gasketed connectors.
 - 2) Corrugated, annular, with silt and watertight joints for storm sewers.

PART 3 - EXECUTION

3.1 PREPARATION

- #### **A. Excavate and backfill as specified in Section 31 2316 and Section 31 2323 with following additional requirements:**
1. Runs shall be as close as possible to those shown on Contract Documents.
 2. Excavate to required depth.
 3. Grade to obtain fall required.
 4. Remove debris from trench before laying bedding and pipe.
 5. Do not cut trenches near footings without consulting Architect.
 6. Backfill only after pipe lines have been tested, inspected, and approved by Architect/Engineer.

3.2 INSTALLATION

- #### **A. PVC / Polyethylene Pipe/ Polypropylene (PP) Pipe:**
1. Install in accordance with ASTM D2321.
 2. Minimum cover for corrugated polyethylene pipe and fittings shall be 12 inches (300 mm) for H-20 load.
 3. Provide 3/4 inch minus gravel to springline of pipe.
- #### **B. Use jacks to make-up gasketed joints.**

3.3 FIELD QUALITY CONTROL**A. Non-Conforming Work:**

1. Failure to install joints properly shall be cause for rejection and replacement of piping system at no additional cost to Owner.

3.4 CLEANING

- A. Remove excess earth from site or place as directed by Architect.

END OF SECTION

SECTION 33 4117**SUBSURFACE STORMWATER MANAGEMENT SYSTEM****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install storm drainage system as described in Contract Documents from point of water collection to terminating point.
- B. Related Requirements:
 - 1. Section 31 2316: 'Excavation' for criteria for performance of excavation.
 - 2. Section 31 2323: 'Fill' for criteria for performance of backfill and compaction.

PART 2 - PRODUCTS**2.1 SYSTEM**

- A. Materials:
 - 1. Bedding Material: crushed gravel.
 - 2. Subsurface Stormwater Management.
 - a. Manufacturers:
 - 1) Type One Acceptable Systems:
 - a) Cultec: Brookfield, CT www.cultec.com.
 - b) StormTech: Wethersfield, CT www.stormtech.com.
 - c) Equal as approved by Architect before bidding. See Section 01 6200.

PART 3 - EXECUTION**3.1 PREPARATION**

- A. Excavate and backfill as specified in Section 31 2316 and Section 31 2323 with following additional requirements:
 - 1. Excavate to required depth.
 - 2. Grade to obtain fall required.
 - 3. Remove debris from trench before laying bedding and pipe.
 - 4. Do not cut trenches near footings without consulting Architect.
 - 5. Backfill only after pipe lines have been tested, inspected, and approved by Architect.

3.2 INSTALLATION

- A. Installation: Install in accordance with Manufacturers' published installation instructions.

3.3 FIELD QUALITY CONTROL

- A. Non-Conforming Work:
 - 1. Failure to install joints properly shall be cause for rejection and replacement of piping system at no cost to Owner.

3.4 CLEANING

- A. Remove excess earth from site or place as directed by Architect.

END OF SECTION