

## **SECTION 33 40 00 - STORMWATER DRAINAGE AND CONVEYANCE**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes:
  - 1. Stormwater Drainage Piping.
  - 2. Stormwater Inlet Structures.

#### **1.3 INFORMATIONAL SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Trench drain, slot drain, and catch basin assemblies
- C. Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from other existing/proposed utilities. Indicate interface and spatial relationship between manholes, piping, and proximate structures.
- D. Profile Drawings: Show system piping in elevation. Draw profiles at horizontal scale of not less than 1 inch equals 50 feet and vertical scale of not less than 1 inch equals 5 feet. Indicate manholes and piping. Show types, sizes, materials, and elevations of other utilities crossing system piping.
- E. Field quality-control reports.

#### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Do not store plastic pipe and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.

#### **1.5 PROJECT CONDITIONS**

- A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
  - 1. Notify Owner's Rep no fewer than two days in advance of proposed interruption of service.
  - 2. Do not proceed with interruption of service without written permission from Owner's Rep.

#### **1.6 QUALITY ASSURANCE**

- A. Installer Qualifications: Fabricator of products.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

- C. Testing Agency Qualifications: Qualified according to ASTM C 1021 or ASTM C 1093 for testing indicated.

## PART 2 - PRODUCTS

### 2.1 PVC PIPE AND FITTINGS

- A. PVC Cellular-Core Piping:
  - 1. PVC Cellular-Core Pipe and Fittings: ASTM F 891, Sewer and Drain Series, PS 50 minimum stiffness, PVC cellular-core pipe with plain ends for solvent-cemented joints.
  - 2. Fittings: ASTM D 3034, SDR 35, PVC socket-type fittings.

### 2.2 TRENCH DRAIN

- A. Provide the following trench drain structure or equivalent approved by Owner's Rep:
  - 1. ACO Klassic Drain K100S  
ACO USA  
North East Sales Office  
P.O. Box 245  
Chardon, OH 44024
- B. Install drain per manufacturer's written instructions. If all installation methods interfere with design in Contract Drawings, notify Owner's Rep so a proper solution can be determined.

### 2.3 SLOT DRAIN

- A. Provide the following slot drain structure or equivalent approved by Owner's Rep:
  - 1. ACO Brickslot Drain  
ACO USA  
North East Sales Office  
P.O. Box 245  
Chardon, OH 44024
- B. Install drain as outlined in contract drawings. Verify that installation method is in compliance with manufacturer's specifications. For any installation components not included in drawings, refer to manufacturer's written instructions.

### 2.4 CATCH BASIN

- A. Provide the following catch basin structure or equivalent approved by Owner's Rep:
  - 1. ACO K900 Series Catch Basin  
ACO USA  
North East Sales Office  
P.O. Box 245  
Chardon, OH 44024
- B. Install basin as indicated in contract drawings. Verify that installation method is in compliance with manufacturer's specifications. For any installation components not included in drawings, refer to manufacturer's written instructions.

## 2.5 AREA DRAIN

- A. Provide the following area drain or equivalent approved by Owner's Rep:
  - 1. Zurn Z560 12" Area Drain  
Zurn Industries, LLC  
1801 Pittsburgh Avenue  
Erie, PA 16502
- B. Install drain as outlined in contract drawings. Verify that installation method is in compliance with manufacturer's specifications. For any installation components not included in drawings, refer to manufacturer's written instructions.

## PART 3 - EXECUTION

### 3.1 EARTHWORK

- A. Excavation, trenching, and backfilling are specified in Section 312000 "Earth Moving."

### 3.2 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
- C. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- D. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.
- E. Install gravity-flow, nonpressure drainage piping according to the following:
  - 1. Install piping pitched down in direction of flow.
  - 2. Install piping with restrained joints at tee fittings and at changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place concrete supports or anchors.
  - 3. Install piping with 48-inch minimum cover.
  - 4. Install PVC cellular-core piping according to ASTM D 2321 and ASTM F 1668.

### 3.3 PIPE JOINT CONSTRUCTION

- A. Join gravity-flow, nonpressure drainage piping according to the following:
  - 1. Join PVC cellular-core piping according to ASTM D 2321 and ASTM F 891 for solvent-cemented joints.

### 3.4 DRAIN INSTALLATION

- A. All drains should be installed per manufacturer's specifications unless otherwise noted.

### 3.5 CONNECTIONS

- A. Contractor is to verify horizontal location and invert of existing public stormwater conveyance system and connect into system. Connection should be made in compliance with any applicable local codes.

### 3.6 IDENTIFICATION

- A. Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.
  - 1. Use detectable warning tape over nonferrous piping and over edges of underground structures.

### 3.7 CLEANING

- A. Clean interior of piping of dirt and superfluous materials. Flush with potable water.

END OF SECTION