

## SECTION 02635

### STORM DRAINAGE PIPING

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Storm drainage piping, fittings, and accessories.
- B. Foundation drainage piping and accessories
- C. Water quality treatment device
- D. Connection of drainage system to municipal storm drain system.

##### 1.02 RELATED SECTIONS

- A. Section 02250 - Dewatering.
- B. Section 02315 - Excavation:
- C. Section 02317 - Trenching for Site Utilities:
- D. Section 02640 - Manholes and Covers.

##### 1.03 REFERENCES

- A. ASTM A 74 - Standard Specification for Cast Iron Soil Pipe and Fittings; 2005.
- B. ASTM A 746 - Standard Specification for Ductile Iron Gravity Sewer Pipe, latest edition.
- C. ASTM C 76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe; 2005b.
- D. ASTM C 443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets; 2005a.
- E. ASTM C 443M - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets (Metric); 2005a.
- F. ASTM D 1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2005.
- G. ASTM D 2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications; 2005.
- H. ASTM D 2729 - Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2003.
- I. ASTM D 3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2004a.
- J. AASHTO M252 - Standard Specification for Corrugated Polyethylene Drainage Pipe.
- K. AASHTO M294 - Standard Specification for Corrugated Polyethylene Drainage Pipe 12 inch to 60 inches in diameter.
- L. AWWA C906 - Standard for Polyethylene (PE) Pressure Pipe and Fittings, 4 inch through 63 inch for Water Distribution and Transmission.

##### 1.04 DEFINITIONS

- A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.
- B. Casing Pipe: Steel pipe to serve as the external portion of the storm drain under the retail

portion of the building, allowing installation or replacement of the carrier pipe without disruption to the building.

- C. Carrier Pipe: Storm drain pipe installed inside the casing pipe.

### **1.05 SUBMITTALS**

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating pipe, pipe accessories.
- C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Project Record Documents:
1. Record location of pipe runs, connections, catch basins, cleanouts, and invert elevations.
  2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

## **PART 2 PRODUCTS**

### **2.01 STORM DRAIN PIPE MATERIALS**

- A. Concrete Pipe Joint Devices: ASTM C 443 (ASTM C 443M) rubber compression gasket joint.
- B. Concrete Pipe: Reinforced, ASTM C 76 (ASTM C 76M), Class II with Wall type A; mesh reinforcement; inside nominal diameter shown on plans, bell and spigot end joints.
- C. Reinforced Concrete Pipe Joint Device: ASTM C 443 (ASTM C 443M) rubber compression gasket joint.
- D. Plastic Pipe: ASTM D 3034, Type PSM, Poly(Vinyl Chloride) (PVC) material; inside nominal diameter shown on plans, bell and spigot style solvent sealed joint end.
- E. Corrugated Polyethylene Pipe (smooth interior): AASHTO M 252, M 294: pipe sizes as indicated on plans; bell and spigot style joint ends. Joints shall be silt tight. Gaskets shall be made of polyisoprene meeting the requirements of ASTM F 477.
- F. Casing Pipe: Smooth steel pipe fabricated in sections for welded field joints. Shall meet the requirements of ASTM A53, Grade B or ASTM A139, Grade B with a minimum yield strength of 35,000 psi. Spiral welded pipe will not be allowed. Minimum wall thickness shall be 0.500 inches.
1. Welding: Continuous butt weld at joints for rigid, watertight encasement. Welding shall conform to AWWA C206.
  2. Size: As indicated on drawings.
  3. Length: As indicated on drawings.
- G. Carrier Pipe: Bluestripe AWWA C906 Polyethylene pipe
1. Size: As indicated on drawings.
  2. Length: As indicated on drawings.
- H. Pipe shall be continually marked with manufacturer's name, pipe size, cell classification, SDR rating, and ASTM classification.
- I. Pipe joints shall be integrally molded bell ends in accordance with ASTM D-3034 Table 2, with factory supplied elastomeric gaskets and lubricant.
- J. 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.
- K. Corrugated Polyethylene Pipe (PE): Pipe complying with AASHTO M294 and MP7, and ASTM D3550. Interior of pipes shall be smooth, and shall have an "n" value of not less than 0.010.

Pipes shall be joined with gasketed bell and spigot joints complying with ASSHTO M252 and M294. Gaskets shall comply with ASTM F477 and ASTM D1149. Provide minimum coverage per manufacturer's specifications.

1. Acceptable Manufacturer's of Corrugated Polyethylene Pipe: Hancor "Sure Lok", ADS N-12 Prolink, or Equal.
- L. Plastic Pipe: ASTM D 3034, Type PSM, Poly(Vinyl Chloride) (PVC) material; inside nominal diameter of specified inches, bell and spigot style solvent sealed joint end.

## **2.02 ACCESSORIES**

- A. 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.
- B. Sand Filler for Casing Pipe: See Section 02317 - Sand bedding & backfill.
- C. Casing Spacers: Manufactured by Advance Products & Systems, Inc., MFG Model CI 1822-1, or approved equivalent.
- D. Mechanical Casing Seal: Manufactured by Innerlynx MFG Model IL-400 or approved equivalent.
- E. Secondary Casing Seal: Manufactured by Advance Products & Systems, Inc., MFG Model AW-1824 End Seal, or approved equivalent.
- F. Water Quality Device - 6 foot diameter DownStream Defender by Hydro International.

## **PART 3 EXECUTION**

### **3.01 TRENCHING**

- A. See Section 02317 for additional requirements.
- B. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

### **3.02 INSTALLATION - PIPE**

- A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.
- B. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal watertight.
- C. Install pipe, fittings, and accessories in accordance with ASTM D 2321 and manufacturer's instructions. Seal joints watertight
- D. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch (3 mm) in 10 feet (3 m).

### **3.03 CASING & CARRIER PIPE INSTALLATION**

- A. Casing and carrier pipe installation shall be coordinated with building foundation construction.
- B. Carrier pipe and casing shall be separated by casing spacers. Spacers shall be installed in accordance with manufacturers recommendations.
- C. Annular space between casing pipe and carrier pipe shall be completely filled with sand. Sand shall be placed by pumping or blowing from both ends as necessary to fill the annular space.
- D. Mechanical casing seals shall be provided and installed on both ends of the casing pipe. Install in accordance with manufacturers recommendations.
- E. Secondary casing seals shall be provided and installed at both ends of the casing pipe. Install in accordance with manufacturers recommendations.

### **3.04 WATER QUALITY DEVICE**

Bayside Village Student Housing  
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- A. Install in accordance with manufacturer's requirements.

**3.05 FIELD QUALITY CONTROL**

- A. Perform field inspection and testing in accordance requirements of local authorities having jurisdiction.

**3.06 PROTECTION**

- A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

**END OF SECTION 02635**