

## SECTION 02623

### HIGH-DENSITY POLYETHYLENE PIPE

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

###### A. Scope

1. Furnish and install high-density polyethylene pipe complete with all fittings, jointing materials and all other appurtenances indicated, specified or required for a complete installation

###### B. Additional Requirements Specified Elsewhere

1. Section 01010: Summary of Work
2. Section 01340: Shop Drawings, Product Data, and Samples
3. Section 01400: Quality Control
4. Section 01600: Materials and Equipment

###### C. Related Requirements Specified Elsewhere

1. Section 02200: Earthwork
2. Section 02622: Plastic Pipe
3. Section 02708: Pressure Pipelines and Appurtenances
4. Section 03300: Cast-in-Place Concrete

##### 1.2 QUALITY ASSURANCE

###### A. Requirements of Regulatory Agencies - Refer to Section 01060

###### B. Source Quality Control

1. Clearly and permanently mark each standard and random length of pipe with
  - a. Pipe size
  - b. Class and profile number
  - c. Production code
  - d. Manufacturer's name
2. Testing
  - a. Sample and test three specimens of pipe by flattening
    - 1) Specimens a minimum of 12" long
    - 2) Flatten between parallel plates in a suitable press until the distance between the plates is 40% of the outside diameter of the pipe
    - 3) Apply loading at a uniform rate such that compression is completed in not less than two nor more than five minutes
    - 4) Examine specimens for splitting, cracking or breaking

- b. Sample and test pipe for Pipe Ring Stiffness Constant in accordance with ASTM D2412
  - 1) The Pipe Ring Stiffness Constant is defined in terms of the load, applied between parallel plates, which causes a 1% reduction of pipe diameter
  - 2) Test specimens shall be a minimum of two pipe diameters or 4' in length, whichever is less
  - 3) The minimum Pipe Ring Stiffness Constant shall not be less than 90% of the nominal specified for the pipe class
- c. Test samples shall be of each pipe size and class specified for the project

### 1.3 SUBMITTALS

#### A. Shop Drawings and Product Data

- 1. Material specification data
- 2. Complete details of design, fabrication and construction of pipe and fittings
- 3. Pipe layout drawings
- 4. Installation instructions including pipe bedding and backfill specifications
- 5. Copies of test reports indicating results of conformance testing

#### B. Field Tests: Results of shop and field tests

#### C. Certification of Compliance

- 1. Manufacturer's affidavit of compliance certifying
  - a. All tests have been conducted
  - b. All materials comply with applicable standards
  - c. All materials comply with these Specifications

### 1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Avoid damage to pipe and fittings from impact, bending, compression or abrasion during handling and storage
- B. Do not drop pipe or fittings
- C. Store pipe in manner recommended by manufacturer
- D. Ship gaskets in cartons and store in a clean area away from grease, oil, ozone-producing electric motors, heat and the direct rays of the sun
- E. Use only nylon protected slings to handle pipe
  - 1. Use of hooks or bare cables will not be permitted
- F. Assure materials are kept clean and dry

## PART 2 - PRODUCTS

### 2.1 MATERIALS

#### A. Pipe and Fittings

1. Type: High Density Polyethylene (HDPE) plastic pipe
2. Conformance
  - a. ASTM D 3350-05
  - b. PE 3408/3608
3. Service: Potable water, nonpotable water and wastewater
  - a. Service as shown on Drawings
4. Pipe diameter: As indicated on the Drawings
  - a. Dimension ratio: DR 7 or as otherwise specified on the Drawings
5. O.D. basis
  - a. IPS for less than 4-inch diameter or
  - b. DIPS for 4-inch and larger
6. Integrally marked pipe designating service
  - a. Potable water: Blue stripe
  - b. Nonpotable water: Purple stripe
  - c. Wastewater including activated sludge mixed liquor, waste activated sludge and thickened and/or dewatered biosolids: Green stripe
7. Ends: Butt heat-fusion
  - a. Internal wall of butt-fused joint debaded
8. Design basis: ISCO Industries HDPE pipe

- B. Fittings: Where indicated on the Drawings per manufacturer's recommendations in accordance with detailed design concept

### 2.2 FABRICATION AND MANUFACTURE

#### A. Pipe and Fittings

1. Continuous winding of a special profile onto suitably sized mandrels
2. Produced to constant internal diameters
3. Pipe wall profile in accordance with the manufacturer's recommendation
4. Homogeneous throughout and free from visible cracks, holes, foreign inclusions or other injurious defects
5. Uniform in color, opacity, density and other physical properties
6. No evidence of splitting, cracking or breaking down when tested in accordance with paragraph 1.2.B.2.a.
7. Conform to requirements of ASTM F894

## PART 3 - EXECUTION

### 3.1 INSPECTION

#### A. Examine areas for

1. Defects such as weak structural components that adversely affect execution and quality of work

2. Deviations beyond allowable tolerances
- B. Pipe and Fittings
1. Carefully examine pipe and fittings for cracks, dents, abrasions, holes, foreign inclusions or other injurious defects prior to installation
  2. Mark rejected piping with a yellow crayon and remove from project site within 24 hours
- C. Start installation only when conditions are satisfactory

### 3.2 PREPARATION

- A. Trenching and excavation requirements: Refer to Section 02200 - Earthwork
- B. Pipe Embedment
1. Refer to Section 02200 – Earthwork

### 3.3 INSTALLATION

- A. Shape trench foundation or bedding as required
1. Install high density polyethylene pipe to the lines, elevations and grades as indicated on the Drawings
  2. Do not support pipe on blocks or mounds of earth
  3. Refer to Section 02200 - Earthwork for additional requirements
- B. Carefully maintain correct horizontal and vertical alignment
1. Exercise extreme caution at connections to the existing pipeline
  2. Check line and grade continually to ensure compliance with the Drawings
- C. Join each section of HDPE with the preceding section by
1. Clean ends of pipe
  2. Butt ends of pipe, trim to match adjacent material and join by heat fusion
  3. Develop watertight, full circumference, full strength joints
  4. Quality of the heat fusion joints shall conform to the standards of the industry
  5. Fuse all pieces necessary to install required HDPE piping in one continuous operation of pulling the HDPE conduit into the trench and casing pipe
- D. Adequately protect pipe to prevent crushing or other damage
- E. Using specially manufactured tools, equipment and techniques, remove the bead of HDPE on the interior of the pipe resulting from heat fusion and pressing together of adjacent pieces of pipe to result in continuous smooth pipe interior

F. Contractor's Certification

1. Certify to perform butt fusion welds
2. Provide proof of certification

G. Tracer Wire

1. Refer to Section 02708 – Pressure Pipelines and Appurtenances

3.4 FIELD QUALITY CONTROL

A. Refer to Section 01400 - Quality Control for responsibilities

B. Pressure and Leakage Tests

1. Leakage
  - a. All joints shall be watertight and free of leaks
  - b. Repair each leak discovered by Owner during warranty period
2. Pressure pipelines
  - a. Hydrostatic test in accordance with Section 02708 – Pressure Pipelines and Appurtenances

END OF SECTION