818 - HDPE STORM SEWERS (PRIVATE)

818.1 DESCRIPTION

This section defines requirements for the use of HDPE pipe as an alternate material for privately maintained storm sewer systems originating on private property.

a. Definitions

(1) HDPE pipe – For the purposes of this section, acceptable HDPE pipe is defined as: Type S, double wall (smooth interior, corrugated outer wall), high density polyethylene pipe utilizing a bell-and-spigot joint system and providing a water tight joint.
(2) Incidental landscape drainage system – Systems where the size of the pipe is typically less than a 15" diameter and the City considers the system to be minor in nature.
(3) PE – Polyethylene.
(4) Private storm sewer system – For the intent of this section shall be defined as a system which mainly collects and conveys runoff from a single property and is privately maintained by the property owner. The City will make final determinations regarding which systems may be private versus public during the plan review process.
(5) Roof drain – A pipe system which conveys only runoff from building roofs.
(6) Storm water detention facility – A facility which controls the maximum release rate from a site. It is considered to be separate by definition from the storm sewer system for regulation and specification purposes.

b. General

(1) HDPE pipe is allowed only for private storm sewer systems.
(2) A private storm sewer system may enter the public right-of-way to connect with a public storm sewer at a structure, however when the private storm sewer system utilizes HDPE pipe, the portion of the private storm sewer system within the public right of way must be concrete pipe in accordance with Section 817 of the Standard Specifications The transition from HDPE to concrete pipe shall occur at a structure. The only allowed sizes of HDPE pipe for private storm sewer systems are as follows: 15-inch diameter, 18-inch diameter, and 24-inch diameter.
(3) Roof drains and Incidental landscape drainage systems may use pipe with a diameter less than 15-inches in size. Pipe material must meet industry standards and the Storm Drainage section of the International Building Code as adopted by the City of Overland Park.
(4) Storm water detention facilities may use 15-inch through 60-inch diameter HDPE circular pipe.
(5) HDPE /plastic storm drainage junction structures and inlets are not allowed as part of the private storm sewer system.

c. Authority

Section 15.10.100 Storm Water Management Standards

d. References

(1) ASTM F2306 (Latest Version)
Standard Specification for 12 to 60 in. [300 to 1500 mm] Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Gravity-Flow Storm Sewer and Subsurface Drainage Applications
(2) AASHTO M294
Standard Specification for corrugated PE pipe
(3) ASTM D3350 (Latest Version)
Standard Specification for Polyethylene Plastic Pipes and Fittings Materials
(4) ASTM F477 (Latest Version)
Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
(5) ASTM D2321 (Latest Version)
Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

(6) ASTM D3212 (Latest Version)

Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

(7) City of Overland Park (Engineering Services) Standard Details

e. Certification

All HDPE pipe used in storm sewer applications shall conform to the requirements in the latest edition of AASHTO M294 and ASTM F2306.

818.2 MATERIALS

a. Manufacturers

Pipe shall be provided only by manufacturers that are certified through the Plastic Pipe Institute (PPI) Third Party Certification program and/or the National Transportation Product Evaluation Program (NTPEP).

b. HDPE Pipe & Accessories

(1) Pipe.

The manufacturer of HDPE pipe shall be governed by the latest edition of ASTM F2306-07 and AASHTO M294. Pipe and fittings shall be made from virgin PE compounds which conform to the requirements of cell class 435400C in the latest edition of ASTM D3350-06.

(2) Joints.

(a) Pipe joints shall consist of in-line integral bell and spigot with rubber gasket that meets ASTM F477. Bell shall span over three spigot corrugations.

(b) Water tight joints shall be provided which meet a 10.8 psi laboratory test in accordance with ASTM Test Method D3212.

(3) Fittings.

(a) Fittings shall not reduce or impair the overall integrity or function of the pipeline system.

(b) Fittings shall meet the requirements of AASHTO M294 and ASTM F2306.

(c) Fittings may be either molded or fabricated.

(d) Only fittings supplied or recommended by the manufacturer shall be used.

c. Installation

(1) Installation shall be per ASTM D2321 and the manufacturer's specifications. In the case of a discrepancy between the two, the more restrictive requirements shall govern.

(2) Exception: The minimum cover over the pipe shall be 18-inches for pipes up to 24-inches in diameter. The minimum cover for pipes larger than 24 inches in diameter and up to 60 inches in diameter shall be 24-inches.

818.3 CONSTRUCTION REQUIREMENTS

All pipe, pipe couplings, and accessories shall be unloaded, stockpiled, hauled, distributed, and otherwise handled in a manner which will prevent damage thereto.

Special care shall be taken to lay all pipes to exact grade and line. All pipe, when jointed, shall form a true line of sewer. Any pipe that has a grade or joint disturbed after laying shall be taken up and re-laid.

All pipes shall be laid with the separate sections joined firmly together, with outside laps of circumferential joints pointing upstream, and the center line of the invert coinciding with the specified alignment of the pipe.

The interior surfaces of all pipes shall be thoroughly cleaned of all foreign matter before being lowered in the trenches and shall be kept clean during laying operations.

Joints shall be constructed to attain a watertight joint.

a. Marking.

Each pipe, fitting, or special section shall have markings per AASHTO M294. Required information shall be plainly and permanently marked on each item. Markings shall include: specification

designation, the nominal size, the manufacturer's name, trade name or trademark, plant designation code, and date of manufacture (or appropriate code).

b. Deflection.

Maximum deflection (reduction of the barrel base inside diameter) is 5%. Time of measurement shall be not less than 30 days nor more than 60 days following installation.

Deflections in excess of 5% may require the pipe to be removed and new pipe installed.

c. Field Quality Control & Testing

(1) All storm sewer shall be inspected by City inspectors prior to backfilling the pipe.
(2) Mandrel testing (or other approved method) shall be required when visual inspection reveals excessive deflection as determined by the City. Testing shall be at the expense of the contractor.