

Ordinance Number: 08-08-19-429

AN ORDINANCE TO AUTHORIZE THE USE OF HIGH DENSITY POLYETHYLENE (HDPE) CORRUGATED AND SMOOTH-LINED THERMOPLASTIC PIPE FOR GRAVITY FLOW DRAINAGE PIPE APPLICATIONS

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CHELSEA, ALABAMA AS FOLLOWS:

§1 - Definitions:

Whenever used in this Ordinance, unless otherwise indicated, the following words and phrases shall have the following meanings:

APPURTENANCE: any component necessary to properly install HDPE.

HDPE: high-density polyethylene pipe, either corrugated or smooth lined.

MANDREL TEST: the passing of a ball or elliptical plug-shaped object (mandrel) which is passed through HDPE to ensure that deformation from backfilling has not prevented the acceptable minimum internal diameter of the HDPE to be preserved.

§2 –Uses:

HDPE, which conforms to all conditions specified in the attached document, shall be allowed for non-right-of-way applications within an easement.

§3- Sections and Provisions Severable:

If any section or provision of this ordinance shall be held invalid, such holding shall not affect any other section or provision of this ordinance, each of said sections and provisions being hereby declared severable.

§4 - Effective date:

This ordinance shall become effective on and after all required postings by law.

Note: Specifications for HDPE pipe attached.

Presented and adopted this the 19th day of August, 2008.

S. Earl Niven, Mayor

Donald E. King, Councilmember

Tony Picklesimer, Councilmember

James V. Ferguson, Councilmember

Jeffrey M. Denton, Councilmember

Juanita J. Champion, Councilmember

I, Becky C. Landers, Clerk of the City of Chelsea, Alabama, hereby certify that the above Ordinance was duly adopted by the Council of the City of Chelsea, Alabama at a regular meeting held on the 19th day of August, 2008, and that same has been published in accordance with the law, on the 20th day of August, 2008.

ATTEST:

Becky C. Landers - City Clerk

**HIGH DENSITY POLYETHYLENE (HDPE) CORRUGATED AND
SMOOTH LINED THERMOPLASTIC PIPE SPECIFICATION:
(FOR GRAVITY FLOW DRAINAGE PIPE APPLICATIONS)**

1. Description:

This item shall govern for the furnishing and installing of all High Density Corrugated Polyethylene (HDPE) Smooth Lined Pipe and / or materials for constructing of culverts, side road pipes, storm sewers, stubs, and all related connections and fittings, all of which shall conform to ASTM F2306 (diameters 12"-60"), latest edition. The pipes shall be of the sizes, types, and dimensions shown on the plans, and contained in this specification. In addition, it shall include all connections and joints to new or existing pipes, storm sewer manholes, inlets, headwalls, and other appurtenances as may be required to complete the work.

2. Materials:

Unless otherwise specified on the plans or herein, thermoplastic pipe and joint fittings shall conform to the following:

- A. High Density Polyethylene (HDPE) Corrugated and Smooth Lined Pipe & Fittings shall be manufactured in accordance with requirements of ASTM F2306, latest edition.
- B. High Density Polyethylene (HDPE) Corrugated and Smooth Lined Pipe shall be manufactured from virgin PE compounds which conform with the requirements of ASTM D 3350.
- C. Minimum Pipe Stiffness (PS) at five percent deflection shall be as described in ASTM F2306, Section 6.3 when tested in accordance with ASTM D 2412.

3. Installation:

Installation shall be in accordance with ASTM D 2321, "Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications".

A. General Installation Requirements:

Thermoplastic pipe shall be unloaded and handled with reasonable care. Pipe shall be placed in the bed starting at the downstream end. Trenches must be excavated in such a manner as to insure that the sides will be stable under all working conditions. Trench walls shall be sloped or supported in conformance with all standards of safety. Only as much trench as can be safely maintained shall be opened. All trenches shall be backfilled as soon as practicable, but no later than the end of each working day.

B. Trench Widths:

Trench width shall be sufficient to ensure working room to properly and safely place and compact haunching and other backfill materials. Minimum trench width shall not be less than 1.25 times the pipe outside diameter plus 12 inches. (1.25 x O.D. + 12") If flowable fill is used, the trench width shall not be less than the outside diameter plus 12 inches. (O.D. + 12")

Note: On multiple pipe barrel runs the clear distance between pipes is as follows:
12"-24" Diameters: Clear span = 12"
24" & Greater Diameter: Clear span = 1/2 x Diameter

C. Outside the Roadway Bedding and Backfill Options:

Bedding material shall meet the requirements of ASTM D2321 Class I material. A minimum of 6" of bedding shall be provided prior to placement and shall be loosely compacted. Bedding material size shall be 1 1/2" maximum granular material. Backfill material shall meet the same requirements as the bedding material and shall extend to 1/2 of the diameter of the pipe. Backfill material shall be placed in 6 inch lifts and compacted to 90% SPD.

E. Minimum Cover:

The minimum cover is one foot (1.0') for HS-25 Live Loads (4"-48" Diameters) and two feet for (2.0') for larger diameter structures (60" Diameter); however, care should be taken when heavy construction equipment loads cross the pipe trench during construction. If the passage of construction equipment over an installed pipeline is necessary during project construction, compacted fill in the form of a ramp shall be constructed to a minimum elevation of three (3.0') feet over the top of the pipe. Any damaged pipe shall be replaced at the contractor's expense.

F. Installation Deflection:

The internal diameter of the barrel shall not be reduced by more than 5% of its base inside diameter when measured or inspected not less than 60 days following completion of installation.

G. Joints:

Joints shall be installed that the connection of pipe sections will form a continuous line free from irregularities in the flow line. Joints shall meet one of the following:

- 1.) **Soil tight joints** are specified as a function of opening size, channel length and backfill particle size. If the size of the opening exceeds 3mm, the length of the channel must be at least four times the size of the opening. A backfill material containing a high percentage of fine-graded soils requires investigation for the specific type of joint to be used to guard against soil infiltration. Information regarding joint soil tightness criteria can be found in AASHTO's *Standard Specifications for Highway Bridges, Division II, Section 26, "Metal Culverts"*.

- 2.) **Silt tight joints** should be used where the backfill material has a high percentage of fines. Silt tight bell and spigot joints will utilize an elastomeric rubber seal meeting ASTM F 477. Silt tight joints must be designated to pass a laboratory pressure test of at least 14kPa (2.0 psi).
- 3.) **Watertight joints** must meet a 74kPa (10.8 psi) laboratory test per ASTM D3212 and utilize a bell and spigot design with a gasket meeting ASTM F477.

H. Installation Training:

Documentation will be required showing that the contractor for the project has familiarized themselves with the appropriate installation techniques for HDPE pipe. ADS/Hancor will provide periodic design/installation educational sessions with engineers and contractors; notice of these sessions, as well as attendee lists, shall be forwarded to the Town's engineer.

4. Measurement and Payment:

This item shall be measured for payment by the linear foot. Such measurements shall be made between the ends of the barrel along its flow line. For multiple pipes, the measured length shall be the sum of the lengths of the barrels, measured as described above. Pipe shall be paid for at the contract unit price per linear foot, complete in place, as provided by the proposal and contract. The contract price per linear foot shall be the total compensation for the furnishing of all labor, materials, tools, equipment, and incidentals necessary to complete the work including excavation, backfill, and disposal of surplus materials in accordance with the plans and these specifications.

5. Post Installation Inspection:

The Contractor shall provide a "go/no-go" mandrel test on a minimum of 100% of the pipelines installed for pipes up to 36" diameter. The mandrel size shall be 95% of the base inside diameter of the pipe. For pipes greater than 36" diameter, deflection measurements will be made manually. The test shall be conducted at least 60 days after the installation of the pipeline and results provided to the City prior to final plat approval. If the mandrel or other inspection tests fail, the Contractor shall replace the pipe at no extra charge to the owner.

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