

### CORRUGATED HDPE DRAINAGE PIPE - GENERAL

Lane's primary polyethylene pipe is a dual-wall high density polyethylene (HDPE) with a smooth interior and corrugated exterior manufactured for all drainage applications, including storm sewers, culverts, storm water storage and water quality management. An integrated bell and spigot coupler is provided on 20' nominal pipe lengths with diameters ranging from 6" to 48".

A number of different options are available beyond the standard 20-ft double-wall pipe offerings, including single-wall pipe (corrugated interior/exterior), perforated pipe, plain-end pipe (i.e. no bell/spigot), and coil pipe. Specifications listed below encompass the complete line of pipe standards for storm, land, and subsurface drainage applications:

Specification	Description	Application
AASHTO M252 <sup>1,2</sup>	Corrugated HDPE Pipe (3-10")	Storm Sewers, Culverts, Subsurface Drainage
AASHTO M294 <sup>1,2</sup>	Corrugated HDPE Pipe (12-60")	Storm Sewers, Culverts, Subsurface Drainage
ASTM F2306 <sup>1,2</sup>	Corrugated HDPE Gravity-Flow Storm Sewer (12-60")	Storm Sewers, Subsurface Drainage
ASTM F405 <sup>1,3</sup>	Corrugated HDPE Pipe and Fittings (3-6")	Soil Drainage, Septic Field Leach Beds
ASTM F667 <sup>1,3,4</sup>	Corrugated HDPE Pipe and Fittings (3-24")	Culverts, Subsurface Drainage
ASTM F2648 <sup>1,4</sup>	Corrugated HDPE Pipe and Fittings (2-60")	Culverts, Subsurface Drainage

<sup>1</sup>Specification identifies the material, manufacture and workmanship requirements for the intended application

<sup>2</sup>Specification requires virgin polyethylene resins

<sup>3</sup>Specification intended for single-wall (internally and externally corrugated) pipe

<sup>4</sup>Intended for the agricultural, landfill and forestry markets (additional SCG resistance recommended for other applications)

### PIPE CLASSIFICATIONS

Lane's pipe offerings follow the AASHTO classification system. Lane's perforated pipe offerings conform to the AASHTO specifications for size, spacing and placement of the perforations.

*Specify Type S pipe for double-wall pipe (smooth interior, corrugated exterior)*

*Specify Type SP pipe for double-wall perforated pipe*

*Specify Type C pipe for single-wall pipe (corrugated exterior and interior)*

*Specify Type CP pipe for single-wall perforated pipe*

*Specify Class 1 perforations subsurface drainage or combination storm and underdrain.*

*Specify Class 2 perforations for fully perforated pipe to be used for subsurface drainage only.*

Note: When perforated pipe is specified the perforations shall conform to the requirements for Class 2 unless noted otherwise. See the Perforation Guide (PG-1 through PG-5) for complete information.

### JOINT PERFORMANCE

Bell and spigot joint performance designations relate the ability of the system to control leakage and/or material infiltration.

Soil-tight joints prevent infiltration of soil particles larger than those passing a No. 200 Sieve.

Silt-tight joints employ an elastomeric rubber seal and meet a laboratory pressure rating of at least 2 psi.

Water-tight joints are gasketed connections meeting a 10.8 psi laboratory test per ASTM D3212.

Note: Joints shall meet the soil-tight performance requirements unless specified otherwise.

### INSTALLATION OF CORRUGATED HDPE PIPE

Corrugated HDPE pipe is a flexible pipe material that derives structural rigidity from the strength and relative stiffness of the backfill envelope. The backfill-culvert interaction attained defines the ability of system to withstand service loads. Installation specifications illustrating backfill envelopes, addressing appropriate backfill material selection, and identifying proper compaction guidelines help ensure acceptable levels of backfill-culvert interaction are realized:

ASTM D2321 Practice for Installing Thermoplastic Pipe for Sewers and Other Gravity Flow Applications  
AASHTO LRFD Bridge Construction Specifications, Section 30, Thermoplastic Pipe

### STRUCTURAL DESIGN OF CORRUGATED HDPE

Standard methods of structural analysis are generally based on research<sup>1</sup> adopted by AASHTO and incorporated into the AASHTO LRFD Bridge Design Specifications.

AASHTO LRFD Bridge Design Specifications, Section 3, Loads and Load Factors  
AASHTO LRFD Bridge Design Specifications, Section 12, Buried Structures and Tunnel Liners

<sup>1</sup>Current design methods are largely based on the following reports:

NCHRP Report 438, Recommended LRFD Specifications for Plastic Pipe and Culverts

NCHRP Report 631, Updated Test and Design Methods for Thermoplastic Drainage Pipe

---

### ADDENDA TO THE SPECIFICATION GUIDE

Project specifications primarily involve meeting AASHTO M252/M294 and/or ASTM F2648, the principal difference being the ability to use recycled resins.

**LANE'S AASHTO M252/M294 PIPE** is manufactured, tested and supplied in accordance with the National Transportation Product Evaluation Program (NTPEP), a division of AASHTO. Under this program Lane certifies that products (resin or pipe) it produces meets or exceeds the requirements of AASHTO M252/M294. An administrator, AASHTO Materials Reference Library (AMRL), validates Lane's certification through annual audits, testing, inspection and review of Lane's QC program.

**LANE'S ASTM F2648 PIPE** is produced from an engineered compound of virgin and recycled HDPE resins meeting the cell classification and material performance requirements of AASHTO M294. Lane's ASTM F2648 pipe is engineered to a higher standard than that required by ASTM F2648 to ensure sufficient service life for all storm drainage applications.

The resin compound contains a minimum 40% post-consumer recycled material that is subject to a quality assurance program that ensures compliance with cell classification requirements. Lane qualifies its recycled blends to ensure sufficient service life for all storm drainage applications by engineering a compound with ample slow-crack-growth (SCG) resistance, the primary material property that relates quality and the critical component for assessing service life. SCG resistance is measured using the Notched Constant Ligament Stress (NCLS) test per ASTM F2136. Lane's ASTM F2648 pipe is certified to exceed the SCG resistance requirements of AASHTO M294 as well as all other corrugated HDPE pipe specifications.