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#### NORTH CAROLINA

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#### TEXAS

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#### CORPORATE HEADQUARTERS

Camp Hill 717.761.8175

### LANE Products

Corrugated Metal Pipe  
 Spiral Rib Pipe  
 Corrugated HDPE Pipe  
 Corrugated Polypropylene Pipe  
 Structural Plate Pipe and Arches  
 Structural Plate Box Culverts  
 Storm Water Collection Chambers  
 Storm Water Management Systems  
 Storm Water Filters  
 CFT (HDPE) Water Quality Unit  
 CMP Sandfilter  
 Open Top Slotted Drain  
 Welded Wire Mesh Gabions  
 Structural Plate Headwall-Culvert Systems  
 Custom Fabrications (Pond Kits, Trash Racks, etc.)  
 Long Span Bridge & Culvert Services  
 Rebar and Custom Powder Coatings

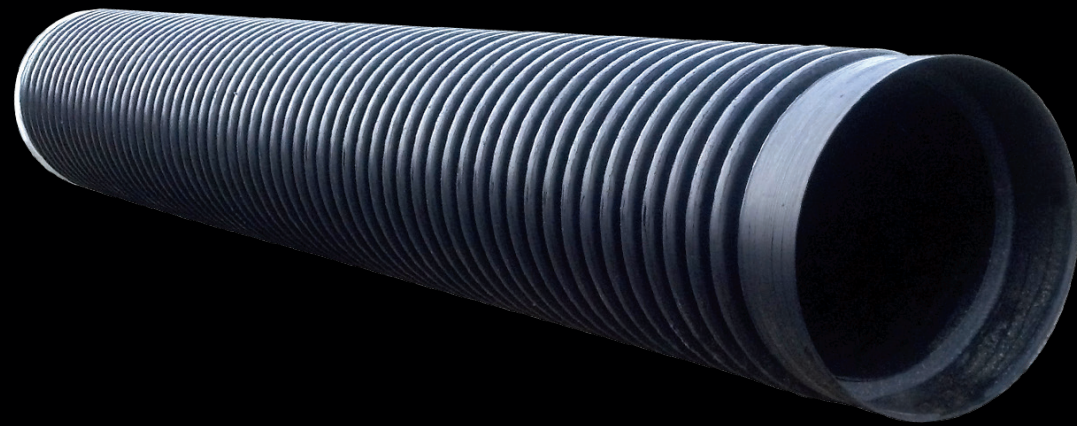


An Employee-Owned Company



## HDPE PRODUCTS

QUALITY, PERFORMANCE AND ECONOMY COMBINED



### LANE'S HDPE DRAINAGE PIPE

Lane provides the complete product line to meet all your HDPE drainage needs - the full range of diameters, options for standard perforated patterns (see Page 5), and custom fabricated fittings. Lane's HDPE pipe offerings can meet all the subsurface drainage demands of your site, building, roads and pavements. Whether made from prime virgin resins or with recycled materials, Lane's HDPE pipe has the strength and service life needed for your project.

For more information, visit: [lane-enterprises.com/HDPE-Pipe](http://lane-enterprises.com/HDPE-Pipe)

*DID YOU KNOW? HDPE pipes provides a greater service life and better life cycle cost than concrete pipes.*

### ABOUT LANE

As a full-line manufacturer of corrugated metal and plastic drainage products, Lane Enterprises, Inc. operates plants throughout the Northeastern, Mid-Atlantic, and South-Central states producing various types of buried structures for the construction industry.

For nearly 90 years, Lane has partnered with contractors, engineers, and municipalities to supply reliable products that provide the highest levels of service life, strength, versatility, and economy. Our focus on quality products, responsive customer service, and technical expertise has established a long, proven history of successful partnerships within the industries we serve.



### SPECIFY HD100 AND HD100EC PIPE

HD100 and HD100EC are today's top two standard corrugated polyethylene drainage pipes featuring a dual wall, a smooth interior, and the century-long service life your customers deserve.

#### SPECIFY HD100 TO MEET AASHTO M252 OR M294V

HD100 exceeds the AASHTO standards by using 100 percent virgin resins with enhanced long-term properties. Lane's higher material standards are aimed to ensure a minimum 100-year service life.

#### SPECIFY HD100EC TO MEET AASHTO M294R AND ASTM F2648

HD100EC exceeds ASTM F2648 by using an engineered compound with better long-term properties than required by ASTM and AASHTO. The engineered compound is designed to produce material properties capable of passing the industry's 100-year service life protocol.

#### HD TOUGH:

- High Density PE ..... Exceeds material, performance, and testing requirements of today's pipe standards.
- Heavy Duty Pipe ..... Easily withstands the rigorous demands of the construction process.
- High Durability Performance ..... Chemically inert with high stress crack and oxidation resistance.

#### GIVE IT 100%:

- 100% virgin resin (HD100 only)
- Minimum 100-year service life
- A Manning's roughness coefficient as low as 0.0100

*Use for 100-year service life applications may be subject to a local or state agency verification protocol.*

#### HD100EC IS GREEN, BUT DOESN'T COST YOU MORE OF IT:

- Produced from an engineered compound utilizing recycled resins
- Eco-friendly product for the environmentally conscious
- Use of recycled resins produces an efficient cost material

#### MANNING'S N-VALUE FOR DESIGN

Tests consistently show a Manning's n in the range of 0.009 to 0.011. The major investigation (2005 Utah State University) recognized an effective Manning's n as low as 0.010. Manning's n for design is conservatively factored to 0.012 for in-service performance.

#### JOINT PERFORMANCE

Both the HD100 and HD100EC pipe afford the full range of joint performance available today, from soil-tight to water-tight (per ASTM D3212). Standard bell-and-spigot pipe joints include a manufacturer-installed gasket (elastomeric seal per ASTM F477).



#### LANE'S HD100/HD100EC PIPE

HD100	Meets AASHTO M252 and M294V
HD100EC	Meets AASHTO M294R and ASTM F2648
Diameters	4" through 60"
Pipe Lengths	20' (nominal)
Joints	ASTM D3212 Certified
Manning's n	Use n = 0.012 for design

*Burial depths that exceed table values are attainable with a special design. Consult your local representative for more information.*

**INSTALLATION**

HD100/HD100EC interacts with select backfill and proper installation to form a composite structure. It is the resulting soil-culvert interaction system that defines the ability of HD100/HD100EC to withstand service loads. Standards for proper installation with guidelines in selecting pipe embedment material are found in ASTM D2321.

**MINIMUM COVER HEIGHTS**

Minimum cover heights are typically assigned using industry established guidelines while maximum allowable burial depths vary considerably with the type of embedment material and the level of compaction, with the highest covers resulting from the use of manufactured aggregates.

**MAXIMUM COVER HEIGHTS**

Maximum burial depths corresponding to the soil classification system of ASTM D2321 are shown in the table below, with the best results obtained using manufactured or processed aggregates (i.e. crushed rock).

MINIMUM COVER HEIGHTS FOR LIVE LOADS	
Truck Loadings (H20, H25 or HL93) <sup>1</sup> , 4" thru 48" dia.	12"
Truck Loadings (H20, H25 or HL93) <sup>1</sup> , 60" dia.	24"
Minimum Cover for E-80 (Rail Road) Loads	24"
Temporary Cover for Construction Loads <sup>2</sup>	2' to 4'

<sup>1</sup> May be subject to local or state agency minimum cover requirements.  
<sup>2</sup> Cover for construction loads depends on pipe diameter and construction equipment (see table below).

Nominal Pipe Diameter (ft)	MINIMUM COVER FOR CONSTRUCTION LOADS (in)			
	Axle Loads (kips)			
	18-50	50-75	75-100	110-150
2.0 - 3.0	24.0	30.0	36.0	36.0
3.5 - 5.0	36.0	36.0	42.0	48.0



LANE HD100/HD100EC PIPE – ALLOWABLE BURIAL DEPTHS (FT)						
Diameter (in)	Class I		Class II		Class III	
	Compacted	Dumped	95%	90%	95%	90%
12	29	21	21	15	15	10
15	26	23	19	13	14	10
18	29	22	21	15	15	10
24	27	21	20	14	14	9
30	25	19	18	12	13	9
36	27	22	20	13	14	9
42	33	23	22	15	15	10
48	23	17	16	10	11	7
60	25	19	18	12	12	7

Burial depths that exceed table values may be attainable with a special design. Contact your local representative for more information.

1. Installation in accordance with ASTM D2321.
2. Class I indicates a soil that generally provides the highest soil stiffness at any given percent compaction, and provides a given soil stiffness with the least compactive effort. Each higher number soil class provides successively less soil stiffness at a given compaction and requires greater compactive effort to provide a given level of soil stiffness.
3. All acceptable backfill materials are not presented here. See ASTM D2321 for a complete listing of classifications.
4. Results based on the AASHTO LRFD design method using zero hydrostatic pressure and a soil density of 120 pcf. Greater cover heights are attainable with appropriate modifications to the design method - Contact Lane for further details.
5. Dumped Class I material is estimated at 90% maximum standard Proctor density.

**PERFORATIONS**

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

**CLASS 1 PERFORATIONS**

(Partially Perforated Pipe)

Class 1 perforations are for pipe intended to be used for subsurface drainage or combination storm and underdrain. As such, the pipe maintains an unperforated segment above the invert to serve as a flow channel. Perforations are circular and arranged in rows parallel to the axis of the pipe with one perforation in each row for each corrugation. Rows of perforations are arranged in two equal groups placed symmetrically on each side of a lower unperforated segment corresponding to the flow line of the pipe.

Class 1 Perforations		Type SP
D	d	WIA
12	0.3750	4.10
15	0.3750	3.04
18	0.3750	2.69
24	0.3750	2.68
30	0.3750	2.64
36	0.3750	2.61
42	0.3750	2.00
48	0.3750	2.00
60	0.3750	1.77

PIPE SIZES AND HANDLING WEIGHTS			
Nominal Inside Diameter (in)	Actual Outside Diameter (in)	<sup>1</sup> Single-Wall Handling Weight (lbs/ft)	<sup>2</sup> Double-Wall Handling Weight (lbs/20ft)
4	4.75	0.31	10
6	7.05	0.78	20
8	9.40	1.10	30
10	12.00	1.80	40
12	14.52	3.01	60
15	17.57	4.31	100
18	21.42	6.01	120
24	28.05	9.49	200
30	35.03	10	300
36	40.89	10	400
42	47.49	10	550
48	54.39	10	640
60	66.51	10	856

<sup>1</sup>AASHTO Type C (Type CP, Class 1 and 2 perforations)  
<sup>2</sup>AASHTO Type S (Type SP, Class 1 and 2 perforations)

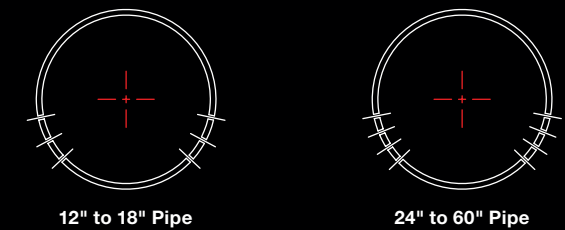


Figure 1. Class 1 Perforations

d = diameter of circular perforation (in)      D = nominal pipe diameter (in)  
 L = average length of slotted perforation (in)      WIA = water inlet area (in<sup>2</sup>/ft)  
 W = average width of slotted perforation (in)

**CLASS 2 PERFORATIONS**

(Fully Perforated Pipe)

Class 2 perforations are for pipe intended to be used for subsurface drainage only. Perforations may be circular or slotted, and are uniformly spaced along the length and circumference of the pipe.

Class 2 Perforations		Type SP
D	d	WIA
12	0.3125	2.85
15	0.3125	2.11
18	0.3125	1.87
24	0.3750	2.68
30	0.3750	2.64
36	0.3750	2.61
42	0.3750	2.00
48	0.3750	2.00
60	0.3750	3.53

Class 2 Perforations		Type CP	Type SP
D	L x W	WIA	WIA
4	0.783 x 0.069	4.02	n/a
6	0.769 x 0.055	2.46	2.63
8	0.759 x 0.050	1.79	1.87
10	0.779 x 0.054	1.24	1.32

Minimum values shown (dimensions vary between plants).

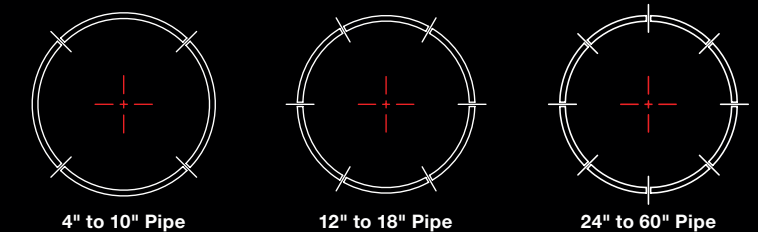


Figure 2. Class 2 Perforations

60" pipe has double perforations centered at each of the eight locations shown.

**CORRUGATED HDPE DRAINAGE PIPE STANDARDS**

A number of different options are available beyond the standard 20' double-wall pipe, including: single-wall pipe (corrugated interior/exterior), perforated pipe, plain-end pipe (i.e. no bell/spigot) and coil pipe. The standards shown below encompass the complete line of corrugated HDPE pipe products for storm, land and subsurface drainage applications. Each standard identifies the material, manufacture and workmanship requirements for the intended application.

STANDARDS ASSOCIATED WITH LANE'S CORRUGATED HDPE PIPE		
Standard	Description	Application
AASHTO M252 <sup>1</sup>	Corrugated HDPE Pipe (3 - 10")	Storm Sewers, Culverts, Subsurface Drainage Systems
AASHTO M294 <sup>2</sup>	Corrugated HDPE Pipe (12 - 60")	Storm Sewers, Culverts, Subsurface Drainage Systems
ASTM F2306 <sup>1</sup>	Corrugated HDPE Storm Sewer (12 - 60")	Storm Sewers, Subsurface Drainage
ASTM F667	Corrugated HDPE Pipe and Fittings (3 - 24")	Culverts, Subsurface Drainage
ASTM F2648 <sup>2</sup>	Corrugated HDPE Pipe and Fittings (2 - 60")	Culverts, Subsurface Drainage

<sup>1</sup>Standard requires virgin polyethylene resins.  
<sup>2</sup>Standard allows pipe production from both virgin resins (AASHTO M294V) and resins with a recycled content (AASHTO M294R). ASTM F2648 does not have differentiating nomenclature.

The HD100EC is made from an engineered compound containing a recycled content. To maintain quality and ensure a long service life, Lane's HD100EC pipe is designed to exceed the material performance requirements of AASHTO M252/294.

**PIPE CLASSIFICATIONS**

Generally follow the AASHTO classification system:

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 for subsurface drainage or combination storm and underdrain.

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

**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.

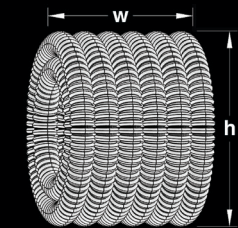
**SPECIAL APPLICATIONS**

**LANE'S COIL PIPE**

Consistent with Lane's commitment to high quality, coil pipe is produced using quality resins that ensure high strength and a long service life. Options include 4", 6" and 8" diameters; in perforated or nonperforated patterns; with a full range of fittings. Lane's coil pipe is made with resins that meet or exceed the standards set by pertinent DOT, forestry or agricultural agencies. Whether made with prime virgin resins or with a recycled content, Lane's coil pipe has the strength and service life needed for your project.



Small Coil		Maxi Coil		
DIAMETER	L.F.	L.F.	lbs.	width x height
4"	100, 250	3000	1050	8.5' x 9.0'
6"	100	1400	1260	8.5' x 9.0'
8"	80	725	1088	8.5' x 9.0'



**Product Options:**

- 4", 6" and 8" Diameters
- Agricultural or DOT Grades
- Regular or Heavy Duty
- Perforated or Solid Wall
- Small or Maxi Coils
- Standard Couplers and Fittings

**Solid Wall Applications:**

- Roof Drains
- Downspouts
- Driveway Culverts
- Rear Yard Sump Mains
- Agricultural Mains
- Outlet Drains

**Perforated Applications:**

- Athletic/Recreational Field Drainage
- Agricultural Drainage
- Golf Course/Landscape Drainage
- Retaining Wall Drain
- Highway Under Drain
- Foundation/Basement Drain

**CFT WATER QUALITY UNIT**

Lane's Counter Flow Technology (CFT) water quality unit is a cost-effective and eco-friendly structural BMP designed to treat the "first flush" of a storm event by intercepting the flow, removing the pollutants and reintroducing treated flow in a manner suitable for today's storm water regulators. Lane's CFT is manufactured from high-quality corrugated HDPE pipe and has no mechanical, moving or replacement parts. It provides superior reliability and efficiency than comparable products for less cost.



**STANDARD FITTINGS AND CUSTOM FABRICATIONS**

Lane's fitting fabrication shop produces a full assortment of fittings and custom fabrications for all pipe diameters: fittings for storm water storage, water quality devices, flow diversion chambers, orifice plates, weirs, trash racks, riser ladders and et al. Standard and special drawings are available to aid the designer in the use of corrugated HDPE for the varied applications.



**STORM WATER MANAGEMENT SYSTEMS**

Lane manufactures Storm Water Management Systems for detention, retention and infiltration purposes. As a manufacturer of both corrugated metal and polyethylene pipe, Lane enjoys the unique position of being able to supply whichever product is better suited for the project. Since Lane also manages 100% of the fabrication work for both standard and custom fittings, the customer can have the same superior quality in every piece delivered to the site.



***DID YOU KNOW?** Lane's HD100EC pipe qualifies for "Recycled Content" LEED credits.*