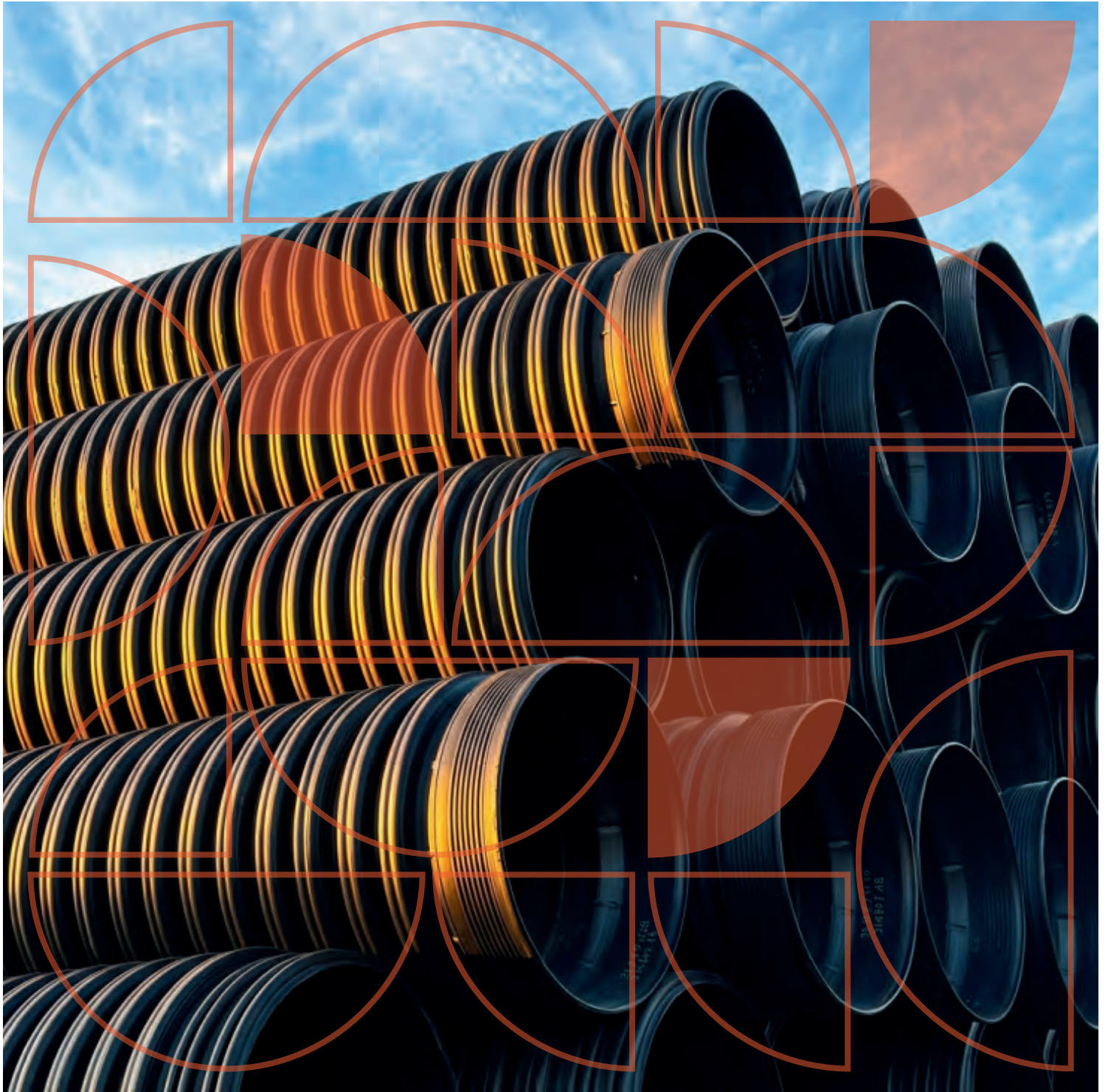


TDR ULTRA®

HDPE CORRUGATED PIPE



TDR ULTRA® is a corrugated HDPE pipe product line engineered with exceptional strength, watertight joints, and advanced technology. Its dual layer, co-extruded integrated bell, corrugated exterior with reinforced double-arch corrugations, and smooth interior liner generates the optimal hydraulic performance for your project.

SCOPE

This specification establishes the requirements for 4 inches through 60 inches TDR ULTRA® pipe and fittings for gravity-flow drainage applications. The product is TxDOT-approved for use in transportation infrastructure projects.

PIPE REQUIREMENTS

TDR ULTRA® pipe shall have a dual wall - corrugated exterior with reinforced double-arch corrugations and smooth interior black liner and dual layer co-extruded integrated bell. Manning's roughness coefficient (n) for hydraulic design shall be assumed as 0.010.

Pipe shall comply with the following standards:

- 4 through 10 inches: AASHTO M252, ASTM F2648, and ASTM F667
- 12 through 60 inches: AASHTO M294, ASTM F2306, ASTM F2648, and ASTM F667

MATERIALS

TDR ULTRA® pipe and fittings must be manufactured using high-density polyethylene (HDPE) meeting the minimum requirements of cell classification 435420C/E for all pipe sizes as defined and described in ASTM D3350. Carbon black content shall be between 2 and 4%.

Materials for 12 through 60 inches pipe shall additionally comply with the Notched Crack Long-Stiffness (NCLS) test per AASHTO M294 Section 9.4 and ASTM F2306 Section 5.1.

JOINT PERFORMANCE

TDR ULTRA® pipe shall be joined using a watertight dual wall integrated bell and spigot joint meeting the requirements of AASHTO M252, ASHTO M294, ASTM F2306 and ASTM F2648. The joint shall be watertight according to ASTM D3212. Pre-installed gaskets shall meet the requirements of ASTM F477. Joint assembly shall utilize a water-based lubricant, either TDR-supplied or equivalent, to facilitate gasket installation. Please refer to TDR Installation Guideline for more details.

INSTALLATION

Pipe and fittings shall be installed in accordance with ASTM D2321 and TDR's published Installation Guideline. Minimum cover for trafficked areas shall be 12" (0.3m). Maximum cover height depends on materials used for embedment and haunching. Please refer to TDR's Technical Service for more detail. Contact your TDR's representative for the latest installations guideline and recommendations.

PERFORATION

When perforated, the minimum water inlet area shall be designed as follows:

- 4 through 10 inches: 1.0 in²/ft (20 cm²/m)
- 12 through 18 inches: 1.5 in²/ft (30 cm²/m)
- Larger than 18 inches: 2.0 in²/ft (40 cm²/m)

Contact TDR's technical representative for specific perforation pattern recommendations applicable to your project requirements.

DIMENSIONS

Nominal ID	Typical Internal Diameter		Typical Outside Diameter		Min. Wall Thickness		Min. Pipe Stiffness @ 5% Deflection	
in (mm)	in	mm	in	mm	in	mm	psi	kPa
4" (100mm)	4.09"	104	4.7"	120.0	0.02"	0.60	50	345
6" (150mm)	6.02"	153	6.9"	174.1	0.04"	1.00	50	345
8" (200mm)	8.00"	203	9.1"	231.3	0.04"	1.10	50	345
10" (250mm)	10.04"	255	11.4"	290	0.06"	1.50	50	345
12" (300mm)	12.28"	312	14.1"	358.9	0.07"	1.70	50	345
15" (375mm)	15.04"	382	17.5"	444.7	0.08"	2.00	42	290
18" (450mm)	18.11"	460	21.1"	534.9	0.09"	2.20	40	275
24" (600mm)	24.25"	616	27.9"	707.9	0.10"	2.50	34	235
30" (750mm)	30.04"	763	34.9"	879.1	0.10"	2.50	29	200
36" (900mm)	36.02"	915	41.4"	1051.6	0.12"	3.00	22	155
42" (1050mm)	42.05"	1068	47.5"	1207.5	0.13"	3.20	21	145
48" (1200mm)	48.74"	1238	55.7"	1415.3	0.14"	3.50	20	135
60" (1500mm)	60.04"	1525	68.1"	1729	0.16"	4.00	15	105

Note: Values provided for reference purposes only. Contact a TDR technical representative for additional information.