

(800) 505-7506



Bridge Drain Systems

www.unitedfiberglass.com

(800) 505-7506

MADE IN USA

BRIDGE DRAIN SYSTEMS BRIDGE DRAIN SYSTEMS BRIDGE DRAIN SYSTEMS

Bridge Drain Pipe

Pipe Compressive End Loads Due to Restrained Thermal Expansion - Uninsulated Pipe

Nominal Pipe Size	OD	Wall Thickness (LBS.)	Weight/ft.	Gallons/ft.	Unsupported Span @ 125°F
4"	4.500"	0.12"	1.33	0.74	11.7'
6"	6.625"	0.12"	1.91	1.02	18.0'
8"	8.625"	0.12"	2.59	1.48	21.0'
10"	10.750"	0.18"	4.22	2.34	22.5'
12"	12.750"	0.18"	5.00	2.78	19.7'
14"	14.400"	0.18"	6.83	3.92	20.3'
16"	16.500"	0.18"	7.82	4.50	23.1'
18"	18.500"	0.18"	8.78	5.00	23.6'
20"	20.570"	0.210"	11.36	6.53	23.6'

Nominal Pipe Size	(LBS./Ft.)	Nominal Pipe Size	(LBS./Ft.)
4"	24.3	14"	-
6"	35.0	16"	110.0
8"	45.0	18"	125.8
10"	84.0	20"	187.1
12"	95.0		

Above data based on 100psi @ 75°F safety factor at ambient temperature. This data is based on the maximum stress for the pipe at 125°F. It is based on thermal expansion and contraction on the piping for design of joints, anchors, expansion joints and bending moment calculations.

Nominal Ultimate Properties

Thermal Expansion - Uninsulated Pipe

Property	Test Method	Size	@ 75°F
Hoop Tensile Stress (Psi)	ANSI/ASTM D1559	4"-12"	80,000
Based on Reinforced Thickness		12"-36"	80,000

Change in Temperature °F	Change in Length (inches/100 ft.)
25	0.375
50	0.750
75	1.125
100	1.500
125	1.875
150	2.250

The coefficient of thermal expansion for Uninsulated Bridge Drain Pipe is 2.25 in/in/°F.

Ultimate Bending Moment - 90° Elbow

Nominal Pipe Size	Moment Foot-pounds	Nominal Pipe Size	Moment Foot-pounds
4"	1,900	14"	3,200
6"	3,600	16"	4,200
8"	5,700	18"	6,400
10"	11,200	20"	7,800
12"	15,900		

Note: The actual operating conditions should never exceed 50% of the ultimate values shown. The maximum 12" dia. pipe operating pressure should not exceed 4,000 psig.

Bridge Drain Pipe Flow Rates & Velocity for Full Bore Gravity Flow

Nominal Pipe Size	1% Gradient		2% Gradient		4% Gradient	
	Flow (ft ³ /sec)	Velocity (ft/s)	Flow (ft ³ /sec)	Velocity (ft/s)	Flow (ft ³ /sec)	Velocity (ft/s)
4	0.23	2.3	0.33	3.3	0.46	4.6
6	0.55	3.0	0.83	4.3	1.31	6.0
8	1.35	3.6	1.90	5.1	2.59	7.2
10	2.43	4.2	3.43	5.5	4.86	9.4
12	3.90	4.7	5.51	6.7	7.75	9.4
14	5.54	5.1	7.83	7.3	11.07	10.3
16	8.09	5.7	11.44	8.0	16.18	11.3
18	11.23	6.1	15.63	8.6	22.07	12.2
20	14.87	6.6	20.61	9.3	28.14	13.1

Note: The above flow and velocity are based on Manning's roughness coefficient of 0.015. The velocity of flow in gpm is equal to the flow rate multiplied by 4.48. The velocity of flow in ft/min is equal to the velocity multiplied by 6.6.

Pipe Composition: Filament-wound "E" type fiberglass reinforced thermosetting resin pipe manufactured in accordance with ASTM D2596.

Standard Fittings: Manufactured specifically for bridge drain and duct work applications in accordance with NBS PS 15-59 standards and ASTM D 562.

- 90° Elbows
- Concentric Reducers
- Expansion Joints
- 45° Elbows
- Truss Covers
- Flanges
- Saddle Tees
- Couplings
-
- 45° Lateral Saddles
- Cleanouts
-