

ULTRA FLO®

Heights of Cover

Galvanized, ALUMINIZED STEEL Type 2 or Polymer Coated** Steel ULTRA FLO® H 20 and H 25 Live Load

Diameter (Inches)	Minimum/Maximum Cover (Feet) Specified Thickness (Inches) and Gage			
	(0.064) 16	(0.079) 14	(0.109) 12	(0.138) 10
	18	1.0 / 108	1.0 / 151	
21	1.0 / 93	1.0 / 130	1.0 / 216	
24	1.0 / 81	1.0 / 113	1.0 / 189	
30	1.0 / 65	1.0 / 91	1.0 / 151	
36	1.0 / 54	1.0 / 75	1.0 / 126	
42	1.0 / 46	1.0 / 65	1.0 / 108	
48	1.0 / 40	1.0 / 56	1.0 / 94	1.0 / 137
54	1.25 / 36	1.25 / 50	1.0 / 84	1.0 / 122
60	1.25* / 32*	1.25 / 45	1.0 / 75	1.0 / 109
66		1.5 / 41	1.25 / 68	1.25 / 99
72		1.5* / 37*	1.25 / 63	1.25 / 91
78		1.75* / 34*	1.5 / 58	1.5 / 84
84			1.75 / 54	1.75 / 78
90			2.0* / 50*	2.0 / 73
96			2.0* / 47*	2.0 / 68
102			2.5* / 43*	2.5 / 61
108				2.5* / 54*
114				2.5* / 49*
120				2.5* / 43*

Galvanized, ALUMINIZED STEEL Type 2 or Polymer Coated** Steel ULTRA FLO® E 80 Live Load

Diameter (Inches)	Minimum/Maximum Cover (Feet) Specified Thickness (Inches) and Gage			
	(0.064) 16	(0.079) 14	(0.109) 12	(0.138) 10
	18	1.0 / 93	1.0 / 130	
21	1.0 / 79	1.0 / 111	1.0 / 186	
24	1.0 / 69	1.0 / 97	1.0 / 162	
30	1.0 / 55	1.0 / 78	1.0 / 130	
36	1.5 / 46	1.25 / 65	1.0 / 108	
42	1.5 / 39	1.5 / 55	1.25 / 93	
48	2.0 / 34	1.75 / 48	1.5 / 81	1.5 / 118
54	3.0* / 28*	2.0 / 43	1.5 / 72	1.5 / 104
60		2.0 / 39	1.75 / 65	1.75 / 94
66		2.5* / 35*	2.0 / 58	2.0 / 85
72			2.0 / 49	2.0 / 78
78			2.5 / 42	2.5 / 72
84			2.75* / 35*	2.5 / 67
90				2.5 / 62
96				2.5* / 58*
102				3.0* / 52*

Notes:

- The tables for Steel H 20 and H 25 loading are based on the NCSA CSP Design Manual, 2008 and were calculated using a load factor of K=0.86. The tables for Steel E 80 loading are based on the AREMA Manual. The tables for Aluminum HL 93 loading are based on AASHTO LRFD Design Criteria.
- The haunch areas of a pipe-arch are the most critical zone for backfilling. Extra care should be taken to provide good material and compaction to a point above the spring line.
- E 80 minimum cover is measured from top of pipe to bottom of tie.
- H 20, H 25 and HL 93 minimum cover is measured from top of pipe to bottom of flexible pavement or top of rigid pavement.
- The pipe-arch tables are based on the corner bearing pressures as shown. These values may increase or decrease with changes in allowable corner bearing pressures. Consider the use of a round pipe in cases where the height of cover exceeds 8'.
- Larger size pipe-arches may be available on special order.
- M.L. (Heavier gage is required to prevent crimping at the haunches.)
- For construction loads, see Page 15.
- Sewer gage (trench conditions) tables for corrugated steel pipe can be found in the AISI book "Modern Sewer Design," 4th Edition, 1999. These tables may reduce the minimum gage (GA) due to a higher flexibility factor allowed for a trench condition.

Galvanized, ALUMINIZED STEEL Type 2 or Polymer Coated** Steel ULTRA FLO® Pipe-Arch H 20 and H 25 Live Load

Size		Minimum/Maximum Cover (Feet) Specified Thickness (Inches) and Gage		
Round Equivalent (Inches)	Span x Rise (Inches)	(0.064) 16	(0.079) 14	(0.109) 12
18	20 x 16	1.0 / 16		
21	23 x 19	1.0 / 15		
24	27 x 21	1.0 / 13		
30	33 x 26	1.0 / 13	1.0 / 13	
36	40 x 31	1.0 / 13	1.0 / 13	
42	46 x 36	M.L.?	M.L.?	1.0 / 13
48	53 x 41	M.L.?	M.L.?	1.25 / 13
54	60 x 46	M.L.?	M.L.?	1.25 / 13
60	66 x 51	M.L.?	M.L.?	1.25 / 13

Galvanized, ALUMINIZED STEEL Type 2 or Polymer Coated** Steel ULTRA FLO® Pipe-Arch E 80 Live Load

Size		Minimum/Maximum Cover (Feet) Specified Thickness (Inches) and Gage	
Round Equivalent (Inches)	Span x Rise (Inches)	(0.064) 16	(0.109) 12
18	20 x 16	2.0 / 22	
21	23 x 19	2.0 / 21	
24	27 x 21	2.0 / 18	
30	33 x 26	2.0 / 18	
36	40 x 31	2.0 / 17	
42	46 x 36		2.0 / 18
48	53 x 41		2.0 / 18
54	60 x 46		2.0 / 18
60	66 x 51		2.0 / 18

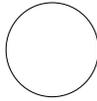


ULTRA FLO® can be manufactured from polymer coated steel for added durability.

- All heights of cover are based on trench conditions. If embankment conditions exist, there may be restriction on gages for the large diameters. Your Contech Sales Representative can provide further guidance for a project in embankment conditions.
- All steel ULTRA FLO® is installed in accordance with ASTM A798 "Installing Factory-Made Corrugated Steel Pipe for Sewers and Other Applications."
 - * These sizes and gage combinations are installed in accordance with ASTM A796 paragraphs 18.2.3 and ASTM A798. For aluminum ULTRA FLO® refer to ASTM B790 and B788.
 - ** Contact your local Contech representative for more specific information on Polymer Coated ULTRA FLO® for 12 GA and 10 GA.
 - *** Consult your Contech Sales Representative for E 80 Live Loads for Aluminum ULTRA FLO®.

Heights of Cover

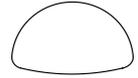
Aluminum ULTRA FLO® HL 93 Live Load



Diameter (Inches)	Minimum/Maximum Cover (Feet)			
	Specified Thickness (Inches) and Gage			
	(0.060) 16	(0.075) 14	(0.105) 12	(0.135) 10
18	1.0/43	1.0/61		
21	1.0/38	1.0/52	1.0/84	
24	1.0/33	1.0/45	1.0/73	
30	1.25/26	1.25/36	1.25/58	
36	1.5*/21*	1.50/30	1.5/49	1.5/69
42		1.75*/25*	1.75/41	1.75/59
48			2.0/36	2.0/51
54			2.0/32	2.0/46
60			2.0*/29*	2.0/41
66				2.0/37
72				2.5*/34*

See previous page for height of cover notes.

Aluminum ULTRA FLO® Pipe-Arch HL 93 Live Load



Size		Minimum/Maximum Cover (Feet)			
		Specified Thickness (Inches) and Gage			
Round Equivalent (Inches)	Span x Rise (Inches)	(0.060) 16	(0.075) 14	(0.105) 12	(0.135) 10
18	20 x 16	1.0/16			
21	23 x 19	1.0/15			
24	27 x 21	1.25/13	1.25/13		
30	33 x 26	1.5/13	1.5/13	1.5/13	
36	40 x 31		1.75/13	1.75/13	
42	46 x 36			2.0/13	2.0/13
48	53 x 41			2.0/13	2.0/13
54	60 x 46			2.0*/13*	2.0/13
60	66 x 51				2.0/13

Approximate Weight/Foot Contech ULTRA FLO® Pipe

Handling Weight for **ALUMINIZED STEEL Type 2** or **Galvanized Steel** ULTRA FLO®

Diameter (Inches)	Weight (Pounds/Lineal Foot)			
	Specified Thickness (Inches) and Gage			
	(0.064) 16	(0.079) 14	(0.109) 12	(0.138) 10
18	15	18		
21	17	21	29	
24	19	24	36	
30	24	30	42	
36	29	36	50	
42	33	42	58	
48	38	48	66	80
54	45	54	75	90
60	48	60	83	99
66		66	91	109
72		72	99	119
78		78	108	129
84			116	139
90			124	149
96			132	158
102			141	168
108				175
114				196
120				206

Weights for polymer coated pipe are 1% to 4% higher, varying by gage.

Handling Weight for **ALUMINUM** ULTRA FLO®

Diameter (Inches)	Weight (Pounds/Lineal Foot)			
	Specified Thickness (Inches) and Gage			
	(0.060) 16	(0.075) 14	(0.105) 12	(0.135) 10
18	5	6		
21	6	8	11	
24	7	9	13	
30	9	11	15	
36	11	13	18	23
42		15	21	26
48			24	30
54			27	34
60			30	37
66				41
72				45



ULTRA FLO® is available in long lengths, and its light weight allows it to be unloaded and handled with small equipment.



Reduced excavation due to the smaller outside diameter of ULTRA FLO®.