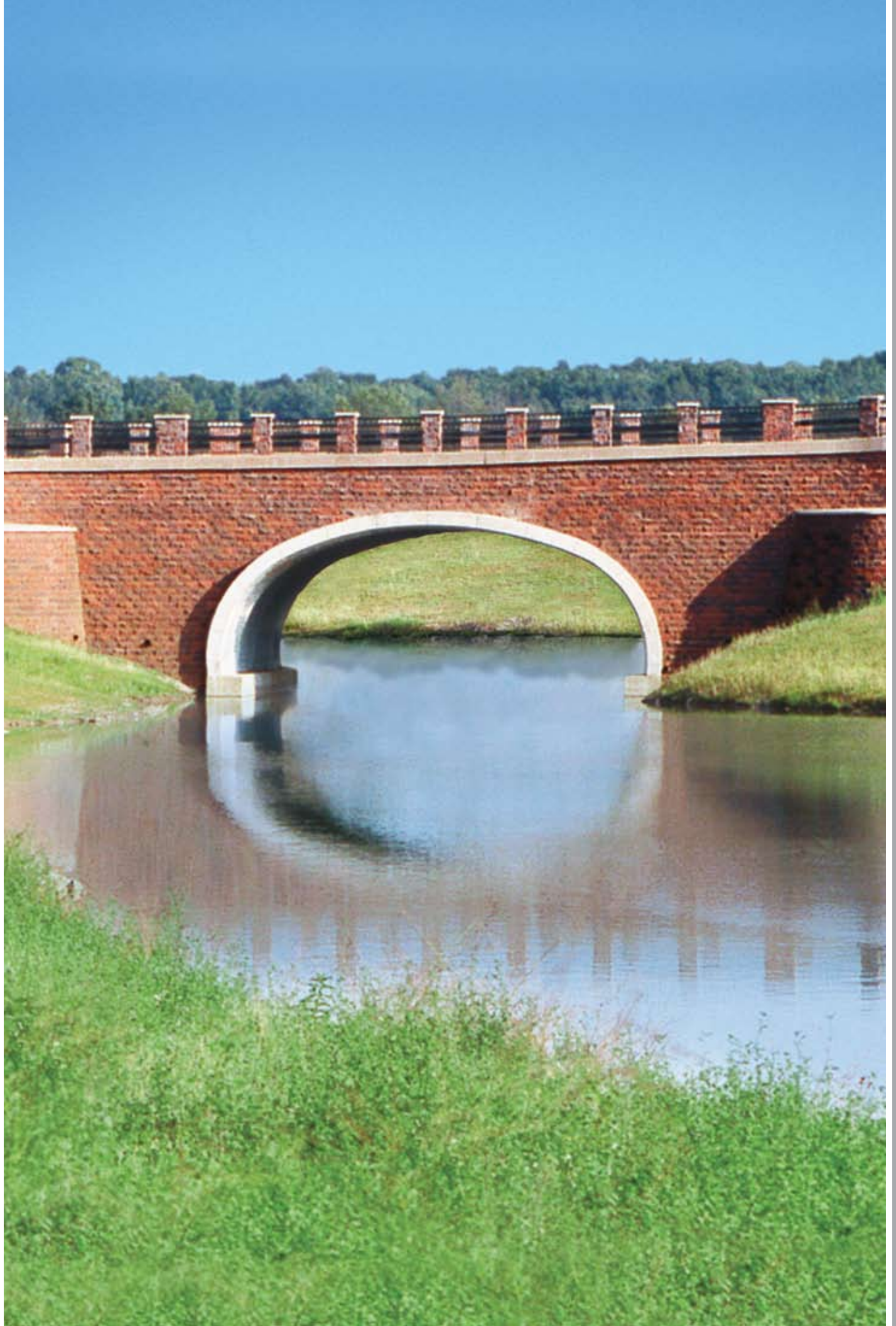
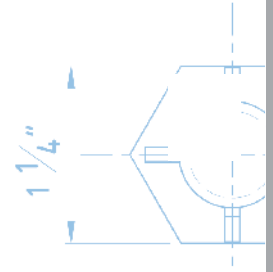


Bolt-A-Plate®

bigrbridge.com







The Right Bridge. Built Right.

The Right Solution for Any Job.

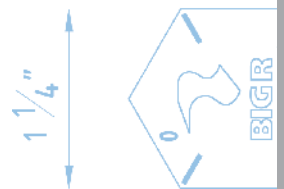
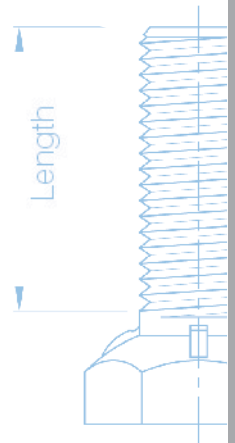
When it comes to infrastructure projects, Big R Bridge is the design specialist with a proven reputation for consistently delivering the right solutions, the right quality and the right support throughout America. We know that high-quality products, engineering excellence and innovative, proprietary designs – not to mention exemplary customer service – are key to a successful business relationship.

The Right Choice.

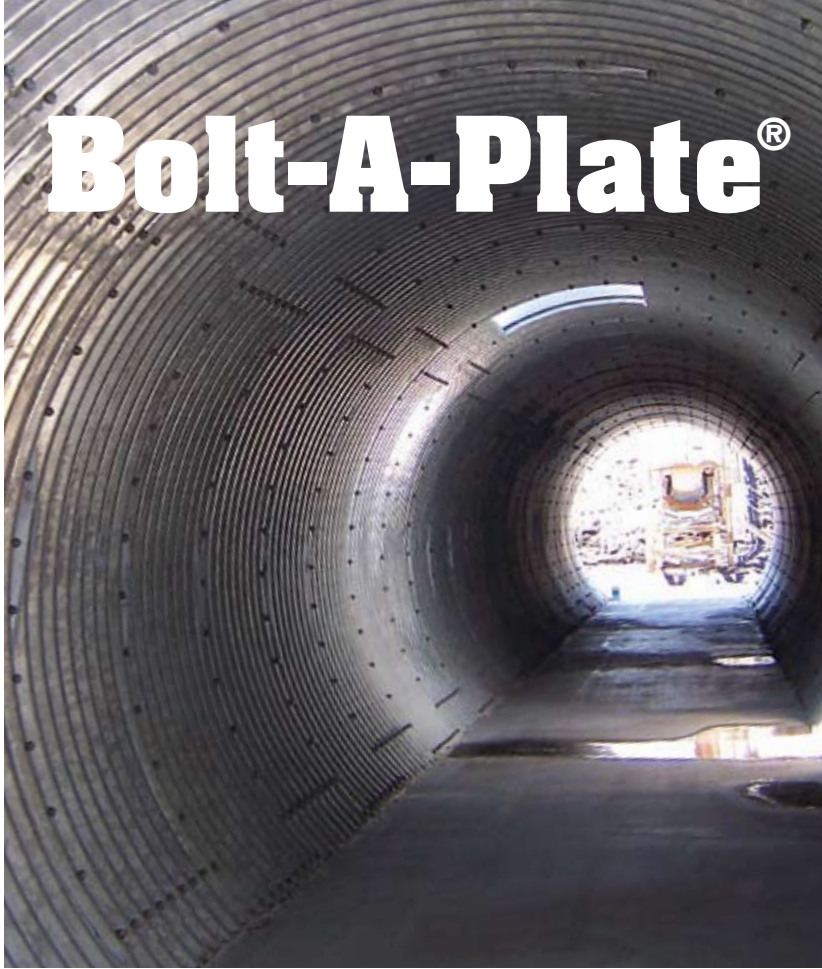
From our modern production facilities in Greeley, Colorado and Fort Worth, Texas, along with those of our partners in the AIL Group of Companies around the world, we design and manufacture attractive and economical infrastructure solutions in a variety of sizes and types, ranging from culverts and tunnels to bridges, underpasses and stream enclosures. Give us your application and Big R technical representatives will work hard with your team to find the right solution that best suits your needs.

The Right Quality.

Although we make a wide variety of products, they all share common attributes. Better looks. Better quality. Better performance. Period. Better still, we readily provide on-site assistance when needed and your order will be delivered to the job site on time, and ready to assemble. Simply put, you're always going to get Big R's best and that's a promise.



Bolt-A-Plate®



Bolt-A-Plate® is ideal for new site developments, county stream crossings, as well as urban rehabilitations. It maintains natural streambeds and reduces environmental impacts. Bolt-A-Plate® structures are effectively utilized as strong and economical alternatives to elaborate bridge replacements.



Strong
Economical
Lightweight

Bolt-A-Plate® is ideal for:

- Wetland crossings
- Underpasses
- Culverts
- Stream enclosures
- Fishways
- Bridge replacements
- Conveyor tunnels



Bolt-A-Plate® Structural Shapes and Details

Arches - Standard and Low Profile anchored on footings are ideal for installations where there is limited headroom and low height of cover restrictions. They are especially useful in sites where it is desirable to maintain natural stream beds and are widely used for stream enclosures, culverts and storm sewers.

High Profile arches are engineered to maintain a natural waterway and allow for an abrasive bedload. Additionally, these arches are ideal for projects that include large end areas or large spans. The high profile arch is also used for highway grade separations.

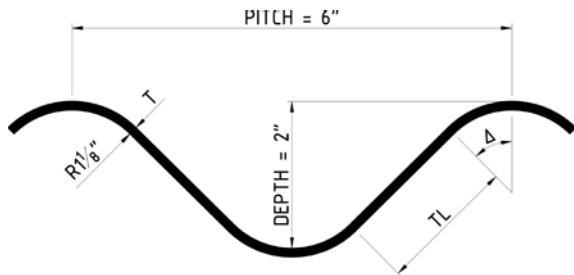
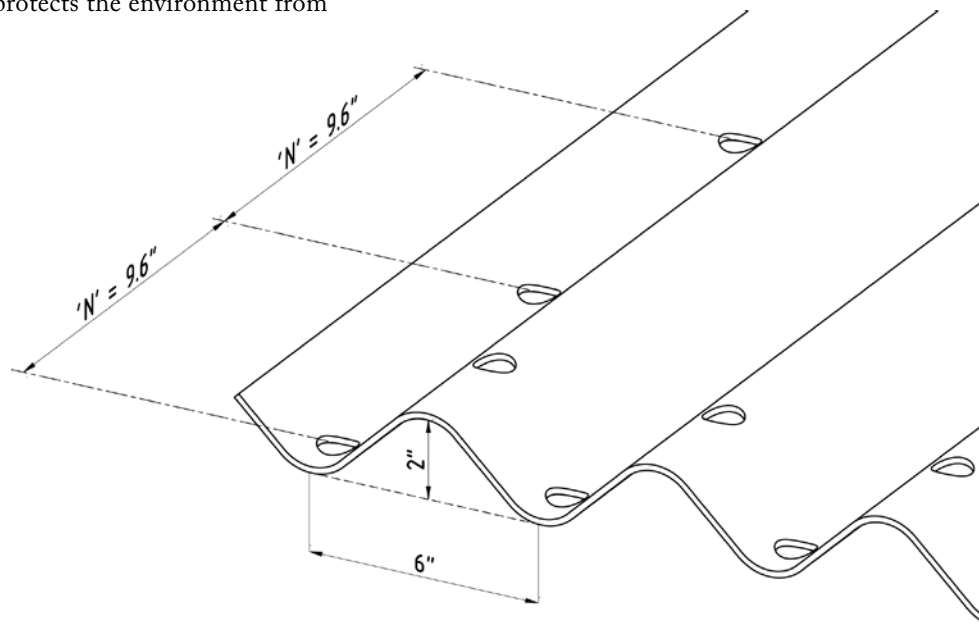
Clearance Box sizes are available from your local Big R representative.

Pear Shape is generally used for railway tunnels and underpasses. With proper end treatment, Bolt-A-Plate® provides access and protects the environment from erosion problems.

Round Pipe is the most common and versatile of the Bolt-A-Plate® shapes. This shape is used primarily for culverts, sewers and sub-drains, but is also appropriate for storage bins, tunnels and bridges.

Pipe-Arch is ideal for bridges and underpasses with limited overhead clearance. Pipe-arch's unique shape provides hydraulic advantages at low flow rates for culverts and sewers.

Elliptical shapes are commonly used for underpasses and service tunnels. The **horizontal** ellipse is better suited for multi-lane, vehicular underpasses, while the **vertical** ellipse shape is more appropriate for single lane vehicular and railway underpasses.



Corrugation Profile: 6" x 2"

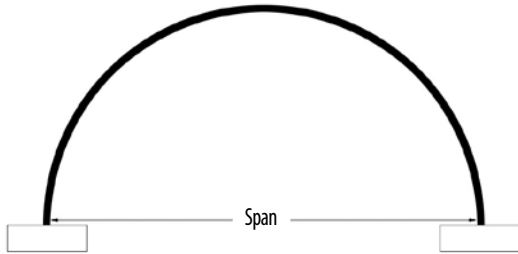
Wall Thickness Specified (in)	Area (A) (in ² /ft)	Tangent Length(TL) (in)	Tangent Angle(Δ) (degrees)	Moment of Inertia(I) (in ⁴ /in)	Radius of Gyration(r) (in)
0.111	1.556	1.893	44.47	60.417	0.682
0.123	1.664	1.885	44.53	64.517	0.682
0.140	2.003	1.861	44.73	78.167	0.684
0.163	2.281	1.840	44.90	88.946	0.684
0.170	2.449	1.828	45.00	96.167	0.686
0.202	2.905	1.795	45.29	113.939	0.686
0.241	3.525	1.748	45.69	139.031	0.688
0.281	4.116	1.702	46.08	163.245	0.690

Specified thickness includes 3oz/ft² zinc coating

Section Properties - ASTM A796

Dimensions shown are nominal sizes, final dimensions may vary.

STANDARD ARCH



Note: Structure No. 40A5 = 40N total
 Dimensions are to the inside crests.
 Other sizes are available upon request.
 Dimensions shown are nominal sizes,
 final dimensions may vary.

All No.	Size		End Area (ft ²)	Min. Cover (in)
	Span (ft-in)	Rise (ft-in)		
10A	5-0	2-8	10.5	12
9A	-	2-3	8.5	12
8A	-	1-10	6.5	12
12A1	6-0	3-2	15	12
11A	-	2-9	12.5	12
10A1	-	2-4	10	12
9A1	-	1-10	7.5	12
14A1	7-0	3-8	20	12
13A	-	3-3	17.5	12
12A2	-	2-10	15	12
11A1	-	2-5	12	12
16A1	8-0	4-2	26	12
15A	-	3-9	23.5	12
14A2	-	3-4	20	12
13A1	-	2-11	17	12
12A3	-	2-5	13.5	12
18A	9-0	4-8	33	18
17A	-	4-4	30	18
16A2	-	3-11	26.5	18
15A1	-	3-5	23	18
14A3	-	3-0	19	18
20A	10-0	5-3	41	18
19A1	-	4-10	37	18
18A1	-	4-5	33.5	18
17A1	-	4-0	29.5	18
16A3	-	3-6	25.5	18
15A2	-	3-0	21	18

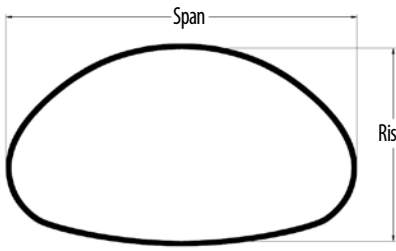
All No.	Size		End Area (ft ²)	Min. Cover (in)
	Span (ft-in)	Rise (ft-in)		
22A	11-0	5-9	49.5	18
21A1	-	5-4	45.5	18
20A1	-	4-11	41	18
19A	-	4-6	37	18
18A	-	4-0	32.5	18
17A1	-	3-6	27.5	18
24A	12-0	6-3	59	18
23A1	-	5-10	54.5	18
22A1	-	5-5	49.5	18
21A	-	5-0	45	18
20A2	-	4-7	40	18
19A2	-	4-1	35	18
26A1	13-0	6-9	69.5	24
25A1	-	6-4	64.5	24
24A1	-	5-11	59	24
23A	-	5-6	54	18
22A2	-	5-1	49	18
21A2	-	4-7	43.5	18
28A	14-0	7-3	81	18
27A	-	6-10	75	18
26A	-	6-6	69.5	24
25A	-	6-0	64	24
24A2	-	5-7	58	24
23A1	-	5-2	52.5	24
22A3	-	4-8	46.5	24
30A1	15-0	7-9	92.5	24
29A	-	7-5	86.5	24
28A1	-	7-0	80.5	24
27A1	-	6-7	74.5	24
26A2	-	7-0	68.5	24
25A2	-	5-8	62.5	24
24A3	-	5-2	56	24
23A3	-	4-8	50	24

All No.	Size		End Area (ft ²)	Min. Cover (in)
	Span (ft-in)	Rise (ft-in)		
32A	16-0	8-3	104.5	24
31A1	-	7-11	98.5	24
30A	-	7-6	92	24
29A1	-	7-1	86	24
28A2	-	6-8	79.5	24
27A2	-	6-2	73	24
26A3	-	5-9	66.5	24
25A3	-	5-3	60	24
34A	17-0	8-10	118.5	30
33A1	-	8-5	111.5	30
32A1	-	8-0	105	30
31A2	-	7-7	98	30
30A2	-	8-0	91.5	30
29A2	-	6-9	84.5	30
28A3	-	6-3	77.5	30
27A3	-	5-9	70.5	30
26A4	-	5-3	63	30
36A	18-0	9-4	132.5	30
35A1	-	8-11	125.5	30
34A1	-	8-6	118.5	30
33A2	-	8-1	111.5	30
32A2	-	7-8	104	30
31A	-	7-3	97	30
30A3	-	6-9	89.5	30
31A3	-	6-4	82	30
28A3	-	5-9	74	30
38A	19-0	9-10	148	30
37A	-	9-5	140	30
36A1	-	9-0	133	30
35A2	-	8-8	125	30
34A2	-	8-2	117.5	30
33A2	-	7-9	110	30
32A2	-	7-4	102.5	30
31A3	-	6-10	94.5	30
30A4	-	6-4	86.5	30
29A4	-	5-10	78.5	30
40A	20-0	10-4	164	30
39A	-	9-11	156	30
38A1	-	9-7	148	30
37A1	-	9-2	140	30
36A2	-	8-9	132	30
35A2	-	8-3	124	30
34A3	-	7-10	116	30
33A3	-	7-4	107.5	30
32A4	-	6-10	99.5	30
31A4	-	6-4	91	30
42A	21-0	10-10	180.5	36
41A	-	10-6	172	36
40A	-	10-1	164	36
39A1	-	9-8	155.5	36
38A1	-	9-3	147	36
37A2	-	8-10	139	36
36A3	-	8-4	130	36
35A3	-	7-11	121.5	36
34A4	-	7-5	113	36
33A4	-	6-11	104	36
32A5	-	6-4	95	36
44A	22-0	11-5	198	36
43A	-	11-0	189	36
42A1	-	10-7	180.5	36
41A1	-	10-2	172	36
40A1	-	9-9	163	36
39A2	-	9-4	154.5	36
38A2	-	8-11	145.5	36
37A3	-	8-5	136.5	36
36A4	-	7-11	127.5	36
35A4	-	7-5	118	36
34A5	-	6-11	108.5	36
45A	23-0	11-6	207	36
44A1	-	11-1	198	36
43A1	-	10-8	189	36
42A2	-	10-3	180	36
41A2	-	9-10	170.5	36
40A2	-	9-5	161.5	36
39A3	-	8-11	152	36
38A3	-	8-6	142.5	36
37A3	-	8-0	133	36
36A4	-	7-6	123	36
35A4	-	6-11	113	36
47A	24-0	12-0	226	36
46A	-	11-7	216.5	36
45A1	-	11-2	207	36
44A2	-	10-9	197.5	36
43A2	-	10-4	188	36
42A3	-	9-11	178	36
41A3	-	9-6	168.5	36
40A3	-	9-0	158.5	36
39A4	-	8-6	149	36
38A4	-	8-0	138.5	36
37A4	-	7-6	128	36
49A	25-0	12-6	245	42
48A	-	12-2	236	42
47A1	-	11-9	226	42
46A1	-	11-4	216	42
45A2	-	10-10	206	42
44A3	-	10-5	196	42
43A3	-	10-0	186	42
42A4	-	9-6	175	42
40A4	-	8-7	155	42
39A5	-	8-0	144	42
38A5	-	7-6	133	42
51A	26-0	13-0	266	42
50A	-	12-8	256	42
49A1	-	12-3	245	42
48A1	-	11-10	235	42
47A1	-	11-5	225	42
46A2	-	10-11	214	42
45A3	-	10-6	204	42
44A4	-	10-1	193	42
43A4	-	9-7	183	42
42A5	-	9-1	172	42
41A5	-	8-7	161	42
40A5	-	8-1	149	42

DESIGN NOTES FOR ALL SHAPES:

- 1) Minimum covers from AASHTO Standard Design for Highway Bridges Section 12.
- 2) Construction Traffic may require greater minimum cover.
- 3) For information on design and maximum covers please contact Big R Bridge.

PIPE-ARCH



Note: Structure No. 31 PA-6-18 = 31N Top, 2x 3N corners, 18N Bottom, Total N = 55
 Dimensions are to the inside crests.
 Other sizes are available upon request.
 Corner Bearing Pressure may be critical at the corner radii.
 Dimensions shown are nominal sizes, final dimensions may vary.

AIL No.	Size		End Area (ft ²)	Min. Cover (in)
	Span (ft-in)	Rise (ft-in)		
11 PA 6-5	6-1	4-7	22	12
12 PA 6-5	6-4	4-9	24	12
12 PA 6-6	6-9	4-11	26	12
13 PA 6-6	7-0	5-1	28	12
14 PA 6-6	7-3	5-3	31	12
14 PA 6-7	7-8	5-5	33	12
15 PA 6-7	7-11	5-7	35	12
16 PA 6-7	8-2	5-9	38	18
16 PA 6-8	8-7	5-11	40	18
17 PA 6-8	8-10	6-1	43	18
17 PA 6-9	9-4	6-3	46	18
18 PA 6-9	9-6	6-5	49	18

AIL No.	Size		End Area (ft ²)	Min. Cover (in)
	Span (ft-in)	Rise (ft-in)		
19 PA 6-9	9-9	6-7	52	18
19 PA 6-10	10-3	6-9	55	18
19 PA 6-11	10-8	6-11	58	18
20 PA 6-11	10-11	7-1	61	18
20 PA 6-12	11-5	7-3	64	18
21 PA 6-12	11-7	7-5	67	18
22 PA 6-12	11-10	7-7	71	18
22 PA 6-13	12-4	7-9	74	24
23 PA 6-13	12-6	7-11	78	24
24 PA 6-13	12-8	8-1	81	24
25 PA 6-13	12-10	8-3	85	24
25 PA 6-14	13-5	8-5	89	24

AIL No.	Size		End Area (ft ²)	Min. Cover (in)
	Span (ft-in)	Rise (ft-in)		
25 PA 6-15	13-11	8-7	93	24
26 PA 6-15	14-1	8-9	97	24
27 PA 6-15	14-3	8-11	101	24
27 PA 6-16	14-10	9-1	105	24
27 PA 6-17	15-4	9-3	109	24
28 PA 6-17	15-6	9-5	113	24
29 PA 6-17	15-8	9-7	118	24
30 PA 6-17	15-10	9-9	122	24
30 PA 6-18	16-5	9-11	126	30
31 PA 6-18	16-7	10-1	131	30

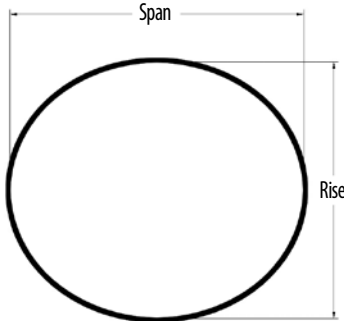
**All corner plates are curved to 18" inside

AIL No.	Size		End Area (ft ²)	Min. Cover (in)
	Span (ft-in)	Rise (ft-in)		
9 PA 10-5	6-9	5-0	27	12
11 PA 10-5	7-4	5-4	31	12
12 PA 10-5	8-0	5-9	36	18
14 PA 10-6	8-6	6-2	42	18
16 PA 10-6	8-10	6-10	48	18
15 PA 10-9	10-2	6-6	52	18
15 PA 10-11	11-2	6-9	57	18
18 PA 10-12	12-3	7-6	71	24
23 PA 10-11	12-9	8-6	89	24
24 PA 10-12	13-3	9-4	98	24
25 PA 10-12	13-6	9-6	102	24

AIL No.	Size		End Area (ft ²)	Min. Cover (in)
	Span (ft-in)	Rise (ft-in)		
25 PA 10-13	14-0	9-8	106	24
26 PA 10-13	14-2	9-10	110	24
27 PA 10-13	14-5	10-0	115	24
27 PA 10-14	14-11	10-2	119	24
27 PA 10-15	15-4	10-4	124	24
28 PA 10-15	15-7	10-6	129	24
29 PA 10-15	15-10	10-8	133	24
29 PA 10-16	16-3	10-10	138	30
30 PA 10-16	16-6	11-0	143	30
30 PA 10-17	17-0	11-2	148	30
31 PA 10-17	17-2	11-4	153	30
32 PA 10-17	17-5	11-6	158	30
32 PA 10-18	17-11	11-8	163	30
33 PA 10-18	18-1	11-10	168	30
33 PA 10-19	18-7	12-0	174	30
34 PA 10-19	18-9	12-2	179	30
34 PA 10-20	19-3	12-4	185	30
35 PA 10-20	19-6	12-6	190	30
36 PA 10-20	19-8	12-8	196	30
37 PA 10-20	19-11	12-10	202	30
37 PA 10-21	20-5	13-0	208	36
38 PA 10-21	20-7	13-2	214	36

**All corner plates are curved to 31" inside

HORIZONTAL ELIPSE



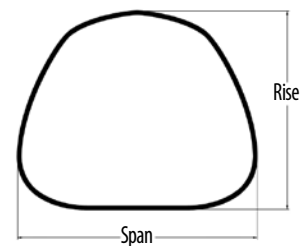
Note: Structure No. 70 HE34 = 2x 35N Top, 2x 17N Sides, Total N = 104
 Dimensions are to the inside crests.
 Other sizes are available upon request.
 Dimensions shown are nominal sizes, final dimensions may vary.

AIL No.	Size		End Area (ft ²)	Min. Cover (in)
	Span (ft-in)	Rise (ft-in)		
16 HE10	7-4	5-6	31.3	12
18 HE10	8-1	5-9	36.4	18
20 HE10	8-10	6-0	41.4	18
20 HE12	9-2	6-9	48.2	18
22 HE10	9-7	6-4	46.7	18
22 HE12	9-11	7-0	54	18
24 HE10	10-4	6-7	52.2	18
24 HE12	10-8	7-3	60.1	18
24 HE14	11-0	8-0	68.2	18
26 HE10	11-1	6-10	58.1	18
26 HE12	11-4	7-6	66.4	18
26 HE14	11-8	8-3	75.1	18
28 HE10	11-9	7-1	64.2	18

AIL No.	Size		End Area (ft ²)	Min. Cover (in)
	Span (ft-in)	Rise (ft-in)		
26 HE10	12-0	8-11	84.1	24
28 HE12	12-1	7-10	73	24
28 HE14	12-5	8-6	82.2	24
28 HE16	12-9	9-2	91.7	24
30 HE10	12-6	7-4	70.5	24
30 HE12	12-10	8-1	79.9	24
30 HE14	13-2	8-9	89.6	24
30 HE16	13-6	9-6	99.6	24
32 HE12	13-7	8-4	87.1	24
32 HE14	13-11	9-0	97.3	24
32 HE16	14-3	9-9	107.8	24
32 HE18	14-7	10-5	118.7	24
32 HE20	14-11	11-2	129.9	24

AIL No.	Size		End Area (ft ²)	Min. Cover (in)
	Span (ft-in)	Rise (ft-in)		
36 HE18	15-10	11-3	138	24
36 HE22	17-4	11-7	157	30
36 HE28	18-9	13-1	195	30
44 HE20	19-4	12-9	191	30
50 HE16	20-10	12-2	194	36
52 HE18	21-11	13-1	221	36
54 HE20	23-0	14-1	249	36
54 HE28	24-4	16-11	320	42
58 HE26	25-5	16-9	330	42
60 HE32	27-2	19-1	405	42
66 HE32	29-5	19-11	455	42
70 HE34	31-2	21-2	512	48

UNDERPASS SHAPE



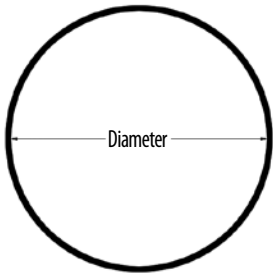
Note: Structure No. 22 PU-12-26-18 = 22N Top, 2x 6N corners, 2x 13N Sides, 18N Bottom, Total N = 78
 Dimensions are to the inside crests.
 Other sizes are available upon request.
 Dimensions shown are nominal sizes, final dimensions may vary.

AIL No.	Size		End Area (ft ²)	Min. Cover (in)
	Span (ft-in)	Rise (ft-in)		
5 PU-6-10-3	5-8	5-9	27	12
6 PU-6-10-3	5-8	6-1	-	12
7 PU-6-10-3	5-9	6-6	32	12
6 PU-6-12-3	5-9	7-0	32	12
7 PU-6-12-3	5-9	7-4	36	12
6 PU-6-14-3	5-10	7-8	38	12
7 PU-6-14-3	5-10	8-2	41	12
10 PU-10-10-5	8-6	8-6	58.4	18
11 PU-10-10-5	8-8	8-8	61.8	18
12 PU-10-10-5	8-11	8-11	65.3	18

AIL No.	Size		End Area (ft ²)	Min. Cover (in)
	Span (ft-in)	Rise (ft-in)		
11 PU-10-12-6	9-8	9-4	73.2	18
12 PU-10-12-9	10-10	9-6	80.8	18
13 PU-10-12-9	11-5	10-3	92.6	18
13 PU-10-14-10	12-2	11-0	107	24
14 PU-10-14-11	12-11	11-2	116	24
14 PU-10-16-11	13-2	11-10	126	24
15 PU-10-16-12	13-10	12-2	136	24
15 PU-10-18-12	14-1	12-10	147	24
16 PU-10-18-13	14-6	13-5	158	24
16 PU-10-20-13	14-10	14-0	169	24

AIL No.	Size		End Area (ft ²)	Min. Cover (in)
	Span (ft-in)	Rise (ft-in)		
17 PU-10-20-14	15-6	14-4	180	24
17 PU-10-22-14	15-8	15-0	192	24
18 PU-10-22-15	16-4	15-5	204	30
19 PU-10-24-14	16-5	16-0	217	30
19 PU-10-24-15	16-9	16-3	227	30
19 PU-12-24-15	17-3	17-0	239	30
20 PU-12-24-16	18-4	16-11	252	30
21 PU-12-24-17	19-1	17-2	266	30
21 PU-12-26-17	19-6	17-7	280	30
22 PU-12-26-18	20-4	17-9	298	36

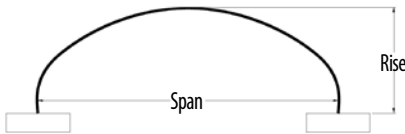
ROUND



Note: Structure No. 104R = 104N
Dimensions are to the inside crests.
Other sizes are available upon request.
Dimensions shown are nominal sizes, final dimensions may vary.

AIL No.	Size Diameter (ft-in)	End Area (ft ²)	Min. Cover (in)	AIL No.	Size Diameter (ft-in)	End Area (ft ²)	Min. Cover (in)	AIL No.	Size Diameter (ft-in)	End Area (ft ²)	Min. Cover (in)
20R	5	19.1	12	50R	12-6	124	24	80R	20	320.6	30
22R	5-6	23.2	12	52R	13	134.3	24	82R	20-6	337	36
24R	6	27.8	12	54R	13-6	144.9	24	84R	21	353.8	36
26R	6-6	32.7	12	56R	14	156	24	86R	21-6	371	36
28R	7	38.1	12	58R	14-6	167.5	24	88R	22	388.6	36
30R	7-6	43.9	12	60R	15	179.4	24	90R	22-6	406.6	36
32R	8	50	12	62R	15-6	191.7	24	92R	23	425	36
34R	8-6	56.6	18	64R	16	204.4	24	94R	23-6	443.8	36
36R	9	63.6	18	66R	16-6	217.5	30	96R	24	463	42
38R	9-6	71	18	68R	17	231	30	98R	24-6	482.6	42
40R	10	78.8	18	70R	17-6	244.9	30	100R	25	502.7	42
42R	10-6	87.1	18	72R	18	259.2	30	102R	25-6	523.1	42
44R	11	95.7	18	74R	18-6	274	30	104R	26	543.9	42
46R	11-6	104.7	18	76R	19	289.1	30				
48R	12	114.2	18	78R	19-6	304.7	30				

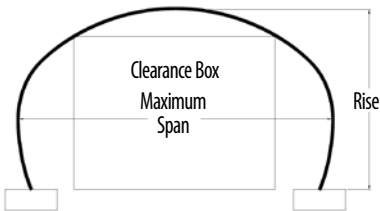
LOW PROFILE ARCH



Note: Structure No. 42 LA 14= 42N top, 14N sides, Total N= 70
Dimensions are to the inside crests.
Other sizes are available upon request.
Dimensions shown are nominal sizes, final dimensions may vary.

AIL No.	Size (ft-in)			End Area (ft ²)	AIL No.	Size (ft-in)			End Area (ft ²)	AIL No.	Size (ft-in)			End Area (ft ²)
	Max Span	Bot. Span	Total Rise			Max Span	Bot. Span	Total Rise			Max Span	Bot. Span	Total Rise	
23LA6	20-1	19-10	7-6	121	31LA9	27-3	27-1	10-0	217	38LA7	31-9	31-7	10-3	255
23LA5	19-5	19-1	6-10	105	33LA7	28-1	27-11	9-7	212	38LA10	33-1	32-7	12-5	330
25LA6	21-6	21-4	7-9	134	33LA9	28-9	28-7	10-3	234	39LA9	33-2	33-0	11-1	289
26LA6	22-3	22-1	7-11	140	34LA7	28-10	28-8	9-8	221	39LA11	34-5	34-1	13-3	377
27LA6	23-0	22-9	8-0	147	36LA7	30-3	30-1	9-11	238	41LA9	34-7	34-6	11-4	308
28LA6	23-9	23-6	8-2	154	36LA9	30-11	30-9	10-8	261	41LA14	37-11	37-7	15-8	477
29LA6	24-6	24-3	8-4	161	36LA10	31-7	31-2	12-1	309	42LA9	35-4	35-2	11-5	318
30LA6	25-2	25-0	8-5	169	37LA7	31-0	30-10	10-1	246	42LA14	38-8	38-4	15-9	490
31LA6	25-11	25-9	8-7	176	37LA10	32-4	31-11	12-3	320					

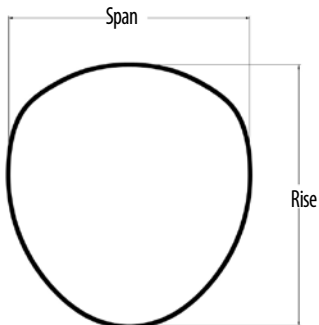
HIGH PROFILE ARCH



Note: Structure No. 42 HA11-13 = 42N top, 11N upper sides, 13N lower sides, Total N = 90
Dimensions are to the inside crests.
Other sizes are available upon request.
Dimensions shown are nominal sizes, final dimensions may vary.

AIL No.	Size (ft-in)			End Area (ft ²)	AIL No.	Size (ft-in)			End Area (ft ²)	AIL No.	Size (ft-in)			End Area (ft ²)
	Max Span	Bot. Span	Total Rise			Max Span	Bot. Span	Total Rise			Max Span	Bot. Span	Total Rise	
21HA5-4	20-1	19-6	9-1	152	30HA7-8	26-6	24-0	15-3	348	38HA6-10	31-9	28-8	17-3	470
23HA6-6	20-8	18-10	12-1	214	31HA5-7	25-11	24-1	13-3	295	38HA8-12	33-1	28-9	20-1	571
25HA5-6	21-6	19-10	11-8	215	31HA7-8	27-3	24-10	15-5	360	39HA6-10	32-6	29-6	17-4	484
25HA7-8	22-10	19-10	14-7	285	33HA5-7	27-5	25-8	13-7	317	39HA8-12	33-10	29-7	20-3	588
26HA5-6	22-3	20-7	11-10	225	33HA8-8	29-5	27-1	16-5	412	41HA6-10	34-0	31-2	17-8	514
26HA6-8	22-11	20-0	14-0	27	34HA5-8	28-2	25-11	14-5	349	41HA7-12	34-7	30-7	19-10	591
27HA5-6	23-0	21-5	12-0	235	34HA8-10	30-1	26-9	18-1	467	41HA8-13	35-3	30-7	21-3	645
27HA7-8	24-4	21-6	14-10	310	36HA6-8	30-3	28-2	15-5	399	41HA11-13	37-3	32-6	23-5	747
28HA5-6	23-9	22-2	12-1	245	36HA8-10	31-7	28-4	18-4	497	42HA6-10	34-8	31-11	17-10	529
29HA5-8	24-6	21-11	13-9	289	37HA6-8	31-0	29-0	15-7	413	42HA7-12	35-4	31-5	20-0	608
29HA7-8	25-9	23-2	15-2	335	37HA7-10	31-8	28-6	17-9	484	42HA8-13	36-0	31-5	21-5	663
30HA5-7	25-2	23-3	13-2	283	37HA8-12	32-4	27-11	19-11	554	42HA11-13	38-0	33-5	23-6	767

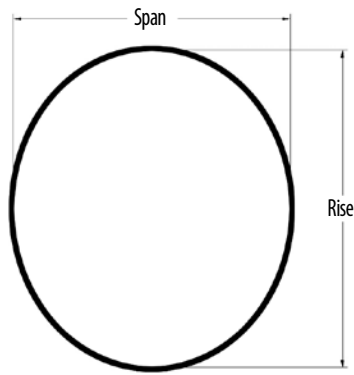
PEAR SHAPED UNDERPASS



Note: Structure No. 34 PS 7-24-26 = 34N top, 7N top corners x 2, 24 N sides x 2, 26N bottom, Total N = 122
Dimensions are to the inside crests.
Other sizes are available upon request.
Dimensions shown are nominal sizes, final dimensions may vary.

AIL No.	Size (ft-in)			End Area (ft ²)	AIL No.	Size (ft-in)			End Area (ft ²)
	Max Span	Bot. Span	Total Rise			Max Span	Bot. Span	Total Rise	
25 PS 5-24-15	23-8	25-8	14-11	481	28 PS 5-30-12	26-8	28-3	18-0	593
22 PS 7-22-20	24-0	25-10	15-1	496	27 PS 8-22-25	28-1	27-10	16-10	624
27 PS 7-20-21	25-6	25-11	15-10	521	32 PS 7-24-24	28-7	30-7	19-7	689
27 PS 5-25-18	24-10	27-8	16-9	544	32 PS 8-23-25	30-0	29-8	20-0	699
30 PS 6-26-16	27-5	27-0	18-1	578	34 PS 7-24-26	30-0	31-2	19-11	736

VERTICAL ELIPSE



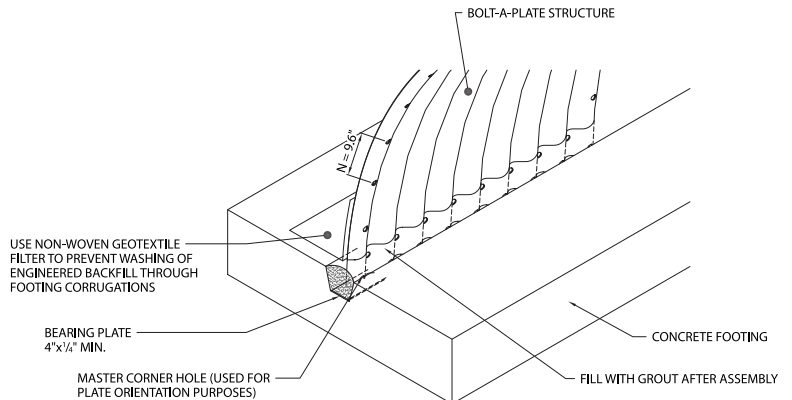
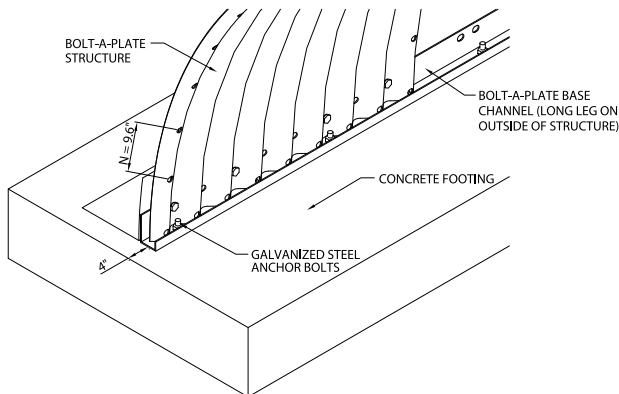
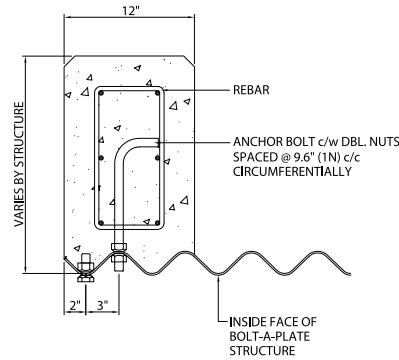
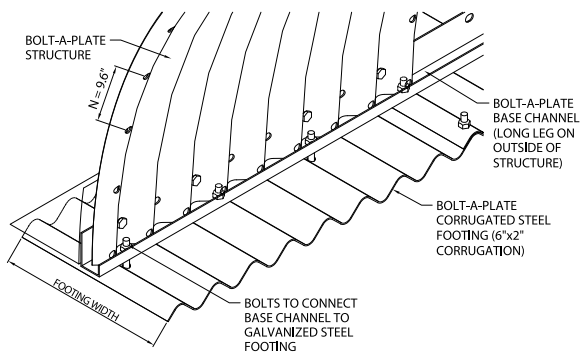
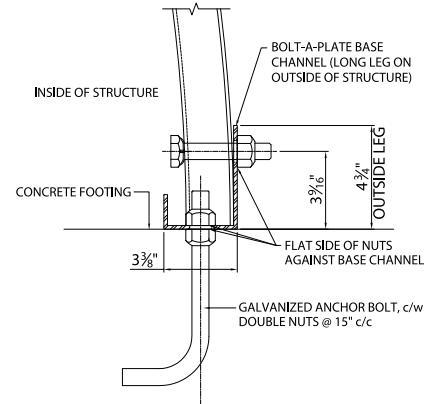
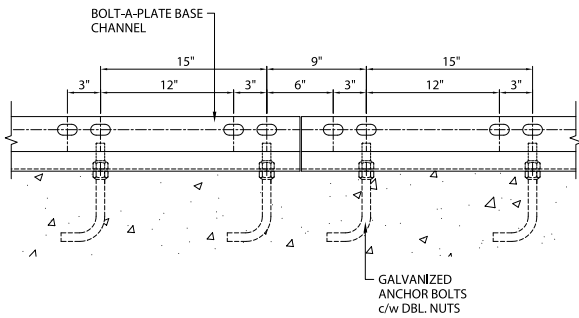
AIL No.	Size (ft-in)			End Area (ft ²)
	Max Span	Bot. Span	Total Rise	
10-VE-6	8-0	7-7	8-4	50
11-VE-6	8-6	8-1	8-11	55
9-VE-9	9-0	8-7	9-6	62
10-VE-9	9-6	9-1	10-0	70
14-VE-6	10-0	9-7	10-7	77
15-VE-6	10-6	10-0	11-1	85
16-VE-6	11-0	10-6	11-7	94
17-VE-6	11-6	11-0	12-1	102
18-VE-6	12-0	11-6	12-7	112
16-VE-9	12-6	11-1	13-1	124

AIL No.	Size (ft-in)			End Area (ft ²)
	Max Span	Bot. Span	Total Rise	
17-VE-9	13-0	12-4	13-7	134
18-VE-9	13-6	12-10	14-1	144
19-VE-9	14-0	13-3	14-7	155
20-VE-9	14-6	13-9	15-3	167
12-VE-18	15-0	14-3	15-9	178
13-VE-18	15-6	14-9	16-3	191
14-VE-18	16-0	15-1	16-9	203
15-VE-18	16-6	15-9	17-5	216
14-VE-20	17-0	16-3	18-0	230
15-VE-20	17-6	16-9	18-6	244

AIL No.	Size (ft-in)			End Area (ft ²)
	Max Span	Bot. Span	Total Rise	
18-VE-18	18-0	17-3	19-0	258
19-VE-18	18-6	17-8	19-6	272
18-VE-20	19-0	18-0	20-0	287
19-VE-20	19-6	18-8	20-6	302
19-VE-21	20-0	19-0	21-2	318
20-VE-21	20-6	19-8	21-9	336
21-VE-21	21-0	20-0	22-3	352
22-VE-21	21-6	20-6	22-9	370

Note: Structure No. 10-VE-6 = 10N top & bot, 6N side x 2,
 Dimensions are to the inside crests.
 Other sizes are available upon request.
 Dimensions shown are nominal sizes, final dimensions may vary.

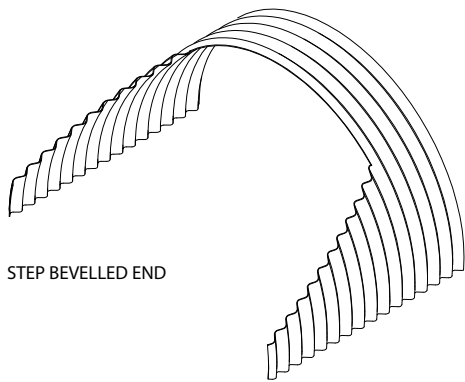
FOUNDATION OPTIONS AND DETAILS



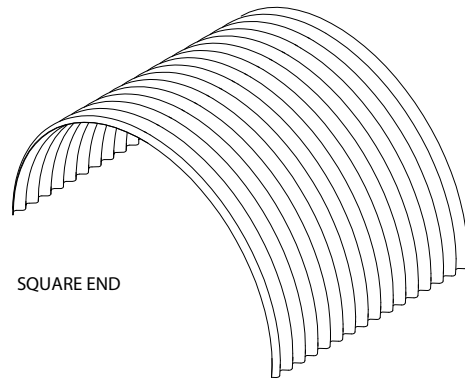


END TREATMENT OPTIONS

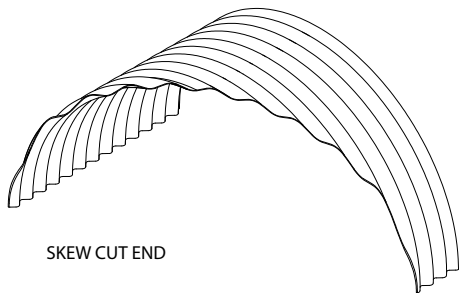
The purpose of the structure end treatment is to enhance aesthetic appeal, improve hydraulic efficiency, prevent scour and increase flow capacity. Depending on the structural capacity and hydraulic efficiencies required, Bolt-A-Plate structures can be supplied with square, bevelled or skewed ends.



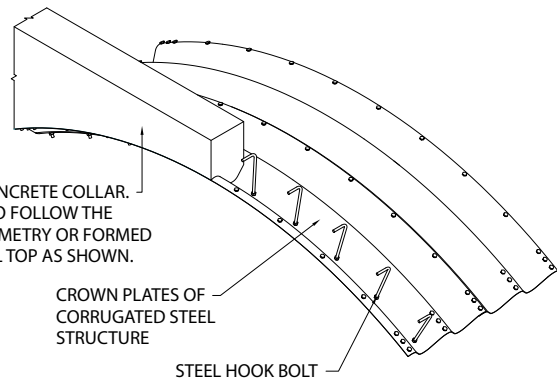
STEP BEVELLED END



SQUARE END



SKEW CUT END



CAST IN PLACE CONCRETE COLLAR.
MAY BE CURVED TO FOLLOW THE
STRUCTURE'S GEOMETRY OR FORMED
WITH A FLAT LEVEL TOP AS SHOWN.

CROWN PLATES OF
CORRUGATED STEEL
STRUCTURE

STEEL HOOK BOLT

Bolt-A-Plate® Design and Installation

Bolt-A-Plate® structures are rapidly becoming the product of choice for high strength, economical, bridge and underpass construction. Our engineers are on call to provide complete project assistance and product support from start to finish.

STRUCTURAL DESIGN

If designed properly, the combination of structural steel and surrounding soil allows Bolt-A-Plate® to support extremely heavy loads. Standard designs are developed in accordance with AASHTO, ASTM or The Handbook of Steel Drainage and Highway Construction Products. However, design assistance and recommendations can be specified to your project. Contact your local Big R sales representative.

SITE INVESTIGATION AND PREPARATION

A thorough site investigation should be conducted before installing a Bolt-A-Plate® structure. If footings are to be used, the foundation will have to be capable of supporting vertical and horizontal loads developed by the structure. The aim is to design a structurally sound foundation that will allow the structure to develop full interaction between soil and steel culvert.

Site preparation should provide a solid base for the structure. It should be good quality material, free from rocks, roots, debris, and organic material. Scouring must be considered when designing a Bolt-A-Plate® structure. Big R gladly offers technical assistance on foundation investigation and site preparation for varying site conditions.

ASSEMBLY

Big R Bolt-A-Plate® structures arrive at the site ready for assembly and, in special situations, structures may be fully assembled. Every Bolt-A-Plate® structure comes complete with a detailed plan and installation instructions. Experienced supervision, when required, will ensure correct, efficient assembly. Upon request, Big R can provide on-site supervision for installation of any structure it supplies.



PRODUCTS AND SERVICES

- Super-Cor® Plate Bridges
- Bolt-A-Plate® Structural Plate
- Precast Panel Retaining Walls
- Welded Wire Retaining Walls
- Dur-A-Span™ Aluminum Structural Plate
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- Corrugated Steel Pipe
- Corrugated Steel Pipe Arch
- Modular Vehicular Bridges
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