

Dur·A·Span™

Aluminum Structural Plate



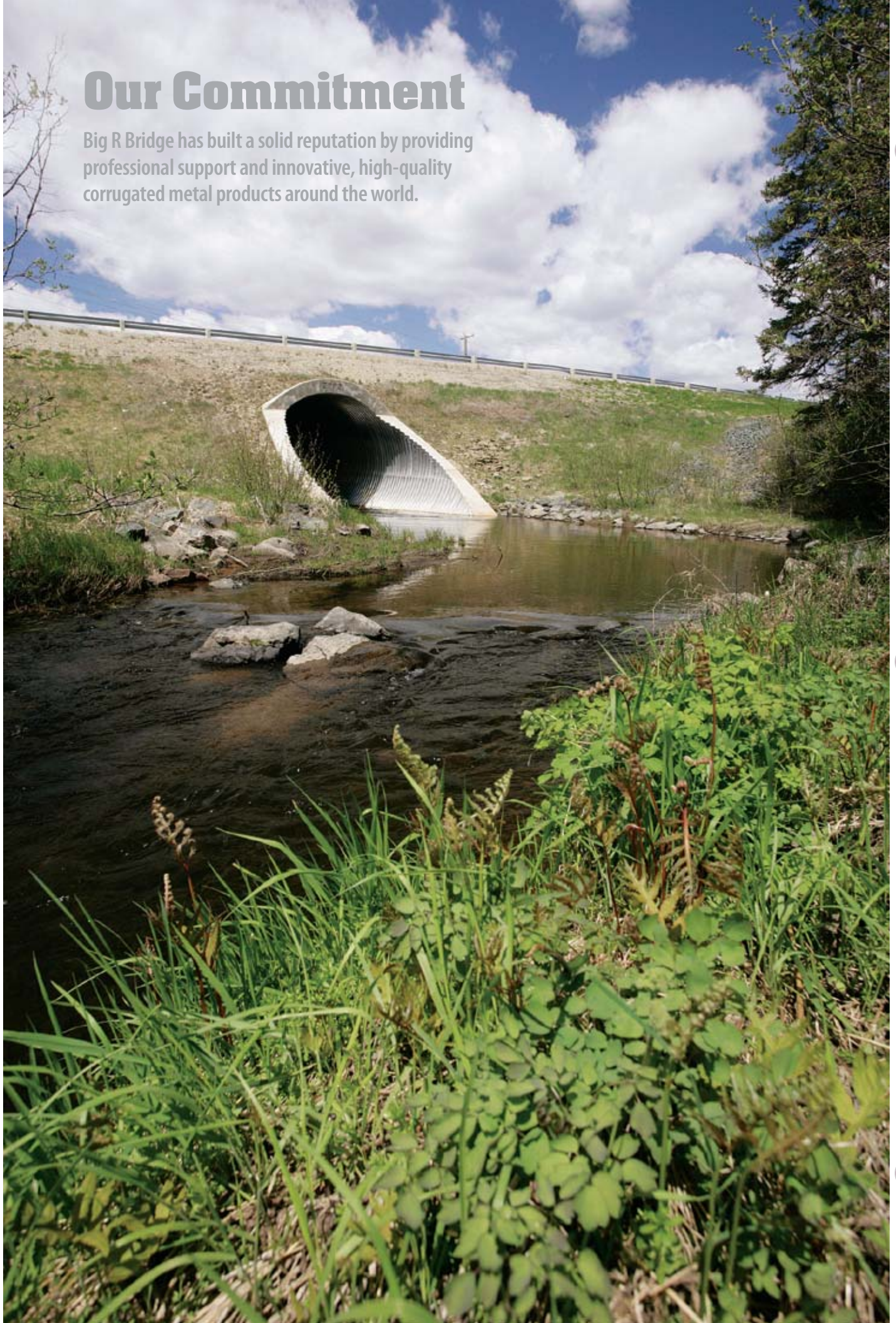
bigrbridge.com



BIG R
BRIDGE

Our Commitment

Big R Bridge has built a solid reputation by providing professional support and innovative, high-quality corrugated metal products around the world.



Dur·A·Span™

Lightweight, strong and corrosion/abrasion resistant, Big R's Dur-A-Span Aluminum Structural Plate has been going the distance in over 1,000 structures worldwide for many years – beating the usual heavyweight contenders, like precast concrete, on overall performance and cost. And now, thanks to our innovative reinforcing rib technology, Dur-A-Span can go even farther (and wider) to outperform all challengers. The proven strength, economy and longevity of Dur-A-Span is ideal for coastal or remote installations.

Corrosion/Abrasion Resistant

Aluminum is well-known for its longer design service life. Proven over many years of wet/dry corrosion/abrasion cycles, its tough, self-healing, oxide surface film reforms immediately if mechanically damaged or corroded in an aggressive environment like salt water.

Lightweight

Dur·A·Span is only 1/50 the weight of reinforced concrete pipe, so it ships for less and installs faster – especially in remote areas. Individual plates and ribs can usually be handled by one worker and bundles can be moved by light-duty lifts.

Easy to Install

Many lightweight Dur·A·Span structures can be shipped assembled to provide obvious installation savings in time and money. If delivered unassembled, the nested components can be made in large sections with up to three different radii in the same plate, reducing the number of joints and assembly time.

Strong

Dur·A·Span is made from the strongest non-heat treatable alloy in common use – alloy 5052. Additional hardware made from alloys 6061 and 6063 also have a proven history of excellent corrosion resistance even in salt-water environments. Their principle magnesium and chromium alloying elements offer high ultimate and yield strengths to create structures that meet AASHTO design requirements.

Dur·A·Span is ideal for coastal or remote areas in:

- Stream and river crossings
- Culverts and storm drains
- Conveyor or utility line covers
- Road salt or other storage structures



Dur·A·Span Box shown with our three types of reinforcement ribs.



All in a day's work and no heavy lifting!

Many Dur-A-Span™ structures can be shipped assembled and be set in position the same day with a medium duty crane or an excavator. In this case, the headwalls were attached on arrival and, at the end of the day, everything was in position and engineered backfilling had begun.



Light, Strong and Durable by Design.

Ever notice how it's only this type of shell that survives the pounding surf? Like the shell, Dur-A-Span™ structures are designed to withstand the harshest corrosive and abrasive coastal environments to outlast all others.



Dur-A-Span versus Concrete

Weight	1/50 the weight of concrete pipe
Installation	Faster, easier to install than concrete, less labor and trucking costs
Site Impact	Minimal with aluminum, lighter (lower cost) equipment, less excavating
Maintenance	Very low, easy to inspect, continuous footings eliminate settling
Durability	Corrosion/abrasion resistant, mechanical joints and aluminum hardware eliminate separation issues
Versatility	Many size, shape, footing, headwall and wingwall choices
Overall Cost	Installed life cycle cost is substantially lower than concrete
Fish-Friendly Flow	Expansive opening, hydraulic profile design, open bottoms, prevent debris build up and facilitate fish movement.



Dur-A-Span



Traditional RCB

Design

Dur-A-Span corrugation pattern of 9" by 2 ½" incorporates design theories confirmed by exhaustive field tests. The result is a more efficient and economical structure with a higher section modulus and moment of inertia to increase strength and stiffness. The ¾" steel assembly bolts are hot dip galvanized and specially heat treated to meet ASTM A449 specifications. Aluminum (ASTM F468 Alloy 6061-T6) and stainless steel (ASTM F593 Alloy Group 1, 2 or 3) assembly bolts are also available.

End Treatments

Standard end finishes for Dur-A-Span include square ends, step bevels, skews, partial bevels, and skew bevels. Integrated headwall and wingwall solutions are also available.

Dur-A-Span structures are virtually maintenance-free with a design service life of over 75 years.

Box Culverts

Dur-A-Span™ corrugated aluminum structural plate box culverts combine the structural qualities of rigid box culverts with flexible metal culverts and result in a totally engineered installation. Usually supplied with an open invert, box culverts are an environmentally friendly solution to your construction needs, promoting fish passage throughout the construction period and beyond. Box culverts are used primarily when height is limited and can be used with cover heights as low as 18". A variety of footing options are available.

Full Corrugated Inverts*

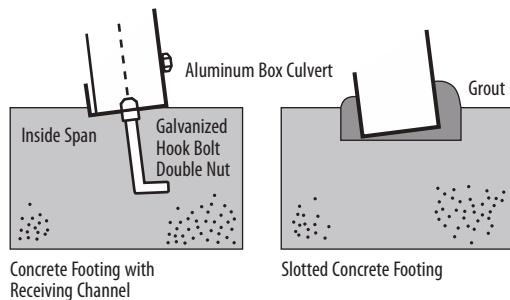
Full aluminum inverts should be used where scour is a potential problem. They are supplied with flat sheet toe walls.

Footing Pads*

Short footing pads are generally the most economical solution for sites where the stream bed is non-erodible. If the stream bed permits, footing pads should be buried a minimum of 18".

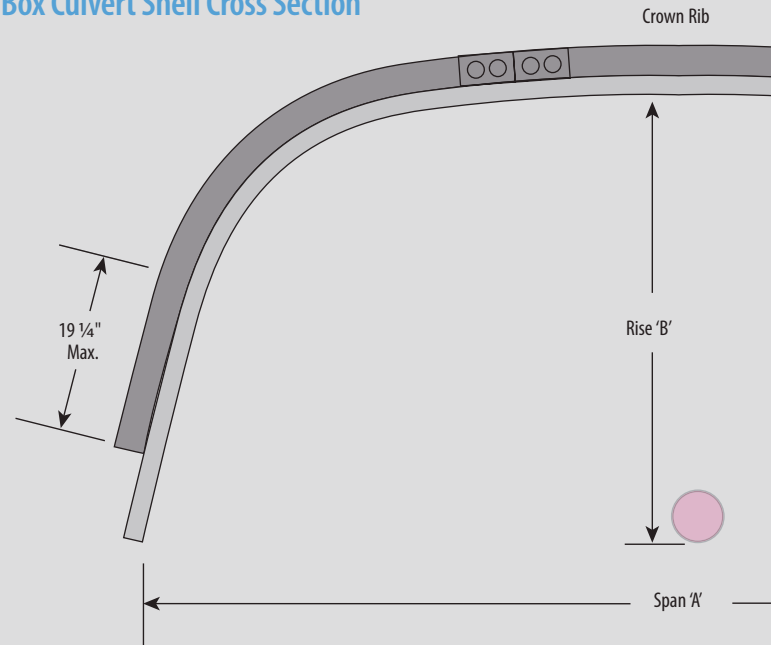
Concrete Footings

When concrete footings or concrete inverts are required, Dur-A-Span may be placed in a receiving channel or in a pre-formed slot. Big R can also supply precast concrete footings for faster installation.



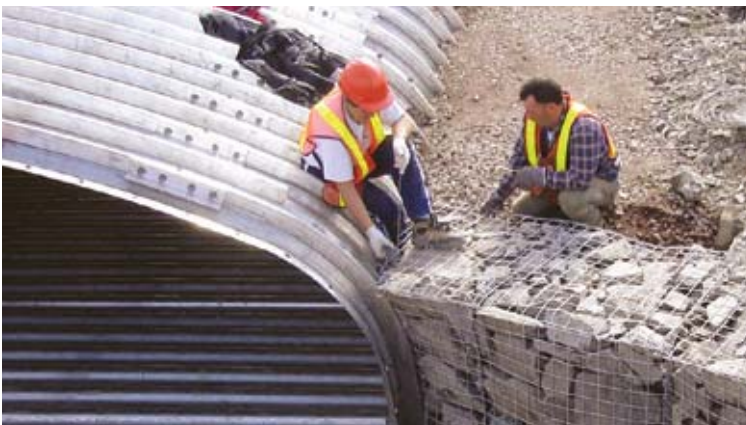
*A minimum soil bearing capacity of 4000 psf is required.

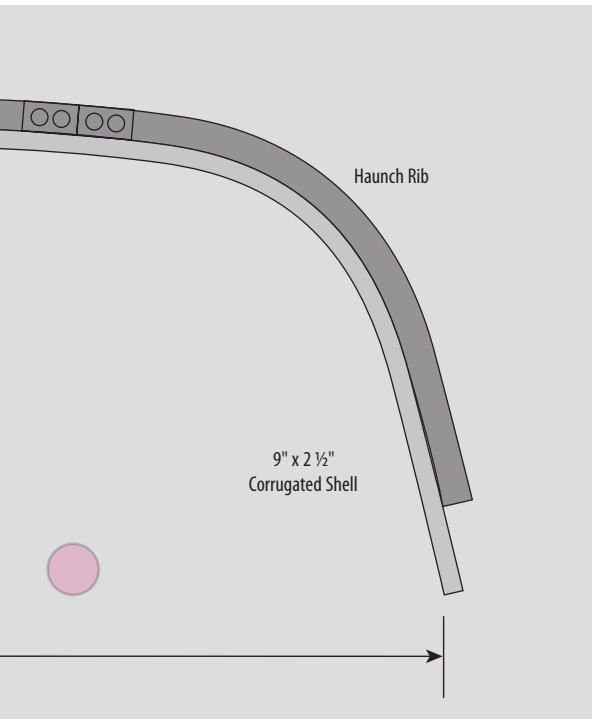
Box Culvert Shell Cross Section



Headwall Packages

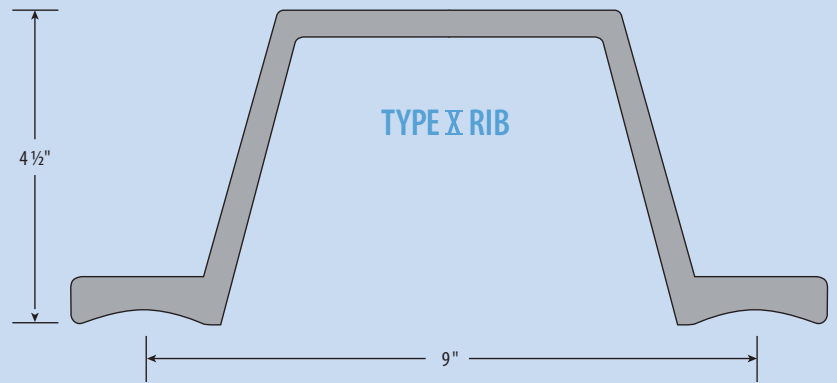
The standard headwall package features a headwall and usually two wingwalls. The headwall package results in a finished-looking structure, helps prevent scouring, and assists in channeling water flow. Other attractive headwall options include cast-in-place concrete, precast concrete, mechanically-stabilized earth walls with concrete fascia, gabion baskets or blocks.





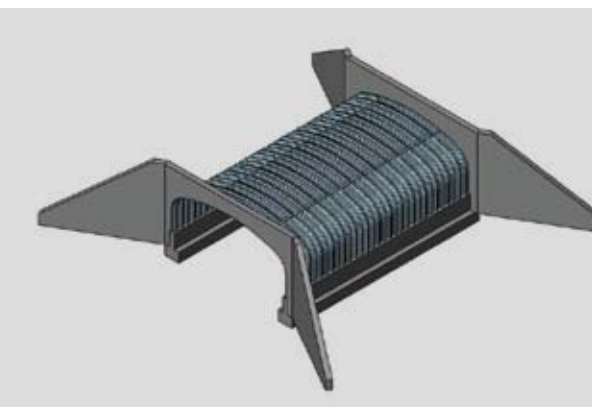
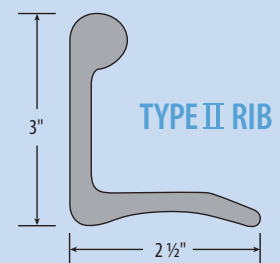
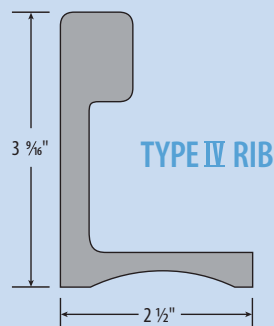
Our new Type X Hat-Shaped Rib allows larger spans.

Our latest rib technology innovation is now taking Dur-A-Span™ to even greater spans and rises than ever before. Our Type X Hat-Shaped Rib's patented, symmetrical profile resists out-of-plane bending and makes it significantly stronger than all other available profiles in both the axial and lateral directions. It easily configures to any haunch radius and can be grout filled for even greater composite strength.



Our Type II and Type IV ribs are ideal for smaller spans.

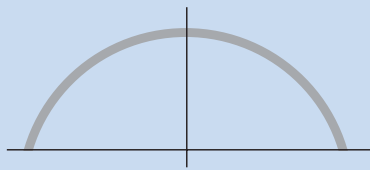
Maximum span width is 25'5\"/>



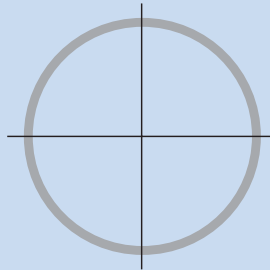
Other Shapes

We create Dur-A-Span™ structures in a wide variety of shapes and configurations to suit many different project needs. If you don't see what you are looking for here, talk to a Big R Technical Representative about our custom sizes and shapes.

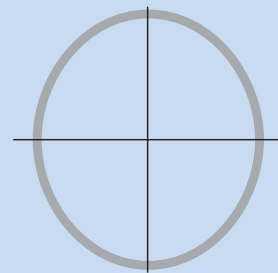
Arch



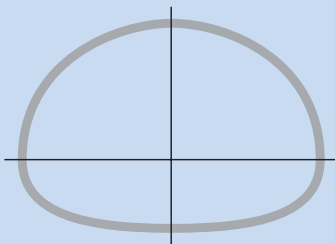
Round



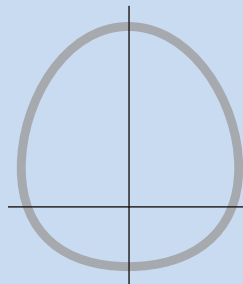
Vertical Ellipse



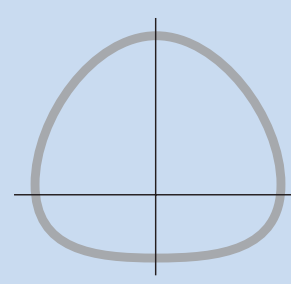
Pipe Arch

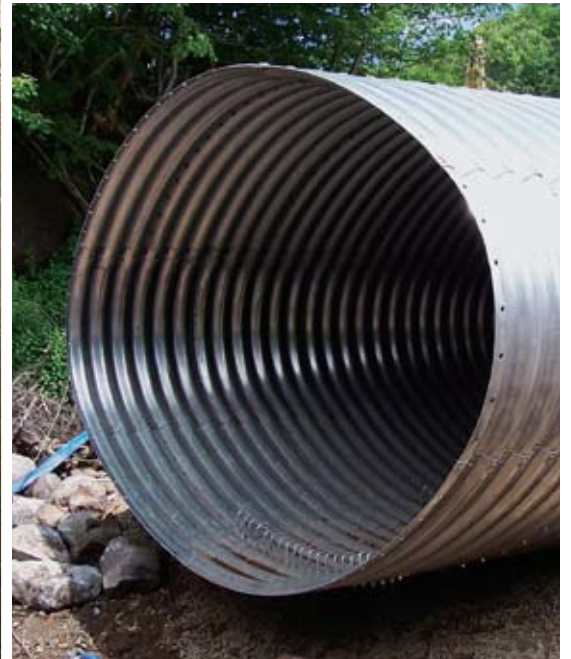
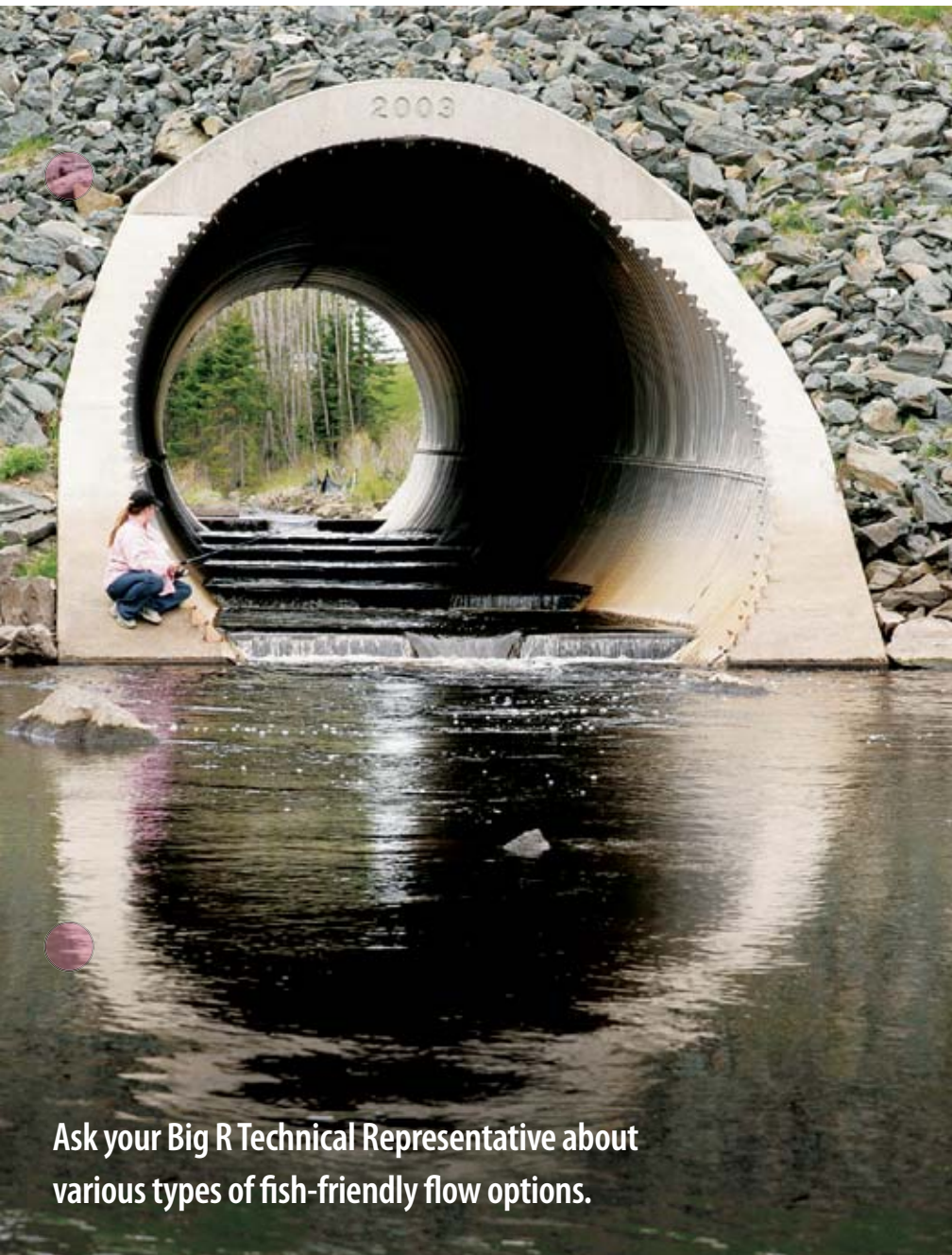


Underpass
(Pedestrian/Animal)



Underpass
(Vehicular)

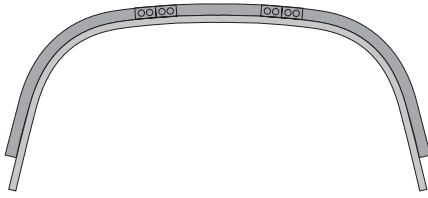




Ask your Big R Technical Representative about various types of fish-friendly flow options.



Box Culverts

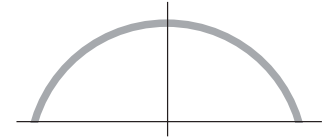


Struct. No.	Span 'A' (ft-in)	Rise 'B' (ft-in)	Approx. Area (ft ²)
DS-1B	8-9	2-6	18.4
DS-2B	9-2	3-3	25.4
DS-3B	9-7	4-1	32.6
DS-4B	10-0	4-10	40.2
DS-5B	10-6	5-7	48.1
DS-6B	10-11	6-4	56.4
DS-7B	11-4	7-2	65.0
DS-8B	10-2	2-8	23.0
DS-9B	10-7	3-5	31.1
DS-10B	10-11	4-3	39.5
DS-11B	11-4	5-0	48.2
DS-12B	11-8	5-9	57.2
DS-13B	12-1	6-7	66.4
DS-14B	12-5	7-4	76.0
DS-15B	11-7	2-10	28.1
DS-16B	11-11	3-7	37.4
DS-17B	12-3	4-5	46.9
DS-18B	12-7	5-2	56.6
DS-19B	12-11	6-0	66.6
DS-20B	13-3	6-9	76.9
DS-21B	13-0	3-0	33.8
DS-22B	13-4	3-10	44.2
DS-23B	13-7	4-7	54.8
DS-24B	13-10	5-5	65.6
DS-25B	14-1	6-2	76.6
DS-26B	14-5	3-3	40.0
DS-27B	14-8	4-1	51.5
DS-28B	14-10	4-10	63.2
DS-29B	15-1	5-8	75.1
DS-30B	15-4	6-5	87.2
DS-31B	15-6	7-3	99.4
DS-32B	15-9	8-0	111.8
DS-33B	15-10	3-6	46.8
DS-34B	16-0	4-3	59.5
DS-35B	16-2	5-1	72.3
DS-36B	16-4	5-11	85.2
DS-37B	16-6	6-8	98.3
DS-38B	16-8	7-6	111.5
DS-39B	16-10	8-3	124.8
DS-40B	17-9	3-10	54.4
DS-41B	18-2	4-7	68.3
DS-42B	18-7	5-4	82.5
DS-43B	19-0	6-1	97.1
DS-44B	19-5	6-11	111.9

Struct. No.	Span 'A' (ft-in)	Rise 'B' (ft-in)	Approx. Area (ft ²)
DS-45B	19-10	7-8	127.1
DS-46B	20-3	8-5	142.6
DS-47B	19-1	4-2	63.3
DS-48B	19-5	4-11	78.3
DS-49B	19-9	5-8	93.6
DS-50B	20-1	6-6	109.2
DS-51B	20-6	7-3	125.0
DS-52B	20-10	8-1	141.2
DS-53B	21-2	8-10	157.6
DS-54B	20-4	4-6	73.1
DS-55B	20-7	5-3	89.2
DS-56B	20-11	6-1	105.5
DS-57B	21-3	6-10	122.1
DS-58B	21-6	7-8	139.0
DS-59B	21-10	8-5	156.0
DS-60B	22-1	9-3	173.3
DS-61B	21-7	4-11	83.8
DS-62B	21-10	5-8	101.0
DS-63B	22-1	6-6	118.4
DS-64B	22-3	7-3	135.9
DS-65B	22-6	8-1	153.7
DS-66B	22-9	8-10	171.6
DS-67B	23-0	9-8	189.8
DS-68B	22-9	5-4	95.5
DS-69B	23-0	6-1	113.7
DS-70B	23-2	6-11	132.1
DS-71B	23-4	7-8	150.6
DS-72B	23-6	8-6	169.3
DS-73B	23-8	9-3	188.1
DS-74B	23-10	10-1	207.0
DS-75B	24-0	5-9	108.2
DS-76B	24-1	6-6	127.5
DS-77B	24-3	7-4	146.8
DS-78B	24-4	8-2	166.2
DS-79B	24-5	8-11	185.7
DS-80B	24-7	9-9	205.3
DS-81B	24-8	10-6	225.0
DS-82B	25-2	6-2	122.0
DS-83B	25-2	7-0	142.2
DS-84B	25-3	7-9	162.4
DS-85B	25-4	8-7	182.6
DS-86B	25-4	9-5	202.9
DS-87B	25-5	10-2	223.3

Standard Structure Listing

Arch



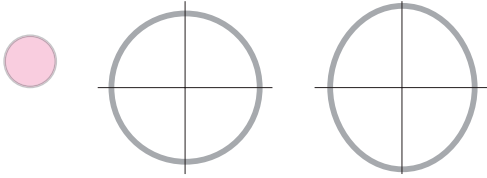
Span (ft-in)	Rise (ft-in)	Approx. Area (ft ²)
5-0	1-9	6.5
	2-3	8.5
6-0	2-7	10.4
	1-10	7.8
7-0	2-4	10.2
	2-9	12.6
	3-2	14.9
8-0	2-4	12.0
	2-10	14.8
	3-3	17.5
9-0	3-8	20.3
	2-11	17.0
	3-4	20.2
10-0	4-2	26.4
	2-11	19.1
	3-10	26.3
11-0	4-8	33.4
	3-6	25.3
	4-5	33.3
12-0	5-2	41.2
	3-6	27.8
	4-6	36.8
13-0	5-8	49.8
	4-1	35.3
	5-0	45.0
14-0	6-3	59.3
	4-1	38.1
	5-1	48.9
15-0	5-11	59.3
	6-9	69.5
	4-8	46.9
16-0	5-7	58.4
	6-5	69.5
	7-3	80.6
17-0	4-8	50.0
	5-8	62.6
	6-7	74.7
18-0	7-5	86.5
	7-9	92.5
	5-3	60.0
19-0	6-2	73.3
	7-1	86.2
	7-11	98.9
20-0	8-3	105.2
	5-3	63.5
	6-3	77.9
21-0	7-2	91.7
	8-0	105.2
	8-10	118.7
22-0	5-9	74.8
	6-9	89.9
	7-8	104.5
23-0	8-6	118.8
	8-11	125.9
	6-4	86.9
24-0	7-4	102.7
	8-2	118.0
	9-0	133.2
25-0	9-5	140.7

Standard Structure Listing

Spans in excess of 40 ft are available.

Depending upon your application, Box Culvert or Arch spans may be designed in excess of 40 ft. Please consult with a Big R Technical Representative for further information.

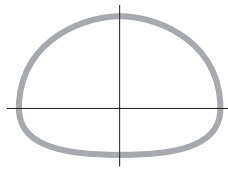
Round and Vertical Ellipse



Round Dia. (in)	Ellipse Dimensions		Approx. Area (ft ²)
	Span (in)	Rise (in)	
60	56	62	19
66	62	68	23
72	67	75	27
78	73	81	32
84	79	88	38
90	85	94	44
96	91	101	50
102	97	107	56
108	103	114	63
114	109	120	71
120	115	127	79
126	120	133	87
132	126	139	95
138	132	146	104
144	138	152	114
150	142	157	124
156	148	164	134
162	153	170	145
168	159	176	156
174	165	183	167
180	171	189	179
186	177	195	191
192	182	202	204
198	189	209	217
204	195	215	231
210	200	222	245
216	206	228	259
222	212	235	274
228	217	241	289
234	224	247	305

Standard Structure Listing

Pipe Arch



Span (ft-in)	Rise (ft-in)	Approx. Area (ft ²)
6-7	5-8	29.6
6-11	5-9	31.9
7-3	5-11	34.3
7-9	6-0	36.8
8-1	6-1	39.3
8-5	6-3	41.9
8-10	6-4	44.5
9-3	6-5	47.1
9-7	6-6	49.9
9-11	6-8	52.7
10-3	6-9	55.5
10-9	6-10	58.4
11-1	7-0	61.4
11-5	7-1	64.4
11-9	7-2	67.5
12-3	7-3	70.5
12-7	7-5	73.7
12-11	7-6	77.0
13-1	8-2	83.0
13-1	8-4	86.8
13-11	8-5	90.3
14-0	8-7	94.2
13-11	9-5	101.5
14-3	9-7	105.7
14-8	9-8	109.9
14-11	9-10	114.2
15-4	10-0	118.6
15-7	10-2	123.1
16-1	10-4	127.6
16-4	10-6	132.3

Standard Structure Listing



Relines – infrastructure renewal made easy.

Big R's reline packages can help salvage failing structures and avoid the time, cost, safety and environmental issues inherent in full replacement. Various shapes of Dur-A-Span™ structures can be made for insertion into the existing openings with minimal environmental impact. Grout is placed in the annulus between the structures and new headwall and wingwall packages are available in a variety of finishes. Ask your Big R Technical Representative for more details.

Notes:

Typical cover ranges from 18" to 5'. The maximum cover for aluminum box culverts with full inverts and footing pads should not exceed 4'.

$N = 9 \frac{5}{8}$ "

Dimensions are to inside corrugation crests and are subject to manufacturing tolerances.

Other sizes and custom shapes are available upon request.

Standard Specifications:

AASHTO M219M

(corrugated aluminum structural plate)

ASTM B746/B746M

(corrugated aluminum structural plate)

ASTM B209/B209M

(specification of Imperial and Metric plate)

ASTM B789/B789M

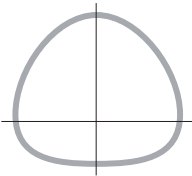
(installation of structural plate)

ASTM B790/B790M

(design of aluminum pipe and structural plate)

AASHTO Standard Specifications for Highway Bridges (design)

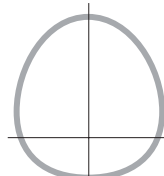
Underpass (Vehicular)



Span (ft-in)	Rise (ft-in)	Approx. Area (ft ²)
12-1	11-0	106
12-10	11-2	114
13-0	12-0	124
13-8	12-4	133
14-0	12-11	143
14-6	13-5	155
14-8	14-1	165
15-5	14-5	177
15-6	15-2	190
16-2	15-6	200
16-6	16-0	208
16-8	16-4	215

Standard Structure Listing

Underpass (Pedestrian/Animal)



Span (ft-in)	Rise (ft-in)	Approx. Area (ft ²)
6-1	5-9	28
6-3	6-1	30
6-3	6-5	32
6-2	6-11	34
6-4	7-3	37
6-3	7-9	39
6-5	8-1	42

Standard Structure Listing

PRODUCTS AND SERVICES

- Corrugated Steel Pipe
- Corrugated Steel Pipe Arch
- Super-Cor® Plate Bridges
- Bolt-A-Plate™ Structural Plate
- Precast Panel Retaining Walls
- Welded Wire Retaining Walls
- Dur-A-Span® Aluminum Structural Plate
- Bolt-A-Bin™ Bin Type Retaining Wall
- Modular Vehicular Bridges
- Pedestrian Bridges
- Sandia Bridges™
- Detour Bridges
- Skyway Bridges
- Bridge Abutments
- Bridge Deck
- Sheet Piling
- Cattleguards
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