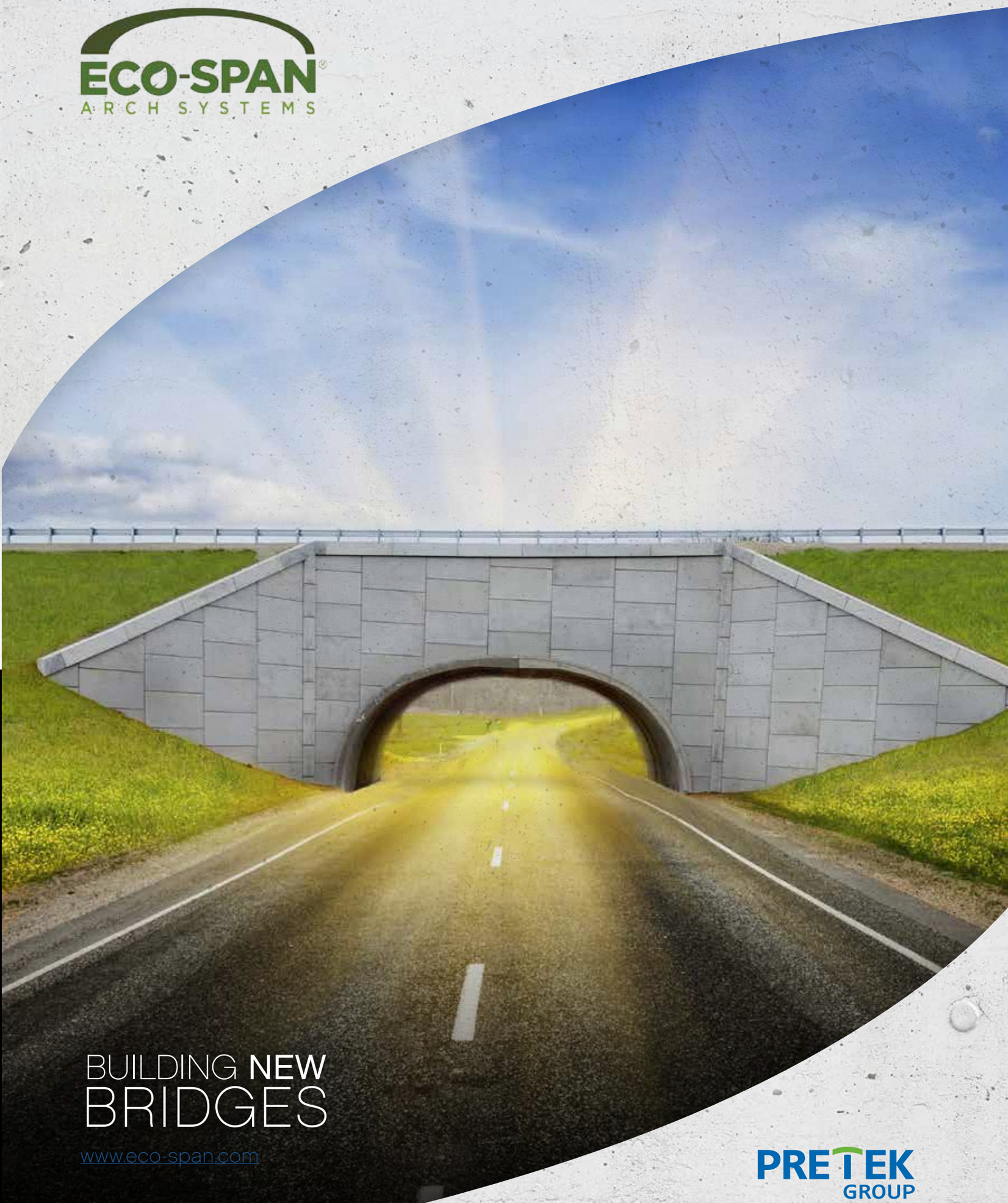
ECO-SPAN®
ARCH SYSTEMS



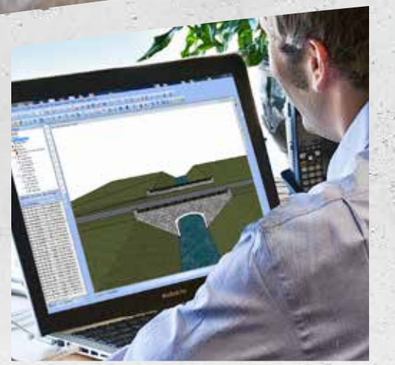
BUILDING **NEW** BRIDGES

www.eco-span.com

PRETEK GROUP

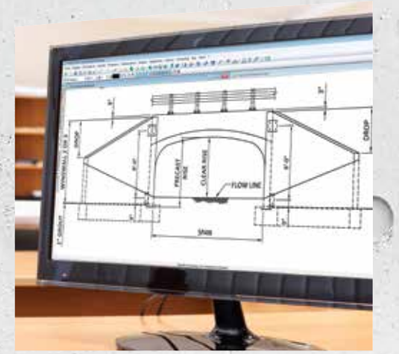
THE PROCESS

Accelerate your small bridge project with a long-lasting, economical, custom-designed modular arch system.



1. Project Assessment

PreTek's application designers provide alternatives and technical support to ensure that all goals are met in the most economical way.



2. Design

The structure is designed for appropriate code, loading and geometry requirements as defined by the owner and engineer of record. Drawings and calculations are sealed by a professional engineer.

3. Casting

The precast arch system is plant-produced per ASTM C1504 at facilities approved by the National Precast Concrete Association (NPCA) and/or the American Concrete Pipe Association (ACPA).

4. Foundations/Site Work

While precast components are manufactured off-site, the contractor performs the site work, reducing overall construction time.

5. Transportation/Installation

Precast components arrive on flatbed trailers, ready for installation. The modular system, including precast concrete headwalls and wingwalls, is set in place, often in a matter of hours.

6. Finished Structure

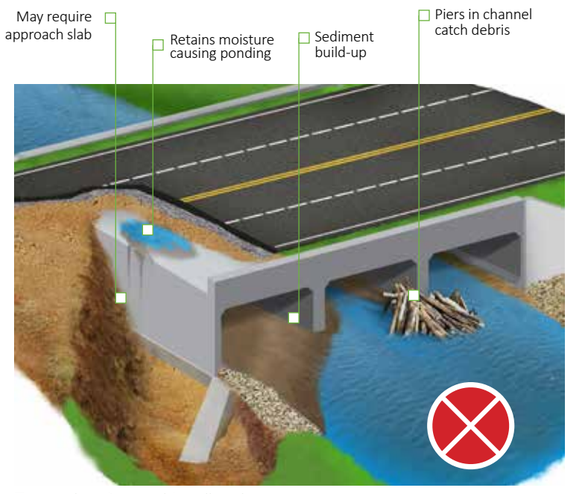
After grouting, joint seal, backfill and paving, the structure is ready for traffic. The new arch bridge is durable, economical and aesthetic.

BURIED ARCHES: part culvert, part bridge—all value!

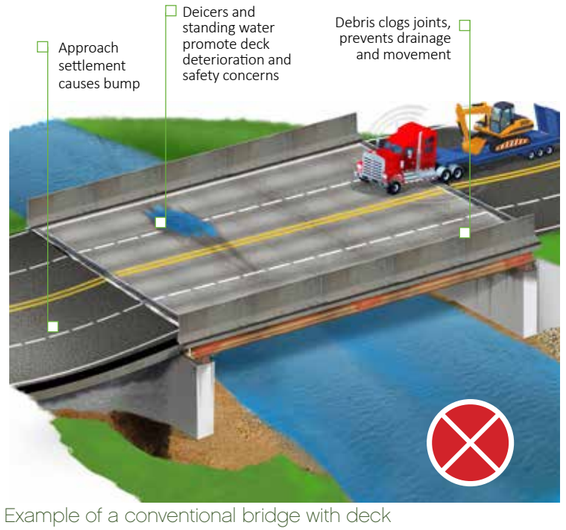
Buried arch bridges are an effective hybrid between culverts and conventional bridges because they combine the strongest features of each structure to offer several unique advantages:

- In smaller streams, arch spans up to 84’ eliminate the need for piers, which often cause sedimentation and debris build-up in the channel. These problems may lead to increased maintenance costs, risk of flooding and scour problems due to higher velocity.
- The open bottom allows a natural stream bed to be maintained, even during construction, which streamlines the permit process.
- Ride quality is improved and there is no need for approach slabs. The arch shape provides a gradual transition on and off the structure.
- Bridge deck maintenance and freezing are eliminated because there is no bridge deck. Pavement may be continuous across the bridge for optimum ride quality.
- Utilities can typically be buried in the fill over the arch.

COMMON BRIDGE & CULVERT DEFICIENCIES



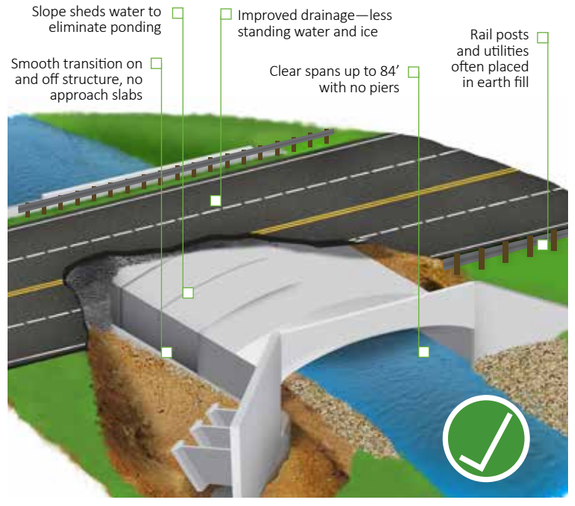
Example of a multi-cell culvert



Example of a conventional bridge with deck

* Long service life plus minimal maintenance equals lower life cycle cost.

ARCH ADVANTAGES



INSTANT DESIGN™

Fast, free, custom estimates and designs

It’s the most advanced online design tool for precast concrete three-sided structures. Receive budget pricing, product application drawings and more.

Features

Basic drawings and details are typically available in 30 minutes or less. Budget pricing provided within one business day after review by one of our design professionals.

Drawings are ideal for inclusion in type/size/location studies, permit applications, proposals and project meetings. More detailed drawings including foundation designs may be developed quickly based on information provided by the user.

START YOUR PROJECT TODAY AT
WWW.ECO-SPAN.COM

Arch-box series

Waterway Area (SF)

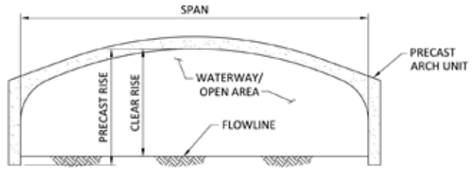
Clear Rise/Nominal Span	12′	14′	16′	20′	24′	28′	32′	36′	42′	48′	54′	60′	72′	84′
1′	7	9	9	9	9	11	12	12	12	14	16	16	28	30
2′	18	22	24	26	26	31	33	33	33	39	44	44	66	71
3′	30	36	39	45	48	57	60	61	61	72	81	81	111	120
4′	42	50	55	65	71	83	89	9	94	110	125	125	163	177
5′	54	64	71	85	95	111	120	126	130	152	173	174	222	240
6′	66	78	87	105	119	138	153	161	168	197	224	228	284	308
7′	78	92	103	125	139	167	184	197	209	244	276	284	350	380
8′	90	106	119	145	167	195	216	232	250	291	329	342	418	457
9′	102	120	135	165	191	223	248	268	292	340	383	401	488	536
10′	114	134	151	185	215	251	280	304	333	387	437	461	559	617
11′	126	148	167	205	239	279	315	340	375	435	491	521	630	699
12′	138	162	183	225	263	307	344	376	417	483	545	581	702	782
13′	150	176	199	245	287	335	376	412	460	531	599	641	774	865
14′	162	190	215	265	311	363	408	448	501	579	653	701	846	949
15′	174	204	231	285	335	391	440	484	544	627	707	761	918	1033

Indicates twin-leaf installation

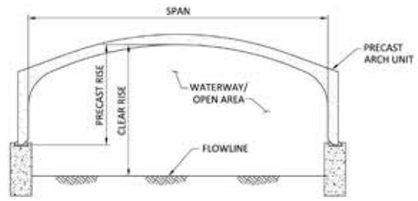
Indicates precast rise availability

Nominal Bridge Unit Length:

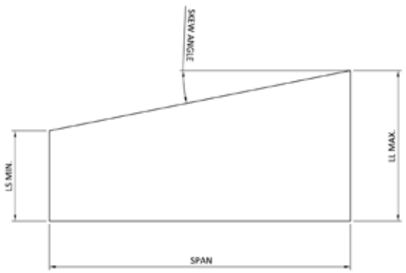
12′-24′ Spans: 8′-0″
28′-42′ Spans: 6′-0″
48′-80′ Spans: 4′-0″



TYPICAL SECTION



TYPICAL SECTION
WITH STEM WALL



SKEWED UNIT PLAN

Maximum Skew

Span	LL Max.	Max. Skew	Ls Min.
12'	7.75'	23.3°	2'
14	7.75'	20.6°	2'
16'	7.75'	18.0°	2'
20'	7.75'	14.9°	2'
24'	7.75'	12.6°	2'
28'	5.75'	7.1°	2'
32'	5.75'	6.3°	2'
36'	5.75'	5.6°	2'
42'	5.75'	4.8°	2'
48'	3.75'	1.4°	2.5'

SKEWED BRIDGE UNIT LIMITS

Design Specifications:

AASHTO LFD & LRFD, AREMA

Manufacturing Specifications:

ASTM C1504

Manufacturing Certifications:

NPCA / ACPA

Design Loads:

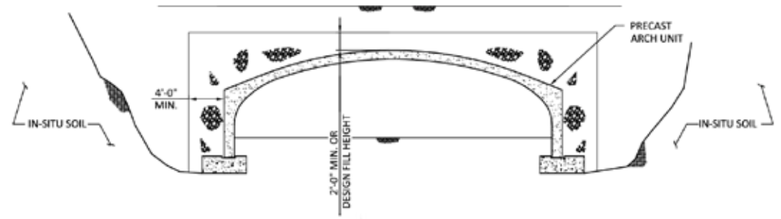
HL-93, Cooper E-80, Aircraft, Construction Equipment, High Fill

Backfill Description

Group classification	A-1a	A-1b	A-2-4	A-2-5	A3
Typical USCS Materials	GW, GP, SP	GM, SW, SP, 5M	GM, SM, ML, SP, GP	SC, GC, GM	SP, SM, SW
Percent passing #10	50 MAX.				
Percent passing #40	30 MAX.	50 MAX.			51 MIN.
Percent passing #200	15 MAX.	25 MAX.	35 MAX.	35 MAX.	10 MAX.
Characteristics of fraction passing #40 liquid limit			40 MAX.	41 MIN.	
Characteristics of fraction passing #40 plasticity index	6 MAX.	5 MAX.	10 MAX.	10 MAX.	
Description of material	Mostly gravel with some sands and fines	Gravelly sand or graded sand	Silty or clayey gravel and sand	Silty or clayey gravel and sand	Fine sand

Acceptable Backfill Material

Span	Fill Height	Material in Zone A
≤ 24′– 0″	< 12′– 0″	A1, A2, A3,
≤ 24′– 0″	≥ 12′– 0″	A1, A3
> 24′– 0″	ALL	A1, A3



VERSA™ SERIES

Multiple-Radius

Nominal Bridge Unit Length:
VM17-VM31: 8’-0”
VM33-VM48: 6’-0”
VM55-VM66: 4’-0”
VM72T-VM84T: 6’-0”

VM17 — WATERWAY

SPAN	RISE	AREA (SF)
13'	4'-0 7/8"	37
14'	4'-11 5/8"	49
15'	6'-1 1/8"	66
16'	7'-8 3/8"	91
17'	12'-4 1/8"	168

VM24 — WATERWAY

SPAN	RISE	AREA (SF)
15'	3'-3 1/2"	36
16'	3'-11 1/2"	46
17'	4'-8 1/8"	58
18'	5'-5 1/2"	72
19'	6'-3 5/8"	87
20'	7'-2 7/8"	106
21'	8'-3 1/4"	127
22'	9'-5 1/2"	152
23'	10'-10 1/4"	184
24'	12'-7 1/4"	225

VM26 — WATERWAY

SPAN	RISE	AREA (SF)
17'	3'-3 1/2"	42
18'	3'-11 1/2"	54
19'	4'-8 1/8"	67
20'	5'-5 1/2"	83
21'	6'-3 5/8"	100
22'	7'-2 7/8"	120
23'	8'-3 1/4"	143
24'	9'-5 1/2"	171
25'	10'-10 1/4"	205
26'	12'-7 1/4"	250

VM31 — WATERWAY

SPAN	RISE	AREA (SF)
24'	4'-2 1/2"	74
25'	4'-9 1/4"	86
26'	5'-4 3/4"	102
27'	6'-1 1/2"	122
28'	6'-11 3/4"	146
29'	8'-0 3/8"	176
30'	9'-5 1/2"	218
31'	12'-2 5/8"	302

VM33 — WATERWAY

SPAN	RISE	AREA (SF)
27'	5'-1 1/8"	99
28'	5'-8 3/4"	117
29'	6'-5 1/2"	138
30'	7'-3 7/8"	163
31'	8'-4 3/4"	196
32'	9'-10 1/2"	243
33'	13'-0"	344

VM38 — WATERWAY

SPAN	RISE	AREA (SF)
32'	4'-10 5/8"	116
33'	5'-5 5/8"	135
34'	6'-1 1/2"	157
35'	6'-10 5/8"	182
36'	7'-9 5/8"	215
37'	8'-11 3/8"	257
38'	10'-7 3/8"	320

VM41 — WATERWAY

SPAN	RISE	AREA (SF)
34'	4'-11 1/8"	122
35'	5'-5 1/2"	140
36'	6'-0 3/4"	162
37'	6'-9"	187
38'	7'-6 3/4"	217
39'	8'-6 1/2"	255
40'	9'-9 7/8"	305
41'	11'-11 3/8"	392

VM44 — WATERWAY

SPAN	RISE	AREA (SF)
37'	5'-6 3/4"	148
38'	6'-1 1/2"	169
39'	6'-9 1/8"	194
40'	7'-6"	223
41'	8'-4 3/8"	258
42'	9'-5 1/4"	303
43'	10'-11"	366
44'	13'-0"	456

VM48 — WATERWAY

SPAN	RISE	AREA (SF)
42'	6'-7 1/4"	194
43'	7'-2"	219
44'	7'-9 5/8"	247
45'	8'-6 3/8"	279
46'	9'-4 5/8"	318
47'	10'-5 3/8"	368
48'	11'-10 7/8"	437

VM55 — WATERWAY

SPAN	RISE	AREA (SF)
49'	7'-0 1/4"	248
50'	7'-7 1/2"	278
51'	8'-3 7/8"	313
52'	9'-1 5/8"	355
53'	10'-1 3/8"	407
54'	11'-4 7/8"	476
55'	13'-0"	563

VM60 — WATERWAY

SPAN	RISE	AREA (SF)
55'	7'-5 1/2"	303
56'	8'-1 1/2"	339
57'	8'-10 3/4"	383
58'	9'-9 3/4"	436
59'	10'-11 3/4"	504
60'	12'-8 1/2"	607

VM66 — WATERWAY

SPAN	RISE	AREA (SF)
61'	8'-5 3/8"	372
62'	9'-1 1/8"	412
63'	9'-10 1/8"	458
64'	10'-8 3/4"	515
65'	11'-10 1/8"	586
66'	13'-4 7/8"	689

VM72T — WATERWAY

SPAN	RISE	AREA (SF)
67'	13.76	688'
68'	14.77	756'
69'	15.57	811'
70'	16.73	892'
71'	18.26	1000'
72'	21.44	1227'

VM78T — WATERWAY

SPAN	RISE	AREA (SF)
72'	14' - 5 1/2"	775
73'	15' - 3"	832
74'	16' - 1 1/2"	896
75'	17' - 1 1/2"	971
76'	18' - 4 1/4"	1063
77'	19' - 11 1/4"	1185
78'	23' - 2 3/4"	1440

VM84T — WATERWAY

SPAN	RISE	AREA (SF)
78'	16' - 2"	937
79'	16' - 11 7/8"	1002
80'	17' - 11"	1076
81'	18' - 11 3/4"	1161
82'	20' - 3"	1265
83'	21' - 11 1/8"	1403
84'	26' - 0"	1743

“T” DESIGNATION DENOTES TWIN-LEAF INSTALLATION

VERSA™ SERIES

Single-Radius

Nominal Bridge Unit Length:
VS8-VS30: 8’-0”
VS36T-VS54T: 6’-0”

VS8 — CLEAR — WATERWAY

SPAN	RISE	AREA (SF)
6'	1' - 4 1/4"	6
7'	2' - 0 3/4"	11
8'	4' - 0"	25
8'	5' - 0"	33
8'	6' - 0"	41
8'	7' - 0"	49
8'	8' - 0"	57
8'	9' - 0"	65
8'	10' - 0"	73
8'	11' - 0"	81

VS10 — CLEAR — WATERWAY

SPAN	RISE	AREA (SF)
7'	1' - 5 1/8"	7
8'	2' - 0"	12
9'	2' - 9 7/8"	19
10'	5' - 0"	39
10'	6' - 0"	49
10'	7' - 0"	59
10'	8' - 0"	69
10'	9' - 0"	79
10'	10' - 0"	89
10'	11' - 0"	99

VS12 — CLEAR — WATERWAY

SPAN	RISE	AREA (SF)
8'	1' - 6 3/8"	9
9'	2' - 0 3/8"	13
10'	2' - 8 1/4"	19
11'	3' - 7 1/4"	29
12'	6' - 0"	57
12'	7' - 0"	69
12'	8' - 0"	81
12'	9' - 0"	93
12'	10' - 0"	105
12'	11' - 0"	117

VS16 — CLEAR — WATERWAY

SPAN	RISE	AREA (SF)
10'	1' - 9"	13
11'	2' - 2 1/4"	17
12'	2' - 8 1/2"	23
13'	3' - 4"	31
14'	4' - 1 1/2"	42
15'	5' - 2 5/8"	57
16'	8' - 0"	101
16'	9' - 0"	117
16'	10' - 0"	133
16'	11' - 0"	149

VS20 — CLEAR — WATERWAY

SPAN	RISE	AREA (SF)
14'	2' - 10 1/4"	28
15'	3' - 4 5/8"	36
16'	4' - 0"	45
17'	4' - 8 3/4"	57
18'	5' - 7 3/4"	73
19'	6' - 10 1/2"	96
20'	10' - 0"	157
20'	11' - 0"	177
20'	12' - 0"	197
20'	13' - 0"	217

VS24 — CLEAR — WATERWAY

SPAN	RISE	AREA (SF)
18'	4' - 0 3/4"	51
19'	4' - 8"	63
20'	5' - 4 3/8"	76
21'	6' - 2 1/4"	93
22'	7' - 2 1/2"	115
23'	8' - 6 7/8"	146
24'	12' - 0"	226
24'	13' - 0"	250
24'	14' - 0"	274
24'	15' - 0"	298

VS30 — CLEAR — WATERWAY

SPAN	RISE	AREA (SF)
24'	6' - 0"	101
25'	6' - 8 1/2"	119
26'	7' - 6 1/4"	139
27'	8' - 5 1/2"	164
28'	9' - 7 3/8"	196
29'	11' - 1 7/8"	240
30'	15' - 0"	353
30'	16' - 0"	383
30'	17' - 0"	413
30'	18' - 0"	443

VS36T — CLEAR — WATERWAY

SPAN	RISE	AREA (SF)
30'	8' - 0 5/8"	171
31'	8' - 10 1/8"	195
32'	9' - 9"	224
33'	10' - 9 5/8"	258
34'	12' - 1"	301
35'	13' - 9 1/2"	359
36'	18' - 0"	509
36'	19' - 0"	545
36'	20' - 0"	581
36'	21' - 0"	617

VS42T — CLEAR — WATERWAY

SPAN	RISE	AREA (SF)
36'	10' - 2 1/4"	260
37'	11' - 0 3/4"	292
38'	12' - 0 5/8"	330
39'	13' - 2 1/2"	374
40'	14' - 7 1/8"	429
41'	16' - 5 3/8"	504
42'	21' - 0"	693
42'	22' - 0"	735
42'	23' - 0"	777
42'	24' - 0"	819

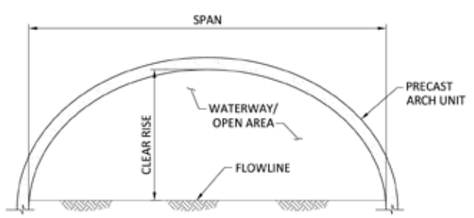
VS48T — CLEAR — WATERWAY

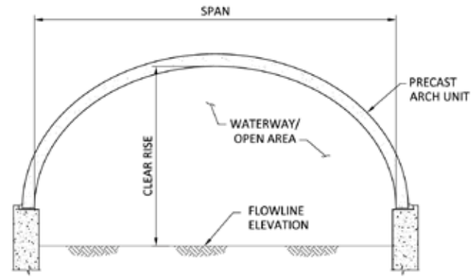
SPAN	RISE	AREA (SF)
42'	12' - 4 5/8"	371
43'	13' - 4"	411
44'	14' - 4 7/8"	458
45'	15' - 7 3/4"	513
46'	17' - 1 3/4"	581
47'	19' - 1 1/2"	673
48'	24' - 0"	905
48'	25' - 0"	953
48'	26' - 0"	1001
48'	27' - 0"	1049

VS54T — CLEAR — WATERWAY

SPAN	RISE	AREA (SF)
48'	14' - 7 5/8"	502
49'	15' - 7 7/8"	552
50'	16' - 9 5/8"	609
51'	18' - 1 1/2"	676
52'	19' - 8 5/8"	758
53'	21' - 9 7/8"	868
54'	27' - 0"	1145
54'	28' - 0"	1199
54'	29' - 0"	1253
54'	30' - 0"	1307

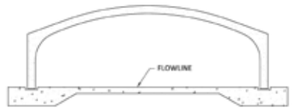
“T” DESIGNATION DENOTES TWIN-LEAF INSTALLATION



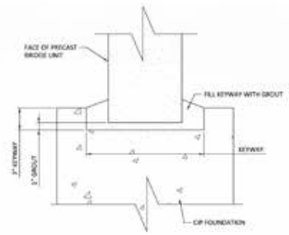


FOUNDATION OPTIONS

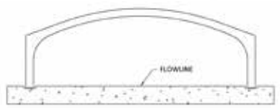
STRIP FOUNDATION



STRIP FOUNDATION W/ PAVED INVERT

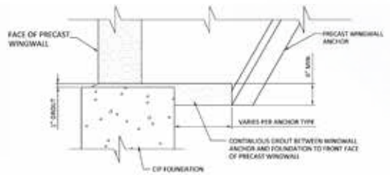


BRIDGE UNIT GROUT DETAIL

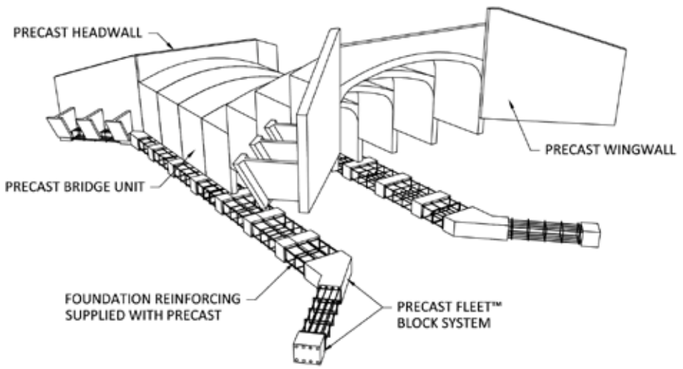


STRUCTURAL BASE SLAB FOUNDATION

DEEP FOUNDATION (PILE/ CAISSON)



WINGWALL GROUT DETAIL



SAVE TIME WITH PRECAST FOUNDATIONS. FULL PRECAST AND PARTIAL PRECAST (FLEET BLOCK) SYSTEMS ARE AVAILABLE.

ANCHOR WALL SYSTEM

Time-saving hybrid cantilever precast concrete wall

Advantages

- Rigid, cantilever design on concrete foundations works well around culverts and streams.
- May be designed to resist bridge rail impact and highway or railroad surcharge.
- Heights up to 20’ with no straps—minimal interference with utilities.
- Easily accommodates form liner finishes and complex alignments.
- Large pieces minimize installation time.
- Less concrete and less excavation compared to L-shaped or traditional cantilever walls.
- Temporary bracing is typically not required.
- May be designed for various backfill types.
- Foundations may be precast or cast-in-place.

Provided By

PRETEK GROUP

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