ECO-SPAN® ARCH SYSTEMS

DURABLE, ECONOMICAL, ENVIRONMENTALLY FRIENDLY

Arch bridges have long been appreciated for their strength and aesthetic value. With today's construction techniques, arch bridges are an easy choice for short-span bridge construction. Whether you want to replace an aging, deficient bridge, span a creek or river for a golf course path, expand an airport tarmac over a roadway, develop a tunnel for vehicular traffic, or provide access to land once inaccessible for new development , there are many ways to solve these challenges. A precast concrete arch bridge provides outstanding value for each situation.

ECO-SPAN® arches offer a variety of shapes to fit different site conditions. Designs include single-piece arch, two-piece arch, and conventionally reinforced parapets and wingwalls, headwalls, and endwalls. A wide range of span lengths, span heights, and load capacities can be accommodated. One factor to consider is the weight of each bridge section that must be transported to the job site. Roadway load and size limits are usually the only factor that may restrict the size of these bridge sections, even though a precast producer's facility may be able to produce larger sections.

SUPERIOR STRENGTH AND DURABILITY

The strength of precast concrete gradually increases over time and does not deteriorate when exposed to harsh environments as some other materials do. Other materials can deteriorate, experience creep and stress relaxation, lose strength and/or deflect over time. In addition, the shape of the arch naturally sheds water so that ponding does not occur on the top slab. Studies have shown that precast concrete products can provide a service life in excess of 100 years. Additional design options can extend the service life of products exposed to severe conditions.

QUALITY CONTROL

Because precast concrete products are produced in a controlled plant environment, they exhibit high quality and uniformity. Problems affecting quality typically found on a job site - temperature, humidity, craftsmanship and material quality - are nearly eliminated in a plant environment.

AVAILABILTY AND EASE OF INSTALLATION

Because precast concrete bridge sections are manufactured in advance of installation, they are ready for transportation to the job site at a moments notice. They are quickly set onto the bridge foundation in a matter of hours using a small crew and crane. Backfilling and overlaying can begin immediately rather than waiting several days for cast-in-place concrete to reach proper strength. Projects to designed with precast concrete can save weeks or months over cast-in-place concrete construction.

DESIGN SUPPORT

Pretek Group, the team of professional engineers responsible for the design of the ECO-SPAN arch system, can work with you to define the arch bridge that fits your grading, hydraulic, load-carrying, and geotechnical requirements as well as your budget.

AESTHETICS

ECO-SPAN arches can also include spandrel and wingwall panels with architectural finishes. Finishes commonly available are: colored smooth-as-cast, textured formliner, exposed aggregate, acid etch, brick, and sand blast. Each are distinctly different and provide architects and owners a broad choice in appearance to help match the surrounding environment.

ENVIROMENTALLY FRIENDLY

Precast concrete is nontoxic, environmentally safe, and made from all natural materials, making it an ideal material for use over and near natural waterways. Concrete has no known ill effects on groundwater and surface water quality. Also with a three-sided precast concrete arch bridge, disturbance of stream beds is significantly reduced, allowing the water environment to return to normal more quickly than other alternatives. In some cases, stream disturbance can be completely eliminated.

ECONOMICAL

Precast concrete arches offer lower long-term cost when compared with other materials. Additionally, because precast bridges require significantly less construction time, overall project cost savings realized. Purchase of a ECO-SPAN arch includes a complete bridge design with foundations by specialized professional engineers. The owner's consultant needs only to specify the design criteria, including foundation and geotechnical requirements, resulting in additional savings on project design cost. With ECO-SPAN's producer-direct pricing and non-proprietary shapes, arch bridges can be significantly less expensive than they once were.

Precast concrete is the material of choice for short-span bridges. Precast bridge sections can be manufactured in a broad range of sizes, are durable during transportation, installation, and use, can easily be installed by a small crew, are structurally sound, are environmentally safe, and are less vulnerable to damage from weather and corrosion than other materials.

PRETEK GROUP
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ECO-SPAN® ARCH SYSTEMS
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INSTANT DESIGN™

FAST, FREE, CUSTOM ESTIMATES AND DESIGNS

MOST ADVANCED ONLINE DESIGN TOOL FOR PRECAST CONCRETE THREE-SIDED STRUCTURES
RECEIVE BUDGET PRICING, PRODUCT APPLICATION DRAWINGS AND MORE

Features

No registration or login; visit the site and start your design.

Simple calculations and logic built into the data entry process increases speed and reduces errors.

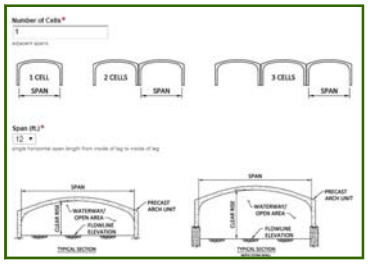
Users guided to most effective and efficient use of the ECO-SPAN® system.

Drawings and/or 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.

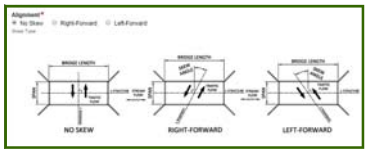
START YOUR PROJECT TODAY AT WWW.ECO-SPAN.COM

Design Steps



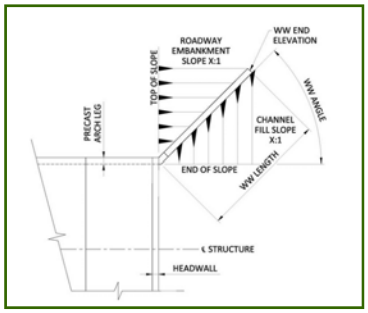
1. Define span and opening

Choose the shape, span and rise that provide the required opening size for water conveyance, storage, or vehicle clearance.



2. Layout—Skew, Length

Define bridge layout including skew angle and bridge length



3. Elevations / Heights

Enter headwall and earth cover height or elevations.

4. Wingwalls & Foundations

Choose foundation type and enter wingwall data, or let the program calculate the most efficient wingwall layout for your project.

5. Submit

Submit your information and request—we take it from there.

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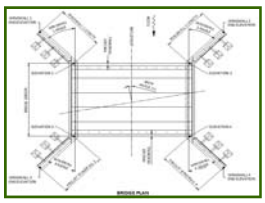
THE PROCESS

OUR EXPERIENCED TEAM OF PROFESSIONAL ENGINEERS, APPLICATION DESIGNERS AND PRECAST CONCRETE PRODUCERS IS READY TO ASSIST WITH YOUR NEXT ECO-SPAN® PROJECT.

Project Assessment

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



Design

The structure is designed for appropriate code, loading and geometry requirements as defined by the owner and engineer of record.

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).

Foundations / Site Work

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

Transportation

Precast components arrive on flat-bed trailers, ready for installation.

Installation

The modular system including precast concrete headwalls and wingwalls is set in place, often in a matter of hours.

Finished Structure

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

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ECO-SPAN® ARCH SYSTEMS
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ANCHOR WALL

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 formliner 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.

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FLEET FOUNDATION

FLEET™ FOUNDATION SYSTEM

NEW ECO-SPAN® PRECAST CONCRETE FOUNDATION SYSTEM COMBINES THE SPEED OF PRECAST WITH THE ECONOMY OF CAST-IN-PLACE.

Advantages

Blocks are encapsulated in cast-in-place concrete, minimizing cold joints which could lead to premature reinforcing corrosion.

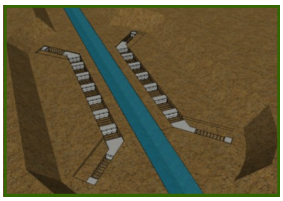
Optional bolt-on side forms are available. External form bracing (kickers) are not required.

Pre-fabricated reinforcing cages are quickly installed between pre-cast blocks.

Blocks are typically shipped on a single load are installed by small equipment, eliminating the need for extra crane time.

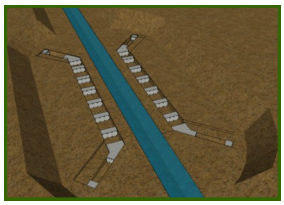
Speed—in most cases, no cast-in-place concrete (or curing) is required prior to arch installation.

Process



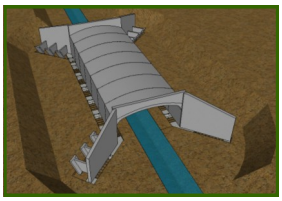
Fleet™ Foundation Blocks

When excavation is complete and a compacted gravel base is prepared, foundation pieces may be set with small equipment.



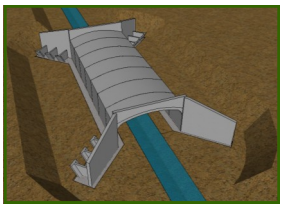
Reinforcing & Form Panels

Reinforcing cages are installed between blocks and longitudinal bars are added. Form panels are bolted to blocks, if required.



Arch and Wall Units

Bridge components are installed on precast foundation before any concrete is poured on site.



Add Concrete

Concrete is added to finish the precast/cast-in-place foundation system. Backfill may be placed when concrete reaches design strength.

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ECO-SPAN® ARCH SYSTEMS
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ARCH-BOX SERIES

Arch-Box (AB) Series

Nominal Bridge Unit Length:
12' - 24' Spans: 8'-0"
28' - 42' Spans: 6'-0"
48' - 80' Spans: 4'-0"

Waterway Area (SF)

Clear Rise \ Nominal Span	12'	14'	16'	18'	20'	22'	24'	26'	28'	32'	36'	42'	48'	54'	60'	72'	84'
1'	7	9	9	11	9	11	9	11	11	12	12	12	14	16	16	28	30
2'	18	22	24	28	26	30	26	30	31	33	33	33	39	44	44	66	71
3'	30	36	39	45	45	51	48	54	57	60	61	61	72	81	81	111	120
4'	42	50	55	63	65	72	71	79	83	89	92	94	110	125	125	163	177
5'	54	64	71	81	85	95	95	105	111	120	126	130	152	173	174	222	240
6'	66	78	87	99	105	119	119	131	138	153	161	168	197	224	228	284	308
7'	78	92	103	117	125	143	139	157	167	184	197	209	244	276	284	350	380
8'	90	106	119	135	145	167	167	183	195	216	232	250	291	329	342	418	457
9'	102	120	135	153	165	191	191	209	223	248	268	292	340	383	401	488	536
10'	114	134	151	171	185	215	215	235	251	280	304	333	387	437	461	559	617
11'	126	148	167	189	205	239	239	261	279	315	340	375	435	491	521	630	699
12'	138	162	183	207	225	263	263	287	307	344	376	417	483	545	581	702	782
13'	150	176	199	225	245	287	287	313	335	376	412	460	531	599	641	774	865
14'	162	190	215	243	265	311	311	339	363	408	448	501	579	653	701	846	949
15'	174	204	231	261	285	335	335	365	391	440	484	544	627	707	761	918	1033

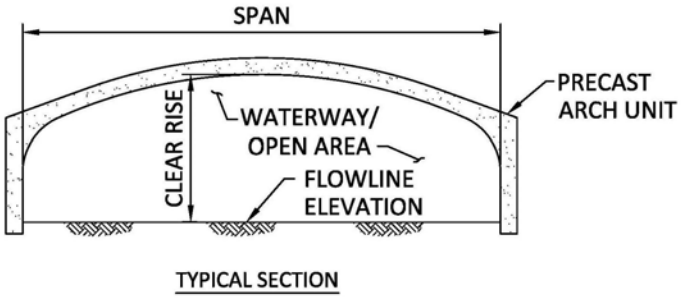
Indicates twin-leaf installation

Thick line indicates minimum precast rise

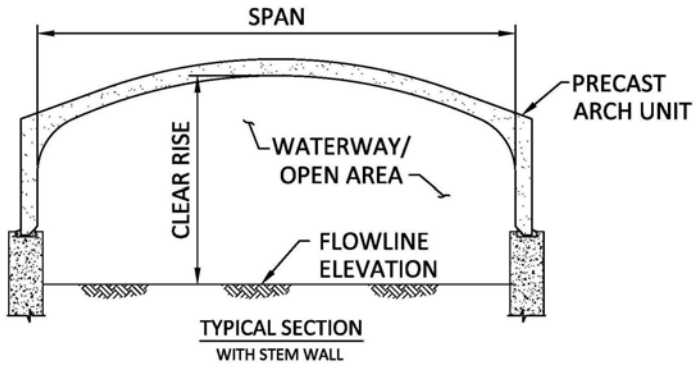
Weight (Tons/ft)

Precast Rise \ Nominal Span	12'	14'	16'	18'	20'	22'	24'	26'	28'	32'	36'	42'	48'	54'	60'	72'	84'
3'	0.94	1.04															
4'	1.04	1.14	1.58	1.71													
5'	1.14	1.24	1.71	1.83	1.86	1.99	2.06	2.19									
6'	1.24	1.34	1.83	1.96	1.99	2.11	2.19	2.31	2.84								
7'	1.34	1.44	1.96	2.08	2.11	2.24	2.31	2.44	2.99	3.56							
8'	1.44	1.54	2.08	2.21	2.24	2.36	2.44	2.56	3.14	3.71	4.06						
9'	1.54	1.64	2.21	2.33	2.36	2.49	2.56	2.69	3.29	3.86	4.23	4.75					
10'	1.64	1.74	2.33	2.46	2.49	2.61	2.69	2.81	3.44	4.01	4.41	4.85	5.28	6.51			
11'	1.74	1.84	2.46	2.58	2.61	2.74	2.81	2.94	3.59	4.16	4.58	5.03	5.48	6.71	7.11		
12'	1.84	1.94	2.58	2.71	2.74	2.86	2.94	3.06	3.74	4.31	4.76	5.20	5.68	6.91	7.33		
13'	1.94	2.04	2.71	2.83	2.86	2.99	3.06	3.19	3.89	4.46	4.93	5.38	5.88	7.11	7.56	11.06	
14'	2.04	2.14	2.83	2.96	2.99	3.11	3.19	3.31	4.04	4.61	5.11	5.55	6.08	7.31	7.78	11.33	
15'	2.14	2.24	2.96	3.08	3.11	3.24	3.31	3.44	4.19	4.76	5.28	5.73	6.27	7.51	8.01	11.60	14.80

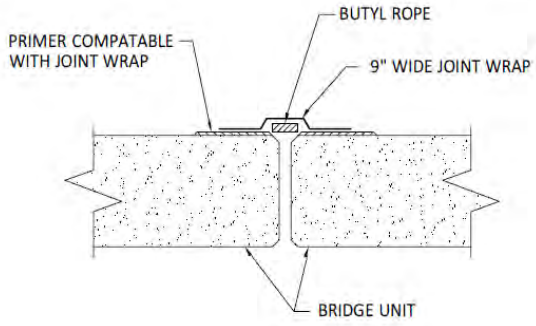
Indicates twin-leaf installation



TYPICAL SECTION



TYPICAL SECTION
WITH STEM WALL



NOTE:
Joint is considered "soil-tight". Additional protection is recommended if a water-tight joint is required.

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ECO-SPAN® ARCH SYSTEMS
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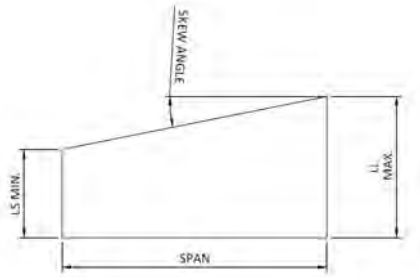
ARCH-BOX SERIES

Design Specifications : AASHTO LFD & LRFD, AREMA
Manufacturing Specifications: ASTM C1504
Manufacturing Certifications: NPCA

BACKFILL DESCRIPTION						
GROUP CLASSIFICATION	A-1a	A-1b	A-2-4	A-2-5	A3	A4
PERCENT PASSING #10	50 MAX.					
PERCENT PASSING #40	30 MAX.	50 MAX.			51 MAX.	
PRECENT PASSING #200	15 MAX.	25 MAX.	35 MAX.	35 MAX.	10 MAX.	36 MAX.
CHARACTERISTICS OF FRACTON PASSING #40, LIQUID LIMIT			40 MAX.	41 MAX.		40 MAX.
CHARACTERISTIC OF FRACTION PASSING #40, PLASTICITY INDEX	6 MAX.	9 MAX.	10 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	LOW COMP. SILTS

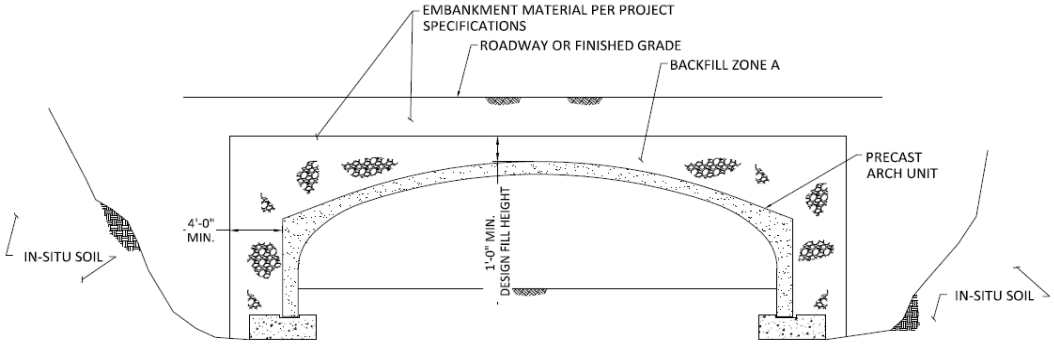
ACCEPTABLE BACKFILL MATERIAL		
SPAN	FILL HEIGHT	MATERIAL IN ZONE A
< 24'-0"	< 12'-0"	A1, A2, A3, A4
< 24'-0"	≥ 12'-0"	A1, A3
≥ 24'-0"	ALL	A1, A3

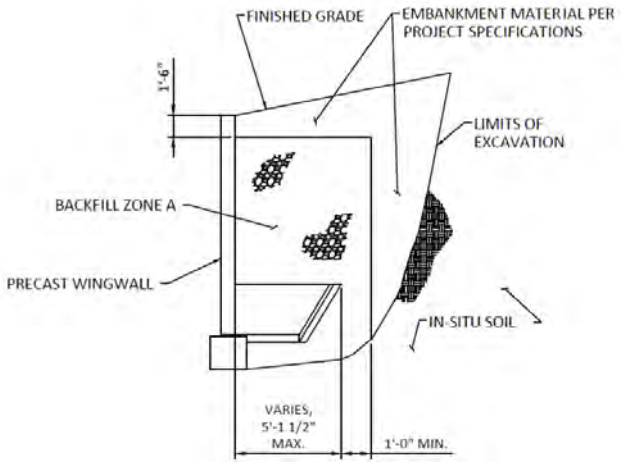


SKEWED UNIT PLAN

Maximum Skew			
Span	L_L Max.	Max. Skew	L_S 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





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ECO-SPAN® ARCH SYSTEMS
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TECHNICAL DETAILS

VERSA™ SERIES

Single-Radius

Nominal Bridge Unit Length:
VS8-VS30: 8'-0"
VS36T-VS54T: 6'-0"

VS8

SPAN	CLEAR RISE	WATERWAY 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

SPAN	CLEAR RISE	WATERWAY 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

SPAN	CLEAR RISE	WATERWAY 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

SPAN	CLEAR RISE	WATERWAY 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

SPAN	CLEAR RISE	WATERWAY 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

SPAN	CLEAR RISE	WATERWAY 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

SPAN	CLEAR RISE	WATERWAY 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

SPAN	CLEAR RISE	WATERWAY 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

SPAN	CLEAR RISE	WATERWAY 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

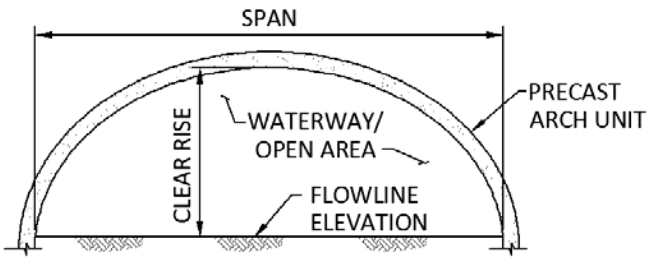
VS48T

SPAN	CLEAR RISE	WATERWAY 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

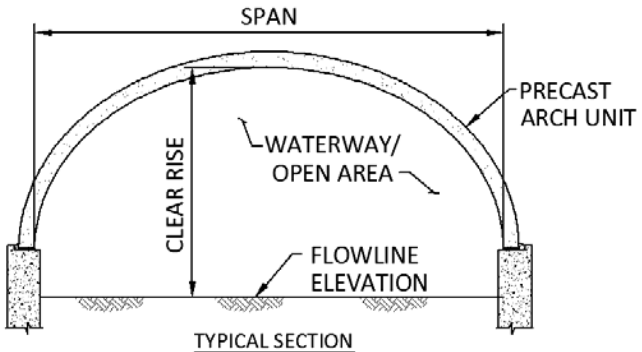
VS54T

SPAN	CLEAR RISE	WATERWAY 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

SHADED AREAS DENOTE TWIN-LEAF INSTALLATION

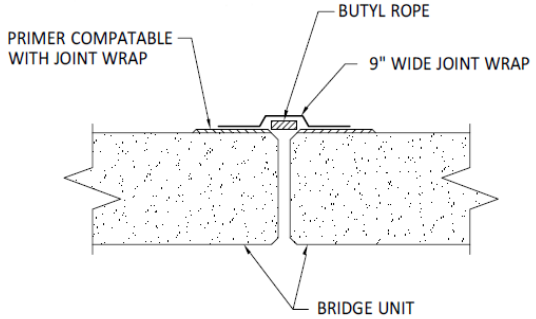


TYPICAL SECTION



TYPICAL SECTION
WITH STEM WALL

NOTE:
Joint is considered "soil-tight". Additional protection is recommended if a water-tight joint is required.



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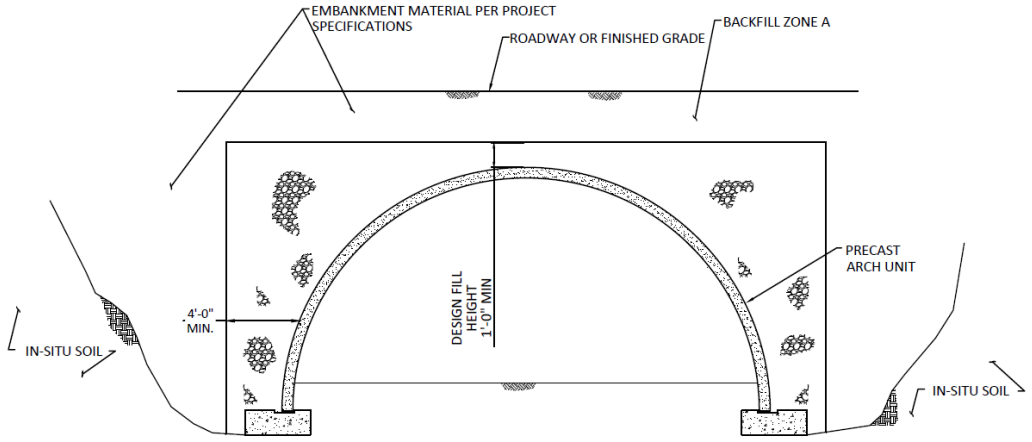
VERSA™ SERIES

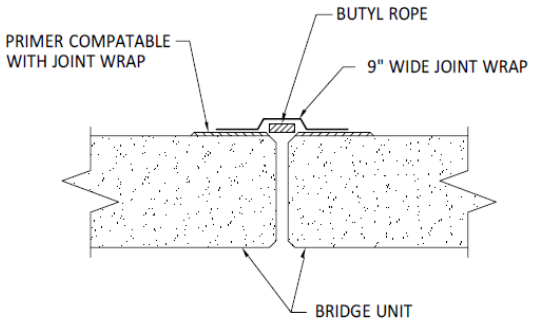
Single-Radius

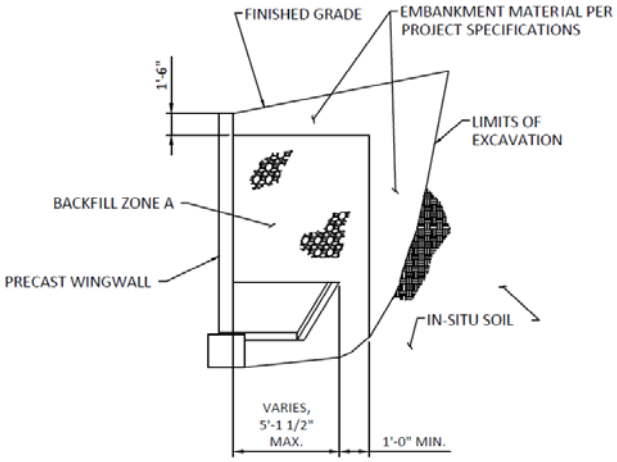
BACKFILL DESCRIPTION						
GROUP CLASSIFICATION	A-1a	A-1b	A-2-4	A-2-5	A3	A4
PERCENT PASSING #10	50 MAX.					
PERCENT PASSING #40	30 MAX.	50 MAX.			51 MAX.	
PRECENT PASSING #200	15 MAX.	25 MAX.	35 MAX.	35 MAX.	10 MAX.	36 MAX.
CHARACTERISTICS OF FRACTON PASSING #40, LIQUID LIMIT			40 MAX.	41 MAX.		40 MAX.
CHARACTERISTIC OF FRACTION PASSING #40, PLASTICITY INDEX	6 MAX.	9 MAX.	10 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	LOW COMP. SILTS

Design Specifications :
AASHTO LFD & LRFD, AREMA
Manufacturing Specifications:
ASTM C1504
Manufacturing Certifications:
NPCA

ACCEPTABLE BACKFILL MATERIAL		
SPAN	FILL HEIGHT	MATERIAL IN ZONE A
< 24'-0"	< 12'-0"	A1, A2, A3, A4
< 24'-0"	≥ 12'-0"	A1, A3
≥ 24'-0"	ALL	A1, A3







NOTE:
Joint is considered "soil-tight". Additional protection is recommended if a water-tight joint is required.

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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

SPAN	RISE	WATERWAY 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

SPAN	RISE	WATERWAY 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

SPAN	RISE	WATERWAY 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

SPAN	RISE	WATERWAY 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

SPAN	RISE	WATERWAY 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

SPAN	RISE	WATERWAY 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

SPAN	RISE	WATERWAY 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

SPAN	RISE	WATERWAY 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

SPAN	RISE	WATERWAY 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

SPAN	RISE	WATERWAY 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

SPAN	RISE	WATERWAY 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

SPAN	RISE	WATERWAY 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

SPAN	RISE	WATERWAY 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'

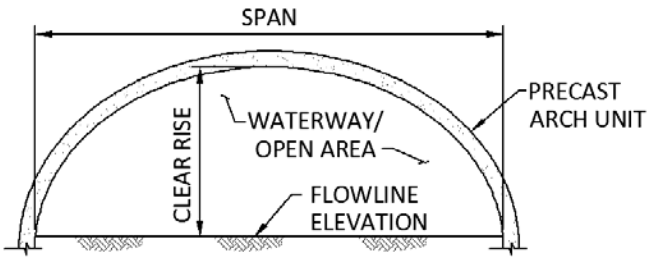
VM78T

SPAN	RISE	WATERWAY 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

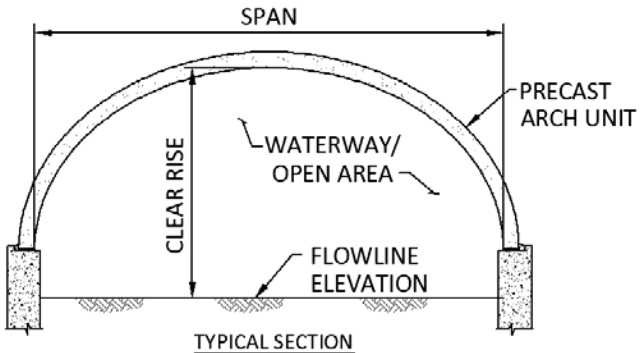
VM84T

SPAN	RISE	WATERWAY 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

SHADED AREAS DENOTE TWIN-LEAF INSTALLATION



TYPICAL SECTION



TYPICAL SECTION
WITH STEM WALL

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VERSA™ SERIES

Multiple-Radius

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Manufacturing Specifications: ASTM C1504
Manufacturing Certifications: NPCA

BACKFILL DESCRIPTION						
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PERCENT PASSING #40	30 MAX.	50 MAX.			51 MAX.	
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CHARACTERISTICS OF FRACTON PASSING #40, LIQUID LIMIT			40 MAX.	41 MAX.		40 MAX.
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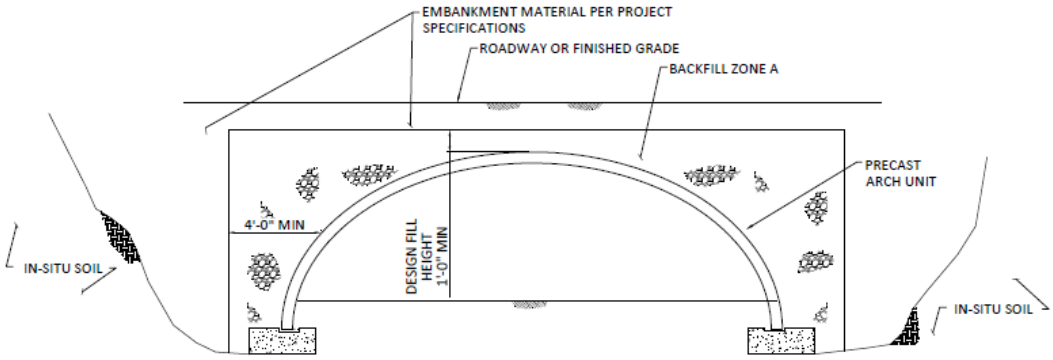
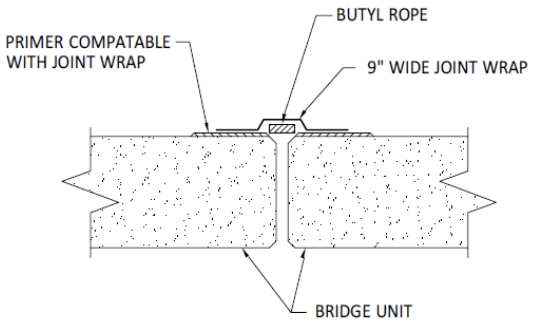
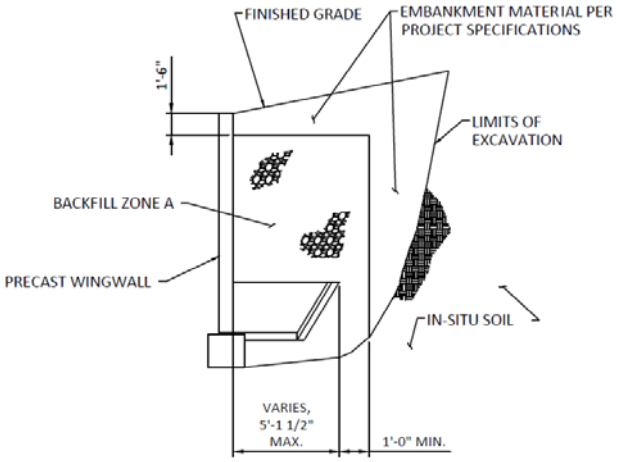
DESCRIPTION OF MATERIAL	MOSTLY GRAVEL WITH SOME SANDS AND FINES	GRAVELLY SAND OR GRADED SAND	SILTY OR CLAYEY GRAVEL AND SAND	SILTY OR CLAYEY GRAVEL AND SAND	FINE SAND	LOW COMP. SILTS

ACCEPTABLE BACKFILL MATERIAL		
SPAN	FILL HEIGHT	MATERIAL IN ZONE A
< 24'-0"	< 12'-0"	A1, A2, A3, A4
< 24'-0"	≥ 12'-0"	A1, A3
≥ 24'-0"	ALL	A1, A3







NOTE:
Joint is considered "soil-tight". Additional protection is recommended if a water-tight joint is required.

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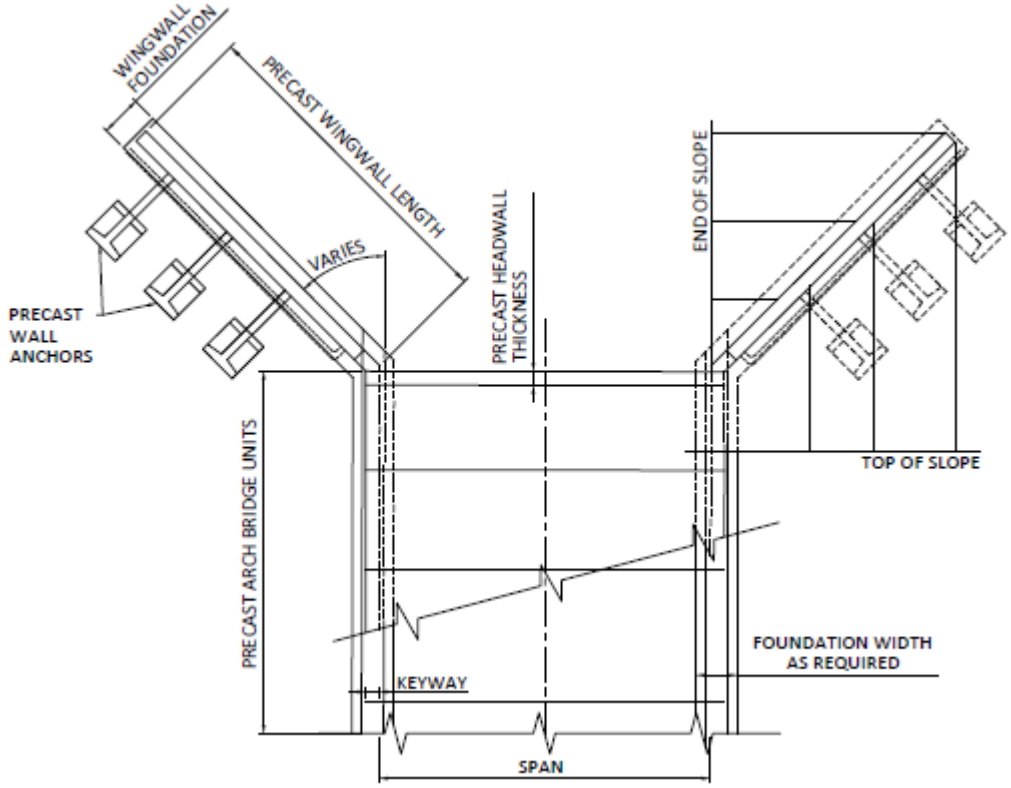
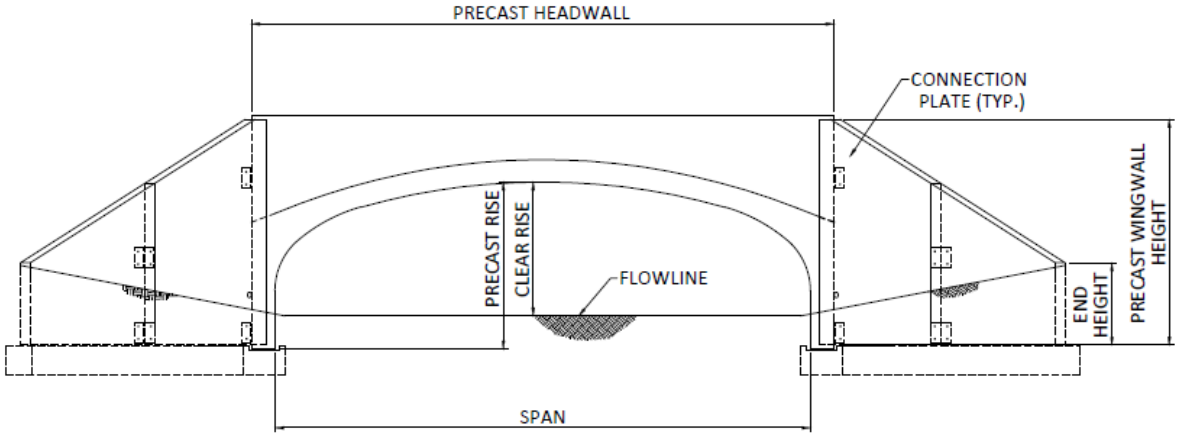
END TREATMENTS - PRECAST

For design tools and assistance, visit the Design Center at www.eco-span.com



BRIDGE & FOUNDATION PLAN



BRIDGE ELEVATION

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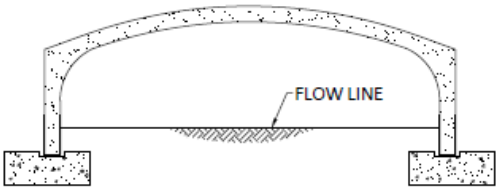
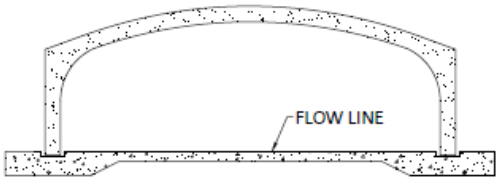
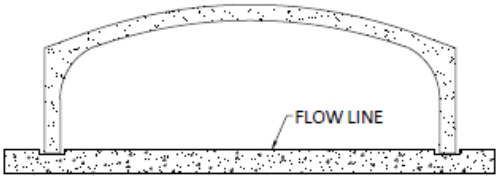
FOUNDATION OPTIONS



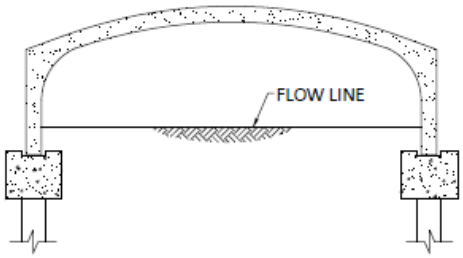
STRIP FOUNDATION



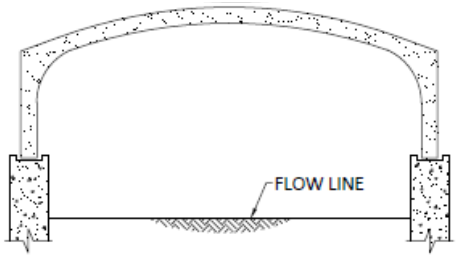
STRIP FOUNDATION W/ PAVED INVERT



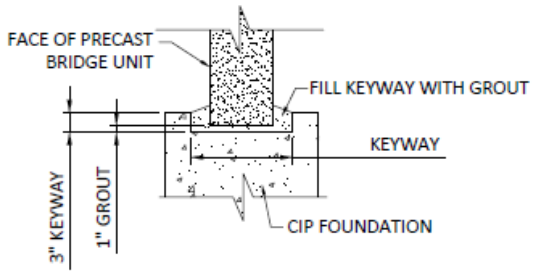
STRUCTURAL BASE SLAB FOUNDATION



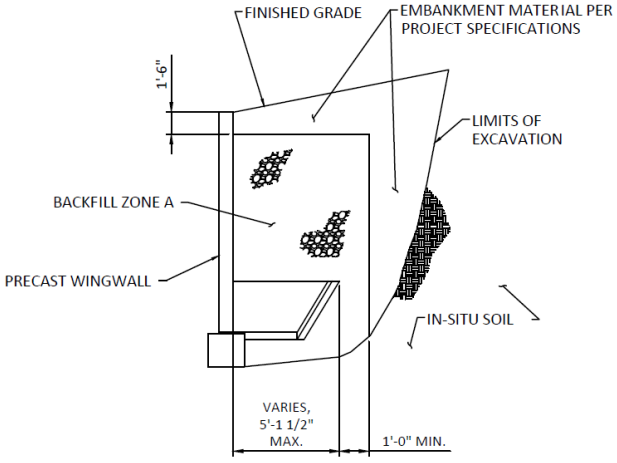
DEEP FOUNDATION (PILE / CAISSON)

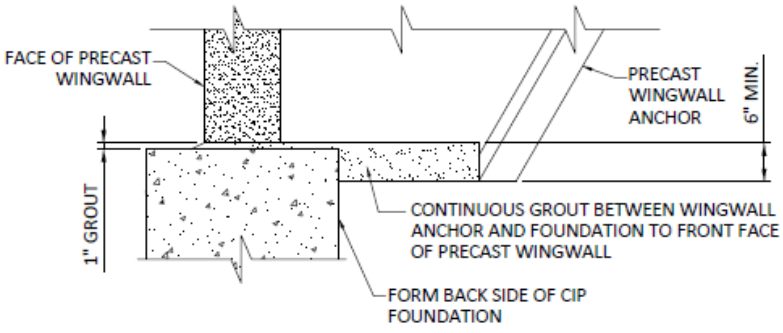


PEDESTAL FOUNDATION



BRIDGE UNIT GROUT DETAIL





WINGWALL GROUT DETAIL

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