Cost Effective Bridge Replacement and Rehabilitation Solutions

Todd Black – Area Manager - Structures
Kim Cimarolli – Bridge Consultant

Meet the Team

Todd Black, PE - Area Manager

Todd is the Area Manager for Kansas, Nebraska, Missouri & Illinois. He has over 19 years of experience in the construction/consulting industry. Todd ha a BS in Civil Engineering from Kansas State University and a MS in Enginee Management from the University of Kansas.

Kim Cimarolli - Bridge Consultant

Kim is the Southern Illinois and Eastern Missouri Bridge Consultant for Contech Engineered Solutions. She graduated from the University of Missou - Rolla with a Bachelor of Science in Mechanical Engineering. Prior to joinin Contech, Kim was an engineering consultant specializing in construction oversight and custom metal fabrication.

Todd and Kim are responsible for providing technical knowledge and consultative solution development to owners, engineers and contractors in the civil infrastructure industry.

Contech Engineered Solutions

Bridges & Structures, Stormwater Management, Pipe, Erosion Control and Retaining Walls

Clear Span Bridges

Pipe Solutions

i-Series™ Culvert

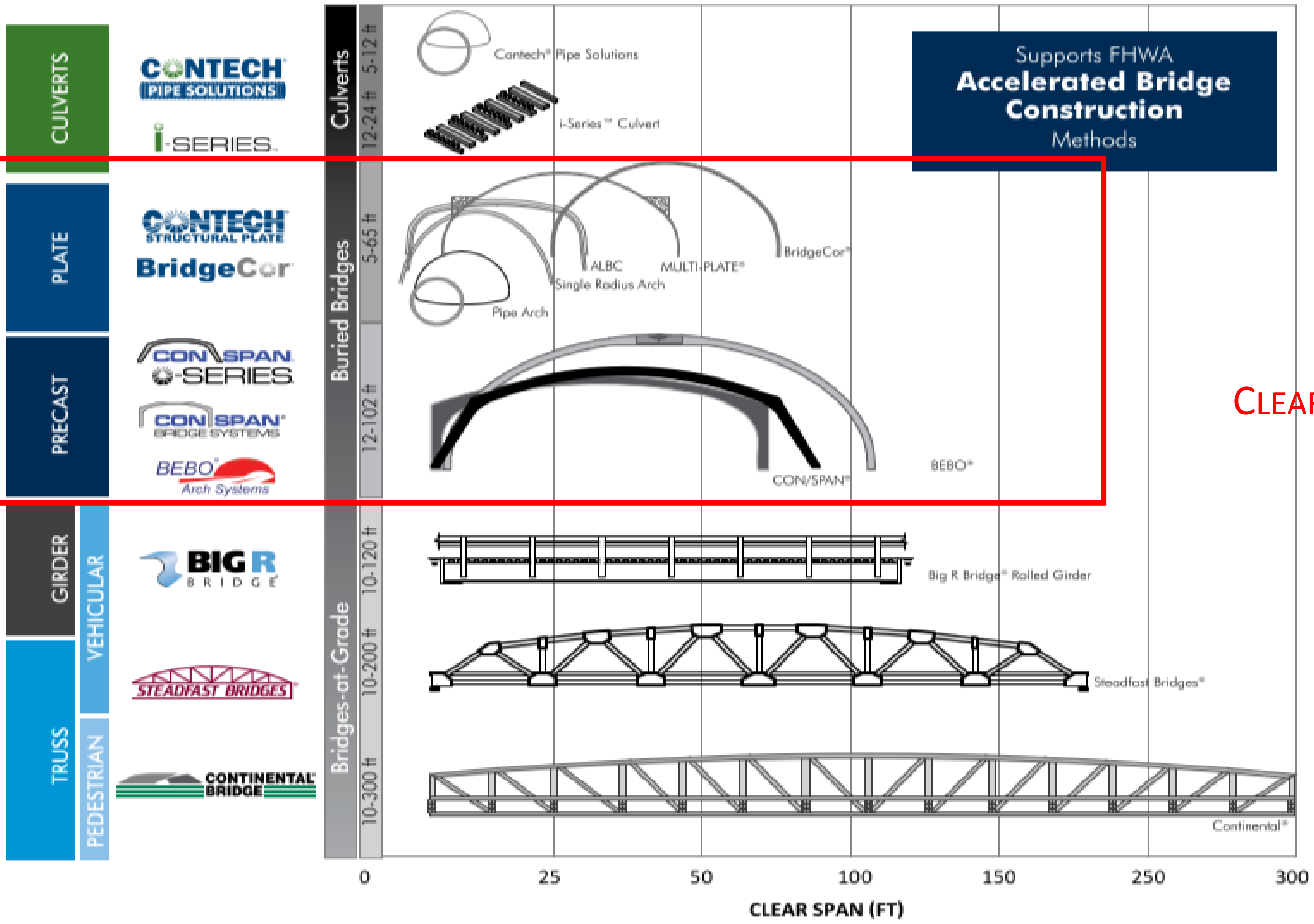
MULTI-PLATE®
Aluminum Structural Plate
Aluminum Box Culvert
SUPER-SPAN™
SUPER-PLATE®
BridgeCor®

CON/SPAN® O-Series®
CON/SPAN®
BEBO®

Big R Bridges®
(Rolled Girder)

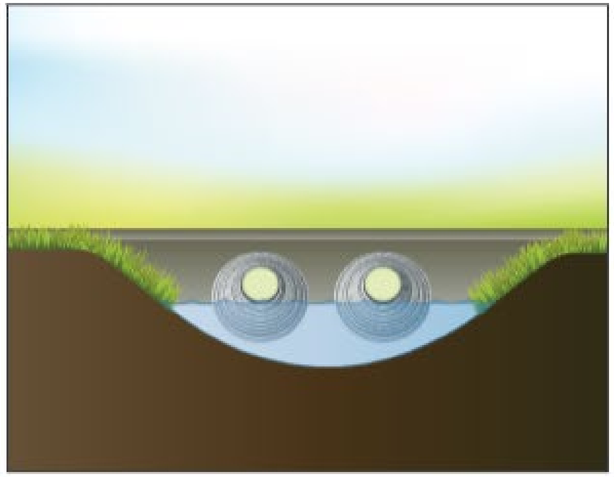
Steadfast Bridges® (Vehicular)

Continental® Bridges (Pedestrian)

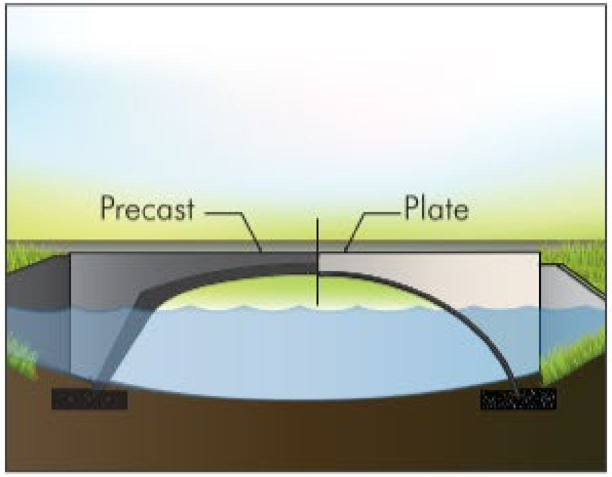


CLEAR SPANS 5' TO 102'

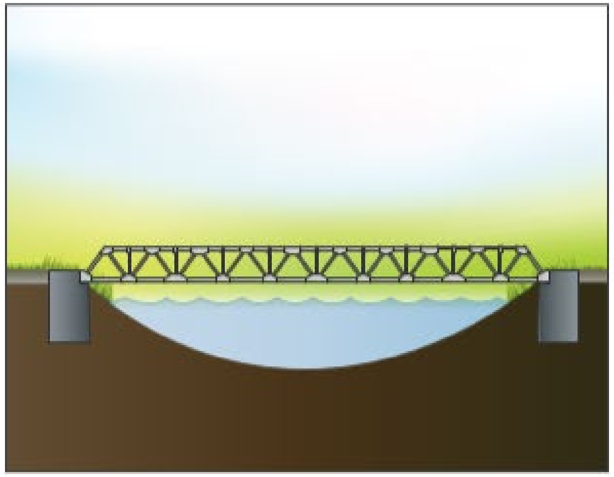
What is a Buried Bridge?



CULVERT



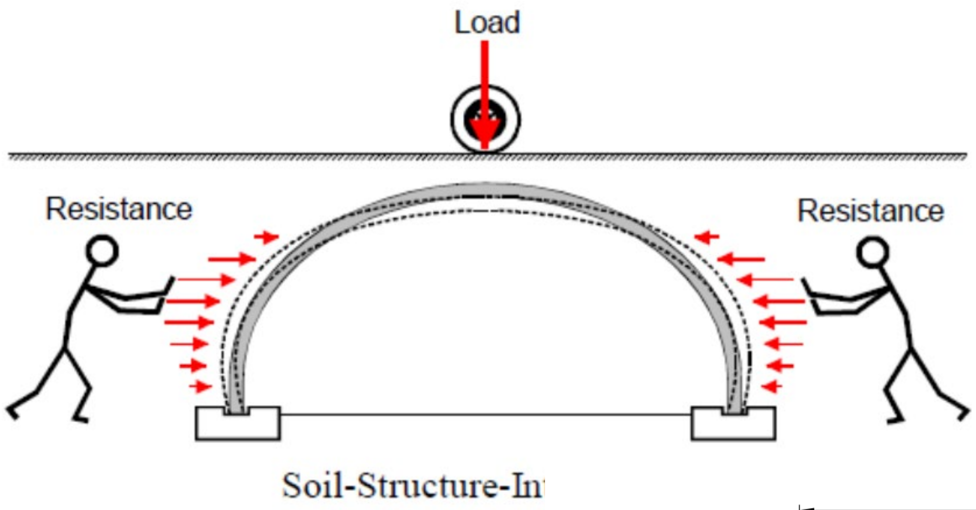
BURIED BRIDGE

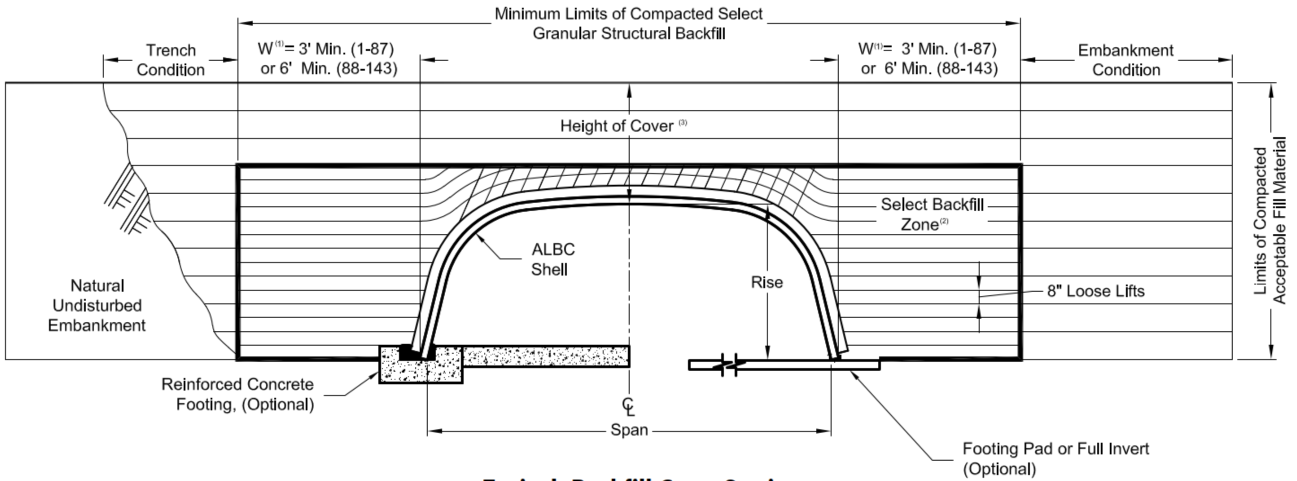


BRIDGE AT-GRADE

A STRUCTURE MADE OF EITHER PREFABRICATED PRECAST OR METAL PLATES PLUS ENGINEERED SOIL, THAT IS DESIGNED AND CONSTRUCTED TO INDUCE A BENEFICIAL INTERACTION OF THE TWO MATERIALS

Soil Structure Interaction

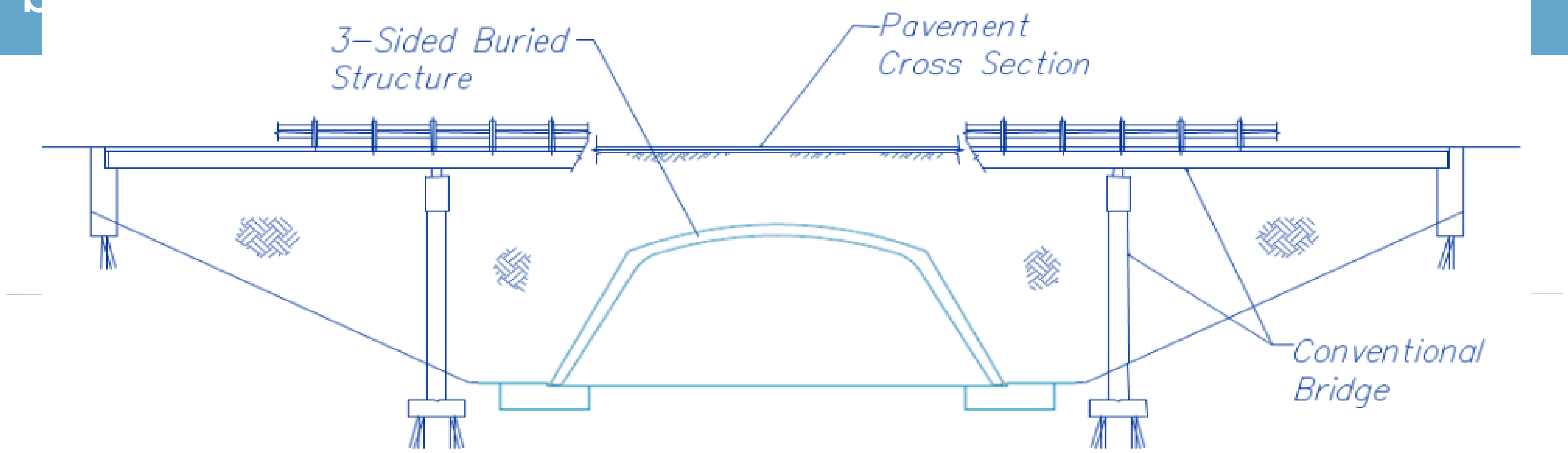




Typical Backfill Cross Section

Buried Bridge Applications

Buried b



Conventional Bridge

Advantages of a Buried Bridge over a Bridge at Grade

- Shorter construction time / phasing means lower initial cost
- Minimal / no long-term maintenance lowers overall life cycle cost
  - Compared to continual bridge deck maintenance
- Shorter construction time minimizes traffic disruption
- Bury utilities in backfill over structure
- Increased safety with limited / no freeze concerns & deck maintenance

Buried Bridge Applications

Buried bridge vs Bridge - at- Grade

CONTECH STRUCTURAL PLATE

MoDOT Route 96 under I-44 - Halltown, MO

Buried Bridge Applications

Buried bridge vs Multi - Cell Box Culvert

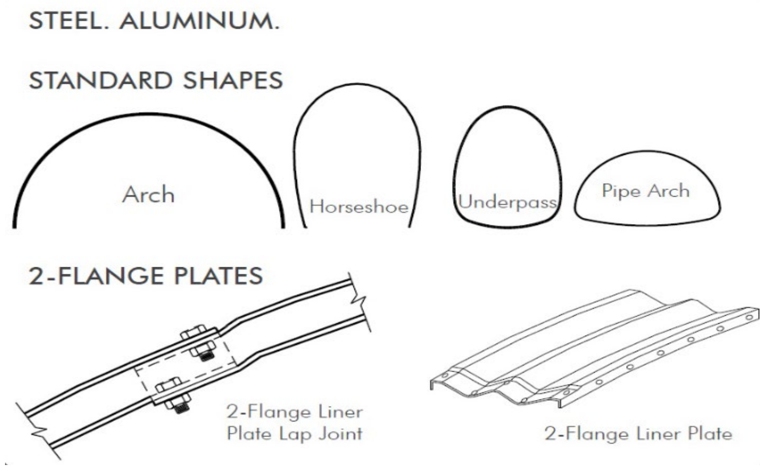
MoDOT Route 94 under I-44 / Halltown, MO

Buried Bridge Applications

Reline & Rehabilitation

Plate

Precast



Tunnel Liner Plate

CONTECH STRUCTURAL PLATE

KDOT US-59 / Winchester, KS

Accelerated Bridge Program

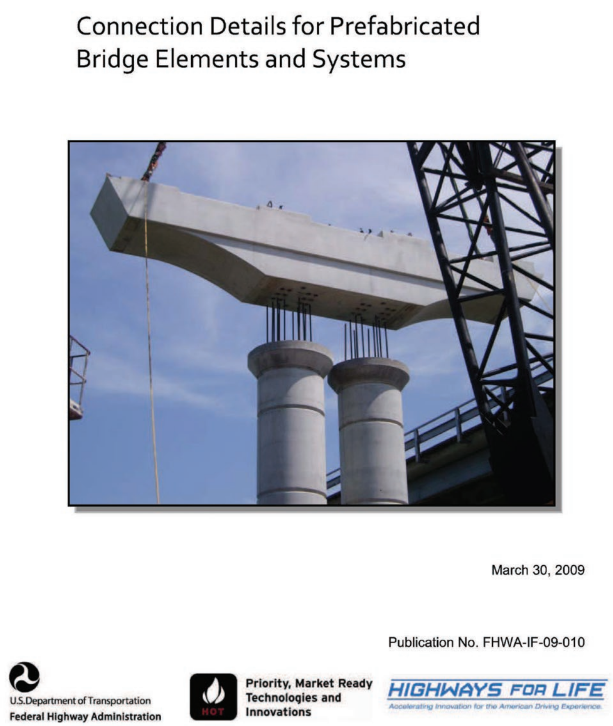
U.S. Department of Transportation
Federal Highway Administration

Accelera ***C)***

•ABC is innovative pla truction
methods anner to reduce occurs when
building rehabilitating

Prefabric **ystems**

•PBES a a bridge that a d include
features uction time an urs when
building or replacing e nal
construc


Connection Details for Prefabricated
Bridge Elements and Systems

March 30, 2009

Publication No. FHWA-IF-09-010

U.S. Department of Transportation
Federal Highway Administration

Priority, Market Ready Technologies and Innovations

HIGHWAYS FOR LIFE

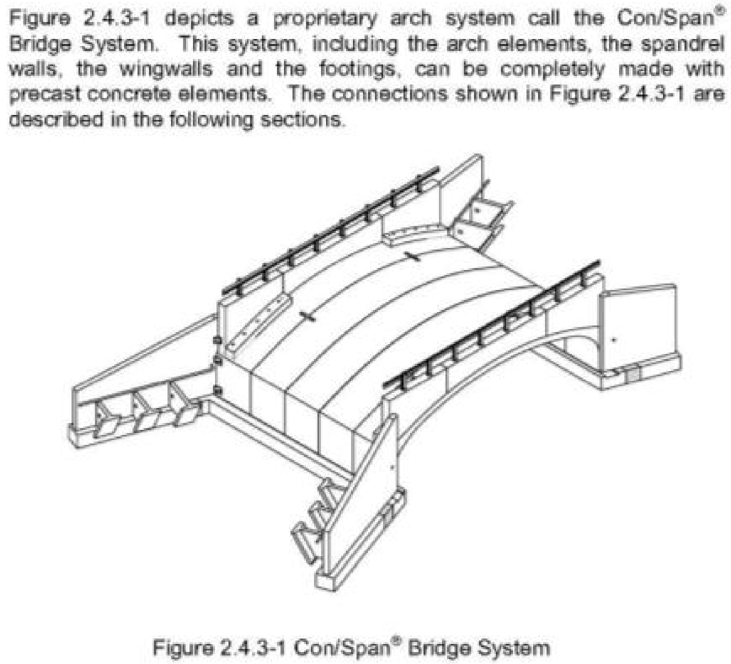


Figure 2.4.3-1 depicts a proprietary arch system call the Con/Span® Bridge System. This system, including the arch elements, the spandrel walls, the wingwalls and the footings, can be completely made with precast concrete elements. The connections shown in Figure 2.4.3-1 are described in the following sections.

Figure 2.4.3-1 Con/Span® Bridge System

"Prefabricated elements of a bridge produced offsite can be assembled quickly, and can reduce design time and cost, minimize forming, minimize lane closure time and/or possibly eliminate the need for a temporary bridge."

Buried Bridge Solutions

Contech Structural Plate

In service since the 1930s

CONTECH STRUCTURAL PLATE

BridgeCor

Plate Manufacturing Process

Structural Plate

Light - weight materials for speed of construction

- Freight economy
- Reduced equipment and labor demands
- Ideal for remote site applications
- Working under utilities
- Reduced detour time

Structural Plate

Accelerated Bridge Construction

- Preassembly reduces road closure time from weeks to days
- Prepping foundation while assembling the structure
- Structural plate can be fully or partially assembled then lifted into place
- Light weight structure may not require a crane rental
- Backfill can start immediately after installation

Structural Plate

Material Options

STEEL

BRIDGECOR / MULTI-PLATE / SUPERSPAN

Railroad Rehabilitation

DOT

ALUMINUM

ALUMINUM STRUCTURAL PLATE
ALUMINUM BOX CULVERT

Residential Development

Golf Course Community

Structural Plate

Shape Versatility

SHAPES			STRUCTURE SIZE RANGES - INSIDE SPAN X RISE MULTI-PLATE® *6" x 2" Steel*	BridgeCor® *15" x 5.5" Steel*	ALSP *9" x 2.5" Aluminum*
Round		min.	5'-0"	19'-11"	6'-0"
		max.	26'-0"	50'-6"	21'-0"
Vertical Ellipse		min.	4'-8" x 5'-2"		4'-8" x 5'-2"
		max.	25'-0" x 27'-8"		20'-1" x 22'-3"
Underpass		min.	12'-2" x 11'-0"		12'-1" x 11'-0"
		max.	20'-4" x 17'-9"		20'-5" x 17'-9"
Single Radius Arch		min.	6'-0" x 1'-10"	19'-7" x 9'-9"	5'-0" x 1'-9"
		max.	26'0" x 13'1"	54'-4" x 27'-2"	23'-0" x 11'-11"
Two Radius Arch		min.		18'-5" x 8'-4"	
		max.		50'-7" x 19'-11"	
Horizontal Ellipse		min.	7'-4" x 5'-6"		9'-2" x 6'-8"
		max.	14'-11" x 11'-2"		14'-11" x 11'-2"
Pipe Arch		min.	6'-1" x 4'-7"		6'-7" x 5'-8"
		max.	20'-7" x 13'-2"		21'-11" x 14'-11"
Low-Profile Arch SUPER-SPAN™ / SUPER-PLATE®		min.	19'-5" x 6'-9"		19'-5" x 6'-9"
		max.	45'-0" x 18'-8"		38'-8" x 15'-9"
High Profile Arch SUPER-SPAN™ / SUPER-PLATE®		min.	20'-1" x 9'-1"		20'-1" x 9'-1"
		max.	35'-4" x 20'-0"		35'-5" x 20'-0"
Horizontal Ellipse SUPER-SPAN™ / SUPER-PLATE®		min.	19'-4" x 12'-9"		19'-4" x 12'-9"
		max.	37'-2" x 22'-2"		37'-3" x 22'-2"
Pear-Arch SUPER-SPAN™		min.	23'-11" x 23'-4"		
		max.	30'4" x 25'10"		
Pear SUPER-SPAN™		min.	23'-8" x 25'-5"		
		max.	29'-11" x 31'-3"		
Box Culvert		min.		17'-6" x 6'-10"	8'-9" x 2'-6"
		max.		35'-4" x 13'-11"	35'-3" x 13'-7"

Custom sizes and shapes are available. Not available.

CONTECH ENGINEERED SOLUTIONS

Structural Plate

Durability

Contributing factors of long-term durability

- pH
- Resistivity
- Hardness
- External contaminants
  - Deicing salts
  - Agricultural chemicals
- Abrasion Levels

STEEL

$6.0 \leq pH \leq 10.0$

Resistivity > 2,500 ohm-cm

ALUMINUM

$4.0 \leq pH \leq 9.0$

Resistivity > 500 ohm-cm

NCSPA.org for Service Life Calculator

- Based on CALTRANS/AISI studies of CSP

Buried bridges designed without inverts

Improves overall durability

Eliminates potential invert corrosion

Quality backfill aids in durability

Impermeable membranes over structure

Structural Plate

End Treatments

Metal headwall

Concrete headwall

Aluminum headwall

MSE Panel wall

Step-beveled end

Wire-face basket

CONTECH STRUCTURAL PLATE

Silver Dollar City Ped Tunnel / Branson, MO

CONTECH STRUCTURAL PLATE

Cooper County Culvert Replacement / Boonville, MO

CONTECH STRUCTURAL PLATE

Kaw Valley WTP - Lawrence, KS

CONTECH STRUCTURAL PLATE

Emergency Bridge Replacement
Chilhowee, MO

CONTECH STRUCTURAL PLATE MoDOT US61 / Oak Ridge, MO

CONTECH STRUCTURAL PLATE Shepherd of the Hills Expressway / Branson, MO

Precast Concrete Arches

CON/SPAN -SERIES

CON/SPAN BRIDGE SYSTEMS

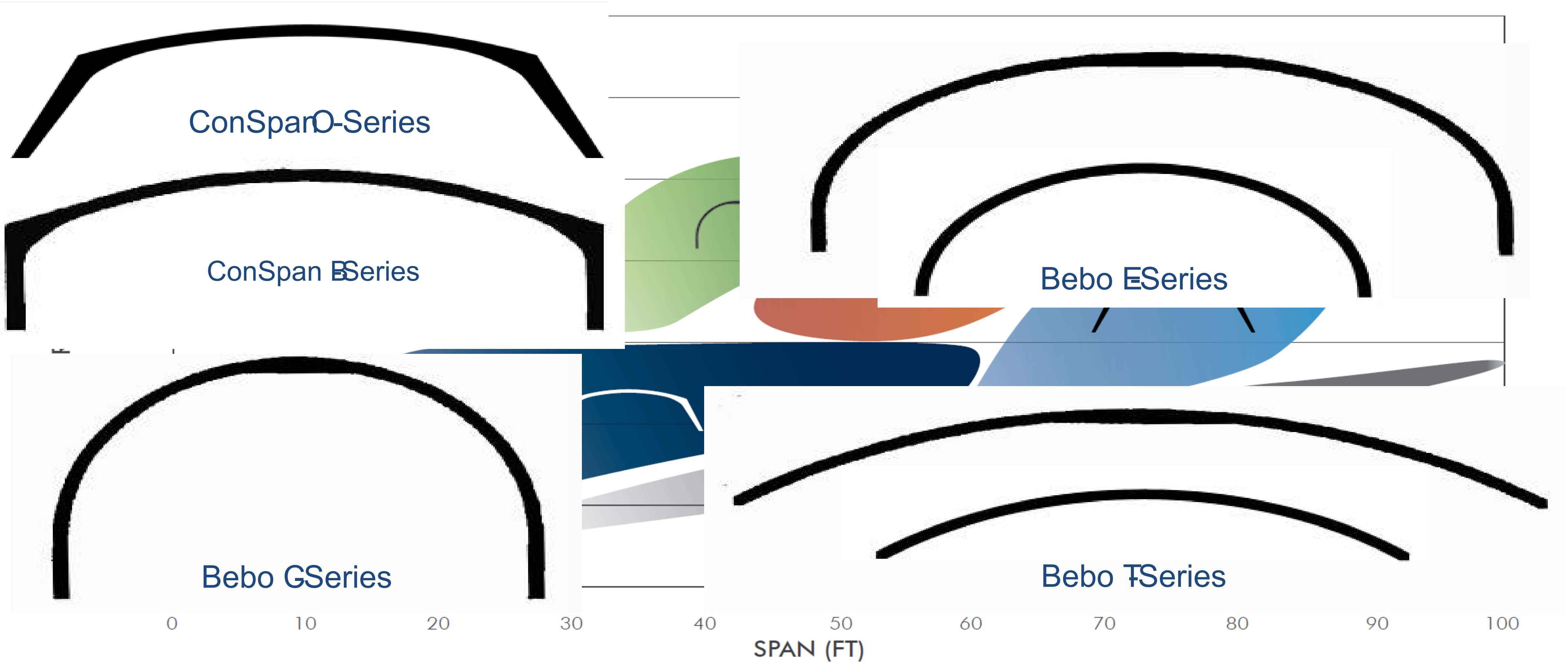
BEBO Arch Systems

Precast Concrete Arches

Modular Components

Precast Concrete Arches

Available Shapes



Precast Concrete Arches

End Treatments


MSE large block headwall


Concrete headwall w/ formliner


Concrete headwall w/ rock face


Precast headwall


MSE panel wall


Precast headwall w/ formliner

CON/SPAN BRIDGE SYSTEMS Howell St / Cape Girardeau, MO

CON/SPAN BRIDGE SYSTEMS MoDOT Hwy 67 / Bonne Terre, MO

BEBO Arch Systems

Kansas Expressway / Springfield, MO

CON/SPAN® BRIDGE SYSTEMS Corby Parkway / St. Joseph, MO


CON SPAN
BRIDGE SYSTEMS
St. James Bridge / Hollister, MO

Big R Modular Rolled Girder

Modular Bridges – Accelerated Construction

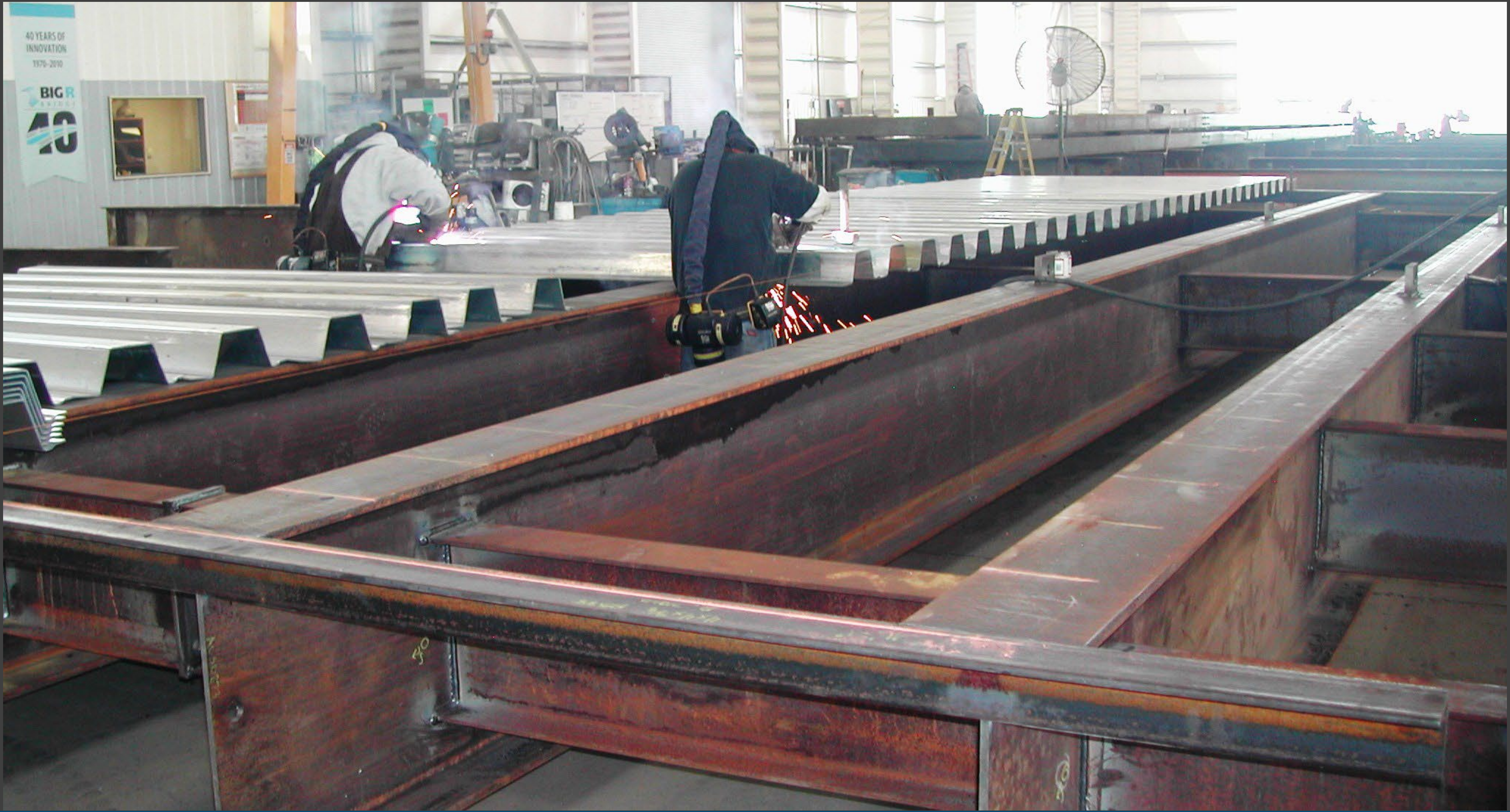
BIG R BRIDGE

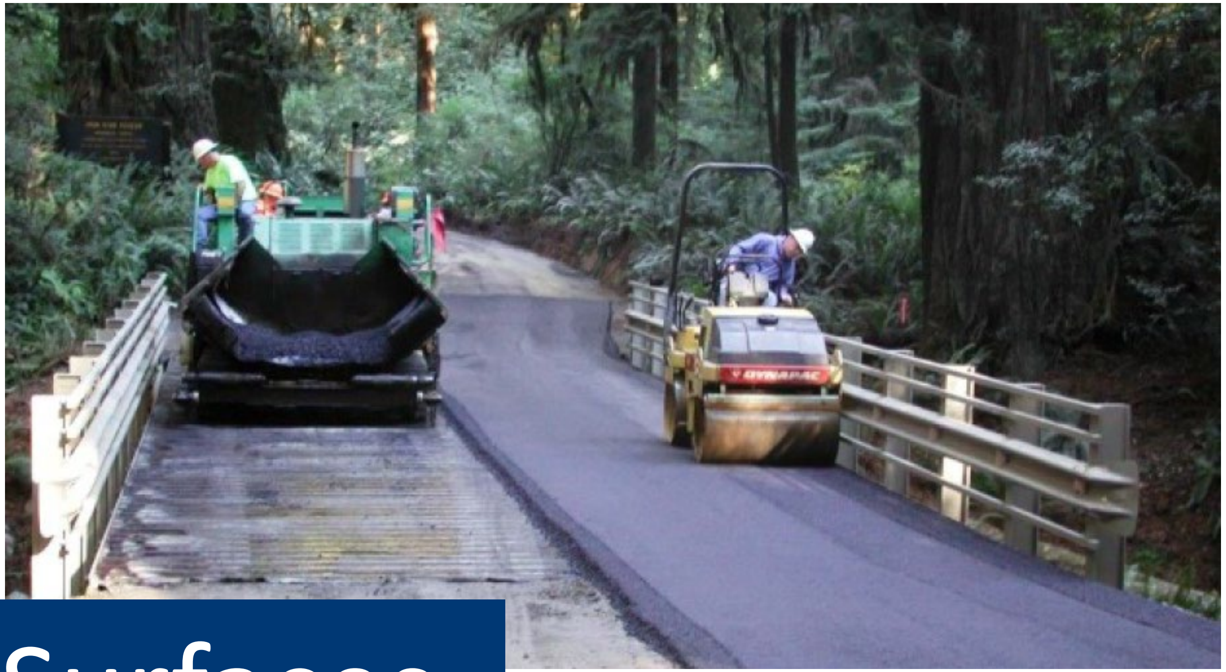
Why Modular?

- Extremely cost-effective
- Ships and installs quickly
- Easy to customize
- Many rail and deck options
- Light-weight compared to concrete
- Great for heavy-duty vehicle loading
- Available in any width, standard single lane is 14’ or 16’
- Lengths from 10’ to 140’
- A selection of Contech abutment systems
- Adaptable for use as pedestrian bridges
- AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017

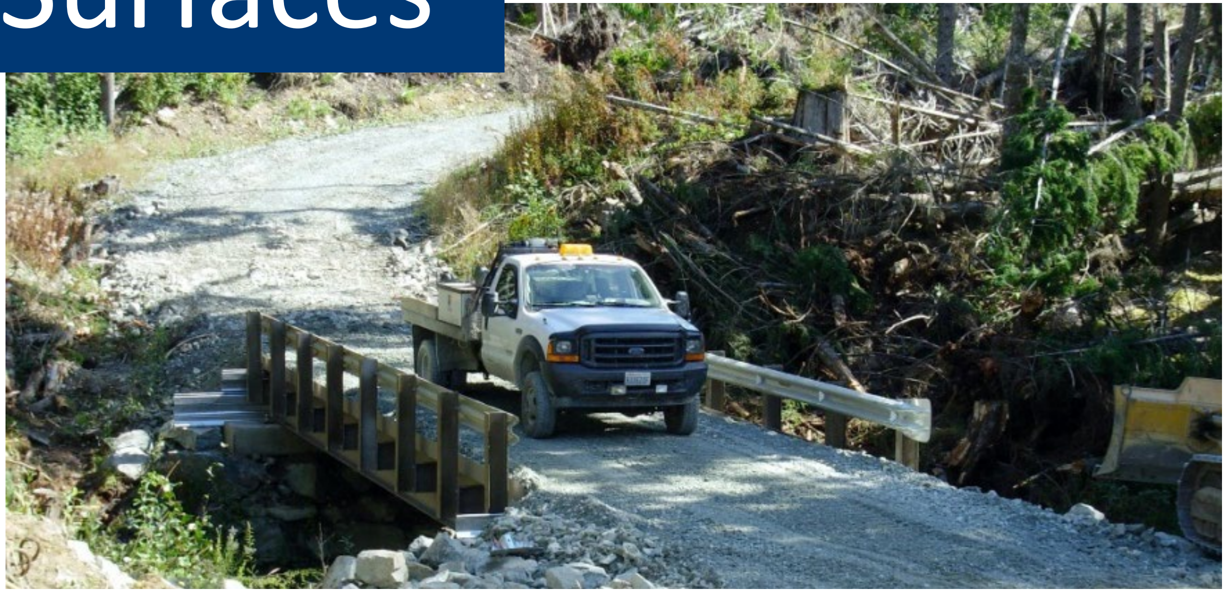
Deck Systems

Corrugated Steel


40 YEARS OF
INNOVATION
1970-2010
BIG R
40



Wearing Surfaces



CIP Concrete – Composite or Non-Composite

Railing Options

BIG R BRIDGE

Big R Custom Rolled Girder

BIG R BRIDGE

Rail Project – La Grande, OR

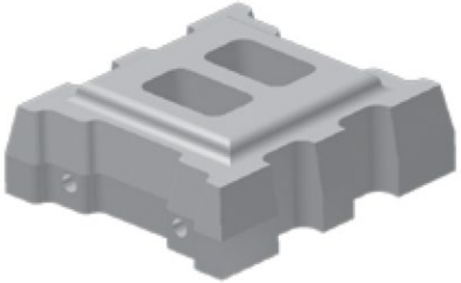
Dermody Elmhurst
Kimley-Horn & Associates
Elmhurst, IL

BIG R BRIDGE

Big Springs Road
C2RL Engineers
Maryville, TN

Armortec Hard Armor Solutions

Armortec Hard Armor Solutions



Armorflex

A-Jacks

XBlocPlus

ArmorFlex Articulated Concrete Blocks

INVERT PROTECTION

SCOUR PROTECTION

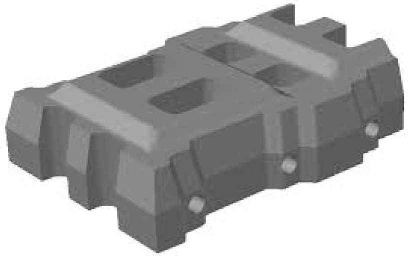
DAM OVERTOPPING

CHANNEL LINING

ARMORTEC
Erosion Control Solutions

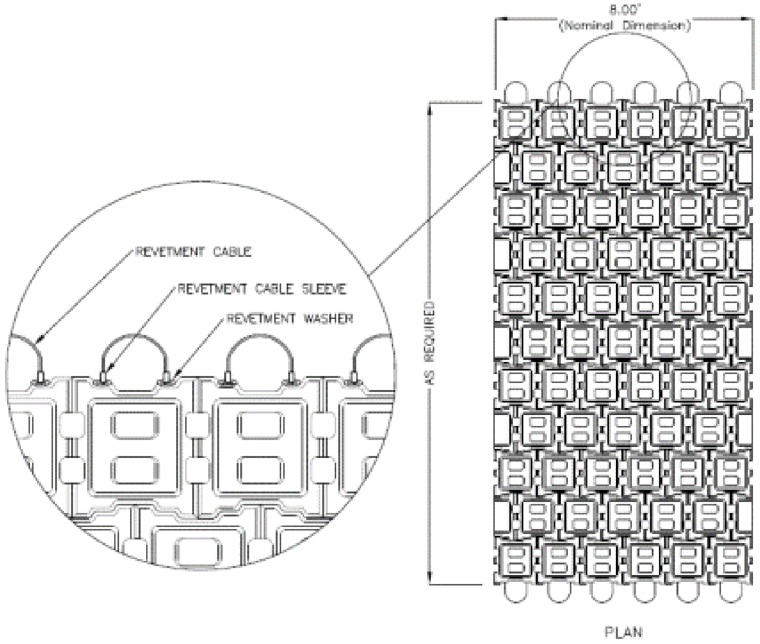
Closed-Cell Block

Open-Cell Block

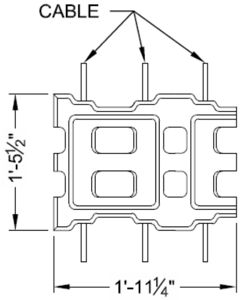


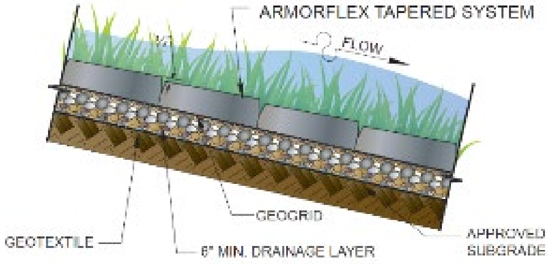
Block & a Half

ArmorFlex



TYPICAL ARMORFLEX MAT
NOT TO SCALE

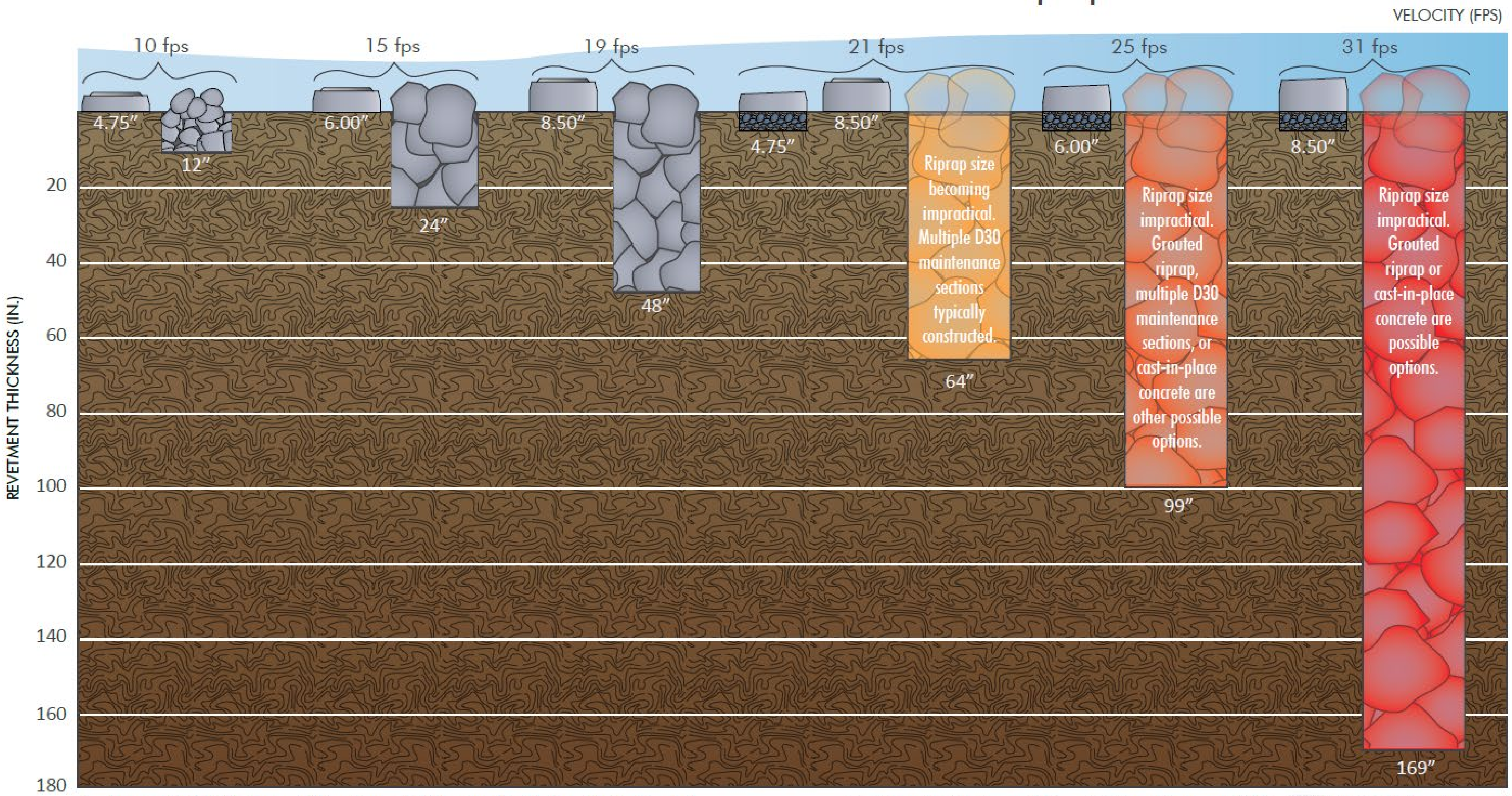




- Flexible, interlocking matrices of concrete blocks
- Uniform size, shape, and weight
- Specific Hydraulic capacities substantiated by ASTM Testing

- Mattresses or Hand-Placed Blocks
  - 4 Thicknesses (4.75”, 6”, 7.5”, 8.5”)
  - 3 Footprints (0.98 sf, 1.77 sf, 2.58 sf)
  - 3 Types (Open, Closed, Tapered)
  - Block and a Half

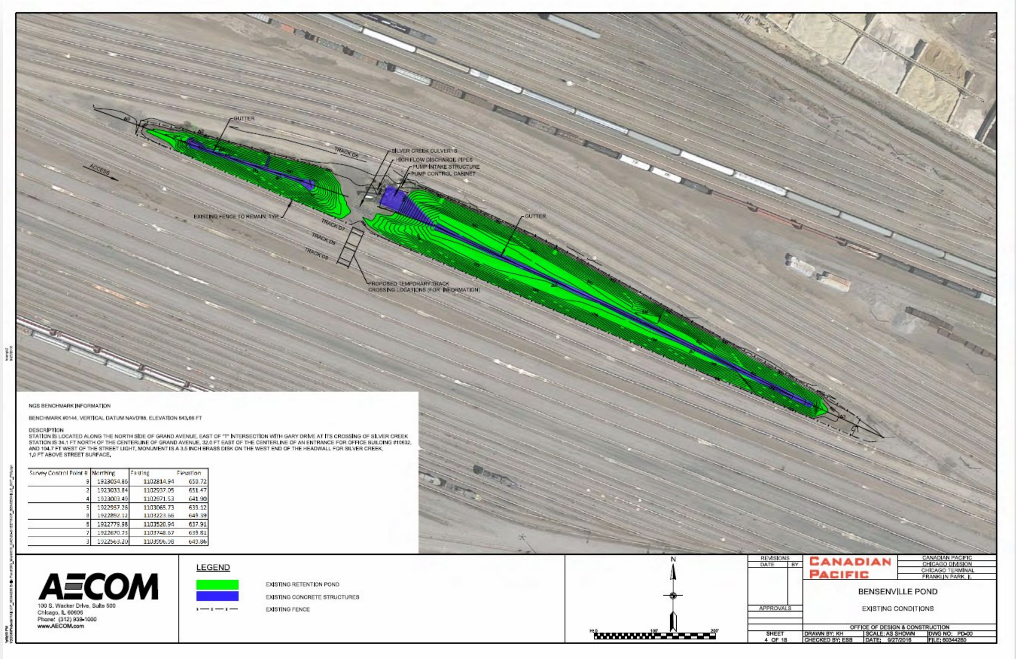
ArmorFlex® ACB vs Traditional Riprap*



* *Assume 4H:1V sideslopes, 2% bedslope, 15ft. bed width, 3ft. flow depth, FS =1.5*

Canadian Pacific Rail Yard

Chicago, Illinois



Design Challenges
- Armoring of a stormwater detention pond
- Approximately 51,000 square feet of coverage area

Solution
- Class 45s Armorflex Closed-Cell Block

Support
- Contract drawings
- On-site installation assistance

Outcome
- Permanent, easy-to-install and cost-effective erosion system

CONTECH ENGINEERED SOLUTIONS
A QUIKRETE® COMPANY

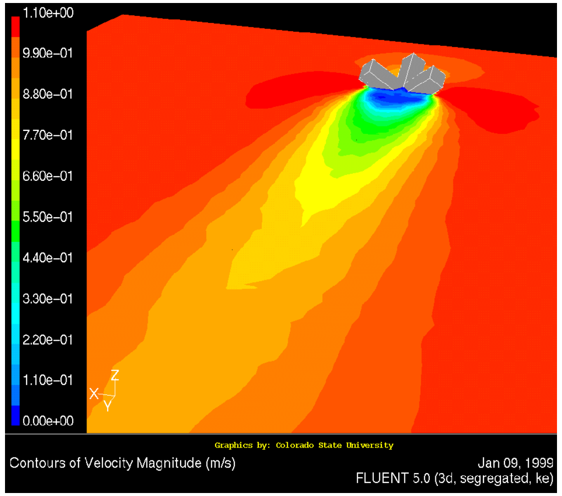
A-Jacks Concrete Armor Units

Bridge Scour – The Issues






A-Jacks Concrete Armor Units



- Interlocking, high stability armoring unit
- Palletized Sipments
- Random or uniform installation
- Hand Placed or Bundled Placement
- Rough layer (manning's n=0.1)
- Full Scale Testing
- Sizes
  - 2', 4', 6', 8', & 10'

Applications






A- Jacks vs. Riprap

- Riprap
  - Assume velocity = 18 fps
  - Class VIII (1-ton) riprap – 6.3’ deep
  - 640 tons of riprap at 60$/ton = $38,400
- A-Jacks
  - Truckload (approx. 540) A-Jacks = $17,280
  - Approx. cost to install = $5 x 540 = $2,700
  - **Total installed cost under $20,000**

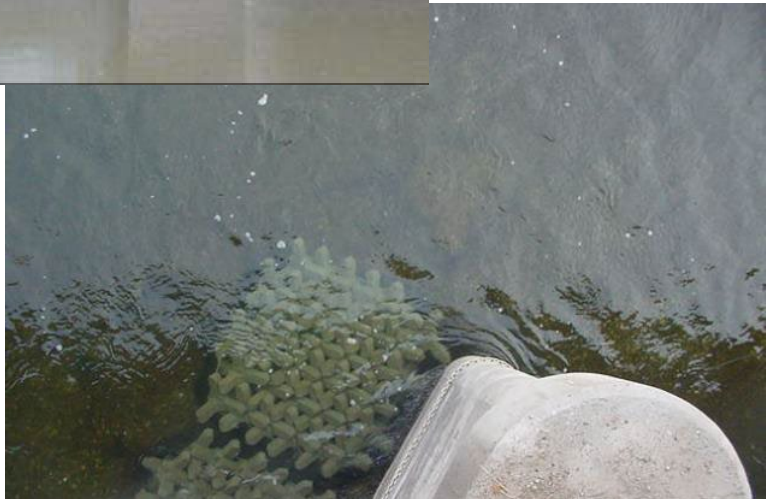
Installation

A- Jacks Installation Techniques

Typical Installation:

- 1,000 units per day
- 4-person crew
    - 1 Operator
    - 2-3 Installers
- Key is the delivery of pallets to the point of use and assembly
- Delivery of pallets with a skid-steer or telehandler works well

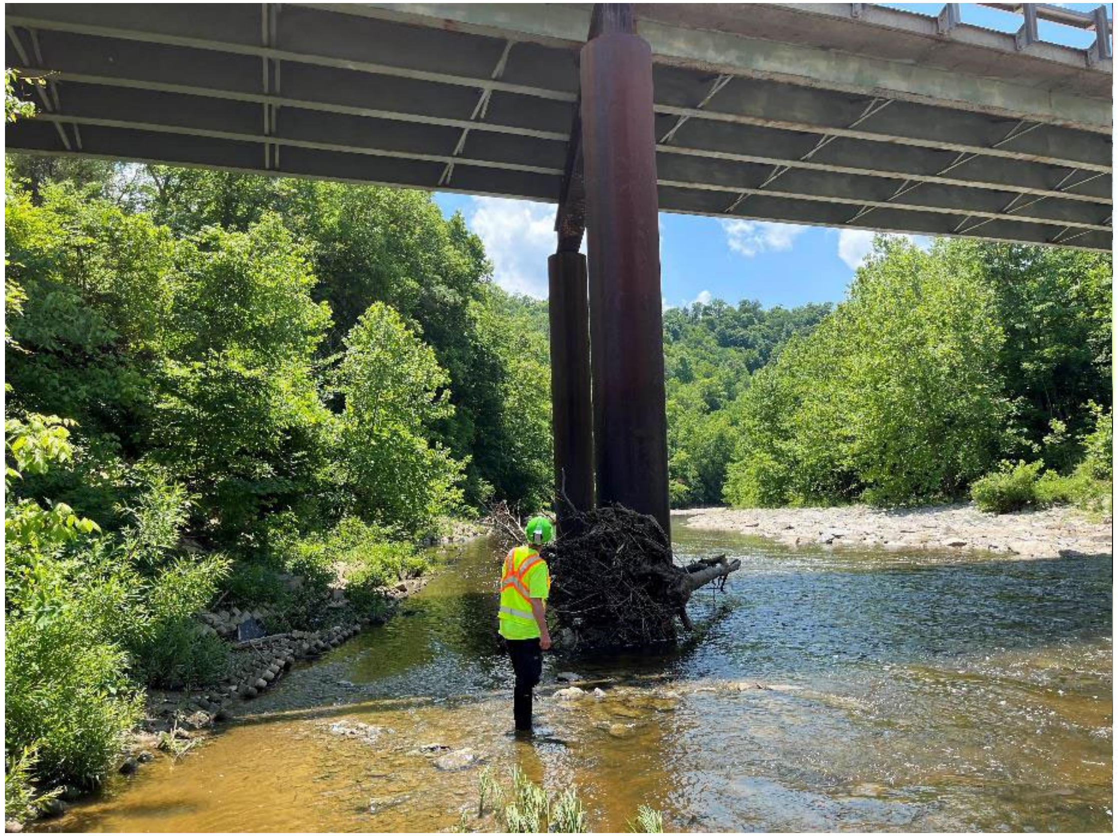
A- Jacks Installation Techniques



Project Profiles

SR221 ODOT

Brown County, Ohio



Situation

- Bridge due for replacement in 5 years
- Abutments compromised due to excess bank erosion
- Needed maintenance-free solution

Solution

- 24” A-Jacks installed along the toe and partially up the bank
- Delayed replacement an additional 7 years beyond planned
- A-Jacks still in place, protecting new structure

TN DOT I-155 Bridge

TN / MO Mississippi River Bridge

Design Challenges
- Deep / Dangerous Water
- No Visibility
- No Ability to dewater

Solution
- 48” A-Jacks for pier scour

Support
- Specifications
- On-site installation assistance

Outcome
- Jensen Construction completed on time and on budget

Spring Creek Bridge

Ozark County, Missouri

Design Challenges
- Erosion at toe of bridge abutment
- Labor from Department of Corrections

Solution
- 24" A-Jacks for Streambank Stabilization

Support
- Specifications
- On-site installation assistance

Outcome
- 6 laborers installed system in less than 2 days

CONTECH®
ENGINEERED SOLUTIONS
A QUIKRETE® COMPANY

Helpful Tools

Building Blocks to a Successful Project

Solution Development

Design Support

Installation

Project Site Parameters

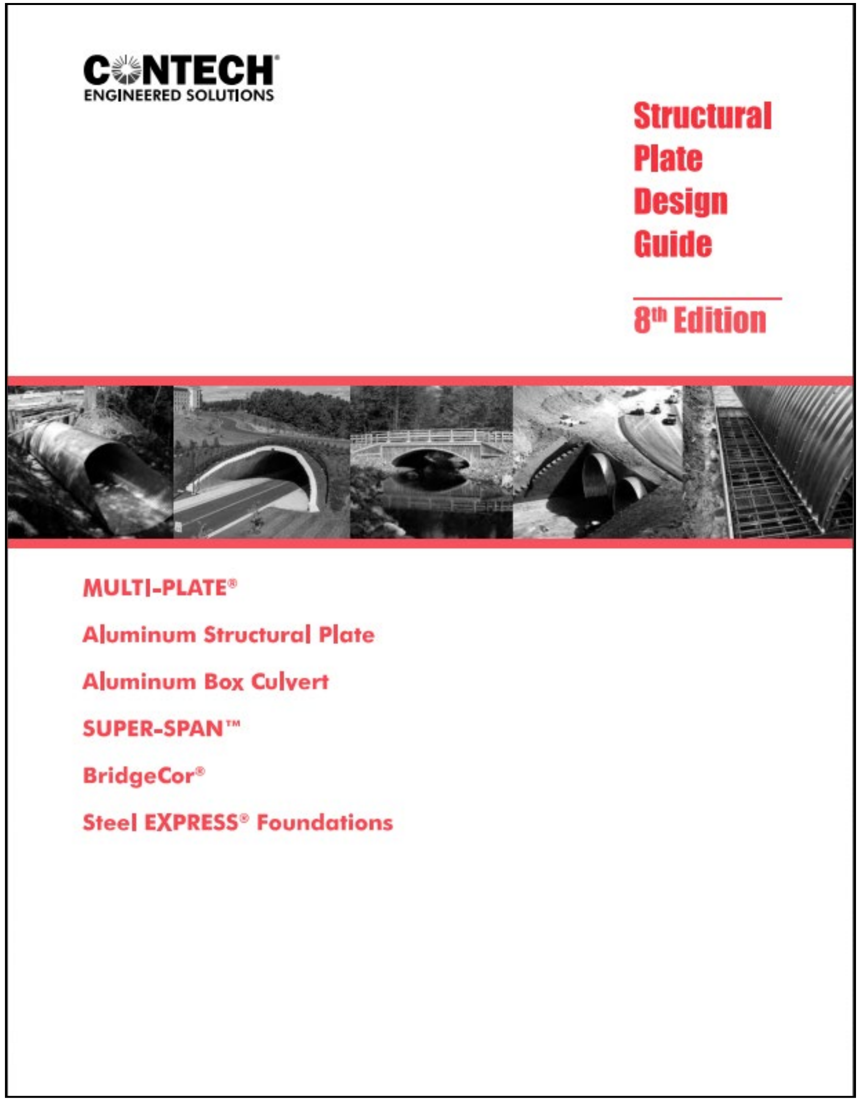
- Span and Rise
- Hydraulic or Clearance Box Requirements
- Environmental Compliance
- Geotechnical Data
- Type of Roadway
- Aesthetic Preferences
- Utilities
- Budget
- Schedule

Structural Plate Design Guide

Structural Plate Technical Information

- Primary resource for structural plate
  - Design processes
  - Service life design guidance
  - Product details
  - Specifications
  - Design details for structure shapes
    - Max./min. height of cover information
    - Structure Plate make-up
    - Plate gage/thickness requirements
    - Reinforcing rib size/spacing

- NCSPA- National Corrugated Steel Pipe Association
  - Service life calculator (www.ncspa.org)



A- Jacks Design

CONTECH ENGINEERED SOLUTIONS

A-Jacks® Pier Scour Design Guide

Overview

The ability of an A-Jacks matrix to dissipate energy and resist the erosive forces of flowing water allows the system to protect channel boundaries from scour and erosion. Extensive laboratory testing has been performed on both model and full-scale units to determine hydraulic properties and evaluate the stability of the A-Jack units. Field tests confirmed that the A-Jacks system provides a flexible, non-erodible barrier between the channel subgrade and potentially damaging flow of water. This A-Jack Pier Scour Design Technical Note reviews the design approach as outlined in FHWA Hydraulic Engineering Circular No. 23 (HEC-23), Design Guideline 19: Concrete Armor Units. An example is included to illustrate the design procedure.

FHWA HEC-23

The design approach detailed in HEC-23 (FHWA, 2009) examines the A-Jack system in modules, also called bundles. Modules are created by banding individual A-Jacks together in a densely interlocked matrix as shown in Figure 1. Multiple module sizes can be configured and evaluated to meet project specific needs by varying the length (L) and width (B) as defined and illustrated in Figure 1 where L is parallel to flow.

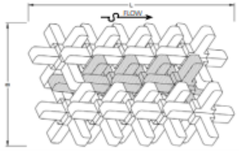


Figure 1: A-Jacks Module Plan View

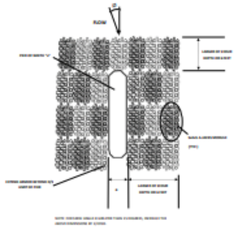


Figure 2: FHWA HEC-23

Placement

Placement of the A-Jack modules around piers is best accomplished using a rectangular pattern as illustrated in Figure 2. Orientation of the modules is recommended to be with the long dimension of the module parallel to the flow whereby providing the module a greater resisting moment. Embedment of the units will also provide greater stability since the exposed height (H_d), as defined in Figure 3, of the unit is smaller further reducing the overturning moment.

Hydraulic Stability

Hydraulic stability of an A-Jack module is estimated by setting the overturning moment, imparted by drag, equal to the resisting moment, a function of submerged weight (WS) and specific gravity (SG) of the module as illustrated in Figure 3 and defined in Equation 1. The drag coefficient (Cd) of 1.05 has been confirmed through physical hydraulic testing (FHWA, 2009).

$$F_d H_d = W_s (L/2) \qquad \text{(EQ.1)}$$

$$F_d = 0.5 C_d \rho A_1 v^2$$

$$A_1 = B \times H_d$$

$$W_s = W \times ((SG - 1)/SG)$$

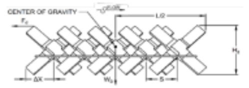


Figure 3: A-Jacks Section View with Force Diagram

Table 1 can be used to create custom module sizes to accommodate specific project needs. The dimensions for length and width can be designed using the Center-to-Center Spacing, S, and the ΔX dimension as defined in Equation 2 and shown in Table 1 and Figure 3.

Table 1: HEC-23 A-Jacks Parameters

A-Jacks System	Typical A-Jacks Weight (lbs)	Drag Coefficient, C_d	Center to Center Spacing, S (ft)	Height, H_d (ft)	ΔX (ft)
AJ-24	73.6	1.05	0.75	1.3	0.66
AJ-48	590.7		1.5	2.67	1.35

$$L \text{ or } B = [(\# \text{ of A-Jacks}) - 1] \times S + (2 \times \Delta X) \qquad \text{(EQ. 2)}$$

Bedding design considerations include incorporation of a stone bedding layer, geotextile, or both. When bedding stone is used as a filter, it must meet average size and gradation requirements to retain the native bed material. Requirements are given in HEC-23 to ensure that the stone will retain the bed material, dissipate excess pore water pressure, and be large enough to resist being removed through the legs of the A-Jacks. In some cases, multiple layers of stone may be required in order to satisfy all the criteria. A suitable geotextile may be placed directly on the channel bed with A-Jack modules placed atop the geotextile, thus eliminating the need for stone bedding. In strong currents a viable construction technique is to attach the geotextile to the bottom of the A-Jack modules. Design procedures for selecting a geotextile are provided in FHWA HEC-23, Design Guideline 16.

Design Example

A bridge crosses a 75-ft wide river where extensive scour has occurred at the bridge piers. The stream bed is 20-ft below the water surface and the upstream velocity is 16-ft/s. The calculated scour depth for the 100-yr flow is 12-ft. Select an appropriate A-Jack unit size for the project conditions.

Solution:

1. Calculate the Drag Force using a 4x3x4 module of 48" A-Jacks.
   $F_d = 0.5C_d \rho A v^2$
   $C_d = 1.05$
   $\rho = 1.94$ slugs/ft³
   $A = B \times H_d$
   $A = [((3-1) \times 1.5) + (2 \times 1.35)] \times 2.67$
   $A = 5.7 \times 2.67 = 15.22$ ft²
   $v = 16$ ft/s
   $F_d = 3{,}963$ lbs
2. Calculate the Overturning Moment.
   $F_d H_d$ = Overturning Moment
   $H_d = 2.67$ ft
   $F_d H_d = 10{,}569$ lb-ft
3. Calculate the Resisting Moment
   $W_s (L/2)$ = Resisting Moment
   $W = 11$ units x 590.7 lbs = 6,498 lbs
   $W_s = 6{,}498 \times ((2.083-1)/2.083)$
   $W_s = 3{,}379$ lbs
   $L/2 = 3.6$ FT
   $W_s (L/2) = 12{,}163$ lb-ft
4. Compare the Overturning and Resisting Moments
   $F_d H_d < W_s L_w$
   10,569 lb-ft < 12,163 lb-ft

   The 4x3x4 48" A-Jack module has sufficient capacity to resist the overturning moment.
5. Evaluate a 6x5x6 module of 24" A-Jacks.
   a. Calculate the Drag Force.
      $F_d = 0.5C_d \rho A v^2$
      $C_d = 1.05$
      $\rho = 1.94$ slugs/ft³
      $A = B \times H_d$
      $A = [((3-1) \times 0.75)+(2 \times 0.66)] \times 1.3$
      $A = 2.82 \times 1.3 = 3.7$ ft²
      $v = 16$FT/s
      $F_d = 964.7$ lbs
   b. Calculate the Overturning Moment
      $F_d H_d$ = Overturning Moment
      $H_d = 1.3$ ft
      $F_d H_d = 1{,}254$ lb-ft
   c. Calculate Resisting Moment
      $W_s (L/2)$ = Resisting Moment
      $W = 17$ units x 73.6 lbs = 1,251 lbs
      $W_s = 1{,}251 \times ((2.083-1)/2.083)$
      $W_s = 650.5$ lbs
      $L/2 = 2.54$ ft
      $W_s (L/2) = 1{,}649$ lb-ft
   d. Compare the Overturning and Resisting Moments.
      $F_d H_d < W_s L_w$
      1,254 lb-ft < 1,649 lb-ft

      The 6x5x6 24" A-Jack module has sufficient capacity to resist the overturning moment and therefore is also a viable design alternative.

CONTECH ENGINEERED SOLUTIONS

Building Blocks to a Successful Project

Solution Development

Design Support

Installation

DYOB® | Structural Plate

Design Your Own Structural Plate solutions.

Current product options include: Aluminum Box Culvert, BridgeCor®

Coming Soon!
MULTI-PLATE & ALSP

DYOB® | Precast

Design Your Own Precast solutions.

Current product options include: CON/SPAN® & BEBO®

DYOB® | Modular Rolled Girder

Design Your Own Modular Rolled Girder solutions.

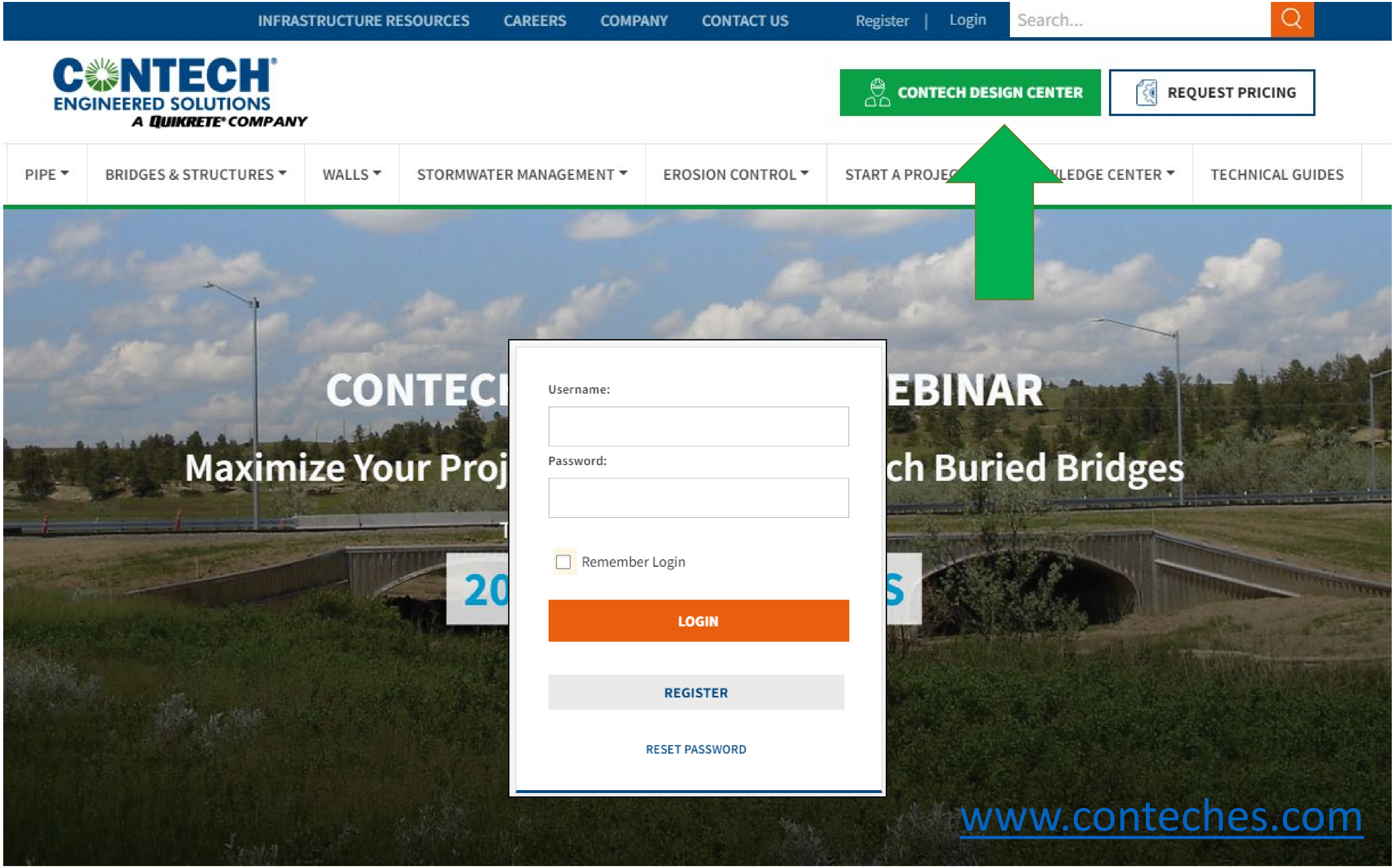
Current product options include: Big R EXPRESS Modular Rolled Girder

DYOB® | Truss

Design Your Own Truss solutions.

Current product options include: Continental Bridge® & Steadfast Bridges®

CONTECH® DESIGN CENTER



www.conteches.com

CONTECH ENGINEERED SOLUTIONS

CONTECH® DESIGN CENTER

DYO Project design made easy.

Big R Test

Auto-Generate Design Name

My Projects

Toolbox

Parameters | Product Info | Site Plan | Documents

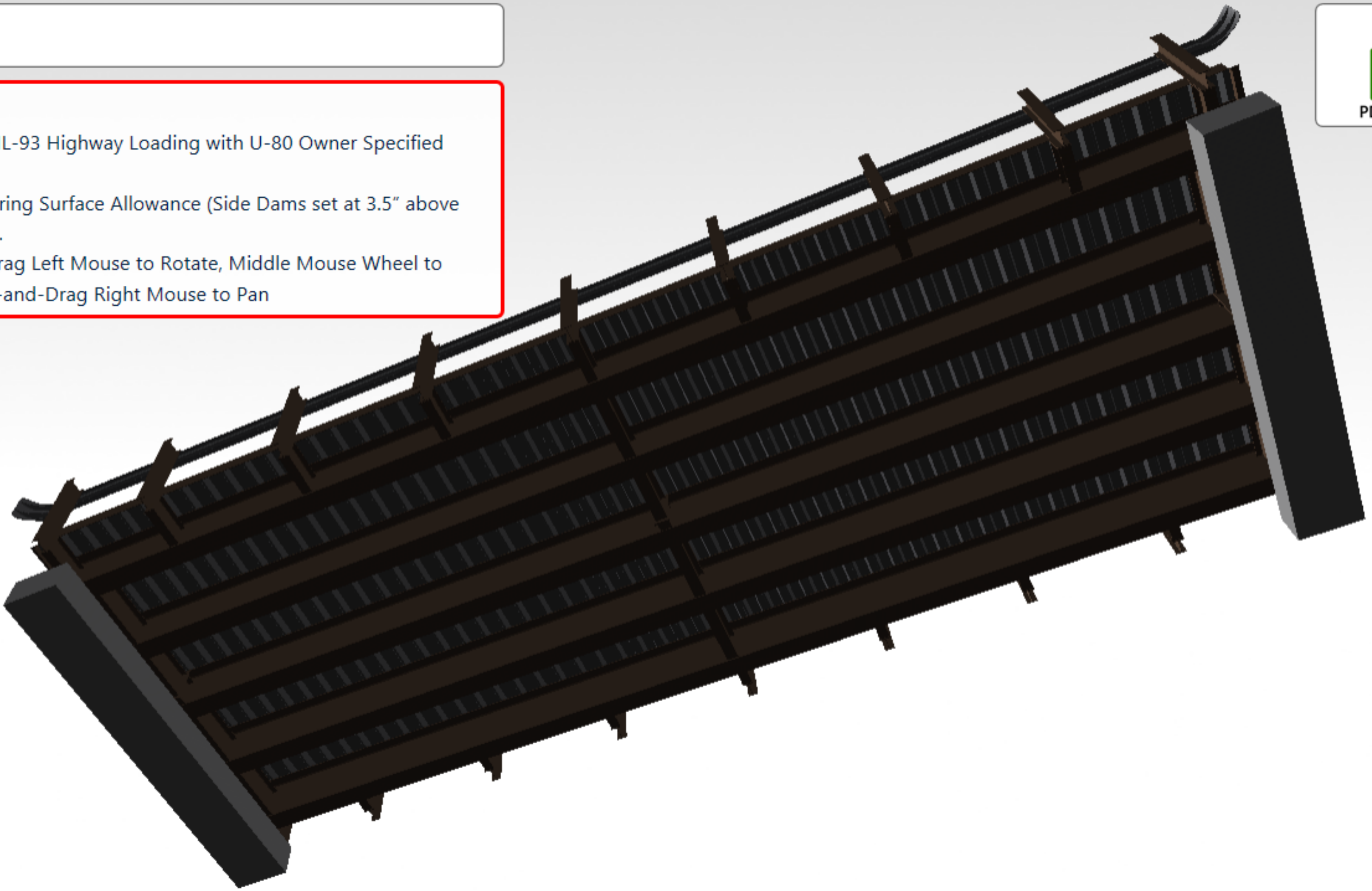
Click HERE to Generate new Structure

Structure Info

Deck Width (ft.) ⓘ	18
Structure Length (ft.) ⓘ	50
Bridge Plank Gauge ⓘ	9
Wearing Surface ⓘ	Asphalt
Bridge Rail Type ⓘ	W-Beam Gu
Abutment ⓘ	Sill by Conte
Backwall ⓘ	N/A

Messages:
- AASHTO HL-93 Highway Loading with U-80 Owner Specified Overload.
- 80psf Wearing Surface Allowance (Side Dams set at 3.5" above top of deck).

Click-and-Drag Left Mouse to Rotate, Middle Mouse Wheel to Zoom, Click-and-Drag Right Mouse to Pan



Export Options

PDF/DWG | 3D Model | Image

Save

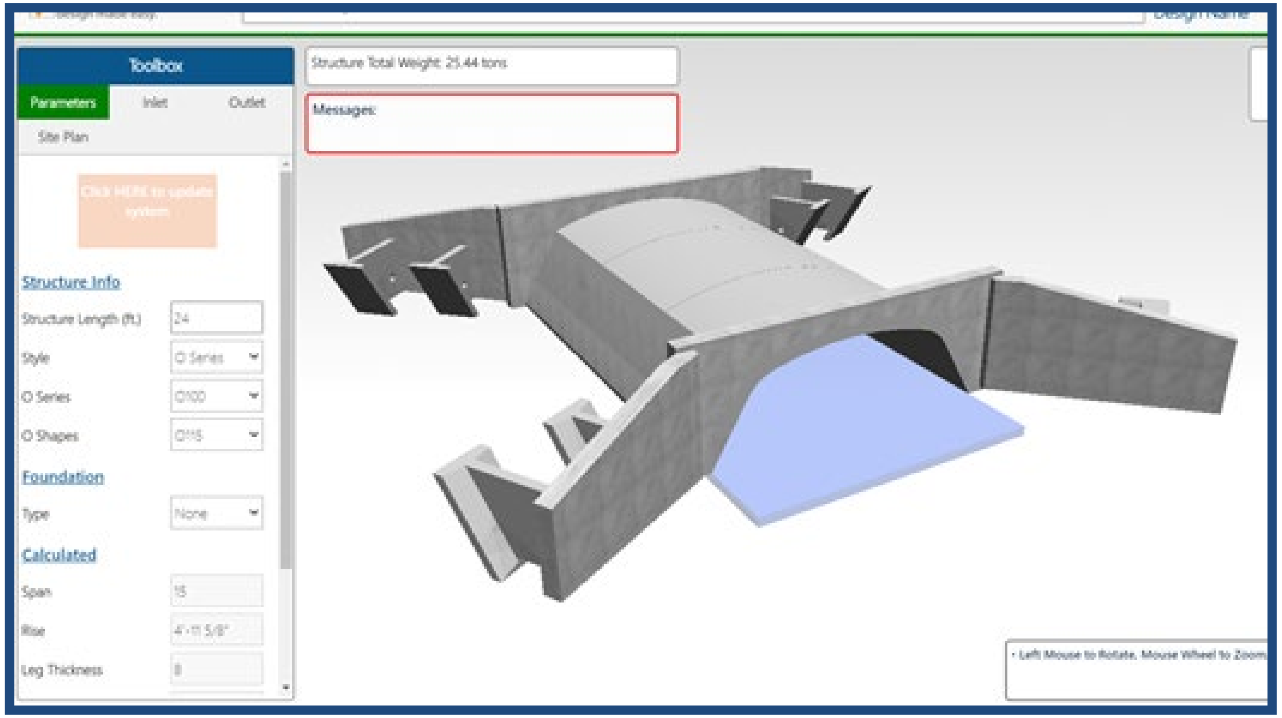
Default

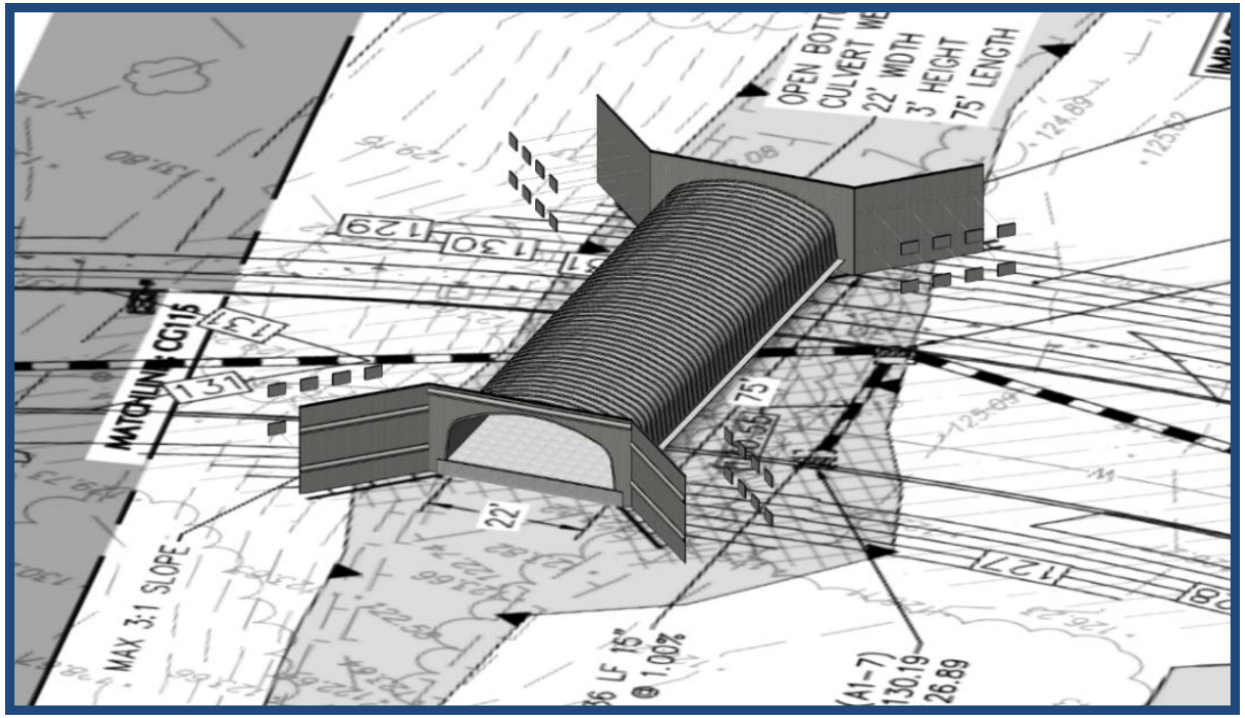
Measure

Move All

CONTECH ENGINEERED SOLUTIONS

CONTECH® DESIGN CENTER





Building Blocks to a Successful Project

Solution Development

Design Support

Installation

- Scope Letters and Installation Guides
- Attending Pre-Bid Meetings

- Preconstruction Meetings
- Onsite Technical Support Available (Field Consultant on all Precast Installations)

Contech. Your project partner.

- One-on-one Project Consultation
- More in-depth, technical information for a specific product or solution
- Schedule a presentation series, covering tailored topics each month
- Help with tools such as DYOB (Design Center) and Structural Plate Design Guide
- Provide preliminary estimates
- Assist with plans and specifications

Options & Support

Specific to Your Project Needs

Kimberly.Cimarolli@ContechES.com 314-807-3023