



# SSSBA Pre-Fabricated and ABC Steel Bridge Showcase

Dr. Michael Barker, PE  
University of Wyoming  
SSSBA Education Director

Structural Engineers Association  
of New Mexico  
August 18, 2021



# Accelerated Bridge Construction (ABC)

---

FHWA (<http://www.fhwa.dot.gov/bridge/abc/>):

“ABC is bridge construction that uses innovative **planning, design, materials, and construction methods** in a safe and cost-effective manner to reduce the onsite construction time that occurs when building new bridges or replacing and rehabilitating existing bridges.”

## ABC improves:

- Site Constructability
- Total project delivery time
- Work-zone safety for the traveling public

## ABC reduces:

- Traffic Impacts
- Onsite construction time
- Weather-related time delays

# Fabricator & Manufacturer Bridge Solutions Showcase

---

## Overview

Short Span Steel Bridge Alliance (SSSBA)

Accelerated Bridge Construction Case Studies

Panel Beam Bridge – Acrow

Modular Beam – Quality Bridge & Fab

Press-Brake Tub Girder – US Bridge / SPS N. Amer

Modular Beam Bridge - Contech

Buried Steel Structure – Big R

Modular Beam Bridge - TrueNorth

Standardized Truss Bridge - US Bridge

Modular Rolled Beam – Wheeler

Lateral Slide Bridge - Delongs

Short Span Steel Bridge Alliance: [www.ShortSpanSteelBridges.org](http://www.ShortSpanSteelBridges.org)

# Short Span Steel Bridge Alliance

A group of **bridge and buried soil structure** industry leaders who have joined together to provide **educational information** on the design and construction of short span steel bridges in installations up to **140 feet in length**.



# Short Span Steel Bridge Alliance

Education (webinars, workshops, forums, conferences)

Technical Resources (standards, guidelines, best practices)

Case Studies (Economics, Steels cost effective)

Simple Design Tools (eSPAN140)

Answering Questions (Bridge Technology)

Prefabricated Bridge Manufacturers (industry contacts)

Innovative & ABC Design



eSPAN140™



# eSPAN140 - Standard Designs for Short Span Steel Bridges

[www.ShortSpanSteelBridges.org](http://www.ShortSpanSteelBridges.org)

---

## Goal:

- Economically competitive (repetitive details and member sizes)
- Expedite the design process
- Homogeneous plate girders
- Lightest weight rolled beams
- Limited depth rolled beams

## AASHTO LRFD Bridge Design:

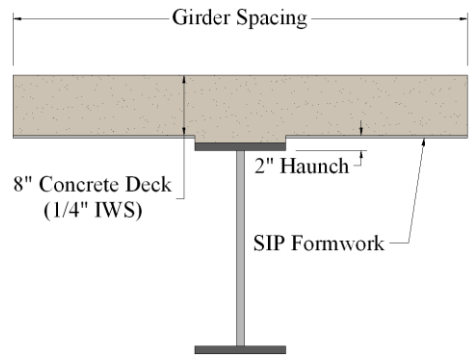
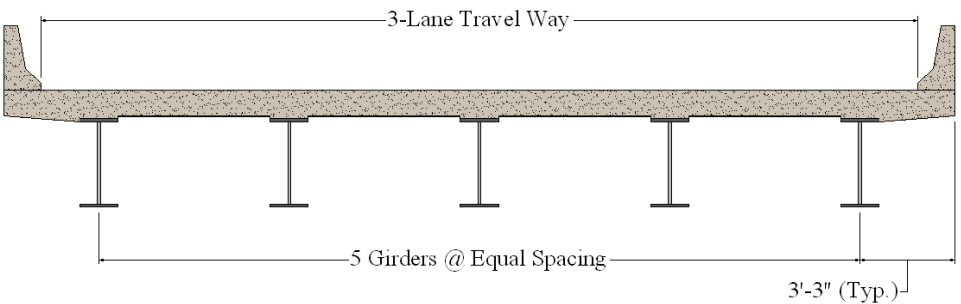
- Strength I,
- Service II,
- Fatigue,
- Constructability,
- $L/800$  Deflection
- HL-93 Vehicular Live Loading

# eSPAN140 - Standard Designs for Short Span Steel Bridges

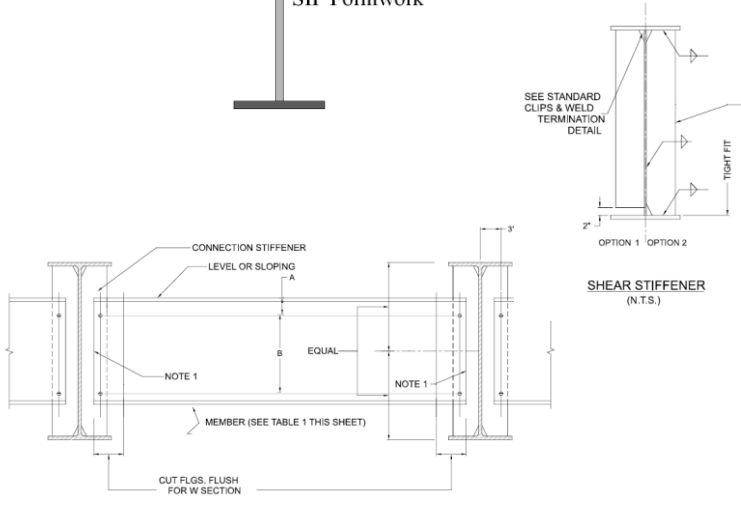
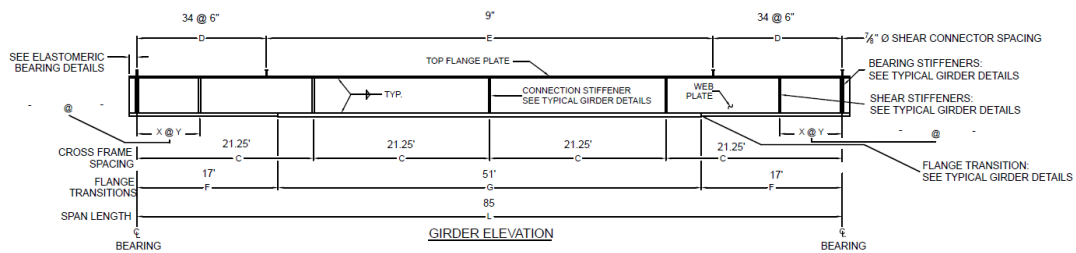
[www.ShortSpanSteelBridges.org](http://www.ShortSpanSteelBridges.org)

Span lengths 20 ft to 140 ft (in 5 ft increments)  
 Four girder spacing: 6'-0", 7'-6", 9'-0" and 10'-6",

For each of these increments: Steel girders, Shear stud & stiffener layouts, Welding and fabrication details, Elastomeric bearings, and Concrete deck design



COMPOSITE PLATE GIRDER WITH PARTIALLY STIFFENED WEB - 4 GIRDERS AT 8' 10" GIRDER SPACING, HOMOGENEOUS



# Pre-Fabricated Bridges – “Send Me A Bridge”

---

## **Benefits** (FHWA Resource Center: Prefabricated Bridge Elements & Systems)

**Time Savings:** concurrent fabrication, construction & less weather issues

**Cost Savings:** reduced construction time, reduced traffic delays

**Safety Advantages:** reduced exposure to hazards

**Increased Constructability:** elements constructed off-site and put in place

**Accelerated Bridge Construction:** for most of the manufacturer solutions

**Bridge-In-a-Box:** convenience and aesthetics for owners

**Now for the Showcase**



# Prefabricated Panel Beam Bridge

## Buquet Street Bridge over Terrebonne Bayou, Gibson, LA

Contractor: Gray Contracting

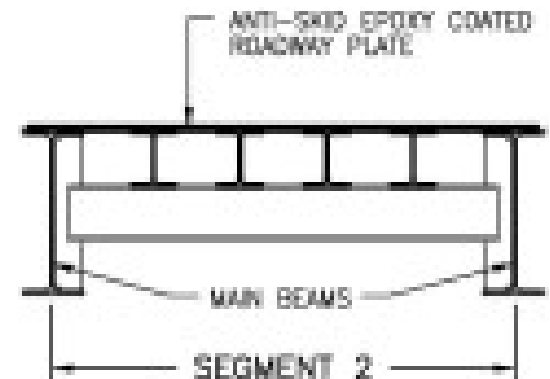
Fabricators: Acrow

90 ft with two 12 ft lanes

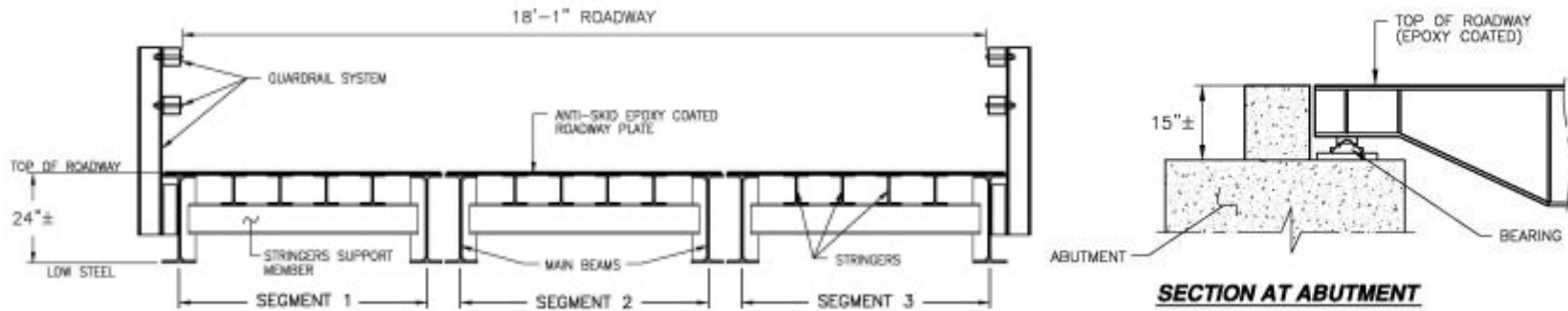
Standard AASHTO HL93 Loading



Parsippany, NJ



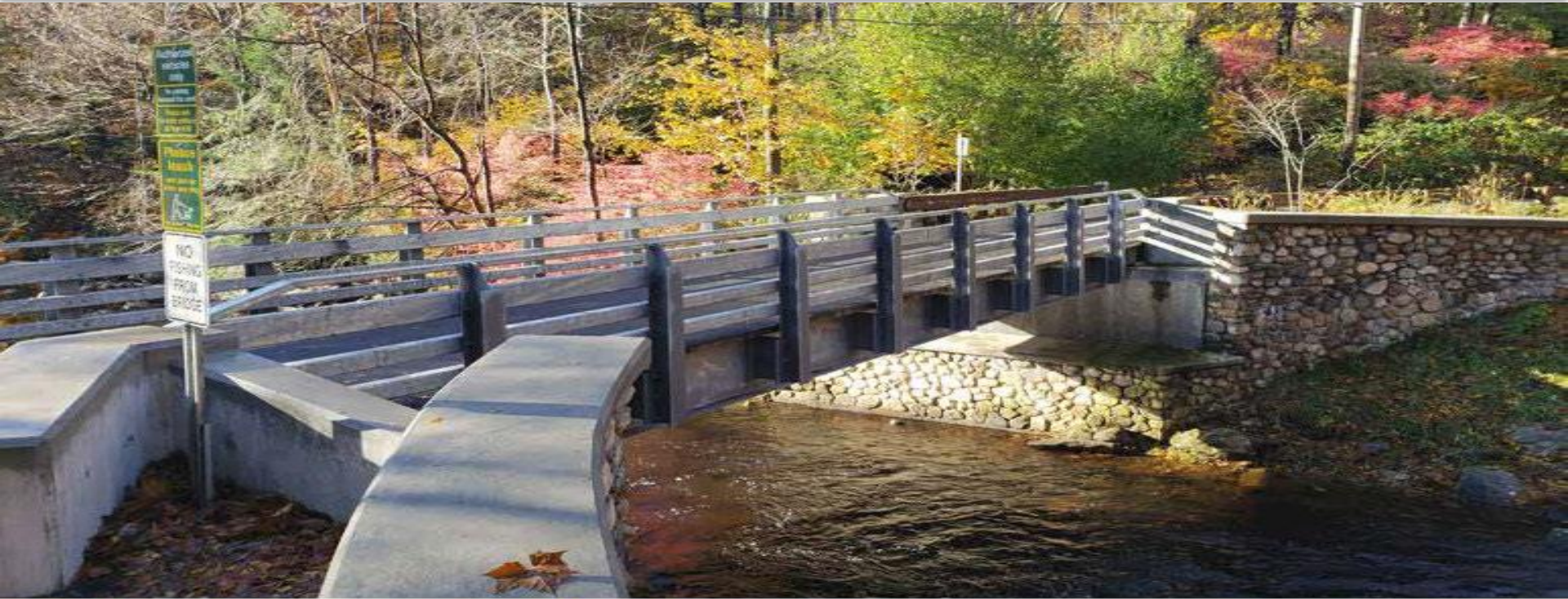
# Prefabricate Panel Beam Bridge



**18FT WIDE ACROW BEAM BRIDGE**



# Prefabricate Panel Beam Bridge



# Modular Beam

## SR 30, PennDoT Bridge Replacement

Contractor: Brayman Construction

Fabricator: Quality Bridge & Fab

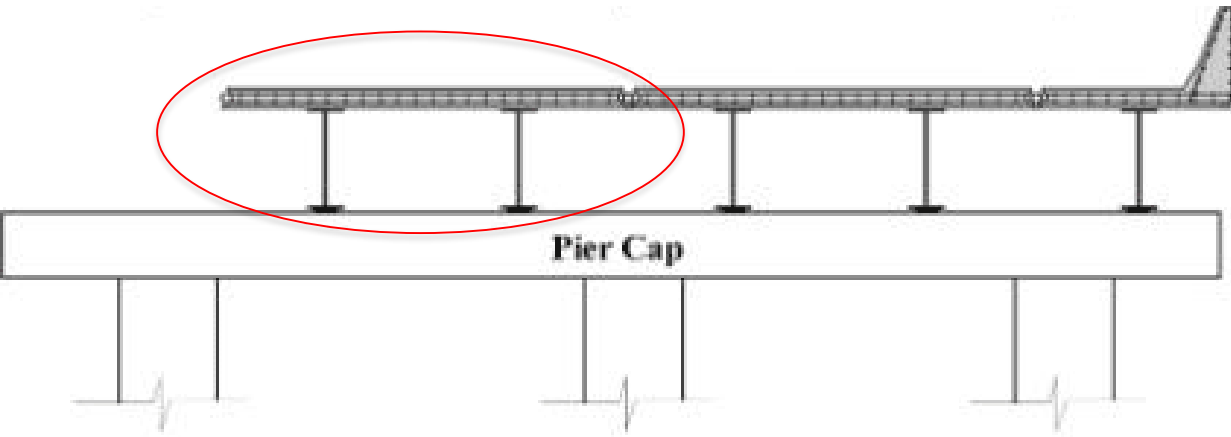


Saxonburg, PA  
&  
West Middlesex, PA

## Bridge Replacement including abutment work & approaches



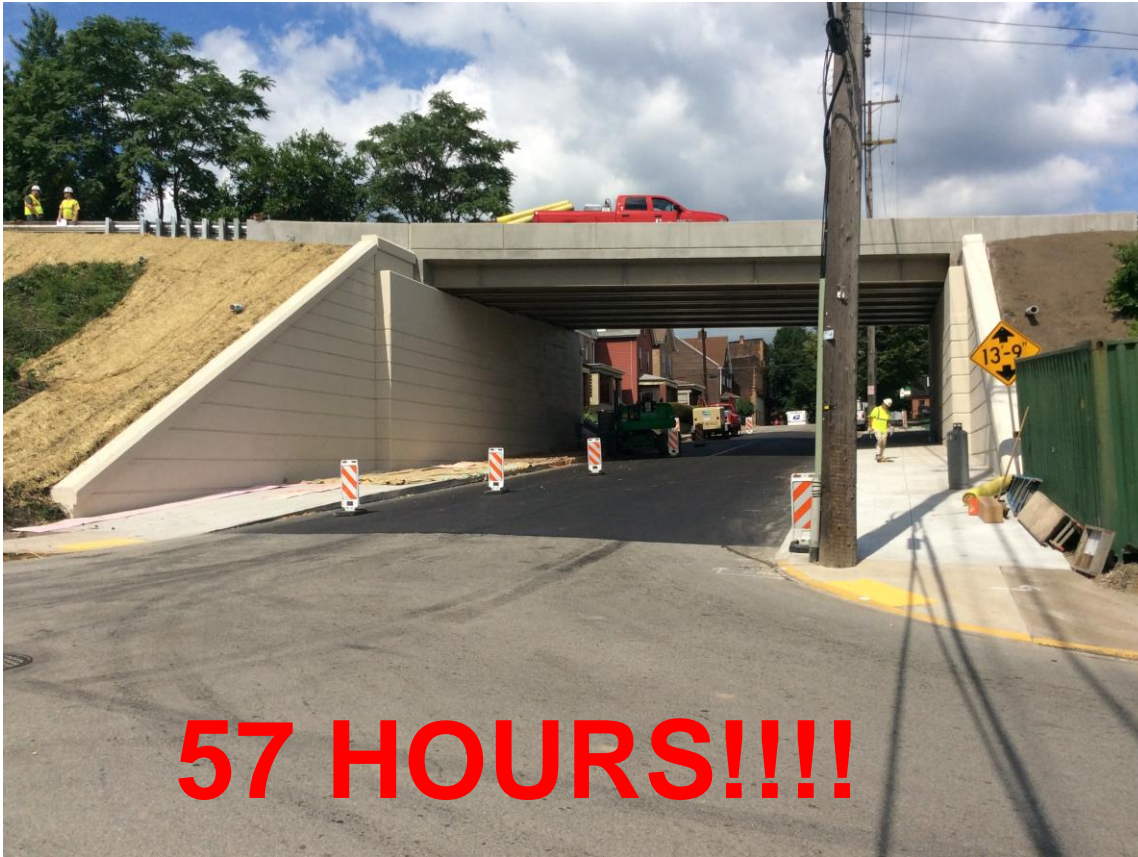
# Modular Beam



# Modular Beam



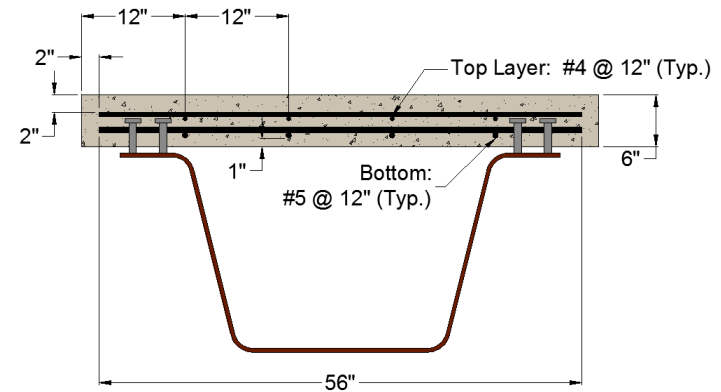
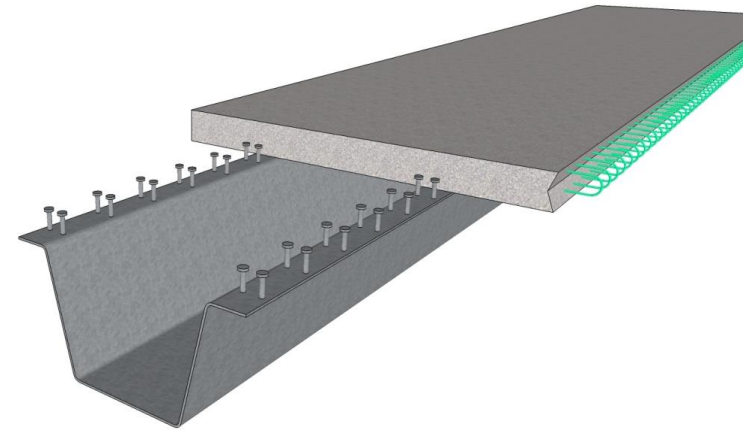
# Modular Beam



# Press-Brake Tub Girders / Folded Plate Systems

## Press-Brake-Formed Steel Tub Girders

- Developed within the technical working group of the Short Span Steel Bridge Alliance.
- Modules are joined using UHPC longitudinal closure pours
  - Girders can be galvanized or comprised of weathering steel.
- Modules can be shipped to site pre-topped or with a variety of deck options





# Press-Brake Tub Girder – Concrete Decks ABC Case Studies

Consultant: Con-Struct/Valmont



**CON**struct  
PRESS BRAKE FORMED STEEL TUB GIRDER BRIDGE

**valmont** 



**Mercer County, PA**  
**Full Depth P/C Deck Panels**  
**Grouted Pocket Composite**



**Monroe County, MI**  
**Pre-Decked Tub Girders**  
**2 Bridges in 3 Weeks**

# Press-Brake Tub Girder with Sandwich Plate Deck

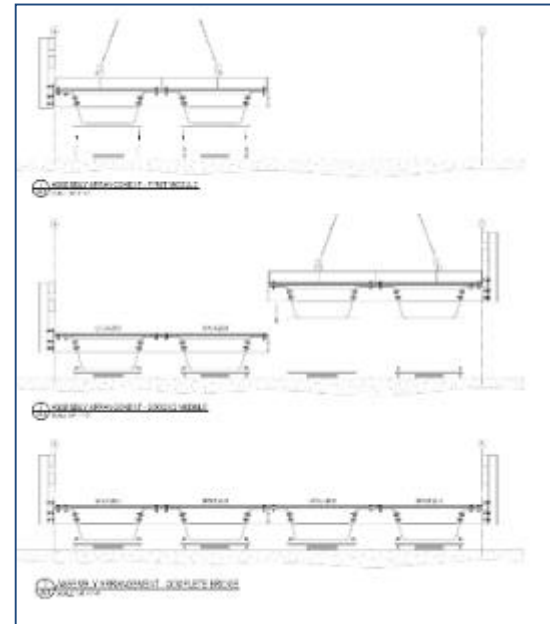
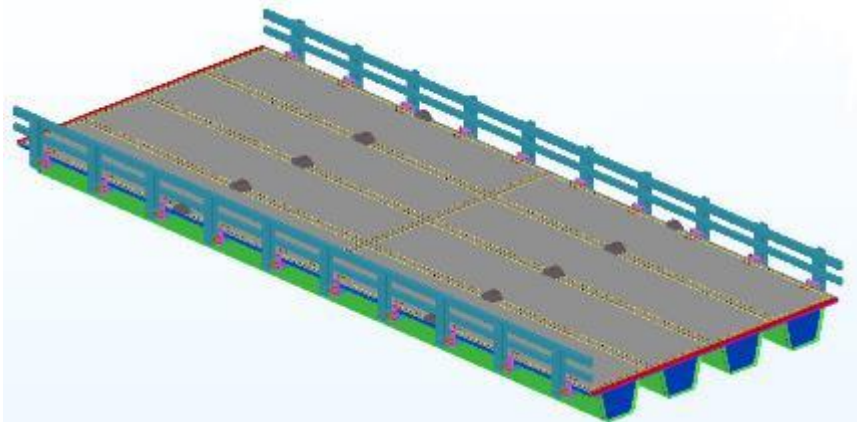
## Muskingum County, OH, Bridge Replacement

Contractor: US Bridge  
Fabricator: Maico Industries  
Sandwich Plate: SPS North America  
Galvanizing & Metalizing: AZZ Galvanizing



Canton, OH  
&  
Ellsworth, KS  
&  
Banks, OR

Low Profile SuperStructure due to SPS



# Press-Brake Tub Girder with Sandwich Plate Deck



# Press-Brake Tub Girder with Sandwich Plate Deck



# Press-Brake Tub Girder with Sandwich Plate Deck

May 1 – May 26, 2017



# Modular Beam

## Smith Road Bridge. Clark County, IN

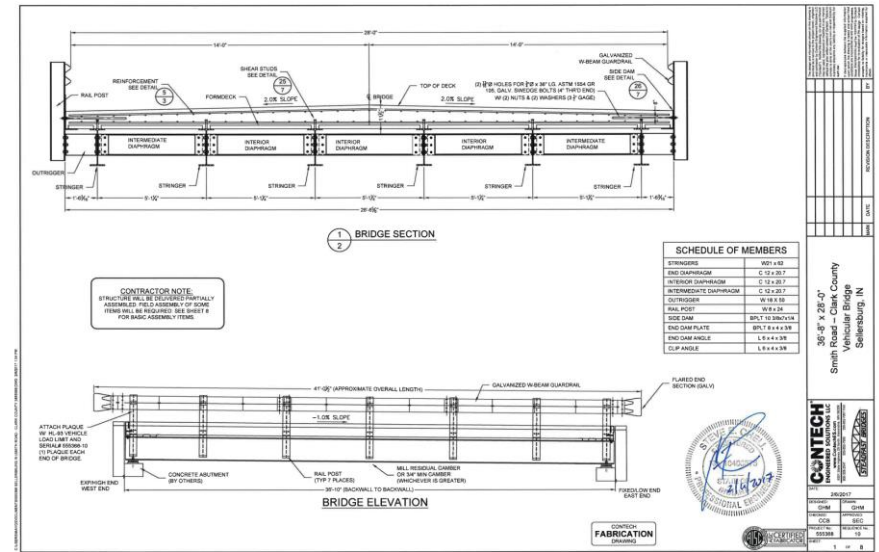
Contractor: CivilCon

Fabricator: Contech



West Chester, OH

## 36 ft 8 in long, 28 ft wide Modular Rolled Beam



# Modular Beam



# Modular Beam





# Modular Beam



# Buried Steel Bridge - Corrugated Steel Plate

## VT Route 2B Bridge Replacement, St. Johnsbury, VT

Contractor: JP Sicard

Fabricator: Big R Bridge

28 day max. trail closure / 50 day road closure for all work

47'11" span x 26'9" rise Arch



Greeley, CO

**BIG R**  
BRIDGE



# Buried Steel Bridge - Corrugated Steel Plate



# Buried Steel Bridge - Corrugated Steel Plate



# Buried Steel Bridge - Corrugated Steel Plate



# Modular Beam

## Sweetgrass County Montana

Contractor: County Crew installed

Design /Fabricator: True North Steel Bridge



West Fargo, ND

24 ft wide x 65 ft long HL93 Pre-Fabricated Modular Bridge



# Modular Beam



# Modular Beam





# Modular Beam



# Pre-Fabricated Truss Bridge

## Morovis Liberty Bridge, Puerto Rico

Contractor: Del Valle Group  
Fabricator: US Bridge

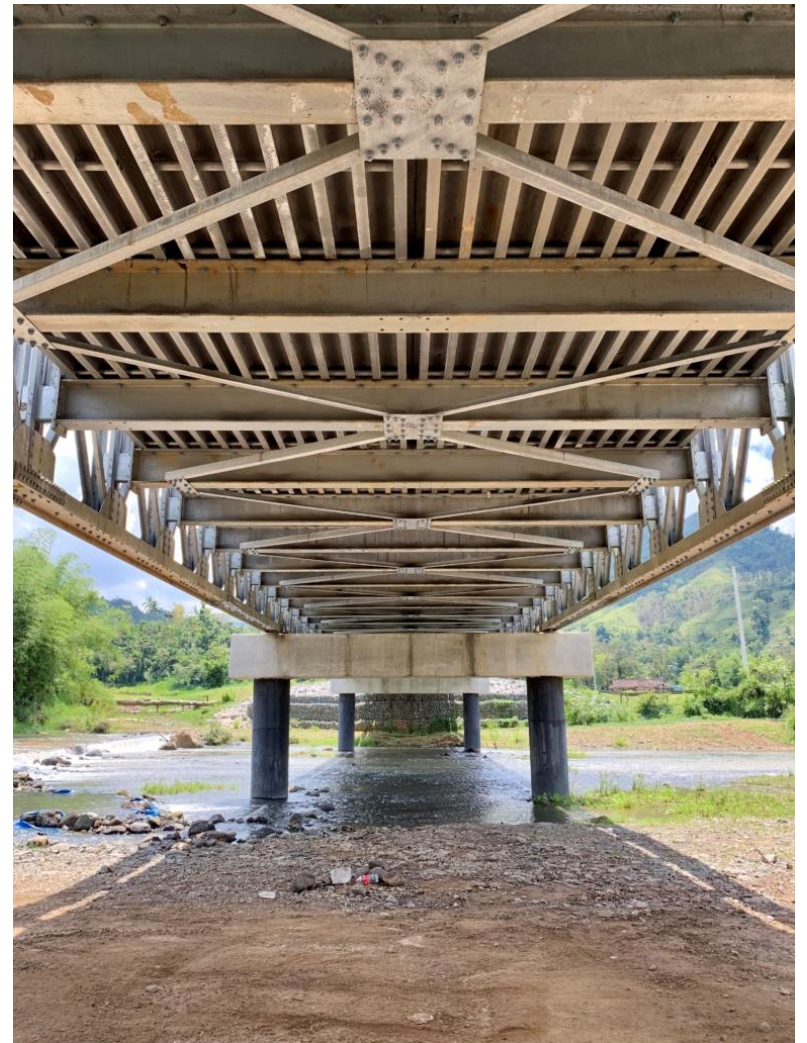


Canton, OH

## 5 Bridges in 6 Weeks Following Hurricane Maria



# Pre-Fabricated Truss Bridge



# Pre-Fabricated Truss Bridge



# Pre-Fabricated Truss Bridge



**5 Bridges in 6 Weeks**  
**Resident, “what helped us the most**  
**was the construction of the metal bridge”**

# Modular Beam

Sevier River Bridge. Axtell, UT

Contractor: Gerber Construction

Fabricator: Wheeler Bridge

**75 ft long, 28 ft wide Modular Rolled Beam**



Minneapolis, MN

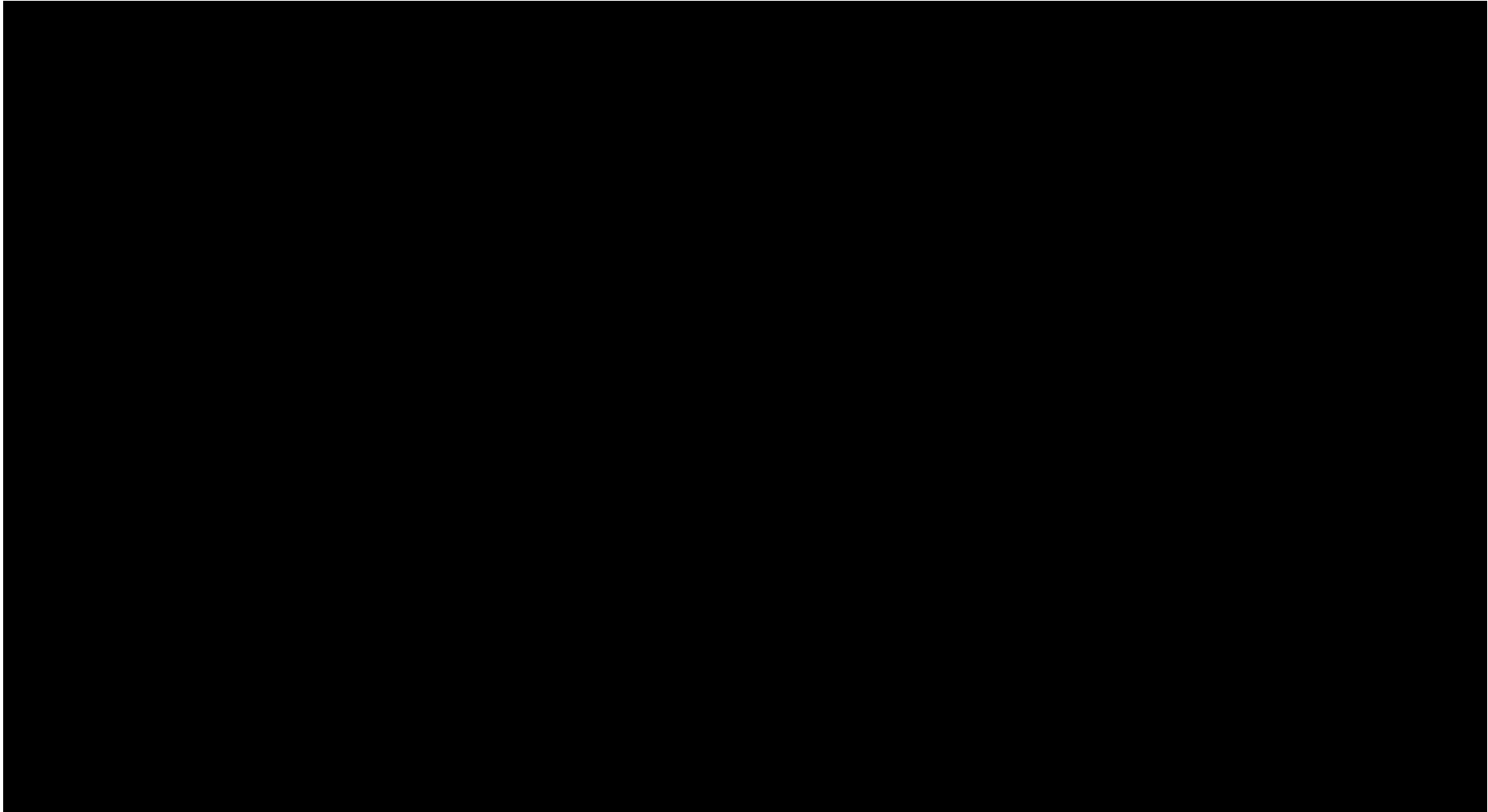


# Modular Beam



# Modular Beam

---





# Modular Beam



# Lateral Slide Bridge Construction ABC Case Study

## I-44 Over the Gasconade River, MO

Contractor: Emery Sapp & Sons

Fabricator: Delongs



Jefferson City, MO

**Build Bridge Next to I-44**

**Push Into Place**

**Minimize Construction  
Time on a Major Bridge  
Replacement**



# Lateral Slide Bridge Construction



# Lateral Slide Bridge Construction



Gasconade River Bridge – MO  
lateral slide

# SSSBA Solutions

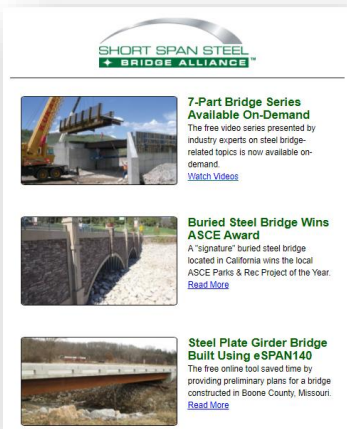


**High Quality Beautiful Bridges**  
**Economical**  
**ABC**



# 5 Ways to Keep Learning About Steel Bridges

## 1. Subscribe to the Weekly Newsletter

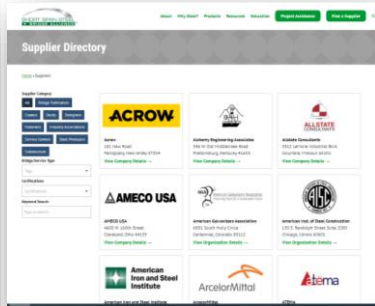


**7-Part Bridge Series Available On-Demand**  
The free video series presented by industry experts on steel bridge-related topics is now available on-demand.  
[Watch Video](#)

**Buried Steel Bridge Wins ASCE Award**  
A "signature" buried steel bridge located in California wins the local ASCE Parks & Rec Project of the Year.  
[Read More](#)

**Steel Plate Girder Bridge Built Using eSPAN140**  
The free online tool saved time by providing preliminary plans for a bridge constructed in Boone County, Missouri.  
[Read More](#)

## 2. Find a Supplier



Supplier Directory

ACROW

AMECO USA

ArcelorMittal

Atama

## 3. Design a Bridge in 5-Minutes



## 4. Receive Free Project Assistance



## 5. Schedule a Workshop/Webinar



[www.ShortSpanSteelBridges.org](http://www.ShortSpanSteelBridges.org)

Questions? Dan Snyder, Director, SSSBA, [dsnyder@steel.org](mailto:dsnyder@steel.org), (301) 367-6179



Website: [ShortSpanSteelBridges.org](http://ShortSpanSteelBridges.org)

Twitter: [@ShortSpanSteel](https://twitter.com/ShortSpanSteel)

Facebook: [Short Span Steel Bridge Alliance](https://www.facebook.com/ShortSpanSteelBridgeAlliance)