Accelerated Bridge Construction Showcase

United for Infrastructure Week
September 17, 2020

Sponsored by:
American Iron and Steel Institute
Short Span Steel Bridge Alliance
American Galvanizers Association

Dr. Michael Barker, PE
University of Wyoming
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
Overview

Accelerated Bridge Construction Case Studies
- Panel Beam Bridge – Acrow
- Modular Beam – Quality Bridge & Fab
- Folded Steel Plate Girder - CDR Maguire
- 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
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: steel is cost-effective)
Simple Design Tools (eSPAN140)
Answer Questions (Bridge Technology Center)
Prefabricated Bridge Manufacturers (industry contacts)
Innovative & ABC Design

Workshops

4 Hour Workshop Agenda

00:00 (40 min) Introduction, Short Span Steel Bridge Overview & Design Tools (eSPAN140)
00:40 (35 min) Bridge Economy & Life Cycle Costs
01:15 (35 min) SSSBA Member Presentation
01:50 (25 min) Break (May Work in Lunch Break and Adjust Times)
02:15 (35 min) NSBA Design Resources & SIMON
02:50 (35 min) SSSBA Member Presentation
03:25 (35 min) Pre-Fabricated Steel Bridges & Accelerated Bridge Construction
04:00 Adjourn

6 Hour Workshop Agenda

00:00 (45 min) Introduction, Short Span Steel Bridge Overview & Design Tools (eSPAN140)
00:45 (40 min) Bridge Economy & Life Cycle Costs
01:25 (35 min) SSSBA Member Presentation
02:00 (25 min) Break (May Work in Lunch Break and Adjust Times)
02:25 (40 min) NSBA Design Resources & SIMON
03:05 (35 min) Practical Detailing, Durability and Steel Protection Systems
03:40 (40 min) Press-Brake Tub Girder Bridges
04:20 (25 min) Break (May Work in Lunch Break and Adjust Times)
04:45 (35 min) SSSBA Member Presentation
05:20 (40 min) Pre-Fabricated Steel Bridges & Accelerated Bridge Construction
06:00 Adjourn

https://www.shortspansteelbridges.org/education/
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
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
Prefabricated Panel Beam Bridge

18'1" ROADWAY

GUARDRAIL SYSTEM
ANTI-SKID EPOXY COATED ROADWAY PLATE

TOP OF ROADWAY
24"±
LOW STEEL
STRINGERS SUPPORT MEMBER
SEGMENT 1

MAIN BEAMS
SEGMENT 2

STRINGERS
SEGMENT 3

15"±
ABUTMENT
BEARING

SECTION AT ABUTMENT

18FT WIDE ACROW BEAM BRIDGE
Prefabricated Panel Beam Bridge
Modular Beam

SR 30, PennDoT Bridge Replacement
Contractor: Brayman Construction
Fabricator: Quality Bridge & Fab

Bridge Replacement including abutment work & approaches

Saxonburg, PA
&
West Middlesex, PA
Modular Beam
Modular Beam

Video

https://www.youtube.com/watch?v=sDHPAftKyho
Modular Beam

57 HOURS!!!!
Folded Steel Plate Girder

JV 70, PennDOT Rapid Bridge Replacement Project

Contractor: Walsh Construction
Fabricators: ATF Inc. - steel
            AC Miller Inc. - precast

Pittsburgh, PA

Completed in 1/2 the time of conventional construction

Saved the public 40 days of detour
Folded Steel Plate Girder

- Delivery to the project coordinated with the crane availability
- Units come with a rigging plan and lifting tabs to facilitate erection
Folded Steel Plate Girder

- Closure pours with conventional concrete & accelerant and overlaid to save money vs. UHPC
- Decks fabricated with threaded inserts to simplify closure pour forming
Folded Steel Plate Girder

Video

https://www.youtube.com/watch?v=iZghneYjpyo
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-Break Tub Girder with Sandwich Plate Deck
Press-Brake Tub Girder with Sandwich Plate Deck

Video

https://www.youtube.com/watch?v=jj7oD5pLI7Q
Modular Beam

Smith Road Bridge. Clark County, IN
Contractor: CivilCon
Fabricator: Contech

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

Video

https://www.youtube.com/watch?v=8FQf6u1T4EM
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
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

24 ft wide x 65 ft long HL93 Prefabricated Modular Bridge
Modular Beam
Prefabricated Truss Bridge

Morovis Liberty Bridge, Puerto Rico

Contractor: Del Valle Group
Fabricator: US Bridge

5 Bridges in 6 Weeks Following Hurricane Maria
Prefabricated Truss Bridge
Prefabricated Truss Bridge

Video

https://www.youtube.com/watch?v=LGnnKPSPDeU
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
Modular Beam
Modular Beam

Video

https://www.youtube.com/watch?v=CGjavn6HyQk
Lateral Slide Bridge Construction
ABC Case Study

I-44 Over the Gasconade River, MO

Contractor: Emery Sapp & Sons
Fabricator: Delongs

Build Bridge Next to I-44
Push Into Place
Minimize Construction Time on a Major Bridge Replacement

Jefferson City, MO
Lateral Slide Bridge Construction

Video

https://www.youtube.com/watch?v=3L9fk744_A4
Lateral Slide Bridge Construction

Gasconade River Bridge – MO
lateral slide
High Quality Beautiful Bridges
Economical
ABC

www.ShortSpanSteelBridges.org
Steel Bridge Resources...

Website: shortspansteelbridges.org
Twitter: @ShortSpanSteel
Facebook: Short Span Steel Bridge Alliance