

Acrow Bridge for:

Florida DOT Design Conference

Acrow 300 Series vs. 700XS Series

6/15/2016

Who we are. What we do.

FDOT - Acrow Contacts

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- **Will Smith** / Acrow SE Region Manager
- Office near Mobile, AL – 311 Magnolia Ave, Fairhope, AL 36532
 - Office #: 251-928-8450
 - Cell #: 251-408-1340
 - Email: wsmith@acrow.com
- Contact Will Smith for more information or to arrange a presentation on the Acrow 700XS series bridging.



**Building Bridges.
Connecting People.**

Company Overview

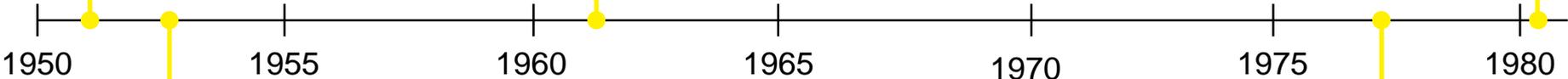


About Acrow

Established in the US in 1951

Started promoting bridges

Supplied 18 bridges to FHWA in wake of Mt. St. Helens eruption



Early focus on concrete formwork



Supplied bridging for the trans-Alaska pipeline road



About Acrow

Acrow moves fabrication to US



1.4 Km Acrow Bridge for New Orleans after Hurricane Katrina



Acrow supplies bridge after I-5 collapse in Seattle



1985

1990

1995

2000

2005

2010

2015

Access Bridge, Lock 26, Mississippi River



Emergency Access Ramp for Ground Zero, New York City



1.45 Km bridge to Chile after 8.7 earthquake



Manufacturing Facilities

Acrow/Milton Steel Co.

Property: 17 acres

4 manufacturing buildings (14,000 sq. feet)

1 office building (11,000 sq. feet)

Location: Pennsylvania, USA (approximately 2 ½ hours from New York City)

Capacity: 25,000 tons as currently configured

Equipment

6 robot cells – 13 robots

Automated vertical and horizontal drill tables

Ficpe automation used for profiling and drilling

CNC Plasma cutting and drilling table

95 team members operating over 3 shifts



Acrow Bridge – Florida 300 Series

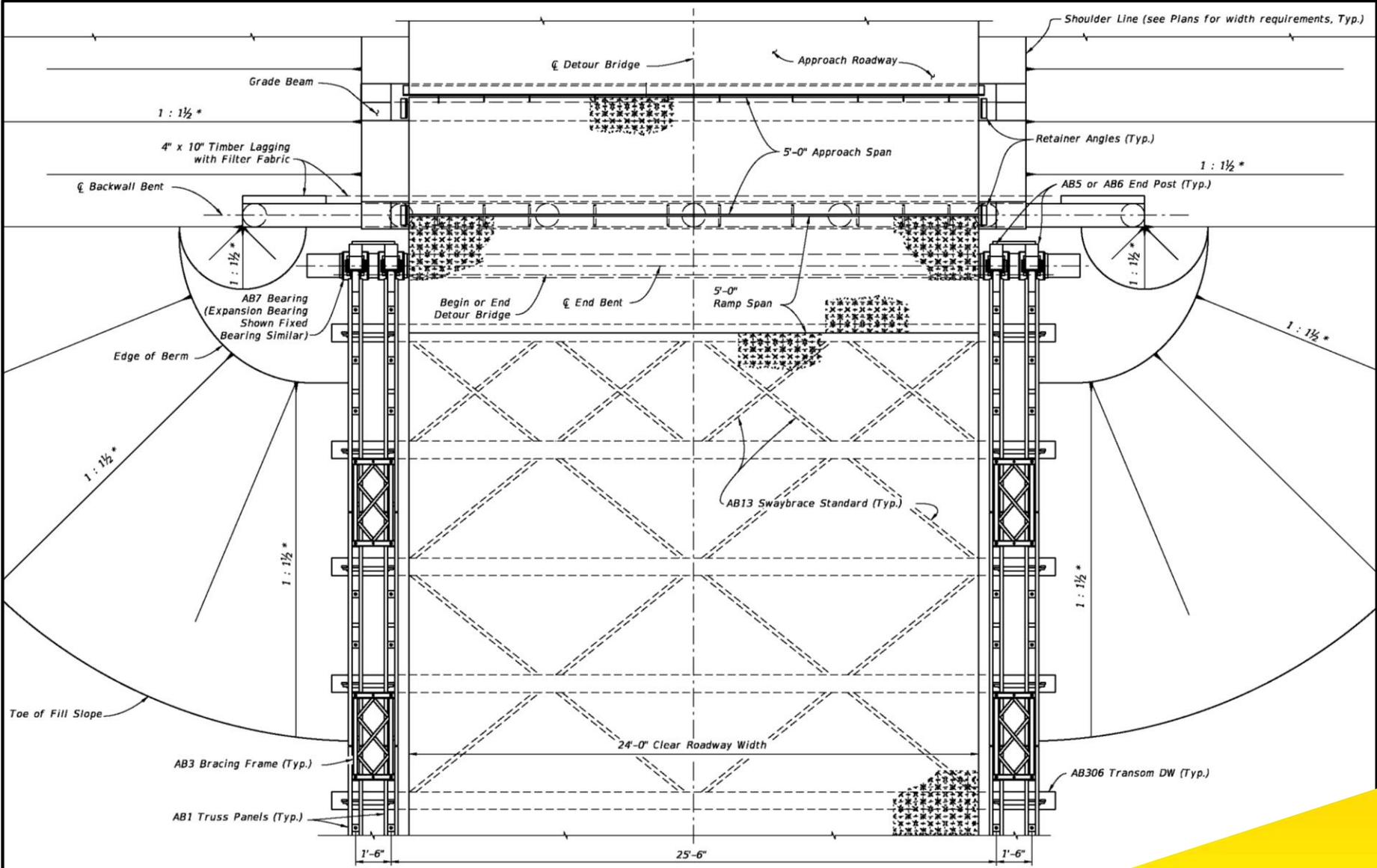
300 Series Summary

- ❑ Supply History ✓ Mid 1970's to late 1990's
- ❑ Roadway widths ✓ 23' – 9 " curb-to-curb
- ❑ AASHTO Design Loads ✓ HS20-44
- ❑ Guard Rail ✓ None supplied – “Thrie Beam” per FDOT
- ❑ Bridge Truss Panel ✓ 10' long x 5' – 1" tall
- ❑ Transom / Floorbeam ✓ One every 5 feet
- ❑ Deck Units ✓ Open Grid
- ❑ Spans ✓ 50, 60 & 70 feet

300 Series Summary (Continued)

- ❑ Truss Configuration ✓ DS (Double Single) & TS (Triple Single)
- ❑ Current Stocks ✓ Approximately 6,000+ feet of 23'- 9" wide
- ❑ Design ✓ No flexibility for longer spans
- ❑ Reinforcing Chord ✓ None in FDOT inventory
- ❑ Bridge Shear Ends ✓ End Posts used for Shear
- ❑ Acrow Engineering Support ✓ None
- ❑ Top Down Construction ✓ Not permitted
- ❑ Bridge Cross Slope ✓ None – level

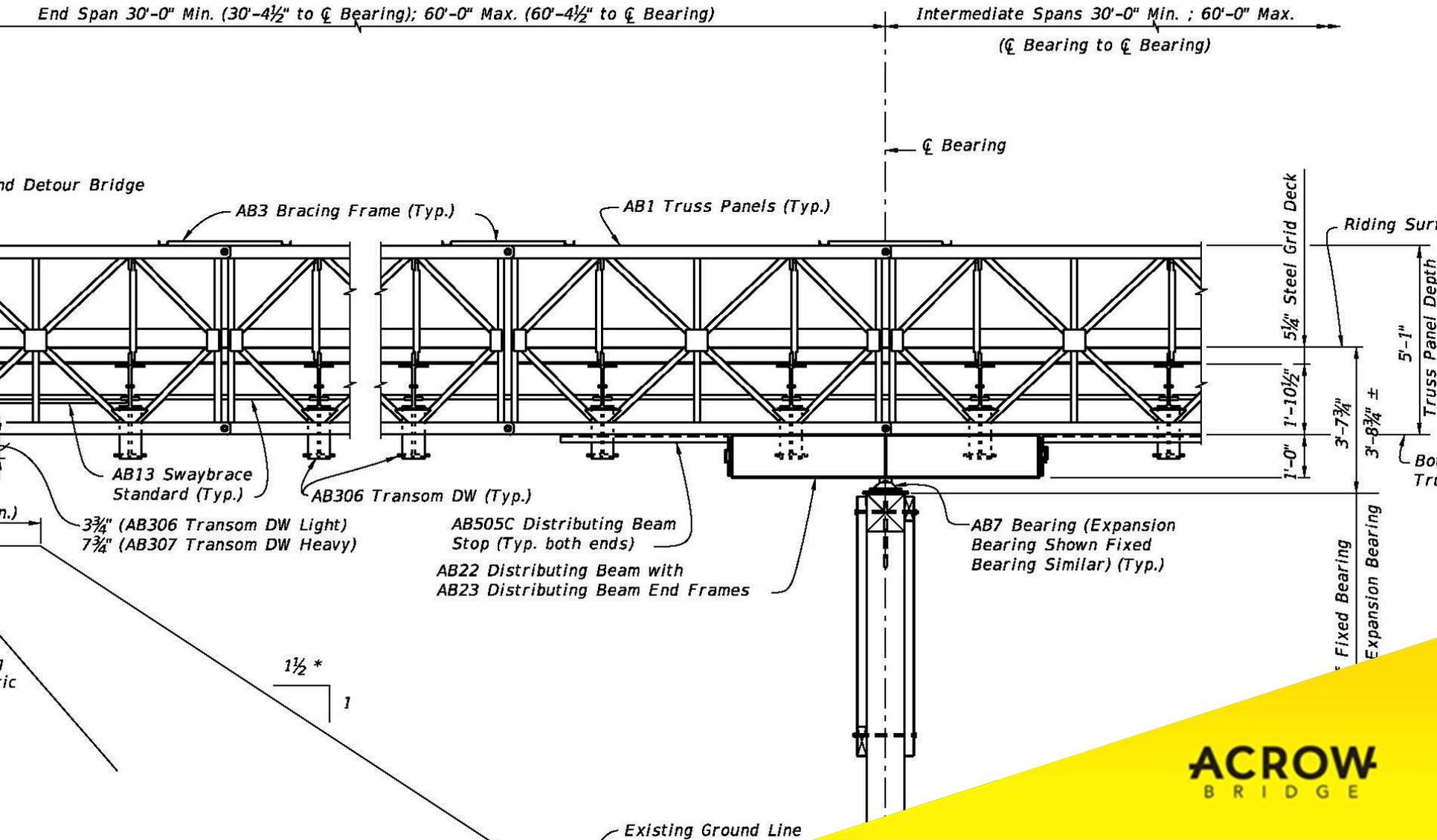
FDOT 2014 Design Standards – Plan View



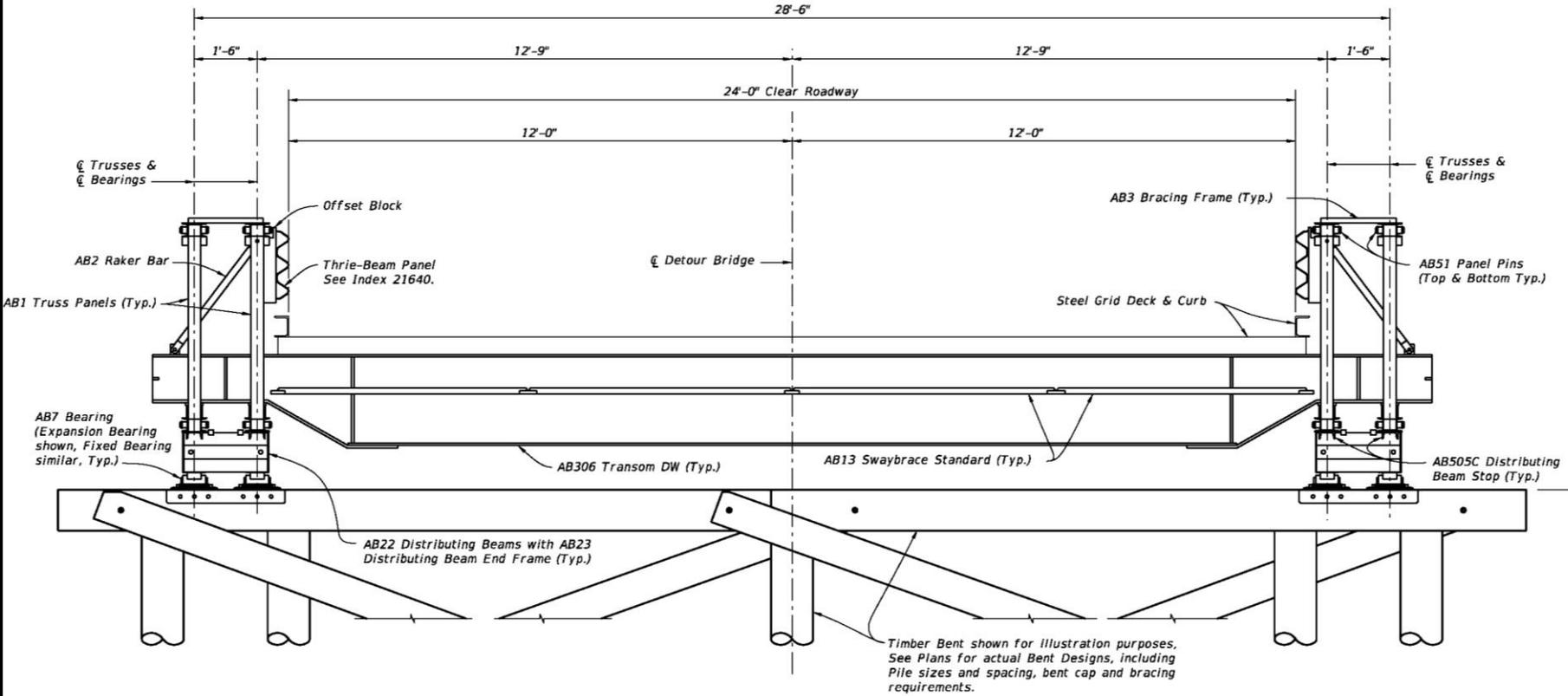
TYPICAL PLAN VIEW OF DETOUR BRIDGE
 (TIMBER PILES SHOWN, STEEL H PILES AND STEEL PIPE PILES SIMILAR)
 (Thrie-Beam Panel not shown for clarity. See Index 21640)



FDOT 2014 Design Standards – Elevation View



FDOT 2014 Design Standards – Cross Section



TYPICAL SECTION THRU DETOUR BRIDGE AT INTERIOR BENTS (TYPICAL SECTION AT END BENTS SIMILAR WITHOUT DISTRIBUTING BEAMS)
(TIMBER PILES SHOWN, STEEL H PILES AND STEEL PIPE PILES SIMILAR)

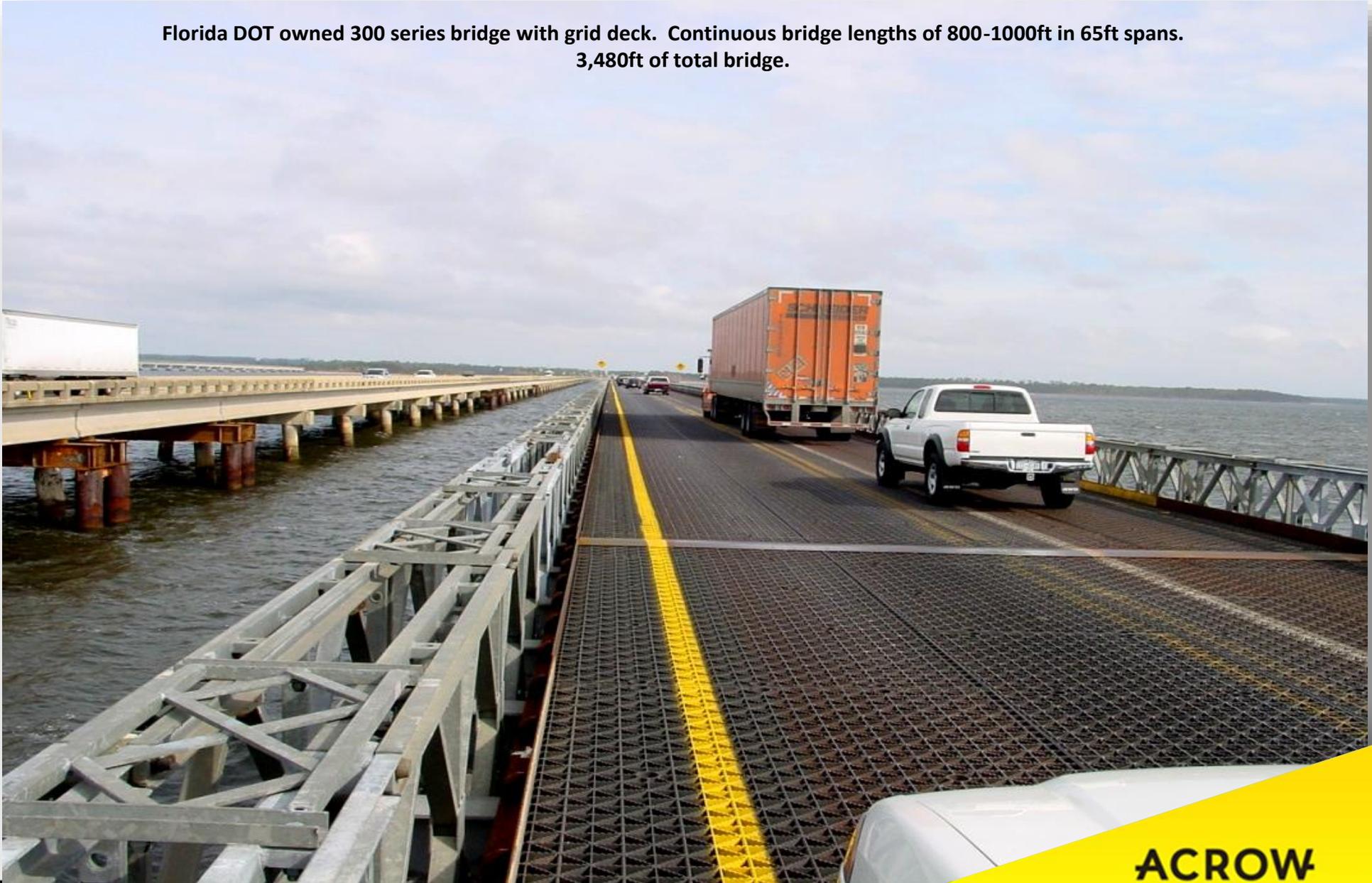
FDOT supplied Temporary Bridge Components including Fixed & Expansion Bearings, Guardrail and associated components not included, see Payment Note, Sheet 1 of 7.
 Contractor supplied foundation components, including Saddle Plates, Keeper Bars & Shims.



Series 300 Examples

Series 300 Example

Florida DOT owned 300 series bridge with grid deck. Continuous bridge lengths of 800-1000ft in 65ft spans. 3,480ft of total bridge.



ACROW
BRIDGE

Acrow Bridge – 700XS Series

Features and Benefits

- Diverse applications
- Multifunctional
- Easily customized to desired length, width and strength
- Fast assembly and disassembly
- Flexible launch methods with minimal equipment needed
- Durable
- Galvanized steel for no maintenance
- Easy to transport worldwide
- Reusable
- Full service design and engineering
- Time-tested technology exceeds most rigorous quality standards
- Certified
 - ISO 9001
 - AISC for Major Bridge Structures with Fracture Critical Endorsement
 - CE of Europe

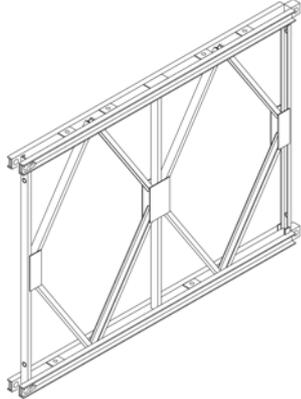
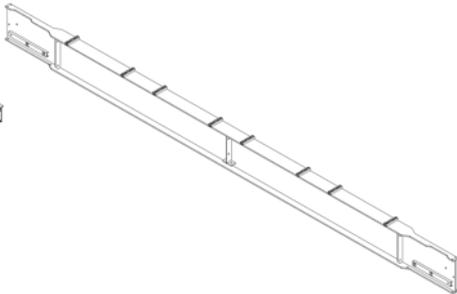
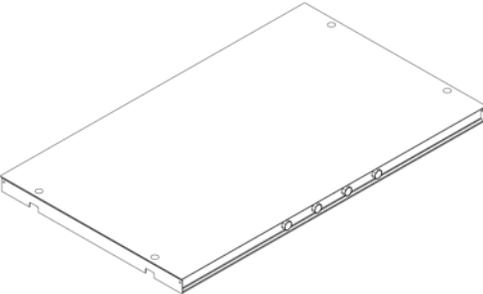
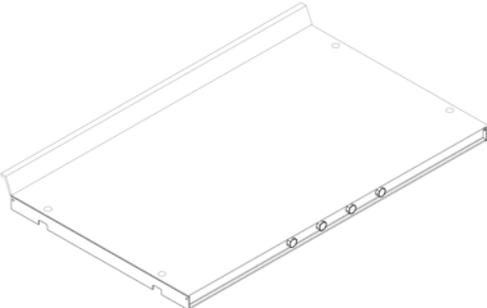
ISO 9001
CERTIFIED



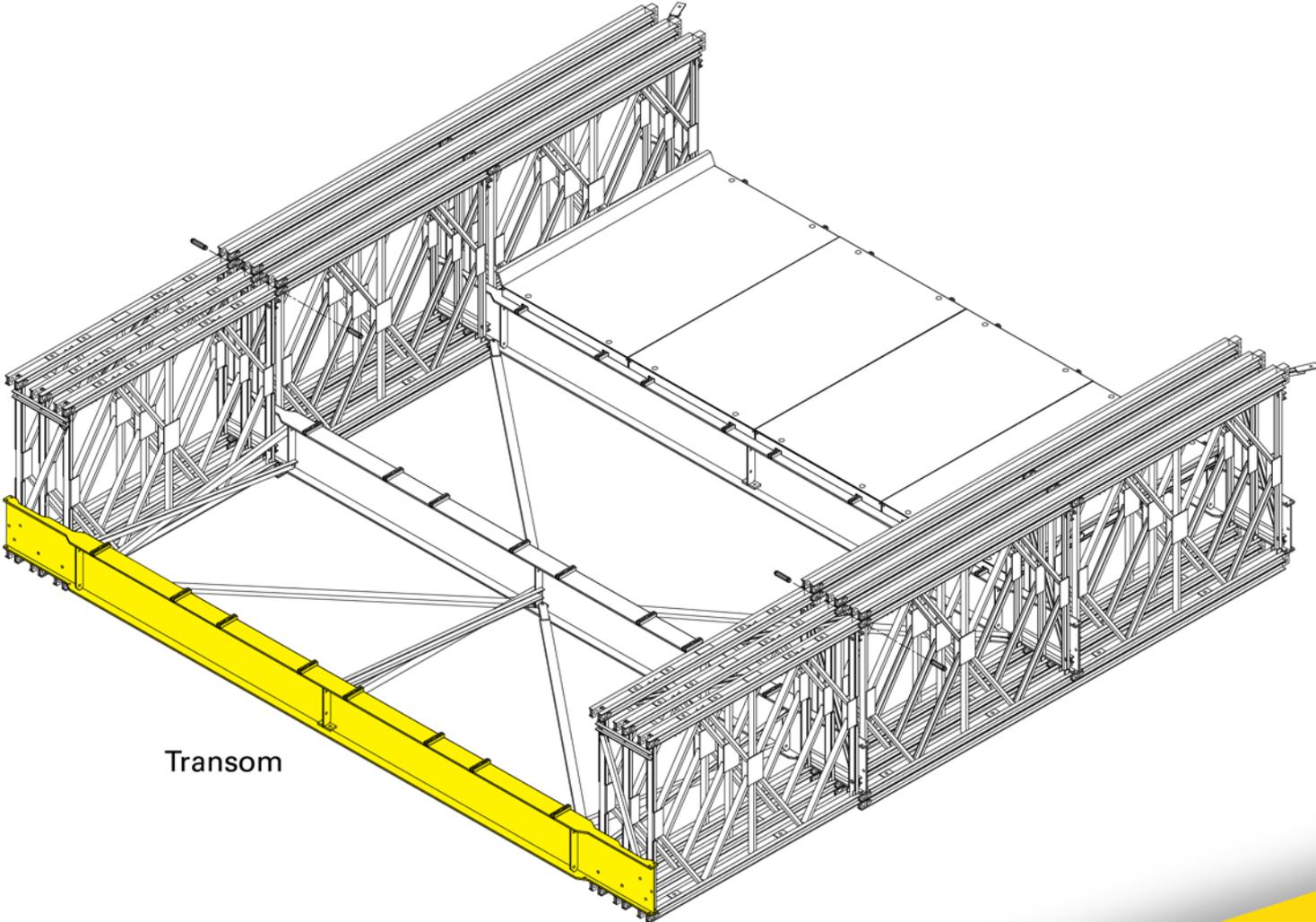
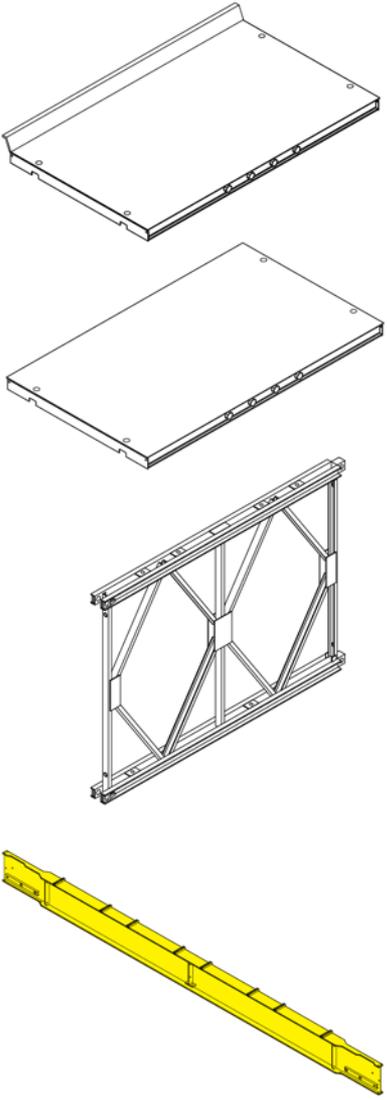
MADE
IN USA



Modular Technology



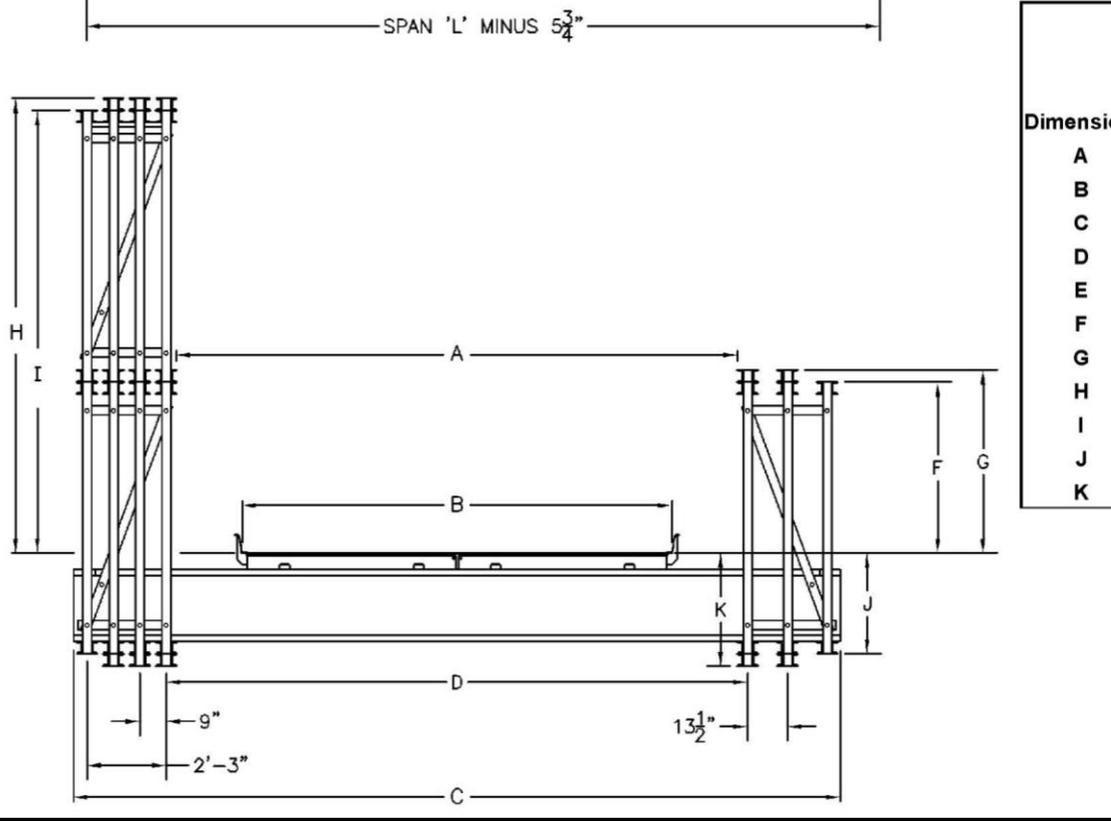
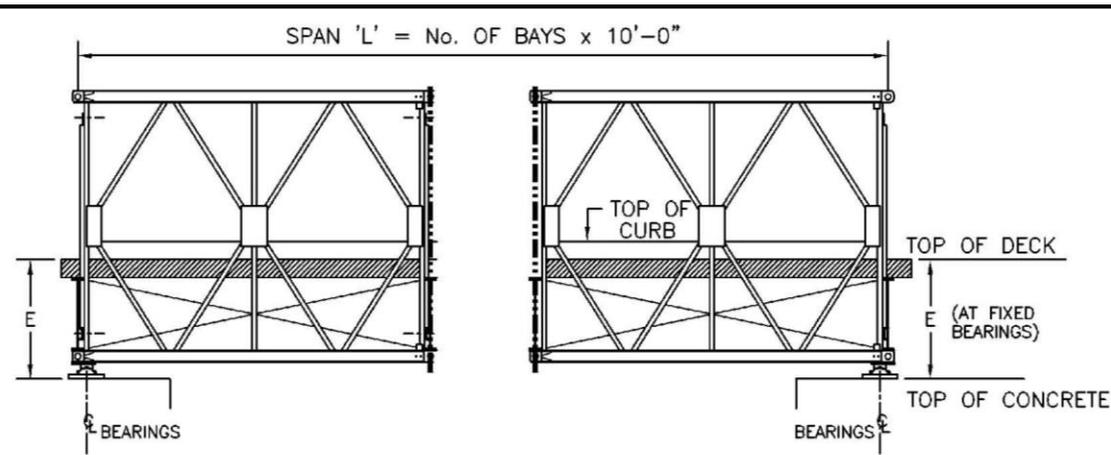
Modular Technology



Transom

FDOT - Specifications

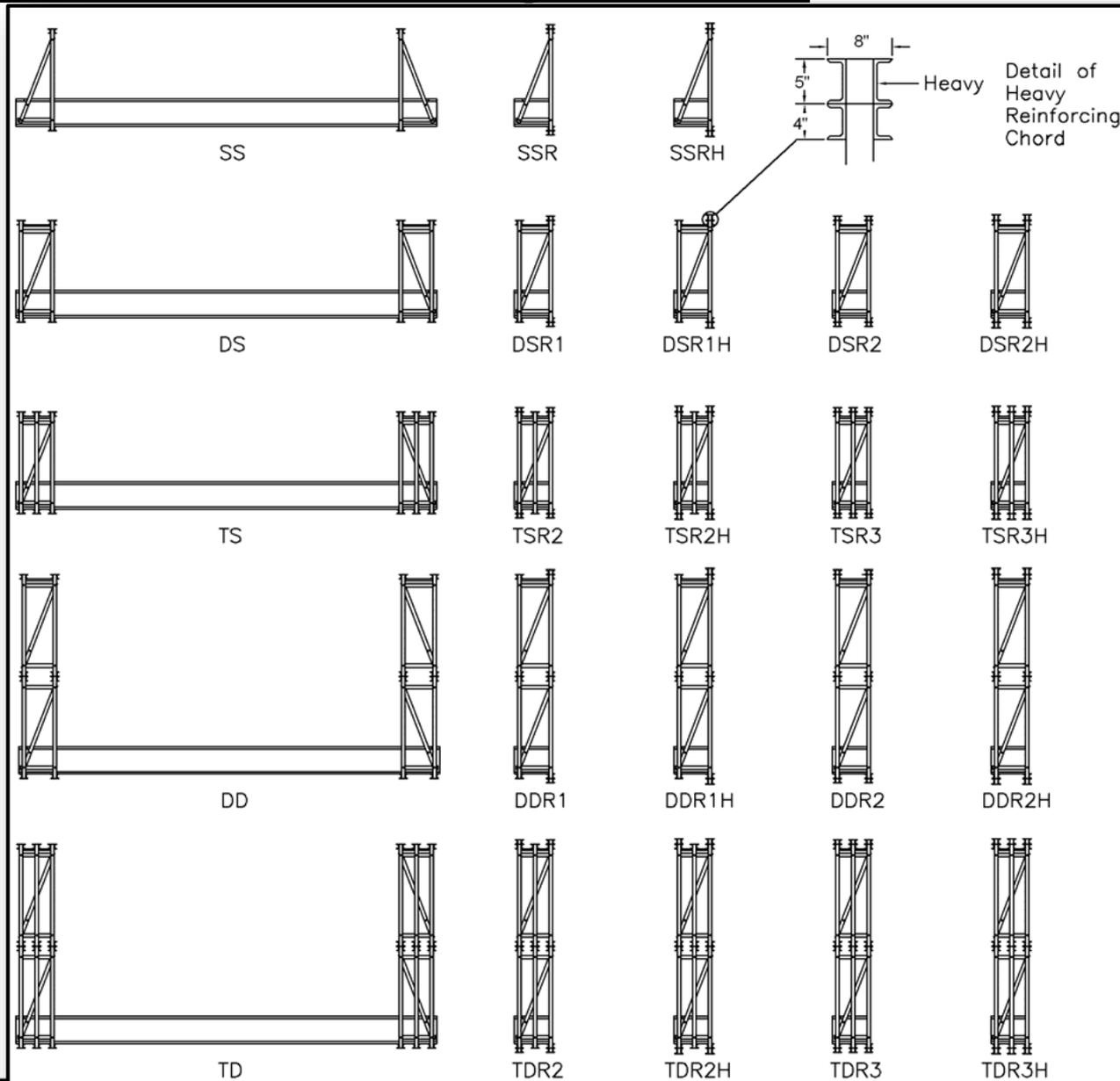
- Bridge Widths
 - ✓ 12' – 42' (24', 36' & 42' ONLY for FDOT)
- Bridge Spans
 - ✓ 10' – 200' +
- Asphalt Overlay Wearing Surface
 - ✓ Membrane for asphalt adhesion recommended for highway applications
 - ✓ Asphalt used to create cross slope or crown on roadway
- TL-4 Guard Rail for all 700XS bridge
- All Bridges designed to meet or exceed AASHTO Standards



Bridge Dimensions

Dimension	BRIDGE WIDTHS (ft., in.)					
	SCW	EW	EW18	2L24	2L30	3L36
A	12' 8 1/2"	15' 8 1/2"	18' 5 1/2"	24' 8 1/2"	31' 4"	37' 10 5/16"
B	12' 0"	13' 7"	18' 0"	24' 0"	30' 0"	36' 0"
C	18' 6"	21' 6"	24' 3"	30' 6"	37' 1 9/16"	43' 7 13/16"
D	13' 3"	16' 3"	19' 0"	25' 3"	31' 10 9/16"	38' 4 13/16"
E	2' 6 7/8"	2' 6 7/8"	2' 7 1/8"	3' 2 5/8"	3' 8 3/4"	4' 2 7/8"
F	5' 4 1/2"	5' 4 1/2"	5' 4 1/4"	4' 8 3/4"	4' 2 5/8"	3' 8 1/2"
G	5' 8 1/2"	5' 8 1/2"	5' 8 1/4"	5' 0 3/4"	4' 6 5/8"	4' 0 1/2"
H	13' 2 1/2"	13' 2 1/2"	13' 2 1/4"	12' 6 3/4"	12' 0 5/8"	11' 6 1/2"
I	12' 10 1/2"	12' 10 1/2"	12' 10 1/4"	12' 2 3/4"	11' 8 5/8"	11' 2 1/2"
J	2' 1 1/2"	2' 1 1/2"	2' 1 3/4"	2' 9 1/4"	3' 3 3/8"	3' 9 1/2"
K	2' 5 1/2"	2' 5 1/2"	2' 5 3/4"	3' 1 1/4"	3' 7 3/8"	4' 1 1/2"

Standard Truss Configurations



Span Types



Simple Span

Span Types



Short Continuous Span

Span Types



Long Span Continuous

Span Types



Maximum Long Span

Span Types



Maximum Long Span – Special

BRIDGE DECK SURFACE – Asphalt Overlay

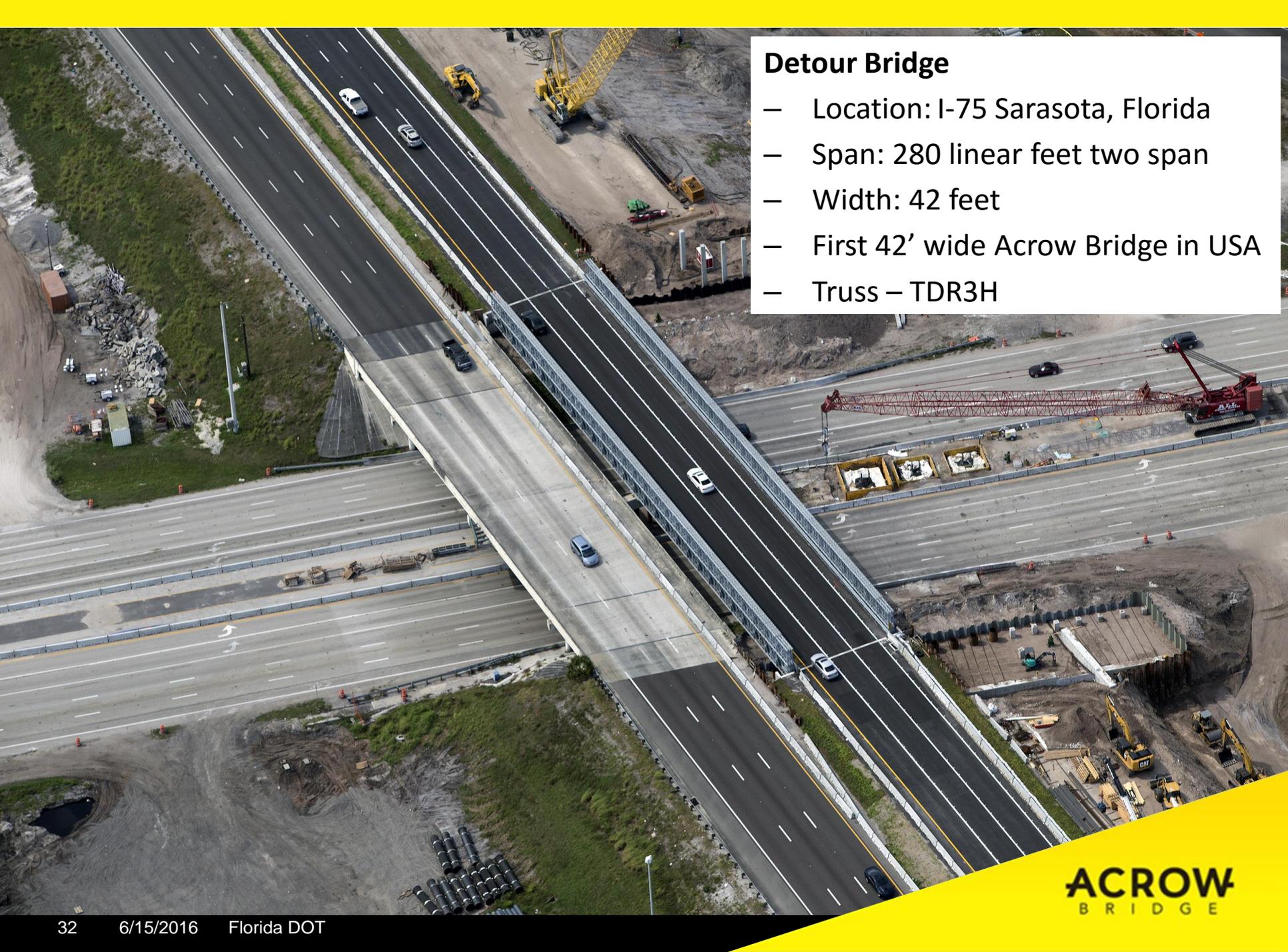
- Membrane recommended for Highway applications for better asphalt adhesion
- If Cross Slope or Crown is required:
 - ✓ Acrow Bridge less than 100ft in length can be “tilted” in cross direction 1%. Therefore, if 2% cross slope is required, 1% is in tilt, the remaining 1% in asphalt.
 - ✓ Acrow Bridge greater than 100ft in length must be installed level. Any crown or cross slope must be created using asphalt only.
 - ✓ If design call for extreme cross slope situations, special transoms beams with cross slope designed into the beams can be obtained from Acrow.
- Removal of asphalt is achieved by scraping top deck with dozer blade

BRIDGE DECK SURFACE – Asphalt Overlay



A large, dark, industrial scene showing a massive, perforated metal structure, likely a bridge component, being moved or positioned. The structure is supported by a concrete base and is surrounded by heavy machinery and structural elements. The lighting is dramatic, highlighting the texture of the metal and the scale of the project.

Florida 700XS Series Project Examples



Detour Bridge

- Location: I-75 Sarasota, Florida
- Span: 280 linear feet two span
- Width: 42 feet
- First 42' wide Acrow Bridge in USA
- Truss – TDR3H

Bypass Bridge

- Location: Hillsborough County, FL
- Span: 200 linear feet
- Width: 24 feet
- Truss – TDR3



Detour Bridge

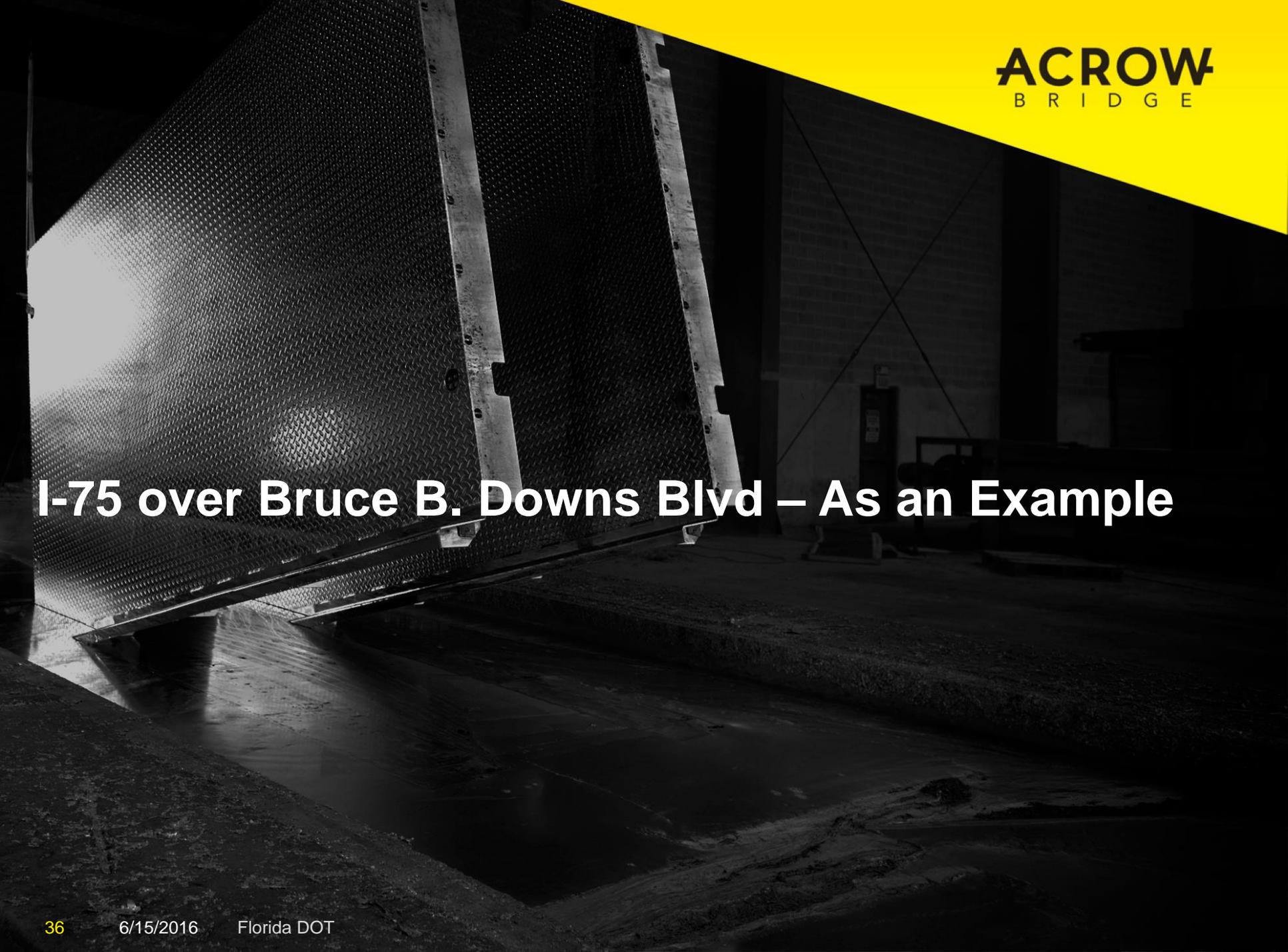
- Location: I-75 Tampa, Florida
- Length: 320 linear feet
- Spans: 90 – 110 – 120 feet
- Width: 36 feet
- Truss – TSR3



Moveable Bridge

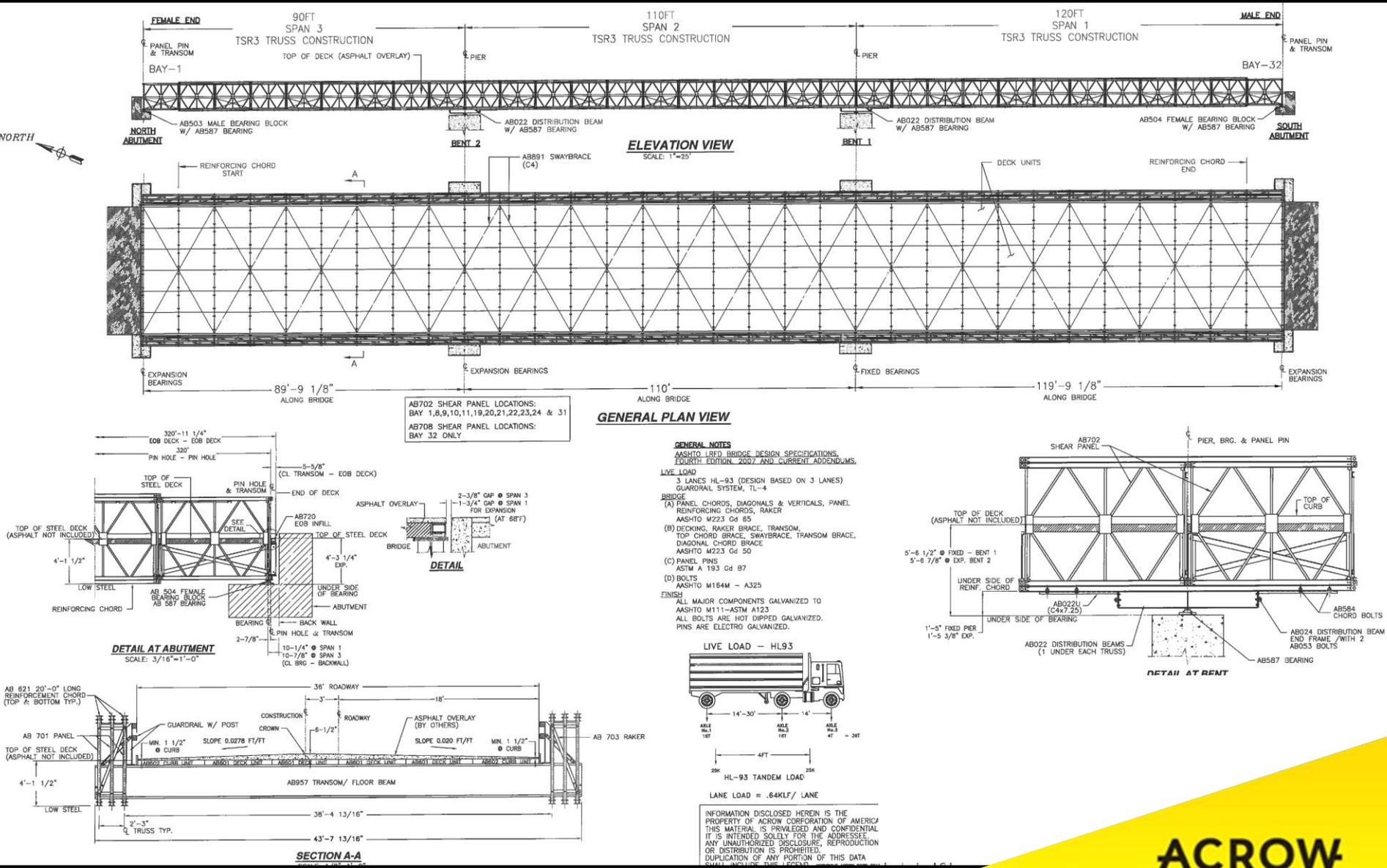
- Location: St. Augustine, FL
- Span: 170 foot lift span
- Width: 25 feet



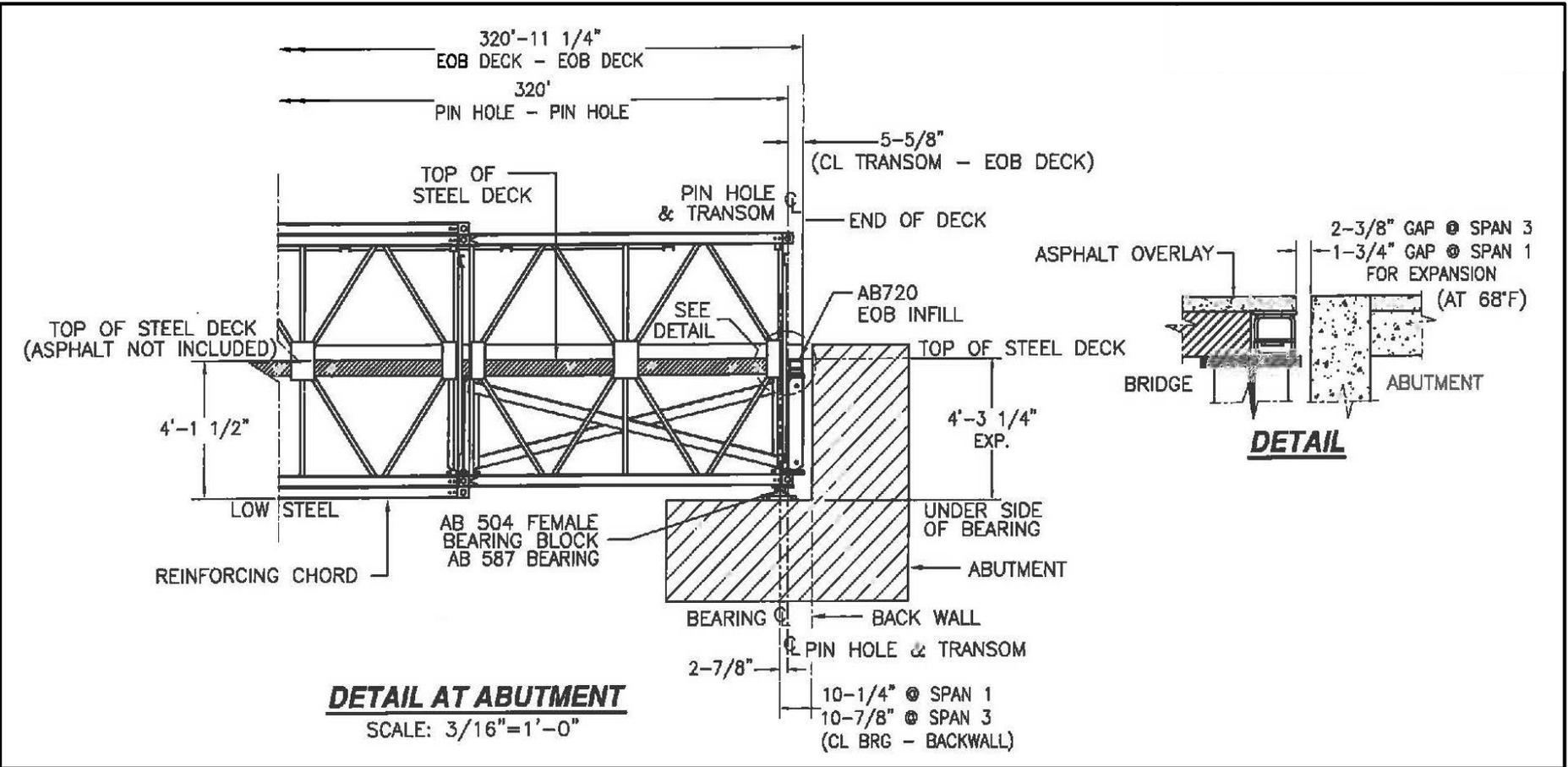
A large, dark, textured metal bridge deck is shown in a dark industrial setting. The deck is supported by a concrete structure and is the central focus of the image. The background is mostly black, with some faint structural elements visible.

I-75 over Bruce B. Downs Blvd – As an Example

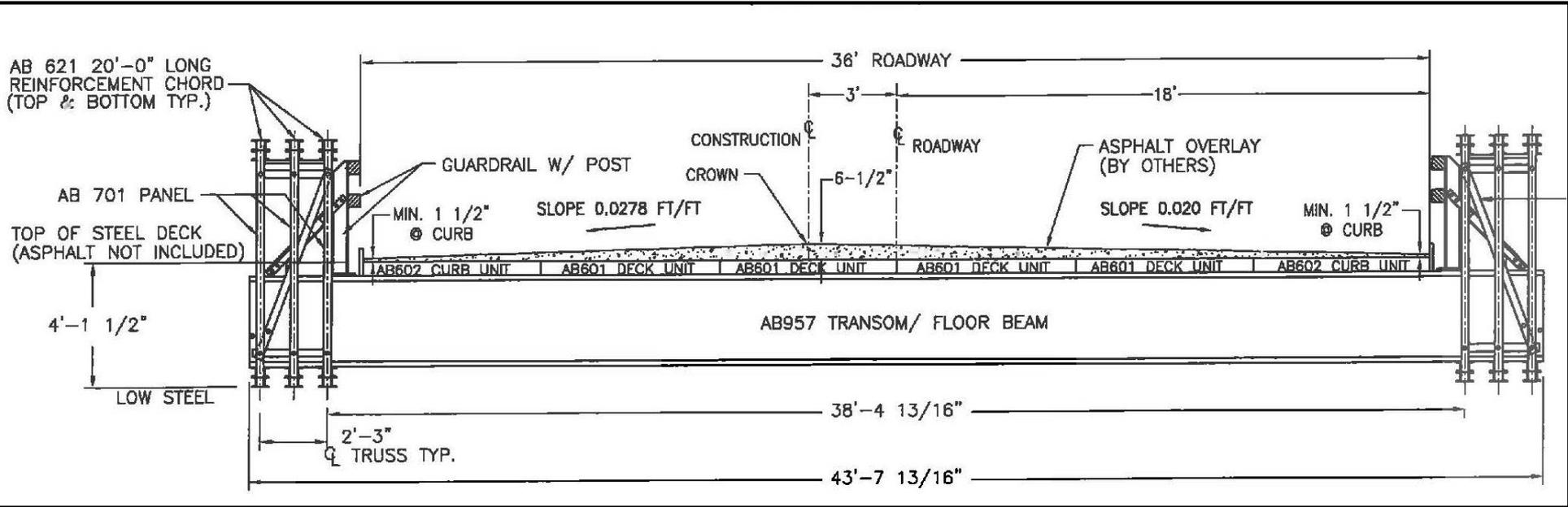
I-75 Tampa over Bruce B. Downs Blvd.



End of Bridge Details



Cross Section



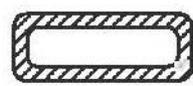
Truss Panel Details

SHAPE OF DIAGONALS

AB701 PANELS — CHANNELS



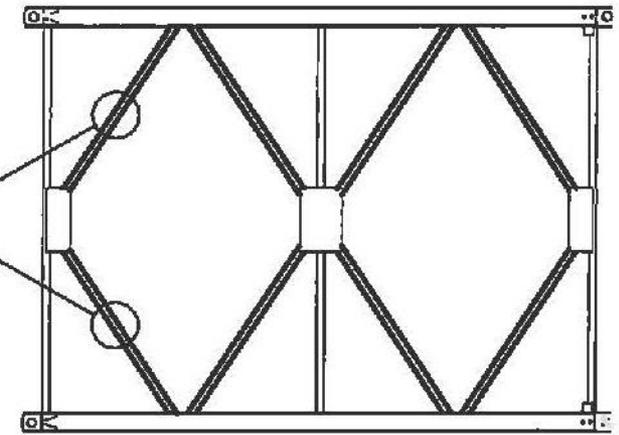
AB702 PANELS — TUBES



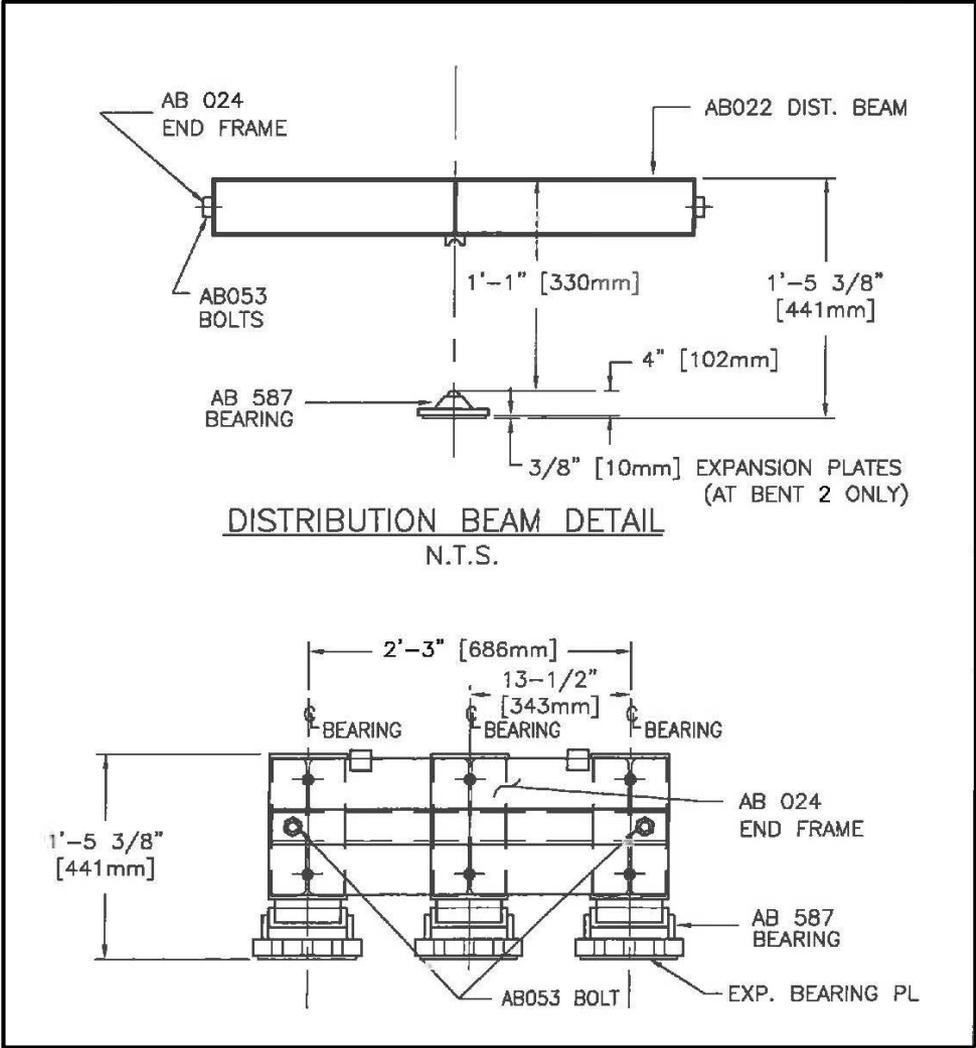
AB708 PANELS — SOLID BARS



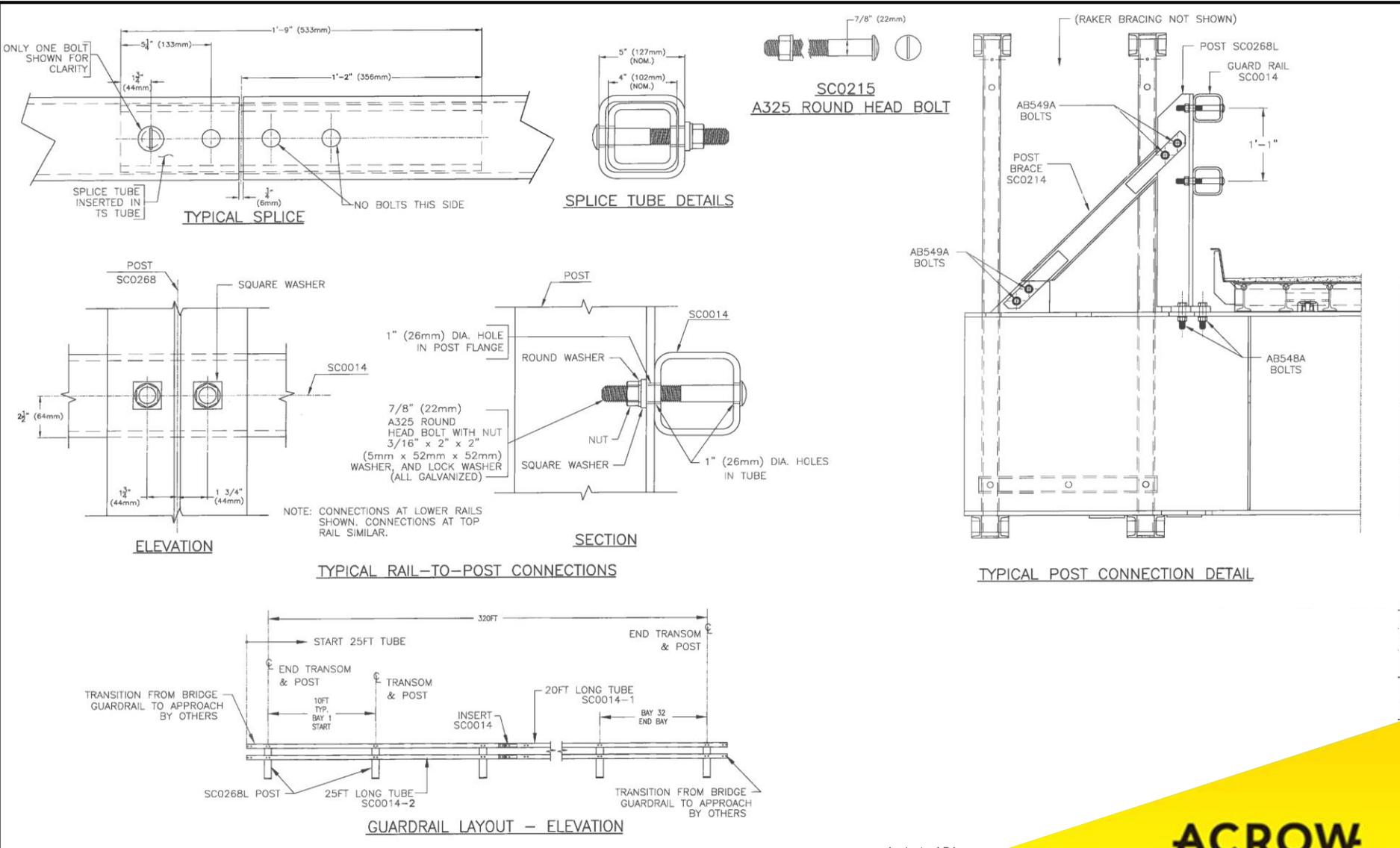
ACROW PANEL



Distribution Beam Details



Guard Rail Details





Acrow 700XS Engineering for FDOT Projects

FDOT Engineering Design Support Services

- Pre-planning engineering support for FDOT designers, design firms & consultants
- Full Florida PE stamped engineering submittals for all projects
- Full set of project-specific bridge plans and details

FDOT Engineering Construction Support Services

- Develop and provide site-specific bridge assembly and installation procedures for the contractor
- Field support technician for contractor installation
- Bridge inspection & certification as required

Onsite Technical Support

We provide a dedicated on-site technician to oversee the installation, working with the customer's assembly crew.

Acrow also provides training courses so that the knowledge of how to assemble and construct a bridge remains resident in a state or country.

Bridge Design Criteria

- **AASHTO LRFD**
 - ✓ **HL-93**
 - ✓ **LL FACTORS**
- **FDOT 120 PERMIT TRUCKS**
- **LL DEFLECTION LIMITS**
- **Load Ratings when required**

Installation Methods

Installation Methods

1. Crane Lift-In

Bridge Span Lifted into place with crane or cranes.

Location: Long Island Expressway



Installation Methods

2. Conventional Cantilevered Launch

The cantilever launch allows for an Acrow bridge to be rolled into place without the use of a crane

Location: Alaska



Conventional Launch. Slowly Push/Pull bridge across gap.

Installation Methods

3. Crane Assist

An Acrow bridge can also be launched using a crane if the required equipment is available

Location: Alabama, USA



700XS Series Summary

- ❑ Supply History ✓ 2014 --
- ❑ Roadway widths ✓ 24' – 0", 36' – 0" & 42' – 0" curb-to-curb
- ❑ AASHTO Design Loads ✓ HL93 (with Florida 120 Permit loads)
- ❑ Guard Rail ✓ TL-4 utilizing two level tubular type
- ❑ Bridge Truss Panel ✓ 10' long x 7' - 6" tall
- ❑ Transom / Floorbeam ✓ One every 10 feet
- ❑ Deck Units ✓ Orthotropic steel deck (10' x 6')
- ❑ Spans ✓ 60' (capable of spans in excess of 200 ft)

700XS Series Summary (Continued)

- ❑ Truss Configuration ✓ TS (Triple Single) others available
- ❑ Current Stocks ✓ 2,000' of 24' wide & 1,320' of 36' wide
- ❑ Design ✓ Flexibility for longer spans
- ❑ Reinforcing Chord ✓ None in FDOT inventory (available from Acrow)
- ❑ Bridge shear ends ✓ Shear Panels used (AB702's & AB708's)
- ❑ Acrow Engineering Support ✓ Full engineering & field support
- ❑ Top Down Construction ✓ Not permitted
- ❑ Bridge Cross Slope ✓ 1% allowed for < 100 ft. Not permitted if > 100 ft. Asphalt used to create crown or cross slope

700XS Other Applications & Uses

Vehicular



Rail



Heavy Haul



Detour



Military



Moveable



Long Span



Beam



Pedestrian



Pipe and Utility



Extractive Industries



Rentals



Shoring Systems



Emergency Services



Onsite Technical Support





Moveable Bridge

- Location: Martha’s Vineyard, MA
- Span: 65 foot Bascule Span
- Width: 24 feet
- Moveable bascule with Acrow Bridge approach spans

Moveable Bridge

- Location: Lynn-Saugus, MA
- Span: 65 foot Bascule Span
- Width: 24 feet
- Moveable bascule with Acrow Bridge approach spans



ACROW
BRIDGE

Launching Truss

- Location: *Kealakaha Stream, Hawaii*
- Span: *220 feet*
- Width: *12 feet*



Straddle Bent Truss Support & Towers

- Location: Atlanta, Georgia
- Span: 85 feet
- Width: 9 feet
- Height: 75 feet





Acrow 300 vs 700XS Series Summary



ACROW
BRIDGE

FDOT Panel Bridge Storage Yard

–Location: Oviedo, Florida

FDOT - Acrow Contacts

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Thank you!

Questions please...

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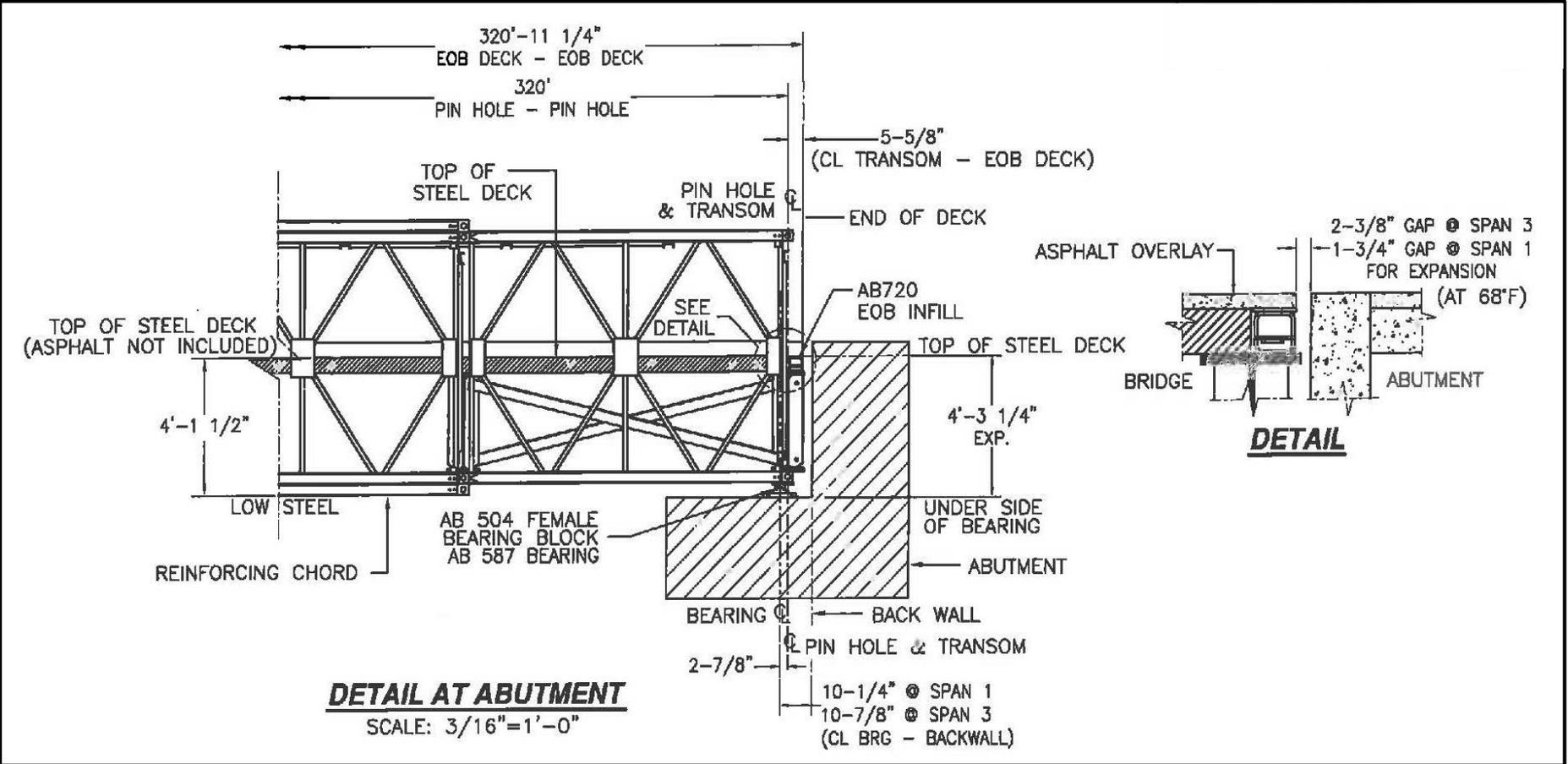
300 Series vs. 700XS Series Summary

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<input type="checkbox"/> <u>Supply History</u>	✓ Mid 1970's to late 1990's	✓ 2015 --
<input type="checkbox"/> <u>Roadway widths</u>	✓ 23' – 9 " curb-to-curb	✓ 24' – 0", 36' – 0" & 42' – 0" curb-to-curb
<input type="checkbox"/> <u>AASHTO Design Loads</u>	✓ HS20-44	✓ HL93 (with FDOT 120 Permit loads)
<input type="checkbox"/> <u>Guard Rail</u>	✓ None supplied – “Thrie Beam”	✓ TL-4 utilizing two level tubular type
<input type="checkbox"/> <u>Bridge Truss Panel</u>	✓ 10' long x 5' – 1" tall	✓ 10' long x 7' - 6" tall
<input type="checkbox"/> <u>Transom / Floorbeam</u>	✓ One every 5 feet	✓ One every 10 feet
<input type="checkbox"/> <u>Deck Units</u>	✓ Open Grid	✓ Orthotropic steel deck (10' x 6')
<input type="checkbox"/> <u>Spans</u>	✓ 50, 60 & 70 feet	✓ 60' - capability of spans > 200 ft

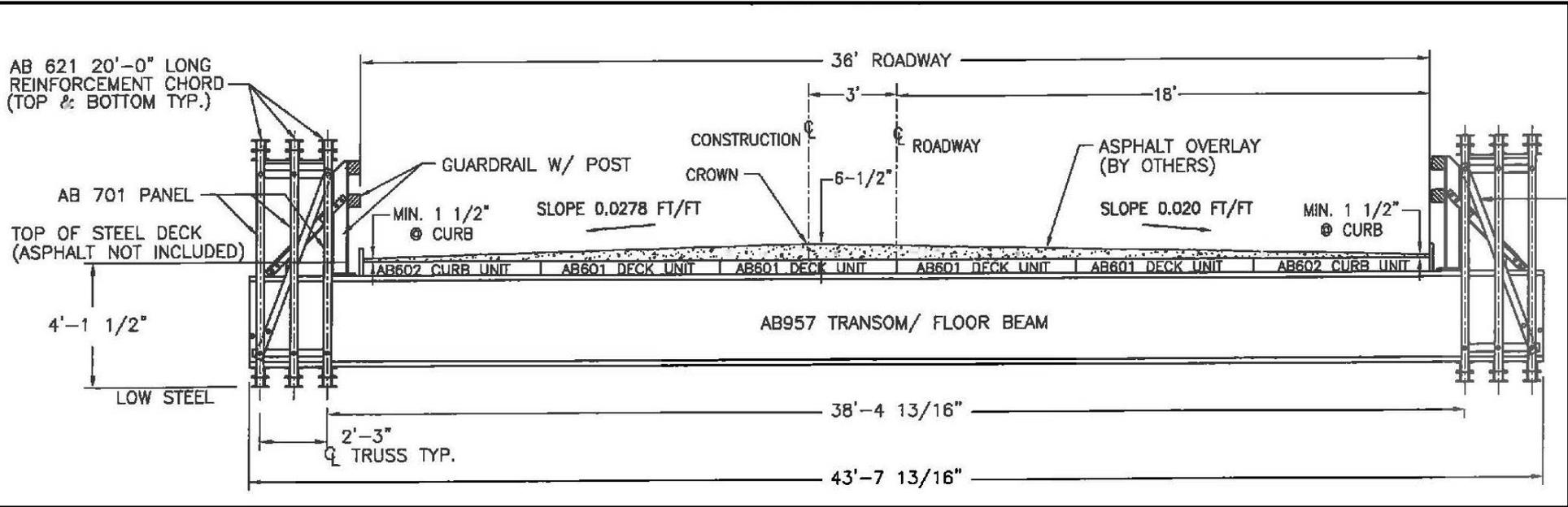
300 Series vs. 700XS Series Summary - continued

	<u>300 Series</u>	<u>700XS Series</u>
<input type="checkbox"/> <u>Truss Configuration</u>	✓ DS (Double Single) & TS (Triple Single)	✓ TS (Triple Single - other configurations available)
<input type="checkbox"/> <u>Current Stocks</u>	✓ Approx. 6,000ft of 23'-9" wide	✓ 2,000ft of 24' wide & 1,320ft of 36' wide
<input type="checkbox"/> <u>Design</u>	✓ No flexibility for longer spans	✓ Flexibility for longer spans > 200 + ft
<input type="checkbox"/> <u>Reinforcing Chord</u>	✓ None in FDOT inventory	✓ None in FDOT inventory (available fm Acrow)
<input type="checkbox"/> <u>Bridge Shear Ends</u>	✓ End Posts used	✓ AB702's/AB708's/AB709's/AB710's
<input type="checkbox"/> <u>Acrow Engineering Support</u>	✓ None	✓ Full engineering/design & field support
<input type="checkbox"/> <u>Top Down Construction</u>	✓ Not permitted	✓ Not permitted
<input type="checkbox"/> <u>Bridge Cross Slope</u>	✓ None – Level	✓ 1% CS if < 100ft. Build level if > 100ft. Asphalt used to create crown or cross slope

End of Bridge Details



Cross Section



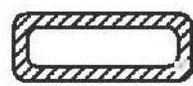
Truss Panel Details

SHAPE OF DIAGONALS

AB701 PANELS — CHANNELS



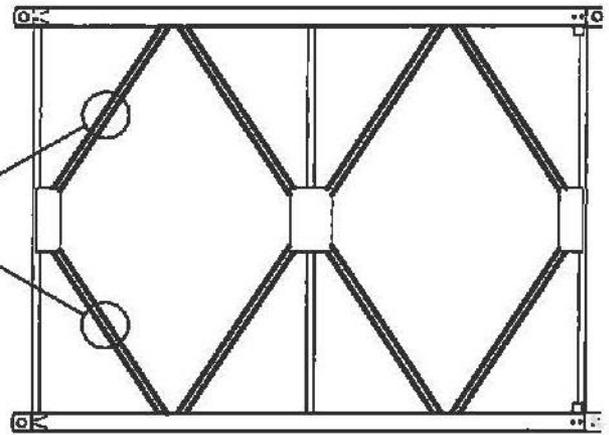
AB702 PANELS — TUBES



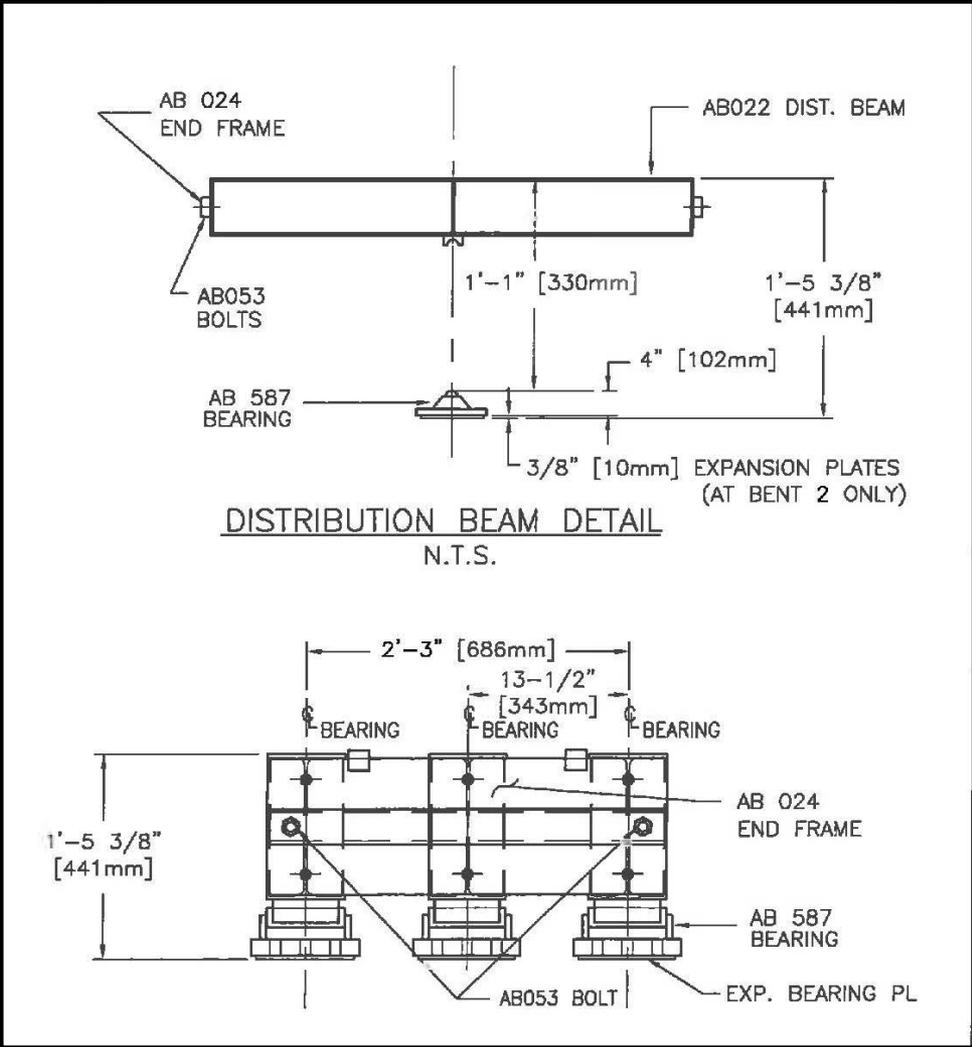
AB708 PANELS — SOLID BARS



ACROW PANEL



Distribution Beam Details



Guard Rail Details

