2023 Fall Conference at Ashore Resort & Beach Club
Ocean City, Maryland

Valmont's Steel U-Beam Allows Michigan Bridge Bundle to be Completed Ahead of Schedule

Theresa O'Riorden

September 29, 2023

BIOGRAPHY

- Regional Bridge Sales Engineer at Valmont Industries, Inc.
- Focuses on Valmont Bridge Systems, specifically the Valmont U-BEAM™
- Has a Bachelor of Science in Civil Engineering from the University of Massachusetts at Lowell.
- Experience in site planning and construction services as well as sales experience in variety of structural products.

ABSTRACT

Bridge Bundling with Steel PBTGs: Speed, Flexibility and Low Cost

- How do State DOTs replace more bridges with less money? “Bridge bundling” involves combining several bridges into a single contract and allows agencies to take advantage of efficiencies, which expedites project delivery and reduces design and construction costs.
- In pursuit of reporting zero critical bridges in Michigan, without approval of additional funds, the Michigan Department of Transportation (MDOT) launched the Rebuilding Our Bridges pilot program in early 2022. Nineteen bridges were identified for the program and MDOT required replacement of each bridge to take 90 days or less. The goal was to maximize available labor, save time and money, and reduce public disruption by starting (and completing) multiple bridges simultaneously.
- The bridges in the pilot program were all structurally deficient concrete box beams and were maintained by separate county agencies, requiring MDOT to collaborate and find solutions that were acceptable to all constituents.
- Press-brake-formed steel tub girders were selected for use due to their quick installation times and long service life. The entire project was completed 1 year ahead of schedule. This presentation will take an in-depth look into why the bundling pilot program was a success.

- 1.0 PDH

REBUILDING OUR BRIDGES
2021 MDOT BRIDGE BUNDLING PROJECT

valmont STRUCTURES

valmont® STRUCTURES

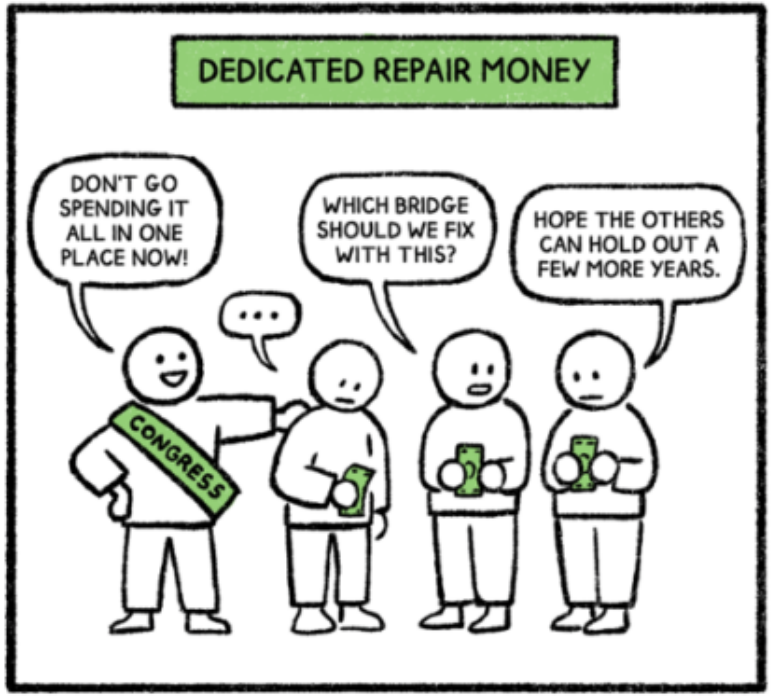
1. Bridge Bundling Project Summary
2. What is a PBTG vs. U-Beam?
3. Valmont Manufacturing Efficiencies
4. The U-BEAM™ Advantage to Michigan Bridge Bundling Project
5. Conclusion & Lessons Learned

2018 Michigan: “FIX THE DAMN ROADS”

In November 2018, Gretchen Whitmer was elected to a resounding victory as Michigan’s governor. Her eponymous slogan?

“Fix the damn roads”

- MDOT expects bridge bundling, which covers several bridge locations under one contract, to streamline coordination and permitting, increase economies of scale, and improve bridge conditions on local routes around the state.



Why Bundle Bridges?

IT'S AN OPPORTUNITY TO DO MORE WITH LESS

….an opportunity to save time and money

- *Expedite project delivery*
- *Save on design and construction costs*

….an opportunity to utilize limited available labor and resources

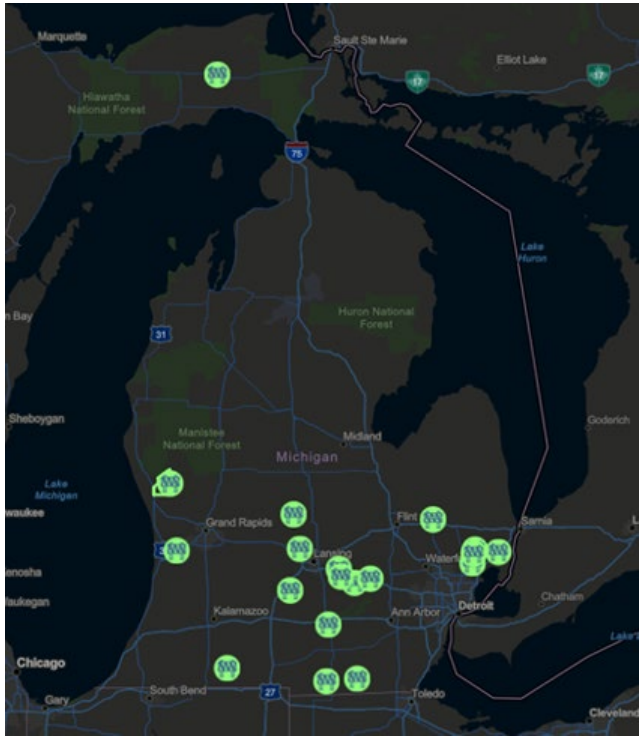
- *Reduce production cost through economies of scale*
- *Maximize use of available labor force*

2019 MDOT Pilot Bridge Bundle Project

MDOT Chief Bridge Engineer Matt Chynoweth:

“The pilot includes 19 local agency-owned bridges around the state with major bridge elements in serious or critical condition. The contract requirements call for them to be finished in 60 or 90 days (each).”

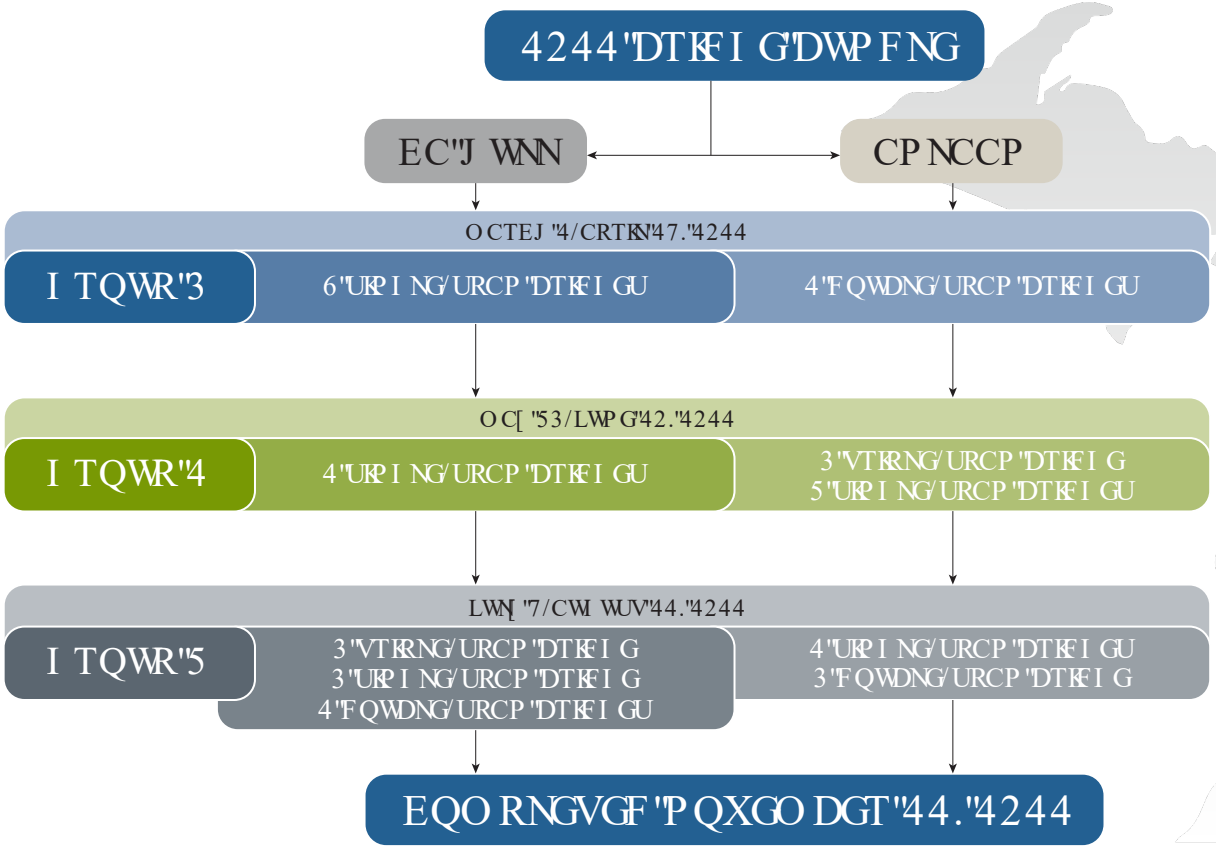
MDOT 19 Bridges Design-Build Bundle Project



Project timeline:

DEC. 2019	MDOT Pilot Announcement
AUG. 2020	5 Contractor Teams Shortlisted
NOV. 2020	MDOT Design-Build Request for Proposal
DEC. 2020	VALMONT Provided U-BEAM™ Priced Solutions to All Shortlisted Contractors
FEB. 2021	Team of CA Hull/Anlaan and Alfred Benesch Named Low Bidder for Project Engineers Estimate $23,785,860 Low Bidder $24,262,230
MAR. 2021	CA HULL Provided Valmont Letter of Intent
AUG. 2021	Received Preliminary Designs
DEC. 2021	Started Fabrication
NOV. 2023	**Contract Required Completion Date**

MDOT Bridge Bundling Actual Timeline



2022 Bridge Bundle: Tallman Road

1915: Tallman Road over the Maple River

HNTB, Bridge Scoping Report

Google Earth

Clinton County

Superstructure Replacement with Widening

Span	Three
Length	190'-11"
Beams	27" prestressed concrete box
Utilities	• **Overhead electrical line** approximately 25' east of the bridge
Trees	Yes
Other Issues	• **Driveway to residential properties** located around 0.11 mile south to the bridge

ANLAAN

NE Quadrant

NW Quadrant

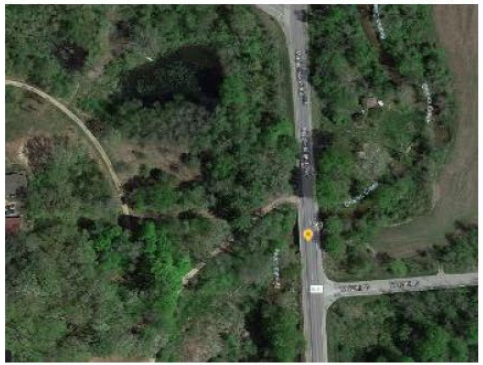
SW Quadrant

SE Quadrant

2022 Bridge Bundle: Maple Island

7660 : Maple Island Road over Brooks Creek

HNTB, Bridge Scoping Report

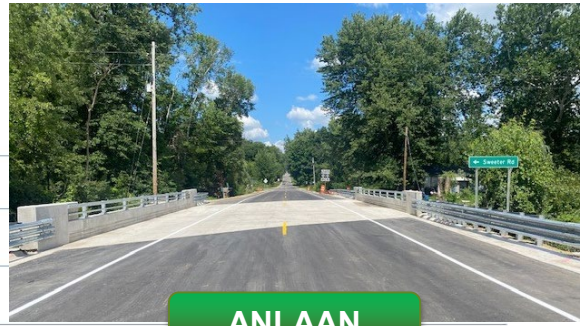


Google Earth

Muskegon County

Superstructure Replacement and Substructure Patching

Span	Single
Length	64'-0"
Beams	27" prestressed concrete box
Utilities	• **Overhead wires** on the East and West sides of the bridge and [illegible] the North reference line
Trees	Yes
Other Issues	• **Residential properties** near the bridge • **Not enough rerouting options** with this bridge



South Approach

North Approach

Phone Lines 20' East of Bridge

Intersection South of Bridge

2022 Bridge Bundle: Palms Road

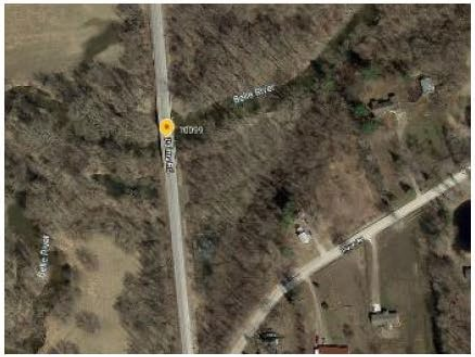
10099 : Palms Road over Belle River

HNTB, Bridge Scoping Report

St. Clair County

Superstructure Replacement and Substructure Patching

Span	Three
Length	195'-1"
Beams	27" prestressed concrete box
Utilities	• **Utilities** in the east side of the bridge
Trees	Yes
Other Issues	-



Google Earth

SW Corner of Deck

SE Guardrail and Overhead Utilities

NW Guardrail

NE Corner of Deck

2022 Bridge Bundle: Nottawa Road

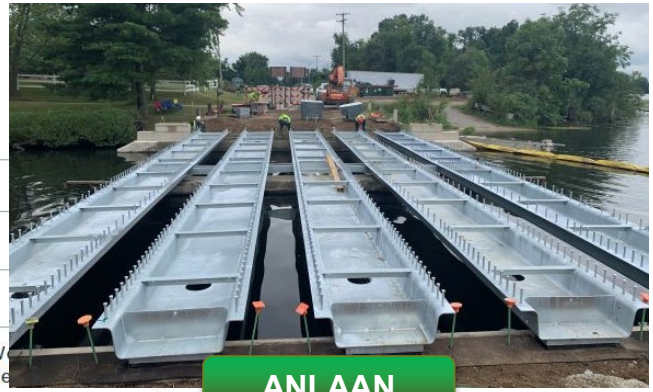
10316 : Nottawa Road over Prairie River

HNTB, Bridge Scoping Report

St. Joseph County

Superstructure Replacement and Substructure Patching

Span	Two
Length	104'-0"
Beams	17" prestressed concrete box
Utilities	• **Utility conduit fastened** to the W • **Overhead electrical** along the We
Trees	No
Other Issues	• **Residential driveway** in the southeast quadrant • **Public boat launch** and parking lot located in the southwest quadrant • **Pier** in poor condition



ANLAAN

Google Earth

South Approach

North Approach

MW Quadrant with Electrical 20' West

SW Quadrant with Boat Launch

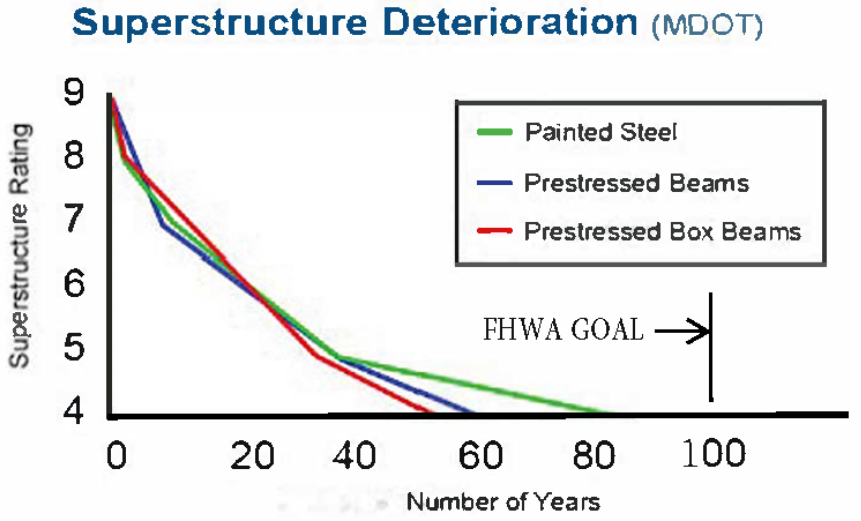
WHAT IS A PBTG VS. U-BEAM?

Concrete is what we've always done.

"Insanity is doing the same thing over and over and expecting different results."

-- Albert Einstein

- Prestressed concrete box beams have been the standard solution since the 1970's for off-system, local agency, non-interstate bridges.
- MDOT study of current inventory shows pre-stressed concrete box beam service life < 50 years
- "Bridge engineers need improved design options so they can deliver bridges that are operational for 100 years or more", FHWA



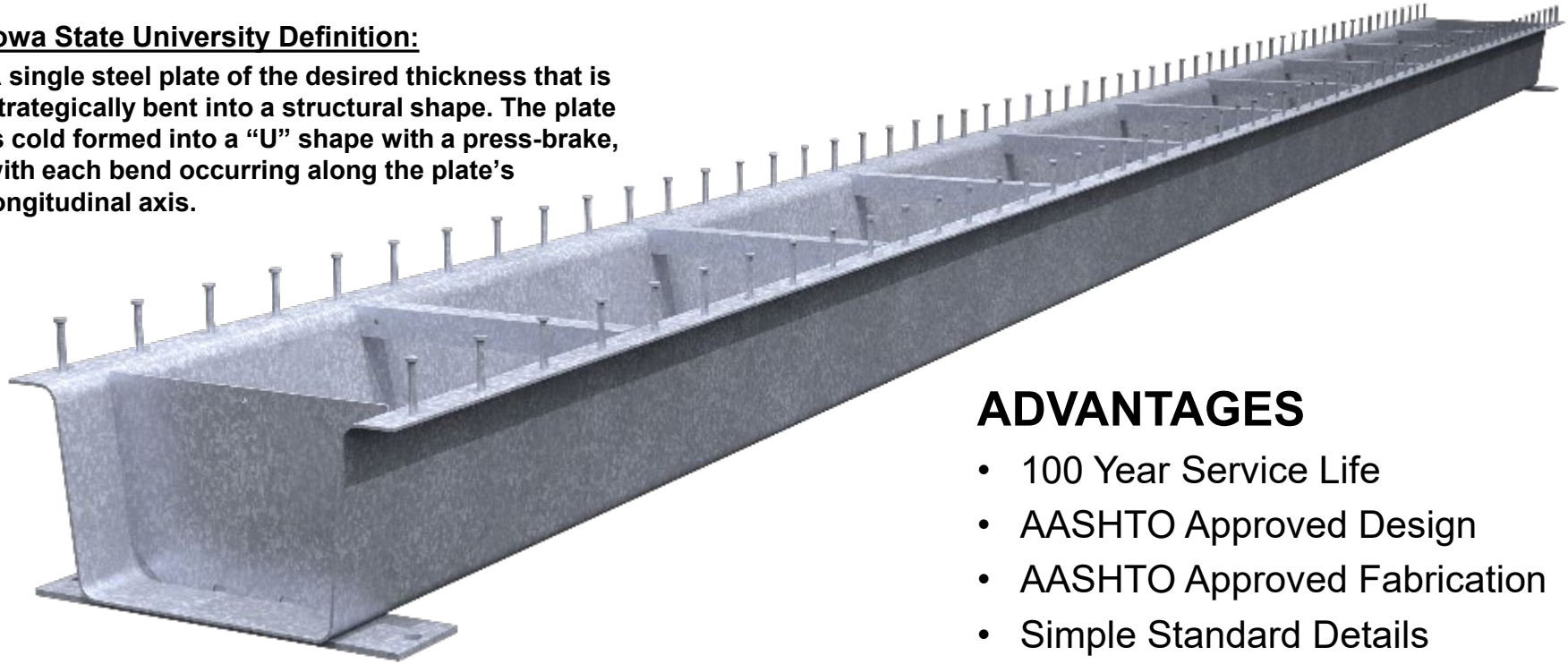
4 - POOR CONDITION: Structural capacity of element is affected or jeopardized by advanced deterioration, section loss, spalling, cracking, or other deficiency

3 - SERIOUS CONDITION: Loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible.

What is a Steel Press-Brake-Formed Tub Girder?

Iowa State University Definition:

A single steel plate of the desired thickness that is strategically bent into a structural shape. The plate is cold formed into a "U" shape with a press-brake, with each bend occurring along the plate's longitudinal axis.



ADVANTAGES

- 100 Year Service Life
- AASHTO Approved Design
- AASHTO Approved Fabrication
- Simple Standard Details
- Easy Installation

2021 AASHTO Focus Technology

National recognition through the AASHTO Innovation Initiative Award

2020 Press-Brake Tub Girders receive the “2020 Innovation Award” as **a ready-to-implement technology** that offers improved performance/effectiveness, and have been demonstrated in "real world" applications.

2021 Press-Brake Tub Girders become a 2021 AASHTO Focus Technology.

2022 Press-Brake Tub Girders to be included in revisions to the 10th Edition of the AASHTO LRFD Bridge Design Specifications. The revisions apply to Specification Equation 6.11.2.2-3, allowing DOTs, Counties and other entities to utilize AASHTO design guidelines instead of rewriting specifications to include U-BEAMs

visit **aii.transportation.org** for more information

DEVELOPMENT AND EXPERIMENTAL TESTING OF PRESS-BRAK FORMED STEEL TUB GIRDERS FOR SHORT SPAN BRIDGE APPLICATIONS

Karl E. Barth, Ph.D.
Gregory K. Michaelson, Ph.D.
Cory L. Gibbs

Submitted to the AISI Steel Market Development Institute Short Span Steel Bridge Alliance

Table 2.2: Equation Legend (AASHTO, 2014)

Chapter 2	AASHTO 7th Edition
Equation 2.1	Equation 6.11.2.1.2-1
Equation 2.2	Equation 6.11.2.1.3-1
Equation 2.3	Equation 6.11.2.2-1
Equation 2.4	Equation 6.11.2.2-2
Equation 2.5	Equation 6.11.2.2-3
Equation 2.6	Equation 6.10.3.2.1-1
Equation 2.7	Equation 6.10.3.2.1-2
Equation 2.8	Equation 6.10.3.2.1-3
Equation 2.9	Equation 6.10.3.2.2-1
Equation 2.10	Equation 6.10.3.2.3-1
Equation 2.11	Equation 6.11.3.2-1
Equation 2.12	Equation 6.11.3.2-2
Equation 2.13	Equation 6.11.3.2-3
Equation 2.14	Equation 6.11.3.2-4
Equation 2.15	Equation 6.11.3.2-5
Equation 2.16	Equation 6.10.3.3-1
Equation 2.17	Equation 6.11.9-1
Equation 2.18	Equation 6.10.4.2.2-1
Equation 2.19	Equation 6.10.4.2.2-2
Equation 2.2	Equation 6.10.4.2.2-3
Equation 2.21	Equation 6.10.4.2.2-4
Equation 2.22	Equation 6.6.1.2.2-1
Equation 2.23	Equation 6.6.1.2.5-1
Equation 2.24	Equation 6.6.1.2.5-2
Equation 2.25	Equation 6.6.1.2.5-3
Equation 2.26	Equation 6.11.6.2.2-1

Chapter 2	AASHTO 7th Edition
Equation 2.39	Equation 6.11.8.2.2-4
Equation 2.40	Equation 6.11.8.2.2-5
Equation 2.41	Equation 6.11.8.2.2-6
Equation 2.42	Equation 6.11.8.2.2-7
Equation 2.43	Equation 6.11.8.2.2-8
Equation 2.44	Equation 6.11.8.2.2-9
Equation 2.45	Equation 6.11.8.2.2-10
Equation 2.46	Equation 6.11.8.2.2-11
Equation 2.47	Equation 6.11.8.2.2-12
Equation 2.48	Equation 6.11.8.2.3-1
Equation 2.49	Equation 6.11.8.2.3-2
Equation 2.50	Equation 6.11.8.2.3-3
Equation 2.51	Equation 6.11.8.3-1
Equation 2.52	Equation 6.10.9.1-1
Equation 2.53	Equation 6.10.9.2-1
Equation 2.54	Equation 6.10.9.2-2
Equation 2.55	Equation 6.10.9.3.2-1
Equation 2.56	Equation 6.10.9.3.2-2
Equation 2.57	Equation 6.10.9.3.2-3
Equation 2.58	Equation 6.10.9.3.2-4
Equation 2.59	Equation 6.10.9.3.2-5
Equation 2.60	Equation 6.10.9.3.2-6
Equation 2.61	Equation 6.10.9.3.2-7
Equation 2.62	Equation 6.10.9.3.2-8
Equation 2.63	Equation 6.10.9.3.3-1
Equation 2.64	Equation 6.10.9.3.3-2

AASHTO DESIGN

AASHTO LRFD Bridge Design Specifications 8th Edition (2017) Section 6.11.
Steel Structures. Box-Section Flexural Members. SSSBA Verification.

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Press-Brake-Formed Tub Girders and the SSSBA

Press-Brake-Formed Tub Girder (PBFTG) Research Reports

- 10 Years of Development and Experimental Testing of Press Brake Tub Girders
- Published a 7 Volume Research Report
- https://www.shortspansteelbridges.org/testing-of-press-brake-tub-girders/

SHORT SPAN STEEL BRIDGE ALLIANCE™

Education
Webinars
Workshops
Conferences

Technical Resources
Standards
Guidelines
Best Practices

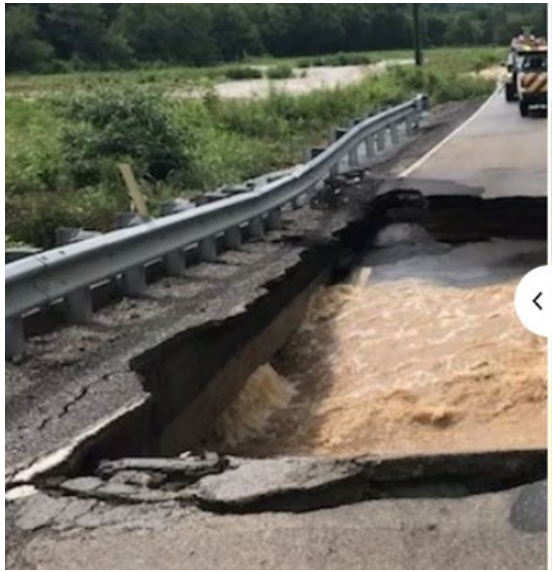
Case Studies
Economics: Steel is Cost-Effective
Innovative & ABC Design

The First Press-Brake Tub Girder Bridge Install

Monroe County Road Commission, Mich.

- 2004 Install
- 40’ Long x 34’ Wide
- NBIS Bi-Annual Inspection
- No signs of deterioration of concrete, driving surface, or corrosion in steel girders

Expedited U-BEAM™ Bridge Installations



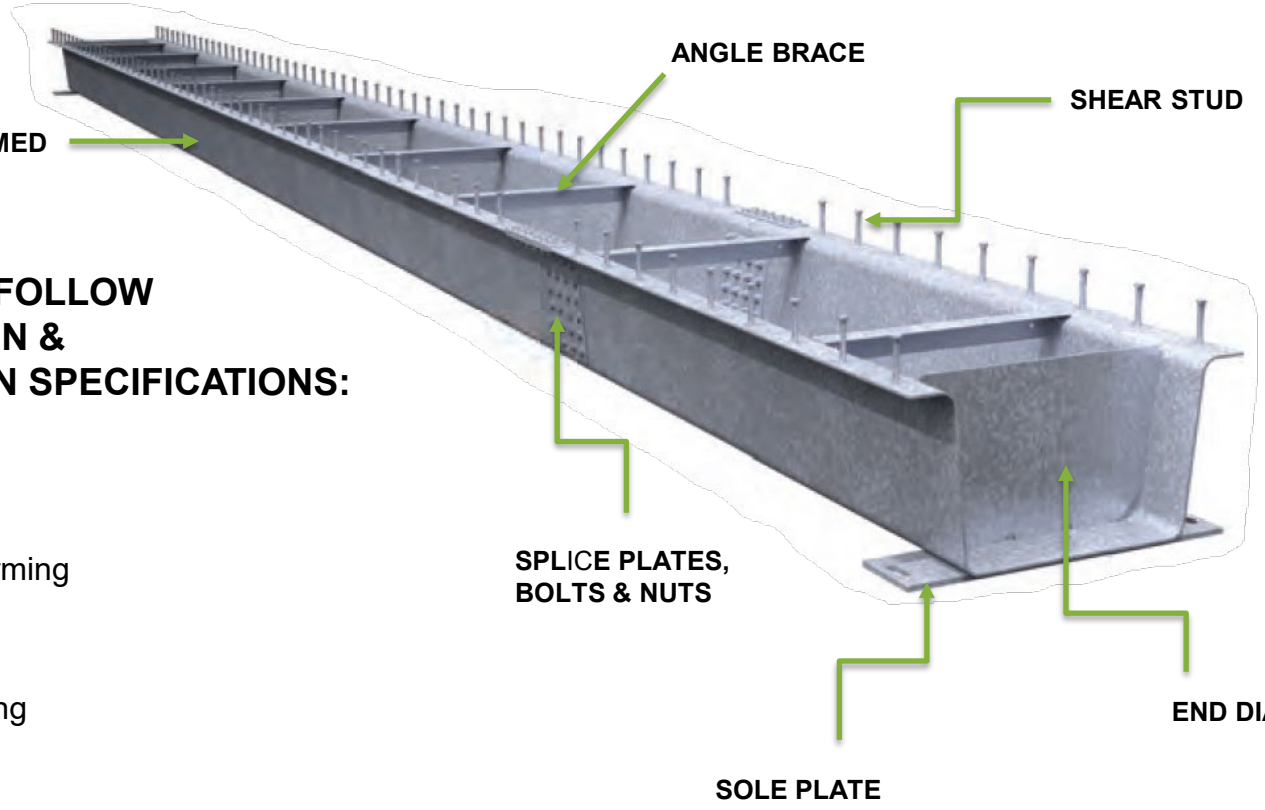
TDOT Sevier County, Tenn. Emergency Replacement

- TDOT purchased U-BEAMs direct from Valmont
- Beams supplied in 6 weeks
- Bridge opened in less than 3 months

Multiple Span U-BEAM™ Installations

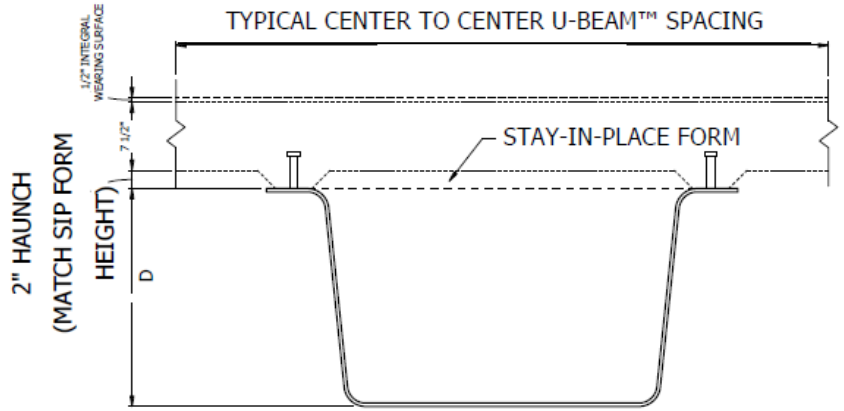
MDOT Grand Traverse County, Mich., August 2021

The Valmont U-BEAM™ (a press-brake-formed steel tub girder)

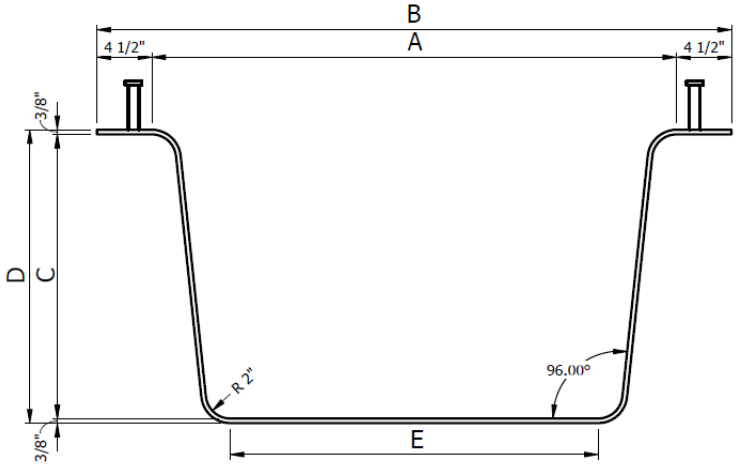


PROCEDURES FOLLOW AASHTO DESIGN & CONSTRUCTION SPECIFICATIONS:

1. Design
2. Shop Drawings
3. Material
4. Press-Brake-Forming
5. Camber
6. Stud Welding
7. Protective Coating
8. Inspection



VALMONT® U-BEAM™ STANDARD COMPOSITE CROSS SECTION



VALMONT® U-BEAM™ STANDARD CROSS SECTION

U-BEAM™ SPACING	BRIDGE LENGTH (ft)															
	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
4' - 6"	U12	U12	U12	U12	U12	U18	U18	U18	U24	U24	U24	U30	U30	U33	U33	S.D.
5' - 0"	U12	U12	U12	U12	U12	U18	U18	U18	U24	U24	U30	U30	U33	U33	S.D.	S.D.
5' - 6"	U12	U12	U12	U12	U18	U18	U18	U24	U24	U24	U30	U30	U33	U33	S.D.	
6' - 0"	U12	U12	U12	U12	U18	U18	U18	U24	U24	U30	U30	U30	U33	S.D.	S.D.	
6' - 6"	U12	U12	U12	U12	U18	U18	U18	U24	U24	U30	U30	U33	U33	S.D.		
7' - 0"	U12	U12	U12	U12	U18	U18	U24	U24	U24	U30	U30	U33	S.D.	S.D.		
7' - 6"	U12	U12	U12	U12	U18	U18	U24	U24	U30	U30	U33	U33	S.D.			
8' - 0"	U12	U12	U12	U18	U18	U18	U24	U24	U30	U30	U33	S.D.	S.D.			

DESIGNATION	A	B	C	D	E
U12	43"	52"	11 1/4"	12"	32 5/8"
U18	43"	52"	17 1/4"	18"	31 3/8"
U24	43"	52"	23 1/4"	24"	30 1/8"
U30	43"	52"	29 1/4"	30"	28 7/8"
U33	45"	54"	32 1/4"	33"	30 1/4"

VALMONT U-BEAM™ DESIGN GUIDELINES

AASHTO LRFD Bridge Design Specifications 8th Edition (2017) Section 6.11.
Steel Structures. Box-Section Flexural Members

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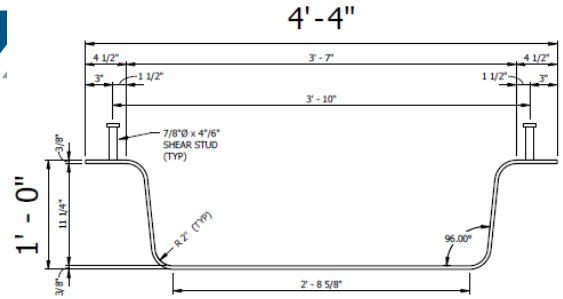
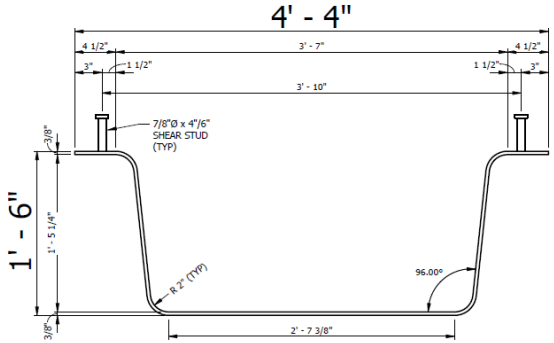


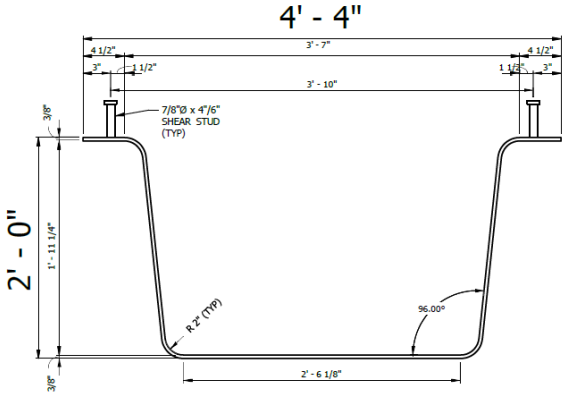
U12 STEEL U-BEAM™

(AASHTO M270, ASTM A709 GR50 T2)



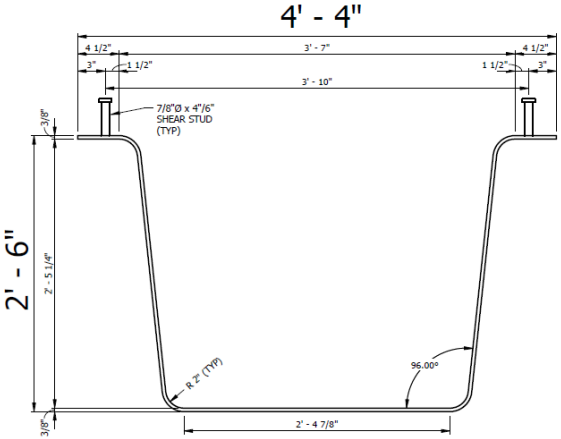
U18 STEEL U-BEAM™

(AASHTO M270, ASTM A709 GR50 T2)



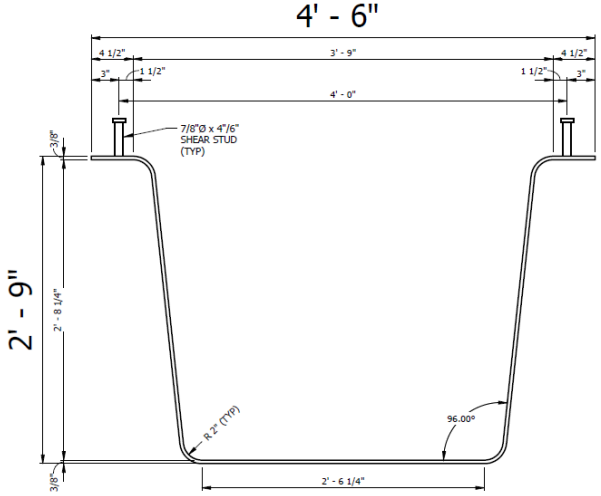
U24 STEEL U-BEAM™

(AASHTO M270, ASTM A709 GR50 T2)



U30 STEEL U-BEAM™

(AASHTO M270, ASTM A709 GR50 T2)



U33 STEEL U-BEAM™

(AASHTO M270, ASTM A572 GR50 T2)

U12 - U33 STANDARD DESIGN SECTIONS

Valmont U-BEAM™ Design Cross Sections.

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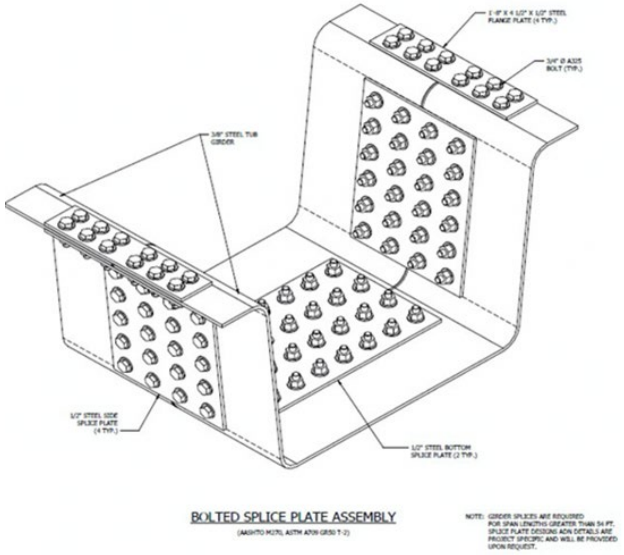
AASHTO BOLTED SPLICE DESIGN

AASHTO LRFD Bridge Construction Specifications 4th Edition (2017) Section11.5.5.3 Surface Conditions. Faying surfaces specified to be galvanized shall be hot-dip galvanized in accordance with AASHTO M111 (ASTM A123).
AASHTO LRFD Bridge Design Specifications 8th Edition (2017) Section 6.13.2.8 Slip Resistance. Class C Surface: hot-dip galvanized surfaces (K_s=0.30)



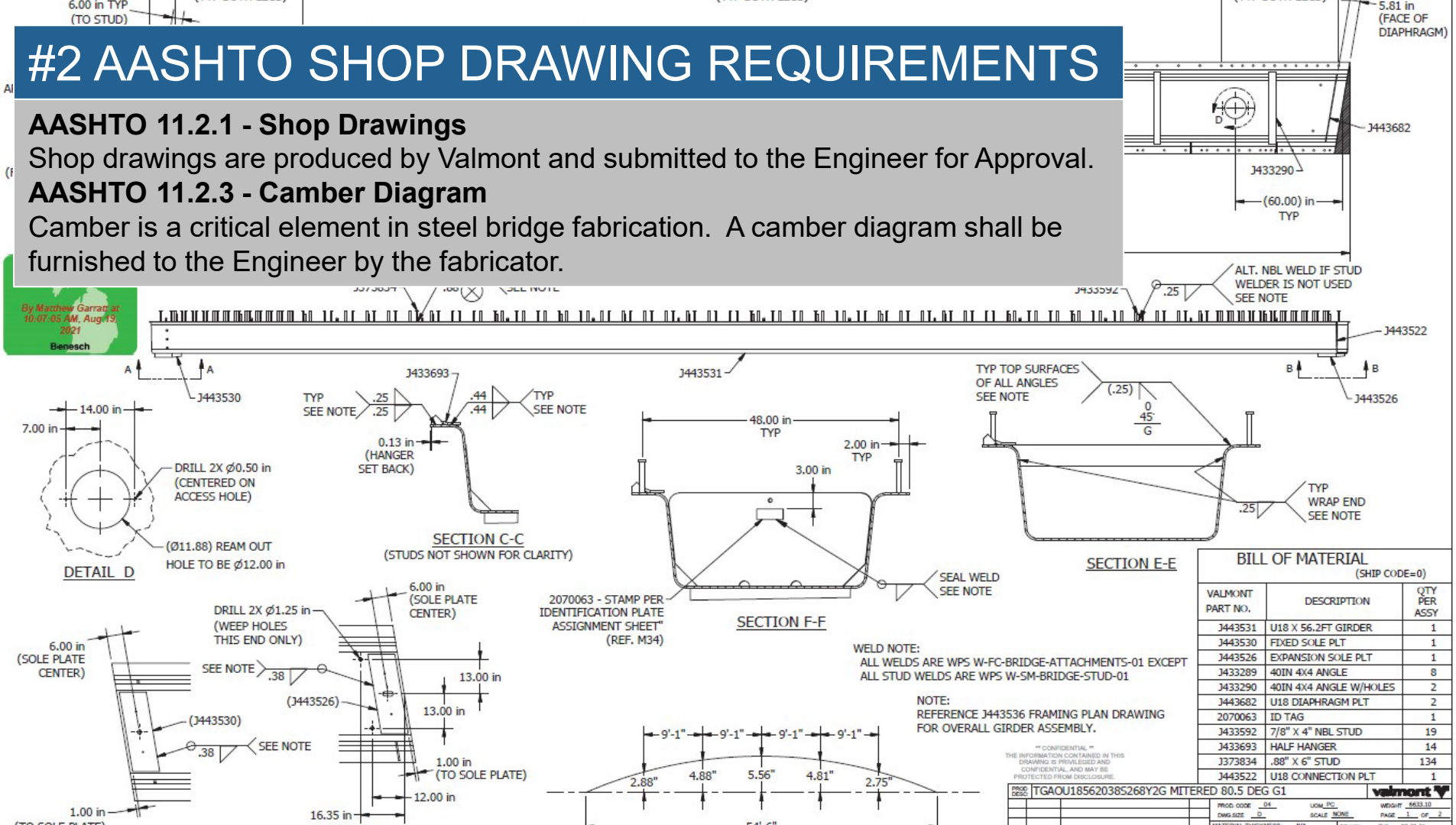
#2 AASHTO SHOP DRAWING REQUIREMENTS

AASHTO 11.2.1 - Shop Drawings

Shop drawings are produced by Valmont and submitted to the Engineer for Approval.

AASHTO 11.2.3 - Camber Diagram

Camber is a critical element in steel bridge fabrication. A camber diagram shall be furnished to the Engineer by the fabricator.



WELD NOTE:
ALL WELDS ARE WPS W-FC-BRIDGE-ATTACHMENTS-01 EXCEPT ALL STUD WELDS ARE WPS W-SM-BRIDGE-STUD-01

NOTE:
REFERENCE J443536 FRAMING PLAN DRAWING FOR OVERALL GIRDER ASSEMBLY.

BILL OF MATERIAL
(SHIP CODE=0)

VALMONT PART NO.	DESCRIPTION	QTY PER ASSY
J443531	U18 X 56.2FT GIRDER	1
J443530	FIXED SOLE PLT	1
J443526	EXPANSION SOLE PLT	1
J433289	40IN 4X4 ANGLE	8
J433290	40IN 4X4 ANGLE W/HOLES	2
J443682	U18 DIAPHRAGM PLT	2
2070063	ID TAG	1
J433592	7/8" X 4" NBL STUD	19
J433693	HALF HANGER	14
J373834	.88" X 6" STUD	134
J443522	U18 CONNECTION PLT	1

PROD DESC: TGAOU18562038S268Y2G MITERED 80.5 DEG G1

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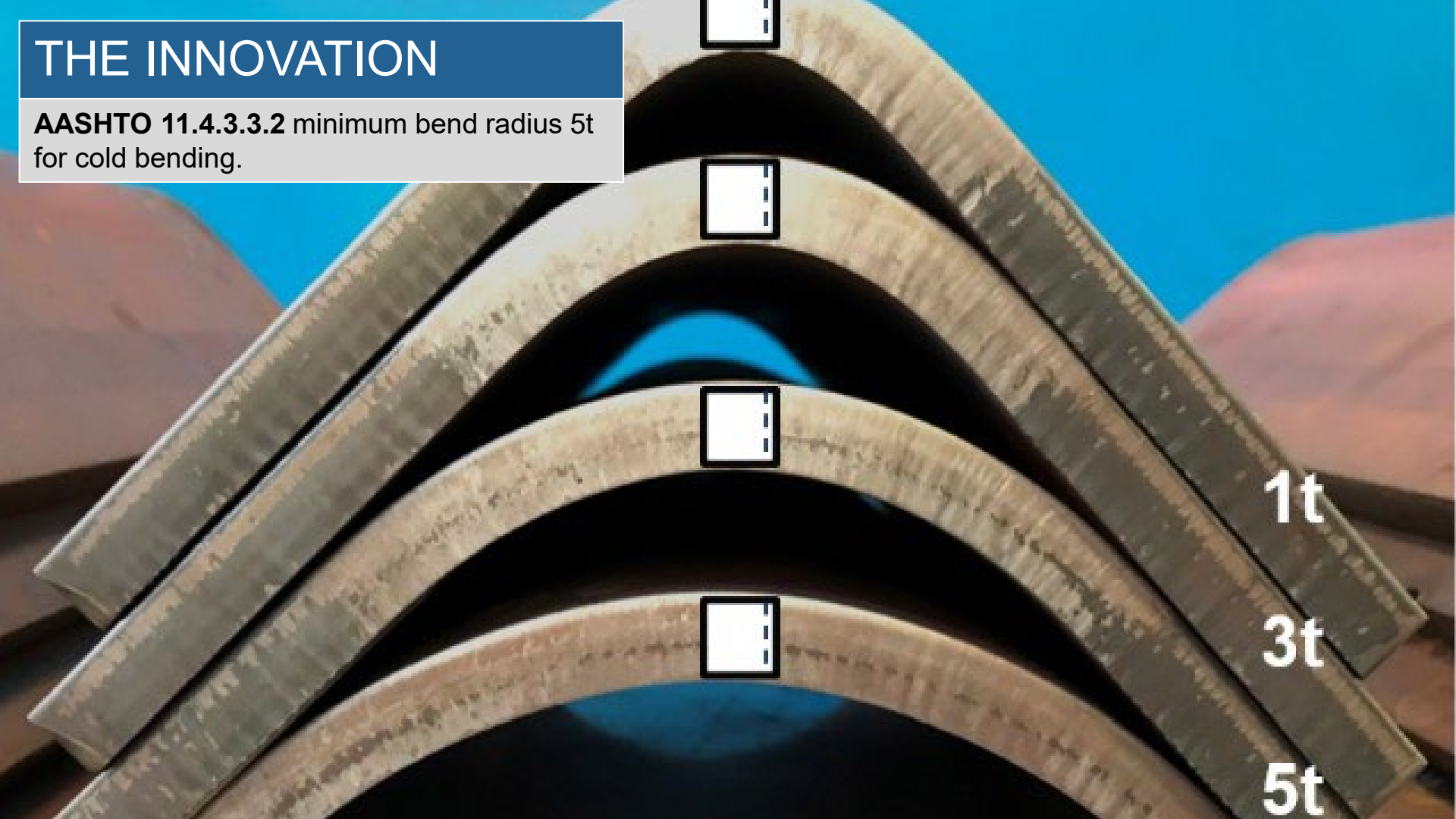
#3 AASHTO STEEL PLATE MATERIAL

AASHTO 11.3.1.2
AASHTO M270. **Made in the USA**. Steel Plates and Structural Shapes shall conform to ASTM A709/A709M.

THE INNOVATION

AASHTO 11.4.3.3.2 minimum bend radius 5t for cold bending.



#4 AASHTO FORMING

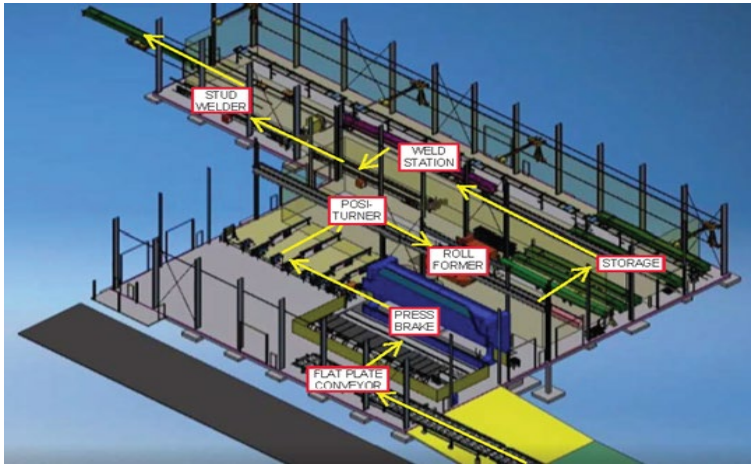
AASHTO 11.4.3.3 - Bent Plates
Fracture-critical and Non-fracture critical plates and bars shall be cold bent.

VALMONT MANUFACTUR-ING EFFICIENCIES

Valmont Manufacturing Innovation

STATE OF THE ART PRESS BRAKE FABRICATION FACILITY:

- AISC intermediate bridge fabricator certification
- Patent pending manufacturing techniques
- increased production capacity by 5
- Total Capitol investment $20M
- Cut production time by 70%
- U-beam^{tm} facility fully staffed with new personnel
- Designed for manufacturing efficiency and reduced carbon emissions
- Opened August 2021

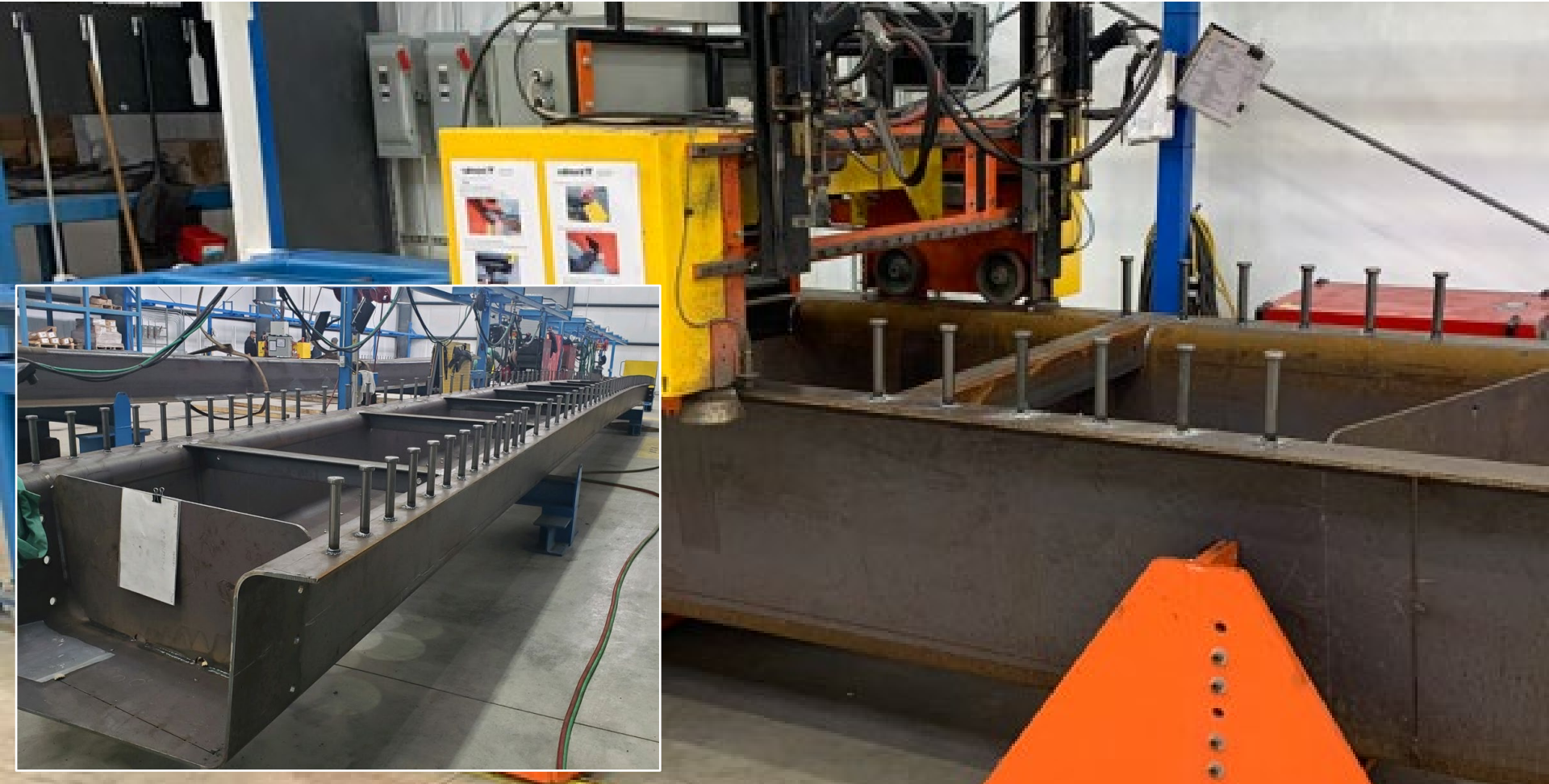


Valmont Manufacturing Innovation: Press Brake

- 60’ long
- 2000 Ton capacity
- Largest single-length press brake in the world
- Safe and efficient material handling

Valmont Manufacturing Innovation: Roll Camber

Valmont Manufacturing Innovation: Shear Stud Welding



Valmont Manufacturing Innovation: Galvanizing

GALVANIZED BRIDGE CASE STUDY

Case Study:

Sterns Bayou Bridge

Ottawa County, MI United States

This is believed to be the first fully galvanized bridge in the United States. Galvanized and installed in 1966, this county bridge measures 420 ft. (128 m) long with a 30-foot clear roadway and a five-foot walkway along each side. All the steel was galvanized including the handrail, diaphragms, fasteners, shear connectors, and beams - some with 30-inch wide flanges, weighing between 99 and 108 pounds per foot. All steel used to erect the Stearns Bayou Bridge has no signs of rusting or staining, and is in excellent shape. The average mil thickness is 4.7 (160µm). Projected life expectancy to first maintenance is 106 years for the principal steel and 44 years for the handrail.

Details:

Year Galvanized	*1966*
Sectors	***Bridge & Highway***
Location	***Ottawa County, MI United States***
Environment	***Rural***

The majority of the steelwork is six feet above a fresh water river in a rural location. Traffic is light to moderate. The entire bridge is subject to winter salting.

At the 2016 inspection, all beams and diaphragms were in very good shape and showed no signs of rusting or staining. The average mil thickness was 4.7. All bolted connections looked good and showed no signs of rust. Bearing pads and expansion areas subject to salt and standing water had an average coating of 2.9 mils.

Projected life expectancy was 106 years for the principal steel.

Sterns Bayou Bridge: Believed to be the first fully hot-dip galvanized bridge in the US

In service in Michigan for over 50 years with no known maintenance.

Coating has an average thickness of 4.7 mils, with minimum average readings in bearing areas of 2.9 mils.

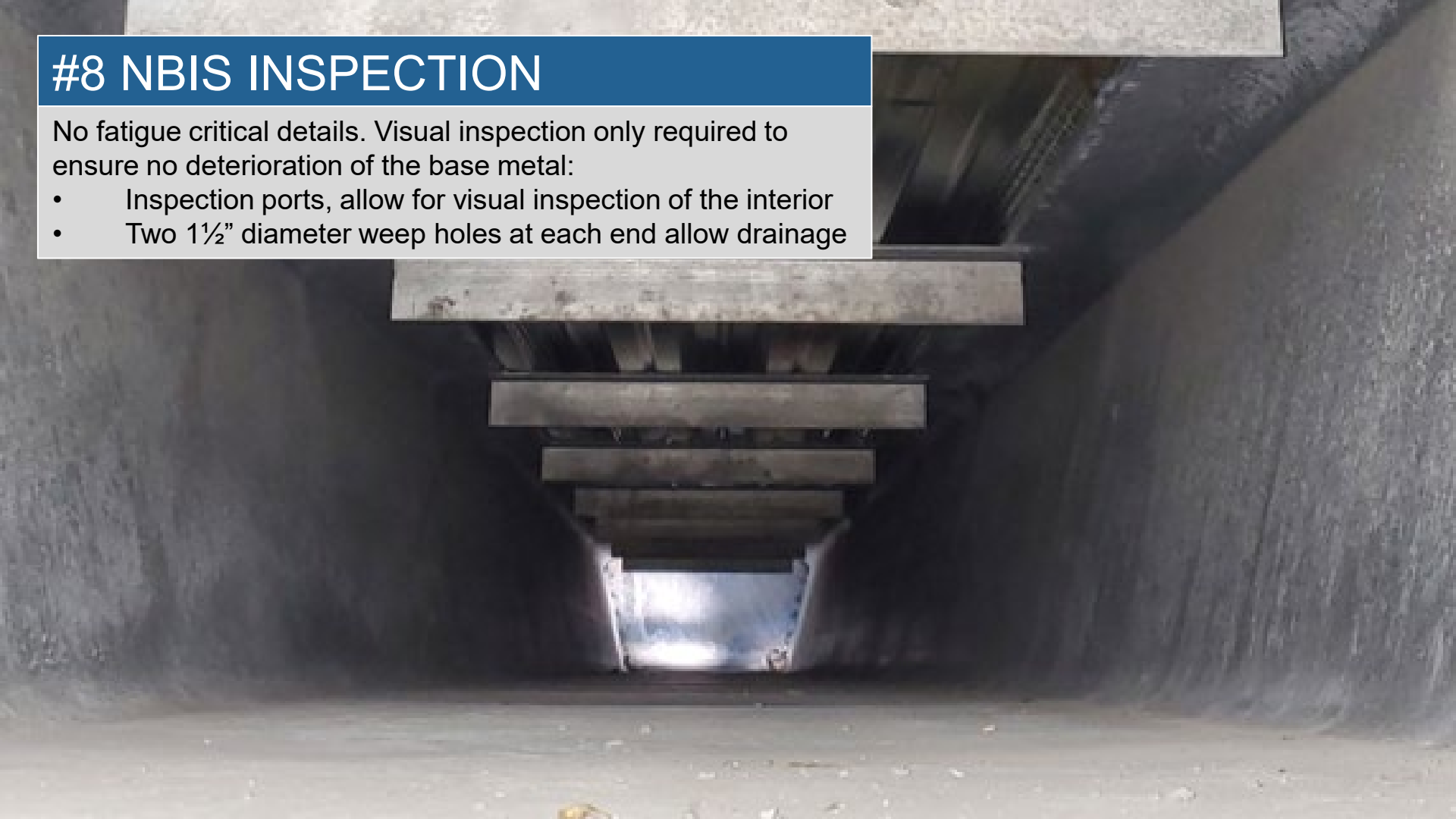
The coating is projected to have a maintenance-free service life of over 106 years for the principal steel.

valmont STRUCTURES

#8 NBIS INSPECTION

No fatigue critical details. Visual inspection only required to ensure no deterioration of the base metal:

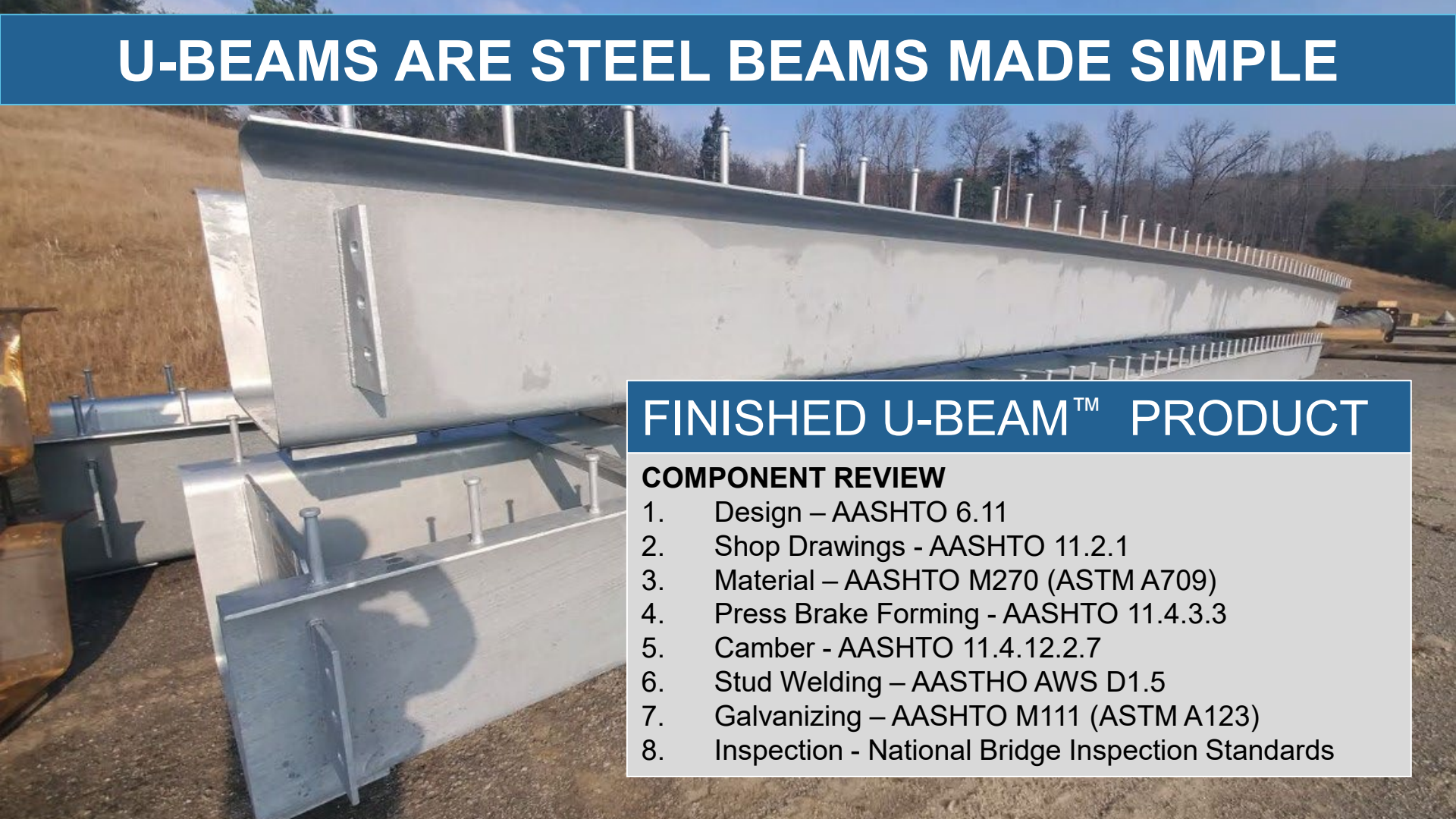
- Inspection ports, allow for visual inspection of the interior
- Two 1½” diameter weep holes at each end allow drainage



Valmont U-BEAM™ Inspection

- NBIS inspection requirements for U-BEAMs are limited to section loss due to corrosion
- Visual observation of the interior U-BEAM™ elements through openings at each end
- Visual inspection should look for chalky white staining or zinc oxide build-up on the surface
- **Base metal thickness and coating thickness can both be measured from the outside with an electromagnetic gauge per ASTM E376**.

U-BEAMS ARE STEEL BEAMS MADE SIMPLE



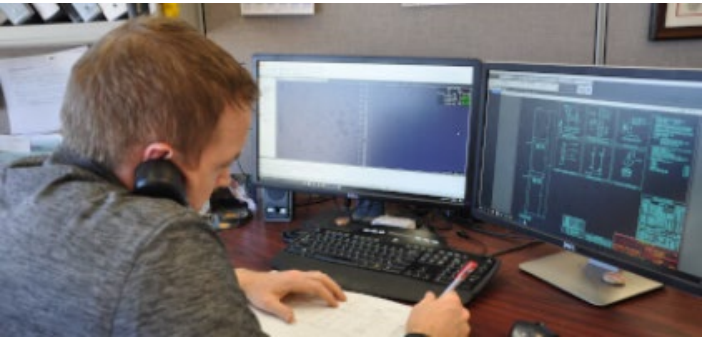
FINISHED U-BEAM™ PRODUCT

COMPONENT REVIEW

1. Design – AASHTO 6.11
2. Shop Drawings - AASHTO 11.2.1
3. Material – AASHTO M270 (ASTM A709)
4. Press Brake Forming - AASHTO 11.4.3.3
5. Camber - AASHTO 11.4.12.2.7
6. Stud Welding – AASTHO AWS D1.5
7. Galvanizing – AASHTO M111 (ASTM A123)
8. Inspection - National Bridge Inspection Standards

THE U-BEAM™ ADVANTAGE TO MBBP

U-BEAM™ ADVANTAGE: Engineering Services



From Concept to Reality

At Valmont® Structures, we've been turning concepts into reality for decades. We've learned firsthand that the ability to move a concept to reality starts with experience. At Valmont, we have over 100 engineers on staff around the world. Their collective global experience enables us to create unique structures while also meeting specific architectural requirements and municipal codes. But our experience doesn't end there. Instead it extends with the knowledge that is gained working across a wide array of solutions that include lighting, traffic, mass transit, signage, communications structures and even foundation design.

Valmont Engineered Support Services

Valmont provided all 5 shortlisted teams with specific design solutions and prices for each of the 19 bridges, including:

- Ensured Most Economical U-BEAM™ Solution
- Provided Construction Accessories (bearing pads, metal deck, forming hardware)
- Stamped Design and Shop Drawings (seamless coordination of deliverables)
- Can Also Provide Stamped Load Rating

U-BEAM™ ADVANTAGE: Time Savings

Reduce Construction Schedule By As Much As One Year!

Valmont provided all 157 U-BEAMs in an eight-month construction season:

- Secured ALL 500 tons of material for project by 3/12/21
- 3rd party inspection at Valmont Jasper, Tenn., facility
- Hot-Dip Galvanizing at Valmont Birmingham, Ala., facility

U-BEAM™ ADVANTAGE: Large Production Capacity

PURPOSE BUILT PRESS BRAKE TUB GIRDER FACILITY

Valmont State-of-the-Art Fabrication Facility

New plant opened August 2020

- AISC and DOT Certifications
- Designed for efficiency and sustainability
- Cuts production time by 70%
- Capabilities include:
  - 2000 Ton 60’ Press Brake
  - Roll form camber capabilities
  - Automated stud welding
  - Safe and efficient material handling

U-BEAM™ ADVANTAGE: Economy of Scale

Efficient Freight, Easy Handling

Utilize national carriers on standard size trailers:

- Deliver as many as six U-BEAMs in a single load
- Lighter loads for weight restricted access
- Unload with light equipment (rubber mounted)
- Easy job site storage (smaller footprint)
- Easy accessibility to job site (important in rural locations)

U-BEAM™ ADVANTAGE: Reduced Construction Cost

Simple Rigging, Smaller Equipment

Installation Made Easy:

- Nylon slings with basket rigging
- Extended reach of equipment (eliminate use of barges)
- Use of smaller equipment (some sites only need an excavator)
- Easy accessibility to job site (important in rural locations)

U-BEAM™ ADVANTAGE: Reduced Construction Cost

Less Field Work, Less Exposure to Hazardous Conditions

Forming Made Simple:

- No external intermediate diaphragms (no assembly)
- Concrete forming directly atop top flanges (no welding)
- Constant haunch (no survey prior to installation)
- Pre-installed formwork hardware (half-hangers and screed studs)
- Easily and safely install fascia brackets on the ground

U-BEAM™ ADVANTAGE: Reuse Existing Foundations

Variable Sole Plate Thickness, Tapered Sole Plates, Variable Bearing Pad Thickness

No modifications to exiting bearing seat:

- Accounted for flat bearing seats with tapered sole plate
- Accounted for crown with variable height bearing pads
- Existing bearing seats surveyed before and after existing superstructure was removed
- Eliminated expensive and time consuming rehabilitation of abutments and piers

U-BEAM™ ADVANTAGE: Reduce Costs

497 Tons of Steel Purchased Six Months Prior To Fabrication

Tub girder priced at $2.11/lb. (2021 Dollars)

- All plate purchased by 3/12/21
- Price included fully fabricated and galvanized U-BEAMs
- Delivered with field splice material

WDGCOU'4243'DTKEIG'DWPFNG'RTKEKPI		
Rtkeglnd0*hwm{'hcdtkecvgf.'icnxcpk{gf'cpf'fgnkxgtgf+<"&40'3'"*4243+		
WDGCOU' Fguki pcvkqp	Rqwpfu lhv0 *hwm{'hcdtkecvgf cpf'icnxcpk{gf+	Rtkeglhv0 *hwm{'hcdtkecvgf cpf'icnxcpk{gf,+
W34	328'ndu0	&446
W3:	339'ndu0	&469
W46	356ndu0	&4: 5

** Price does not include bearing pads, anchor bolts, metal deck form, or engineering fee for non-standard shapes.*

REBUILDING OUR BRIDGES CONCLUSION & LESSONS LEARNED

MDOT Pilot Project a “Major Success”

Michigan’s bridge bundling project a ‘major success’ - 19 bridges reopened to normal traffic

(MDOT)

By Dane Kelly

Published: Nov. 23, 2022 at 4:25 PM EST

LANSING, Mich. (WILX) - The Michigan Department of Transportation’s bridge bundling pilot project was completed Tuesday.

Original story: **Michigan tests bundling bridge projects together to increase efficiency**

“The initiative to bundle bridge projects together was done as a means to make construction more time and cost-efficient. When the program was announced in February, MDOT said the project could streamline nearly every aspect of improving bridge conditions.

MDOT announced Wednesday all 19 bridges have been completed and reopened to traffic. The department called the pilot program a **‘major success.’”**

Lessons Learned:

- A Valmont-provided design = quickly produced shop drawings.
- Buying material early = the lowest prices for materials & shortened fabrication lead times.
- If freight routes have restricted bridges, it's easy to limit the truck loads with U-Beams.
- Contractors need to be warned to schedule subs sooner than anticipated when using U-Beams, because installation is so fast and easy.
- If using existing foundations, grade adjustments can be easily made with sole plates and bearing pads.
- Using shallower beams by adding cover plates (Special Design) can be used to meet hydraulic requirements.
- Bunding too many bridge locations together will escalate project prices due to having too much work and not enough workers.

2023 MDOT Phase II Bridges Bundle Project

Whitmer Announces Phase II of Bridge Repair Program to Fix 59 Bridges

FOR IMMEDIATE RELEASE
April 6, 2022
Contact: Press@michigan.gov

Gov. Whitmer Announces Phase II of Bridge Repair Program to Fix 59 Bridges

Phase II will streamline and bundle 59 bridge projects to make them more cost-effective and save taxpayer money

"Major repairs are ongoing on bridges across Michigan as we are continuing to fix the damn roads to keep drivers safe and save them time and money."

Executive Office of the Governor

Communications Division
press@michigan.gov

QUESTIONS?

Contact:

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