DELONG'S

BUILDING A **STRONGER** TOMORROW

New Jersey Short Spa

Steel Bridge Workshop

SIMPLE FOR DEAD CONTINU

GARY WASCHE'S, INC.

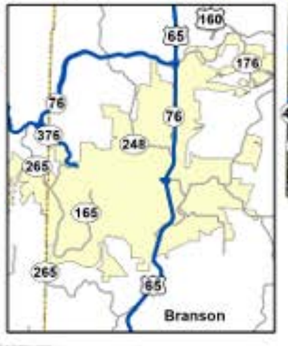
Jefferson City

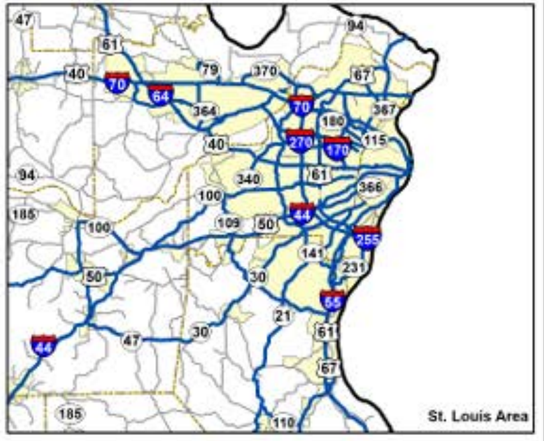
Sedalia

MoDOT's Highway System
Major and Minor Routes

Major Routes

Minor Routes





NORTH

MoDOT

Missouri Department of Transportation
Transportation Planning
1-888-ASK-MODOT
WWW.MODOT.ORG
November 2025

Why did MoDOT need the FARM proje

ONE LANE BRIDGES/LOAD RATED BRIDGES

Why did MoDOT need the FARM proje

FAILING SUBSTRUCTURE

MODOT GOALS

- Repair or replace up to 40 bridges
- Remove load restrictions
- Make all structures two lanes wide
- Stay within budget of $26 million

CRITERIA FOR JUDGIN

1. How many bridges do you plan to repair and replace?
2. How durable and long lasting are the bridges?
3. How will you minimize disruption to the traveling public?

SUMMARY AND RECOM

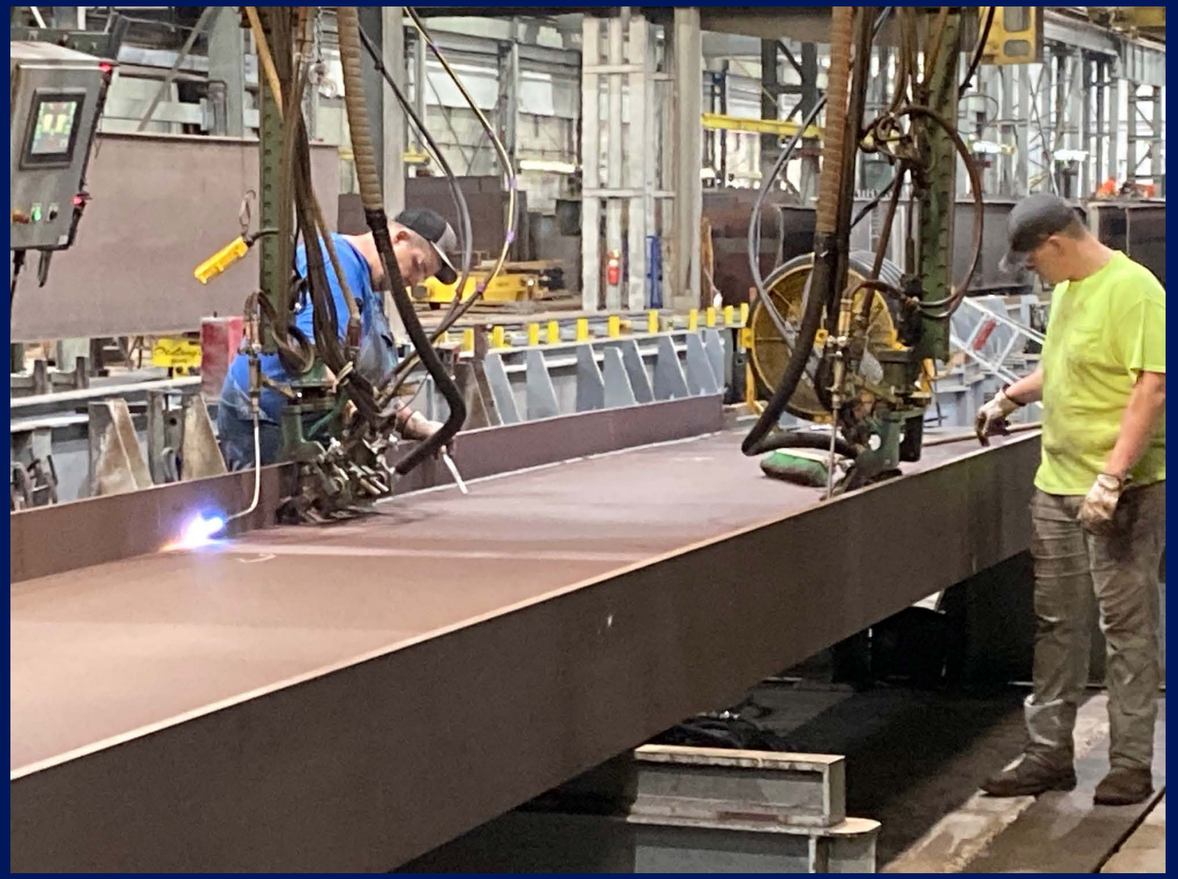
Category	Available Points	Team 1	Team 2	Team 3
Bridge Bundle Definition Part 1	40	39.7	38.3	40
Bridge Bundle Definition Part 2 (Bonus Points)	15	1.5	0	1.5
Bridge Quality and Longevity	30	18.7	20	21.7
Location Completion and Maintenance of Traffic	15	5.8	11.8	8.9
TOTAL	100	65.7	70.1	72.1

THEY ARE NOT PLATE

No need to cut flange plates.

There are no shop welded flange plates.

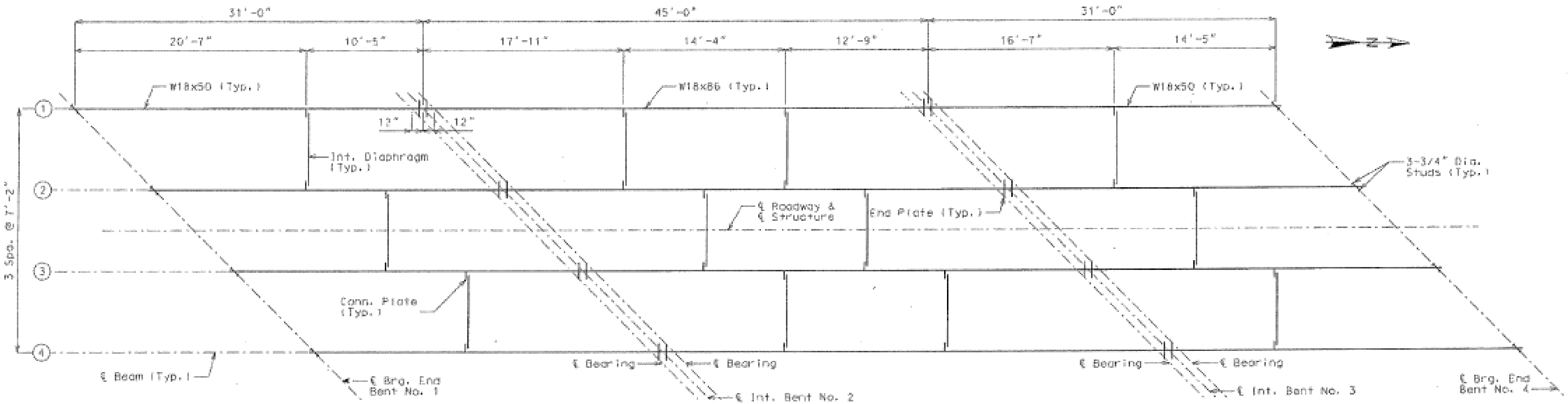
We don’t cut a web plate with a cambered shape.



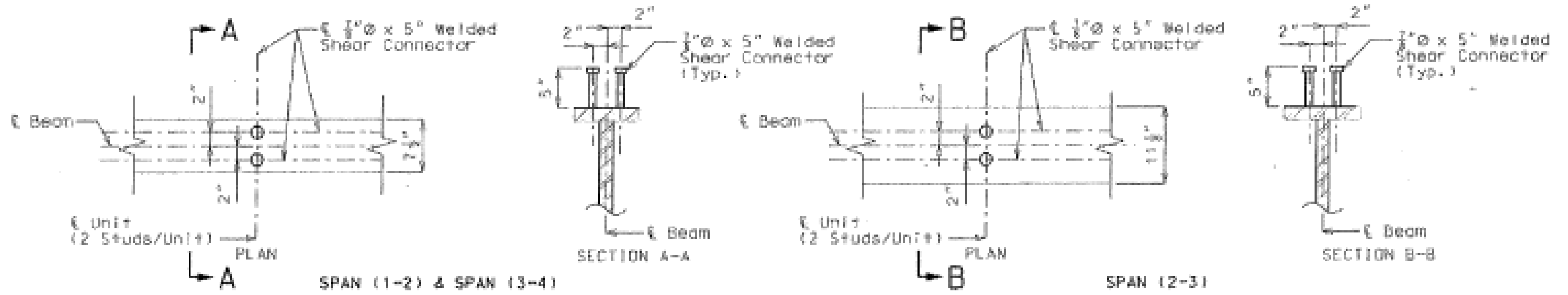
Because we’re working rolled shapes,
there are no flange to web welds.

SDCL BRIDGES – HAUNCHED SPLICES

FULL ASSEMBLY IS NO

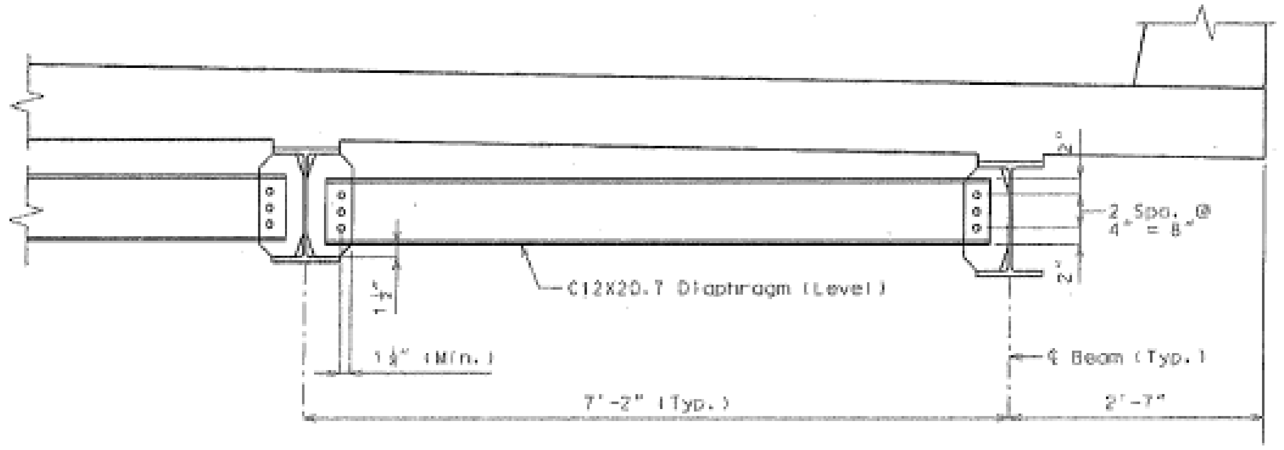


PLAN OF STRUCTURAL STEEL



DETAILS OF SHEAR CONNECTORS

Weight of 1450 pounds of shear connectors for the beams is included in the weight of Galvanized Fabricated Structural Low Allow Steel (I-Beam) A709, Grade 50. Shear connectors shall be in accordance with Sec 712, 1037, and 1080.



TYPICAL PART SECTION SHOWING INTERMEDIATE DIAPHRAGMS

Notes:

(1) - denotes Girder Number.

Intermediate diaphragm connection plate and diaphragm spacing may vary from plan dimension by a maximum of 3" for diaphragm to connect to the intermediate diaphragm connection plate.

Field connections shall be made with 3/4" diameter ASTM F3125 Grade A325 Type 1 bolts and 13/16" diameter holes, except as noted.

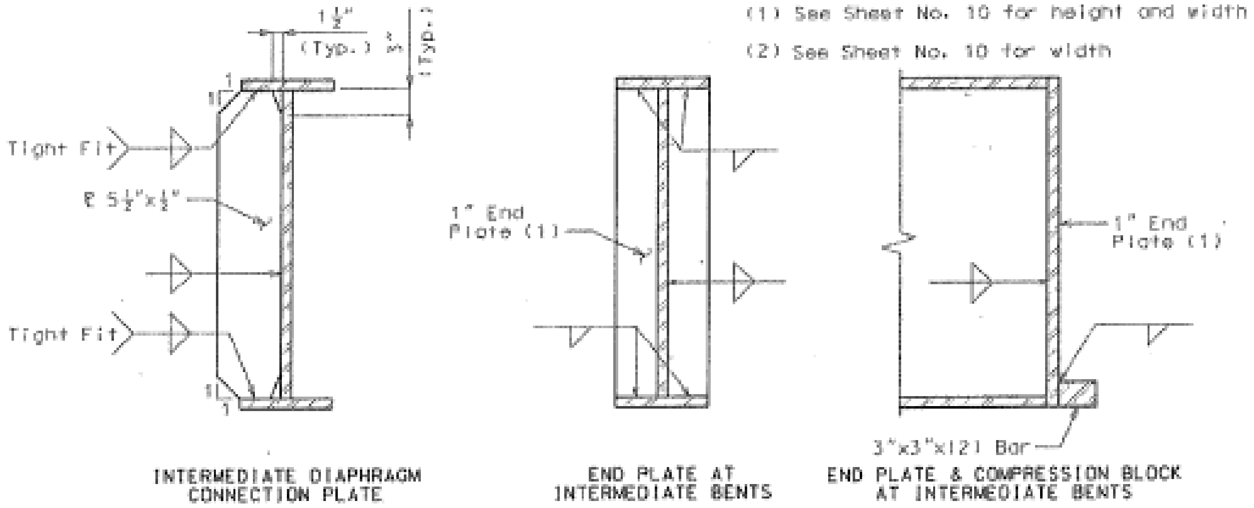
At the contractor's option, holes in the diaphragm plate of non slab bearing diaphragms may be made 3/16" larger than the nominal diameter of the bolt. A hardened washer shall be usedunder the bolt head and nut when this option is used. Holes in the girder diaphragm connection plate or transverse web stiffener shall be standard size.

Longitudinal dimensions are horizontal dimensions.

For additional steel details, see Sheet No. 10.

(1) See Sheet No. 10 for height and width

(2) See Sheet No. 10 for width



WELDING DETAILS

FRAMING PLAN

Detailed Aug. 2021
Cbked Dec. 2021

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 9 of 23

STATE OF MISSOURI — JASON M KEMNITZ — NUMBER PE-2010008260 — PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED SEALED AND DATED ELECTRONICALLY

DATE PREPARED	2/17/2022
ROUTE	M
STATE	MO
DISTRICT	NE
SHEET NO.	9
COUNTY	SCHUYLER
JOB NO.	J2S3318
CONTRACT ID.	210601-B01
PROJECT NO.	
BRIDGE NO.	A9180

REVISIONS

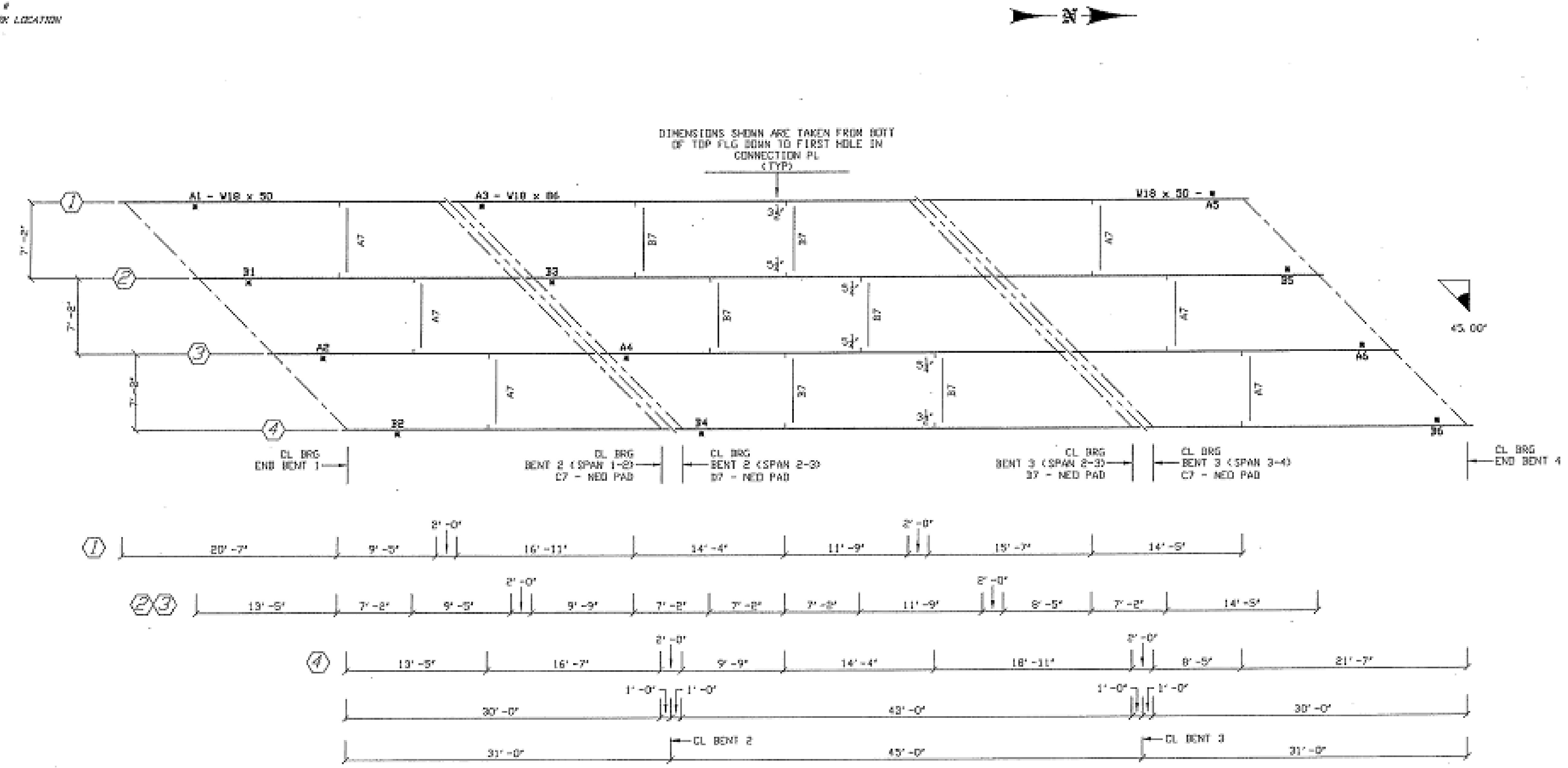
NO.	APPD. BY	DATE	
A	JMK	11/30/21	FINAL PLANS - DESIGN PACKAGE 2
1	JMK	02/21/22	RFC PLANS - DESIGN PACKAGE 2

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
MoDOT
105 WEST CAPITOL JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

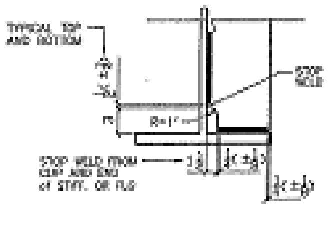
WILSON & COMPANY ENGINEERS & ARCHITECTS

A9180-18

LEGEND
Ⓡ STRINGER #
■ PIECE MARK LOCATION



STEEL PLACING PLAN



TYPICAL WELD LIMIT & CLIP DETAIL

GENERAL NOTES:

1.) ALL STEEL TO BE ASTM A709 GR.50, UNLESS NOTED. SHEAR STUDS SHALL CONFORM TO AASHTO M169 GR. 1015 (AISI C1015).
2.) ALL MATERIAL DENOTED T2 SHALL HAVE CHARPY V-NOTCH REQUIREMENTS OF 15 FT LBS @ 40°F. – TEMPERATURE ZONE 2.
3.) LONGITUDINAL DIMENSIONS SHOWN ARE TAKEN PARALLEL TO GRADE AT TOP OF BOTTOM FLANGE.
4.) BEAM FLANGES SHALL BE SQUARED UP AT ALL POINTS OF BEARING. ALL BEARING STIFFENER PLATE LENGTHS ARE 1/2" LONG TO ALLOW FOR SHOP FIT. ALL INTERMEDIATE ARE 1/4 LONG TO ALLOW FOR SHOP FIT.
5.) ALL WELDING, OXYGEN CUTTING, SHEARING, CLIPPING, AND DIMENSIONAL TOLERANCES SHALL BE IN ACCORDANCE WITH REQUIREMENTS SET FORTH IN THE ANSI/AASHTO/AWS D1.5-2002, BRIDGE WELDING CODE AND AS MODIFIED BY MODOT STD SPECS. 2021 EDITION.
6.) BEAM WELDING SHALL BE SUBJECT TO RADIOGRAPHIC, ULTRASONIC AND MAGNETIC PARTICLE INSPECTION, WHERE APPLICABLE.
7.) ALL CORNERS OF THERMALLY CUT OR SHEARED EDGES IN COATED AREAS SHALL BE GROUND TO A BROKEN EDGE.
8.) HEAT NUMBER AND COLOR CODING SHALL BE PLACED ON ALL PRINCIPAL PIECES IN ACCORDANCE WITH MISSOURI STANDARD SPECIFICATIONS, SECTION 1080.2.4. PRINCIPAL PIECES INCLUDE ALL WEBS, FLANGES, BEAMS, SPLICE PLATES, BEARING STIFFENER PLATES, BEARING SOLE PLATES, AND ALL LOAD BEARING MEMBERS OF END DIAPHRAGMS.
9.) IF OIL, GREASE, OR OTHER CONTAMINANTS HAVE ACCUMULATED PRIOR TO GALVANIZING STEEL SURFACES SHALL BE CLEANED BY A COMBINATION OF SSPC-SP1 (SOLVENT CLEANING) AND SSPC-SP8 (BLAST CLEANING)
10.) DELONG'S IS TO PROTECT NON-GALVANIZED SURFACES PRIOR TO SHIPMENT TO GALVANIZER.
11.) ALL STEEL TO BE GALVANIZED PER ASTM A123. THE MINIMUM AVERAGE COATING THICKNESS SHALL BE 3.9 MILS AND THE MAXIMUM AVERAGE COATING THICKNESS SHALL BE 20 MILS, PER MODOT SPEC 1081.20.4. ALL REPAIRS PER ASTM A780, HOT STICK ZINC ALLOY METHOD, AFTER GALVANIZING. THE FAYING SURFACES OF SPLICES SHALL BE HAND WIRE BRUSHED.

BILL OF MATERIAL

DRW#	MARK	QTY	SHAPE	DIMENSIONS	GRADE	REMARK	CATEGORY	FIN
E1	BO1	82	BO	3/4 x 2 1/4	A325-M6		BOLT	
E1	NU1	82	NU	3/4	A563-MGALV		BOLT	
E1	WA1	164	WA	3/4	F436-MGALV		BOLT	

HIGH STRENGTH FIELD BOLTS ASTM F3125 (A325–Mechanically Galvanized)

M-Mark	Ship Qty	Description Shape	Description Size/Length	Grip	Head	Nut	Washer (Type)	Req'd Holes	Test	Extra	Location
BO1	82	BO	3/4 x 2 1/4	13/16	Hex	Hex	3-Carb	72	9	1	@ DIAPHRAGM

FIELD NUTS (A563–Mechanically Galvanized)

M-Mark	Ship Qty	Description Shape	Description Size	Type	Req'd Holes	Test	Extra
NU1	82	NU	3/4	HEX	72	9	1

FIELD WASHERS (F436–Mechanically Galvanized)

M-Mark	Ship Qty	Description Shape	Description Size	Type	Req'd Holes	Test	Extra
WA1	164	WA	3/4	CARB	144	18	2

REVISIONS

DATE	MK	REMARKS	DATE	MK	REMARKS

DE LONG'S INC.
JEFFERSON CITY SEDALIA
DIAL: 573-635-6121 • FAX: 573-635-6101
P.O. BOX 479 • 301 DIX ROAD • JEFFERSON CITY, MO. 65102

RT. M OVER S. FORK NORTH FABIUS

Customer: LEHMAN CONSTRUCTION
Location: SCHUYLER CO, MO
JOB NO. J2S3318 CONTRACT NO. 210601-B01
BRIDGE NO: A8180
Arch.-Engr. WILSON & COMPANY

PAINT
SEE GENERAL NOTES

Unless Noted Otherwise
3/4# BOLTS
13/16# HOLES

DETAILER: KJO DATE: 4/8/22
CHECKER: KSB DATE: 4/18/22

RFC 04/11/22

JOB No. 21-160

Sht.No. E1 Sht.Total E1/07

A B C D E F G H J K M N P S T U V W X Y Z AA AB AC AD AE AF AG AH AJ AK AM AN AP AS AT AU AV AW AX AY AZ

M:\KJO\2021\21-100\21-160\21-160-E1.dwg, 4/20/2022 10:47:33 AM

CUT TO LENGTH

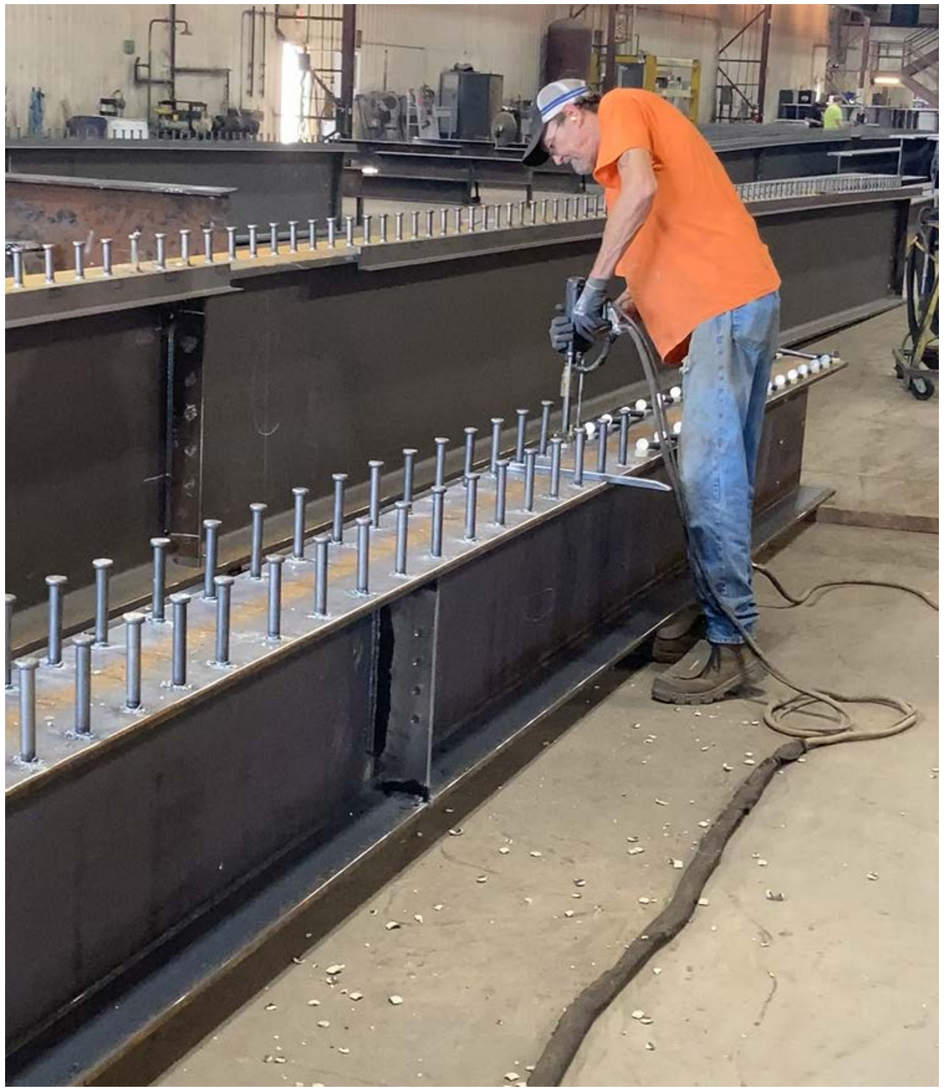
CAMBERED BEAM IN T

INSTALL DIAPHRAM CON

INSTALL END PLAT

INSTALL END BLOC

INSTALL SHEAR CONN



COATING

- First choice was weathering, as that was least cost.
  - Grade 50W had to come from mill, not service center as there was not enough time to wait for mill rolling.
- Galvanizing was more expensive but provided the desired longevity and could be done within construction schedule.

INSPECTION

SHIPPING

CONSTRUCTION

CONSTRUCTION

CONSTRUCTION

CONSTRUCTION

CONSTRUCTION

CONSTRUCTION

COMPLETE BRIDGE

TRUE OR FALSE

SDCL stands for Simple for Dead, Continuous for Live.

SDCL stands for Simple
Continuous for Live.

TRUE

TRUE OR FALSE

SDCL bridges should not be galvanized.

SDCL bridges should not b

FALSE

Galvanizing is one of several appropriate corrosion protection methods.

TRUE OR FALSE

In general, rolled steel beam bridges are less complex, and faster and easier to fabricate than plate girders.

In general, rolled steel bear
less complex, and faster and easier to
fabricate than plate girders.
TRUE

QUESTIONS?

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garyw@delongsinc.com
573-635-5121 ext. 1272