DESIGN DESIGNATION

VARIOUS ROUTES

A.A.D.T. - 2023 = VARIOUS:
SEE LOCATION MAP
NOTES FOR EACH BRIDGE

V = VARIOUS

FUNCTIONAL CLASSIFICATION- VARIOUS

CONVENTIONAL SYMBOLS
(USED IN PLANS)

	EXISTING	NEW
BUILDINGS AND STRUCTURES		
GUARD RAIL		
GUARD CABLE		
CONCRETE RIGHT-OF-WAY MARKER		
STEEL RIGHT-OF-WAY MARKER		
LOCATION SURVEY MARKER		
UTILITIES		
FIBER OPTICS	-FO-	-FO-
OVERHEAD CABLE TV	-OTV-	-OTV-
UNDERGROUND CABLE TV	-UTV-	-UTV-
OVERHEAD TELEPHONE	-OT-	-OT-
UNDERGROUND TELEPHONE	-UT-	-UT-
OVERHEAD POWER	-OE-	-OE-
UNDERGROUND POWER	-UE-	-UE-
SANITARY SEWER	-S-	-S-
STORM SEWER	-SS-	-SS-
GAS	-G-	-G-
WATER	-W-	-W-
MANHOLE	SAN	
FIRE HYDRANT	HYD	
WATER VALVE	WV	
WATER METER	WM	
DROP INLET	DI	
DITCH BLOCK		
GROUND MOUNTED SIGN	SIGN	
LIGHT POLE		
H-FRAME POWER POLE		
TELEPHONE PEDESTAL	PED	
FENCE		
CHAIN LINK	-V-	
WOVEN WIRE	-X-	
GATE POST		
BENCHMARK	BM	

NOTE: DASHED OR OPEN SYMBOLS INDICATE EXISTING FEATURES

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

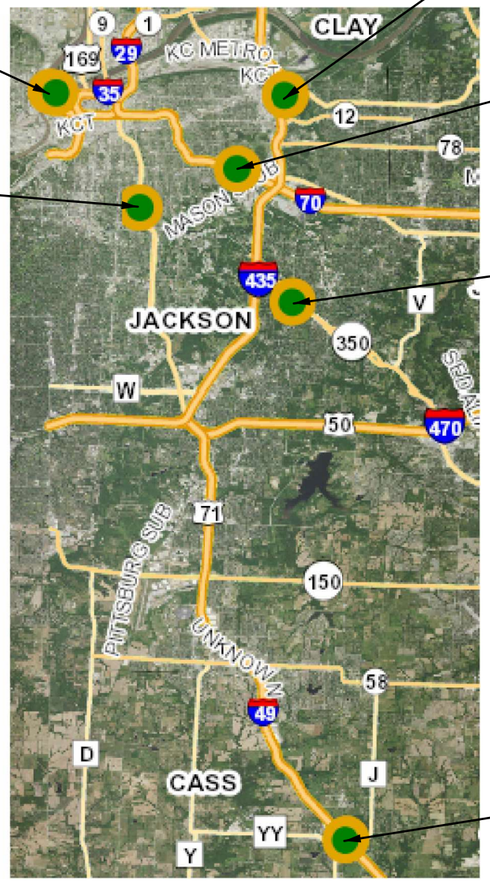
PLANS FOR PROPOSED STATE HIGHWAY

JACKSON & CASS COUNTIES

KEY MAP
LOCATION OF JACKSON & CASS COUNTIES

I-70
VIADUCT
BRIDGE
A5658
A.A.D.T.= 38551

43RD ST
OVER
US 71
BRIDGE
A5184
A.A.D.T.= 746



SB & NB I-435
OVER US 24
TWO BRIDGES
A1750
A.A.D.T.= 45548

WB I-70
OVER
US 40
L0966
A.A.D.T= 67900

BLUE RIDGE
BLVD
OVER
MO 350
BRIDGE
L0126
A.A.D.T.= 8286

ROUTE J
OVER
I-49
BRIDGE
A2330
A.A.D.T.= 1156

BRIDGE REPAIRS

THE EXISTENCE AND APPROXIMATE LOCATION OF UTILITY FACILITIES KNOWN TO EXIST, AS SHOWN ON THE PLANS, ARE BASED ON THE BEST INFORMATION AVAILABLE TO THE COMMISSION AT THIS TIME. THIS INFORMATION IS PROVIDED BY THE COMMISSION "AS-IS" AND THE COMMISSION EXPRESSLY DISCLAIMS ANY REPRESENTATION OR WARRANTY AS TO THE COMPLETENESS, ACCURACY, OR SUITABILITY OF THE INFORMATION FOR ANY USE. RELIANCE UPON THIS INFORMATION IS DONE AT THE RISK AND PERIL OF THE USER, AND THE COMMISSION SHALL NOT BE LIABLE FOR ANY DAMAGES THAT MAY ARISE FROM ANY ERROR IN THE INFORMATION. IT IS, THEREFORE, THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE, LOCATION AND STATUS OF ANY FACILITY. SUCH VERIFICATION INCLUDES DIRECT CONTACT WITH THE LISTED UTILITIES.

INDEX OF SHEETS

LENGTH OF PROJECT

CASS COUNTY

BRIDGE A2330 NB I-49 LOG MILE 167.481

JACKSON COUNTY

BRIDGE A5658
EB I-70 RAMP TO BEARDSLEY RD LOG MILE 0.046

BRIDGES A1750
SB I-435 OVER US 24 LOG MILE 38.896
NB I-435 OVER US 24 LOG MILE 16.324

BRIDGE A5184 SB US 71 LOG MILE 121.960

BRIDGE L0966 WB I-70 LOG MILE 242.932

BRIDGE L0126 EB MO 350 LOG MILE 2.082

FOR INFORMATION ONLY
ESTIMATED DISTURBED ACRES XX ACRES

STATE OF MISSOURI
HEATHER R. BARROWS
NUMBER PE-2016040670
PROFESSIONAL ENGINEER
09/09/2024 9:49:13 AM
HEATHER R. BARROWS - CIVIL
MO-PE-2016040670

DATE PREPARED
9/9/2024

ROUTE	STATE
VARIOUS	MO
DISTRICT	SHEET NO.
KC	1

COUNTY
JACKSON/CASS

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

DESCRIPTION	DATE

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

TEMPORARY TRAFFIC SETUP TYPES *

LOCATION NUMBER	COUNTY	LOCATION	BRIDGE NUMBER	TEMPORARY TRAFFIC CONTROL SETUP 1	TEMPORARY TRAFFIC CONTROL SETUP 2	TEMPORARY TRAFFIC CONTROL SETUP 3	TEMPORARY TRAFFIC CONTROL SETUP 4	TEMPORARY TRAFFIC CONTROL SETUP 5
1	CASS	ROUTE C OVER I-49	A2330		1			
2	JACKSON	BLUE RIDGE BLVD OVER MO 350	L0126	1				
3	JACKSON	WB I-70 OVER US 40	L0966W	1				
4	JACKSON	43RD STREET OVER US 71	A5184	1				
5	JACKSON	NB I-435 OVER US 24	A1750N	1				
6	JACKSON	SB I-435 OVER US 24	A1750S			1		
7	JACKSON	I-70 EB (VIADUCT) EXIT 2B RAMP TO BEARDSLEY ROAD	A5658				1	
		TOTAL (FOR INFORMATION ONLY)		4	1	1	1	0

* FOR BIDDING PURPOSES ONLY, ADJUSTMENTS WILL BE MADE IN THE FIELD AS NEEDED

TEMPORARY TRAFFIC PAY ITEMS

LOCATION NUMBER	COUNTY	LOCATION	BRIDGE NUMBER	TEMPORARY TRAFFIC (EA.) PAY TOTAL
1	CASS	ROUTE C OVER I-49	A2330	1
2	JACKSON	BLUE RIDGE BLVD OVER MO 350	L0126	1
3	JACKSON	WB I-70 OVER US 40	L0966W	1
4	JACKSON	43RD STREET OVER US 71	A5184	1
5	JACKSON	NB I-435 OVER US 24	A1750N	1
6	JACKSON	SB I-435 OVER US 24	A1750S	1
7	JACKSON	I-70 EB (VIADUCT) EXIT 2B RAMP TO BEARDSLEY ROAD	A5658	1

MOBILIZATION
1 LUMP SUM

NOTE: TRAFFIC CONTROL TO BE PAID FOR ONCE PER LOCATION, NOT PER THE NUMBER OF SETUPS OR LANE CLOSURE SWITCH NEEDED FOR THE WORK.

SUMMARY OF QUANTITIES
SHEET 1 OF 1

STATE OF MISSOURI
HEATHER R. BARROWS
NUMBER PE-2016040670
PROFESSIONAL ENGINEER
08/26/2024 11:30:30 AM
HEATHER R. BARROWS - Dbl.
MO-PE-2016040670

DATE PREPARED
8/26/2024

ROUTE	STATE
VARIOUS	MO

DISTRICT	SHEET NO.
KC	3

COUNTY
JACKSON/CASS

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

DESCRIPTION	DATE

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

Traffic Control Legend, Sign Spacing, Device Spacing, Channelizing Taper Lengths And Recommended Maximum Speed Reductions

SIGN SPACING FOR ADVANCE SIGN SERIES (1) (2)		
PERMANENT POSTED SPEED MPH	UNDIVIDED HIGHWAYS	DIVIDED HIGHWAYS (S)
0-35	200′	200′
40-45	350′	500′
50-55	500′	1000′
60-70	1000′	✳✳ SA - 1000′ SB - 1500′ SC - 2640′

✳✳ THE SA DIMENSION IS THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN.

THE SB DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS.

THE SC DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGNS.

(THE "FIRST SIGN" IS THE SIGN IN A THREE-SIGN SERIES THAT IS CLOSEST TO THE TEMPORARY TRAFFIC CONTROL ZONE. THE "THIRD SIGN" IS THE SIGN THAT IS FURTHEST UPSTREAM FROM THE TEMPORARY TRAFFIC CONTROL ZONE)

TAPER LENGTHS AND END TREATEMENTS FOR CONCRETE BARRIER				
PERMANENT POSTED SPEED MPH	MINIMUM LANE TAPER LENGTH (3) 10′	11′	12′	END TREATMENT (4)
<40	160′	168′	176′	BARRIER HEIGHT TRANSITION
≥40	160′	168′	176′	APPROVED CRASH CUSHION

TAPER LENGTHS AND SPACING FOR CHANNELIZERS							
PERMANENT POSTED SPEED MPH	MINIMUM LANE TAPER LENGTH (L) (3) 10′	11′	12′	MINIMUM SHOULDER TAPER LENGTH (T1) BASED ON 10′ SHOULDER	BUFFER LENGTH FT	MAXIMUM CHANNELIZER SPACING THROUGH TAPER	THROUGH WORK AREA
0-35	205′	225′	245′	70′	280′	35′	40′
40-45	450′	495′	540′	150′	400′	40′	80′
50-55	550′	605′	660′	185′	560′	50′	80′
60-70	700′	770′	840′	235′	840′	60′	120′

DETAILS NOTES:

(1) SPACING BETWEEN SIGNS AND SPACING BETWEEN LAST SIGN AND FLAGGER, BEGINNING OF TAPER, OF SIGNED CONDITION.

(2) SPACING MAY BE ADJUSTED AS NECESSARY TO MEET FIELD CONDITIONS.

(3) TAPER LENGTHS SHOWN INCLUDE LENGTH REQUIRED FOR LANE AND 10' SHOULDER

(4) CONCRETE BARRIER MAY BE INSTALLED AT 8:1 FLARE RATE FROM THE SHOULDER POINT OF THE LIMITS OF THE CLEAR ZONE WHERE THE SIDE SLOPE IS 6:1 OR FLATTER

LANE TAPER LENGTH (L)

L = W X P FOR 40 MPH OR MORE

$L = \frac{WP^2}{60}$ FOR 35 MPH OR LESS

L = TAPER LENGTH IN FEET

W = LATERAL SHIFT IN FEET

P = POSTED SPEED PRIOR TO ROAD WORK IN MPH

SHOULDER TAPER LENGTH (T1)

ADJUST LENGTH ACCORDING TO SHOULDER WIDTH BASED ON TABLE RATE FOR 10' WIDE.

TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- FLAGGER
- CHANNELIZER
- PROTECTIVE VEHICLE WITH WORK SIGN, FLASHING ARROW PANEL AND REAR-MOUNTED IMPACT ATTENUATOR UNIT.
- FLASHING ARROW PANEL
- CHANGEABLE MESSAGE BOARD
- TYPE III MOVEABLE BARRICADE

LEGEND NOTE:

THE PROTECTIVE VEHICLE SIGN SHALL BE MOUNTED AT A RECOMMENDED HEIGHT OF 48 IN. ABOVE THE ROAD SURFACE.

GENERAL NOTES:

1. SEE STANDARD PLAN 616.10 FOR DETAILS AND ITEMS NOT SHOWN.
2. EXISTING SIGNS SHALL BE COVERED DURING WORKING HOURS ONLY IF IN CONFLICT WITH TRAFFIC CONTROL PLANS.
3. NO DIRECT PAYMENT WILL BE MADE FOR RELOCATING, COVERING, UNCOVERING OR REMOVING SIGNS.
4. CONES ALLOWABLE FOR DAYTIME OPERATIONS ONLY.
5. LOCATE FLASHING ARROW PANEL AT BEGINNING OF TAPER WHEN FEASIBLE, ARROW PANELS ARE ALWAYS LOCATED BEHIND CHANNELIZERS OR CONES.

EPG TABLE 616.29 RECOMMENDED MAXIMUM SPEED REDUCTIONS	
ACTIVITY (I.E. WORKERS, EQUIPMENT OR MATERIAL) LOCATION	RECOMMENDED WORK ZONE SPEED REDUCTION (WHEN APPLICABLE)
10 FT. BEYOND EDGE OF TRAVELWAY TO EDGE OF RIGHT OF WAY	NO SPEED REDUCTION
IN TRAFFIC LANE OR WITHIN 10FT. OF THE TRAFFIC LANE	10 MPH
HEAD-TO-HEAD ON MULTILANE	10 MPH

SPECIAL CIRCUMSTANCES WITHIN A TEMPORARY TRAFFIC CONTROL WORK ZONE MAY WARRANT A LOWER SPEED LIMIT THAN RECOMMENDED ABOVE. ALL SPEED LIMIT REDUCTIONS GREATER THAN 10 MPH SHALL BE DOCUMENTED, SUBMITTED TO AND APPROVED BY THE DISTRICT WORK ZONE COORDINATOR.

STATE OF MISSOURI
HEATHER R. BARROWS
NUMBER PE-2016040670
PROFESSIONAL ENGINEER
08/13/2024 1:18:24 PM
HEATHER R. BARROWS - CIVIL
MO-PE=2016040670

DATE PREPARED: 8/13/2024

ROUTE	STATE
VARIOUS	MO
DISTRICT	SHEET NO.
KC	4

COUNTY: JACKSON/CASS

JOB NO.: JKU0410

CONTRACT ID.:

PROJECT NO.:

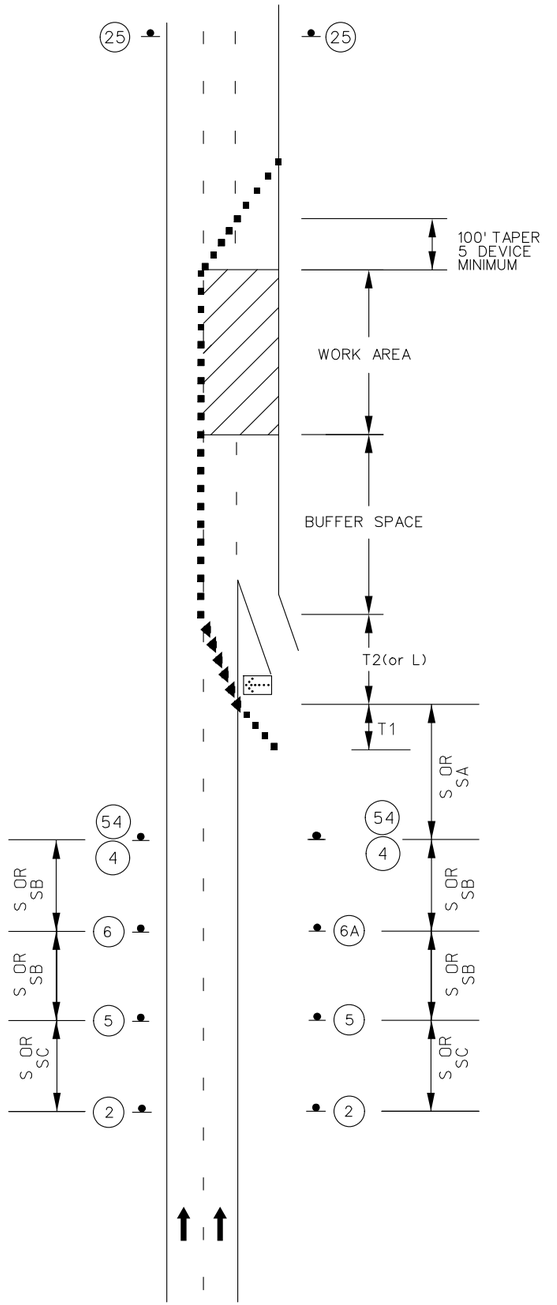
BRIDGE NO.:

DESCRIPTION	DATE

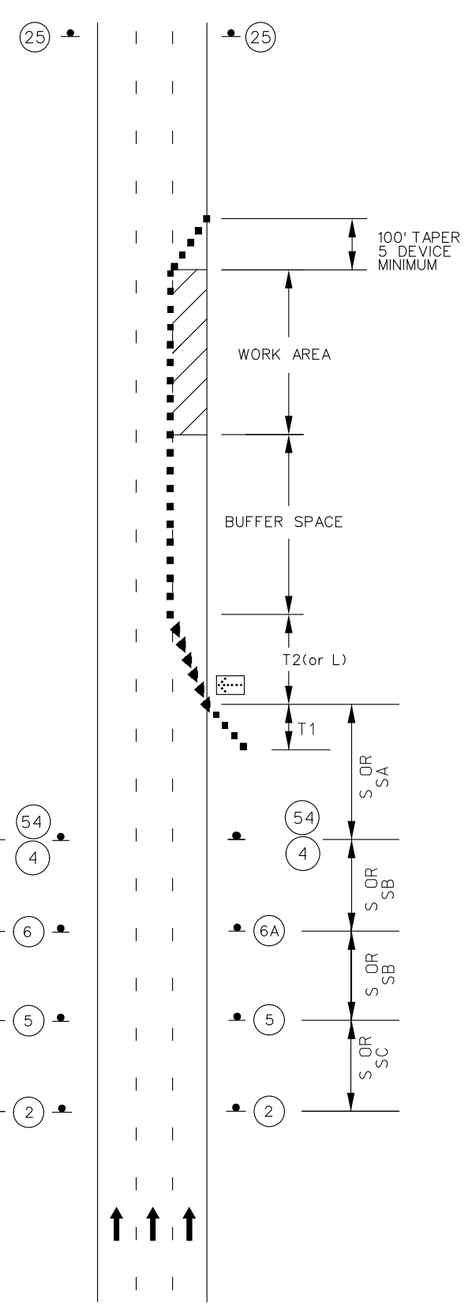
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

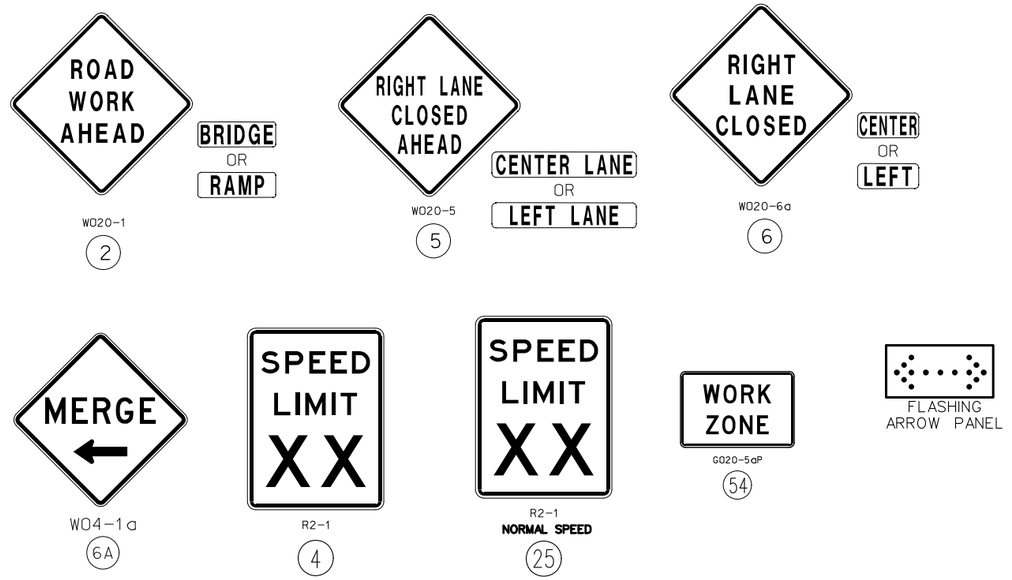
TEMPORARY TRAFFIC CONTROL SHEET
SHEET 1 OF 5



TYPICAL RIGHT LANE CLOSURE
WITHIN CLOSED RAMP ENTRANCE
MULTI-LANE DIVIDED HIGHWAY



TYPICAL LEFT OR RIGHT LANE CLOSURE
MULTI-LANE DIVIDED HIGHWAY



NOTES:

SEE TRAFFIC CONTROL SHEET 1 FOR WORK ZONE SPEED LIMIT GUIDELINES.

SEE TRAFFIC CONTROL SHEET 1 FOR SIGN SPACING, DEVICE SPACING AND CHANNELIZING TAPER LENGTHS.

A FLASHING ARROW BOARD SHALL BE USED WHEN A FREEWAY LANE IS CLOSED. WHEN MORE THAN ONE FREEWAY LANE IS CLOSED, A SEPARATE ARROW BOARD SHALL BE USED FOR EACH CLOSED LANE.

SETUP
TYPE 1

SINGLE LANE CLOSURE

STATE OF MISSOURI
HEATHER R. BARROWS
NUMBER PE-2016040670
PROFESSIONAL ENGINEER
08/13/2024 1:19:06 PM
HEATHER R. BARROWS - CIVIL
MO-PE-2016040670

DATE PREPARED
8/13/2024

ROUTE	STATE
VARIOUS	MO
DISTRICT	SHEET NO.
KC	5

COUNTY
JACKSON/CASS

JOB NO.
JKU0410

CONTRACT ID.

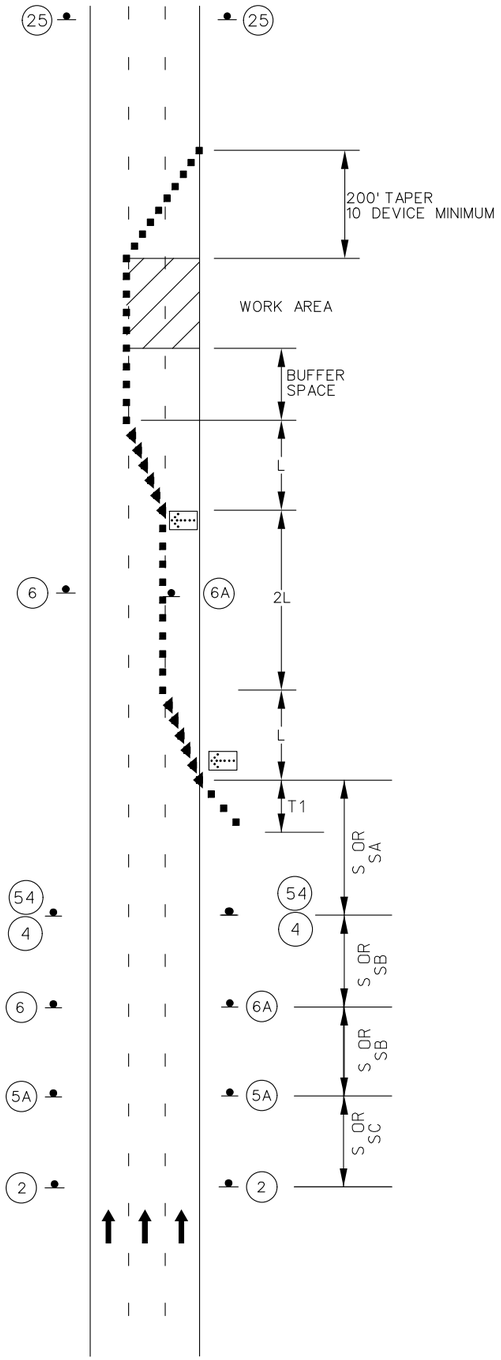
PROJECT NO.

BRIDGE NO.

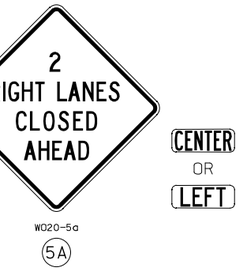
DESCRIPTION	DATE

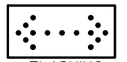
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

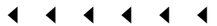
TEMPORARY TRAFFIC CONTROL SHEET
SHEET 2 OF 5



LANE CLOSURE TWO LANES OF
MULTI-LANE DIVIDE HIGHWAY







DIRECTIONAL INDICTOR BARRICADES, WITH LIGHT

CHANNELIZERS

NOTES:

SEE TRAFFIC CONTROL SHEET 1 FOR WORK ZONE SPEED LIMIT GUIDELINES.

SEE TRAFFIC CONTROL SHEET 1 FOR SIGN SPACING, DEVICE SPACING AND CHANNELIZING TAPER LENGTHS.

A FLASHING ARROW BOARD SHALL BE USED WHEN A FREEWAY LANE IS CLOSED. WHEN MORE THAN ONE FREEWAY LANE IS CLOSED, A SEPARATE ARROW BOARD SHALL BE USED FOR EACH CLOSED LANE.

SETUP
TYPE 2
DOUBLE LANE CLOSURE

STATE OF MISSOURI
HEATHER R. BARROWS
NUMBER PE-2016040670
PROFESSIONAL ENGINEER
08/13/2024 1:20:03 PM
HEATHER R. BARROWS - CIVIL
MO-PE-2016040670

DATE PREPARED
8/13/2024

ROUTE	STATE
VARIOUS	MO
DISTRICT	SHEET NO.
KC	6

COUNTY
JACKSON/CASS

JOB NO.
JKU0410

CONTRACT ID.

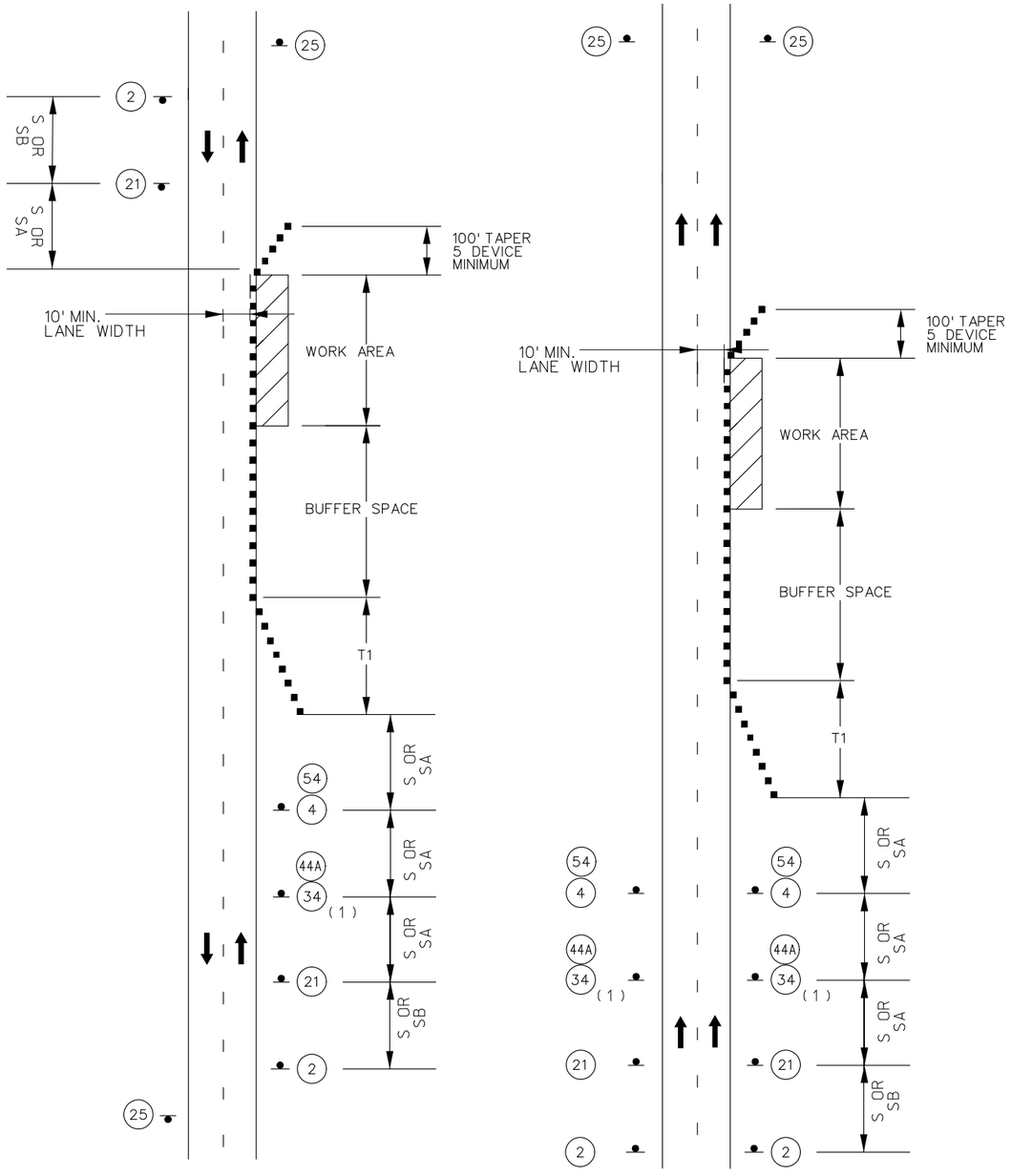
PROJECT NO.

BRIDGE NO.

DESCRIPTION	DATE

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

TEMPORARY TRAFFIC CONTROL SHEET
SHEET 3 OF 5

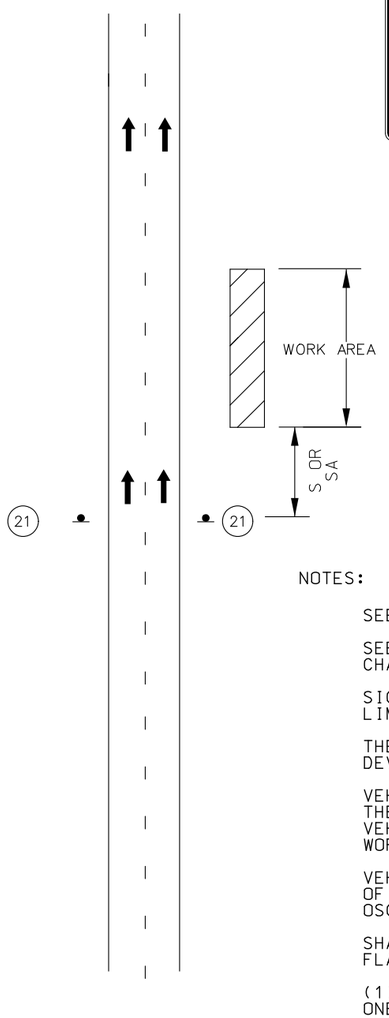


TWO LANE UNDIVIDED
SHOULDER WORK
MINOR TRAVELWAY ENCROACHMENT

SETUP TYPE 3

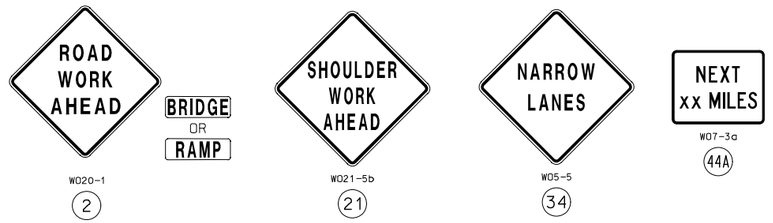
MULTI-LANE DIVIDED
SHOULDER WORK
MINOR TRAVELWAY ENCROACHMENT

SETUP TYPE 3



MULTI-LANE DIVIDED
WORK BEYOND SHOULDER
NO TRAVELWAY ENCROACHMENT

SETUP TYPE 4



NOTES:

SEE TRAFFIC CONTROL SHEET 1 FOR WORKZONE SPEED LIMIT GUIDELINES.

SEE TRAFFIC CONTROL SHEET 1 FOR SIGN SPACING, DEVICE SPACING AND CHANNELIZING TAPER LENGTHS.

SIGN 2 NOT REQUIRED IF SHOULDER WORK IS LOCATED WITHIN THE LIMITS OF AN ACTIVITY AREA WHERE ANOTHER SIGN 2 IS ALREADY USED.

THE PROTECTIVE VEHICLE MAY BE OMITTED IF A TAPER AND CHANNELIZING DEVICES ARE USED.

VEHICLE- MOUNTED SIGNS SHALL BE MOUNTED IN A MANNER SUCH THAT THEY ARE NOT OBSCURED BY EQUIPMENT OR SUPPLIES. SIGN LEGEND ON VEHICLE-MOUNTED SIGNS SHALL BE COVERED OR TURNED FROM VIEW WHEN WORK IS NOT IN PROGRESS.

VEHICLE HAZARD WARNING SIGNALS SHALL NOT BE USED INSTEAD OF THE VEHICLE'S HIGH -INTENSITY ROTATING FLASHING, FLASHING, OSCILLATING, OR STROBE LIGHTS.

SHADOW AND WORK VEHICLES SHALL DISPLAY HIGH-DENSITY ROTATING, FLASHING, OSCILLATING, OR STROBE LIGHTS.

(1). SIGN 44A NOT REQUIRED FOR NARROW LANE SECTIONS LESS THAN ONE MILE.

SETUP
TYPES 3 & 4
SHOULDER WORK
MINOR OR NO ENCROACHMENT

STATE OF MISSOURI
HEATHER R. BARROWS
NUMBER PE-2016040670
PROFESSIONAL ENGINEER
08/13/2024 1:20:51 PM
HEATHER R. BARROWS - CIVIL
MO-PE-2016040670

DATE PREPARED
8/13/2024

ROUTE	STATE
VARIOUS	MO
DISTRICT	SHEET NO.
KC	7

COUNTY
JACKSON/CASS

JOB NO.
JKU0410

CONTRACT ID.

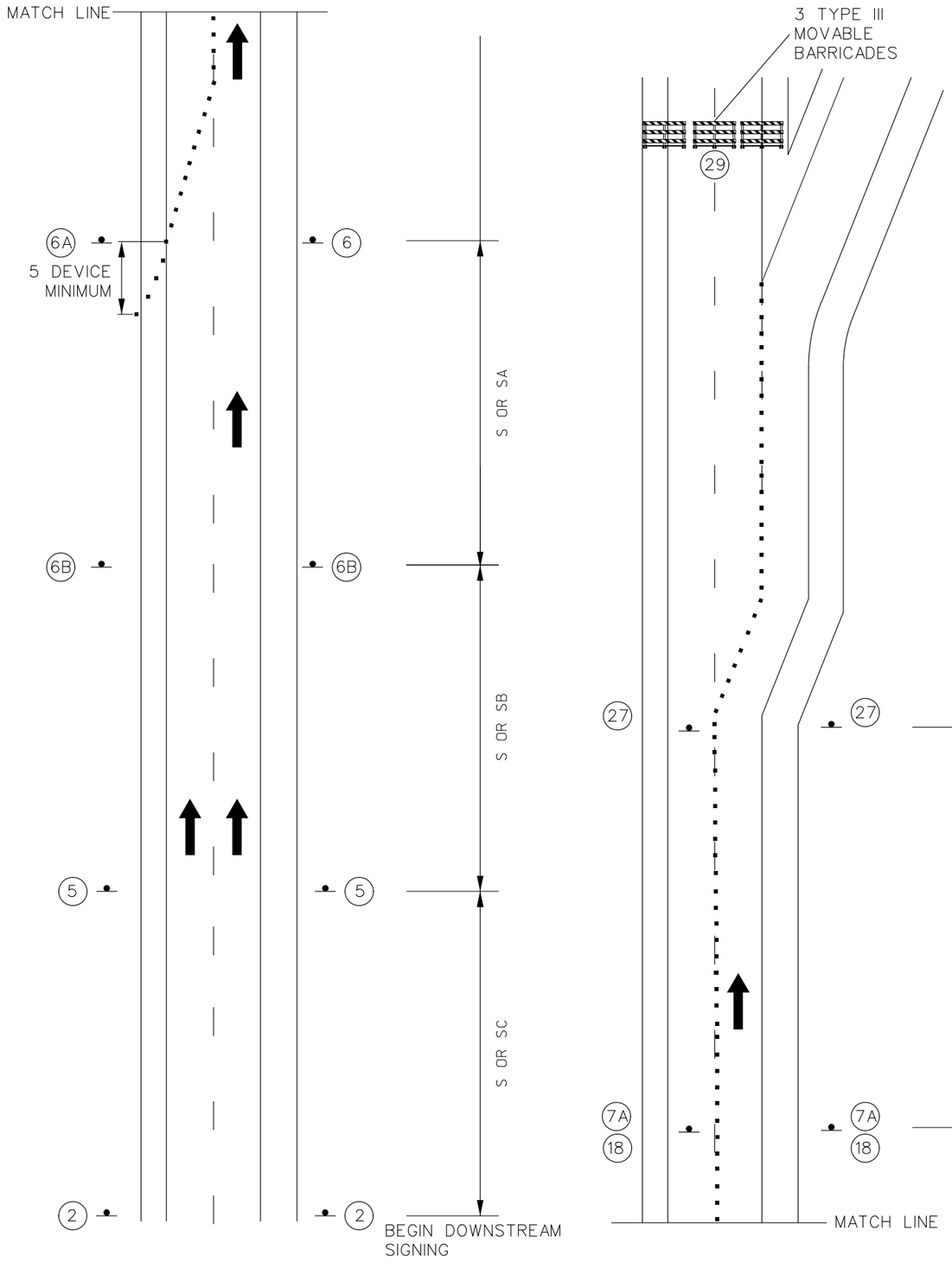
PROJECT NO.

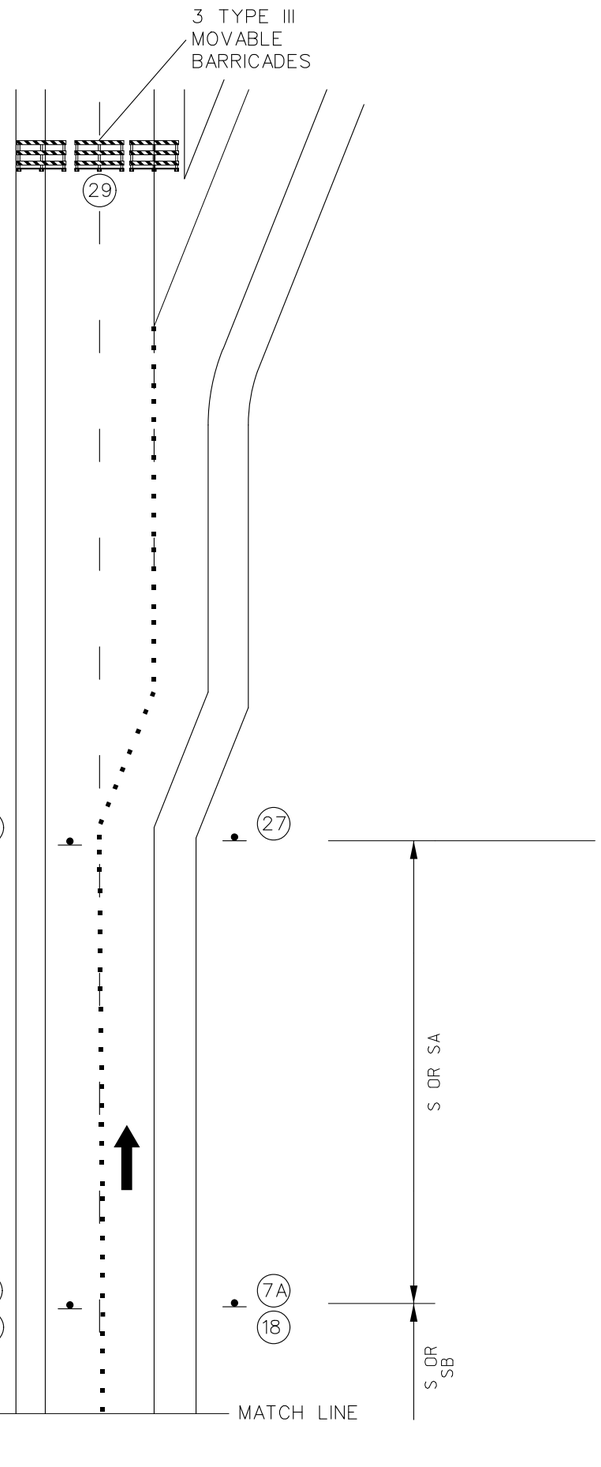
BRIDGE NO.

DESCRIPTION	DATE

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

TEMPORARY TRAFFIC CONTROL SHEET
SHEET 4 OF 5





W020-1
2

W020-5
5

W09-1
6B

W04-1aR
6A

W020-6a
6

FLASHING ARROW PANEL

CHANNELIZER

R4-7a
7A

W020-2
18

M04-9R
27

R11-2
29

MOVEABLE BARRICADE

SETUP TYPE 5

ENTIRE LANE CLOSURES AT INTERCHANGE

STATE OF MISSOURI
HEATHER R. BARROWS
NUMBER PE-2016040670
PROFESSIONAL ENGINEER
08/26/2024 11:32:48 AM
HEATHER R. BARROWS • CIVIL
MO•PE•2016040670

DATE PREPARED
8/21/2024

ROUTE	STATE
VARIOUS	MO
DISTRICT	SHEET NO.
KC	8

COUNTY
JACKSON/CASS

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

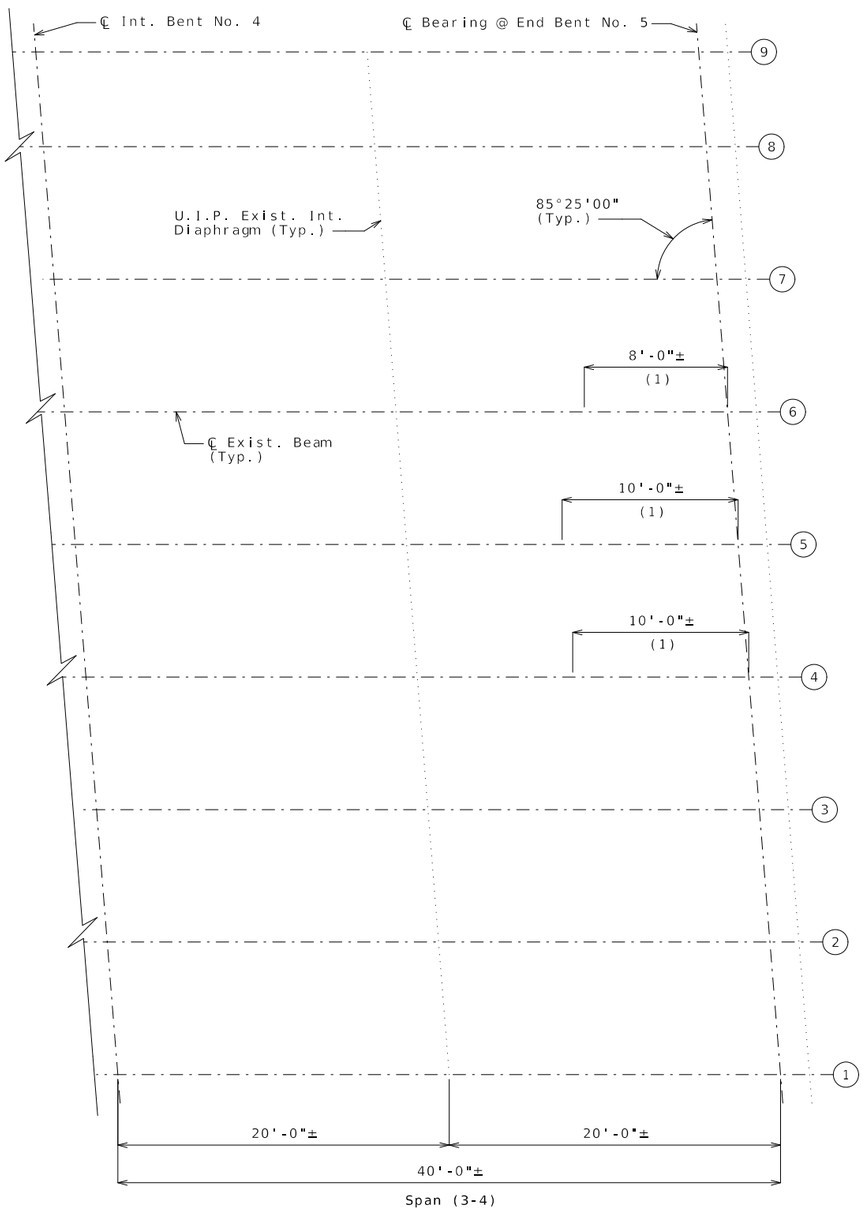
DESCRIPTION	DATE

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

TEMPORARY TRAFFIC CONTROL SHEET
SHEET 5 OF 5

SEC/SUR 7 TWP 49N RGE 32W

U.I.P. AND REPAIR EXISTING FIRE DAMAGED (35'-46'-54'-40') CONTINUOUS COMPOSITE WIDE FLANGE BEAM SPANS (SKEW: 4°35' R.A.)



PART PLAN OF STRUCTURAL STEEL

PHASES OF WORK

Prior to Heat Straightening:

1. Powerwash existing structural steel and existing concrete in Span (4-5).
2. Complete surface preparation of existing steel that will be subjected to Non-Destructive Testing (NDT) or heat from the heat straightening process.
3. Remove the intermediate diaphragms and connection plates as indicated in the plans or directed by the engineer. As approved by the engineer, existing connection plates may be re-used. Non-Destructive Testing (NDT) of the connection plate welds are required to assure suitability for re-use; paint shall be removed prior to any NDT of welds. Existing connection plates not re-used shall be removed and the beams ground smooth.
4. Inspect beam in the area of repair for cracks by any non-destructive means. If cracks are identified, repair cracks as directed by the engineer.

Heat Straightening:

1. Heat straighten beams covering the length of the collision damaged beams. The beams shall be heat straightened to remove web and bottom flange twisting. See Special Provisions.
2. The lanes over the work area and adjacent lane(s) of Route I-435 NB shall remain closed, and no traffic shall be allowed over the beam(s) being straightened during the heat straightening process.
3. MoDOT has concerns about heat straightening through a splice location. Please consult your heat straightening subcontractor as you prepare your bid.

Post Heat Straightening:

1. Recoat beams over the length of damage and where paint was removed during the heat straightening process with System G (Gray).

(2) Approximate beam sweep at point of impact

Beam No.	Dim. A
4	<1"
5	2"
6	2"

DETAIL OF BEAM SHOWING FIRE DAMAGE

(1) Approximate fire damage zone and limits of required heat straightening.

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
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MO-PE-2012000778

DATE PREPARED 8/12/2024

ROUTE I-435 | STATE MO

DISTRICT BR | SHEET NO. 1

COUNTY JACKSON

JOB NO. JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A17506

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

Detailed July 2024
Checked July 2024

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

REPAIRS TO BRIDGE: ROUTE I-435 NB OVER ROUTE 24

ROUTE I-435 FROM ROUTE 12 TO ROUTE 210
ABOUT 1.0 MILE NORTH OF ROUTE 12
BEGINNING STATION 173+30.85± (Match Existing)

GENERAL NOTES:

Design Specifications:

2002 AASHTO LFD (17th Ed.) Standard Specifications

Design Loading:

HS20 Modified (New Construction)
35lb/Sq. Ft. Wearing Surface
H20-S16-44 & Military 24,000 lb. Tandem Axle (1957 & New Construction)

Design Unit Stresses:

Structural Carbon Steel (ASTM A709 Grade 36) fy = 36,000 psi

Recoating Existing Steel:

Protective Coating: System G in accordance with Sec 1081.

Surface Preparation: Surface preparation of the existing steel shall be in accordance with Sec 1081 for Recoating of Structural Steel (System G). The cost of surface preparation will be considered completely covered by the contract lump sum price for Surface Preparation for Recoating Structural Steel.

Prime Coat: The cost of the prime coat will be considered completely covered by the contract lump sum price for Field Application of Inorganic Zinc Primer.

Field Coat(s): The color of the field coat(s) shall be Gray (Federal Standard #26373). The cost of the intermediate field coat will be considered completely covered by the contract lump sum price for Intermediate Field Coat (System G). The cost of the finish field coat will be considered completely covered by the contract lump sum price for Finish Field Coat (System G).

Limits of Paint Overlap: System G shall overlap the existing coating between 6 inches and 12 inches in order to achieve maximum coverage at the paint limit of each complete system. The final field coating shall be masked to provide crisp, straight lines and to prevent overspray beyond the overlap required.

Miscellaneous:

The existing vertical clearance shall be maintained during construction when Route 24 is open to traffic.

Lane closures on Route I-435 NB and Route 24 shall be in accordance with traffic control plans.

Outline of existing work is indicated by light dashed lines. Heavy lines indicate new work.

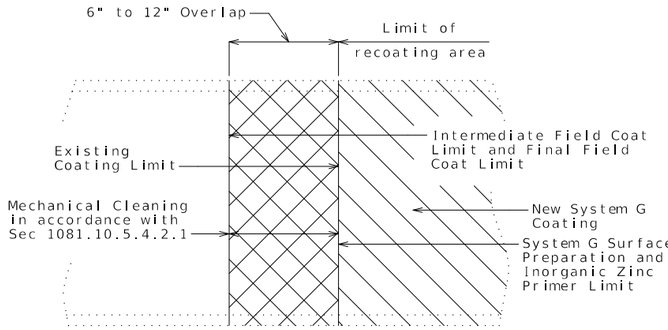
The contractor shall verify all dimensions in field before ordering new material.

All existing dimensions shown were taken from as-built drawings, or limited field measurements.

The contractor shall complete a non-destructive test on the connection plate welds at all beam(s) in damaged areas where connection plates will be re-used to confirm suitability of re-use before installing new diaphragm(s). The cost of this work will be considered completely covered by the contract lump sum price for Non-Destructive Testing. See Special Provisions. Required paint removal for this work will be considered completely covered by the lump sum price for Surface Preparation for Recoating Structural Steel.

The contractor shall heat straighten the damaged portions of beam(s). The cost of this work will be considered completely covered by the contract lump sum price for Heat Straightening. See Special Provisions.

Removal and reinstallation of sign and sign supports as needed will be considered completely covered by the contract lump sum price for Heat Straightening.



PART ELEVATION SHOWING
LIMITS OF PAINT OVERLAP

(Vertical or horizontal paint limit.
Horizontal limit shown)

Estimated Quantities

Item		Quantity
Surface Preparation for Recoating Structural Steel	lump sum	1
Field Application of Inorganic Zinc Primer	lump sum	1
Intermediate Field Coat (System G)	lump sum	1
Finish Field Coat (System G)	lump sum	1
Non-Destructive Testing	lump sum	1
Heat Straightening	lump sum	1

STATE OF MISSOURI
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PROFESSIONAL ENGINEER
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DATE PREPARED
8/13/2024

ROUTE	STATE
I-435	MO
DISTRICT	SHEET NO.
BR	2

COUNTY
JACKSON

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A17506

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

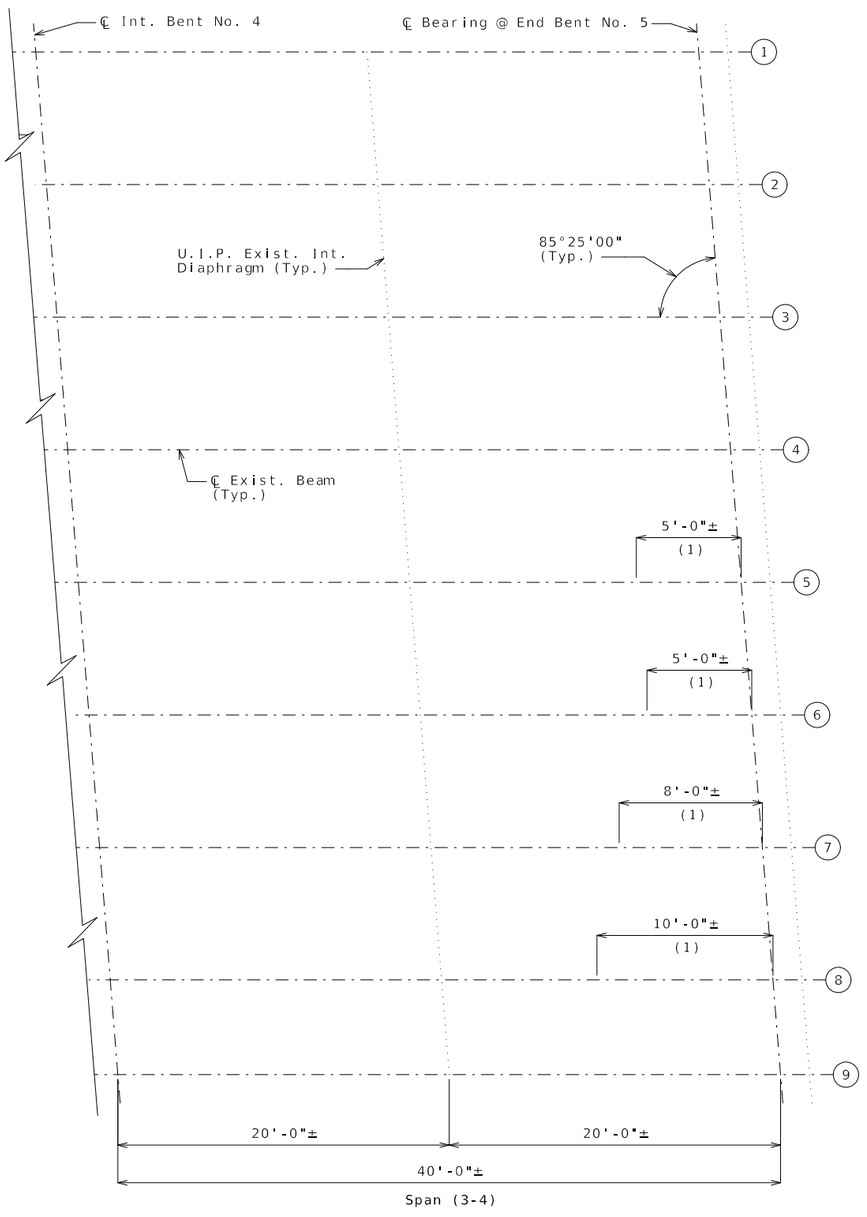
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

Detailed July 2024
Checked July 2024

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

U.I.P. AND REPAIR EXISTING FIRE DAMAGED (35'-46'-54'-40')
CONTINUOUS COMPOSITE WIDE FLANGE BEAM SPANS (SKEW: 4°35' R.A.)

SEC/SUR 7 TWP 49N RGE 32W



PART PLAN OF STRUCTURAL STEEL

PHASES OF WORK

Prior to Heat Straightening:

1. Powerwash existing structural steel and existing concrete in Span (4-5).
2. Complete surface preparation of existing steel that will be subjected to Non-Destructive Testing (NDT) or heat from the heat straightening process.
3. Remove the intermediate diaphragms and connection plates as indicated in the plans or directed by the engineer. As approved by the engineer, existing connection plates may be re-used. Non-Destructive Testing (NDT) of the connection plate welds are required to assure suitability for re-use; paint shall be removed prior to any NDT of welds. Existing connection plates not re-used shall be removed and the beams ground smooth.
4. Inspect beam in the area of repair for cracks by any non-destructive means. If cracks are identified, repair cracks as directed by the engineer.

Heat Straightening:

1. Heat straighten beams covering the length of the collision damaged beams. The beams shall be heat straightened to remove web and bottom flange twisting. See Special Provisions.
2. The lanes over the work area and adjacent lane(s) of Route I-435 SB shall remain closed, and no traffic shall be allowed over the beam(s) being straightened during the heat straightening process.
3. MoDOT has concerns about heat straightening through a splice location. Please consult your heat straightening subcontractor as you prepare your bid.

Post Heat Straightening:

1. Recoat beams over the length of damage and where paint was removed during the heat straightening process with System G (Gray).

(2) Approximate beam sweep at point of impact

DETAIL OF BEAM SHOWING FIRE DAMAGE

Beam No.	Dim. A
5	<1"
6	<1"
7	2"
8	3"

(1) Approximate fire damage zone and limits of required heat straightening.

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
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DATE PREPARED 8/12/2024

ROUTE	STATE
I-435	MO
DISTRICT	SHEET NO.
BR	1

COUNTY JACKSON

JOB NO. JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A17507

DESCRIPTION	DATE

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

REPAIRS TO BRIDGE: ROUTE I-435 SB OVER ROUTE 24

ROUTE I-435 FROM ROUTE 12 TO ROUTE 210
ABOUT 1.0 MILE NORTH OF ROUTE 12
BEGINNING STATION 173+30.85± (Match Existing)

Detailed July 2024
Checked July 2024

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

GENERAL NOTES:

Design Specifications:

2002 AASHTO LFD (17th Ed.) Standard Specifications

Design Loading:

HS20 Modified (New Construction)
35lb/Sq. Ft. Wearing Surface
H20-S16-44 & Military 24,000 lb. Tandem Axle (1957 & New Construction)

Design Unit Stresses:

Structural Carbon Steel (ASTM A709 Grade 36) fy = 36,000 psi

Recoating Existing Steel:

Protective Coating: System G in accordance with Sec 1081.

Surface Preparation: Surface preparation of the existing steel shall be in accordance with Sec 1081 for Recoating of Structural Steel (System G). The cost of surface preparation will be considered completely covered by the contract lump sum price for Surface Preparation for Recoating Structural Steel.

Prime Coat: The cost of the prime coat will be considered completely covered by the contract lump sum price for Field Application of Inorganic Zinc Primer.

Field Coat(s): The color of the field coat(s) shall be Gray (Federal Standard #26373). The cost of the intermediate field coat will be considered completely covered by the contract lump sum price for Intermediate Field Coat (System G). The cost of the finish field coat will be considered completely covered by the contract lump sum price for Finish Field Coat (System G).

Limits of Paint Overlap: System G shall overlap the existing coating between 6 inches and 12 inches in order to achieve maximum coverage at the paint limit of each complete system. The final field coating shall be masked to provide crisp, straight lines and to prevent overspray beyond the overlap required.

Miscellaneous:

The existing vertical clearance shall be maintained during construction when Route 24 is open to traffic.

Lane closures on Route I-435 NB and Route 24 shall be in accordance with traffic control plans.

Outline of existing work is indicated by light dashed lines. Heavy lines indicate new work.

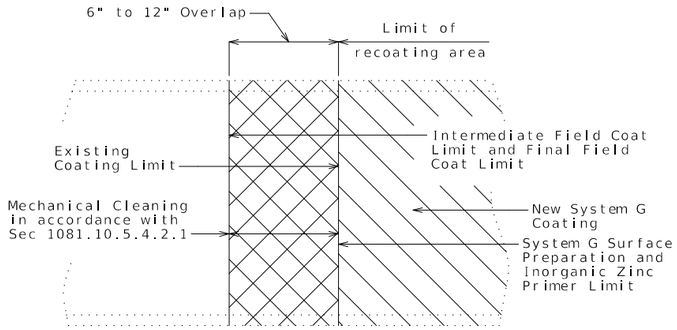
The contractor shall verify all dimensions in field before ordering new material.

All existing dimensions shown were taken from as-built drawings, or limited field measurements.

The contractor shall complete a non-destructive test on the connection plate welds at all beam(s) in damaged areas where connection plates will be re-used to confirm suitability of re-use before installing new diaphragm(s). The cost of this work will be considered completely covered by the contract lump sum price for Non-Destructive Testing. See Special Provisions. Required paint removal for this work will be considered completely covered by the lump sum price for Surface Preparation for Recoating Structural Steel.

The contractor shall heat straighten the damaged portions of beam(s). The cost of this work will be considered completely covered by the contract lump sum price for Heat Straightening. See Special Provisions.

Removal and reinstallation of sign and sign supports as needed will be considered completely covered by the contract lump sum price for Heat Straightening.



PART ELEVATION SHOWING
LIMITS OF PAINT OVERLAP

(Vertical or horizontal paint limit.
Horizontal limit shown)

Estimated Quantities

Item		Quantity
Surface Preparation for Recoating Structural Steel	lump sum	1
Field Application of Inorganic Zinc Primer	lump sum	1
Intermediate Field Coat (System G)	lump sum	1
Finish Field Coat (System G)	lump sum	1
Non-Destructive Testing	lump sum	1
Heat Straightening	lump sum	1

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
08/13/2024 3:12:04 PM
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DATE PREPARED
8/13/2024

ROUTE	STATE
I-435	MO
DISTRICT	SHEET NO.
BR	2

COUNTY
JACKSON

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A17507

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

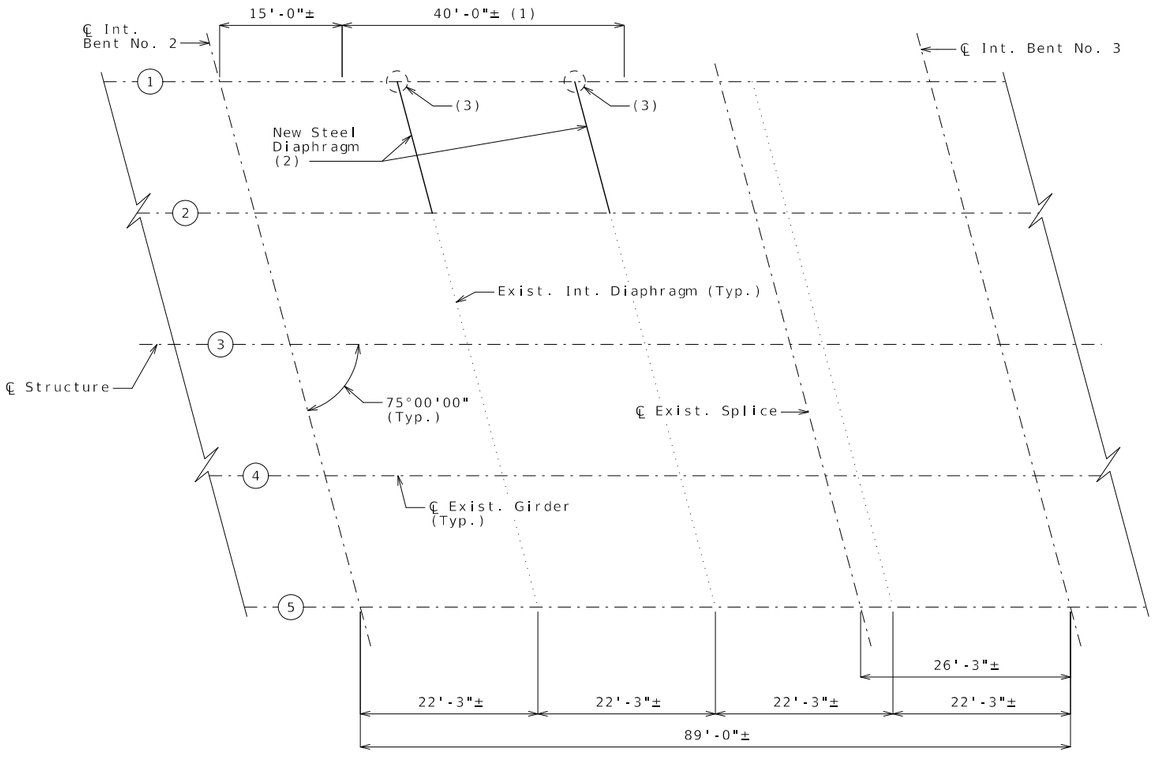
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

Detailed July 2024
Checked July 2024

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

SEC/SUR 15 TWP 45N RGE 32W

U.I.P. AND REPAIR COLLISION DAMAGED (35.5')(2.5'-89'-89'-2.5')(35.5')
CONTINUOUS COMPOSITE PLATE GIRDER SPANS (SKEW: 15° R.A.)



PART PLAN OF STRUCTURAL STEEL

PHASES OF WORK

Prior to Heat Straightening:

1. Complete surface preparation of existing steel that will be subjected to Non-Destructive Testing (NDT) or heat from the heat straightening process.

2. Repair gouges and other deformities in collision damaged girders.

3. Remove the intermediate diaphragms and connection plates as indicated in the plans or directed by the engineer. As approved by the engineer, existing connection plates may be re-used. Non-Destructive Testing (NDT) of the connection plate welds are required to assure suitability for re-use; paint shall be removed prior to any NDT of welds. Existing connection plates not re-used shall be removed and the girders ground smooth.

4. Inspect girder in the area of repair for cracks by any non-destructive means. If cracks are identified, repair cracks as directed by the engineer.

Heat Straightening:

1. Heat straighten girders covering the length of the collision damaged girders. The girders shall be heat straightened to remove web and bottom flange twisting. See Special Provisions.

2. The shoulder and adjacent lane of Route C/J shall remain closed, and no traffic shall be allowed over the girder(s) being straightened during the heat straightening process.

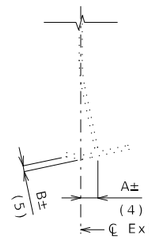
3. MoDOT has concerns about heat straightening through a splice location. Please consult your heat straightening subcontractor as you prepare your bid.

Post Heat Straightening:

1. Install new connection plates and diaphragms.

2 Recoat girders over the length of damage and where paint was removed during the heat straightening process with System G (Gray).

3. Paint new diaphragms and connection plates with System G (Gray).



(4) Approximate girder sweep at point of impact

(5) Approximate vertical distortion of bottom flange

Girder No.	Dim. A	Dim. B
1	9"	*

* Value to be determined by contractor

DETAIL OF GIRDER
SHOWING IMPACT DAMAGE

(1) Approximate collision impact zone and limits of required heat straightening.

(2) Remove existing diaphragm prior to heat straightening.

(3) Remove and replace diaphragm connection plate.

REPAIRS TO BRIDGE: ROUTE C & J
OVER ROUTE 71

ROUTE C/J FROM ROUTE 2 TO ROUTE 58
ABOUT 6.1 MILES SOUTH OF ROUTE 58
BEGINNING STATION 535+00.00± (Match Existing)

Detailed July 2024
Checked July 2024

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

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
08/12/2024 8:20:01 AM
TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED 8/12/2024
ROUTE C/J
STATE MO
DISTRICT BR
SHEET NO. 1
COUNTY CASS
JOB NO. JKU0410
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A23302

DESCRIPTION | DATE

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

GENERAL NOTES:

Design Specifications:

2002 AASHTO LFD (17th Ed.) Standard Specifications

Design Loading:

HS20-44 (New Construction)
15lb/Sq. Ft. Wearing Surface

Design Unit Stresses:

Structural Carbon Steel (ASTM A709 Grade 36) fy = 36,000 psi

Fabricated Steel Connections:

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

Recoating Existing Steel:

Protective Coating: System G in accordance with Sec 1081.

Surface Preparation: Surface preparation of the existing steel shall be in accordance with Sec 1081 for Recoating of Structural Steel (System G). The cost of surface preparation will be considered completely covered by the contract lump sum price for Surface Preparation for Recoating Structural Steel.

Prime Coat: The cost of the prime coat will be considered completely covered by the contract lump sum price for Field Application of Inorganic Zinc Primer.

Field Coat(s): The color of the field coat(s) shall be Gray (Federal Standard #26373). The cost of the intermediate field coat will be considered completely covered by the contract lump sum price for Intermediate Field Coat (System G). The cost of the finish field coat will be considered completely covered by the contract lump sum price for Finish Field Coat (System G).

Limits of Paint Overlap: System G shall overlap the existing coating between 6 inches and 12 inches in order to achieve maximum coverage at the paint limit of each complete system. The final field coating shall be masked to provide crisp, straight lines and to prevent overspray beyond the overlap required.

Coating New Steel:

Protective Coating: System G in accordance with Sec 1081.

Prime Coat: The cost of the prime coat will be considered completely covered by the contract unit price for the fabricated structural steel.

Field Coat(s): The color of the field coat(s) shall be Gray (Federal Standard #26373). The cost of the intermediate field coat will be considered completely covered by the contract lump sum price for Intermediate Field Coat (System G). The cost of the finish field coat will be considered completely covered by the contract lump sum price for Finish Field Coat (System G).

At the option of the contractor, the intermediate field coat and finish field coat may be applied in the shop. The contractor shall exercise extreme care during all phases of loading, hauling, handling, erection and pouring of the slab to minimize damage and shall be fully responsible for all repairs and cleaning of the coating systems as required by the engineer.

Miscellaneous:

The existing vertical clearance shall be maintained during construction when Routes C & J are open to traffic.

Lane closures on Route I-70 and Routes C & J shall be in accordance with traffic control plans.

High strength bolts, nuts and washers will be sampled for quality assurance as specified in Sec 106.

Outline of existing work is indicated by light dashed lines. Heavy lines indicate new work.

The contractor shall verify all dimensions in field before ordering new material.

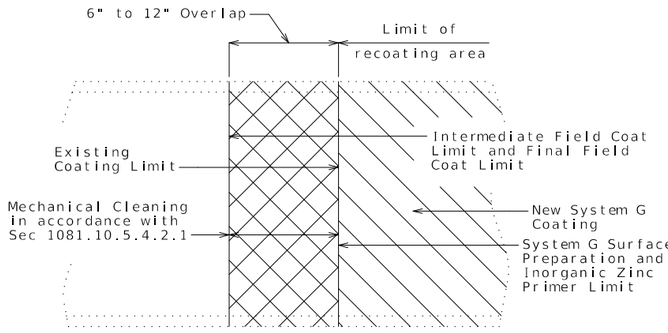
All existing dimensions shown were taken from as-built drawings, or limited field measurements.

The contractor shall complete a non-destructive test on the connection plate welds at all girder(s) in damaged areas where connection plates will be re-used to confirm suitability of re-use before installing new diaphragm(s). The cost of this work will be considered completely covered by the contract lump sum price for Non-Destructive Testing. See Special Provisions. Required paint removal for this work will be considered completely covered by the lump sum price for Surface Preparation for Recoating Structural Steel.

The contractor shall heat straighten the damaged portions of girder(s). The cost of this work will be considered completely covered by the contract lump sum price for Heat Straightening (See Special Provisions).

Removal and reinstallation of sign and sign supports as needed will be considered completely covered by the contract lump sum price for Heat Straightening.

The contractor shall grind smooth surface deformities related to the damage such as gouges. The cost of this work will be considered completely covered by the contract lump sum price for Grind Surface Deformities (See Special Provisions).



PART ELEVATION SHOWING
LIMITS OF PAINT OVERLAP

(Vertical or horizontal paint limit.
Horizontal limit shown)

Estimated Quantities

Item		Quantity
Removal of Diaphragm	each	2
Fabricated Structural Carbon Steel (Misc.)	pound	520
Surface Preparation for Recoating Structural Steel	lump sum	1
Field Application of Inorganic Zinc Primer	lump sum	1
Intermediate Field Coat (System G)	lump sum	1
Finish Field Coat (System G)	lump sum	1
Non-Destructive Testing	lump sum	1
Heat Straightening	lump sum	1
Grind Surface Deformities	lump sum	1

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
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MO-PE-2012000778

DATE PREPARED
8/12/2024

ROUTE	STATE
C / J	MO
DISTRICT	SHEET NO.
BR	2

COUNTY
CASS

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A23302

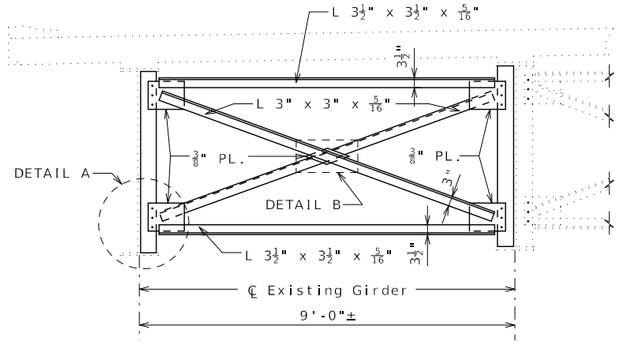
DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

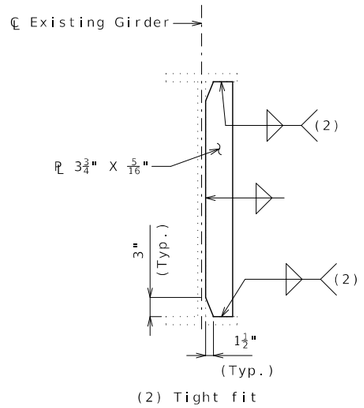
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

Detailed July 2024
Checked July 2024

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

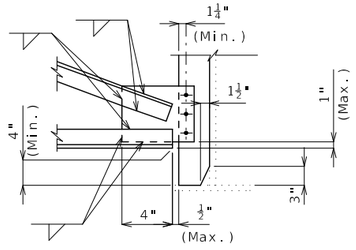


PART SECTION SHOWING NEW INTERMEDIATE DIAPHRAGM



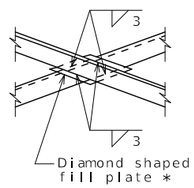
(2) Tight fit

DETAIL OF NEW CONNECTION PLATES

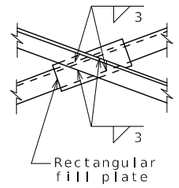


DETAIL A

(Bottom flange shown, top flange similar.)



DETAIL B



OPTIONAL DETAIL B

* At the contractor's option, rectangular fill plates may be used in lieu of diamond fill plates as shown in Optional Detail B.

Notes:

See Sheet No. 1 for phases of work.

Girder No. 1 shall be heat straightened to remove web and bottom flange twisting. Cost will be considered completely covered by the contract lump sum price for Heat Straightening. See Special Provisions.

Limits of collision damage vary by girder. Field verify locations and limits of collision damage requiring repairs.

Estimated limits of new System G Coating are equivalent to approximate limits of heat straightening and shall also include areas where only gouge repairs occur.

The cost of non-destructive testing for connection plate welds evaluated for re-use will be considered completely covered by the contract lump sum price for Non-Destructive Testing. All of the other non-destructive testing will be completely covered by the contract lump sum price for Heat Straightening.

Remove existing diaphragms and their connection plates to Girders No. 1 and 2 per the locations shown. Grind smooth remnants of plates and weldment.

The cost of removing existing diaphragms, connection plates and removal of weld metal with the process of grinding will be considered completely covered by the contract unit price for Removal of Diaphragm (See Special Provisions).

The cost of furnishing and installing new diaphragm and connection plates will be considered completely covered by the contract unit price for Fabricated Structural Carbon Steel (Misc.). Quantity for Fabricated Structural Carbon Steel (Misc.) includes the weight of connection plates to girders and the steel angles that make up the diaphragm. Filler plates and other materials shall be considered subsidiary to the contract unit price for Fabricated Structural Carbon Steel (Misc.).

Contact surfaces shall be in accordance with Sec 1081 for surface preparation.

Contractor may field drill holes with the approval of the Engineer to facilitate construction.

All longitudinal dimensions are parallel to grade.

DIAPHRAGM REPLACEMENT DETAILS

Detailed June 2023
Checked June 2023

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

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
08/12/2024 8:29:37 AM
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MO-PE-2012000778

DATE PREPARED
8/12/2024

ROUTE	STATE
C / J	MO
DISTRICT	SHEET NO.
BR	3

COUNTY
CASS

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

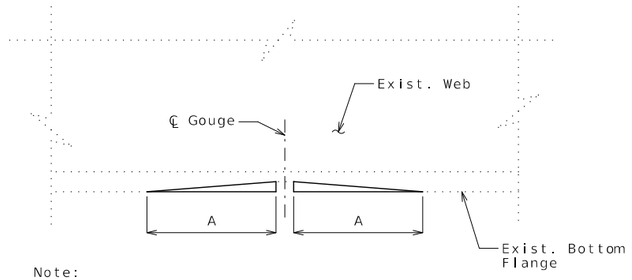
BRIDGE NO.
A23302

DESCRIPTION

DATE

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

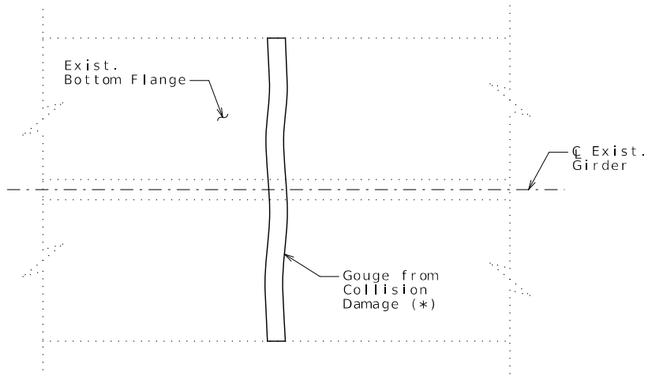
GOUGE REPAIR TYPE 1



Note:
Repairs by grinding shall have edges flared to the flange surface with a slope not exceeding 1 in 10.

GRIND DETAIL FOR FLANGE

DEPTH	A
< $\frac{3}{16}$"	$1\frac{7}{8}$"



PLAN OF GOUGE COLLISION DAMAGE

EVALUATION OF FLANGE GOUGE REPAIRS

If the length of gouge is less than or equal to 2" and depth of the gouge is 1/16" or less, then no repair is necessary.

If the length of the gouge is greater than 2" and the depth of the gouge is 3/16" or less, then use Gouge Repair Type 1.

If the depth of the gouge is greater than 3/16", then use Gouge Repair Type 2.

Payment for beam gouge repairs will be completely covered by Grind Surface Deformities. See Special Provisions.

(*) The girder bottom flange shall be repaired for gouging resulting from collision damage as directed by the Engineer. The Contractor shall not perform any repairs until the defects have been reviewed and categorized by the Engineer, as Type 1 or Type 2.

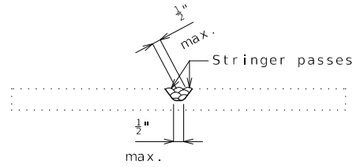
GOUGE REPAIR TYPE 2

Note:
Type 2 repairs shall consist of welding the gouge and grinding it smooth at the Engineer's discretion prior to coating. Welding shall be in accordance with AWS D1.5 standards.

WELD NOTES

(1) All welds shall be made using 1/8" or 5/32" E7018 electrodes only (Not E7028).

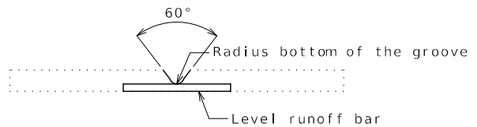
(2) Maximum weld size shall be 1/2" across the face of the weld on each pass. Stringer passes shall be used to achieve this dimension.



(3) Preheat shall be 250°F min. prior to any tacking or welding.

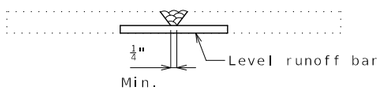
(4) All runoff bars and weld backing bars shall be 1/4" x 1 1/2" flat bar minimum, and shall extend 2" beyond the edge of the flange.

(5) The groove welds shall have a min. of 60° inclined angle.



(6) All welds shall be started 1" out on the runoff bar and continued toward the center of the flange. Runoff bars shall be level with the bottom of the groove.

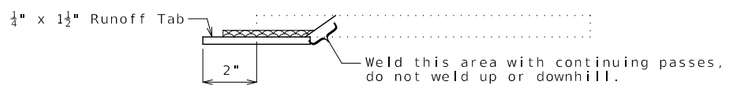
(7) 100% penetration welds shall have a min. 1/4" root opening and all welding shall be done from the top side.



(8) All runoff bars shall be burned off 1/8" min. beyond the edge of the flange and ground flush.

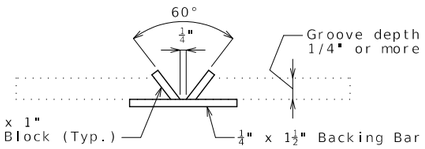
(9) All 100% groove weld backing bars shall be torched or arc gouged off to within 1/8" of the flange and then grind smooth. The bottom of the flange shall be ground smooth after welding.

(10) All welds shall be made in the falt position with no welding up or down on incline slope.



(11) Use 1/4" x 1" flat bar to support the edge of welds that are layered, anytime the groove depth exceeds 1/4".

GOUGE REPAIR TYPE 2 (CONT.)



Edge blocks shall extend 2" from edge of flange, and be removed after welding in the same manner as the backing bar. All welds shall be ground smooth.

Notes:
All Type 2 Repairs to girder flanges shall be Q.C. inspected by ultra-sonic testing. Acceptance or rejection of the repair welds shall be based on the requirements of Table 9.2 of AWS D1.5-95.

Welders shall be AWS Certified for overhead welding.

DETAILS OF GIRDER GOUGE REPAIRS

Detailed July 2024
Checked July 2024

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

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
08/12/2024 8:29:53 AM
TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED
8/12/2024

ROUTE	STATE
C / J	MO
DISTRICT	SHEET NO.
BR	4

COUNTY
CASS

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

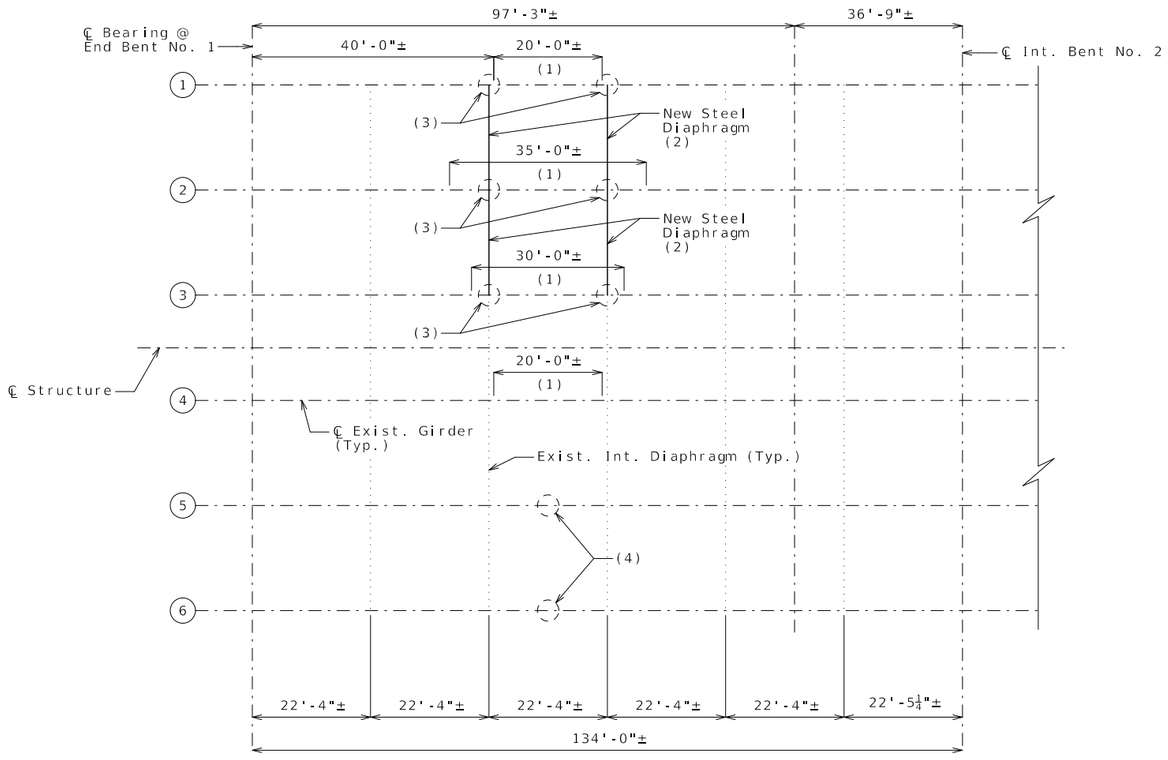
BRIDGE NO.
A23302

DESCRIPTION	DATE

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

SEC/SUR 3 TWP 48N RGE 33W

U.I.P. AND REPAIR COLLISION DAMAGED (134'-104')
CONTINUOUS COMPOSITE PLATE GIRDER SPANS (SKEW: SQUARE)



PART PLAN OF STRUCTURAL STEEL

PHASES OF WORK

Prior to Heat Straightening:

1. Complete surface preparation of existing steel that will be subjected to Non-Destructive Testing (NDT) or heat from the heat straightening process.

2. Repair gouges and other deformities in collision damaged girders.

3. Remove the intermediate diaphragms and connection plates as indicated in the plans or directed by the engineer. As approved by the engineer, existing connection plates may be re-used. Non-Destructive Testing (NDT) of the connection plate welds are required to assure suitability for re-use; paint shall be removed prior to any NDT of welds. Existing connection plates not re-used shall be removed and the girders ground smooth.

4. Inspect girder in the area of repair for cracks by any non-destructive means. If cracks are identified, repair cracks as directed by the engineer.

Heat Straightening:

1. Heat straighten girders covering the length of the collision damaged girders. The girders shall be heat straightened to remove web and bottom flange twisting. See Special Provisions.

2. The shoulder and adjacent lane of 43rd Street shall remain closed, and no traffic shall be allowed over the girder(s) being straightened during the heat straightening process.

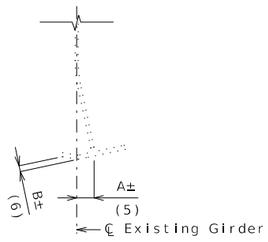
3. MoDOT has concerns about heat straightening through a splice location. Please consult your heat straightening subcontractor as you prepare your bid.

Post Heat Straightening:

1. Install new connection plates and diaphragms.

2 Recoat girders over the length of damage and where paint was removed during the heat straightening process with System G (Gray).

3. Paint new diaphragms and connection plates with System G (Gray).



DETAIL OF GIRDER
SHOWING IMPACT DAMAGE

Girder No.	Dim. A	Dim. B
1	< 1"	*
2	6"	*
3	2"	*
4	< 1"	*

* Value to be determined by contractor

(1) Approximate collision impact zone and limits of required heat straightening.

(2) Remove existing diaphragm prior to heat straightening.

(3) Remove and replace diaphragm connection plate.

(4) Bottom flange gouges.

(5) Approximate girder sweep at point of impact

(6) Approximate vertical distortion of bottom flange

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
08/12/2024 8:50:53 AM
TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED
8/12/2024

ROUTE	STATE
CST	MO
DISTRICT	SHEET NO.
BR	1

COUNTY
JACKSON

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A51841

DESCRIPTION	DATE

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

REPAIRS TO BRIDGE: 43RD STREET OVER ROUTE 71

43RD STREET FROM ROUTE I-70 TO ROUTE 56
ABOUT 0.5 MILE NORTH OF ROUTE 56
BEGINNING STATION 7+96.94± (Match Existing)

Detailed July 2024
Checked July 2024

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

GENERAL NOTES:

Design Specifications:

2002 AASHTO LFD (17th Ed.) Standard Specifications

Design Loading:

HS20 Modified (New Construction)
35lb/Sq. Ft. Wearing Surface
H20-S16-44 & Military 24,000 lb. Tandem Axle (1957 & New Construction)

Design Unit Stresses:

Structural Carbon Steel (ASTM A709 Grade 36) fy = 36,000 psi

Fabricated Steel Connections:

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

Recoating Existing Steel:

Protective Coating: System G in accordance with Sec 1081.

Surface Preparation: Surface preparation of the existing steel shall be in accordance with Sec 1081 for Recoating of Structural Steel (System G). The cost of surface preparation will be considered completely covered by the contract lump sum price for Surface Preparation for Recoating Structural Steel.

Prime Coat: The cost of the prime coat will be considered completely covered by the contract lump sum price for Field Application of Inorganic Zinc Primer.

Field Coat(s): The color of the field coat(s) shall be Gray (Federal Standard #26373). The cost of the intermediate field coat will be considered completely covered by the contract lump sum price for Intermediate Field Coat (System G). The cost of the finish field coat will be considered completely covered by the contract lump sum price for Finish Field Coat (System G).

Limits of Paint Overlap: System G shall overlap the existing coating between 6 inches and 12 inches in order to achieve maximum coverage at the paint limit of each complete system. The final field coating shall be masked to provide crisp, straight lines and to prevent overspray beyond the overlap required.

Coating New Steel:

Protective Coating: System G in accordance with Sec 1081.

Prime Coat: The cost of the prime coat will be considered completely covered by the contract unit price for the fabricated structural steel.

Field Coat(s): The color of the field coat(s) shall be Gray (Federal Standard #26373). The cost of the intermediate field coat will be considered completely covered by the contract lump sum price for Intermediate Field Coat (System G). The cost of the finish field coat will be considered completely covered by the contract lump sum price for Finish Field Coat (System G).

At the option of the contractor, the intermediate field coat and finish field coat may be applied in the shop. The contractor shall exercise extreme care during all phases of loading, hauling, handling, erection and pouring of the slab to minimize damage and shall be fully responsible for all repairs and cleaning of the coating systems as required by the engineer.

Miscellaneous:

The existing vertical clearance shall be maintained during construction when Route 71 is open to traffic.

Lane closures on Route 71 and 43rd Street shall be in accordance with traffic control plans.

High strength bolts, nuts and washers will be sampled for quality assurance as specified in Sec 106.

Outline of existing work is indicated by light dashed lines. Heavy lines indicate new work.

The contractor shall verify all dimensions in field before ordering new material.

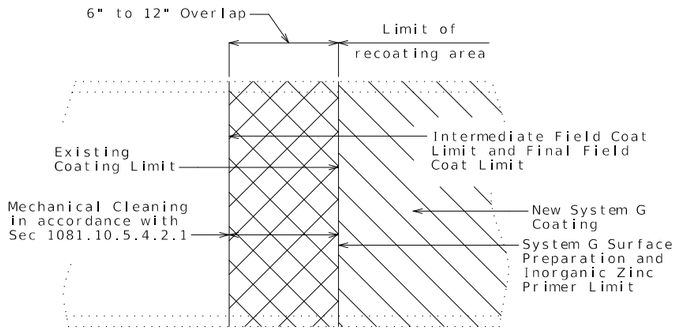
All existing dimensions shown were taken from as-built drawings, or limited field measurements.

The contractor shall complete a non-destructive test on the connection plate welds at all girder(s) in damaged areas where connection plates will be re-used to confirm suitability of re-use before installing new diaphragm(s). The cost of this work will be considered completely covered by the contract lump sum price for Non-Destructive Testing (See Special Provisions). Required paint removal for this work will be considered completely covered by the lump sum price for Surface Preparation for Recoating Structural Steel.

The contractor shall heat straighten the damaged portions of girder(s). The cost of this work will be considered completely covered by the contract lump sum price for Heat Straightening (See Special Provisions).

Removal and reinstallation of sign and sign supports as needed will be considered completely covered by the contract lump sum price for Heat Straightening.

The contractor shall grind smooth surface deformities related to the damage such as gouges. The cost of this work will be considered completely covered by the contract lump sum price for Grind Surface Deformities (See Special Provisions).



PART ELEVATION SHOWING
LIMITS OF PAINT OVERLAP

(Vertical or horizontal paint limit.
Horizontal limit shown)

Estimated Quantities

Item		Quantity
Removal of Diaphragm	each	4
Fabricated Structural Carbon Steel (Misc.)	pound	1020
Surface Preparation for Recoating Structural Steel	lump sum	1
Field Application of Inorganic Zinc Primer	lump sum	1
Intermediate Field Coat (System G)	lump sum	1
Finish Field Coat (System G)	lump sum	1
Non-Destructive Testing	lump sum	1
Heat Straightening	lump sum	1
Grind Surface Deformities	lump sum	1

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
08/12/2024 9:03:53 AM
TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED
8/12/2024

ROUTE	STATE
CST	MO
DISTRICT	SHEET NO.
BR	2

COUNTY
JACKSON

JOB NO.
JKU0410

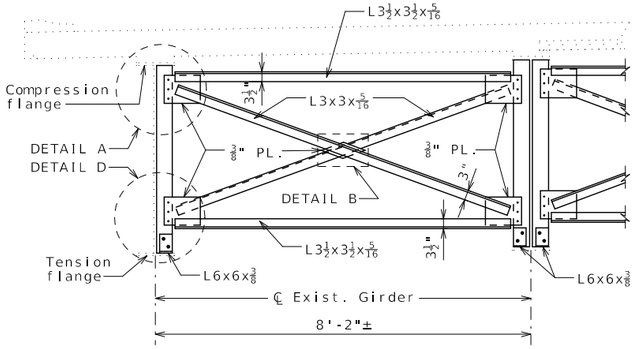
CONTRACT ID.

PROJECT NO.

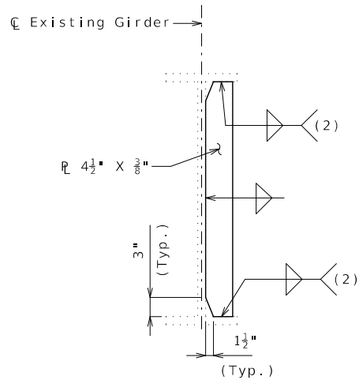
BRIDGE NO.
A51841

DESCRIPTION	DATE

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

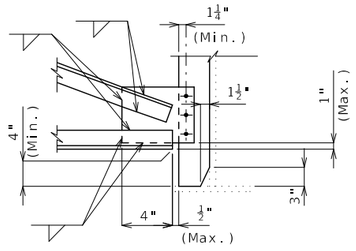


PART SECTION SHOWING NEW INTERMEDIATE DIAPHRAGM



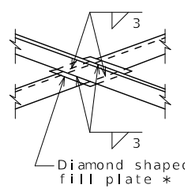
(2) Tight fit

DETAIL OF NEW CONNECTION PLATES

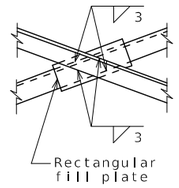


DETAIL A

(Bottom flange shown, top flange similar.)



DETAIL B



OPTIONAL DETAIL B

* At the contractor's option, rectangular fill plates may be used in lieu of diamond fill plates as shown in Optional Detail B.

Notes:

See Sheet No. 1 for phases of work.

Girders No. 1 thru 4 shall be heat straightened to remove web and bottom flange twisting. Cost will be considered completely covered by the contract lump sum price for Heat Straightening (See Special Provisions).

Limits of collision damage vary by girder. Field verify locations and limits of collision damage requiring repairs.

Estimated limits of new System G Coating are equivalent to approximate limits of heat straightening and shall also include areas where only gouge repairs occur.

The cost of non-destructive testing for connection plate welds evaluated for re-use will be considered completely covered by the contract lump sum price for Non-Destructive Testing. All of the other non-destructive testing will be completely covered by the contract lump sum price for Heat Straightening.

Remove existing diaphragms and their connection plates to Girders No. 1 thru 5 per the locations shown. Grind smooth remnants of plates and weldment.

The cost of removing existing diaphragms, connection plates and removal of weld metal with the process of grinding will be considered completely covered by the contract unit price for Removal of Diaphragm (See Special Provisions).

The cost of furnishing and installing new diaphragm and connection plates will be considered completely covered by the contract unit price for Fabricated Structural Carbon Steel (Misc.). Quantity for Fabricated Structural Carbon Steel (Misc.) includes the weight of connection plates to girders and the steel angles that make up the diaphragm. Filler plates and other materials shall be considered subsidiary to the contract unit price for Fabricated Structural Carbon Steel (Misc.).

Contact surfaces shall be in accordance with Sec 1081 for surface preparation.

Contractor may field drill holes with the approval of the Engineer to facilitate construction.

All longitudinal dimensions are parallel to grade.

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
08/12/2024 8:50:37 AM
TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED: 8/12/2024

ROUTE	STATE
CST	MO
DISTRICT	SHEET NO.
BR	3

COUNTY: JACKSON

JOB NO.: JKU0410

CONTRACT ID.:

PROJECT NO.:

BRIDGE NO.: A51841

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

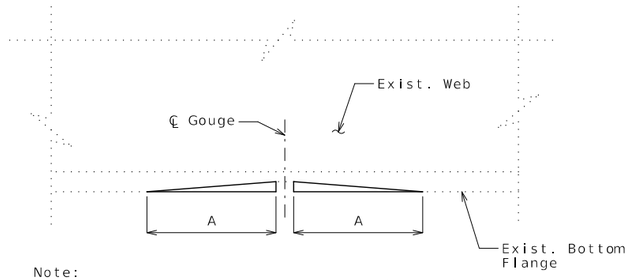
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

Detailed June 2023
Checked June 2023

DIAPHRAGM REPLACEMENT DETAILS

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

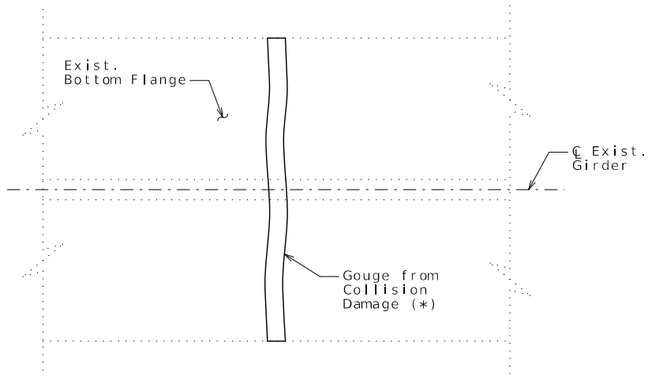
GOUGE REPAIR TYPE 1



Note:
Repairs by grinding shall have edges flared to the flange surface with a slope not exceeding 1 in 10.

GRIND DETAIL FOR FLANGE

DEPTH	A
$< \frac{3}{16}$"	$1\frac{7}{8}$"



PLAN OF GOUGE COLLISION DAMAGE

EVALUATION OF FLANGE GOUGE REPAIRS

If the length of gouge is less than or equal to 2" and depth of the gouge is 1/16" or less, then no repair is necessary.

If the length of the gouge is greater than 2" and the depth of the gouge is 3/16" or less, then use Gouge Repair Type 1.

If the depth of the gouge is greater than 3/16", then use Gouge Repair Type 2.

Payment for beam gouge repairs will be completely covered by Grind Surface Deformities. See Special Provisions.

(*) The girder bottom flange shall be repaired for gouging resulting from collision damage as directed by the Engineer. The Contractor shall not perform any repairs until the defects have been reviewed and categorized by the Engineer, as Type 1 or Type 2.

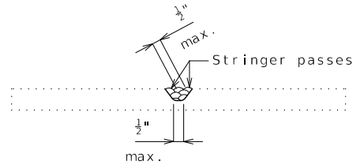
GOUGE REPAIR TYPE 2

Note:
Type 2 repairs shall consist of welding the gouge and grinding it smooth at the Engineer's discretion prior to coating. Welding shall be in accordance with AWS D1.5 standards.

WELD NOTES

(1) All welds shall be made using 1/8" or 5/32" E7018 electrodes only (Not E7028).

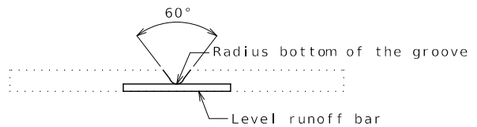
(2) Maximum weld size shall be 1/2" across the face of the weld on each pass. Stringer passes shall be used to achieve this dimension.



(3) Preheat shall be 250°F min. prior to any tacking or welding.

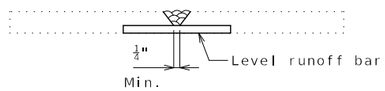
(4) All runoff bars and weld backing bars shall be 1/4" x 1 1/2" flat bar minimum, and shall extend 2" beyond the edge of the flange.

(5) The groove welds shall have a min. of 60° inclined angle.



(6) All welds shall be started 1" out on the runoff bar and continued toward the center of the flange. Runoff bars shall be level with the bottom of the groove.

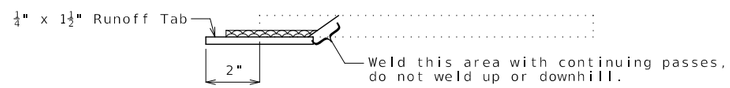
(7) 100% penetration welds shall have a min. 1/4" root opening and all welding shall be done from the top side.



(8) All runoff bars shall be burned off 1/8" min. beyond the edge of the flange and ground flush.

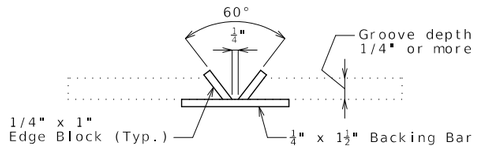
(9) All 100% groove weld backing bars shall be torched or arc gouged off to within 1/8" of the flange and then grind smooth. The bottom of the flange shall be ground smooth after welding.

(10) All welds shall be made in the falt position with no welding up or down on incline slope.



(11) Use 1/4" x 1" flat bar to support the edge of welds that are layered, anytime the groove depth exceeds 1/4".

GOUGE REPAIR TYPE 2 (CONT.)



Edge blocks shall extend 2" from edge of flange, and be removed after welding in the same manner as the backing bar. All welds shall be ground smooth.

Notes:
All Type 2 Repairs to girder flanges shall be Q.C. inspected by ultra-sonic testing. Acceptance or rejection of the repair welds shall be based on the requirements of Table 9.2 of AWS D1.5-95.

Welders shall be AWS Certified for overhead welding.

DETAILS OF GIRDER GOUGE REPAIRS

Detailed July 2024
Checked July 2024

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

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
08/12/2024 8:50:19 AM
TIMOTHY D.LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED
8/12/2024

ROUTE	STATE
CST	MO
DISTRICT	SHEET NO.
BR	4

COUNTY
JACKSON

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

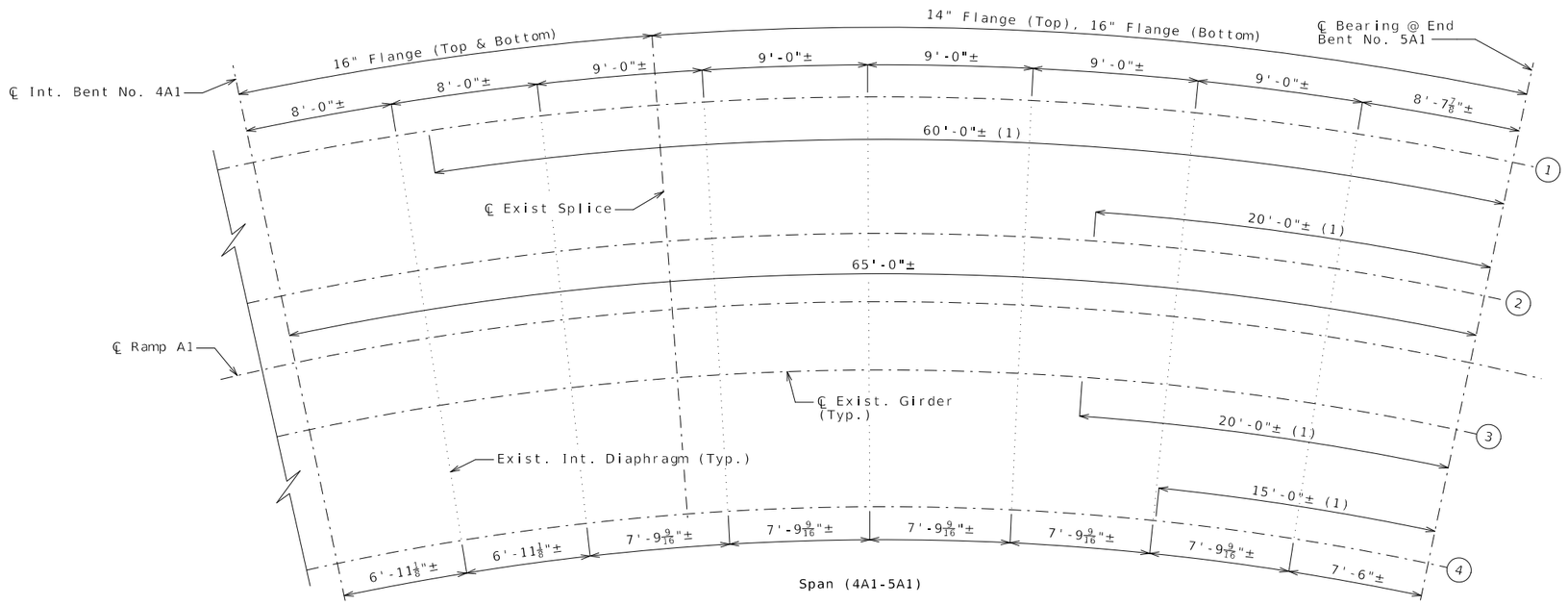
BRIDGE NO.
A51841

DESCRIPTION	DATE

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

SEC/SUR 6 TWP 49N RGE 33W

U.I.P. AND REPAIR EXISTING FIRE DAMAGED (48'-76'-68')(UNIT A1) (155')(72'-78')(126'-126'-155'-120'-96') (8 @ 50')(49'-57'-55'-65')(55'-50'-50'-50')(4 @ 50')(55'-65'-55'-51'-55')(55'-55'-55'-51'-55)(55'-55'-55'-49'-55') (55'-55'-49'-55'-55')(55'-51'-55'-55'-55')(55'-55'-65'-55'-51')(36'-65'-60'-55'-55')(55'-55'-55'-51')(52'-52'-52'-51') CONTINUOUS COMPOSITE PLATE GIRDER SPANS & PRESTRESSED I-GIRDER SPANS



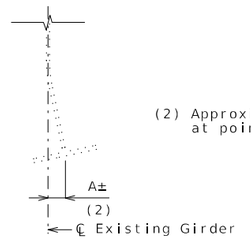
PART PLAN OF STRUCTURAL STEEL

(1) Approximate fire damage zone and limits of required heat straightening.

℄ Ramp - Bluff St.
Curve Data

P.C. = 1+21.88
Δ = 102° 37' 30"
D = 36° 29' 39"
R = 157.00'
L = 281.21'
T = 196.06'

Girder No.	Dim. A
1	2"
2	1"
3	1"
4	1"



(2) Approximate girder sweep at point of impact

DETAIL OF GIRDER SHOWING FIRE DAMAGE

PHASES OF WORK

Prior to Heat Straightening:

1. Powerwash existing structural steel and existing concrete in Span (4A1-5A1).
2. Complete surface preparation of existing steel that will be subjected to Non-Destructive Testing (NDT) or heat from the heat straightening process.
3. Remove the intermediate diaphragms and connection plates as indicated in the plans or directed by the engineer. As approved by the engineer, existing connection plates may be re-used. Non-Destructive Testing (NDT) of the connection plate welds are required to assure suitability for re-use; paint shall be removed prior to any NDT of welds. Existing connection plates not re-used shall be removed and the girders ground smooth.
4. Inspect girder in the area of repair for cracks by any non-destructive means. If cracks are identified, repair cracks as directed by the engineer.

Heat Straightening:

1. Heat straighten girders covering the length of the collision damaged girders. The girders shall be heat straightened to remove web and bottom flange twisting. See Special Provisions.
2. The shoulder and adjacent lane of Route I-70 EB shall remain closed, and no traffic shall be allowed over the girder(s) being straightened during the heat straightening process.
3. MoDOT has concerns about heat straightening through a splice location. Please consult your heat straightening subcontractor as you prepare your bid.

Post Heat Straightening:

1. Install diaphragms.
2. Recoat girders over the length of damage and where paint was removed during the heat straightening process with System G (Gray).
3. Paint diaphragms and connection plates with System G (Gray).

Note: Re-installation of diaphragms that were removed will be considered completely covered by the contract unit price for Removal of Diaphragm.

Detailed July 2024
Checked July 2024

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

REPAIRS TO BRIDGE: ROUTE I-70 EB (INTERCITY VIADUCT) & RAMP TO BLUFF STREET OVER VARIOUS RAILROADS & CITY STREETS

ROUTE I-70 EB FROM ROUTE I-35 TO KANSAS STATE LINE
WEST OF ROUTE I-35
BEGINNING STATION -0+24.95± (Match Existing)

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
08/20/2024 9:22:35 AM
TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED
8/26/2024

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	1

COUNTY
JACKSON

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A56583

DESCRIPTION

DATE

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

GENERAL NOTES:

Design Specifications:

2002 AASHTO LFD (17th Ed.) Standard Specifications

Design Loading:

HS20 Modified (1996 & New Construction)
35lb/Sq. Ft. Wearing Surface
Military 24,000 lb. Tandem Axle (1996 & New Construction)

Design Unit Stresses:

Structural Carbon Steel (ASTM A709 Grade 36) fy = 36,000 psi

Fabricated Steel Connections:

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

Recoating Existing Steel:

Protective Coating: System G in accordance with Sec 1081.

Surface Preparation: Surface preparation of the existing steel shall be in accordance with Sec 1081 for Recoating of Structural Steel (System G). The cost of surface preparation will be considered completely covered by the contract lump sum price for Surface Preparation for Recoating Structural Steel.

Prime Coat: The cost of the prime coat will be considered completely covered by the contract lump sum price for Field Application of Inorganic Zinc Primer.

Field Coat(s): The color of the field coat(s) shall be Gray (Federal Standard #26373). The cost of the intermediate field coat will be considered completely covered by the contract lump sum price for Intermediate Field Coat (System G). The cost of the finish field coat will be considered completely covered by the contract lump sum price for Finish Field Coat (System G).

Limits of Paint Overlap: System G shall overlap the existing coating between 6 inches and 12 inches in order to achieve maximum coverage at the paint limit of each complete system. The final field coating shall be masked to provide crisp, straight lines and to prevent overspray beyond the overlap required.

Coating New Steel:

Protective Coating: System G in accordance with Sec 1081.

Prime Coat: The cost of the prime coat will be considered completely covered by the contract unit price for the fabricated structural steel.

Field Coat(s): The color of the field coat(s) shall be Gray (Federal Standard #26373). The cost of the intermediate field coat will be considered completely covered by the contract lump sum price for Intermediate Field Coat (System G). The cost of the finish field coat will be considered completely covered by the contract lump sum price for Finish Field Coat (System G).

At the option of the contractor, the intermediate field coat and finish field coat may be applied in the shop. The contractor shall exercise extreme care during all phases of loading, hauling, handling, erection and pouring of the slab to minimize damage and shall be fully responsible for all repairs and cleaning of the coating systems as required by the engineer.

Miscellaneous:

The existing vertical clearance shall be maintained during construction.

Lane closures on Route I-70 Ramp shall be in accordance with traffic control plans.

High strength bolts, nuts and washers will be sampled for quality assurance as specified in Sec 106.

Outline of existing work is indicated by light dashed lines. Heavy lines indicate new work.

The contractor shall verify all dimensions in field before ordering new material.

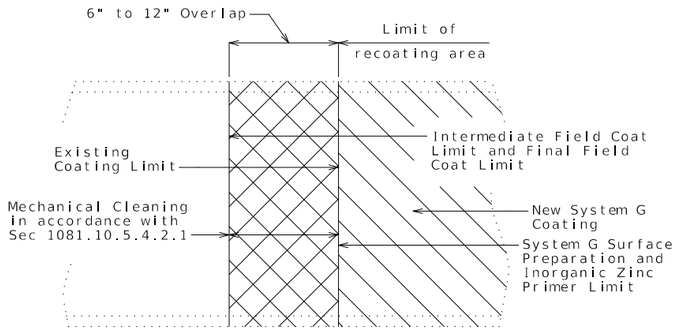
All existing dimensions shown were taken from as-built drawings, or limited field measurements.

The contractor shall complete a non-destructive test on the connection plate welds at all girder(s) in damaged areas where connection plates will be re-used to confirm suitability of re-use before installing new diaphragm(s). The cost of this work will be considered completely covered by the contract lump sum price for Non-Destructive Testing. See Special Provisions. Required paint removal for this work will be considered completely covered by the lump sum price for Surface Preparation for Recoating Structural Steel.

The contractor shall heat straighten the damaged portions of girder(s). The cost of this work will be considered completely covered by the contract lump sum price for Heat Straightening. See Special Provisions.

Removal and reinstallation of sign and sign supports as needed will be considered completely covered by the contract lump sum price for Heat Straightening.

The contractor shall grind smooth surface deformities related to the damage such as gouges. The cost of this work will be considered completely covered by the contract lump sum price for Grind Surface Deformities. See Special Provisions.



PART ELEVATION SHOWING
LIMITS OF PAINT OVERLAP

(Vertical or horizontal paint limit.
Horizontal limit shown)

Estimated Quantities

Item		Quantity
Removal of Diaphragm	each	15
Surface Preparation for Recoating Structural Steel	lump sum	1
Field Application of Inorganic Zinc Primer	lump sum	1
Intermediate Field Coat (System G)	lump sum	1
Finish Field Coat (System G)	lump sum	1
Non-Destructive Testing	lump sum	1
Heat Straightening	lump sum	1

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
08/12/2024 9:04:16 AM
TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED
8/12/2024

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	2

COUNTY
JACKSON

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A56583

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

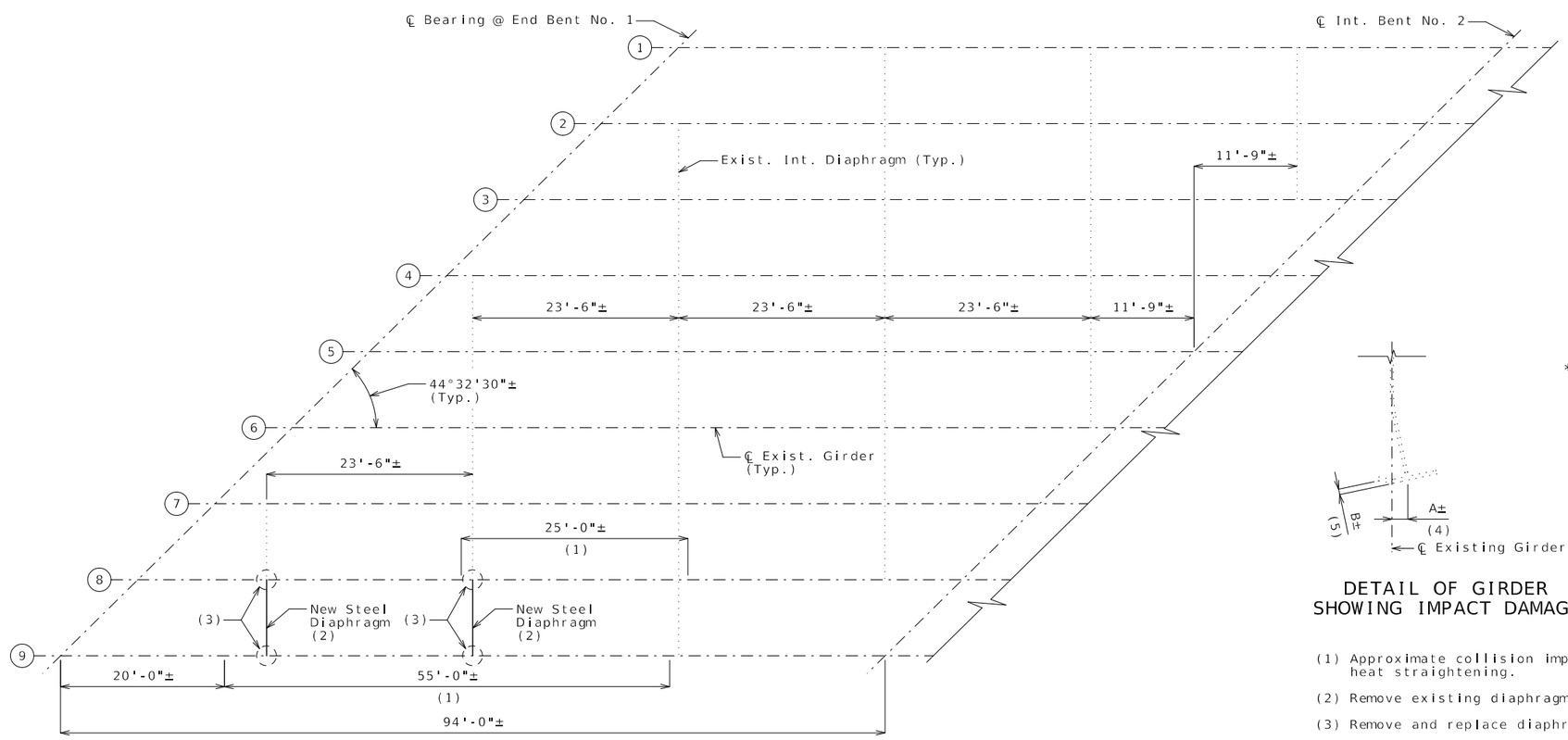
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

Detailed July 2024
Checked July 2024

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

SEC/SUR 8 TWP 48N RGE 32W

U.I.P. AND REPAIR COLLISION DAMAGED (94'-94')
CONTINUOUS COMPOSITE PLATE GIRDER SPANS (SKEW: 45°27'30" L.A.)



PART PLAN OF STRUCTURAL STEEL

Girder No.	Dim. A	Dim. B
8	3"	*
9	15"	*

* Value to be determined by contractor

DETAIL OF GIRDER SHOWING IMPACT DAMAGE

(1) Approximate collision impact zone and limits of required heat straightening.

(2) Remove existing diaphragm prior to heat straightening.

(3) Remove and replace diaphragm connection plate.

(4) Approximate girder sweep at point of impact

(5) Approximate vertical distortion of bottom flange

PHASES OF WORK

Prior to Heat Straightening:

1. Complete surface preparation of existing steel that will be subjected to Non-Destructive Testing (NDT) or heat from the heat straightening process.

2. Repair gouges and other deformities in collision damaged girders.

3. Remove the intermediate diaphragms and connection plates as indicated in the plans or directed by the engineer. As approved by the engineer, existing connection plates may be re-used. Non-Destructive Testing (NDT) of the connection plate welds are required to assure suitability for re-use; paint shall be removed prior to any NDT of welds. Existing connection plates not re-used shall be removed and the girders ground smooth.

4. Inspect girder in the area of repair for cracks by any non-destructive means. If cracks are identified, repair cracks as directed by the engineer.

Heat Straightening:

1. Heat straighten girders covering the length of the collision damaged girders. The girders shall be heat straightened to remove web and bottom flange twisting. See Special Provisions.

2. The shoulder and adjacent lane of Blue Ridge Boulevard shall remain closed, and no traffic shall be allowed over the girder(s) being straightened during the heat straightening process.

3. MoDOT has concerns about heat straightening through a splice location. Please consult your heat straightening subcontractor as you prepare your bid.

Post Heat Straightening:

1. Install new connection plates and diaphragms.

2 Recoat girders over the length of damage and where paint was removed during the heat straightening process with System G (Gray).

3. Paint new diaphragms and connection plates with System G (Gray).

REPAIRS TO BRIDGE: BLUE RIDGE BOULEVARD OVER ROUTE 350

BLUE RIDGE BOULEVARD FROM ROUTE I-70 TO ROUTE 350
ABOUT 3.5 MILES SOUTH OF ROUTE I-70
BEGINNING STATION 135+23.61± (Match Existing)

Detailed July 2024
Checked July 2024

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

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
08/12/2024 8:58:14 AM
TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED 8/12/2024
ROUTE 350 | STATE MO
DISTRICT BR | SHEET NO. 1
COUNTY JACKSON
JOB NO. JKU0410
CONTRACT ID.
PROJECT NO.
BRIDGE NO. L01263

DESCRIPTION | DATE

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

GENERAL NOTES:

Design Specifications:

2002 AASHTO LFD (17th Ed.) Standard Specifications

Design Loading:

HS20 Modified (New Construction)
35lb/Sq. Ft. Wearing Surface
H20-S16-44 & Military 24,000 lb. Tandem Axle (1957 & New Construction)

Design Unit Stresses:

Structural Carbon Steel (ASTM A709 Grade 36) fy = 36,000 psi

Fabricated Steel Connections:

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

Recoating Existing Steel:

Protective Coating: System G in accordance with Sec 1081.

Surface Preparation: Surface preparation of the existing steel shall be in accordance with Sec 1081 for Recoating of Structural Steel (System G). The cost of surface preparation will be considered completely covered by the contract lump sum price for Surface Preparation for Recoating Structural Steel.

Prime Coat: The cost of the prime coat will be considered completely covered by the contract lump sum price for Field Application of Inorganic Zinc Primer.

Field Coat(s): The color of the field coat(s) shall be Gray (Federal Standard #26373). The cost of the intermediate field coat will be considered completely covered by the contract lump sum price for Intermediate Field Coat (System G). The cost of the finish field coat will be considered completely covered by the contract lump sum price for Finish Field Coat (System G).

Limits of Paint Overlap: System G shall overlap the existing coating between 6 inches and 12 inches in order to achieve maximum coverage at the paint limit of each complete system. The final field coating shall be masked to provide crisp, straight lines and to prevent overspray beyond the overlap required.

Coating New Steel:

Protective Coating: System G in accordance with Sec 1081.

Prime Coat: The cost of the prime coat will be considered completely covered by the contract unit price for the fabricated structural steel.

Field Coat(s): The color of the field coat(s) shall be Gray (Federal Standard #26373). The cost of the intermediate field coat will be considered completely covered by the contract lump sum price for Intermediate Field Coat (System G). The cost of the finish field coat will be considered completely covered by the contract lump sum price for Finish Field Coat (System G).

At the option of the contractor, the intermediate field coat and finish field coat may be applied in the shop. The contractor shall exercise extreme care during all phases of loading, hauling, handling, erection and pouring of the slab to minimize damage and shall be fully responsible for all repairs and cleaning of the coating systems as required by the engineer.

Miscellaneous:

The existing vertical clearance shall be maintained during construction when Route 350 is open to traffic.

Lane closures on Blue Ridge Boulevard and Route 350 shall be in accordance with traffic control plans.

High strength bolts, nuts and washers will be sampled for quality assurance as specified in Sec 106.

Outline of existing work is indicated by light dashed lines. Heavy lines indicate new work.

The contractor shall verify all dimensions in field before ordering new material.

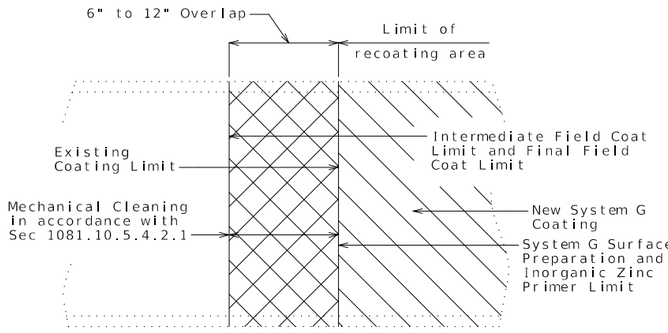
All existing dimensions shown were taken from as-built drawings, or limited field measurements.

The contractor shall complete a non-destructive test on the connection plate welds at all girder(s) in damaged areas where connection plates will be re-used to confirm suitability of re-use before installing new diaphragm(s). The cost of this work will be considered completely covered by the contract lump sum price for Non-Destructive Testing (See Special Provisions). Required paint removal for this work will be considered completely covered by the lump sum price for Surface Preparation for Recoating Structural Steel.

The contractor shall heat straighten the damaged portions of girder(s). The cost of this work will be considered completely covered by the contract lump sum price for Heat Straightening (See Special Provisions).

Removal and reinstallation of sign and sign supports, as needed, will be considered completely covered by the contract lump sum price for Heat Straightening.

The contractor shall grind smooth, surface deformities related to the damage such as gouges. The cost of this work will be considered completely covered by the contract lump sum price for Grind Surface Deformities (See Special Provisions).



PART ELEVATION SHOWING
LIMITS OF PAINT OVERLAP

(Vertical or horizontal paint limit.
Horizontal limit shown)

Estimated Quantities

Item		Quantity
Removal of Diaphragm	each	2
Fabricated Structural Carbon Steel (Misc.)	pound	650
Surface Preparation for Recoating Structural Steel	lump sum	1
Field Application of Inorganic Zinc Primer	lump sum	1
Intermediate Field Coat (System G)	lump sum	1
Finish Field Coat (System G)	lump sum	1
Non-Destructive Testing	lump sum	1
Heat Straightening	lump sum	1
Grind Surface Deformities	lump sum	1

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
08/12/2024 9:04:31 AM
TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED
8/12/2024

ROUTE	STATE
350	MO
DISTRICT	SHEET NO.
BR	2

COUNTY
JACKSON

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
L01263

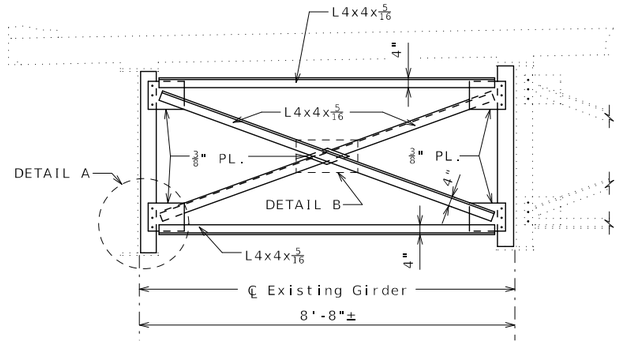
DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

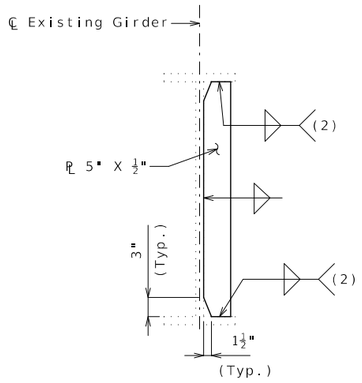
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

Detailed July 2024
Checked July 2024

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

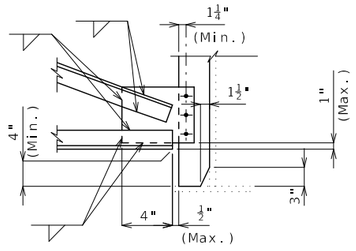


PART SECTION SHOWING NEW INTERMEDIATE DIAPHRAGM



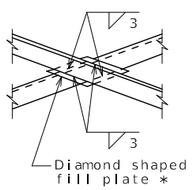
(2) Tight fit

DETAIL OF NEW CONNECTION PLATES

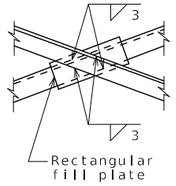


DETAIL A

(Bottom flange shown, top flange similar.)



DETAIL B



OPTIONAL DETAIL B

* At the contractor's option, rectangular fill plates may be used in lieu of diamond fill plates as shown in Optional Detail B.

Notes:

See Sheet No. 1 for phases of work.

Girders No. 8 & 9 shall be heat straightened to remove web and bottom flange twisting. Cost will be considered completely covered by the contract lump sum price for Heat Straightening (See Special Provisions).

Limits of collision damage vary by girder. Field verify locations and limits of collision damage requiring repairs.

Estimated limits of new System G Coating are equivalent to approximate limits of heat straightening and shall also include areas where only gouge repairs occur.

The cost of non-destructive testing for connection plate welds evaluated for re-use will be considered completely covered by the contract lump sum price for Non-Destructive Testing. All of the other non-destructive testing will be completely covered by the contract lump sum price for Heat Straightening.

Remove existing diaphragms and their connection plates to Girders No. 8 and 9 per the locations shown. Grind smooth, remnants of plates and weldment.

The cost of removing existing diaphragms, connection plates and removal of weld metal with the process of grinding will be considered completely covered by the contract unit price for Removal of Diaphragm (See Special Provisions).

The cost of furnishing and installing new diaphragm and connection plates will be considered completely covered by the contract unit price for Fabricated Structural Carbon Steel (Misc.). Quantity for Fabricated Structural Carbon Steel (Misc.) includes the weight of connection plates to girders and the steel angles that make up the diaphragm. Filler plates and other materials shall be considered subsidiary to the contract unit price for Fabricated Structural Carbon Steel (Misc.).

Contact surfaces shall be in accordance with Sec 1081 for surface preparation.

Contractor may field drill holes with the approval of the Engineer to facilitate construction.

All longitudinal dimensions are parallel to grade.

DIAPHRAGM REPLACEMENT DETAILS

Detailed June 2023
Checked June 2023

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

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
08/12/2024 8:59:29 AM
TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED
8/12/2024

ROUTE	STATE
350	MO
DISTRICT	SHEET NO.
BR	3

COUNTY
JACKSON

JOB NO.
JKU0410

CONTRACT ID.

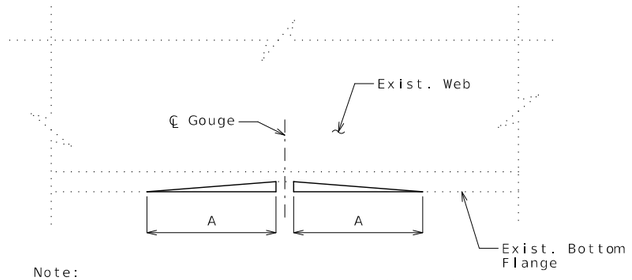
PROJECT NO.

BRIDGE NO.
L01263

DESCRIPTION	DATE

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

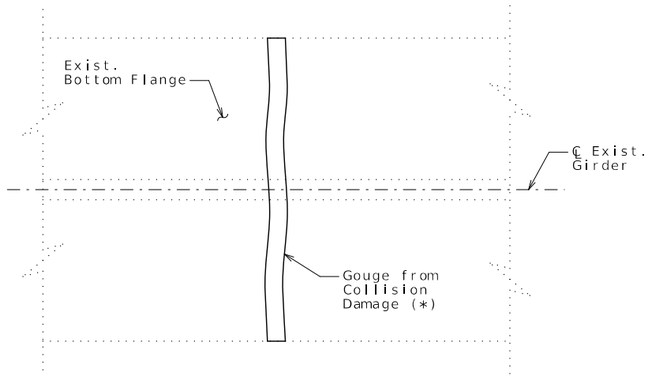
GOUGE REPAIR TYPE 1



Note:
Repairs by grinding shall have edges flared to the flange surface with a slope not exceeding 1 in 10.

GRIND DETAIL FOR FLANGE

DEPTH	A
< $\frac{3}{16}$"	$1\frac{7}{8}$"



PLAN OF GOUGE COLLISION DAMAGE

EVALUATION OF FLANGE GOUGE REPAIRS

If the length of gouge is less than or equal to 2" and depth of the gouge is 1/16" or less, then no repair is necessary.

If the length of the gouge is greater than 2" and the depth of the gouge is 3/16" or less, then use Gouge Repair Type 1.

If the depth of the gouge is greater than 3/16", then use Gouge Repair Type 2.

Payment for beam gouge repairs will be completely covered by Grind Surface Deformities. See Special Provisions.

(*) The girder bottom flange shall be repaired for gouging resulting from collision damage as directed by the Engineer. The Contractor shall not perform any repairs until the defects have been reviewed and categorized by the Engineer, as Type 1 or Type 2.

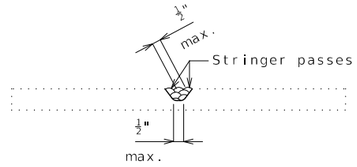
GOUGE REPAIR TYPE 2

Note:
Type 2 repairs shall consist of welding the gouge and grinding it smooth at the Engineer's discretion prior to coating. Welding shall be in accordance with AWS D1.5 standards.

WELD NOTES

(1) All welds shall be made using 1/8" or 5/32" E7018 electrodes only (Not E7028).

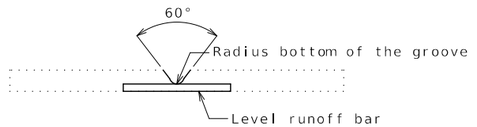
(2) Maximum weld size shall be 1/2" across the face of the weld on each pass. Stringer passes shall be used to achieve this dimension.



(3) Preheat shall be 250°F min. prior to any tacking or welding.

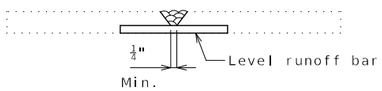
(4) All runoff bars and weld backing bars shall be 1/4" x 1 1/2" flat bar minimum, and shall extend 2" beyond the edge of the flange.

(5) The groove welds shall have a min. of 60° inclined angle.



(6) All welds shall be started 1" out on the runoff bar and continued toward the center of the flange. Runoff bars shall be level with the bottom of the groove.

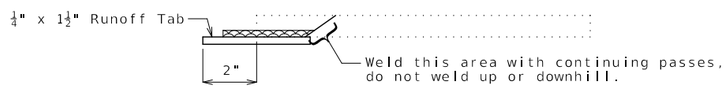
(7) 100% penetration welds shall have a min. 1/4" root opening and all welding shall be done from the top side.



(8) All runoff bars shall be burned off 1/8" min. beyond the edge of the flange and ground flush.

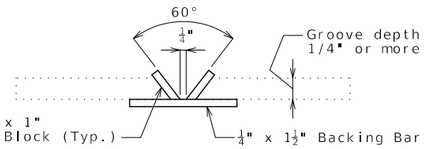
(9) All 100% groove weld backing bars shall be torched or arc gouged off to within 1/8" of the flange and then grind smooth. The bottom of the flange shall be ground smooth after welding.

(10) All welds shall be made in the falt position with no welding up or down on incline slope.



(11) Use 1/4" x 1" flat bar to support the edge of welds that are layered, anytime the groove depth exceeds 1/4".

GOUGE REPAIR TYPE 2 (CONT.)



Edge blocks shall extend 2" from edge of flange, and be removed after welding in the same manner as the backing bar. All welds shall be ground smooth.

Notes:
All Type 2 Repairs to girder flanges shall be Q.C. inspected by ultra-sonic testing. Acceptance or rejection of the repair welds shall be based on the requirements of Table 9.2 of AWS D1.5-95.

Welders shall be AWS Certified for overhead welding.

DETAILS OF GIRDER GOUGE REPAIRS

Detailed July 2024
Checked July 2024

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

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TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
08/12/2024 8:58:44 AM
TIMOTHY D LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED
8/12/2024

ROUTE	STATE
350	MO
DISTRICT	SHEET NO.
BR	4

COUNTY
JACKSON

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

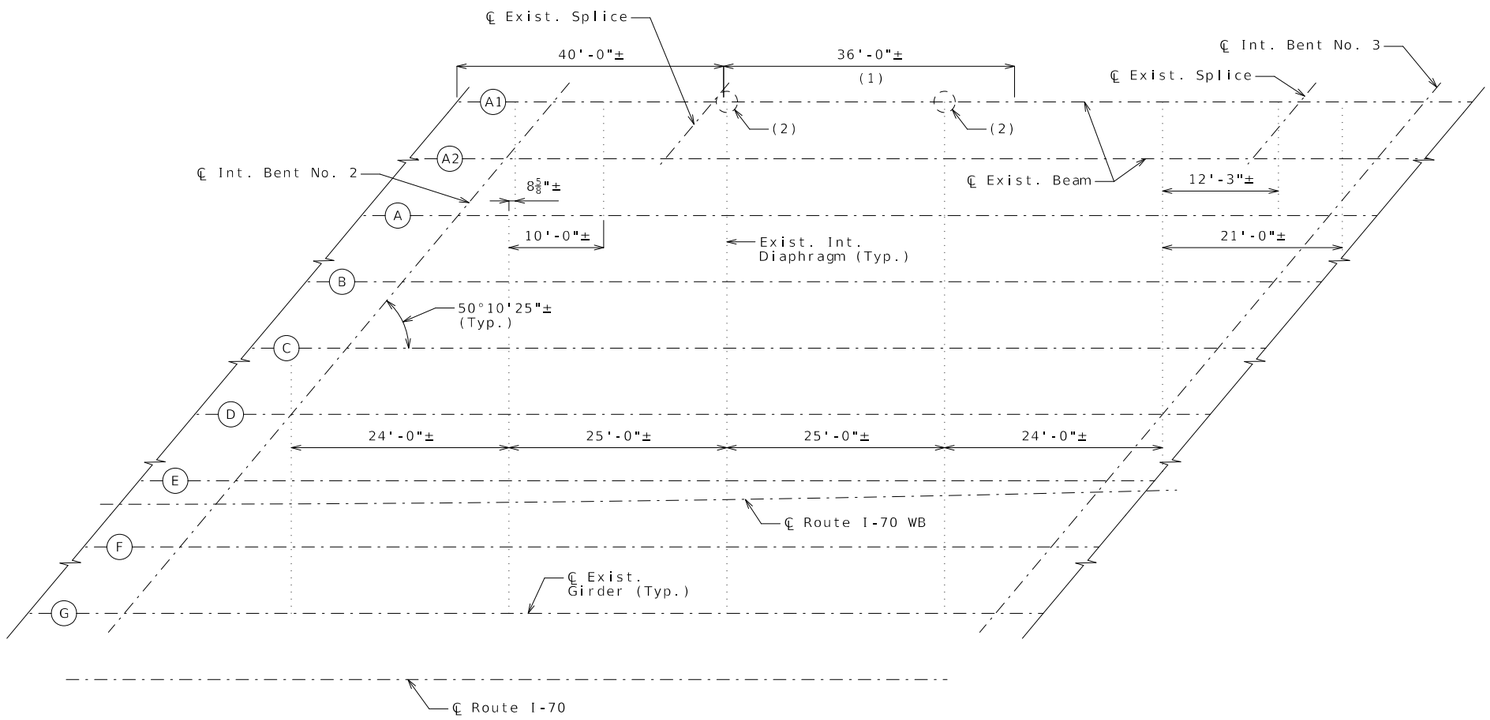
BRIDGE NO.
L01263

DESCRIPTION	DATE

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

SEC/SUR 13 TWP 49N RGE 33W

U.I.P. AND REPAIR COLLISION DAMAGED (63'-98'-63')
CONTINUOUS COMPOSITE PLATE GIRDER AND BEAM SPANS (SKEW: 39°49'35" L.A.)



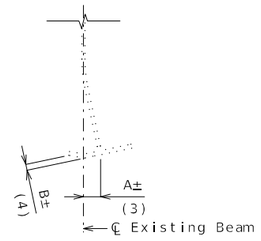
PART PLAN OF STRUCTURAL STEEL

(1) Approximate collision impact zone and limits of required heat straightening.

(2) Bolt replacement of diaphragm connection plate. (7 total)

(3) Approximate beam sweep at point of impact

(4) Approximate vertical distortion of bottom flange



DETAIL OF BEAM
SHOWING IMPACT DAMAGE

PHASES OF WORK

Prior to Heat Straightening:

1. Complete surface preparation of existing steel that will be subjected to Non-Destructive Testing (NDT) or heat from the heat straightening process.
2. Repair gouges and other deformities in collision damaged beams.
3. Remove the intermediate diaphragms and connection plates as indicated in the plans or directed by the engineer. As approved by the engineer, existing connection plates may be re-used. Non-Destructive Testing (NDT) of the connection plate welds are required to assure suitability for re-use; paint shall be removed prior to any NDT of welds. Existing connection plates not re-used shall be removed and the beams ground smooth.
4. Inspect beam in the area of repair for cracks by any non-destructive means. If cracks are identified, repair cracks as directed by the engineer.

Heat Straightening:

1. Heat straighten beams covering the length of the collision damaged beams. The beams shall be heat straightened to remove web and bottom flange twisting. See Special Provisions.
2. The shoulder and adjacent lane of Route I-70 shall remain closed, and no traffic shall be allowed over the beam(s) being straightened during the heat straightening process.
3. MoDOT has concerns about heat straightening through a splice location. Please consult your heat straightening subcontractor as you prepare your bid.

Post Heat Straightening:

1. Install new bolts for diaphragms.
2. Recoat beams over the length of damage and where paint was removed during the heat straightening process with System G (Gray).

Beam No.	Dim. A	Dim. B
A1	5"	*

* Value to be determined by contractor

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TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
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ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	1

COUNTY
JACKSON

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
L09668

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

Detailed July 2024
Checked July 2024

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

REPAIRS TO BRIDGE: ROUTE I-70 WB
OVER ROUTE 40

ROUTE I-70 FROM ROUTE 71 TO ROUTE I-435
ABOUT 4.4 MILES EAST OF ROUTE 71
BEGINNING STATION 249+32.15± (Match Existing)

GENERAL NOTES:

Design Specifications:

2002 AASHTO LFD (17th Ed.) Standard Specifications

Design Loading:

HS20 Modified (New Construction)
35lb/Sq. Ft. Wearing Surface
H20-S16-44 & Military 24,000 lb. Tandem Axle (1957 & New Construction)

Design Unit Stresses:

Structural Carbon Steel (ASTM A709 Grade 36) fy = 36,000 psi

Fabricated Steel Connections:

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

Recoating Existing Steel:

Protective Coating: System G in accordance with Sec 1081.

Surface Preparation: Surface preparation of the existing steel shall be in accordance with Sec 1081 for Recoating of Structural Steel (System G). The cost of surface preparation will be considered completely covered by the contract lump sum price for Surface Preparation for Recoating Structural Steel.

Prime Coat: The cost of the prime coat will be considered completely covered by the contract lump sum price for Field Application of Inorganic Zinc Primer.

Field Coat(s): The color of the field coat(s) shall be Gray (Federal Standard #26373). The cost of the intermediate field coat will be considered completely covered by the contract lump sum price for Intermediate Field Coat (System G). The cost of the finish field coat will be considered completely covered by the contract lump sum price for Finish Field Coat (System G).

Limits of Paint Overlap: System G shall overlap the existing coating between 6 inches and 12 inches in order to achieve maximum coverage at the paint limit of each complete system. The final field coating shall be masked to provide crisp, straight lines and to prevent overspray beyond the overlap required.

Coating New Steel:

Protective Coating: System G in accordance with Sec 1081.

Prime Coat: The cost of the prime coat will be considered completely covered by the contract unit price for the fabricated structural steel.

Field Coat(s): The color of the field coat(s) shall be Gray (Federal Standard #26373). The cost of the intermediate field coat will be considered completely covered by the contract lump sum price for Intermediate Field Coat (System G). The cost of the finish field coat will be considered completely covered by the contract lump sum price for Finish Field Coat (System G).

At the option of the contractor, the intermediate field coat and finish field coat may be applied in the shop. The contractor shall exercise extreme care during all phases of loading, hauling, handling, erection and pouring of the slab to minimize damage and shall be fully responsible for all repairs and cleaning of the coating systems as required by the engineer.

Miscellaneous:

The existing vertical clearance shall be maintained during construction when Route 40 is open to traffic.

Lane closures on Route I-70 and Route 40 shall be in accordance with traffic control plans.

High strength bolts, nuts and washers will be sampled for quality assurance as specified in Sec 106.

Outline of existing work is indicated by light dashed lines. Heavy lines indicate new work.

The contractor shall verify all dimensions in field before ordering new material.

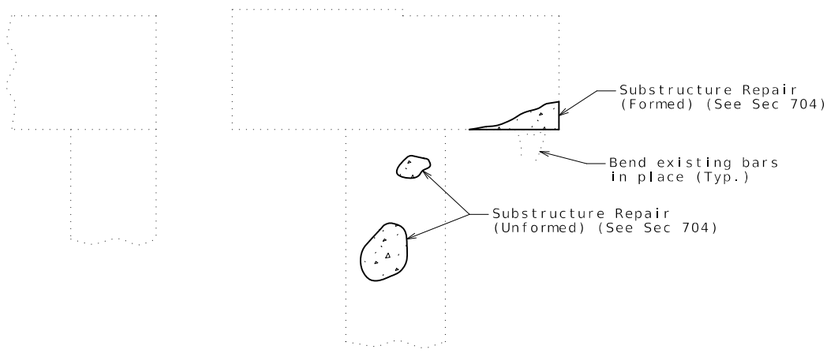
All existing dimensions shown were taken from as-built drawings, or limited field measurements.

The contractor shall complete a non-destructive test on the connection plate welds at all beam(s) in damaged areas where connection plates will be re-used to confirm suitability of re-use before installing new diaphragm(s). The cost of this work will be considered completely covered by the contract lump sum price for Non-Destructive Testing. See Special Provisions. Required paint removal for this work will be considered completely covered by the lump sum price for Surface Preparation for Recoating Structural Steel.

The contractor shall heat straighten the damaged portions of beam(s). The cost of this work will be considered completely covered by the contract lump sum price for Heat Straightening (See Special Provisions).

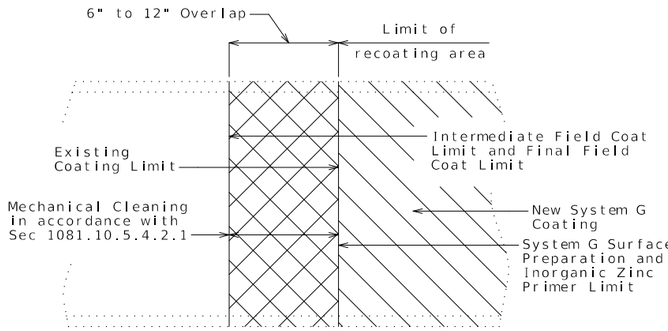
Removal and reinstallation of sign and sign supports as needed will be considered completely covered by the contract lump sum price for Heat Straightening.

The contractor shall grind smooth surface deformities related to the damage such as gouges. The cost of this work will be considered completely covered by the contract lump sum price for Grind Surface Deformities (See Special Provisions).



PART ELEVATION OF INT. BENT NO. 2
SHOWING SUBSTRUCTURE REPAIR

(Looking back station)



PART ELEVATION SHOWING
LIMITS OF PAINT OVERLAP

(Vertical or horizontal paint limit.
Horizontal limit shown)

Notes:

See Sheet No. 1 for phases of work.

Beam No. A1 shall be heat straightened to remove web and bottom flange twisting. Cost will be considered completely covered by the contract lump sum price for Heat Straightening (See Special Provisions).

Limits of collision damage vary by beam. Field verify locations and limits of collision damage requiring repairs.

Estimated limits of new System G Coating are equivalent to approximate limits of heat straightening and shall also include areas where only gouge repairs occur.

The cost of non-destructive testing for connection plate welds evaluated for re-use will be considered completely covered by the contract lump sum price for Non-Destructive Testing. All of the other non-destructive testing will be completely covered by the contract lump sum price for Heat Straightening.

Contact surfaces shall be in accordance with Sec 1081 for surface preparation.

Contractor may field drill holes with the approval of the Engineer to facilitate construction.

All longitudinal dimensions are parallel to grade.

Cost for new bolts to attach diaphragms as shown, will be considered completely covered by the contract lump sum price for Heat Straightening.

Estimated Quantities

Item		Quantity
Substructure Repiar (Formed)	sq. foot	20
Substructure Repiar (Unformed)	sq. foot	10
Surface Preparation for Recoating Structural Steel	lump sum	1
Field Application of Inorganic Zinc Primer	lump sum	1
Intermediate Field Coat (System G)	lump sum	1
Finish Field Coat (System G)	lump sum	1
Non-Destructive Testing	lump sum	1
Heat Straightening	lump sum	1
Grind Surface Deformities	lump sum	1

STATE OF MISSOURI
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NUMBER PE-2012000778
PROFESSIONAL ENGINEER
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MO-PE-2012000778

DATE PREPARED
8/12/2024

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	2

COUNTY
JACKSON

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
L09668

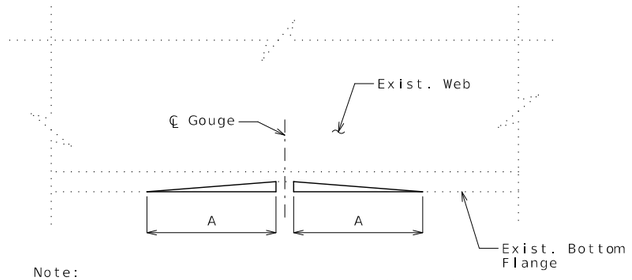
DESCRIPTION	DATE

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

Detailed July 2024
Checked July 2024

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

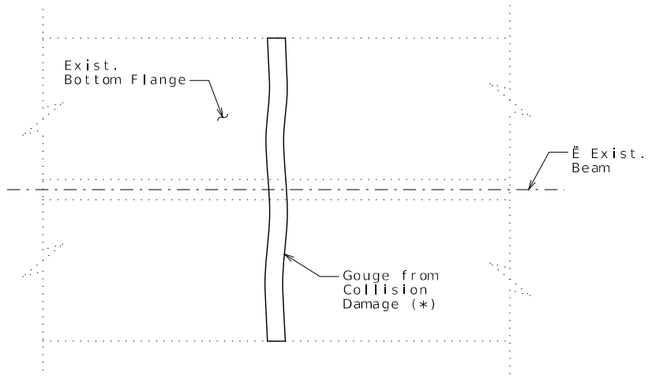
GOUGE REPAIR TYPE 1



Note:
Repairs by grinding shall have edges flared to the flange surface with a slope not exceeding 1 in 10.

GRIND DETAIL FOR FLANGE

DEPTH	A
< $\frac{3}{16}$"	$1\frac{7}{8}$"



PLAN OF GOUGE COLLISION DAMAGE

EVALUATION OF FLANGE GOUGE REPAIRS

If the length of gouge is less than or equal to 2" and depth of the gouge is 1/16" or less, then no repair is necessary.

If the length of the gouge is greater than 2" and the depth of the gouge is 3/16" or less, then use Gouge Repair Type 1.

If the depth of the gouge is greater than 3/16", then use Gouge Repair Type 2.

Payment for beam gouge repairs will be completely covered by Grind Surface Deformities. See Special Provisions.

(*) The beam bottom flange shall be repaired for gouging resulting from collision damage as directed by the Engineer. The Contractor shall not perform any repairs until the defects have been reviewed and categorized by the Engineer, as Type 1 or Type 2.

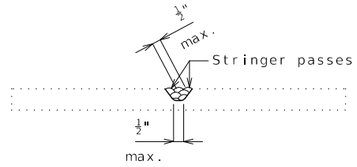
GOUGE REPAIR TYPE 2

Note:
Type 2 repairs shall consist of welding the gouge and grinding it smooth at the Engineer's discretion prior to coating. Welding shall be in accordance with AWS D1.5 standards.

WELD NOTES

(1) All welds shall be made using 1/8" or 5/32" E7018 electrodes only (Not E7028).

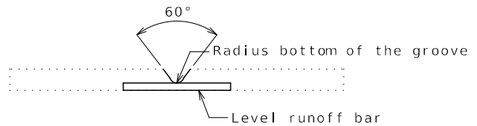
(2) Maximum weld size shall be 1/2" across the face of the weld on each pass. Stringer passes shall be used to achieve this dimension.



(3) Preheat shall be 250°F min. prior to any tacking or welding.

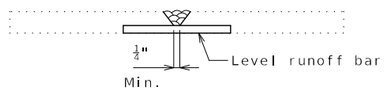
(4) All runoff bars and weld backing bars shall be 1/4" x 1 1/2" flat bar minimum, and shall extend 2" beyond the edge of the flange.

(5) The groove welds shall have a min. of 60° inclined angle.



(6) All welds shall be started 1" out on the runoff bar and continued toward the center of the flange. Runoff bars shall be level with the bottom of the groove.

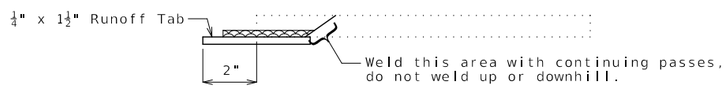
(7) 100% penetration welds shall have a min. 1/4" root opening and all welding shall be done from the top side.



(8) All runoff bars shall be burned off 1/8" min. beyond the edge of the flange and ground flush.

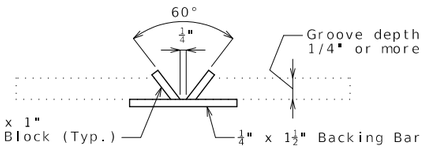
(9) All 100% groove weld backing bars shall be torched or arc gouged off to within 1/8" of the flange and then grind smooth. The bottom of the flange shall be ground smooth after welding.

(10) All welds shall be made in the falt position with no welding up or down on incline slope.



(11) Use 1/4" x 1" flat bar to support the edge of welds that are layered, anytime the groove depth exceeds 1/4".

GOUGE REPAIR TYPE 2 (CONT.)



Edge blocks shall extend 2" from edge of flange, and be removed after welding in the same manner as the backing bar. All welds shall be ground smooth.

Notes:
All Type 2 Repairs to beam flanges shall be Q.C. inspected by ultra-sonic testing. Acceptance or rejection of the repair welds shall be based on the requirements of Table 9.2 of AWS D1.5-95.

Welders shall be AWS Certified for overhead welding.

DETAILS OF BEAM GOUGE REPAIRS

Detailed July 2024
Checked July 2024

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

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
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TIMOTHY D. LEAF - CIVIL
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DATE PREPARED
8/12/2024

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	3

COUNTY
JACKSON

JOB NO.
JKU0410

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