DESIGN DESIGNATION

VARIOUS ROUTES

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

V = VARIOUS

FUNCTIONAL CLASSIFICATION- VARIOUS

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

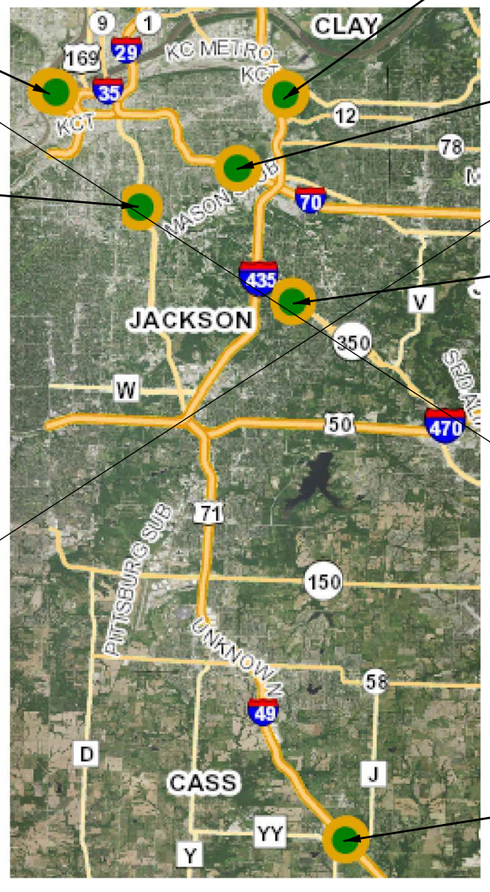
PLANS FOR PROPOSED STATE HIGHWAY

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

1 SHEET DELETED

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

BRIDGE REPAIRS

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

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
ADDENDUM 1	9/26/24

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

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		
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

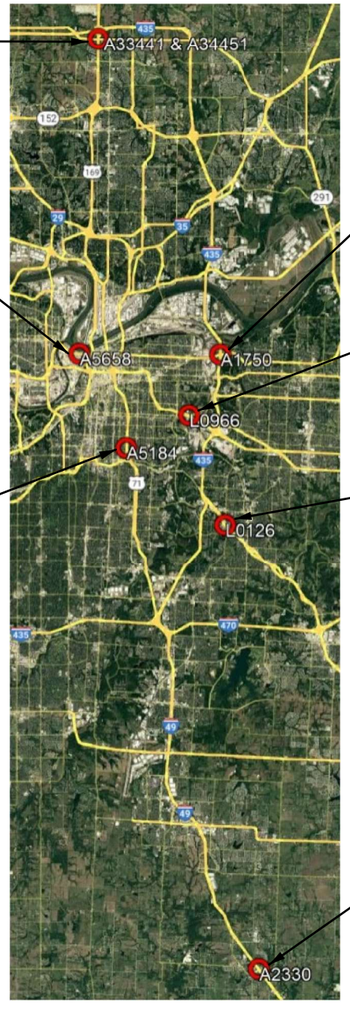
JACKSON, CLAY & CASS COUNTIES

KEY MAP
LOCATION OF JACKSON & CASS COUNTIES

NB RTE 169
OVER COOKINGHAM
BRIDGES
A33441 & A33451
A.A.D.T.= 2023

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

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



NOT TO SCALE

BRIDGE REPAIRS

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

1 SHEET ADDED

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BRIDGES A1750
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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

CLAY COUNTY

BRIDGE A33441 RTE 169 NB LOG MILE 14.925

BRIDGE A33451 RTE 169 NB LOG MILE 14.925

FOR INFORMATION ONLY
ESTIMATED DISTURBED ACRES XX ACRES

STATE OF MISSOURI
HEATHER R. BARROWS
NUMBER PE-2016040670
PROFESSIONAL ENGINEER

09/26/2024 10:32:31 AM
HEATHER R. BARROWS - CIVIL
MO-PE-2016040670

DATE PREPARED
9/26/2024

ROUTE	STATE
VARIOUS	MO
DISTRICT	SHEET NO.
KC	1A

COUNTY
JACKSON/CASS

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

DESCRIPTION	DATE
1 ADDENDUM	9/26/24

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

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.

TEMPORARY TRAFFIC SETUP TYPES

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

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	
8	CLAY	NB RTE 169 OVER COOKINGHAM	A33441	1				
9	CLAY	NB RTE 169 OVER COOKINGHAM	A33451	1				
		TOTAL (FOR INFORMATION ONLY)		5	1	1	1	1

1 REVISED

TEMPORARY TRAFFIC PAY ITEMS

LOCATION NUMBER	COUNTY	LOCATION	BRIDGE NUMBER	TEMPORARY TRAFFIC (L.S.) 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
8	CLAY	NB RTE 169 OVER COOKINGHAM	A33441	1
9	CLAY	NB RTE 169 OVER COOKINGHAM	A33451	1

1 REVISED

SUMMARY OF QUANTITIES
SHEET 1 OF 1

STATE OF MISSOURI
HEATHER R. BARROWS
NUMBER PE-2016040670
PROFESSIONAL ENGINEER
09/26/2024 10:55:06 AM
HEATHER R. BARROWS - CIVIL
MO-PE-2016040670

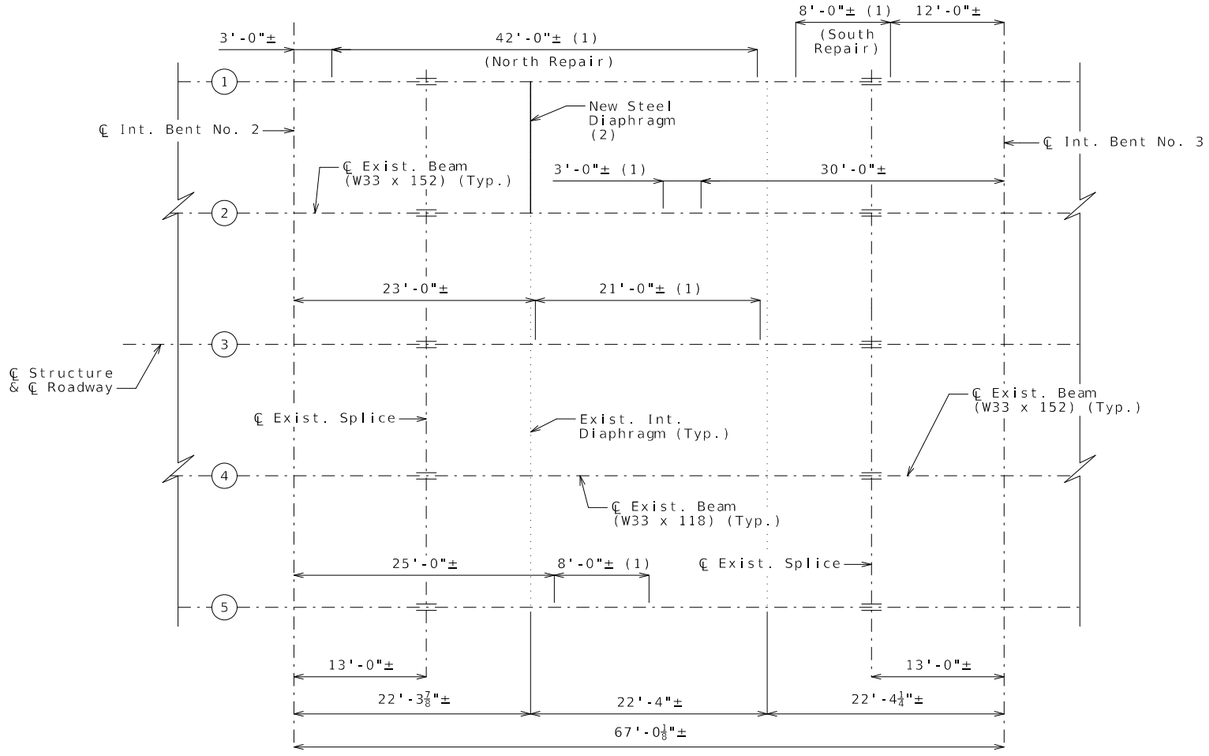
DATE PREPARED: 9/26/2024
ROUTE: VARIOUS | STATE: MO
DISTRICT: KC | SHEET NO.: 3
COUNTY: JACKSON/CASS
JOB NO.: JKU0410
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.:

DATE	DESCRIPTION
9/26/24	ADDENDUM 1

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

U.I.P. AND REPAIR COLLISION DAMAGED (44'-67'-44')
CONTINUOUS COMPOSITE WIDE FLANGE BEAM SPANS (SKEW: SQUARE)

SEC/SUR 23 TWP 52N RGE 33W



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 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 169 NB shall remain closed, and no traffic shall be allowed over the beam(s) being straightened during the heat straightening process.

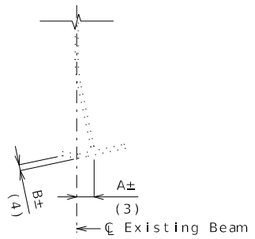
3. MoDOT has concerns about heat straightening through a splice location. Please consult your heat straightening subcontractor as you prepare your bid.

Post Heat Straightening:

1. Install new connection plates and diaphragms.

2 Recoat beams 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 BEAM
SHOWING IMPACT DAMAGE

Beam No.	Dim. A	Dim. B
1 (North Repair)	12"	*
1 (South Repair)	*	3"
2	*	1"
3	8"	*
5	1"	3"

* 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) Approximate beam sweep at point of impact

(4) Approximate vertical distortion of bottom flange

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
09/25/2024 9:15:50 AM
TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED 9/25/2024

ROUTE	STATE
169	MO
DISTRICT	SHEET NO.
BR	1

COUNTY CLAY

JOB NO. JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A33441

DESCRIPTION	DATE

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

Detailed Sept. 2024
Checked Sept. 2024

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

REPAIRS TO BRIDGE: ROUTE 169 NB
OVER NW COOKINGHAM DRIVE

ROUTE 169 NB FROM ROUTE I-435 TO ROUTE 152
ABOUT 0.4 MILE SOUTH OF ROUTE I-435
BEGINNING STATION 24+69.80± (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 NW Cookingham Drive is open to traffic.

Lane closures on NW Cookingham Drive and Route 169 NB 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.

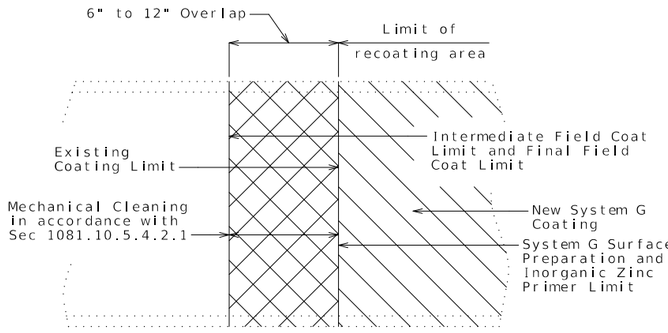
All existing dimensions shown were taken from as-built drawings, or limited field measurements.

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 SHOWING
LIMITS OF PAINT OVERLAP

(Vertical or horizontal paint limit.
Horizontal limit shown)

Estimated Quantities

Item		Quantity
Removal of Diaphragm	each	1
Fabricated Structural Carbon Steel (Misc.)	pound	280
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
09/25/2024 9:16:09 AM
TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED
9/25/2024

ROUTE	STATE
169	MO
DISTRICT	SHEET NO.
BR	2

COUNTY
CLAY

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A33441

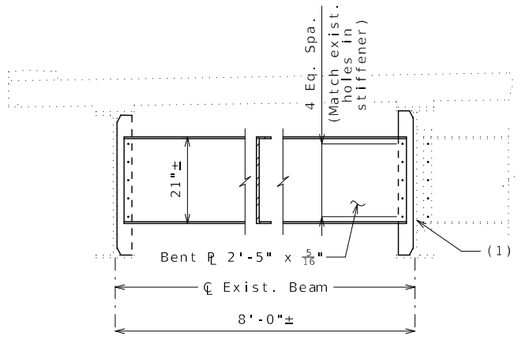
DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

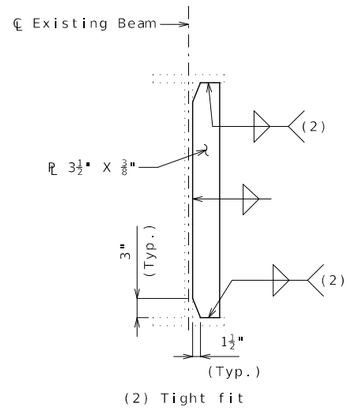
Detailed Sept. 2024
Checked Sept. 2024

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



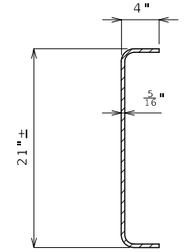
PART SECTION SHOWING NEW INTERMEDIATE DIAPHRAGM

(1) NDT shall be performed on welds to confirm stability for re-use of exist. connection plate



(2) Tight fit

DETAIL OF NEW CONNECTION PLATES



BENT PLATE DETAIL

Notes:

See Sheet No. 1 for phases of work.

Beams No. 1, 2, 3 & 5 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.

Remove existing diaphragms and their connection plates to Beams 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.).

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
09/25/2024 9:16:46 AM
TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED
9/25/2024

ROUTE	STATE
169	MO
DISTRICT	SHEET NO.
BR	3

COUNTY
CLAY

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A33441

DESCRIPTION	DATE

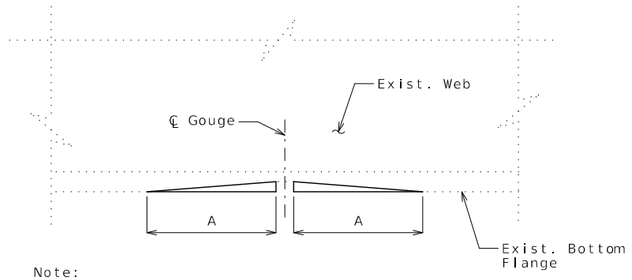
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

DIAPHRAGM REPLACEMENT DETAILS

Detailed Sept. 2024
Checked Sept. 2024

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

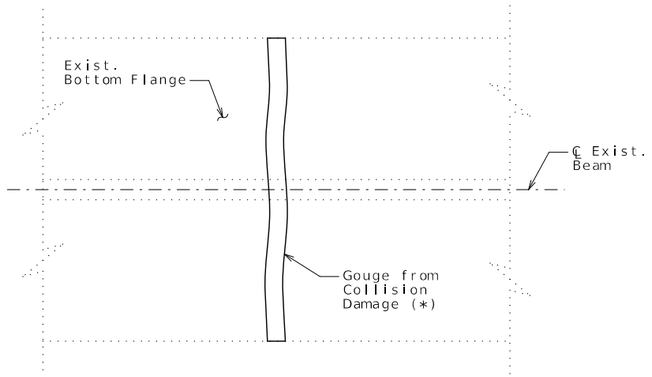
GOUGE REPAIR TYPE 1



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.

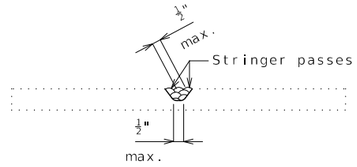
GOUGE REPAIR TYPE 2

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).

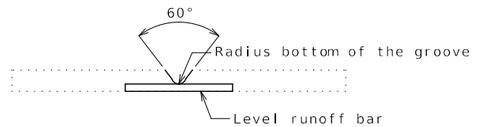
(2) Maximum weld size shall be 1/2" across the face of the weld on each pass. Stringer passes shall be used to achieve this dimension.



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

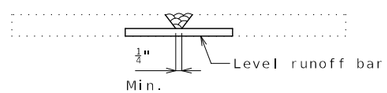
(4) All runoff bars and weld backing bars shall be 1/4" x 1 1/2" flat bar minimum, and shall extend 2" beyond the edge of the flange.

(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.

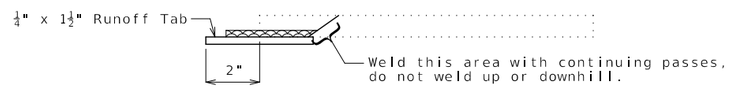
(7) 100% penetration welds shall have a min. 1/4" root opening and all welding shall be done from the top side.



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

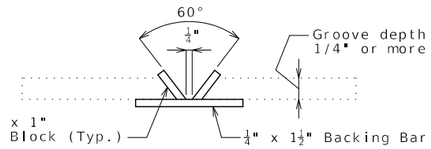
(9) All 100% groove weld backing bars shall be torched or arc gouged off to within 1/8" of the flange and then grind smooth. The bottom of the flange shall be ground smooth after welding.

(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 (IF APPLICABLE)

Detailed Sept. 2024
Checked Sept. 2024

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

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
09/25/2024 9:17:09 AM
TIMOTHY D LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED
9/25/2024

ROUTE	STATE
169	MO
DISTRICT	SHEET NO.
BR	4

COUNTY
CLAY

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

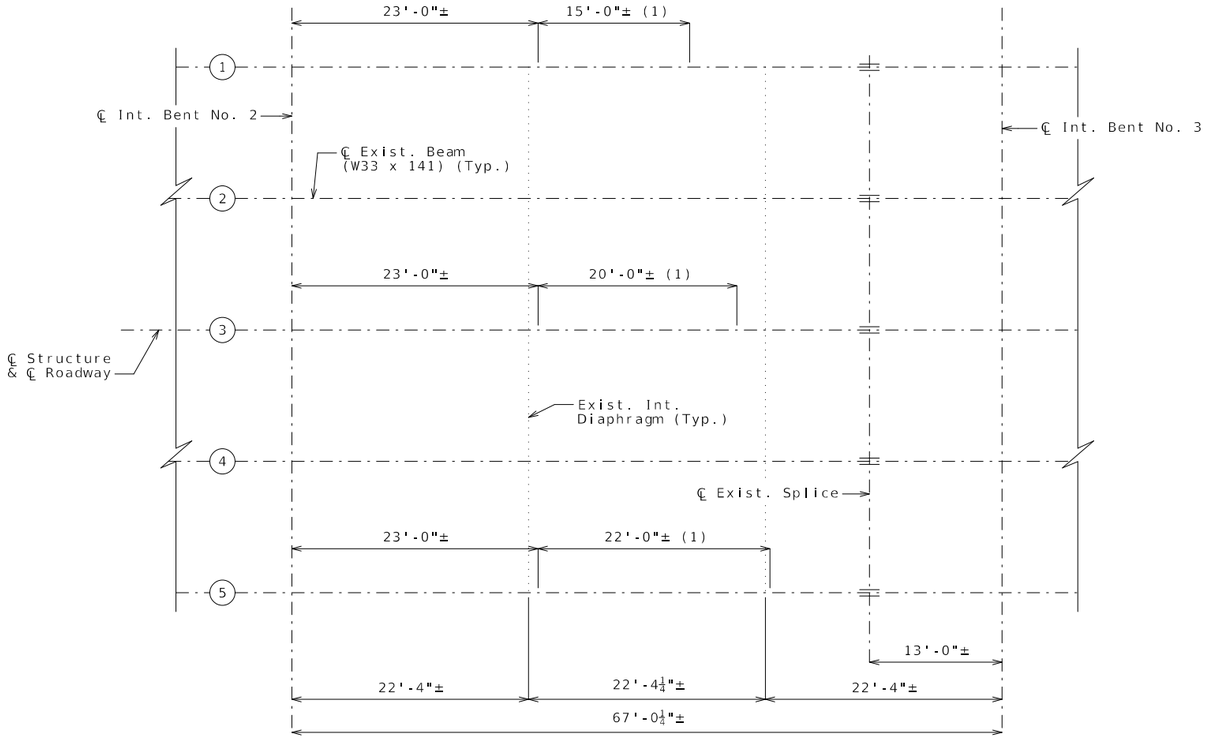
BRIDGE NO.
A33441

DESCRIPTION	DATE

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

U.I.P. AND REPAIR COLLISION DAMAGED (44'-67'-44')
CONTINUOUS COMPOSITE WIDE FLANGE BEAM SPANS (SKEW: SQUARE)

SEC/SUR 23 TWP 52N RGE 33W



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 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 169 NB shall remain closed, and no traffic shall be allowed over the beam(s) being straightened during the heat straightening process.

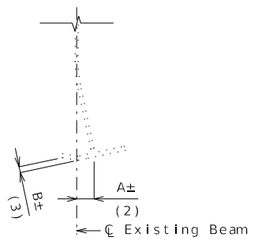
3. MoDOT has concerns about heat straightening through a splice location. Please consult your heat straightening subcontractor as you prepare your bid.

Post Heat Straightening:

1. Install new connection plates and diaphragms.

2 Recoat beams 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 BEAM
SHOWING IMPACT DAMAGE

Beam No.	Dim. A	Dim. B
1	3"	*
3	8"	*
5	5"	*

* Value to be determined by contractor

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

(2) Approximate beam sweep at point of impact

(3) Approximate vertical distortion of bottom flange

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
09/25/2024 9:16:13 AM
TIMOTHY D LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED
9/25/2024

ROUTE	STATE
169	MO
DISTRICT	SHEET NO.
BR	1

COUNTY
CLAY

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A33451

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

Detailed Sept. 2024
Checked Sept. 2024

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

REPAIRS TO BRIDGE: ROUTE 169 NB
OVER NW COOKINGHAM DRIVE

ROUTE 169 NB FROM ROUTE I-435 TO ROUTE 152
ABOUT 0.4 MILE SOUTH OF ROUTE I-435
BEGINNING STATION 24+71.00± (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 NW Cookingham Drive is open to traffic.

Lane closures on NW Cookingham Drive and Route 169 NB 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.

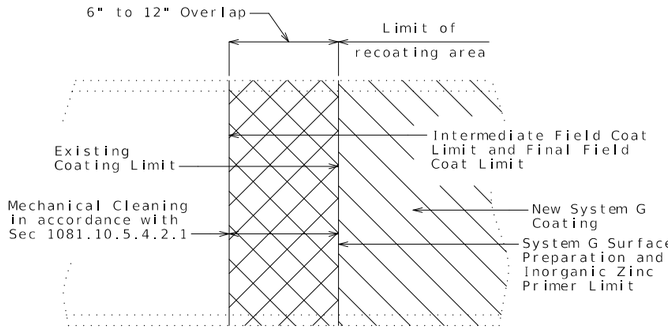
All existing dimensions shown were taken from as-built drawings, or limited field measurements.

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.

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
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
09/25/2024 9:18:26 AM
TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED: 9/25/2024
ROUTE: 169 | STATE: MO
DISTRICT: BR | SHEET NO.: 2
COUNTY: CLAY
JOB NO.: JKU0410
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A33451

DESCRIPTION | DATE

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

Detailed Sept. 2024
Checked Sept. 2024

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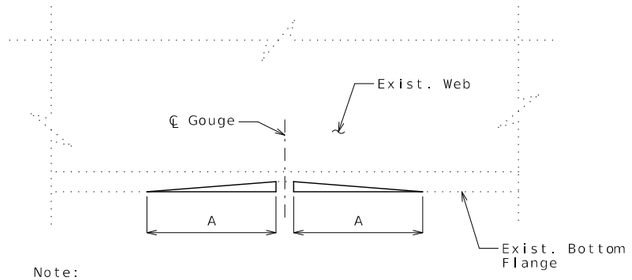
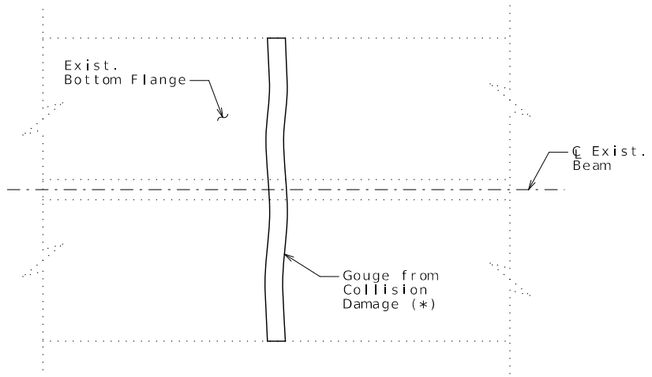
GOUGE REPAIR TYPE 1



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.

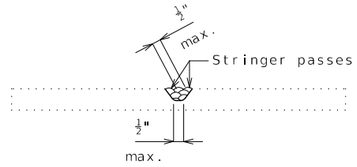
GOUGE REPAIR TYPE 2

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.

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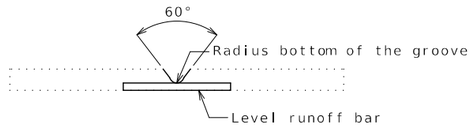
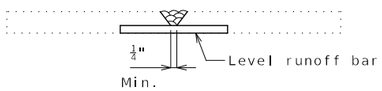


(6) All welds shall be started 1" out on the runoff bar and continued toward the center of the flange. Runoff bars shall be level with the bottom of the groove.

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



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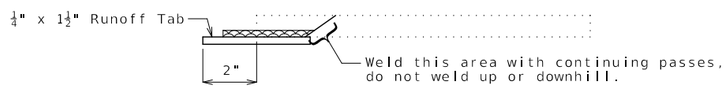
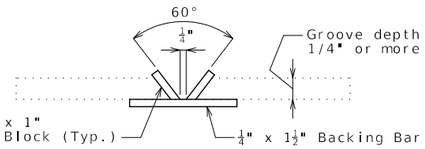


(11) Use 1/4" x 1" flat bar to support the edge of welds that are layered, anytime the groove depth exceeds 1/4".

GOUGE REPAIR TYPE 2 (CONT.)



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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 (IF APPLICABLE)

Detailed Sept. 2024
Checked Sept. 2024

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

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER
09/25/2024 9:18:43 AM
TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

DATE PREPARED
9/25/2024

ROUTE	STATE
169	MO
DISTRICT	SHEET NO.
BR	3

COUNTY
CLAY

JOB NO.
JKU0410

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A33451

DESCRIPTION	DATE

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