DESIGN DESIGNATION

ROUTE 163 - SBL

A.A.D.T. - 2025 = 18238
V = 50 M.P.H.
FUNCTIONAL CLASSIFICATION- OTHER FREEWAY AND EXPRESSWAY

ROUTE 163 - NBL

A.A.D.T. - 2025 = 19149
V = 50 M.P.H.
FUNCTIONAL CLASSIFICATION- OTHER FREEWAY AND EXPRESSWAY

NO NEW RIGHT-OF-WAY REQUIRED

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

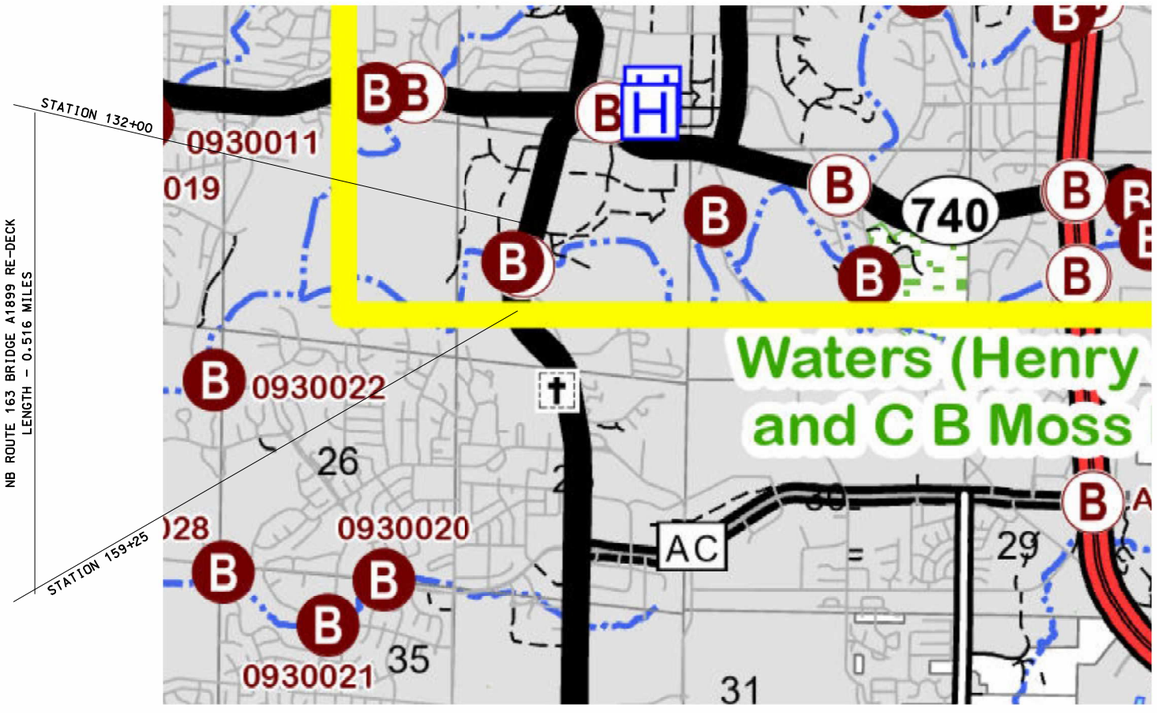
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

PLANS FOR PROPOSED STATE HIGHWAY

BOONE COUNTY



KEY MAP
LOCATION OF BOONE COUNTY



NOT TO SCALE

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

DESCRIPTION	SHEET NUMBER
TITLE SHEET	1
TYPICAL SECTIONS (TS) (1 SHEET)	2
QUANTITIES (QU) (5 SHEETS)	3
PLAN SHEETS (PP)	4-5
TRAFFIC CONTROL SHEETS (TC)	6-15
LIGHTING (LT)	16-17
BRIDGE DRAWINGS A18993 (B)	1-20

LENGTH OF PROJECT

ROUTE 163

BEGINNING OF PROJECT	STA. 132+00
END OF PROJECT	STA. 159+25
APPARENT LENGTH	2725
EQUATIONS AND EXCEPTIONS:	NONE

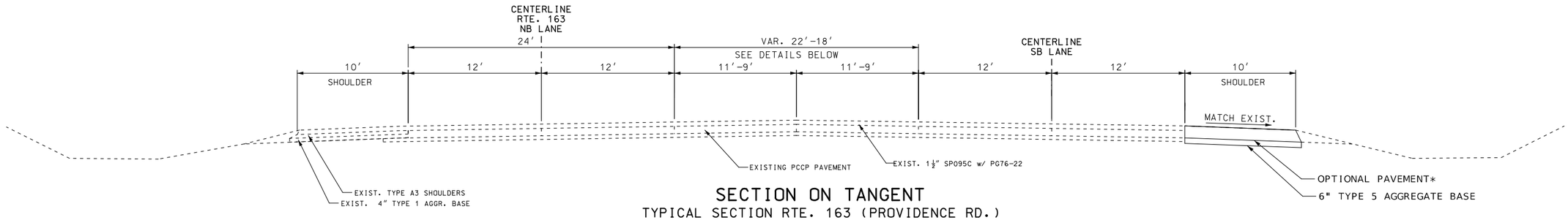
TOTAL CORRECTIONS	0	FEET
NET LENGTH OF PROJECT	2725	FEET
STATE LENGTH	0.516	MILES
FOR INFORMATION ONLY ESTIMATED DISTURBED ACRES	0.2	ACRES

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
10/22/2026 10:53:48 AM
PATRICK.J.HAKE - CIVIL
MO-PE-2010000826

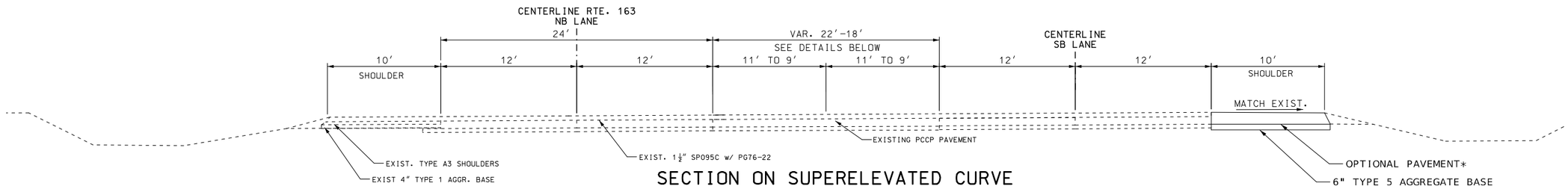
DATE PREPARED: 10/22/2026
ROUTE: 163 | STATE: MO
DISTRICT: CD | SHEET NO.: 1
COUNTY: BOONE
JOB NO.: JCD0333
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A18993

DESCRIPTION | DATE

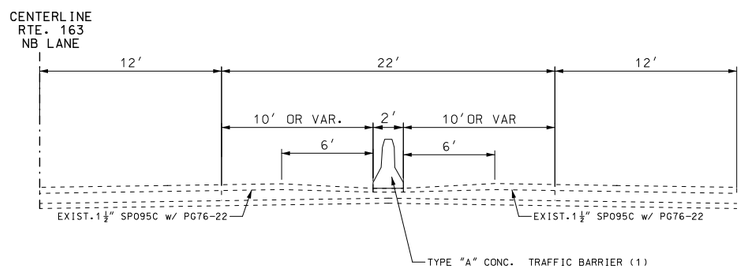
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



SECTION ON TANGENT
TYPICAL SECTION RTE. 163 (PROVIDENCE RD.)
STA. 132+00 TO STA. 159+25

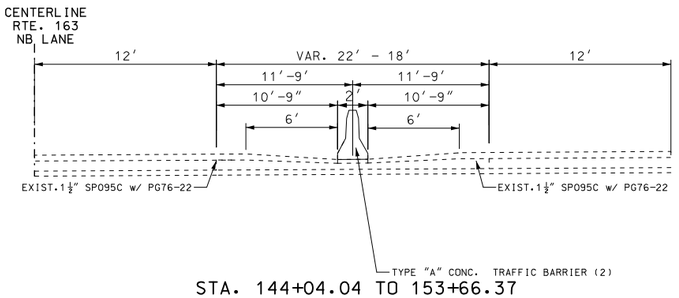


SECTION ON SUPERELEVATED CURVE
TYPICAL SECTION RTE. 163 (PROVIDENCE RD.)
STA. 132+00 TO STA. 159+25



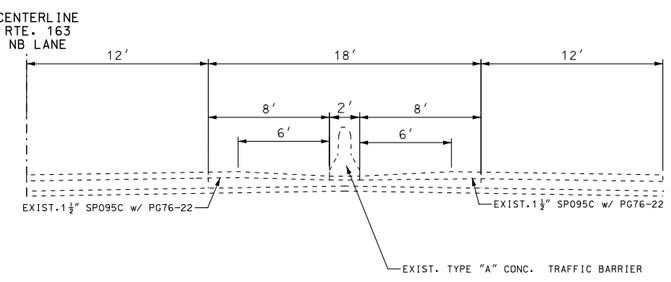
STA. 134+37 TO STA. 144+04.04

(1) NEW TYPE A CONCRETE TRAFFIC BARRIER
STA 135+10 TO STA 136+35
UIP REMAINING EXIST. CONCRETE MEDIAN BARRIER



STA. 144+04.04 TO 153+66.37

(2) NEW TYPE A CONCRETE TRAFFIC BARRIER
STA 148+97 TO STA 153+32
UIP REMAINING EXIST. CONCRETE MEDIAN BARRIER



STA 153+32 TO 159+25

* OPTIONAL PAVEMENT
8.5" HMA - 2" SP125C w/PG70-22 OVER 6.5" SP250C w/PG64-22
8" PCCP - 15' JOINT SPACING w/ 1.25" DOWELS

NOT TO SCALE

TYPICAL SECTION
SHEET 1 OF 1

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/29/2026 9:37:39 AM
PATRICK J HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED
9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	2

COUNTY
BOONE

JOB NO.
JCD0333

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)

REMOVAL OF IMPROVEMENTS

STATION	STATION	LOCATION	ITEM	QTY	REMARKS
132+00	137+15	163 SB	EXISTING PAVEMENT	630.1 SY	SB SHOULDER PAVEMENT
140+28	159+25	163 SB	EXISTING PAVEMENT	2178.4 SY	SB SHOULDER PAVEMENT
132+00	137+15	163 SB	SAW CUT	525 LF	SB SHOULDER PAVEMENT
140+28	159+25	163 SB	SAW CUT	1907 LF	SB SHOULDER PAVEMENT
135+10	136+35	163	BARRIER WALL	125 LF	TYPE A BARRIER WALL
148+97	153+32	163	BARRIER WALL	435 LF	TYPE A BARRIER WALL
136+10	137+35	163 NB	GUARDRAIL	125 LF	INCLUDES END ANCHOR AND BRIDGE TRANSITION
140+08	141+85	163 NB	GUARDRAIL	163 LF	INCLUDES C.E.T AND BRIDGE TRANSITION
142+11		163 NB	SIGN W/POST	1	WEIGHT LIMIT 60 TONS
			TOTAL	1	LUMP SUM

MOBILIZATION
1 LUMP SUM

MGS GUARDRAIL

STATION	STATION	LOCATION	MGS GUARDRAIL LF	MGS BRIDGE APPROACH TRANS. SECT. (REG./ NO CURB) EA	TYPE A CRASHWORTHY END TERMINAL (MASH) EA	MGS END ANCHOR EA	SHAPING SLOPES CLASS III 100FT	MISC. REMOVE AND REINSTALL MEDIAN CET EA	REMARKS
135+10		ROUTE 163						1.00	
136+08	137+35	RTE 163 NB	75.0	1.00		1.00	1.3		A18993 OVER HINKSON CREEK NORTH SIDE
140+08	141+85	RTE 163 NB	87.5	1.00	1.00		2.1		A18993 OVER HINKSON CREEK SOUTH SIDE
		TOTAL	162.50	2.00	1.00	1.00	3.40	1.00	
		USE	163	2.0	1.0	1.0	3	1	

OPTIONAL PAVEMENT - 8.5" HMA OR 8" PCCP

STATION	STATION	LENGTH FT	WIDTH FT	OPTIONAL PAVEMENT SY	TYPE 5 AGGREGATE FOR BASE (6 IN. THICK) SY	SUBGRADING AND SHOULDERING CLASS I 100FT	REMARKS
132+00	137+15	515.000	10.000	572.2	572.2	5.2	SB 163 SHOULDER REPLACEMENT
140+28	159+25	1897.000	10.000	2107.8	2107.8	19.0	SB 163 SHOULDER REPLACEMENT
			TOTAL	2680.0	2680.0	24.20	
			USE	2680.0	2680	24	

TRAFFIC BARRIER

STATION	STATION	LOCATION	CONCRETE TRAFFIC BARRIER, TYPE A LF	REMARKS
135+10	136+35	ROUTE 163	125.0	NORTH OF BRIDGE A18993
148+97	153+32	ROUTE 163	435.0	SOUTH OF BRIDGE A18993
		TOTAL	560.0	
		USE	560	

DRAIN FLUMES

STATION	STATION	LOCATION	LENGTH FT	WIDTH FT	FURNISHING TYPE 1 ROCK DITCH LINER CY	PLACING TYPE 1 ROCK DITCH LINER CY	PERMANENT EROSION CONTROL GEOTEXTILE SY	REMARKS
137+38	137+35	NB ROUTE 163	20	3	1.48	1.48	6.67	NORTH OF BRIDGE A18993
140+08	140+11	NB ROUTE 163	20	3	1.48	1.48	6.67	SOUTH OF BRIDGE A18993
		TOTAL			2.96	2.96	13.34	
		USE			3	3	13	

SUMMARY OF QUANTITIES
SHEET 1 OF 5

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/29/2026 9:37:09 AM
PATRICK J. HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED
9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	3

COUNTY
BOONE

JOB NO.
JCD0333

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)

PAVEMENT MARKING REMOVAL

STATION	STATION	LOCATION	6" INT. WHITE LF	6" SOLID WHITE LF	6" SOLID YELLOW LF	4" INT. WHITE LF	4" SOLID WHITE LF	4" SOLID YELLOW LF	BICYCLE SYMBOL EA	REMARKS
NORTHBOUND LANES										
134+90	136+00	ROUTE 163			110.0					EDGE LINE
149+00	157+62	ROUTE 163			862.0					EDGE LINE
135+42	153+27	ROUTE 163					1785.0			TEMPORARY PAVEMENT MARKING
134+90	157+62	ROUTE 163						2272.0		TEMPORARY PAVEMENT MARKING
140+28	142+28	ROUTE 163		200						BICYCLE EDGE LINE
141+90	141+90	ROUTE 163							1.0	BICYCLE AND ARROW SYMBOL
SOUTHBOUND LANES										
132+00	159+25	ROUTE 163		2613						BICYCLE EDGE LINE
132+00	159+25	ROUTE 163		2613						EDGE LINE
132+00	159+25	ROUTE 163			2613					EDGE LINE
132+00	159+25	ROUTE 163	653							LANE LINE
132+00	159+25	ROUTE 163				653	2613			TEMPORARY PAVEMENT MARKING
132+00	159+25	ROUTE 163						2613		TEMPORARY PAVEMENT MARKING
		TOTAL	653.0	5426.0	3585.0	653.0	4398.0	4885.0	1.0	
		USE	19601							
NOTE: BICYCLE SYMBOLS INCLUDED IN PAY ITEM FOR LF										

TEMPORARY PAVEMENT MARKING

STATION	STATION	LOCATION	4" INT. WHITE LF	4" SOLID WHITE LF	4" SOLID YELLOW LF	REMARKS
NORTHBOUND LANES						
135+42	153+27	ROUTE 163		1,785		EDGE LINE
134+90	157+62	ROUTE 163			2272.0	EDGE LINE
SOUTHBOUND LANES						
132+00	159+25	ROUTE 163		2725		EDGE LINE
132+00	159+25	ROUTE 163			2725	EDGE LINE
132+00	159+25	ROUTE 163	680			LANE LINE
		TOTAL	680.0	4510.0	4997.0	
		USE	10187			

PAVEMENT MARKING

STATION	STATION	LOCATION	6" YELLOW CLASS 2 PVMT MARKING PAINT (25-MIL, TYPE L BEADS) LF	6" WHITE CLASS 2 PVMT MARKING PAINT (25-MIL, TYPE L BEADS) LF	PREFORMED THERMOPLASTIC PAVEMENT MARKING, BICYCLE SYMBOL EA	PREFORMED THERMOPLASTIC PAVEMENT MARKING, BIKE LANE ARROW EA	REMARKS
NORTHBOUND LANES							
134+91	159+25	ROUTE 163 NB	2434				EDGELINE
134+91	159+25	ROUTE 163 NB		2,434			EDGELINE
134+91	159+25	ROUTE 163 NB		610			LANE LINE
134+91	159+25	ROUTE 163 NB		2,434	2	2	BICYCLE LANE
SOUTHBOUND LANES							
132+00	159+25	ROUTE 163 SB	2725				EDGELINE
132+00	159+25	ROUTE 163 SB		2,725			EDGELINE
132+00	159+25	ROUTE 163 SB		680			LANE LINE
132+00	159+25	ROUTE 163 SB		2725	4	4	BICYCLE LANE
		TOTAL	5159	11608	6	6	
		USE	5,159	11,608	6	6	
NOTE: PAVEMENT MARKING TO MATCH EXISTING. LOCATE BEFORE CONSTRUCTION BEGINS							

DELINEATOR POST

STATION	STATION	LOCATION	36 IN. SURFACE-MOUNT DELINEATOR POST EA	REMARKS
140+28	140+28	ROUTE 163 NB	2.0	APPROACH SHOULDER, LEAVE 5' WIDE SPACE FOR BICYCLE LANE
137+35	140+18	ROUTE 163 NB	32.0	PLACE 2' OFF SHOULDER LINE
		TOTAL	34.0	
		USE	34	

SUMMARY OF QUANTITIES
SHEET 2 OF 5

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/29/2026 9:38:40 AM
PATRICK J HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED
9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	3

COUNTY
BOONE

JOB NO.
JCD0333

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)

FLOWABLE BACKFILL			
STATION	LOCATION	FLOWABLE BACKFILL CY	REMARKS
137+35	ROUTE 163 NB	6.9	BRIDGE A18993 BENT 1
140+08	ROUTE 163 NB	6.9	BRIDGE A18993 BENT 4
	TOTAL	13.8	
	USE	14	

CONTRACTOR FURNISHED SURVEYING AND STAKING
1 LUMP SUM

TEMPORARY EROSION CONTROL					
STATION	STATION	LOCATION	SILT FENCE LF	SEDIMENT REMOVAL CY	REMARKS
140+08	142+58	ROUTE 163 NB	250.0	2.5	TO BE USED AS NEEDED AROUND DRAIN FLUME CONSTRUCTION
135+00	137+35	ROUTE 163 NB	235.0	2.4	TO BE USED AS NEEDED AROUND DRAIN FLUME CONSTRUCTION
132+00	137+35	ROUTE 163 SB	535.0	5.4	TO BE USED AS NEEDED AROUND SHOULDER CONSTRUCTION
140+28	159+58	ROUTE 163 SB	1930.0	19.3	TO BE USED AS NEEDED AROUND SHOULDER CONSTRUCTION
		TOTAL	2950.0	29.6	
		USE	2950	30	

CLEARING AND GRUBBING				
STATION	STATION	LOCATION	CLEARING AND GRUBBING ACRE	REMARKS
140+08	140+28	ROUTE 163 NB	0.1	
137+35	137+15	ROUTE 163 SB	0.1	
		TOTAL	0.2	
		USE	1	

SEEDING AND MULCHING				
STATION	STATION	LOCATION	SEEDING AND MULCHING COOL SEASON LS	REMARKS
136+08	137+35	ROUTE 163 NB		NORTH OF BRIDGE A18993
140+08	141+85	ROUTE 163 NB		SOUTH OF BRIDGE A18993
132+00	137+15	ROUTE 163 SB		SB SHOULDER REPLACEMENT
140+28	159+25	ROUTE 163 SB		SB SHOULDER REPLACEMENT
		TOTAL	1.0	
		USE	1	

SUMMARY OF QUANTITIES
SHEET 3 OF 5

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/29/2026 9:37:28 AM
PATRICK J. HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED
9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	3

COUNTY
BOONE

JOB NO.
JCD0333

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)

LIGHTING - CONDUIT, CABLE, AND TRENCHING - UNIVERSITY OF MISSOURI
RTE. 163/MICK DEAVER MEMORIAL DR.

STATION FROM	STATION TO	CENTER TO CENTER DIST. (FT.)	2" RIGID CONDUIT TRENCHED (FT.)	3" RIGID CONDUIT PUSHED (FT.)	POWER CABLE 1c-#2 AWG (FT.)	1" CABLE CONDUIT 2c-#8 AWG (FT.)	TRENCHING TYPE 1 (FT.)	POLE & BRACKET CABLE 1c-#10 AWG (FT.)	REMARKS
PS	PS1	84		92		100			POWER SOURCE TO POWER SUPPLY
PS1	CONT1	4	12		60				3 RUNS OF 20' - #2 AWG CABLE
CONT1	PB 1	6	9			17			
PB 1	PB 2	199		197		205			
PB 2	PB 3	372				378	372		
PB 3	L1	177				185	177	120	
L1	L2	112		116		122		120	
L2	PB 4	50				58	50		
PB 4	PB 5	279				285			
PB 5	L3	51				59	51	120	
L3	L4	110		114		120		120	
						76			ADD 5 % FOR SNAKING
		TOTAL	21	519	60	1,605	650	480	
		USE	21	519	60	1,610	650	480	

LIGHTING - EQUIPMENT -UNIVERSITY OF MISSOURI
RTE. 163

POLE NO.	PULL BOX NO.	STA.	OFFSET FT.	LOCATION	240V - 4 CIRC BASE MOUNTED CONT. STATION EA.	POLE 45' TYPE AT DESIGN (2) EA.	250 W 27,500 LUMEN EQV. LED - B EA.	BRACKET ARM - 15' EA.	POLE FOUNDATION 45' MOUNT HT EA.	PULL BOX PREFORMED CLASS 1 EA.	REMARKS
		128+76.00	134	RTE 163 RT.	1						
	1	128+78.00	129	RTE 163 RT.						1	
	2	130+78.00	127	RTE 163 RT.						1	
	3	134+49.00	166	RTE 163 RT.						1	
L1		136+75.00	112	RTE 163 RT.		1	1	1	1		
L2		136+75.00	34	RTE 163 LT.		1	1	1	1		
	5	137+25.00	28	RTE 163 LT.						1	
	6	140+18.00	28	RTE 163 LT.						1	
L3		140+68.00	32	RTE 163 LT.		1	1	1	1		
L4		140+68.00	77	RTE 163 RT.		1	1	1	1		
				TOTAL	1	4	4	4	4	5	
				USE	1	4	4	4	4	5	

NOTE: ALL CIRCUITS REQUIRE 15 AMP BREAKER IN CONTROLLER

POWER SUPPLY ASSEMBLIES - RTE. 163 - UNIVERSITY OF MISSOURI
TYPE 2 240/120 VOLT SERVICE,
LIGHTING ONLY

CONTROLLER NUMBER	LOCATION	STATION	OFFSET	DRAWING 901.80	CIRCUIT BREAKER TRIP RATING: LIGHTING CONTROLLER CIRCUIT 1	CIRCUIT 2	CIRCUIT 3	CIRCUIT 4	POWER SUPPLY DISCONNECT MAIN BREAKER LIGHTING	SERVICE POLE: CONTRACT FURNISH	UTILITY COMPANY
1	RTE. 163 RT.	128+78	132' RT.	1	15 AMPS				100 AMPS	SEE UTILITY JSP	
			TOTAL	1							
			USE	1							

SUMMARY OF QUANTITIES
SHEET 4 OF 5

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/29/2026 9:37:48 AM
PATRICK J HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED: 9/29/2026
ROUTE: 163 | STATE: MO
DISTRICT: CD | SHEET NO.: 3
COUNTY: BOONE
JOB NO.: JCD0333
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)

SIGN	SIZE IN.	AREA SQ.FT.	QTY EACH	TOTAL AREA SQ.FT.	QTY RELOC EACH	TOTAL RELOC SQ.FT.	SIGN NO.	DESCRIPTION
WARNING SIGNS								
WO1-1L	48X48	16.00						TURN (SYMBOL LEFT)
WO1-1R	48X48	16.00						TURN (SYMBOL RIGHT)
WO1-2L	48X48	16.00						CURVE (SYMBOL LEFT)
WO1-2R	48X48	16.00						CURVE (SYMBOL RIGHT)
WO1-3L	48X48	16.00						REVERSE TURN (SYMBOL LEFT)
WO1-3R	48X48	16.00						REVERSE TURN (SYMBOL RIGHT)
WO1-4L	48X48	16.00	2	32.00			15L	REVERSE CURVE (SYMBOL LEFT)
WO1-4R	48X48	16.00	1	16.00			15R	REVERSE CURVE (SYMBOL RIGHT)
WO1-4bL	48X48	16.00	2	32.00			32L	DOUBLE ARROW REVERSE CURVE (SYMBOL LEFT)
WO1-4bR	48X48	16.00	4	64.00			32R	DOUBLE ARROW REVERSE CURVE (SYMBOL RIGHT)
WO1-4cL	48X48	16.00						TRIPLE ARROW REVERSE CURVE (SYMBOL LEFT)
WO1-4cR	48X48	16.00						TRIPLE ARROW REVERSE CURVE (SYMBOL RIGHT)
WO1-6	60X30	12.50						HORIZONTAL ARROW (SYMBOL)
WO1-6a	72X36	18.00						HORIZ. ARROW (SYMBOL ON PERMANENT BARRICADE)
WO1-7	60X30	12.50						DOUBLE HEAD HORIZONTAL ARROW (SYMBOL)
WO1-7a	72X36	18.00						DOUBLE HEAD HORIZ. ARROW (SYMBOL ON PERM. BARR.)
WO1-8	18X24	3.00						CHEVRON (SYMBOL)
WO1-8a	30X36	7.50						CHEVRON (SYMBOL FOR DIVIDED HIGHWAYS)
WO3-1	48X48	16.00						STOP AHEAD (SYMBOL)
WO3-2	48X48	16.00						YIELD AHEAD (SYMBOL)
WO3-3	48X48	16.00						SIGNAL AHEAD (SYMBOL)
WO3-4	48X48	16.00						BE PREPARED TO STOP
WO3-5	48X48	16.00						SPEED LIMIT AHEAD
WO4-1L	48X48	16.00						MERGE (SYMBOL FROM LEFT)
WO4-1R	48X48	16.00						MERGE (SYMBOL FROM RIGHT)
WO4-1aL	48X48	16.00	1	16.00			6A	MERGE (LEFT)
WO4-1aR	48X48	16.00						MERGE (RIGHT)
WO4-2R	48X48	16.00	2	32.00			6B	RIGHT LANE ENDS
WO5-1	48X48	16.00						ROAD/BRIDGE/RAMP NARROWS
WO5-3	48X48	16.00						ONE LANE BRIDGE
WO5-5	48X48	16.00						NARROW LANES
WO6-1	48X48	16.00						DIVIDED HIGHWAY (SYMBOL)
WO6-2	48X48	16.00						DIVIDED HIGHWAY END (SYMBOL)
WO6-3	48X48	16.00						TWO WAY TRAFFIC (SYMBOL)
WO7-3a	30X24	5.00						NEXT XX MILES (PLAQUE)
WO8-1	48X48	16.00						BUMP
WO8-2	48X48	16.00						DIP
WO8-3	48X48	16.00						PAVEMENT ENDS
WO8-4	48X48	16.00						SOFT SHOULDER
WO8-5	48X48	16.00						SLIPPERY WHEN WET (SYMBOL)
WO8-6	48X48	16.00						TRUCK CROSSING
WO8-6c	48X48	16.00						TRUCK ENTRANCE
WO8-7	36X36	9.00						LOOSE GRAVEL
WO8-7a	36X36	9.00						FRESH OIL / LOOSE GRAVEL
WO8-9	48X48	16.00						LOW SHOULDER
WO8-11	48X48	16.00						UNEVEN LANES
WO8-12	48X48	16.00						NO CENTER LINE
WO8-15	48X48	16.00						GROOVED PAVEMENT
WO8-15P	30X24	5.00						MOTORCYCLE (PLAQUE)
WO8-17L	48X48	16.00						SHOULDER DROP-OFF (SYMBOL LEFT)
WO8-17R	48X48	16.00						SHOULDER DROP-OFF (SYMBOL RIGHT)
WO8-17P	30X24	5.00						SHOULDER DROP-OFF (PLAQUE)
W10-1	42RND.	9.62						RAILROAD CROSSING
WO12-1	24X24	4.00						DOUBLE DOWN ARROW (SYMBOL)
WO12-2	48X48	16.00						LOW CLEARANCE (SYMBOL)
W012-2x	24X18	3.00						LOW CLEARANCE (PLAQUE)
WO12-2a	84X24	14.00						OVERHEAD LOW CLEARANCE (FEET AND INCHES)
WO12-4	120X60	50.00						LOW CLEARANCE XX FT XX IN XX MILES AHEAD
WO12-5	120X60	50.00						WIDTH RESTRICTION XX FT XX IN XX MILES AHEAD
WO13-1	30X30	6.25						ADVISORY SPEED (PLAQUE)
WO16-2	30X24	5.00	2	10.00			22	500 FEET (PLAQUE)
WO16-3	30X24	5.00						X MILE (PLAQUE)
WO20-1	48X48	16.00	8	128.00			2	ROAD/BRIDGE/RAMP WORK AHEAD
WO20-2	48X48	16.00						DETOUR AHEAD
WO20-3	48X48	16.00						ROAD CLOSED AHEAD
WO20-4	48X48	16.00						ONE LANE ROAD AHEAD
WO20-5	48X48	16.00	5	80.00			5	RIGHT/CENTER/LEFT LANE CLOSED AHEAD
WO20-5a	48X48	16.00						2 RIGHT/CENTER/LEFT LANES CLOSED AHEAD
WO20-6a	48X48	16.00	3	48.00			6	RIGHT/CENTER/LEFT LANE CLOSED
WO20-7a	48X48	16.00						FLAGGER (SYMBOL)
WO21-2	36X36	9.00						FRESH OIL
WO21-5aR	48X48	16.00	1	16.00			21A	RIGHT SHOULDER CLOSED
WO21-5bR	48X48	16.00	1	16.00			21B	RIGHT SHOULDER CLOSED AHEAD
WO22-1	48X48	16.00						BLASTING ZONE AHEAD
WO22-2	42X36	10.50						TURN OFF 2-WAY RADIO AND PHONE
WO22-3	42X36	10.50						END BLASTING ZONE
GO22-1	21X15	2.19	2	4.38				WET PAINT (ARROW PIVOTS)

SIGN	SIZE IN.	AREA SQ.FT.	QTY EACH	TOTAL SQ.FT.	QTY RELOC EACH	TOTAL RELOC SQ.FT.	SIGN NO.	DESCRIPTION
GUIDE SIGNS								
E05-1	36X48	12.00						GORE EXIT
E05-2	48X36	12.00						EXIT OPEN
E05-2a	48X36	12.00						EXIT CLOSED
GO20-1	60X24	10.00						ROAD WORK NEXT XX MILES
GO20-2	48X24	8.00						END ROAD WORK
GO20-4	36X18	4.50						PILOT CAR FOLLOW ME
GO20-4a	42X30	8.75						PILOT CAR IN USE WAIT & FOLLOW
GO20-4a	18X12	1.50						PILOT CAR IN USE WAIT & FOLLOW
GO20-5aP	36X24	6.00						WORK ZONE (PLAQUE)
MO4-8a	24X18	3.00						END DETOUR
MO4-9aL	48X36	12.00	6	72.00			27L	DETOUR (LEFT)
MO4-9R	48X36	12.00	7	84.00			27R	DETOUR (RIGHT)
MO4-9P	48X12	4.00						STREET NAME (PLAQUE)
MO4-10L	48X18	6.00						DETOUR ARROW (LEFT)
MO4-10R	48X18	6.00						DETOUR ARROW (RIGHT)
REGULATORY SIGNS								
R1-1	48X48	13.25						STOP
R1-2	48TRI.	6.93						YIELD
R1-2a	36X36	9.00						TO ONCOMING TRAFFIC (PLAQUE)
R1-3P	30X12	2.50						ALL WAY (PLAQUE)
R2-1	36X48	12.00	6	72.00			4	SPEED LIMIT XX
R3-1	48X48	16.00						NO RIGHT TURN (SYMBOL)
R3-2	48X48	16.00						NO LEFT TURN (SYMBOL)
R3-3	36X36	9.00						NO TURNS
R3-4	48X48	16.00						NO U-TURN (SYMBOL)
R3-7L	30X30	6.25						LEFT LANE MUST TURN LEFT
R3-7R	30X30	6.25						RIGHT LANE MUST TURN RIGHT
R4-1	36X48	12.00						DO NOT PASS
R4-2	36X48	12.00						PASS WITH CARE
R4-7a	36X48	12.00						KEEP RIGHT (HORIZONTAL ARROW)
R4-8a	36X48	12.00						KEEP LEFT (HORIZONTAL ARROW)
R5-1	30X30	6.25						DO NOT ENTER
R5-1a	36X24	6.00						WRONG WAY
R6-1L	54X18	6.75						ONE WAY ARROW (LEFT)
R6-1R	54X18	6.75						ONE WAY ARROW (RIGHT)
R6-2L	24X30	5.00						ONE WAY (LEFT)
R6-2R	24X30	5.00						ONE WAY (RIGHT)
R9-9	24X12	2.00						SIDEWALK CLOSED
R9-11L	24X18	3.00						SIDEWALK CLOSED AHEAD, (ARROW LEFT) CROSS HERE
R9-11R	24X18	3.00						SIDEWALK CLOSED AHEAD, (ARROW RIGHT) CROSS HERE
R10-6	24X36	6.00						STOP HERE ON RED (45^ ARROW)
R11-2	48X30	10.00	1	10.00			29	ROAD CLOSED
R11-3a	60X30	12.50						ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY
R11-4	60X30	12.50						ROAD CLOSED TO THRU TRAFFIC
CONST-3A	60X48	20.00						FINE SIGN
CONST-3X	56X12	4.67						SPEEDING/PASSING (PLATE)
MISCELLANEOUS SIGNS								
CONST-5	48X36	12.00						PROJECT INFORMATION
CONST-5	96X48	32.00	2	64.00			60	PROJECT INFORMATION
CONST-8	48X36	12.00	4	48.00			33	WORK ZONE NO PHONE ZONE

616-10.05 CONSTRUCTION SIGNS	TOTAL	845*
616-10.10 RELOCATED SIGNS	TOTAL	

EFFECTIVE: 07-01-2025

ITEM NUMBER	TOTAL QTY	DESCRIPTION
6122008		IMPACT ATTENUATOR 40 MPH (SAND BARRELS)
6122009		IMPACT ATTENUATOR 45 MPH (SAND BARRELS)
6122010		IMPACT ATTENUATOR 50 MPH (SAND BARRELS)
6122012		IMPACT ATTENUATOR 55 MPH (SAND BARRELS)
6122014		IMPACT ATTENUATOR 60 MPH (SAND BARRELS)
6122017		IMPACT ATTENUATOR 65 MPH (SAND BARRELS)
6122019		IMPACT ATTENUATOR 70 MPH (SAND BARRELS)
6122020		REPLACEMENT SAND BARREL
6122030		IMPACT ATTENUATOR (RELOCATION)
6122040	2	WORK ZONE CRASH CUSHION (NARROW)
6122041		WORK ZONE CRASH CUSHION (RELOCATION)
6123001		TRUCK MOUNTED ATTENUATOR (TMA)
6161012		BUOYS (BOATS KEEP OUT)
6161013		BUOYS (NO WAKE)
6161014		SPECIAL SIGN ASSEMBLY (BOATS KEEP OUT)
6161020		CHANNELIZER (DRUM-LIKE)
6161022		CHANNELIZER (CONE)
6161025	60*	CHANNELIZER (TRIM-LINE)
6161026		CHANNELIZER (VERTICAL PANEL)
6161030	4*	TYPE 3 MOVEABLE BARRICADE
6161033	20*	DIRECTION INDICATOR BARRICADE
6161040	1*	FLASHING ARROW PANEL
6161047		TYPE 3 OBJECT MARKER
6161055	20*	SEQUENTIAL FLASHING WARNING LIGHT
6161070		TUBULAR MARKER
6161095		RADAR SPEED ADVISORY SYSTEM
6161096		CHANGEABLE MESSAGE SIGN, COMMISSION FURNISHED/RETAINED
6161098A		CHANGEABLE MESSAGE SIGN WITHOUT COMM. INTERFACE, CONTRACTOR FURNISHED/RETAINED
	4	CHANGEABLE MESSAGE SIGN WITH COMM. INTERFACE, CONTRACTOR FURNISHED/RETAINED
6161099		WORK ZONE TRAFFIC SIGNAL SYSTEM
6162000A		TEMPORARY LONG-TERM RUMBLE STRIPS
6162002		TEMPORARY TRAFFIC BARRIER, CONTRACTOR FURNISHED/RETAINED
	1835	TEMP. TRAFFIC BARRIER ANCHORED, CONTRACTOR FURNISHED/RETAINED
6173600D		TEMP. TRAFFIC BARRIER STIFFNESS TRANSITION CONTRACTOR FURNISHED/RETAINED
6173700B		TEMP. TRAFFIC BARRIER HEIGHT TRANSITION, CONTRACTOR FURNISHED/RETAINED
6173706		RELOCATING TEMPORARY TRAFFIC BARRIER
6174000A		RELOCATING TEMP. TRAFFIC BARRIER ANCHORED
6175010A		RELOCATING TEMP. TRAFFIC BARRIER STIFFNESS
6175011B		RELOCATING TEMP. TRAFFIC BARRIER HEIGHT
6175013		TEMPORARY RAISED PAVEMENT MARKER
6175020A		TEMPORARY TRAFFIC SIGNALS
6208064A		TEMPORARY TRAFFIC SIGNALS AND LIGHTING
9029400		
9029401		

6169901	1	LUMP SUM TEMPORARY TRAFFIC CONTROL (*ITEM INCLUDED)

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/29/2026 9:37:20 AM
PATRICK J HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED: 9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	3

COUNTY: BOONE
JOB NO.: JCD0333
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)

SUMMARY OF QUANTITIES
SHEET 5 OF 5

SCALE

0 50 100 150

135

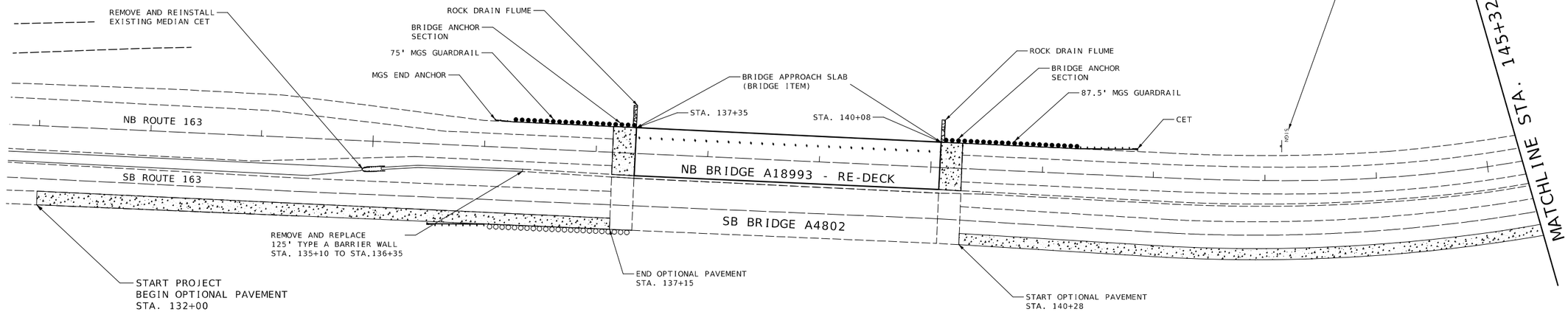
140

145

WEIGHT LIMIT 60 TONS

R12-1

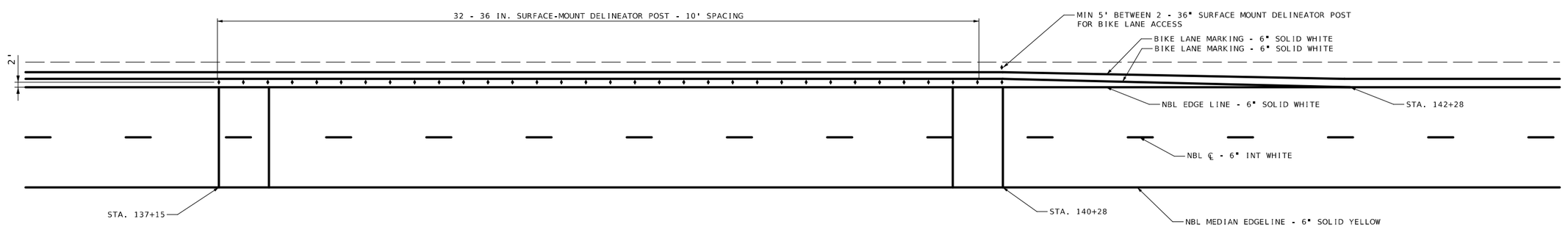
(R)



NOTE: EXISTING NB GUARDRAIL TO BE REMOVED AT BRIDGE A18993

ANY WORK INDICATED ON THE PLANS THAT EXTENDS BEYOND THE PROJECT LIMITS IS CONSIDERED INCIDENTAL TO AND A PART OF THE CONSTRUCTION OF THIS PROJECT

NB BRIDGE A18993 - BIKE LANE DETAIL



STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/29/2026 9:39:14 AM
PATRICK.J.HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED
9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	4

COUNTY
BOONE

JOB NO.
JCD0333

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)

PLAN SHEET
SHEET 1 OF 2

MATCHLINE STA. 145+32

150

155

MATCHLINE STA. 158+90

REMOVE AND REPLACE
435' TYPE A BARRIER WALL
STA. 148+97

STA. 153+32

NB ROUTE 163

S45°47'44"E

SB ROUTE 163

END PROJECT
END OPTIONAL PAVEMENT
STA. 159+25

OPTIONAL PAVEMENT

SCALE

0 50 100 150

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER

09/23/2026 9:38:58 AM
PATRICK J HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED
9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	5

COUNTY
BOONE

JOB NO.
JCD0333

CONTRACT ID.

PROJECT NO.

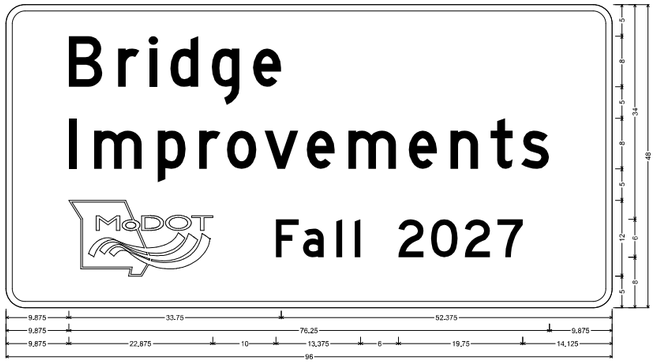
BRIDGE NO.

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

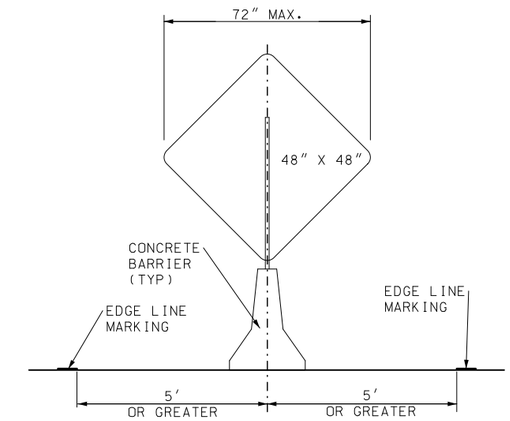
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

PLAN SHEET
SHEET 2 OF 2



CONST-5 SH-FLAT SHEET:
3,000" Radius, 1,000" Border, White on, Green:
"Bridge", Dr: "Improvements", Dr: "Fall 2027", Dr:
Table of letter and object lefts

B 9,875	r 17,750	i 22,750	d 28,000	g 32,625	e 39,125	
I 9,875	m 14,000	p 24,000	r 30,625	o 35,000	v 41,000	e 47,625	m 54,250	e 63,750	n 70,375	t 76,750	s 81,625
9,875	r 42,750	a 47,000	l 52,375	55,250	2 62,125	0 67,375	2 72,625	7 77,875			



STANDARD 48" WARNING SIGN

SIGNS IN NARROW MEDIANS (2)

NOTES:

- ALL SIGNS ON THIS SHEET ARE CONSIDERED PERMANENT FOR THE DURATION OF THE PROJECT, UNLESS OTHERWISE NOTED.

(1) PLACE THE PROJECT INFORMATION SIGN, CONST-5-96, AT A VISIBLE LOCATION WITHIN THE PROJECT LIMITS WHERE IT DOES NOT INTERFERE WITH A SIGN SEQUENCE.

(2) USE 48" X 48" DIAMOND-SHAPED WARNING SIGNS WHENEVER POSSIBLE. RECTANGULAR SIGNS SHALL NOT BE USED IN LIEU OF DIAMOND-SHAPED WARNING SIGNS.

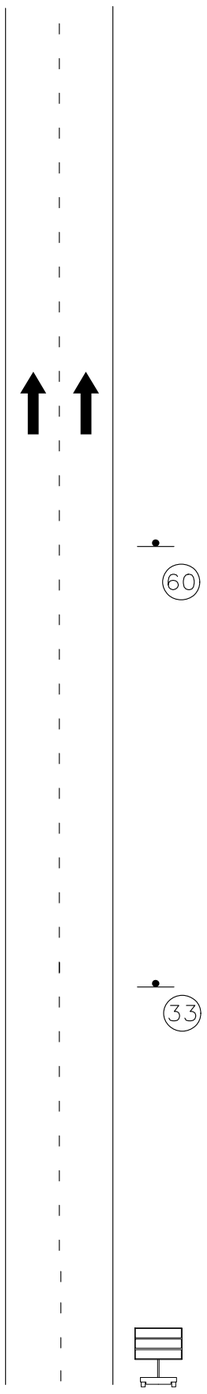
(3) THE "WORK ZONE NO PHONE ZONE" SIGN IS PLACED A MINIMUM OF 500 FEET BEFORE THE ROAD WORK AHEAD SIGN.

GENERAL NOTES:

- LAYOUT IS TYPICAL FOR EITHER DIRECTION.
- CMS TO BE LOCATED AS APPROVED BY THE ENGINEER.
- ANY EXISTING SIGNING THAT CONFLICTS WITH TRAFFIC CONTROL SIGNING SHALL BE COMPLETELY COVERED OR REMOVED.



CONST-5-96
60 (1)



BEGINNING OF PROJECT LIMITS OR INITIAL WORK ZONE SIGN, IF LOCATED OUTSIDE PROJECT LIMITS.



CONST-8
33 (3)

MULTI-LANE DIVIDED
BEGINNING OF PROJECT SIGNING

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/29/2026 9:37:56 AM
PATRICK.J.HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED
9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	6

COUNTY
BOONE

JOB NO.
JCD0333

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 SHEET
SHEET 1 OF 10

Sign Spacing, Device Spacing and Channelizing Taper Lengths

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

TAPER LENGTHS AND SPACING OF CHANNELIZING DEVICES					
SPEED MPH	MINIMUM TAPER LENGTHS (L) FOR LANE WIDTHS (W)			MAXIMUM CHANNELIZER SPACING	
	10 FT	11 FT	12 FT	THROUGH TAPER	THROUGH WORK AREA
0-35	205	225	245	35	40
40-45	450	495	540	40	80
50-55	550	605	660	50	80
60-70	700	770	840	60	120

NOTES:

DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.

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

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

LONGITUDINAL BUFFER SPACE (B)	
SPEED MPH	BUFFER SPACE
0-35	250
40-45	360
50-55	495
60-70	730

TAPER LENGTH (L):

L = WS FOR 40 MPH OR MORE

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

FOR SHOULDER TAPER USE L/3

WHERE:

L = TAPER LENGTH IN FEET

W = LATERAL SHIFT IN FEET

S = POSTED SPEED IN MPH

TRAFFIC CONTROL DEVICES

GENERAL NOTES:

1. SEE STANDARD PLAN 616.10 FOR DETAILS AND ITEMS NOT SHOWN
2. NO DIRECT PAYMENT WILL BE MADE FOR RELOCATING, COVERING, UNCOVERING OR REMOVING SIGNS.
3. CONES ALLOWABLE FOR DAYTIME OPERATIONS ONLY.
4. LOCATE FLASHING ARROW PANEL AT BEGINNING OF TAPER WHEN FEASIBLE, ARROW PANELS ARE ALWAYS LOCATED BEHIND CHANNELIZERS OR CONES.

TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- SIGN (DOUBLE SIDED)
- FLAGGER
- DIRECTION INDICATOR BARRICADE
- CHANNELIZER
- BARRICADE
- CHANGEABLE MESSAGE BOARD
- FLASHING ARROW PANEL
- TMA (TRUCK MOUNTED ATTENUATOR) WITH FLASHING ARROW PANEL

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/29/2026 9:39:06 AM
PATRICK.J.HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED: 9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	7

COUNTY: BOONE

JOB NO.: JCD0333

CONTRACT ID.:

PROJECT NO.:

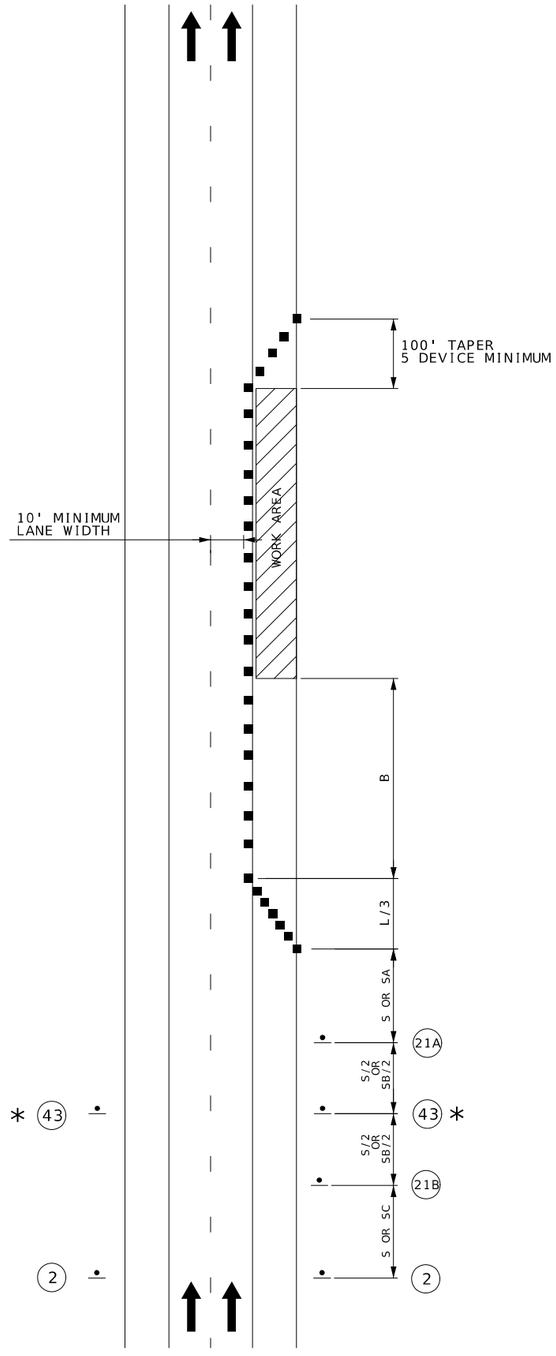
BRIDGE NO.:

DATE	DESCRIPTION

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

TRAFFIC CONTROL SHEET
SHEET 2 OF 10

NOT TO SCALE



SHOULDER WORK

DIVIDED HIGHWAY



WO20-1

(2)





WO21-5bR

(21B)



WO21-5aR

(21A)



WO5-1



WO7-3a

(PLAQUE NOT USED IF LESS THAN ONE MILE.)

(43) *OMIT SIGN 43 FOR NO TRAVELWAY ENCROACHMENT.

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/29/2026 9:36:05 AM
PATRICK.J.HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED
9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	8

COUNTY
BOONE

JOB NO.
JCD0333

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

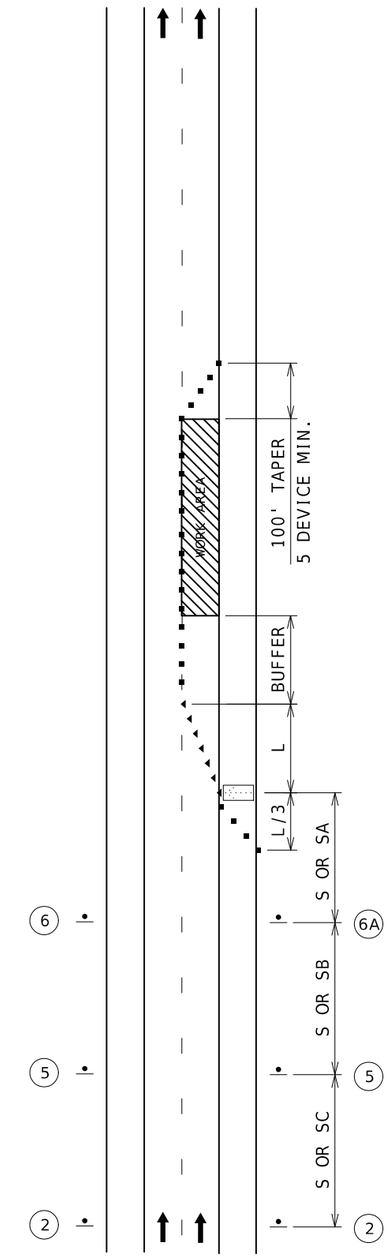
DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

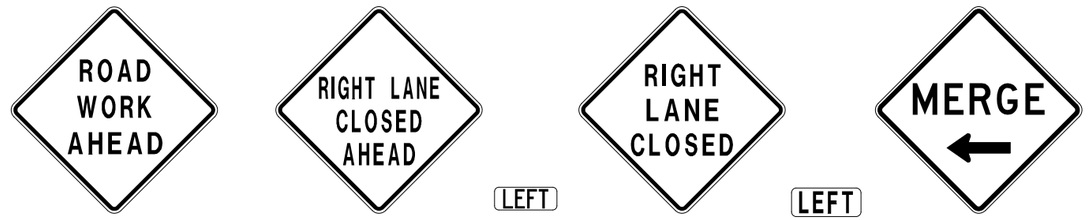
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

TRAFFIC CONTROL SHEET
SHEET 3 OF 10

NOT TO SCALE



SINGLE LANE CLOSURE



STATE OF MISSOURI
PATRICK J HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/23/2026 9:39:30 AM
PATRICK J HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED
9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	9

COUNTY
BOONE

JOB NO.
JCD0333

CONTRACT ID.

PROJECT NO.

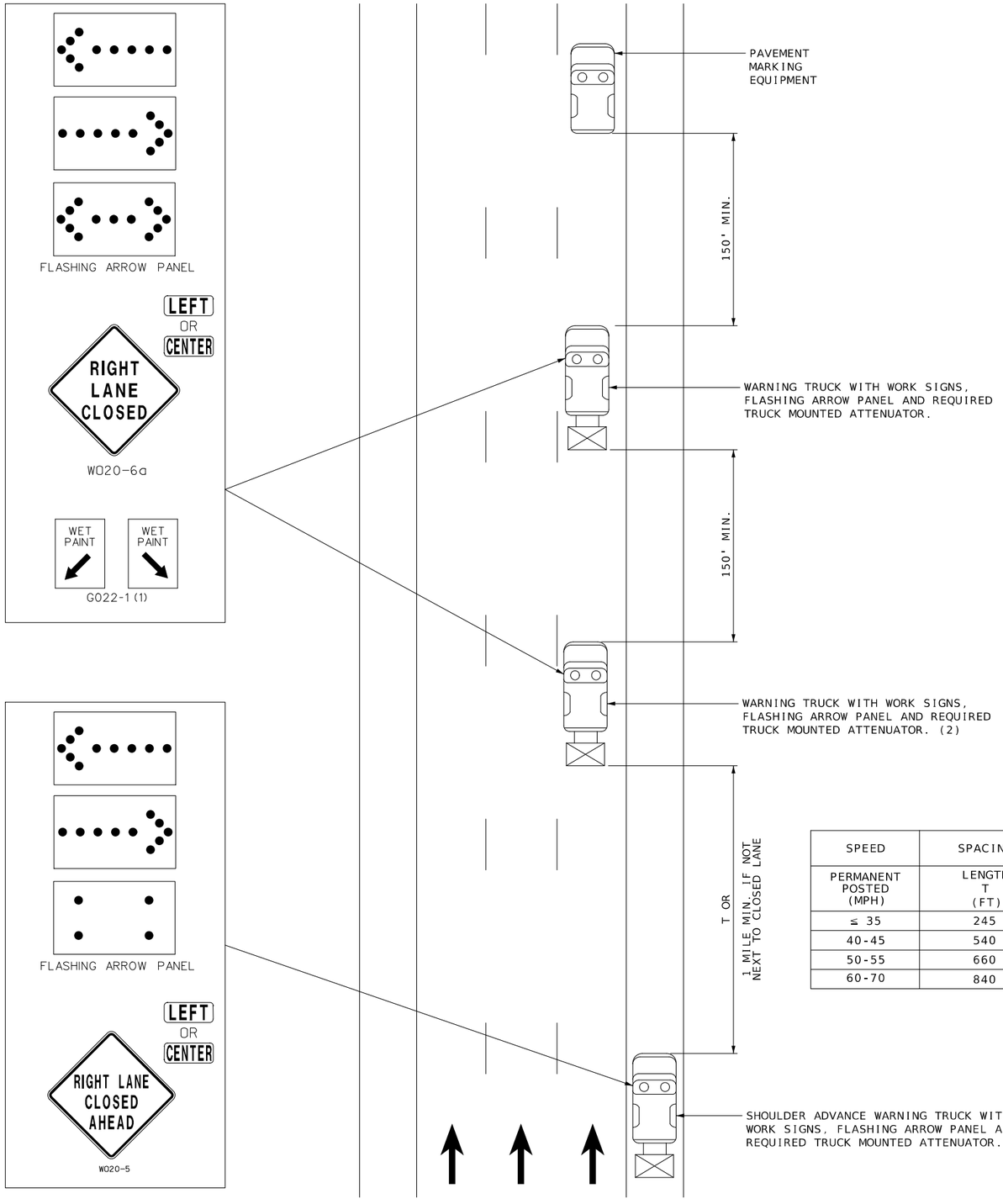
BRIDGE NO.

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

TRAFFIC CONTROL SHEET
SHEET 4 OF 10



SPEED	SPACING
PERMANENT POSTED (MPH)	LENGTH T (FT)
≤ 35	245
40-45	540
50-55	660
60-70	840

STRIPING ON MULTI-LANE HIGHWAY

NOT TO SCALE

NOTES:

UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY PROVIDE ADDITIONAL PROTECTIVE TRUCKS EQUIPPED WITH PROPER WARNING DEVICES.

PROTECTIVE TRUCKS AND WORK VEHICLES SHALL DISPLAY HIGH-INTENSITY ROTATING, FLASHING, OSCILLATING, OR STROBE LIGHTS.

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

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

FLASHING ARROW PANELS SHALL BE INCIDENTAL TO TRUCK MOUNTED ATTENUATORS, WHEREVER USED. NO ADDITIONAL PAYMENT WILL BE MADE.

FLASHING ARROW PANELS SHALL, AS A MINIMUM, BE TYPE B, WITH A SIZE OF 60 X 30 INCHES.

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

(1) WET PAINT SIGNS ARE INSTALLED TO INDICATE THE SIDE IN WHICH THE PAVEMENT MARKING MATERIAL IS BEING APPLIED. AT THE CONTRACTOR'S OPTION, A FRONT FACING WET PAINT SIGN MAY BE INSTALLED ON THE LEFT SIDE OF THE PAVEMENT MARKING EQUIPMENT.

(2) WARNING TRUCK IS POSITIONED AT THE NO TRACK POINT OF THE PAVEMENT MARKING MATERIAL, OR SPACING SHOWN, WHICH EVER IS GREATER.

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/29/2026 9:38:13 AM
PATRICK.J.HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED
9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	10

COUNTY
BOONE

JOB NO.
JCD0333

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 SHEET
SHEET 5 OF 10



WO20-1

(2)



R2-1

(4)



WO1-4bR

(32)



MO4-9aL

(27L)

120

125

CHAMPIONS DR

NB ROUTE 163

S14°49'32"W

SB ROUTE 163

CARRIE FRANCKE DR

2

4

32

27L

MATCHLINE STA. 129+50.00

NOTE: SIGN SPACING 350', EXCEPT FOR BIKE DETOUR OR AS LOCATED IN PLANS

SCALE

0 50 100 150

TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- SIGN (DOUBLE SIDED)
- FLAGGER
- DIRECTION INDICATOR BARRICADE
- CHANNELIZER
- BARRICADE
- CHANGEABLE MESSAGE BOARD
- FLASHING ARROW PANEL
- TMA (TRUCK MOUNTED ATTENUATOR) WITH FLASHING ARROW PANEL

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER

09/29/2026 9:39:22 AM
PATRICK.J.HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED
9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	11

COUNTY
BOONE

JOB NO.
JCD0333

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

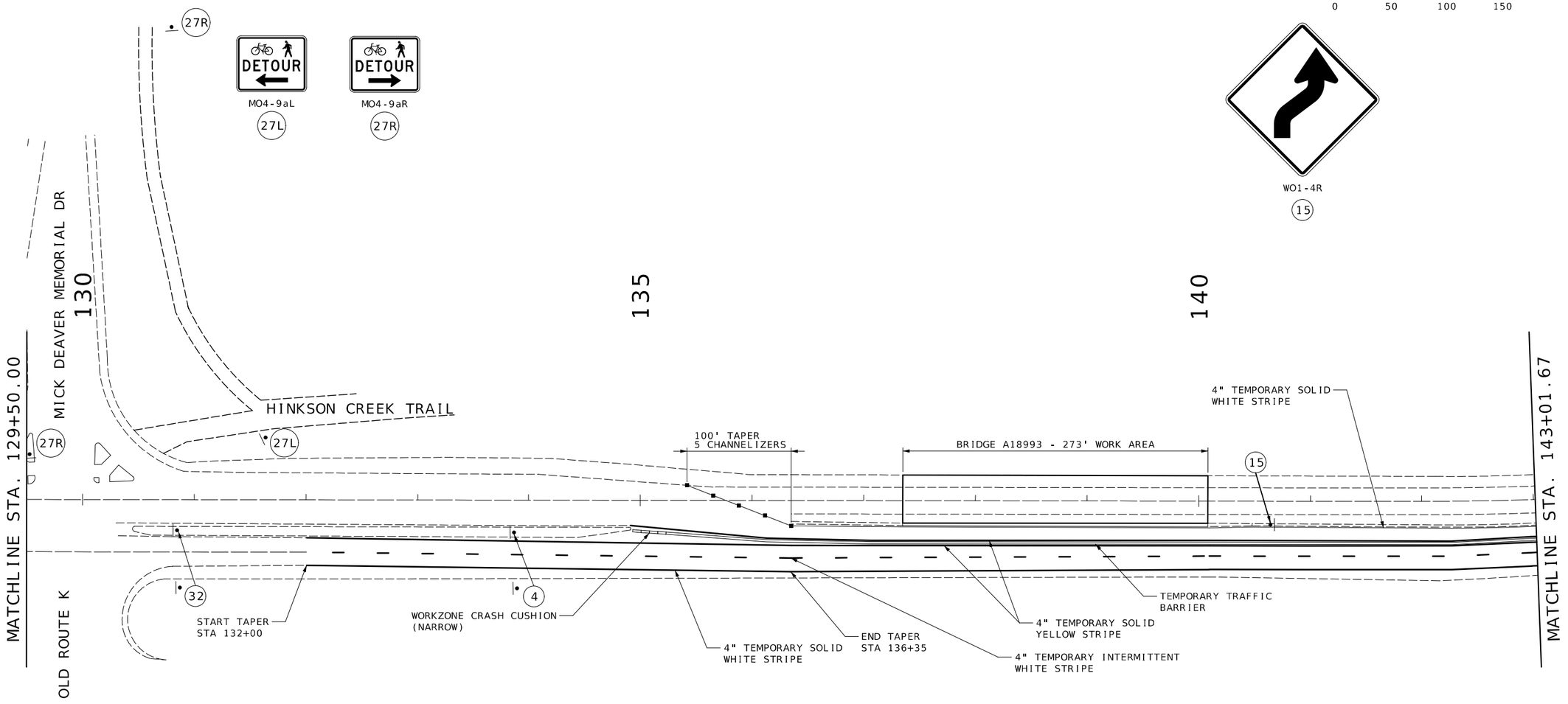
DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

TRAFFIC CONTROL SHEET
SHEET 6 OF 10

SCALE
0 50 100 150







TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- SIGN (DOUBLE SIDED)
- FLAGGER
- DIRECTION INDICATOR BARRICADE
- CHANNELIZER
- BARRICADE
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NOTE: SIGN SPACING 350', EXCEPT FOR BIKE DETOUR OR AS LOCATED IN PLANS

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/29/2026 9:38:50 AM
PATRICK J HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED
9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	12

COUNTY
BOONE

JOB NO.
JCD0333

CONTRACT ID.

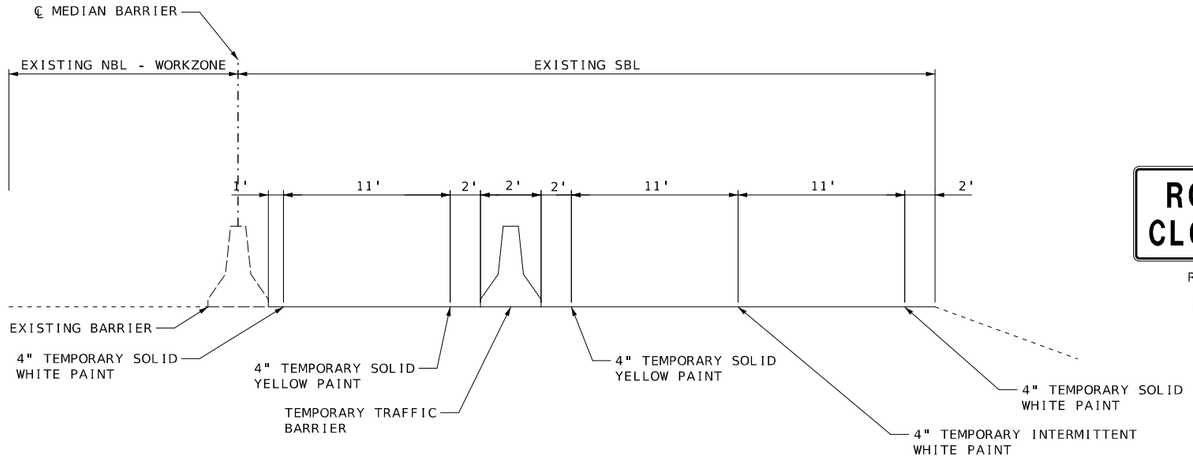
PROJECT NO.

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 SHEET
SHEET 7 OF 10





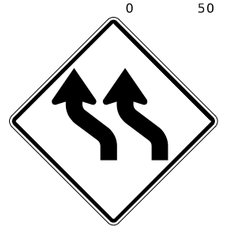
R11-2

29



WO1-4L

15

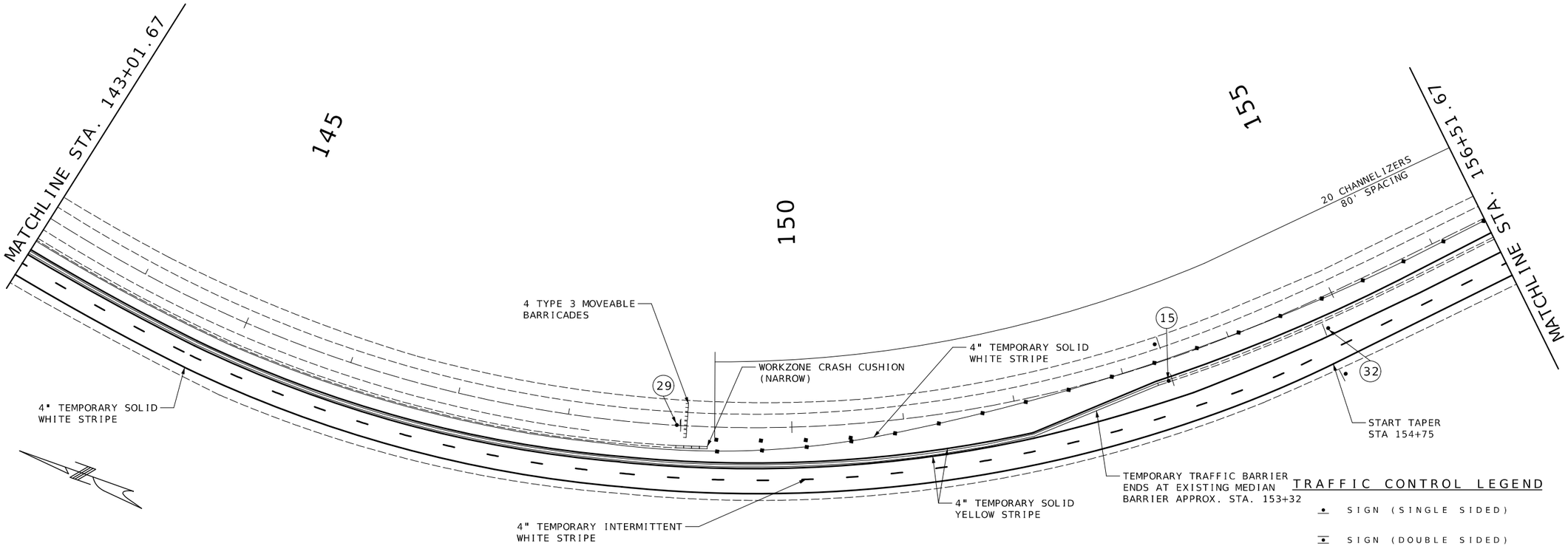


WO1-4bL

32

SCALE

0 50 100 150



TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- SIGN (DOUBLE SIDED)
- FLAGGER
- DIRECTION INDICATOR BARRICADE
- CHANNELIZER
- BARRICADE
- CHANGEABLE MESSAGE BOARD
- FLASHING ARROW PANEL
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NOTE: SIGN SPACING 350', EXCEPT FOR BIKE DETOUR OR AS LOCATED IN PLANS

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/29/2026 9:40:11 AM
PATRICK J. HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED
9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	13

COUNTY
BOONE

JOB NO.
JCD0333

CONTRACT ID.

PROJECT NO.

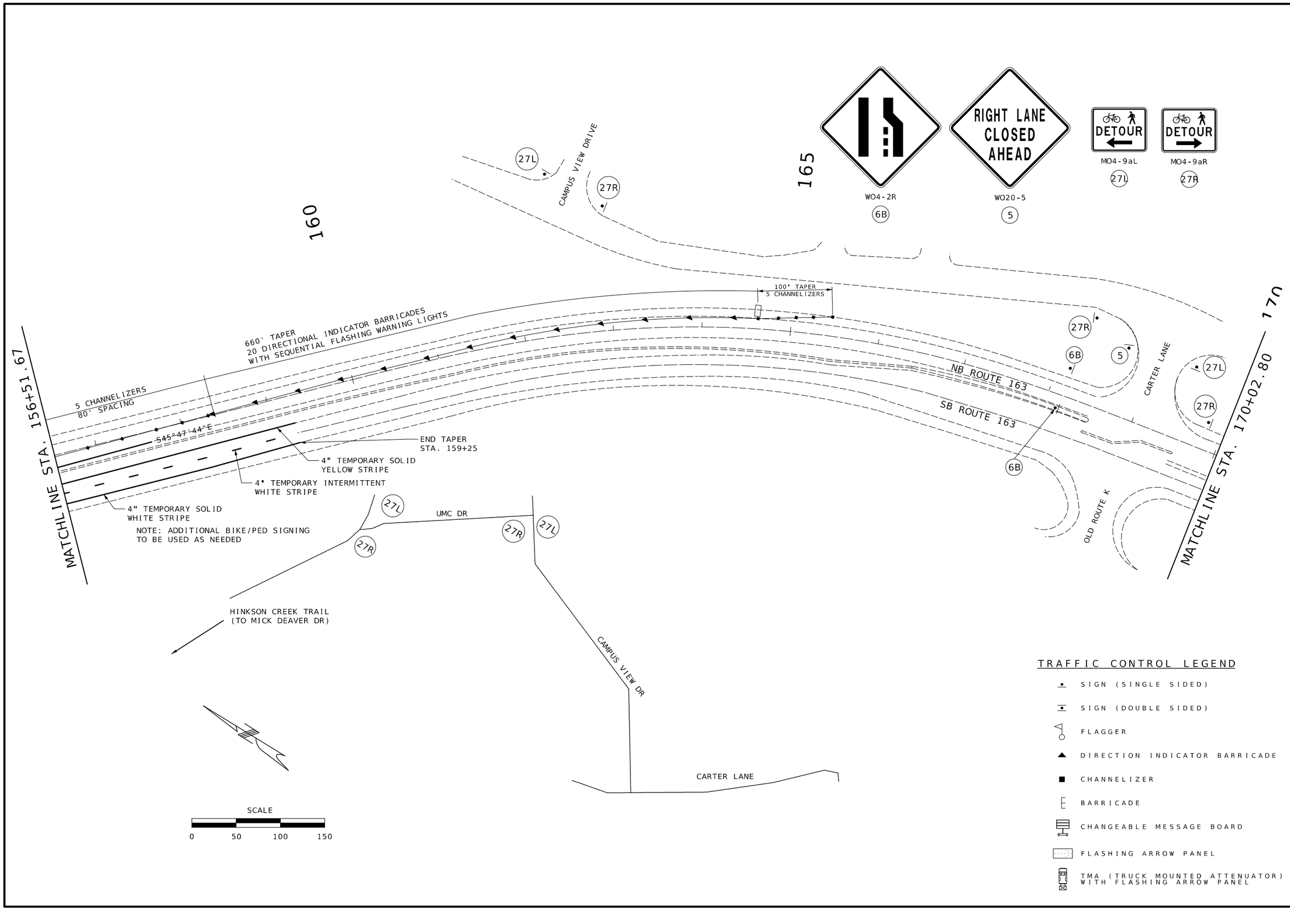
BRIDGE NO.

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

TRAFFIC CONTROL SHEET
SHEET 8 OF 10



TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- SIGN (DOUBLE SIDED)
- FLAGGER
- DIRECTION INDICATOR BARRICADE
- CHANNELIZER
- BARRICADE
- CHANGEABLE MESSAGE BOARD
- FLASHING ARROW PANEL
- TMA (TRUCK MOUNTED ATTENUATOR) WITH FLASHING ARROW PANEL

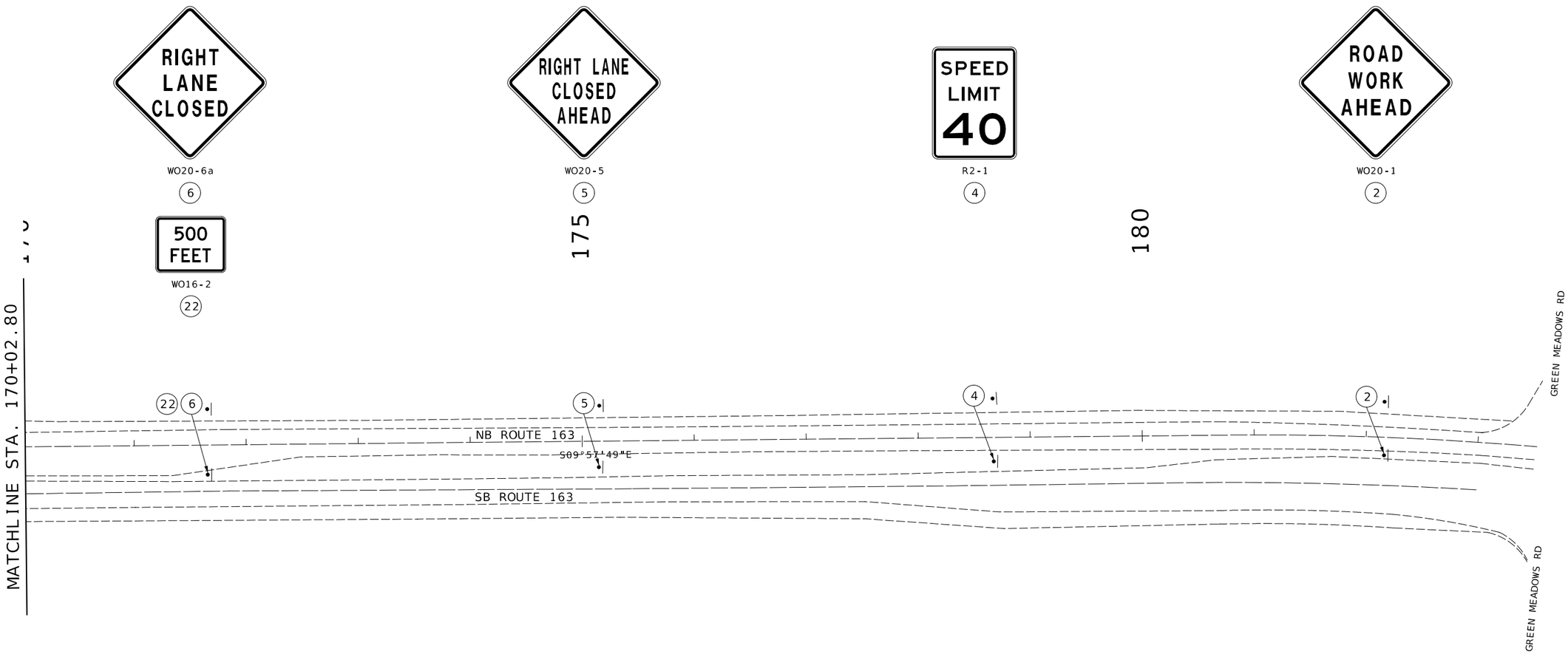
STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/29/2026 9:39:45 AM
PATRICK.J.HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED	9/29/2026
ROUTE	163
STATE	MO
DISTRICT	CD
SHEET NO.	14
COUNTY	BOONE
JOB NO.	JCD0333
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 SHEET
SHEET 9 OF 10



NOTE: SIGN SPACING 350', EXCEPT FOR BIKE DETOUR OR AS LOCATED IN PLANS

SCALE

0 50 100 150

TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- SIGN (DOUBLE SIDED)
- FLAGGER
- DIRECTION INDICATOR BARRICADE
- CHANNELIZER
- BARRICADE
- CHANGEABLE MESSAGE BOARD
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STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER
09/29/2026 9:40:19 AM
PATRICK J HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED: 9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	15

COUNTY: BOONE
JOB NO.: JCD0333
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.:

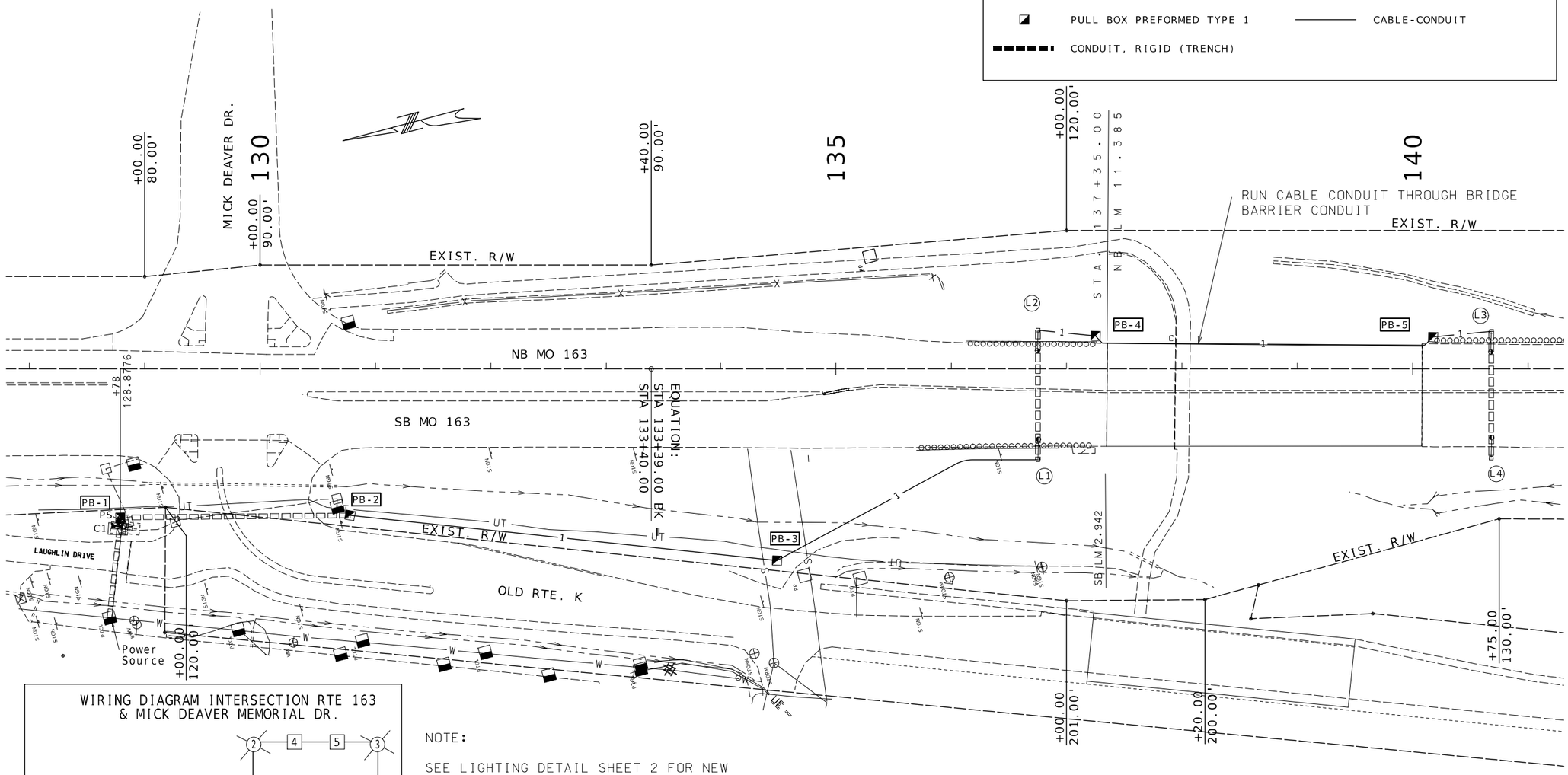
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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

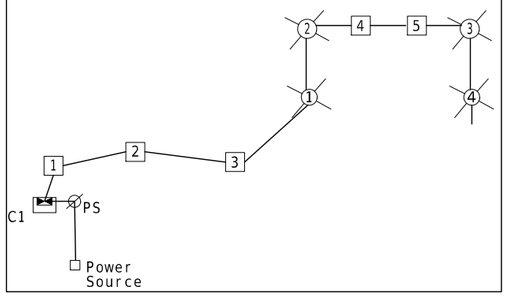
TRAFFIC CONTROL SHEET
SHEET 10 OF 10

LIGHTING LEGEND

	CONTROLLER, LIGHTING	P.S	POWER SOURCE
	CONTROLLER, LIGHTING (EXISTING)		PULL BOX (EXISTING)
	WOOD POST		PULL BOX PREFORMED TYPE 2
	POWER SUPPLY		CONDUIT, RIGID (PUSHED)
	LED-B LUMINAIRE		CABLE-CONDUIT (EXISTING)
	PULL BOX PREFORMED TYPE 1		CABLE-CONDUIT
	CONDUIT, RIGID (TRENCH)		



WIRING DIAGRAM INTERSECTION RTE 163 & MICK DEAVER MEMORIAL DR.



NOTE:

SEE LIGHTING DETAIL SHEET 2 FOR NEW POWER SUPPLY AND CONTROLLER LOCATIONS.

SCALE

0 50 100 150

LIGHTING DETAIL
SHEET 1 OF 2

$FILE$

STATE OF MISSOURI
PATRICK J. HAKE
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PROFESSIONAL ENGINEER
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PATRICK.J.HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED
9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	16

COUNTY
BOONE

JOB NO.
JCD0333

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)

UT

UT

UT

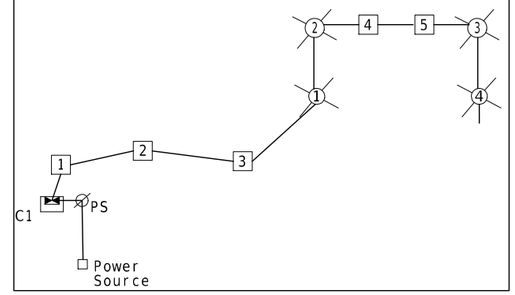
PB-1

POWER SUPPLY

C1

LAUGHLIN DRIVE

WIRING DIAGRAM INTERSECTION RTE 163
& MICK DEAVER MEMORIAL DR.



W

W

W

W

W

POWER SOURCE

LIGHTING LEGEND

	CONTROLLER, LIGHTING	P.S.	POWER SOURCE
	CONTROLLER, LIGHTING (EXISTING)		PULL BOX (EXISTING)
	WOOD POST		PULL BOX PREFORMED TYPE 2
	POWER SUPPLY		CONDUIT, RIGID (PUSHED)
	LED-B LUMINAIRE		CABLE-CONDUIT (EXISTING)
	PULL BOX PREFORMED TYPE 1		CABLE-CONDUIT
	CONDUIT, RIGID (TRENCH)		

LIGHTING DETAIL
SHEET 2 OF 2

STATE OF MISSOURI
PATRICK J. HAKE
NUMBER PE-2010000826
PROFESSIONAL ENGINEER

09/29/2026 9:40:02 AM
PATRICK J HAKE - CIVIL
MO-PE-2010000826

DATE PREPARED
9/29/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
CD	17

COUNTY
BOONE

JOB NO.
JCD0333

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)

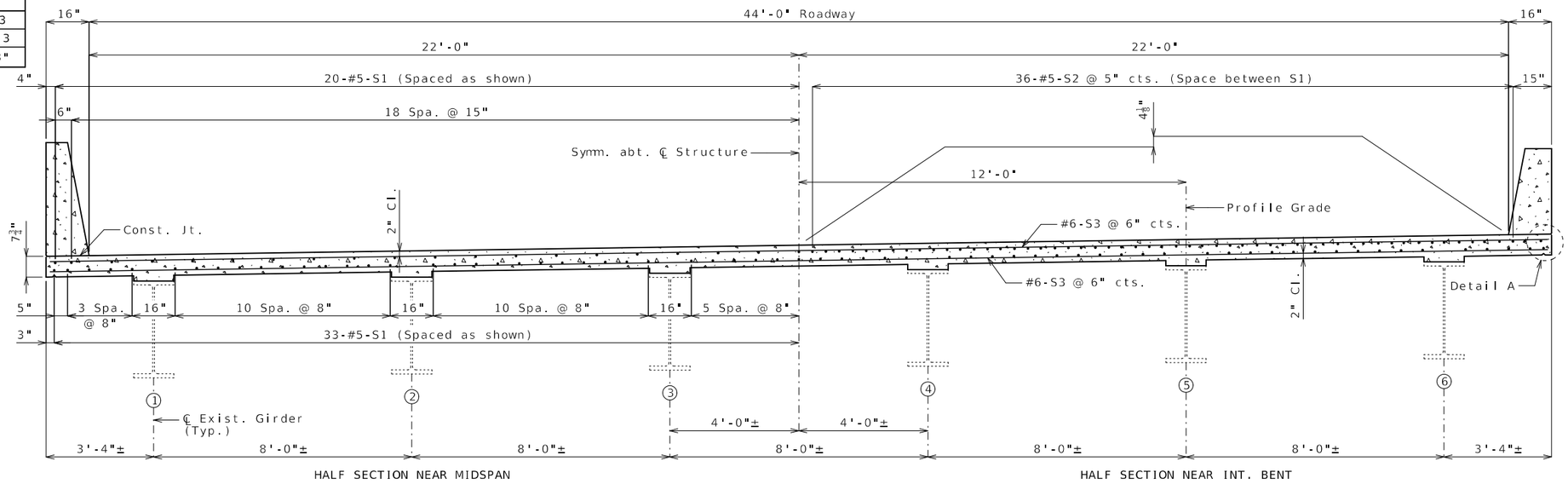
SEC/SUR 24 TWP 48N RGE 13W

U.I.P. AND REDECK EXISTING (82'- 106'- 82') CONTINUOUS COMPOSITE PLATE GIRDER SPANS

Table Showing S2 Bar Lengths			
Int. Bent No. 2		Int. Bent No. 3	
Span 1	Span 2	Span 2	Span 3
28'-3"	28'-3"	28'-3"	28'-3"

Required Lap Length For Bar Splices **	
Bar Size	Splice Length
4	2'-7"
5	3'-3"
6	3'-10"
7	4'-11"

** Unless otherwise shown.



TYPICAL SECTION THRU SLAB

General Notes:

Design Specifications:
2002 AASHTO LFD (17th Ed.) Standard Specifications
Seismic Performance Category A

Design Loading:
HS20-44 (1965 & New Construction)
15 lb/sf Future Wearing Surface
Earth - 120 lb/cf, Equivalant Fluid Pressure 45 lb/cf (Min.)
Fatigue Stress - Case III

Design Unit Stresses:

Class B-1 Concrete (Barrier)	f'c = 4,000 psi
Class B-2 Concrete (End Bents & Superstructure, except Barrier)	f'c = 4,000 psi
Reinforcing Steel (ASTM A615 Grade 60)	fy = 60,000 psi
Structural Carbon Steel (ASTM A709 Grade 36)	fy = 36,000 psi

Joint Filler:
All joint filler shall be in accordance with Sec 1057 for preformed sponge rubber expansion and partition joint filler, except as noted.

Reinforcing Steel:
Minimum clearance to reinforcing steel shall be 1 1/2", unless otherwise shown.

Miscellaneous:
Protective coating for concrete bents and piers (Epoxy) shall be applied as shown on the bridge plans and in accordance with Sec 711.

Bars bonded in existing concrete not removed shall be cleanly stripped and embedded into new concrete where possible. If length is available, existing bars shall extend into new concrete at least 40 diameters for plain bars and 30 diameters for deformed bars, unless otherwise noted.

Roadway surfacing adjacent to bridge ends shall match new bridge slab surface. (Roadway item)

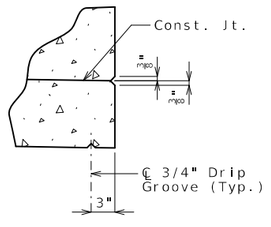
Outline of existing work is indicated by light dashed lines. Heavy lines indicate new work.

The area exposed by the removal of concrete and not covered with new concrete shall be coated with an approved qualified special mortar in accordance with Sec 704.

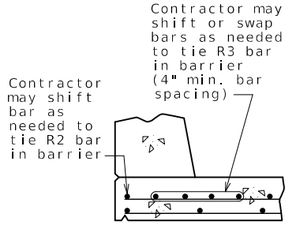
For adjusted girder deflection due to the weight of the new deck and barriers, see Bridge Electronic Deliverables.

Traffic Handling:
Structure to be closed during construction. See roadway plans for traffic control.

Estimated Quantities for Slab on Steel		
Item		Total
Class B-2 Concrete	cu. yard	338
Reinforcing Steel (Epoxy Coated)	pound	135,050



DETAIL A



OPTIONAL SHIFTING TOP BARS AT BARRIER

Estimated Quantities		
Item		Total
Removal of Miscellaneous ACM (Non-Friable)	sq. foot	26
Removal of Existing Bridge Deck	sq. foot	12,754
Bridge Approach Slab (Major)	sq. yard	200
Slab on Steel	sq. yard	1,411
Concrete Traffic Barrier Transition	linear foot	40
Type H Barrier	linear foot	273
Type D Barrier	linear foot	291
Conduit System on Structure	lump sum	1
Protective Coating - Concrete Bents and Piers (Epoxy)	lump sum	1
Strengthening Existing Girders	lump sum	1
Slab Drain	each	13
Rehabilitate Bearing	each	6
Steel Pile Repair	linear foot	24
Structural Steel Repairs	lump sum	1
Vertical Drains at End Bents	each	2
Open Cell Foam Joint Seal	linear foot	45

Cost of any required excavation for bridge will be considered completely covered by the contract unit price for other items.

The table of Estimated Quantities for Slab on Steel represents the quantities used by the State in preparing the cost estimate for concrete slabs. The area of the concrete slab will be measured to the nearest square yard longitudinally from end of slab to end of slab and transversely from out to out of bridge slab (or with the horizontal dimensions as shown on the plan of slab). Payment for stay-in-place corrugated steel forms, conventional forms, all concrete and epoxy coated reinforcing steel will be considered completely covered by the contract unit price for the slab. Variations may be encountered in the estimated quantities but the variations cannot be used for an adjustment in the contract unit price.

Method of forming the slab shall be in accordance with Sec 703. All hardware for forming the slab to be left in place as a permanent part of the structure shall be coated in accordance with ASTM A123 or ASTM B633 with a thickness Class SC 4 and a finish Type I, II or III.

Slab shall be cast-in-place with conventional forming or stay-in-place corrugated steel forms. Precast prestressed panels will not be permitted.

For Optional Stay-In-Place Form Details, see Sheet No. 2.

REPAIRS TO BRIDGE: ROUTE 163 NB OVER HINKSON CREEK

ROUTE 163 FROM ROUTE 740 TO ROUTE AC.
ABOUT 1.3 MILES NORTH OF ROUTE AC.
BEGINNING STATION 137+35.00± (MATCH EXISTING)

Detailed JUNE 2026
Checked JUNE 2026

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

STATE OF MISSOURI
GARRETT L HAGER
NUMBER PE-2023000437
PROFESSIONAL ENGINEER
GARRETT L. HAGER - CIVIL
MO-PE-2023000437

DATE PREPARED
10/23/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	1

COUNTY
BOONE

JOB NO.
JCD0333

CONTRACT ID.

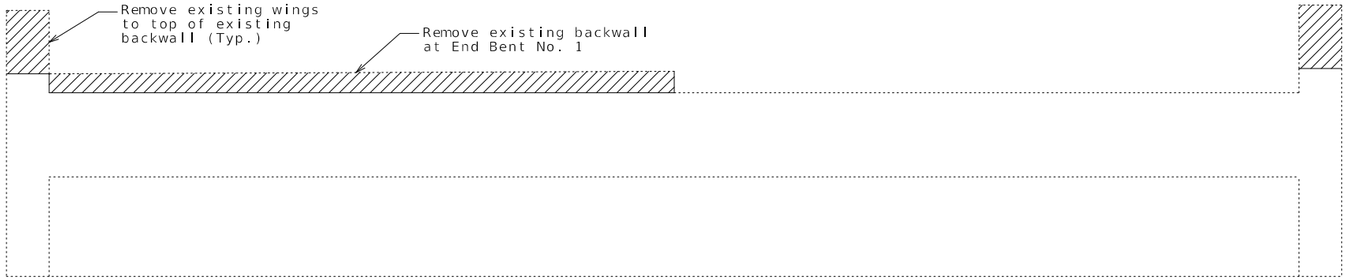
PROJECT NO.

BRIDGE NO.
A18993

DESCRIPTION

DATE

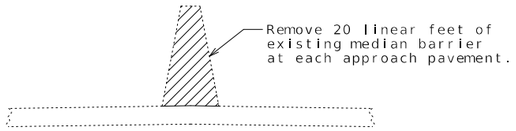
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



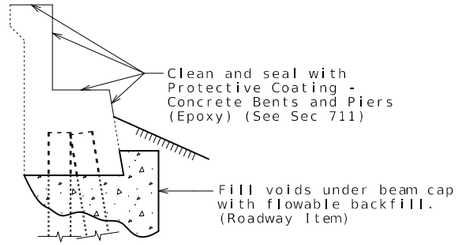
DETAILS OF CONCRETE REMOVAL AT END BENTS

The cost of concrete removal as shown will be considered completely covered by the contract unit price for Removal of Existing Bridge Deck. Vertical backwall and wingwall reinforcement to be cut off one inch below concrete removal surface and the resulting holes shall be filled with a qualified special mortar.

A smooth, level surface shall be provided at Bents No. 1 & 4 removal lines.



DETAILS OF CONCRETE REMOVAL AT APPROACH PAVEMENTS



TYPICAL SECTION THRU END BENT NO. 1 SHOWING PROTECTIVE COATING & FLOWABLE BACKFILL

General Notes:

Stay-In-Place Forms:

Corrugated steel forms, supports, closure elements and accessories shall be in accordance with grade requirement and coating designation G165 of ASTM A653. Complete shop drawings of the permanent steel deck forms shall be required in accordance with Sec 1080.

Corrugations of stay-in-place forms shall be filled with an expanded polystyrene material. The polystyrene material shall be placed in the forms with an adhesive in accordance with the manufacturer's recommendations.

Form sheets shall not rest directly on the top of beam flanges. Sheets shall be securely fastened to form supports with a minimum bearing length of one inch on each end. Form supports shall be placed in direct contact with the flange. Welding on or drilling holes in the beam flanges will not be permitted. All steel fabrication and construction shall be in accordance with Sec 1080 and 712. Certified field welders will not be required for welding of the form supports.

The design of stay-in-place corrugated steel forms is per manufacturer which shall be in accordance with Sec 703 for false work and forms. Maximum actual weight of corrugated steel forms allowed shall be 4 psf assumed for beam loading.

Pouring and Finishing Slab:

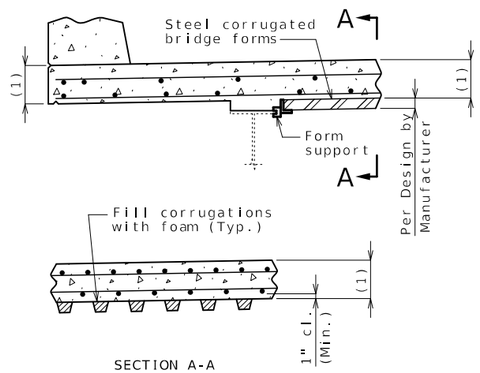
The contractor shall provide bracing necessary for lateral and torsional stability of the beams during construction of the concrete slab and remove the bracing after the slab has attained 75% design strength. Contractor shall not weld on or drill holes in the beams. The cost for furnishing, installing, and removing bracing will be considered completely covered by the contract unit price for Slab on Steel.

Slab shall be poured upgrade from end to end at a minimum rate of 25 cubic yards per hour.

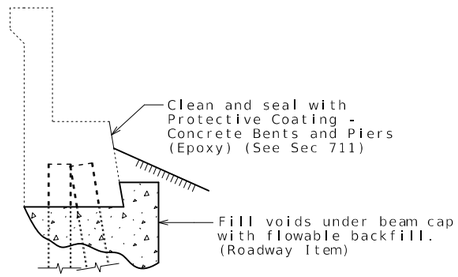
Alternate pour sequences may be submitted to the engineer for approval. Keyed construction joints shall be provided between pours.

Haunching:

(1) Slab is to be considered a uniform thickness as shown on the plans. Haunching will vary. See front sheet for slab thickness.



OPTIONAL STAY-IN-PLACE FORM DETAILS



TYPICAL SECTION THRU END BENT NO. 4 SHOWING PROTECTIVE COATING & FLOWABLE BACKFILL

All exposed surfaces of the existing structural steel piles shall be recoated with one 6-mil thickness of gray epoxy-mastic primer applied over an SSPC-SP3 surface preparation in acordance with Sec 1081. These protective coatings will not be required below the normal low water line. The cost of surface preparation will be considered completely covered by the contract lump sum price for Surface Preparation for Applying Epoxy-Mastic Primer. The cost of the gray epoxy-mastic primer will be comsidered completely covered by the contract lump sum price for Gray Epoxy-Mastic Primer.

STATE OF MISSOURI
GARRETT L. HAGER
NUMBER PE-2023000437
PROFESSIONAL ENGINEER
GARRETT L HAGER - CIVIL
MO-PE-2023000437

DATE PREPARED
10/20/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	2

COUNTY
BOONE

JOB NO.
JCD0333

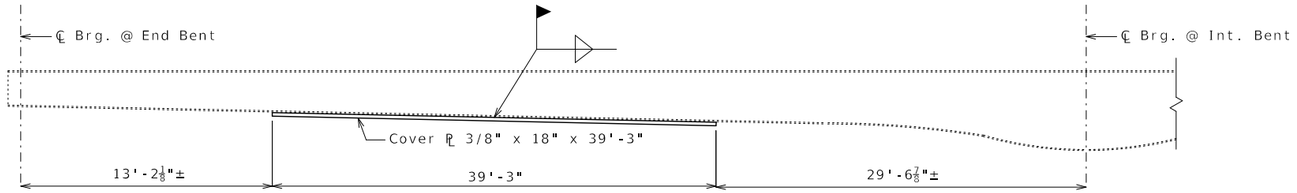
CONTRACT ID.

PROJECT NO.

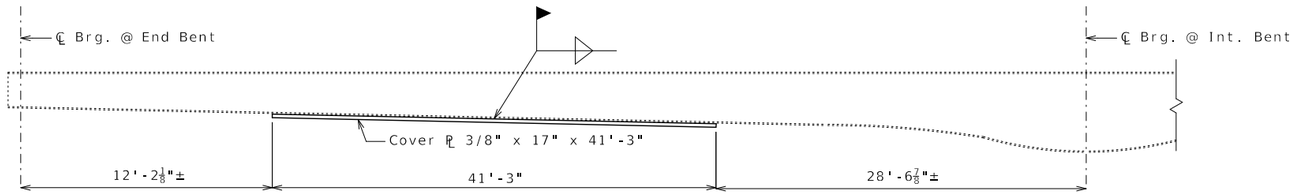
BRIDGE NO.
A18993

DESCRIPTION	DATE

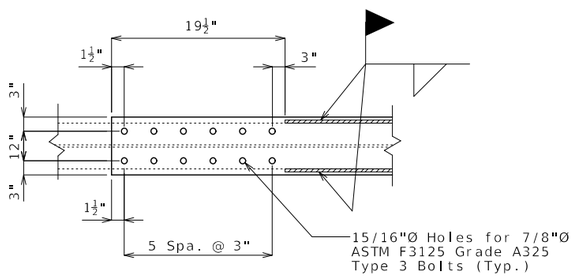
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



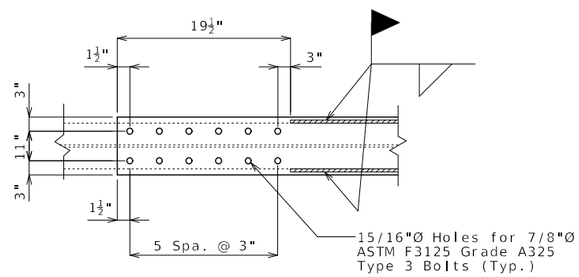
PART ELEVATION OF EXTERIOR GIRDER SHOWING COVER PLATE INSTALLATION
SPAN (1-2) AND SPAN (3-4)



PART ELEVATION OF INTERIOR GIRDER SHOWING COVER PLATE INSTALLATION
SPAN (1-2) AND SPAN (3-4)



TYPICAL DETAIL OF THE
ENDS OF EXTERIOR GIRDER
COVER PLATES
(BOTTOM VIEW)



TYPICAL DETAIL OF THE
ENDS OF INTERIOR GIRDER
COVER PLATES
(BOTTOM VIEW)

Notes:

Beam with end-bolted cover plates shall be installed in the following sequence after existing bridge deck is removed:

1. Drill holes in cover plate and flange.
2. Clean faying surfaces. (See Special Provisions)
3. Install and tighten bolts.
4. Weld cover plate to flange.

Fabricated Structural Steel shall be ASTM A709 Grade 36, except as noted.

Payment for 10,780 pounds of new cover plates, complete in place, will be considered completely covered by the contract lump sum price for Strengthening Existing Girders.

Notch toughness is required for all cover plates.

Contractor shall verify all dimensions in field before finalizing the shop drawings.

STRENGTHENING EXISTING GIRDERS

STATE OF MISSOURI
GARRETT L. HAGER
NUMBER PE-2023000437
PROFESSIONAL ENGINEER
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MO-PE-2023000437

DATE PREPARED
10/20/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	3

COUNTY
BOONE

JOB NO.
JCD0333

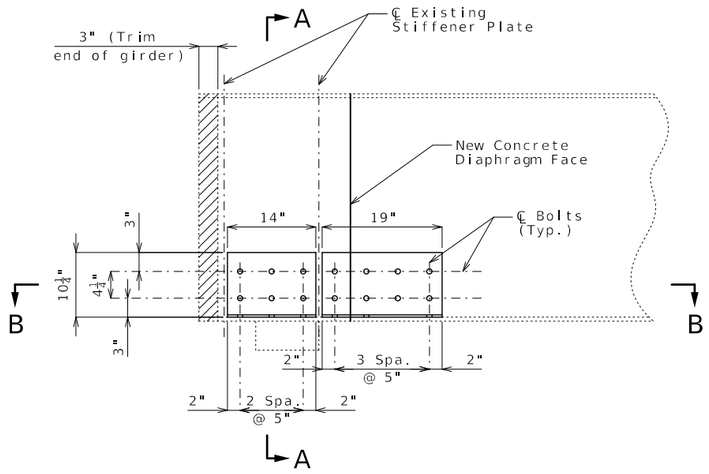
CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A18993

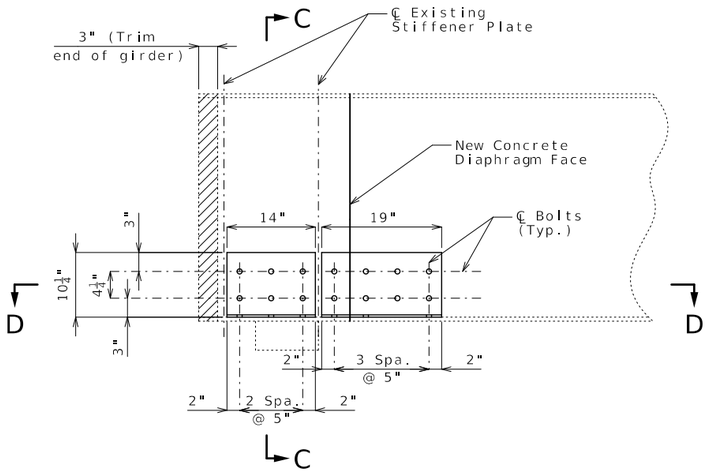
DESCRIPTION	DATE

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

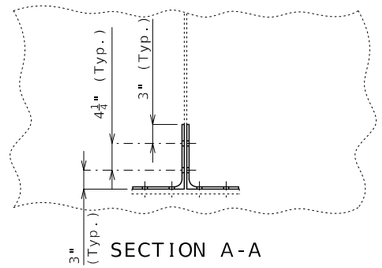


PART ELEVATION SHOWING BEAM END REPAIR (EXTERIOR GIRDERS)

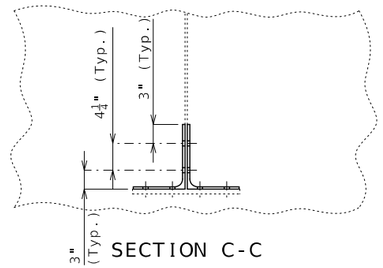
(Girder No. 1 shown, Girder No. 6 similar by mirroring at ℄ structure.)



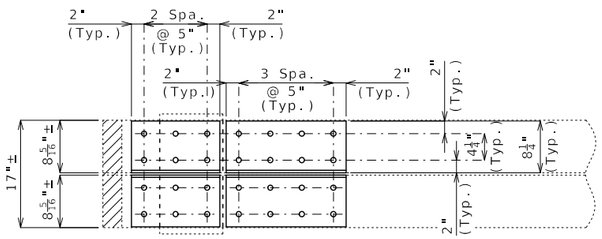
PART ELEVATION SHOWING BEAM END REPAIR (INTERIOR GIRDERS)



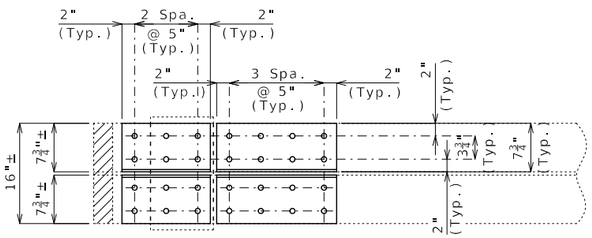
SECTION A-A



SECTION C-C



SECTION B-B



SECTION D-D

Notes:

Existing structural steel shall be cleaned and repainted in accordance with Sec 1081 prior to installation of new steel plates.

The cost of all structural steel, bolts, nuts and washers, and all associated labor, will be considered completely covered by the contract unit price for Structural Steel Repairs.

After bearings have been reset, holes for bolts in the bottom flange over bearings shall be drilled and tapped if bolt and nut installation can not be achieved.

All structural steel shall be ASTM A709 Grade 36.

Use 13/16"∅ holes for 3/4"∅ H.S. bolts, nuts and washers.

DETAILS OF STRUCTURAL STEEL REPAIR AT END BENT NO. 1

Detailed JUNE 2026
Checked JUNE 2026

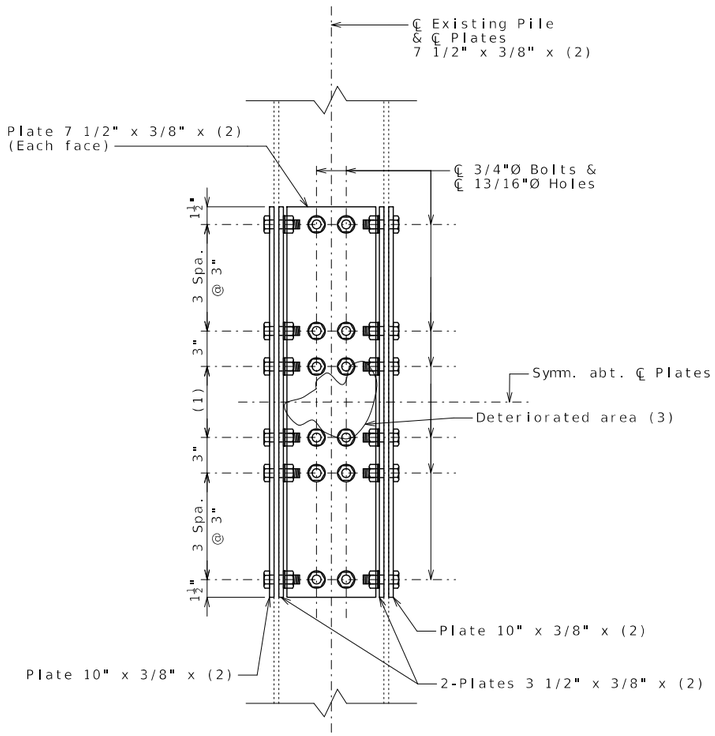
Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
GARRETT L HAGER
NUMBER PE-2023000437
PROFESSIONAL ENGINEER
GARRETT L. HAGER - CIVIL
MO-PE-2023000437

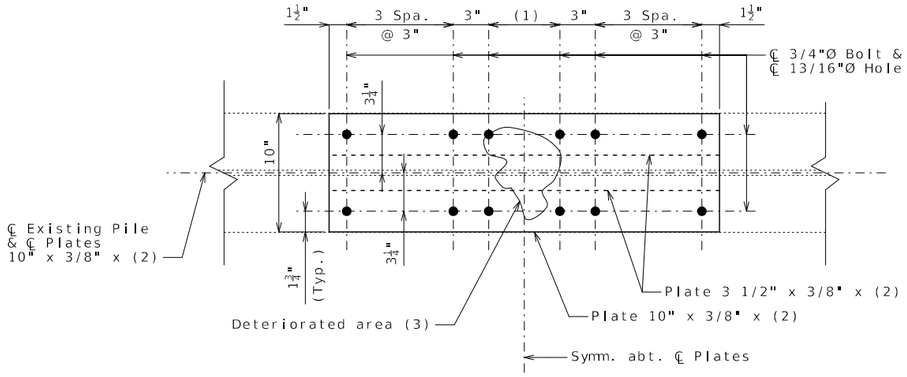
DATE PREPARED: 10/20/2026
ROUTE: 163 | STATE: MO
DISTRICT: BR | SHEET NO.: 4
COUNTY: BOONE
JOB NO.: JCD0333
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A18993

DESCRIPTION | DATE

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

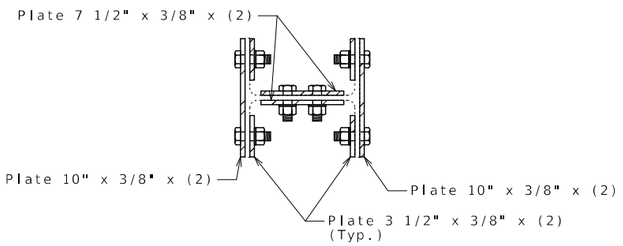


PART ELEVATION SHOWING PILE PLATING

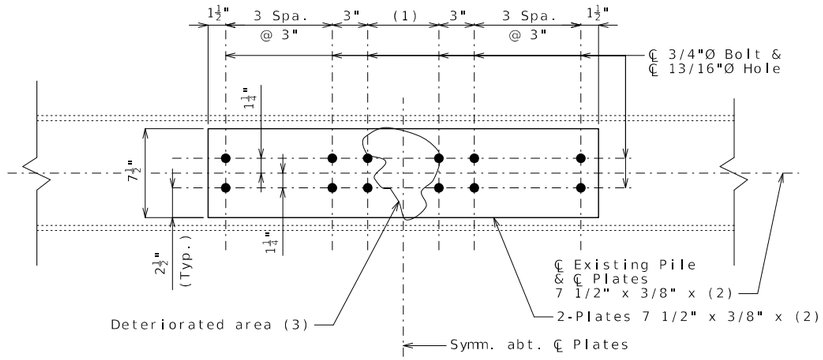


PART PLAN OF FLANGE SHOWING PILE PLATING

(Web plates not shown for clarity.)



SECTION SHOWING PILE PLATING



PART PLAN OF WEB SHOWING PILE PLATING

(Flange plates not shown for clarity.)

General Notes:

Design Specifications:
2002 AASHTO LFD (17th Ed.) Standard Specifications

Fabricated structural steel shall be ASTM A709 Grade 36 or 50.

Field connections shall be made with 3/4-inch diameter ASTM F3125 Grade A325 Type 1 bolts and 13/16-inch diameter holes.

Only one pile shall be repaired at a time.

Instructions for Pile Plating:

(1) Number of 3" spaces shall be determined in the field to extend past the extents of the deteriorated area.

(2) Plate length shall be determined in the field.

(3) Extents of deteriorated area will be determined by the engineer.

(4) Use plates as templates for field drilling holes in existing pile. Place bolts snug tight as drilled per each. High-strength tightening shall begin after all bolts are installed per flange or web.

General Notes:

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

All new or existing structural steel shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum).

Cost of furnishing and installing structural steel, including any excavation and any other incidental material or labor to complete pile repair, complete in place, will be considered completely covered by the contract unit price for Steel Pile Repair. Variations may be encountered in the estimated quantities but the variations can not be used for an adjustment in the contract unit price.

PILE REPAIR AT END BENT NO. 4

Detailed JUNE 2026
Checked JUNE 2026

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

STATE OF MISSOURI
GARRETT L HAGER
NUMBER PE-2023000437
PROFESSIONAL ENGINEER
GARRETT L. HAGER - CIVIL
MO-PE-2023000437

DATE PREPARED
10/20/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	5

COUNTY
BOONE

JOB NO.
JCD0333

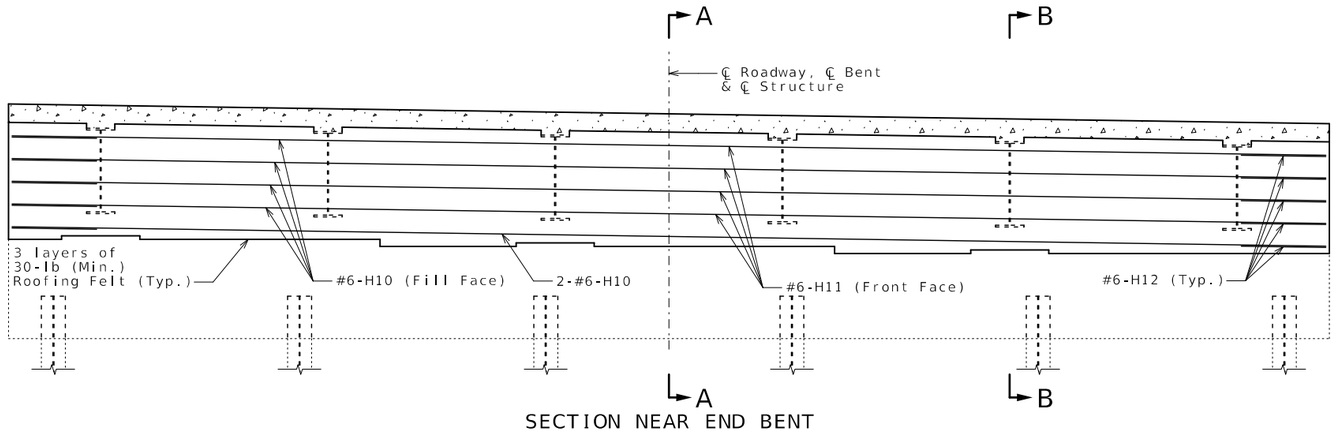
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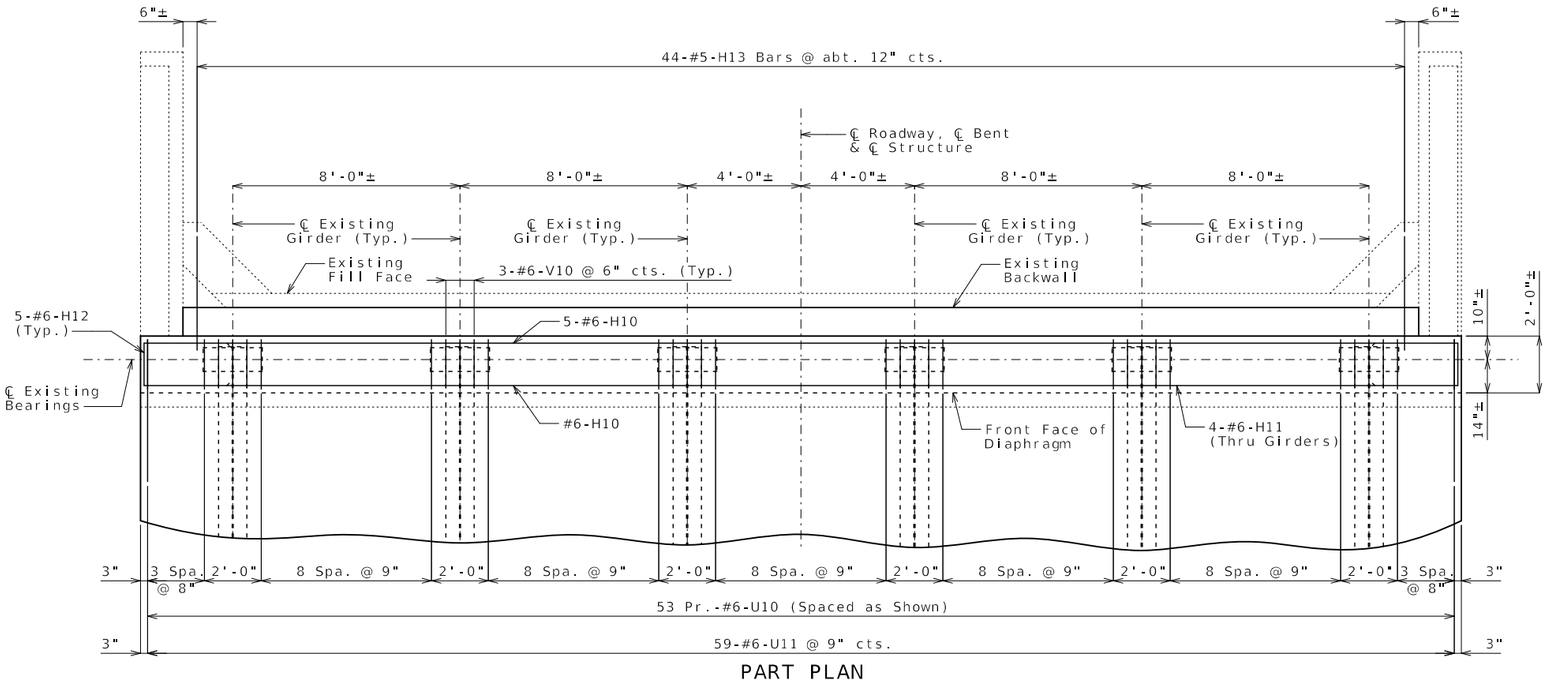
BRIDGE NO.
A18993

DESCRIPTION	DATE

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



SECTION NEAR END BENT



PART PLAN

Notes:

The contractor shall use one of the qualified resin anchor systems in accordance with Sec 1039.

Cost of furnishing and installing the resin anchor systems, complete in place, will be considered completely covered by the contract unit price for Slab on Steel.

The minimum embedment depth in concrete with f'c = 4,000 psi for the resin anchor systems shall be that required to meet the minimum ultimate pullout strength in accordance with Sec 1039 but shall not be less than 5".

An epoxy coated #6 Grade 60 reinforcing bar shall be substituted for the 3/4"○ threaded rod for System A.

The exposed and accessible surfaces of the existing structural steel and bearings that will be encased in concrete shall be cleaned with a minimum of SSPC-SP-3 surface preparation and coated with a minimum of one coat of gray epoxy-mastic primer (non-aluminum) in accordance with Sec 1081 to produce a dry film thickness of not less than 3 mils before concrete is poured. The surface preparation and coating for beams shall extend a minimum of one foot outside the face of the beam encasement. Payment for cleaning and coatingsteel to be encased in concrete will be considered completely covered by the contract unit price for Slab on Steel.

The H11 bars are segmented for ease of placement through girder web holes. The total bar length for H11 bars shown in Bill of Reinforcing Steel allows for one lap splice with a length of 3'-10". Acual bar segment lengths to be determined by contractor for ease of installing bars. The contractor may use a mechanical bar splice in lieu of a lap splice. When a mechanical bar splice is used, the actual bar segment length will be determined by the contractor to accommodate manufacturer's recommendations for installation and ease of construction. The cost of furnishing and installing the bar splices will be considered completely covered by the contract unit price for Slab on Steel. No adjustment of the quantity of reinforcing steel will be allowed for the use of mechanical bar splices.

Reset bearing pads and plates which have slipped out of place by jacking up the girder slightly, removing, cleaning, lubricating with graphite, and returning the bearing pads and plates to their proper position. Under no circumstances are sledge hammers to be used in an attempt to drive the bearing pads and plates back into position. Cost for resetting bearing pads and plates with be considered completely covered by the contract unit price for Rehabilitate Bearing.

Cost of field drilling holes in existing wide plate girder webs will be considered completely covered by the contract unit price for Slab on Steel.

All concrete and reinforcement is included in the Estimated Quantites for Slab on Steel and will be considered completely covered by the contract unit price for Slab on Steel.

Work this sheet with Sheet No. 7.

For Sections A-A & B-B see Sheet No. 7.

For details of Vertical Drains at End Bents, see Sheet No. 8.

For details and reinforcement of Type D barrier at End Bents, see Sheets No. 12 & 13.

For details and reinforcement of Type H barrier at End Bents, see Sheets No. 14 & 15.

STATE OF MISSOURI
GARRETT L HAGER
NUMBER PE-2023000437
PROFESSIONAL ENGINEER
GARRETT L HAGER - CIVIL
MO-PE-2023000437

DATE PREPARED
10/20/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	6

COUNTY
BOONE

JOB NO.
JCD0333

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A18993

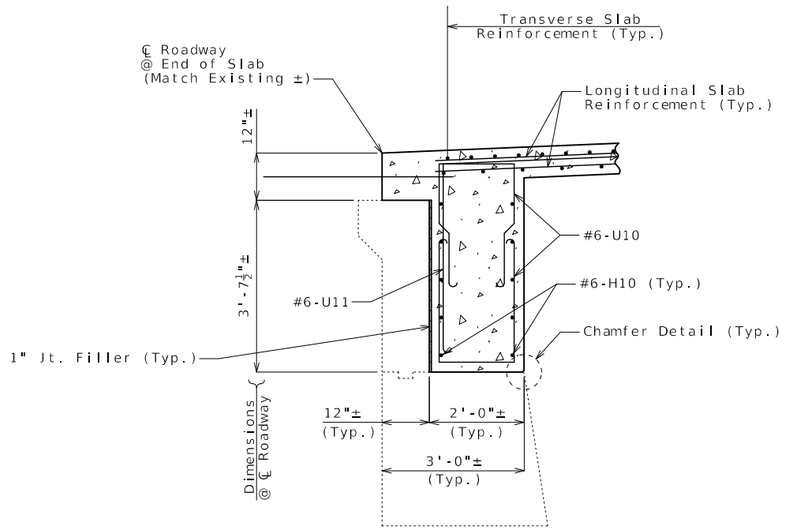
DESCRIPTION	DATE

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

DETAILS OF END BENT NO.1

Detailed JUNE 2026
Checked JUNE 2026

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

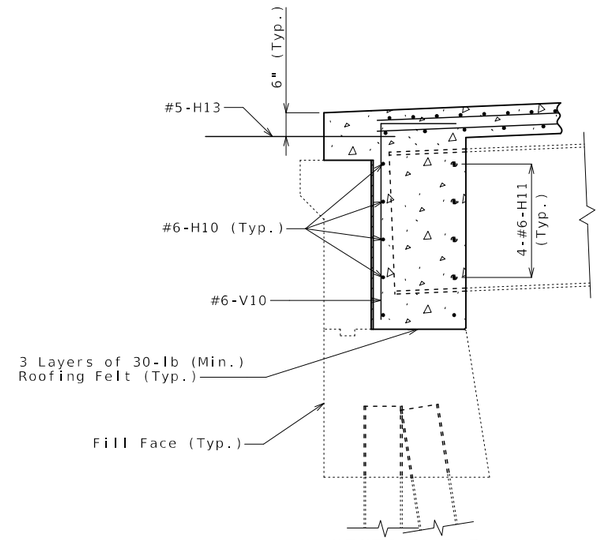


SECTION A-A

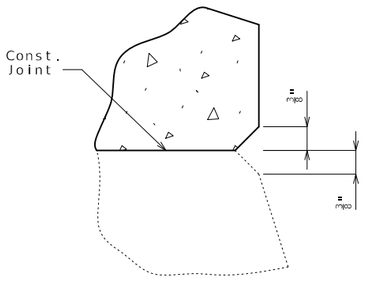
Notes:

Work this sheet with Sheet No. 6.

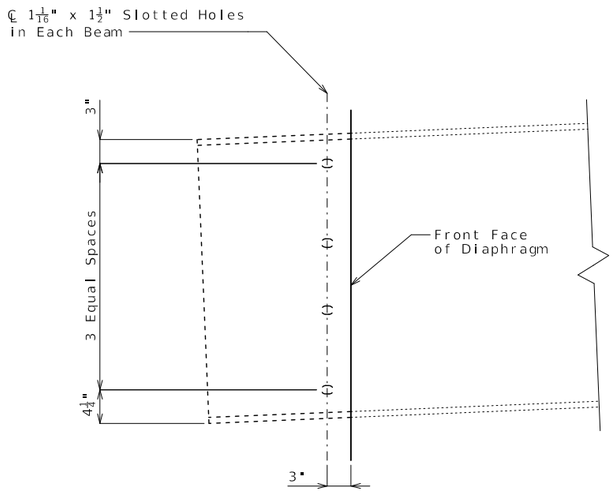
For reinforcement of the barrier, see Sheet No. 13.



SECTION B-B



CHAMFER DETAILS



DETAILS OF WEB HOLES
AT END BENT

END BENT NO. 1

STATE OF MISSOURI
GARRETT L. HAGER
NUMBER PE-2023000437
PROFESSIONAL ENGINEER
Garrett L. Hager
GARRETT L. HAGER - CIVIL
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DATE PREPARED
10/20/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	7

COUNTY
BOONE

JOB NO.
JCD0333

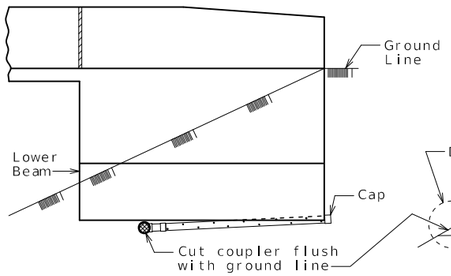
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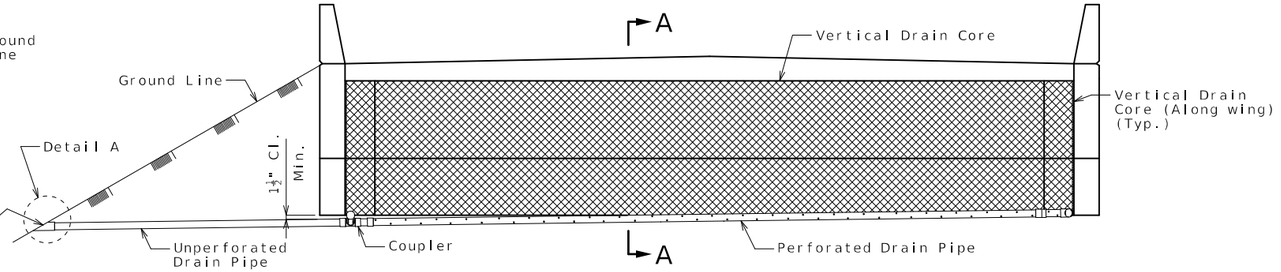
BRIDGE NO.
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DESCRIPTION	DATE

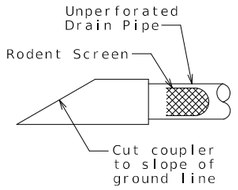
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



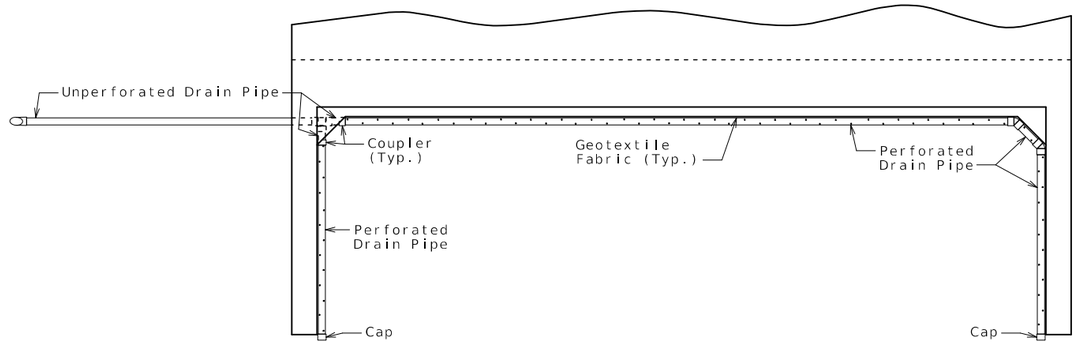
ELEVATION OF WING



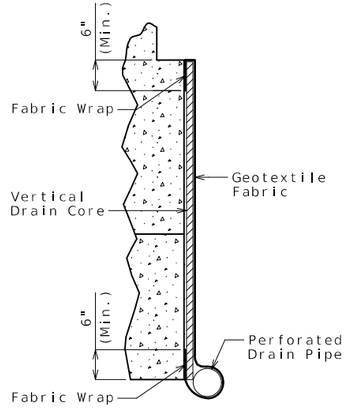
ELEVATION OF END BENT



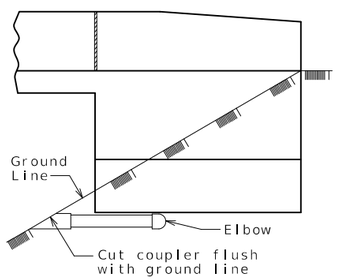
DETAIL A



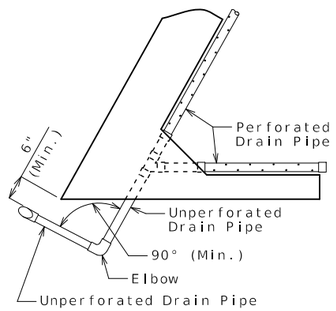
PLAN OF END BENT



PART SECTION A-A
(Section thru wing similar)



ELEVATION OF WING



PART PLAN

OPTIONAL TURNED DRAIN
(Use only when straight drain is not practical.)

General Notes:

All drain pipe shall be sloped 1 to 2 percent.

Drain pipe may be either 6-inch diameter corrugated metallic-coated steel pipe underdrain, 4-inch diameter corrugated polyvinyl chloride (PVC) drain pipe, or 4-inch diameter corrugated polyethylene (PE) drain pipe.

Drain pipe shall be placed at fill face of end bent and inside face of wings. The pipe shall slope to lowest grade of ground line, also missing the lower beam of end bent by a minimum of 1 1/2 inches.

Perforated pipe shall be placed at fill face side and inside face of wings at the bottom of end bent and plain pipe shall be used where the vertical drain ends to the exit at ground line.

VERTICAL DRAIN AT END BENTS

(Squared end bent shown, skewed end bent similar)

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10/20/2026

ROUTE	STATE
163	MO

DISTRICT	SHEET NO.
BR	8

COUNTY
BOONE

JOB NO.
JCD0333

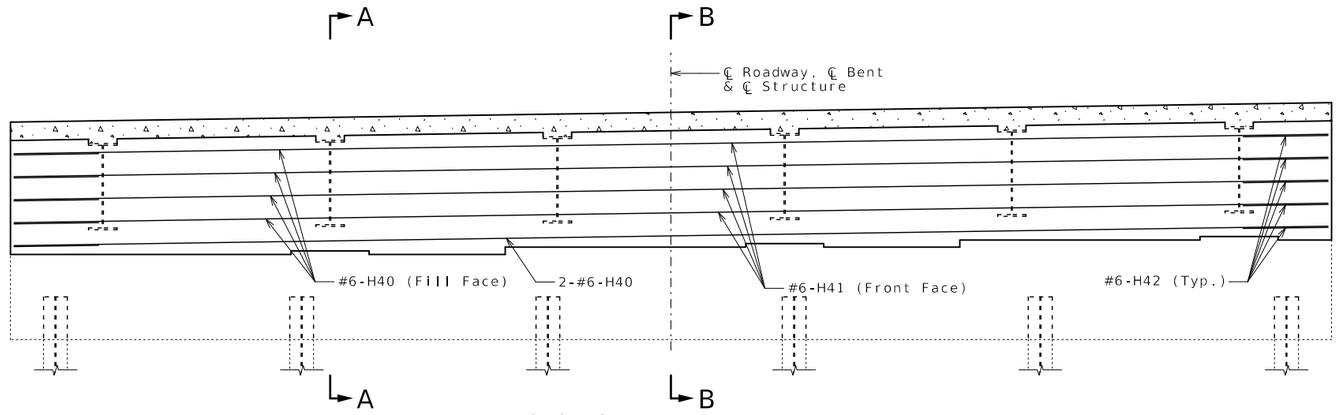
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PROJECT NO.

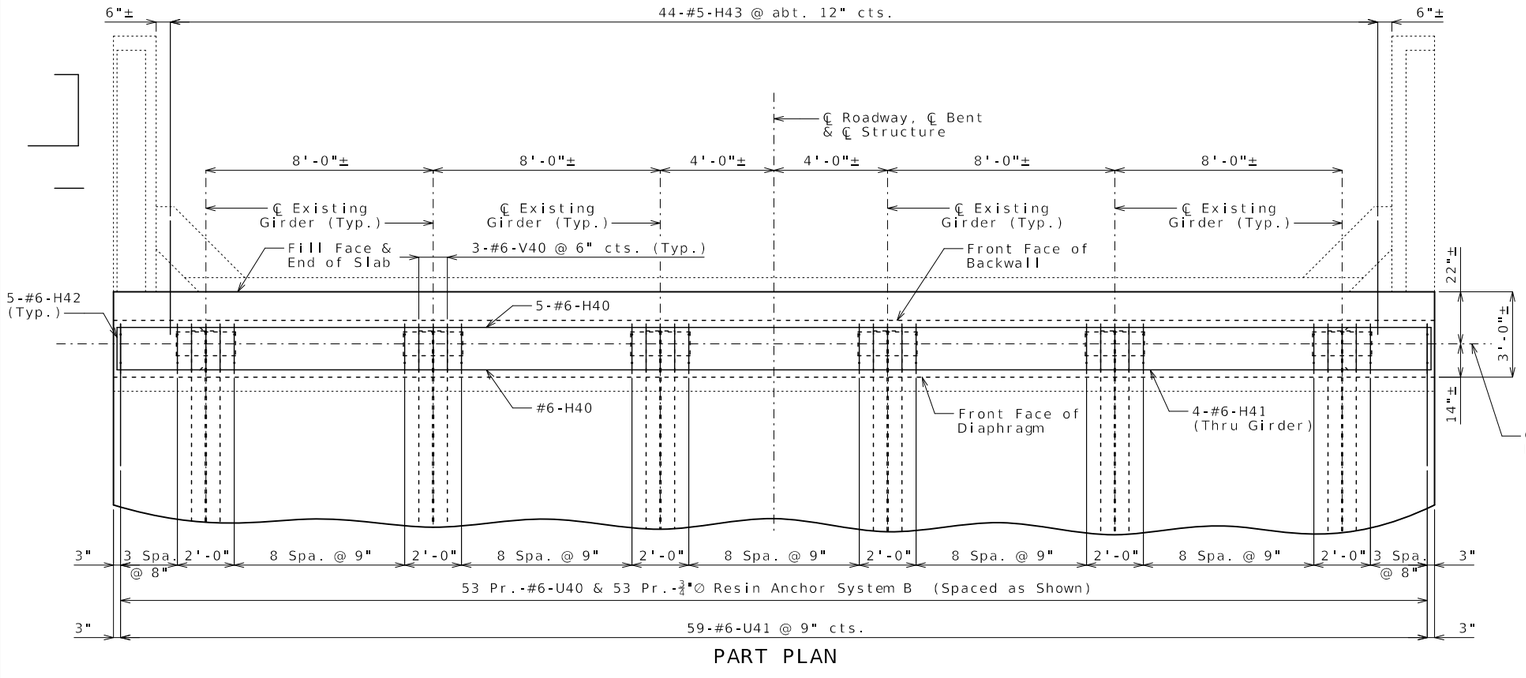
BRIDGE NO.
A18993

DESCRIPTION	DATE

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



SECTION NEAR END BENT



PART PLAN

Notes:

The contractor shall use one of the qualified resin anchor systems in accordance with Sec 1039.

Cost of furnishing and installing the resin anchor systems, complete in place, will be considered completely covered by the contract unit price for Slab on Steel.

The minimum embedment depth in concrete with f'c = 4,000 psi for the resin anchor systems shall be that required to meet the minimum ultimate pullout strength in accordance with Sec 1039 but shall not be less than 5".

An epoxy coated #6 Grade 60 reinforcing bar shall be substituted for the 3/4"∅ threaded rod for Systems A &B.

The exposed and accessible surfaces of the existing structural steel and bearings that will be encased in concrete shall be cleaned with a minimum of SSPC-SP-3 surface preparation and coated with a minimum of one coat of gray epoxy-mastic primer (non-aluminum) in accordance with Sec 1081 to produce a dry film thickness of not less than 3 mils before concrete is poured. The surface preparation and coating for beams shall extend a minimum of one foot outside the face of the beam encasement. Payment for cleaning and coatingsteel to be encased in concrete will be considered completely covered by the contract unit price for Slab on Steel.

The H41 bars are segmented for ease of placement through girder web holes. The total bar length for H41 bars shown in Bill of Reinforcing Steel allows for one lap splice with a length of 3'-10". Actual bar segment lengths to be determined by contractor for ease of installing bars. The contractor may use a mechanical bar splice in lieu of a lap splice. When a mechanical bar splice is used, the actual bar segment length will be determined by the contractor to accomodate manufacturer's recommendations for installation and ease of construction. The cost of furnishing and installing the bar splices will be considered completely covered by the contract unit price for Slab on Steel. No adjustment of the quantity of reinforcing steel will be allowed for the use of mechanical bar splices.

Cost of field drilling holes in existing wide flange beam webs will be considered completely covered by the contract unit price for Slab on Steel.

All concrete and reinforcement is included in the Estimated Quantites for Slab on Steel and will be considered completely covered by the contract unit price for Slab on Steel.

For details of Vertical Drains at End Bents, see Sheet No. 8.

Work this sheet with Sheet No. 10.

For Sections A-A & B-B, see Sheet No. 10.

For details and reinforcement of Type D barrier at End Bents, see Sheets No. 12 & 13.

For details and reinforcement of Type H Barrier at End Bents, see Sheets No. 14 & 15.

STATE OF MISSOURI
GARRETT L HAGER
NUMBER PE-2023000437
PROFESSIONAL ENGINEER
GARRETT L. HAGER - CIVIL
MO-PE-2023000437

DATE PREPARED
10/20/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	9

COUNTY
BOONE

JOB NO.
JCD0333

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A18993

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
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1-888-ASK-MODOT (1-888-275-6636)

DETAILS OF END BENT NO.4

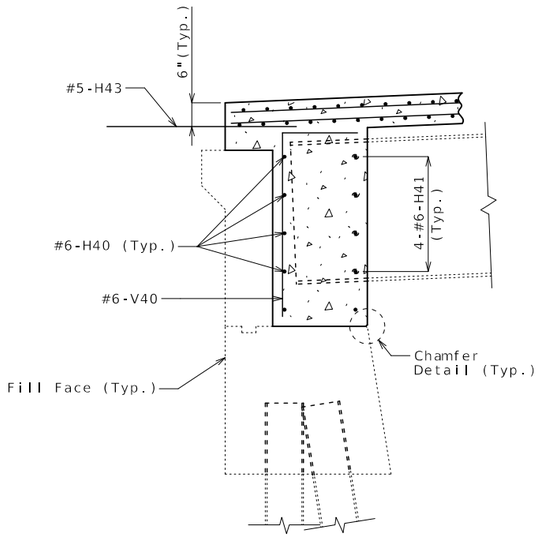
Detailed JUNE 2026
Checked JUNE 2026

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

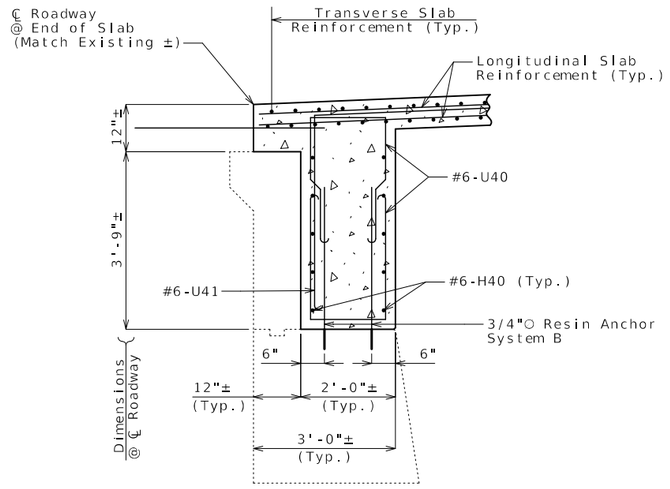
Notes:

Work this sheet with Sheet No. 9.

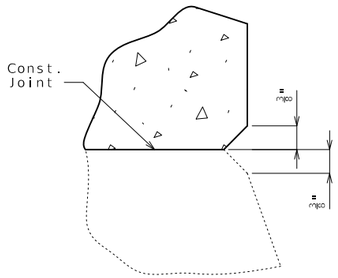
For reinforcement of the barrier, see Sheet No. 13.



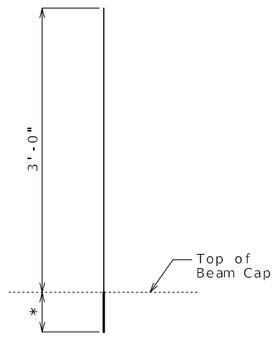
SECTION A-A



SECTION B-B

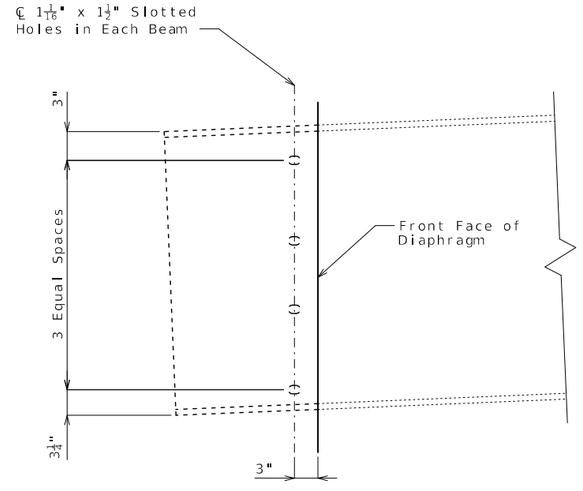


CHAMFER DETAIL



* Manufacturer's recommended embedment length (5" Min.)

DETAILS OF RESIN ANCHOR SYSTEMS



DETAILS OF WEB HOLES AT END BENT

END BENT NO. 4

STATE OF MISSOURI
GARRETT L. HAGER
NUMBER PE-2023000437
PROFESSIONAL ENGINEER
GARRETT L. HAGER - CIVIL
MO-PE-2023000437

DATE PREPARED: 10/20/2026

ROUTE	STATE
163	MO

DISTRICT	SHEET NO.
BR	10

COUNTY: BOONE

JOB NO.: JCD0333

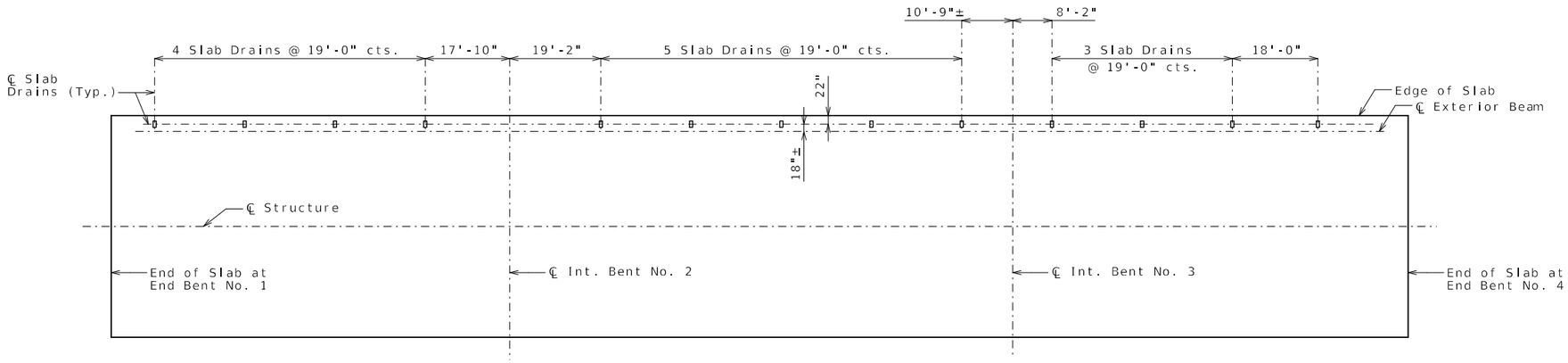
CONTRACT ID.:

PROJECT NO.:

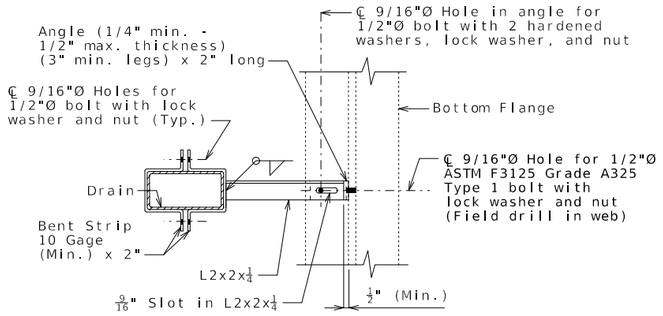
BRIDGE NO.: A18993

DESCRIPTION	DATE

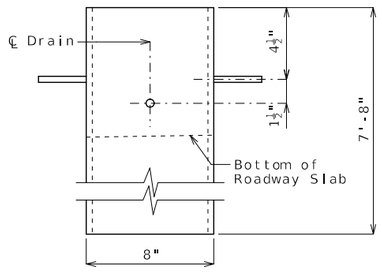
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



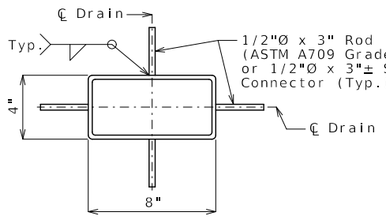
PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS



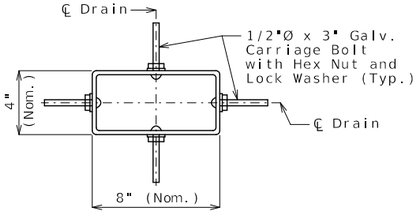
PART SECTION SHOWING BRACKET ASSEMBLY



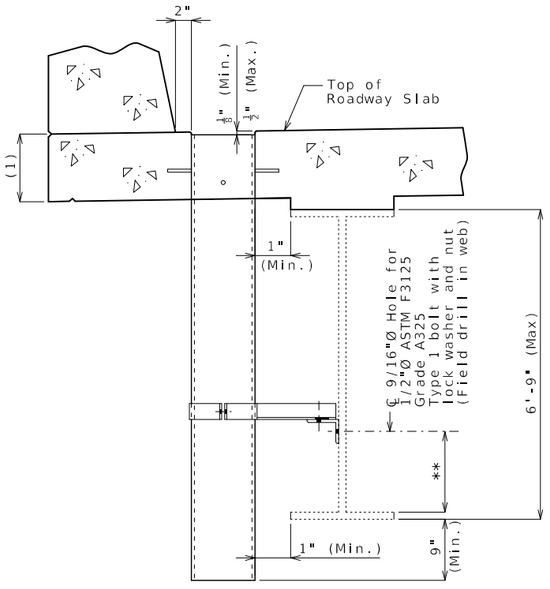
ELEVATION OF DRAIN



PLAN OF STEEL DRAIN OPTION

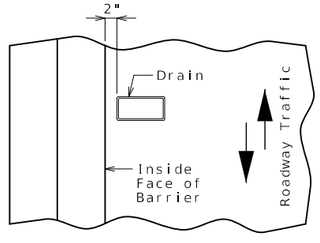


PLAN OF FRP DRAIN OPTION



PART SECTION NEAR DRAIN

** Use ⅛ of web depth.



PART PLAN OF SLAB AT DRAIN

General Notes:

Contractor shall have the option to construct either steel or FRP slab drains. All drains shall be of same type.

Slab drain bracket assembly shall be ASTM A709 Grade 36 steel.

Locate drains in slab by dimensions shown in Part Section Near Drain.

Reinforcing steel shall be shifted to clear drains.

The bracket assembly shall be galvanized in accordance with ASTM A123.

All bolts, hardened washers, lock washers and nuts shall be galvanized in accordance with ASTM F2329,

All 1/2"Ø bolts shall be ASTM A307, except as shown.

Shop drawings will not be required for the slab drains and the bracket assembly.

The bolt hole for the bracket assembly attachment shall be shifted to the minimum extent necessary to field drill in the existing web.

(1) See front sheet for slab thickness.

Notes for Steel Drain:

Slab drains may be fabricated of either 1/4" welded sheets of ASTM A709 Grade 36 steel or from 1/4" structural steel tubing ASTM A500 or A501.

Outside dimensions of drains are 8" x 4".

The drains shall be galvanized in accordance with ASTM A123.

Notes for FRP Drain:

Drains shall be machine filament-wound thermosetting resin tubing meeting the requirements of ASTM D2996 with the following exceptions:

Shape of drains shall be rectangular with outside nominal dimensions of 8" x 4".

Minimum reinforced wall thickness shall be 1/4 inch.

The resin used shall be ultraviolet (UV) resistant and/or have UV inhibitors mixed throughout. Drains may have an exterior coating for additional UV resistance.

The color of the slab drain shall be gray (Federal Standard #26373). The color shall be uniform throughout the resin and any coating used.

The combination of materials used in the manufacture of the drains shall be tested for UV resistance in accordance with ASTM D4329 Cycle A. The representative material shall withstand at least 500 hours of testing with only minor discoloration and without any physical deterioration. The contractor shall furnish the results of the required ultraviolet testing prior to acceptance of the slab drains.

At the contractor's option, drains may be field cut. The method of cutting FRP slab drain shall be recommended by the manufacturer to ensure a smooth, chip free cut.

STATE OF MISSOURI
GARRETT L HAGER
NUMBER PE-2023000437
PROFESSIONAL ENGINEER
GARRETT L. HAGER - CIVIL
MO-PE-2023000437

DATE PREPARED
10/20/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	11

COUNTY
BOONE

JOB NO.
JCD0333

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A18993

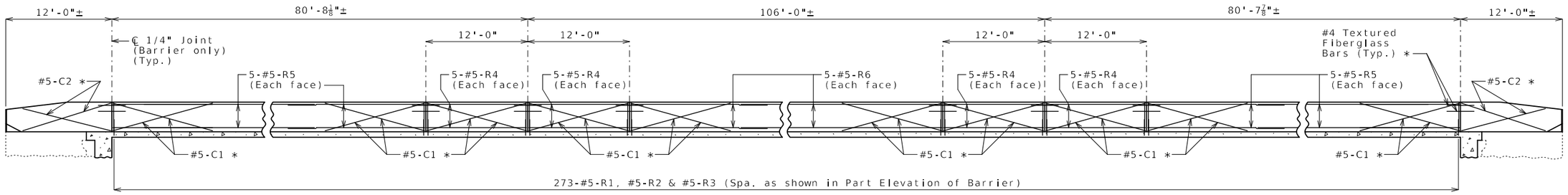
DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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JEFFERSON CITY, MO 65102
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SLAB DRAINS

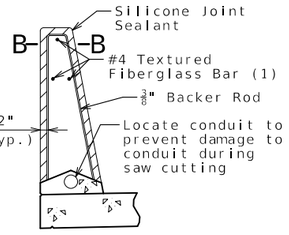
Detailed JUNE 2026
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Note: This drawing is not to scale. Follow dimensions.

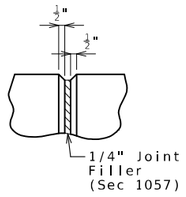


ELEVATION OF LEFT BARRIER

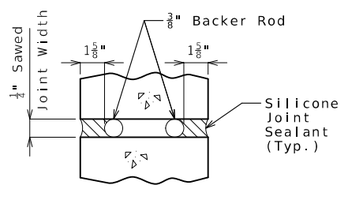
Longitudinal dimensions are horizontal.



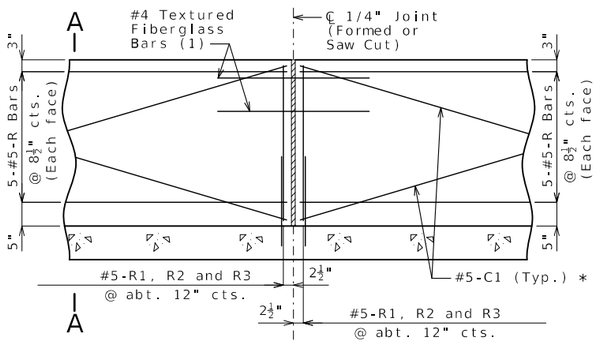
SECTION THRU SAW CUT JOINT



PART ELEVATION AT FORMED JOINT

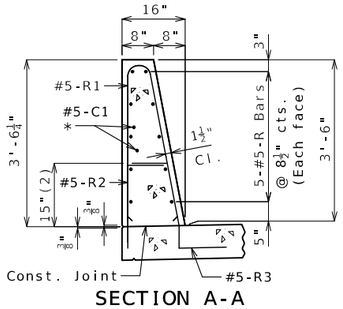


SECTION B-B



PART ELEVATION OF BARRIER

(1) Four feet long, centered on joint, slip-formed option only

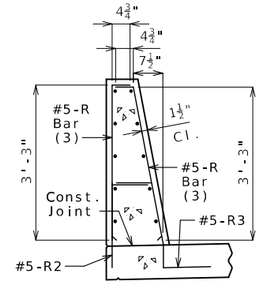


SECTION A-A

Use a minimum lap of 2'-6" for #5 horizontal barrier bars.

The cross-sectional area above the slab is 3.52 square feet.

(2) To top of bar



R-BAR PERMISSIBLE ALTERNATE SHAPE

(3) The R1 bar may be separated into two bars as shown, at the contractor's option, only when slip forming is not used. (All dimensions are out to out.)

General Notes:

* Slip-formed option only.

Conventional forming or slip forming may be used. Saw cut joints may be used with conventional forming.

Top of barrier shall be built parallel to grade and barrier joints (except at end bents) normal to grade.

All exposed edges of barrier shall have either a 1/2-inch radius or a 3/8-inch bevel, unless otherwise noted.

Payment for all concrete and reinforcement, complete in place, will be considered completely covered by the contract unit price for Type D Barrier per linear foot.

Concrete in barrier shall be Class B-1.

Measurement of barrier is to the nearest linear foot for each structure, measured along the outside top of slab from end of wing to end of wing.

Concrete traffic barrier delineators shall be placed on top of the barrier as shown on Missouri Standard Plan 617.10 and in accordance with Sec 617. Delineators on bridges with two-lane, two-way traffic shall have retroreflective sheeting on both sides. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for Type D Barrier.

Joint sealant and backer rods shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

For slip-formed option, both sides of barrier shall have a vertically broomed finish and the top shall have a transversely broomed finish.

Conduit system in left barrier not shown for clarity. For details of counduit system, see Sheet No. 18.

Plastic waterstop shall not be used with saw cut joints.

TYPE D BARRIER

Detailed JUNE 2026
Checked JUNE 2026

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

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PROFESSIONAL ENGINEER
GARRETT L. HAGER - CIVIL
MO-PE-2023000437

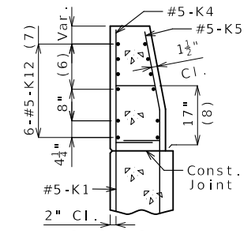
DATE PREPARED 10/20/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	12

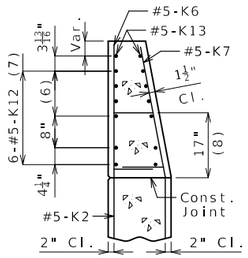
COUNTY: BOONE
JOB NO.: JCD0333
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A18993

DATE	DESCRIPTION

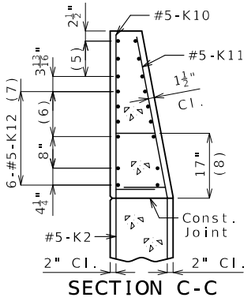
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105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



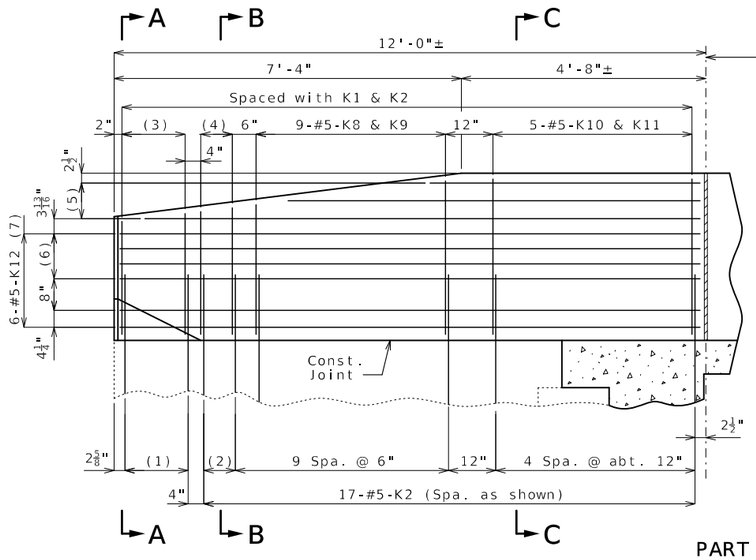
SECTION A-A

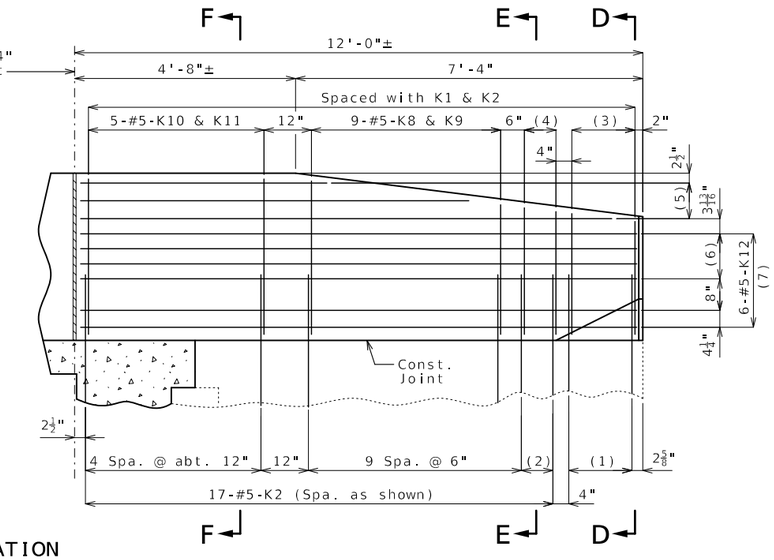


SECTION B-B

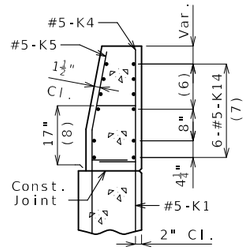


SECTION C-C

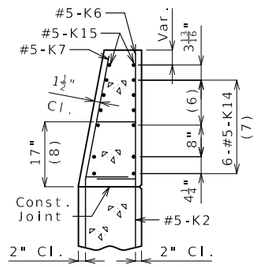




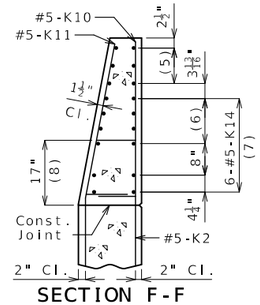
PART ELEVATION



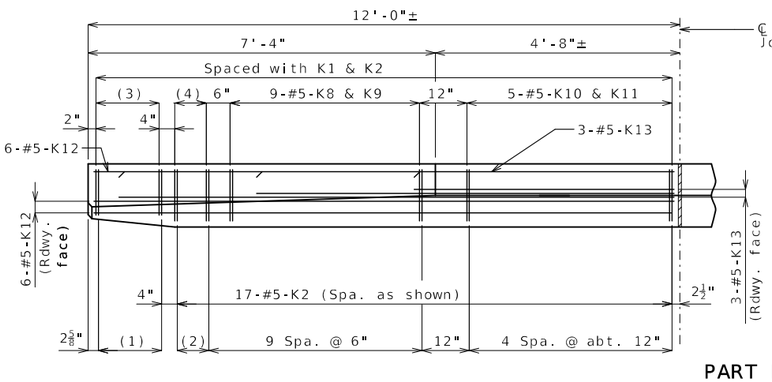
SECTION D-D

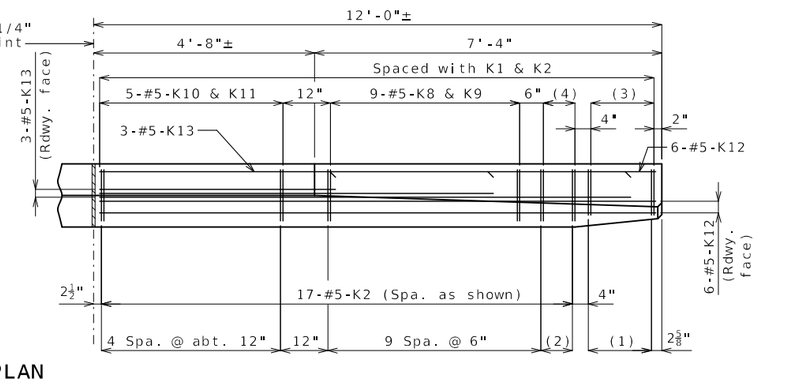


SECTION E-E

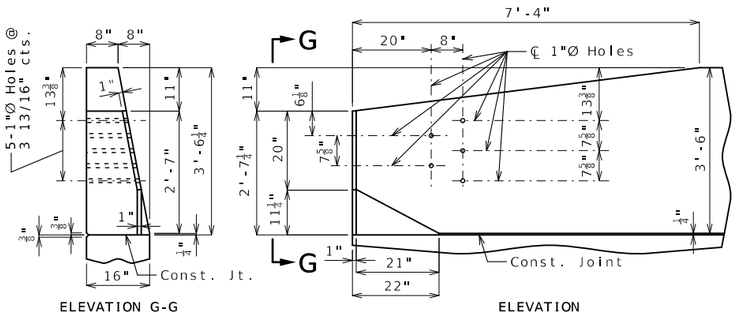


SECTION F-F





PART PLAN



ELEVATION G-G

ELEVATION

(1) 5-#5-K1 @ 4" cts.

(2) 2 spaces @ 4"

(3) 5-#5-K4 & K5

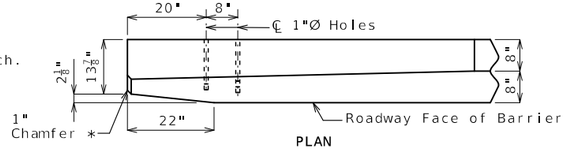
(4) 3-#5-K6 & K7

(5) 3-#5-K13 @ 4½" cts., each face

(6) 3 spaces @ 3 13/16"

(7) Spaced as shown, each face

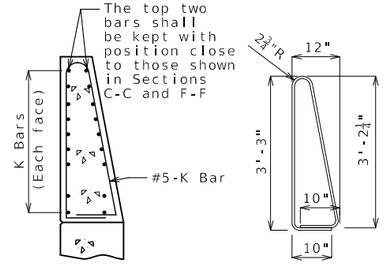
(8) To top of bar



PLAN

* Transition to zero at Type A curb for gutter lines to match.

DETAILS OF GUARD RAIL ATTACHMENT



K10-K11 BAR PERMISSIBLE ALTERNATE SHAPE

(Other K bars not shown for clarity)

The K10-K11 bar combination may be furnished as one bar as shown, at the contractor's option.

All dimensions are out to out.

General Notes:

Concrete traffic barrier delineators shall be placed on top of the barrier as shown on Missouri Standard Plan 617.10 and in accordance with Sec 617. Delineators on bridges with two-lane, two-way traffic shall have retroreflective sheeting on both sides. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for Type D Barrier.

Reinforcing Steel:
Minimum clearance to reinforcing steel shall be 1 1/2" except as shown for bars embedded into end bent.

TYPE D BARRIER AT END BENTS

(Left barrier shown)

Detailed JUNE 2026
Checked JUNE 2026

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

STATE OF MISSOURI
GARRETT L HAGER
NUMBER PE-2023000437
PROFESSIONAL ENGINEER
Garrett L Hager
Digitally signed by GARRETT L HAGER - CIVIL
MO-PE-2023000437

DATE PREPARED
10/20/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	13

COUNTY
BOONE

JOB NO.
JCD0333

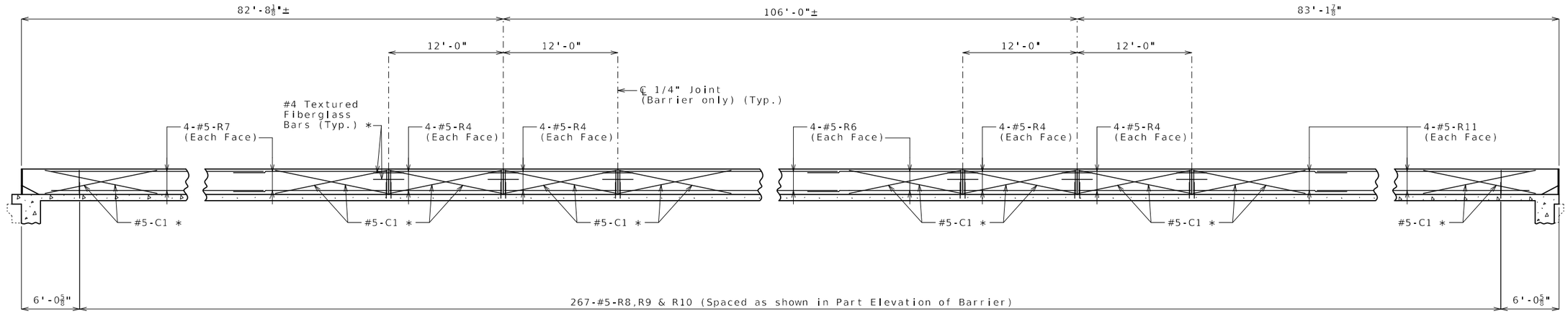
CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A18993

DESCRIPTION	DATE

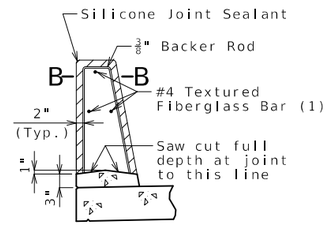
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



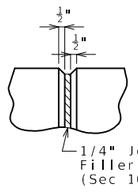
SPAN (1-2) SPAN (2-3) SPAN (3-4)

ELEVATION OF RIGHT BARRIER

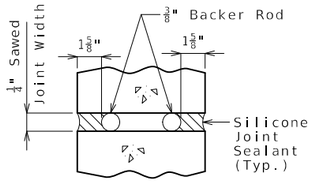
Longitudinal dimensions are horizontal.



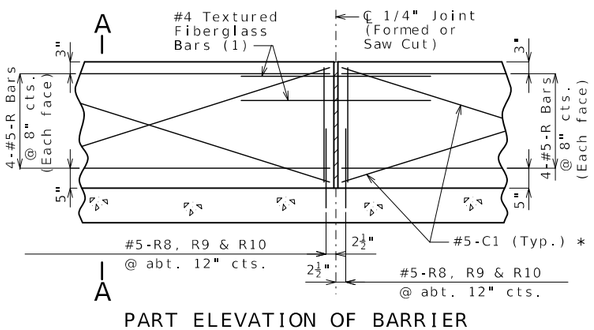
SECTION THRU SAW CUT JOINT



PART ELEVATION AT FORMED JOINT

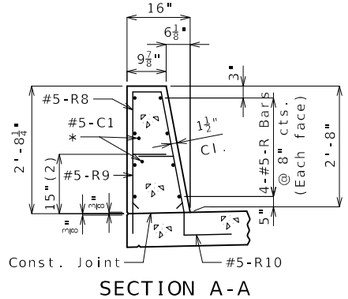


SECTION B-B



PART ELEVATION OF BARRIER

(1) Four feet long, centered on joint, slip-formed option only

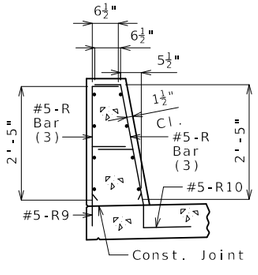


SECTION A-A

Use a minimum lap of 2'-6" for #5 horizontal barrier bars.

The cross-sectional area above the slab is 2.89 square feet.

(2) To top of bar



R-BAR PERMISSIBLE ALTERNATE SHAPE

(3) The R8 bar may be separated into two bars as shown, at the contractor's option, only when slip forming is not used. (All dimensions are out to out.)

General Notes:

* Slip-formed option only.

Conventional forming or slip forming may be used. Saw cut joints may be used with conventional forming.

Top of barrier shall be built parallel to grade and barrier joints normal to grade.

All exposed edges of barrier shall have either a 1/2-inch radius or a 3/8-inch bevel, unless otherwise noted.

Payment for all concrete and reinforcement, complete in place, will be considered completely covered by the contract unit price for Type H Barrier per linear foot.

Concrete in barrier shall be Class B-1.

Measurement of barrier is to the nearest linear foot for each structure, measured along the outside top of slab from end of slab to end of slab.

Concrete traffic barrier delineators shall be placed on top of the barrier as shown on Missouri Standard Plan 617.10 and in accordance with Sec 617. Delineators on bridges with two-lane, two-way traffic shall have retroreflective sheeting on both sides. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for Type H Barrier.

Joint sealant and backer rods shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

For slip-formed option, both sides of barrier shall have a vertically broomed finish and the top shall have a transversely broomed finish.

Plastic waterstop shall not be used with saw cut joints.

STATE OF MISSOURI
GARRETT L HAGER
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PROFESSIONAL ENGINEER
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MO-PE-2023000437

DATE PREPARED
10/20/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	14

COUNTY
BOONE

JOB NO.
JCD0333

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A18993

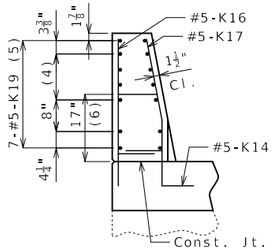
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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

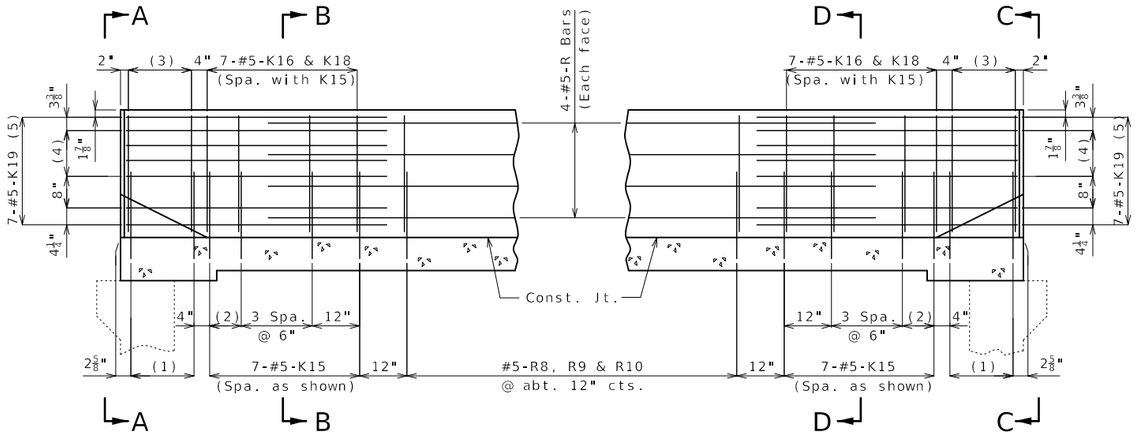
TYPE H BARRIER

Detailed SEPT 2026
Checked SEPT 2026

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



ELEVATION A-A



PART ELEVATION

(1) 5-#5-K14 @ 4" cts.

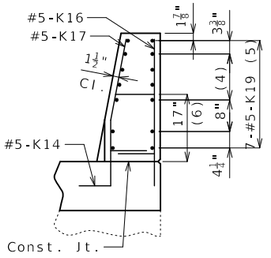
(2) 2 Spaces @ 4"

(3) 5-#5-K16 and 5-#5-K17, spaced with K14

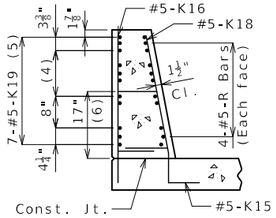
(4) 3 Spaces @ $3\frac{13}{16}$"

(5) Spaced as shown, each face

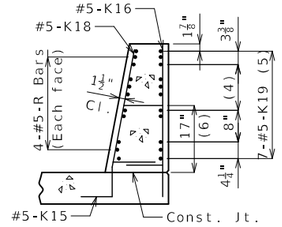
(6) To top of bar



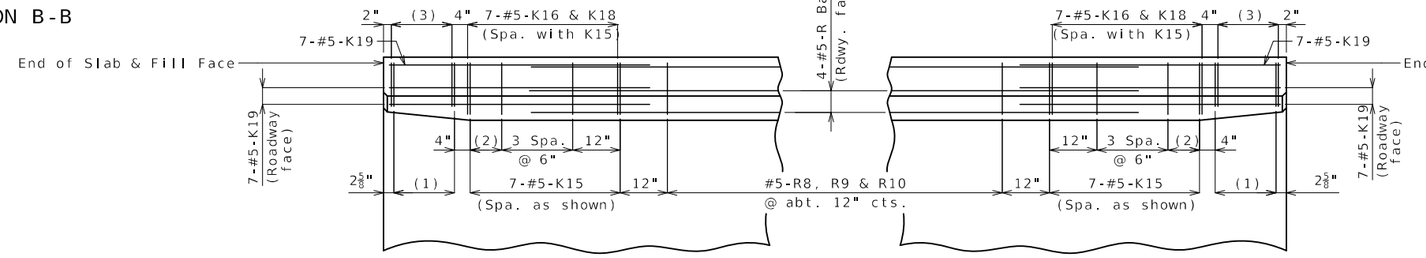
ELEVATION C-C



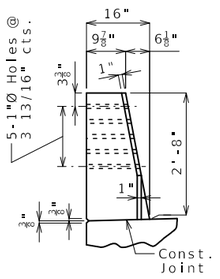
SECTION B-B



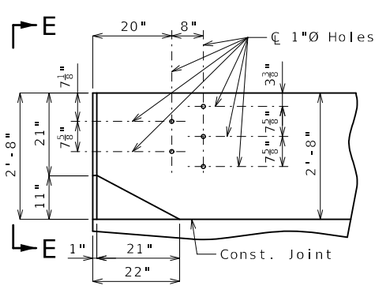
SECTION D-D



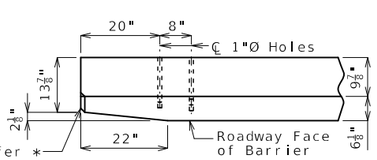
PART PLAN



ELEVATION E-E



ELEVATION



PLAN

* Transition to zero at Type A curb for gutter lines to match.

DETAILS OF GUARD RAIL ATTACHMENT

General Notes:

Concrete traffic barrier delineators shall be placed on top of the barrier as shown on Missouri Standard Plan 617.10 and in accordance with Sec 617. Delineators on bridges with two-lane, two-way traffic shall have retroreflective sheeting on both sides. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for Type H Barrier.

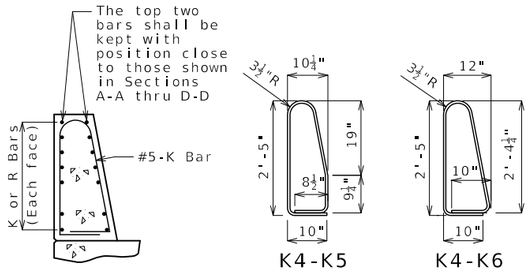
Reinforcing Steel:

Minimum clearance to reinforcing steel shall be 1 1/2".

Use a minimum lap of 2'-6" between K19 bars and R bars.

TYPE H BARRIER AT END BENTS

(Left barrier shown, right barrier similar)



PERMISSIBLE ALTERNATE SHAPES

(Other K bars not shown for clarity)

The K16-K17 and K16-K18 bar combination may be furnished as one bar as shown, at the contractor's option.

All dimensions are out to out.

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MO-PE-2023000437

DATE PREPARED
10/20/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	15

COUNTY
BOONE

JOB NO.
JCD0333

CONTRACT ID.

PROJECT NO.

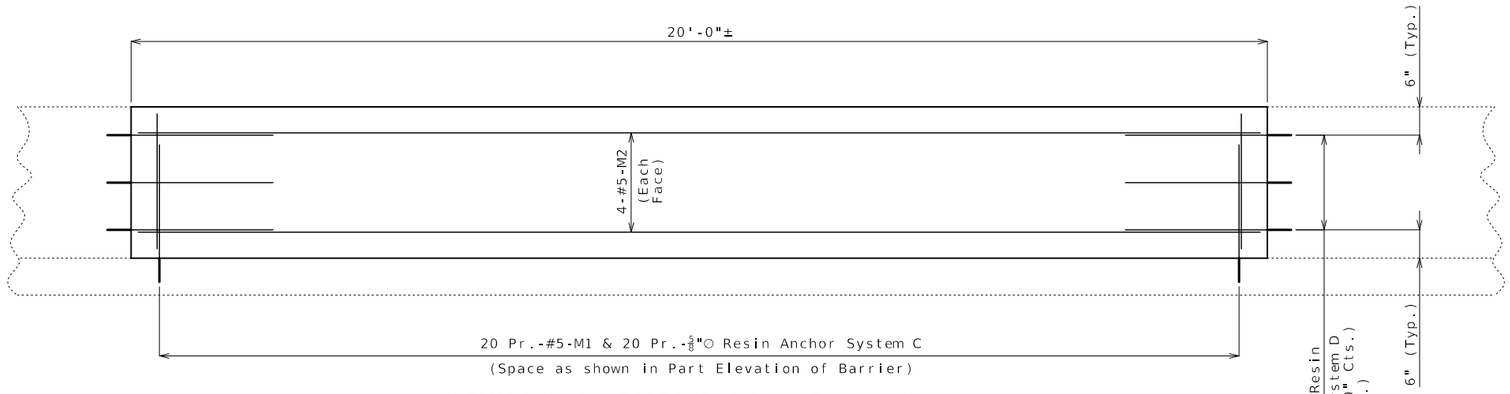
BRIDGE NO.
A18993

DESCRIPTION	DATE

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

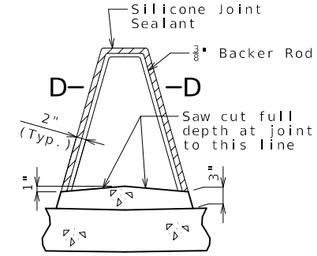
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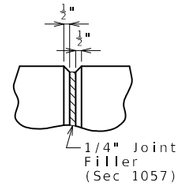


ELEVATION OF BARRIER AT APPROACH SLABS

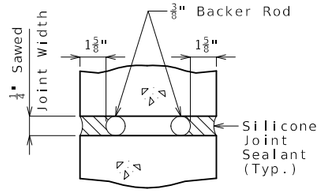
Longitudinal dimensions are horizontal.



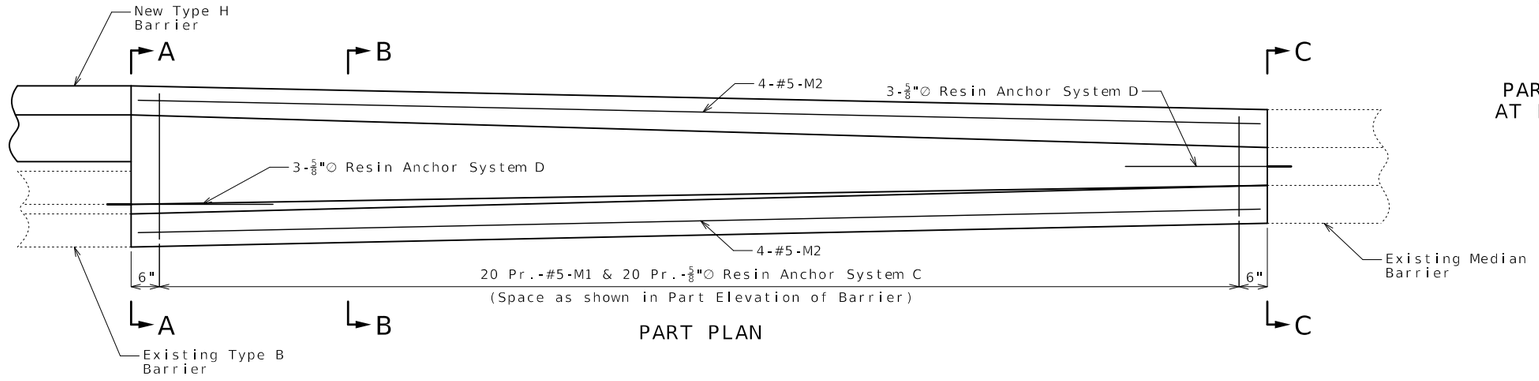
SECTION THRU SAW CUT JOINT



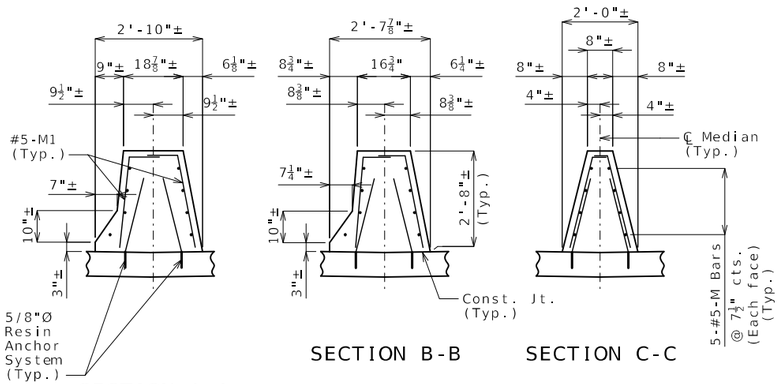
PART ELEVATION AT FORMED JOINT



SECTION D-D



PART PLAN



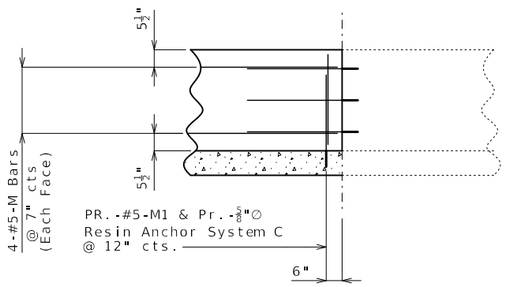
SECTION A-A

Use a minimum lap of 2'-6" for #5 horizontal barrier bars.

The cross-sectional area above the slab is 4.69 square feet.

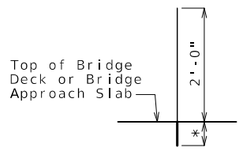
SECTION B-B

SECTION C-C

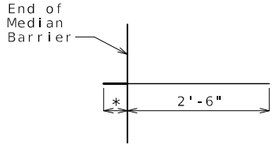


PART ELEVATION OF BARRIER

(1) Four feet long, centered on joint, slip-formed option only



Resin Anchor System C (80 required) (Bend in Field)



Resin Anchor System D (12 required)

DETAILS OF RESIN ANCHOR SYSTEMS

* Manufacturer's recommended embedment length (5" Min.)

General Notes:

* Slip-formed option only.

Conventional forming or slip forming may be used. Saw cut joints may be used with conventional forming.

Top of barrier shall be built parallel to grade with barrier joints normal to grade.

All exposed edges of barrier shall have either a 1/2-inch radius or a 3/8-inch bevel, unless otherwise noted.

Payment for all concrete and reinforcement, complete in place, will be completely covered by the contract unit price for Type C Barrier per linear foot.

Concrete in the barrier shall be Class B-1.

Measurement of barrier is to the nearest linear foot, measured along the top of slab at centerline median from end of bridge approach slab to end of bridge approach slab.

Concrete traffic barrier delineators shall be placed on top of the barrier as shown on Missouri Standard Plan 617.10 and in accordance with Sec 617. Delineators shall have retroreflective sheeting on both sides. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for Concrete Traffic Barrier Transition.

Joint sealant and backer rods shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

For slip-formed option, both sides of barrier shall have a vertically broomed finish and the top shall have a transversely broomed finish.

The contractor shall use one of the qualified resin anchor systems in accordance with 1039.

Cost of furnishing and installing the resin anchor system, complete in place, will be considered completely covered by the contract unit price for Concrete Traffic Barrier Transition.

The minimum embedment depth in concrete with f'c = 4,000 psi for the resin anchor system shall be that required to meet the minimum ultimate pullout strength in accordance with Sec 1039 but shall not be less than 5 inches.

An epoxy coated #5 Grade 60 reinforcing bar shall be substituted for the 5/8-inch diameter threaded rod.

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DATE PREPARED: 10/20/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	16

COUNTY: BOONE

JOB NO.: JCD0333

CONTRACT ID.:

PROJECT NO.:

BRIDGE NO.: A18993

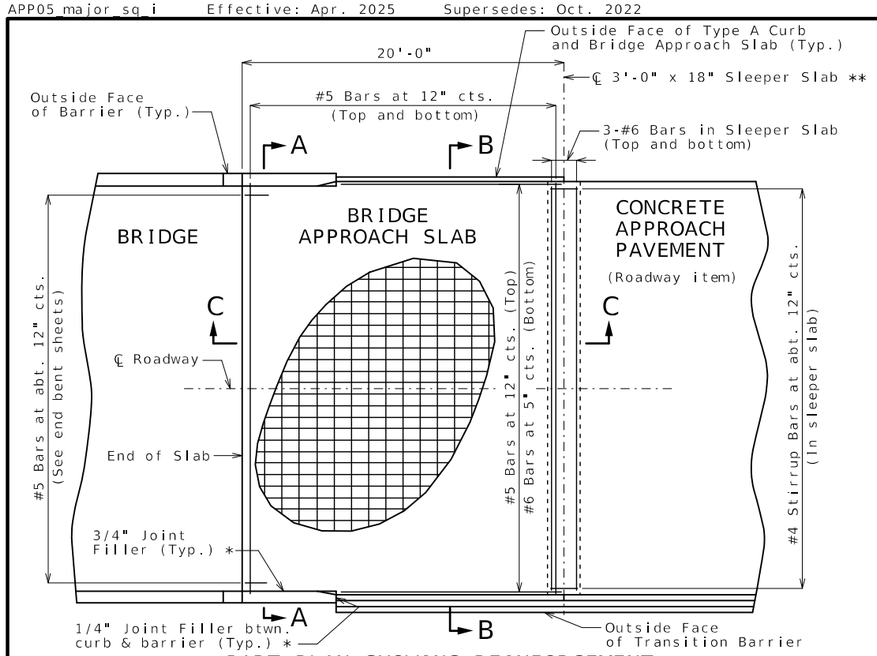
DESCRIPTION	DATE

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

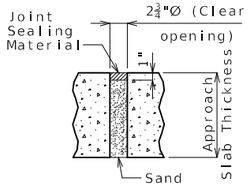
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CONCRETE TRAFFIC BARRIER TRANSITION

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

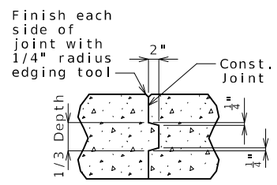


PART PLAN SHOWING REINFORCEMENT

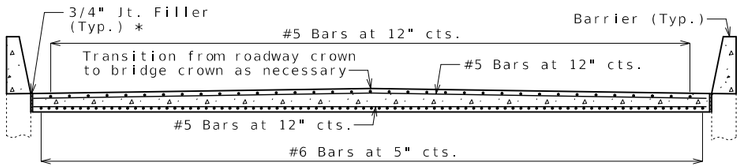


UNDERSEAL ACCESS HOLE DETAIL

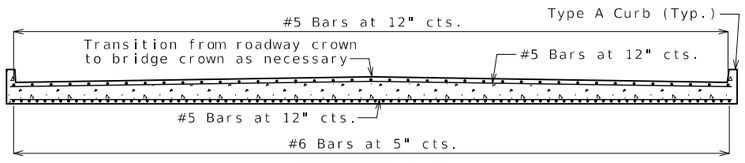
(If required)



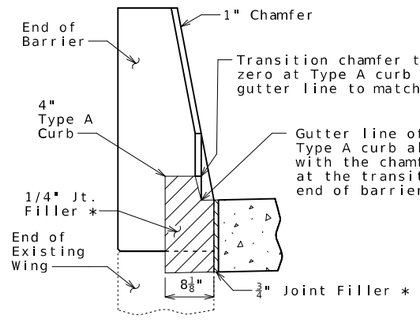
CONSTRUCTION JOINT DETAIL



SECTION A-A

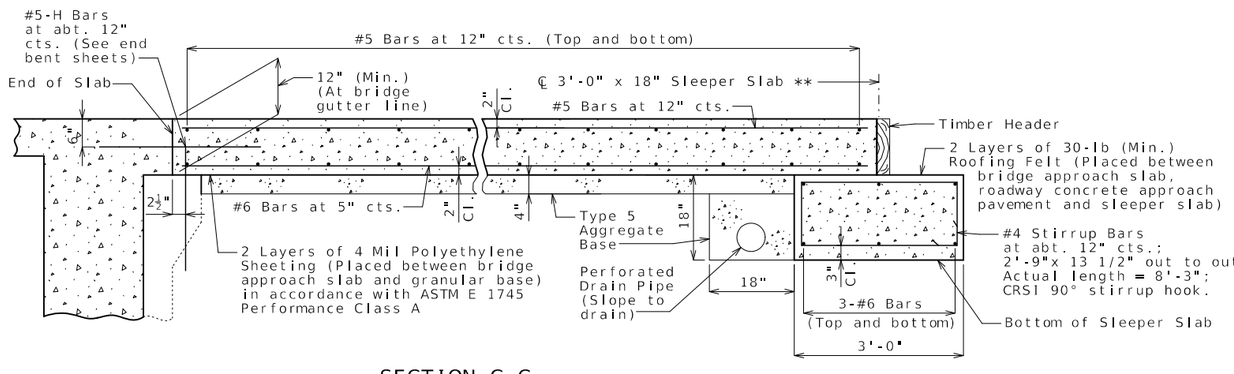


SECTION B-B

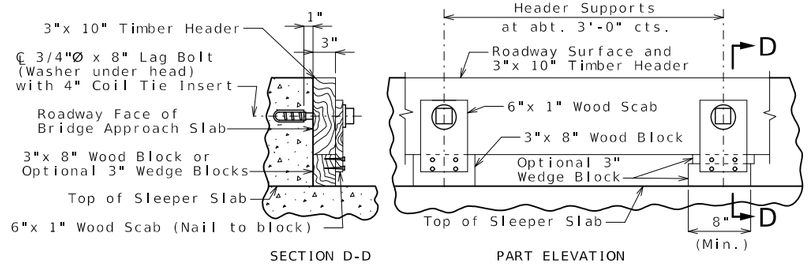


SECTION BETWEEN CURB AND BARRIER

With the approval of the engineer, the contractor may crown the bottom of the approach slab to match the crown of the roadway surface.



SECTION C-C



SECTION D-D PART ELEVATION

DETAILS OF TIMBER HEADER

Remove timber header when concrete pavement is placed.

General Notes:

All concrete for the bridge approach slab and sleeper slab shall be in accordance with Sec 503 (f'c = 4,000 psi).

The reinforcing steel in the bridge approach slab and the sleeper slab shall be epoxy coated Grade 60 with fy = 60,000 psi.

Drain pipe may be either 6" diameter corrugated metallic-coated pipe underdrain, 4" diameter corrugated polyvinyl chloride (PVC) drain pipe, or 4" diameter corrugated polyethylene (PE) drain pipe.

Minimum clearance to reinforcing steel shall be 1 1/2", unless otherwise shown.

The reinforcing steel in the bridge approach slab and the sleeper slab shall be continuous. The transverse reinforcing steel may be made continuous by providing a minimum lap splice of 24 inches for #5 bars and 40 inches for #6 bars, or by mechanical bar splice.

All joint filler shall be in accordance with Sec 1057 for preformed fiber expansion joint filler except as noted.

The contractor shall pour and satisfactorily finish the bridge slab before placing the bridge approach slab.

Longitudinal construction joints in approach slab and sleeper slab shall be aligned with longitudinal construction joints in bridge slab.

For concrete approach pavement details, see roadway plans.

See Missouri Standard Plan 609.00 for details of Type A curb.

Payment for furnishing all materials, labor and excavation necessary to construct the approach slab, including the timber header, sleeper slab, underdrain, Type 5 aggregate base, joint filler and all other appurtenances and incidental work as shown on this sheet, complete in place, will be considered completely covered by the contract unit price for Bridge Approach Slab (Major) per square yard.

* Seal joint between vertical face of approach slab and wing with sealant in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

** ℄ Open Cell Foam Joint Seal (End Bent No. 1) &
℄ 3/4" Joint Filler (End Bent No. 4)

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ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	17

COUNTY: BOONE
JOB NO.: JCD0333
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A18993

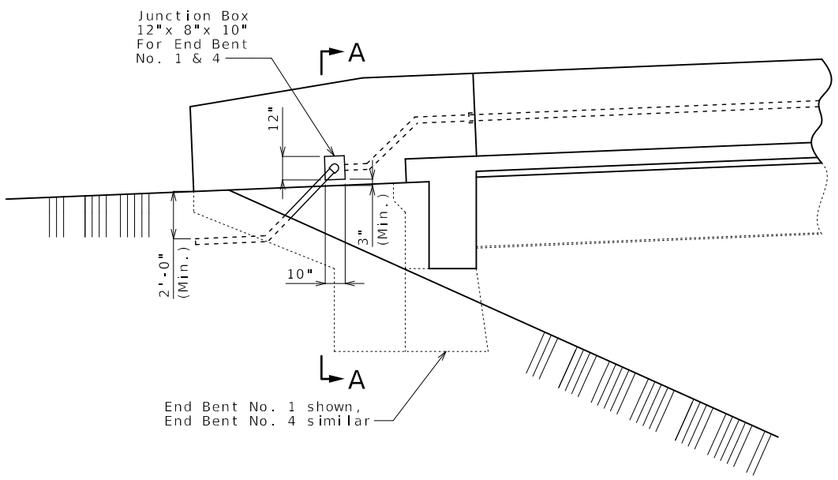
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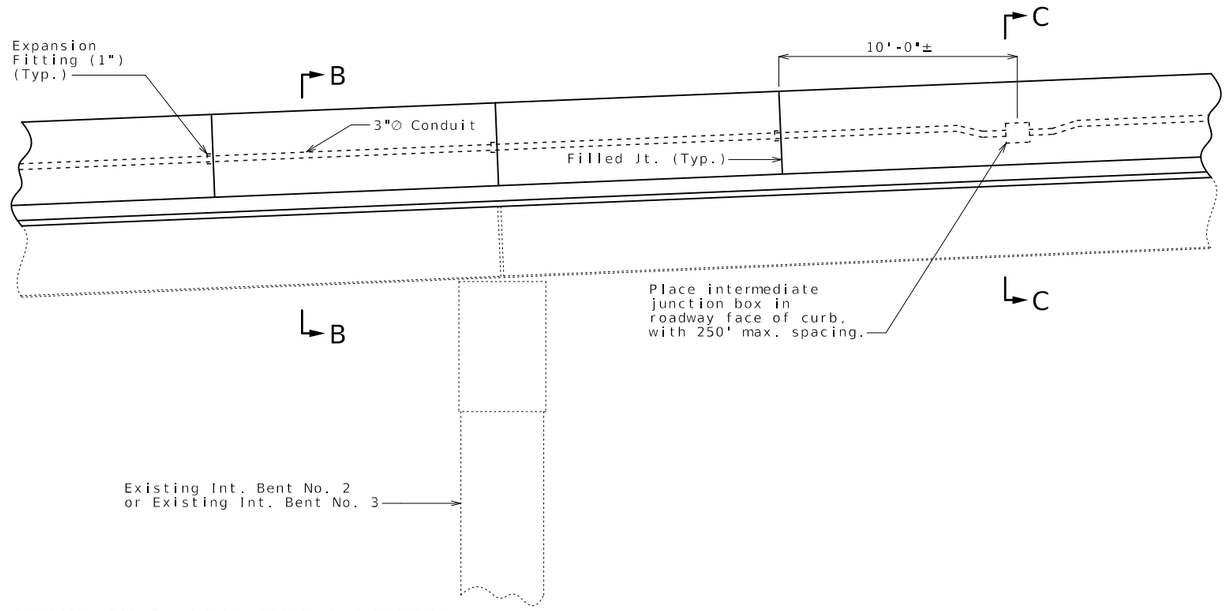
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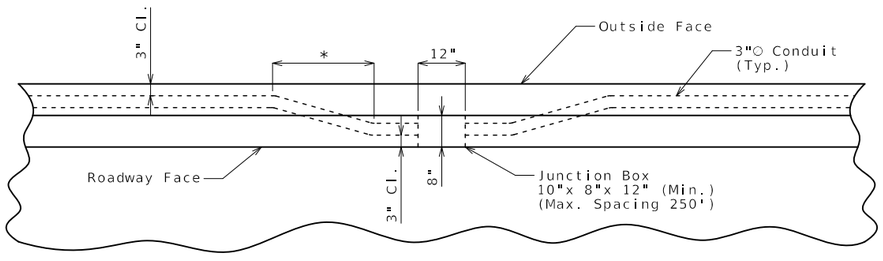
Note: This drawing is not to scale. Follow dimensions.

BRIDGE APPROACH SLAB (MAJOR)



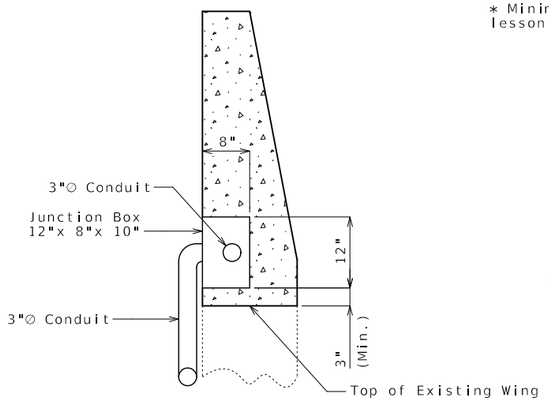


PART ELEVATION OF LEFT TYPE D BARRIER
SHOWING LOCATION OF CONDUIT

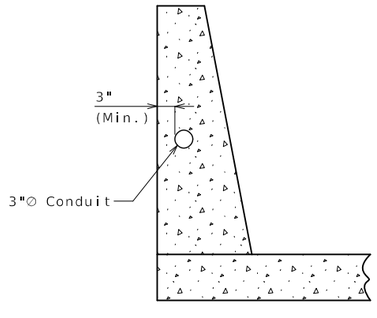


PART PLAN OF JUNCTION BOX IN BARRIER CURB

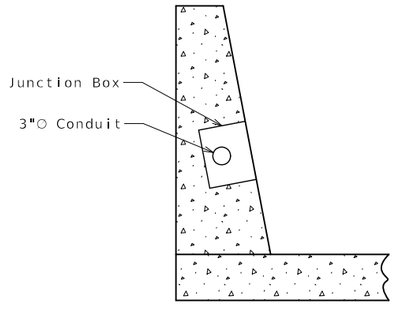
* Minimize Sweep Length (near Junction Box only) in order to lesson the number of #5 R-Bars necessary to bend in the field (Typ.).



SECTION A-A



SECTION B-B



SECTION C-C

General Notes:

All conduit shall be rigid non-metallic schedule 40 heavy wall PVC (polyvinyl chloride plastic) with 3" minimum cover in concrete. Each section of conduit shall bear the Underwriter's Laboratories, Inc., UL label.

All conduit clamps shall be commercially available conduit clamps approved by the engineer.

Anchor bolts and nuts shall be ASTM F1554 Grade 55. Anchor bolts, nuts and washers shall be fully galvanized.

Shift reinforcing steel in field where necessary to clear conduit and junction boxes.

Expansion fittings shall be placed as shown and set in accordance with the manufacturer's requirements and based on the air temperature at the time of setting given an estimated total expansion movement of 1" at filled joins using a maximum temperature range of 150°F and a maximum temperature of 120°F.

All Type D Barrier junction boxes shall be PVC molded in accordance with Sec 1062 and designed for flush mounting. End bent junction boxes shall be PVC molded in accordance with Sec 1062 and designed for surface mounting. The conduit terminations shall be permanent or separable. The terminations and covers shall be of watertight construction and shall beet requirements for NEMA 4 enclosure.

Drainage shall be provided at low points or other critical locations of all conduits and all junction boxes in accordance with Sec 707. All conduits shall be sloped to drain where possible.

Payment for furnishing and installing 3"∅ Conduit System, complete in place, will be considered completely covered by the constract lump sum price for Conduit System on Structure.

For details and reinforcement of Type D Barrier not shown, see Sheets No. 12 & 13.

DETAILS OF CONDUIT SYSTEM ON STRUCTURE
(Left Type D Barrier)

Detailed SEPT 2026
Checked SEPT 2026

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

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10/20/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	18

COUNTY
BOONE

JOB NO.
JCD0333

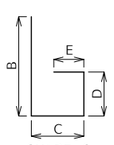
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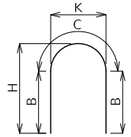
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DESCRIPTION	DATE

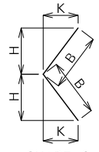
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JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



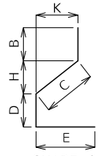
SHAPE 6
or 6S



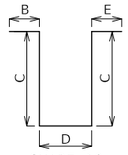
SHAPE 7



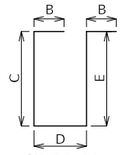
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or 8S



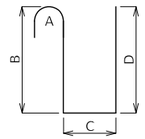
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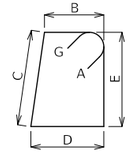
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or 10S



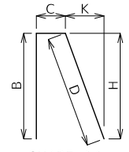
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or 11S



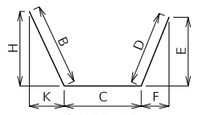
SHAPE 12



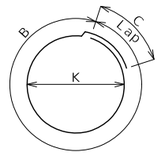
SHAPE 13S



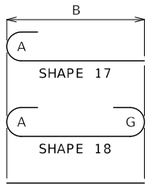
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or 14S



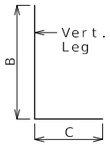
SHAPE 15
or 15S



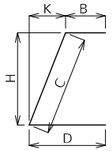
SHAPE 16



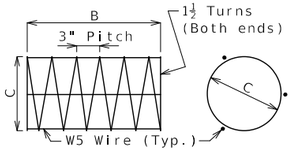
SHAPE 17
SHAPE 18
SHAPE 20



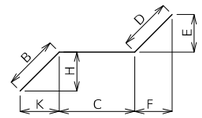
SHAPE 19
or 19S



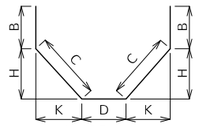
SHAPE 21
or 21S



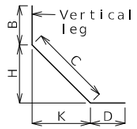
SHAPE 22



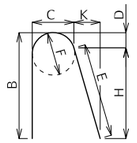
SHAPE 23
or 23S



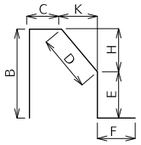
SHAPE 24
or 24S



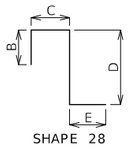
SHAPE 25
or 25S



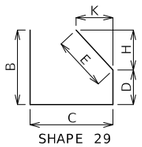
SHAPE 26



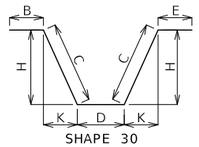
SHAPE 27S



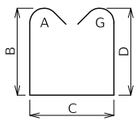
SHAPE 28
or 28S



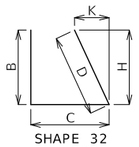
SHAPE 29
or 29S



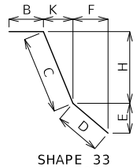
SHAPE 30
or 30S



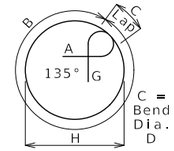
SHAPE 31S



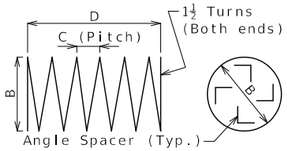
SHAPE 32
or 32S



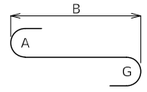
SHAPE 33
or 33S



SHAPE 34S



SHAPE 35 (1)

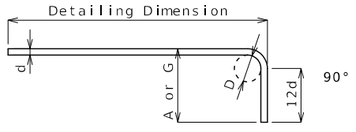


SHAPE 36

Finished Bend Diameters D and Hook Dimensions

Standard Pin Bend Shapes

Size	Case	D	A or G		J
			90°	180°	180°
#4	1	3"	8"	6"	4"
#5	1	3¾"	10"	7"	5"
#6	1	4½"	12"	8¼"	6"
#7	2	5¼"	14"	9¾"	7"
	3	7"	15"	11½"	8¾"
#8	2	6"	16"	11"	8"
	3	8"	17"	13¼"	10"
#9	1	9½"	19½"	15½"	11¾"
#10	1	10¾"	22"	17½"	13¼"
#11	1	12"	24½"	19½"	14⅞"
#14	1	18¼"	31¼"	27½"	21⅝"
#18	1	24"	41½"	36¾"	28½"

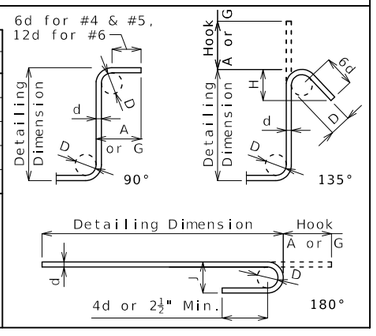


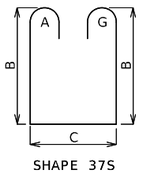
Stirrup Pin Bend Shapes (S)

Size	Case	D	A or G			H	J
			90°	135°	180°	135°	180°
#4	2	2"	4½"	4½"	5"	2⅝"	3"
	3	3"	5"	5¼"	6"	3"	4"
#5	2	2½"	5¾"	5¾"	5¾"	3⅝"	3¾"
	3	3¾"	6¼"	6½"	7"	3⅞"	5"
#6	1	4½"	12"	7¾"	8¼"	4⅜"	6"

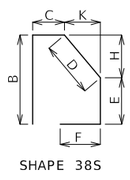
Applicable for all grades of steel.

Case 1 applies to all reinforcement. Case 2 applies to all reinforcement except for galvanized bars. Case 3 applies to galvanized bars only.





SHAPE 37S



SHAPE 38S

BENDING DIAGRAMS

All dimensions are out to out.

Shapes ending with an S shall be bent in accordance with stirrup pin bend shapes.

Unless otherwise noted, finished bending diameter D is the same for all bends of a shape.

(1) Shall be a deformed or plain spiral bar or wire.

Four angle or channel spacers are required for each column spiral. Spacers are to be placed on inside of spirals. Length and weight of column spirals do not include splices or spacers.

Reinforcing Steel Totals (Pounds)

		Substructure		Superstructure				Entire Bridge	
				Slab			Slip		
	Size	Plain	Coated	Plain	Coated	Barrier	Form	Plain	Coated
By Size	W5	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0
	5	0	0	0	40,040	13,265	291	0	53,596
	6	0	0	0	81,453	0	0	0	81,453
	7	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0
	9	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0
	11	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0
	18	0	0	0	0	0	0	0	0
By Type		0	0	0	121,493	13,265	291	0	135,049

All superstructure reinforcing steel shall be Epoxy Coated unless otherwise specified.

BENDING DIAGRAMS AND REINFORCING STEEL TOTALS

Detailed JUNE 2026
Checked JUNE 2026

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

STATE OF MISSOURI
GARRETT L HAGER
NUMBER PE-2023000437
PROFESSIONAL ENGINEER
GARRETT L. HAGER - CIVIL
MO-PE-2023000437

DATE PREPARED
10/20/2026

ROUTE	STATE
163	MO
DISTRICT	SHEET NO.
BR	19

COUNTY
BOONE

JOB NO.
JCD0333

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A18993

DESCRIPTION	DATE

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

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
		SUPERSTRUCTURE													
		END BENT 1													
6	6 H10	DIAPHRAGM	E	20		46 5.00							46 5	46 5	418
4	6 H11	DIAPHRAGM	E	20		50 3.00							50 3	50 3	302
10	6 H12	DIAPHRAGM	E	10S			3 0.00	21.00					7 9	7 5	111
44	5 H13	DIAPHRAGM	E	20		4 0.00							4 0	4 0	184
106	6 U10	DIAPHRAGM	E	10S			2 7.25	19.00					6 10	6 6	1,035
59	6 U11	DIAPHRAGM	E	19S		3 11.75	5 0.00						9 0	8 10	783
18	6 V10	DIAPHRAGM	E	19S		4 1.50	19.00						5 9	5 7	151
		END BENT 4													
6	6 H40	DIAPHRAGM	E	20		46 5.00							46 5	46 5	418
4	6 H41	DIAPHRAGM	E	20		50 3.00							50 3	50 3	302
10	6 H42	DIAPHRAGM	E	10S			3 0.00	21.00					7 9	7 5	111
44	5 H43	DIAPHRAGM	E	20		4 0.00							4 0	4 0	184
106	6 U40	DIAPHRAGM	E	10S			2 7.50	19.00					6 10	6 6	1,035
59	6 U41	DIAPHRAGM	E	19S		4 1.25	5 0.00						9 1	8 11	790
18	6 V40	DIAPHRAGM	E	19S		3 11.00	19.00						5 6	5 4	144
		SLAB													
520	5 S1	SLAB	E	20		57 6.00							57 6	57 6	31,186
144	5 S2	SLAB	E	20		56 6.00							56 6	56 6	8,486
1088	6 S3	SLAB	E	20		46 5.00							46 5	46 5	75,853
		BARRIER													
		TYPE D													
20	5 C1	SLIP FORM	E	20		12 0.00							12 0	12 0	250
4	5 C2	SLIP FORM	E	20		9 9.00							9 9	9 9	41
10	5 K1	BARRIER	E	27S		3 5.00	9.25	5.25	2 11.75		5.25	1.00	7 7	7 5	77
34	5 K2	BARRIER	E	27S		3 5.00	9.25	14.50	2 2.75		14.25	2.75	7 8	7 5	263
10	5 K4	BARRIER	E	19S	2	2 4.25	10.00						3 2	3 1	
		Incr. = 0.500"				2 6.25	10.00						3 4	3 3	33
10	5 K5	BARRIER	E	38S	2			18.50	9.50	8.25	18.00	4.00	3 0	2 11	
		Incr. = 0.500"						20.50	9.50	8.25	20.00	4.50	3 2	3 1	31
6	5 K6	BARRIER	E	19S		2 6.75	10.00						3 5	3 3	20
6	5 K7	BARRIER	E	21S			2 6.75	10.00			2 6.00	6.25	3 5	3 4	21
18	5 K8	BARRIER	E	19S	2	2 8.50	10.00						3 7	3 5	
		Incr. = 0.750"				3 2.50	10.00						4 1	3 11	69
18	5 K9	BARRIER	E	21S	2		2 8.50	10.00			2 7.75	6.75	3 7	3 6	
		Incr. = 0.750"					3 2.50	10.00			3 1.75	7.75	4 1	4 0	70
10	5 K10	BARRIER	E	19S		3 3.00	10.00						4 1	4 0	42
10	5 K11	BARRIER	E	21S			3 3.00	10.00			3 2.25	7.75	4 1	4 0	42
24	5 K12	BARRIER	E	20		11 9.00							11 9	11 9	294
12	5 K13	BARRIER	E	20	2	11 0.00							11 0	11 0	
		Incr. = 14.375"				5 0.00							5 0	5 0	100
10	5 K14	BARRIER	E	27S		21.00	9.25	5.25	5.25	12.00	5.25	1.00	4 5	4 1	43
14	5 K15	BARRIER	E	27S		21.00	9.25	17.25	3.50	12.00	17.00	3.25	5 3	4 11	72
24	5 K16	BARRIER	E	19S		2 5.00	10.00						3 3	3 2	79
10	5 K17	BARRIER	E	38S				19.25	9.50	8.25	18.75	4.25	3 1	3 0	31
14	5 K18	BARRIER	E	21S			2 5.00	10.00			2 4.25	6.00	3 3	3 2	46
28	5 K19	BARRIER	E	20		5 6.00							5 6	5 6	161
80	5 M1	MEDIAN CURB	E	14S			4.00	2 6.00			2 5.00	7.25	2 10	2 9	229
16	5 M2	MEDIAN CURB	E	20		19 9.00							19 9	19 9	330
273	5 R1	BARRIER	E	26		3 3.00	5.50	2.25	3 1.25	5.50	3 0.75	6.75	7 0	6 9	1,922
273	5 R2	BARRIER	E	19S		19.75	9.50						2 5	2 4	664
273	5 R3	BARRIER	E	27S			9.50	15.25	4.75	12.00	15.00	3.00	3 6	3 3	925
56	5 R4	BARRIER	E	20		11 9.00							11 9	11 9	686
40	5 R5	BARRIER	E	20		37 7.00							37 7	37 7	1,568
28	5 R6	BARRIER	E	20		44 3.00							44 3	44 3	1,292

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
16	5 R7	BARRIER	E	20		35 4.00							35 4	35 4	590
267	5 R8	BARRIER	E	14S		2 5.00	6.50	2 5.50			2 5.00	5.50	5 5	5 3	1,462
267	5 R9	BARRIER	E	19S		19.00	9.50						2 5	2 3	627
267	5 R10	BARRIER	E	27S			9.50	15.25	3.50	12.00	15.00	3.00	3 4	3 2	882
16	5 R11	BARRIER	E	20		35 7.00							35 7	35 7	594

Nominal lengths are based on out to out dimensions shown in bending diagrams and are listed to the nearest inch for fabricator's use. Actual lengths are measured along centerline bar to the nearest inch. Weights are based on actual lengths.

For bending diagrams and steel reinforcing totals, see Sheet No. 19.

Detailed JUNE 2026
Checked JUNE 2026

Reinforcing steel (ASTM A615 Grade 60) fy = 60,000 psi

BILL OF REINFORCING STEEL

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

Sheet No. 20 of 20

Codes: C = Required coatings, where E = Epoxy Coated and G = Galvanized.

SH = Required shape, see bending diagrams.

V = Sets of varied bars and number of bars of each length. Bar dimensions vary in equal increments between dimensions shown on this line and the following line and the actual length dimension shown on this line and the following line vary by the specified increment.

STATE OF MISSOURI
GARRETT L HAGER
NUMBER PE-2023000437
PROFESSIONAL ENGINEER
GARRETT L. HAGER - CIVIL
MO-PE-2023000437

DATE PREPARED
10/20/2026

ROUTE 163 | STATE MO
DISTRICT BR | SHEET NO. 20
COUNTY BOONE
JOB NO. JCD0333
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A18993

DESCRIPTION | DATE

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