MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

PLANS FOR PROPOSED STATE HIGHWAY

BOONE COUNTY
BRIDGE REPAIR
BRIDGE A44492

DESIGN DESIGNATION

I-70

A.A.D.T. - 2023 = 38,450
D.H.V. = 7%
T = 24%
V = 70 M.P.H.

FUNCTIONAL CLASSIFICATION- INTERSTATE

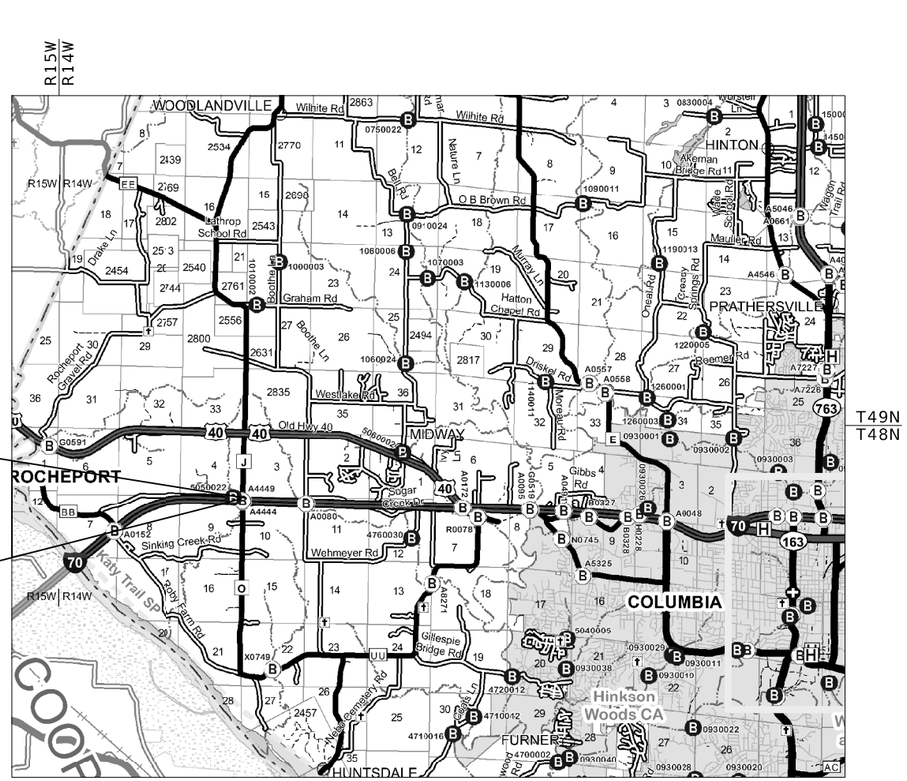
ROUTE J / ROUTE O

A.A.D.T. - 2023 = 1,440
D.H.V. = 7%
T = 10%
V = 55 M.P.H.

FUNCTIONAL CLASSIFICATION- MAJOR COLLECTOR

NO R/W REQUIRED

KEY MAP
LOCATION OF BOONE COUNTY



WB LOG MILE 132.300

PROJECT LOCATION
LENGTH = 0.010 MILES
BRIDGE A44492 REPAIR

WB LOG MILE 132.310

NOT TO SCALE

CONVENTIONAL SYMBOLS
(USED IN PLANS)

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

NOTE: DASHED OR OPEN SYMBOLS INDICATE EXISTING FEATURES

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

INDEX OF SHEETS

DESCRIPTION	SHEET NUMBER
TITLE SHEET	1
QUANTITIES (QU) (2 SHEETS)	2
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BRIDGE DRAWINGS (B)	
A44492	1-8

LENGTH OF PROJECT

BEGINNING OF PROJECT	LOG MILE 132.300
END OF PROJECT	LOG MILE 132.310
APPARENT LENGTH	54.67 FEET
EQUATIONS AND EXCEPTIONS:	
TOTAL CORRECTIONS	0.00 FEET
NET LENGTH OF PROJECT	54.67 FEET
STATE LENGTH	0.010 MILES
FOR INFORMATION ONLY ESTIMATED DISTURBED ACRES	0 ACRES

STATE OF MISSOURI
MELANIE J. TOWNSEND
NUMBER PE-2000155363
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

DATE PREPARED: 8/12/2024
ROUTE: I-70
STATE: MO
DISTRICT: CD
SHEET NO.: 1
COUNTY: BOONE
JOB NO.: JCDM0064
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.:

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

REV.	DESCRIPTION	DATE

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

GBA
9801 Renner Blvd, Ste. 300
Lenexa, KS 66219
913.492.0400
GBAteam.com

GEORGE BUTLER ASSOCIATES, INC.
PRO. ENGINEER 000133
ARCHITECT 000212
PRO. LAND SURVEYOR 000059

MELANIE J TOWNSEND
PROFESSIONAL ENGINEER
PE-2000155363

PERMANENT PAVEMENT MARKING					
LOCATION	HIGH BUILD WATERBORNE PAVEMENT MARKING TYPE L BEADS				PREFORMED THERMOPLASTIC PAVEMENT MARKING
	6" WHITE		6" YELLOW	12" WHITE	24" WHITE
	SOLID	INTERMITTENT	SOLID	SOLID	SOLID
	(LF)	(LF)	(LF)	(LF)	(LF)
MAINLINE WB I-70	372	1263		217	
WB I-70 OFF-RAMP	652		520	215	18
WB I-70 ON-RAMP	162		75		
PROJECT TOTAL	1186	1263	595	432	18
BID ITEM TOTAL	2449		595	432	18

PAVEMENT MARKING REMOVAL	
	PAVEMENT MARKING REMOVAL
	PERMANENT PAVEMENT MARKING
	(LF)
BID ITEM TOTAL	1030

CONTRACTOR FURNISHED SURVEYING AND STAKING
1 LUMP SUM

MOBILIZATION
1 LUMP SUM

SUMMARY OF QUANTITIES
SHEET 1 OF 2

STATE OF MISSOURI
JASON LAWRENCE C. JARQUIO
NUMBER PE-2021011939
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
8/12/2024

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

COUNTY
BOONE

JOB NO.
JCDM0064

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A44492

DESCRIPTION	DATE

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JASON L. JARQUIO
PROFESSIONAL ENGINEER
PE-2021011939

EFFECTIVE: 07-01-2024

SIGN	SIZE IN.	AREA SQ.FT.	QTY EACH	TOTAL AREA SQ.FT.	QTY RELOC EACH	TOTAL RELOC SQ.FT.	SIGN NUM.	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						REVERSE CURVE (SYMBOL LEFT)
WO1-4R	48X48	16.00						REVERSE CURVE (SYMBOL RIGHT)
WO1-4bL	48X48	16.00						DOUBLE ARROW REVERSE CURVE (SYMBOL LEFT)
WO1-4bR	48X48	16.00						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						MERGE (LEFT)
WO4-1aR	48X48	16.00						MERGE (RIGHT)
WO5-1	48X48	16.00	1	16.00			43	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)
WO12-2x	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			19	500 FEET (PLAQUE)
WO16-3	30X24	5.00						X MILE (PLAQUE)
WO20-1	48X48	16.00	9	144.00			2	ROAD/BRIDGE/RAMP WORK AHEAD
WO20-2	48X48	16.00	6	96.00			18	DETOUR AHEAD
WO20-3	48X48	16.00	4	48.00			20	ROAD CLOSED AHEAD
WO20-4	48X48	16.00						ONE LANE ROAD AHEAD
WO20-5	48X48	16.00						RIGHT/CENTER/LEFT LANE CLOSED AHEAD
WO20-5a	48X48	16.00						2 RIGHT/CENTER/LEFT LANES CLOSED AHEAD
WO20-6a	48X48	16.00						RIGHT/CENTER/LEFT LANE CLOSED
WO20-7a	48X48	16.00						FLAGGER (SYMBOL)
WO21-2	36X36	9.00						FRESH OIL
WO21-5	48X48	16.00						SHOULDER WORK / SHOULDER WORK 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						WET PAINT (ARROW PIVOTS)

SIGN	SIZE IN.	AREA SQ.FT.	QTY EACH	TOTAL SQ.FT.	QTY RELOC EACH	TOTAL RELOC SQ.FT.	SIGN NUM.	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	2	16.00			26	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	4	24.00			54	WORK ZONE (PLAQUE)
MO4-8a	24X18	3.00	4	12.00			52	END DETOUR
MO4-9L	48X36	12.00						DETOUR (LEFT)
MO4-9R	48X36	12.00						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	2	24.00			4A	SPEED LIMIT 50
R2-1	36X48	12.00	2	24.00			4B	SPEED LIMIT 60
R2-1	36X48	12.00	1	12.00			4C	SPEED LIMIT 30
R2-1	36X48	12.00	2	24.00			25	SPEED LIMIT 70 (NORMAL SPEED)
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	2	24.00			46	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)
R8-7	48X36	12.00	2	24.00			5	EMERGENCY STOPPING ONLY
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	3	30.00			29	ROAD CLOSED
R11-3a	60X30	12.50						ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY
R11-4	60X30	12.50	4	50.00			30	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						POINT OF PRESENCE
CONST-7	72X36	18.00						RATE OUR WORK ZONE
CONST-8	48X36	12.00	2	24.00				WORK ZONE NO PHONE ZONE
SP-1	138X60	57.50	2	115.00			55	RIGHT LANE FOLLOW RAMP
SP-2	126X60	52.5	2	105.00			56	I-70 WEST USE BOTH LANES
DETOURS	VARIES	21.20	23	487.60			50A-N	DETOUR SIGN ASSEMBLY (RTE J/O)
DETOURS	VARIES	28.90	9	260.10			51A-F	DETOUR SIGN ASSEMBLY (TO W I-70)
DETOURS	VARIES	26.90	7	188.30			51G-K	DETOUR SIGN ASSEMBLY (TO I-70)
DETOURS	VARIES	28.90	2	57.80			51L	DETOUR SIGN ASSEMBLY (TO E I-70)

616-10.05 CONSTRUCTION SIGNS	TOTAL	1841
616-10.10 RELOCATED SIGNS	TOTAL	0

ITEM NUMBER	TOTAL QTY	DESCRIPTION
5122008		IMPACT ATTENUATOR 40 MPH (SAND BARRELS)
5122009		IMPACT ATTENUATOR 45 MPH (SAND BARRELS)
5122010	2	IMPACT ATTENUATOR 50 MPH (SAND BARRELS)
5122012		IMPACT ATTENUATOR 55 MPH (SAND BARRELS)
5122014		IMPACT ATTENUATOR 60 MPH (SAND BARRELS)
5122017		IMPACT ATTENUATOR 65 MPH (SAND BARRELS)
5122019	1	IMPACT ATTENUATOR 70 MPH (SAND BARRELS)
5122020	4	REPLACEMENT SAND BARREL
5122030		IMPACT ATTENUATOR (RELOCATION)
6123001		TRUCK MOUNTED ATTENUATOR (TMA)
5161008	9	ADVANCED WARNING RAIL SYSTEM
5161012		BUOYS (BOATS KEEP OUT)
5161013		BUOYS (NO WAKE)
5161014		SPECIAL SIGN ASSEMBLY (BOATS KEEP OUT)
5161025	53	CHANNELIZER (TRIM LINE)
5161030	16	TYPE III MOVEABLE BARRICADE
5161033		DIRECTION INDICATOR BARRICADE
5161040	1	FLASHING ARROW PANEL
5161047		TYPE III OBJECT MARKER
5161055		SEQUENTIAL FLASHING WARNING LIGHT
5161070		TUBULAR MARKER
5161095		RADAR SPEED ADVISORY SYSTEM
5161096		CHANGEABLE MESSAGE SIGN, COMMISSION FURNISHED/RETAINED
€161098A		CHANGEABLE MESSAGE SIGN W/O COMM. INTERFACE - CONTRACTOR FURNISHED/RETAINED
5161099	4	CHANGEABLE MESSAGE SIGN WITH COMM. INTERFACE - CONTRACTOR FURNISHED/RETAINED
€162000A		WORK ZONE TRAFFIC SIGNAL SYSTEM
5162002		TEMPORARY LONG-TERM RUMBLE STRIPS
€173600D	1262.5	TEMPORARY TRAFFIC BARRIER CONTRACTOR FURNISHED/RETAINED
€173602B		TEMPORARY TRAFFIC BARRIER CONTRACTOR FURNISHED/COMMISSION RETAINED
€174000A		TEMP. TRAFFIC BARRIER HEIGHT TRANSITION
€175010A		RELOCATING TEMPORARY TRAFFIC BARRIER
€176000B		TEMPORARY TRAFFIC BARRIER COMMISSION FURNISHED/RETAINED
€177000B		TEMP. TRAFFIC BARRIER HEIGHT TRANSITION COMMISSION FURNISHED/RETAINED
€208064A		TEMPORARY RAISED PAVEMENT MARKER
9029400		TEMPORARY TRAFFIC SIGNALS
9029401		TEMPORARY TRAFFIC SIGNALS AND LIGHTING
€205301B	6640	TEMPORARY REMOVABLE MARKING TAPE, 4 IN. WHITE
€205303B	1000	TEMPORARY REMOVABLE MARKING TAPE, 4 IN. YELLOW
5205442	2	TEMPORARY NON-REMOVABLE MARKING TAPE STRAIGHT ARROW

SUMMARY OF QUANTITIES
SHEET 2 OF 2

STATE OF MISSOURI
JASON LAWRENCE C. JARQUIO NUMBER PE-2021011939
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 8/12/2024

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

COUNTY: BOONE
JOB NO.: JCDM0064
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A44492

DESCRIPTION | DATE

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JASON L. JARQUIO
PROFESSIONAL ENGINEER
PE-2021011939

TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- CHANNELIZER
- DIRECTIONAL INDICATOR BARRICADES
- TYPE III BARRICADE
- TYPE II ADA BARRICADE
- IMPACT ATTENUATOR
- LANE USE ARROW
- WORK AREA
- FLASHING ARROW PANELS
- FLAGGER
- CHANGEABLE MESSAGE BOARD
- BARRIER HEIGHT TRANSITION

W020-1

(2)

W020-5

(5)

W020-6a

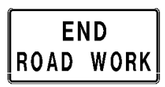
(6)

W04-1a

(6A)

W021-5b

(21)



G020-2

(26)

✳ NOTE: INCLUDE ADVANCED WARNING RAIL SYSTEM ON ALL LONG-TERM STATIONARY OPERATIONS

CHANNELIZING DEVICE SPACING		
POSTED SPEED PRIOR TO CONSTRUCTION, MPH (P)	MAX. CHANNELIZER SPACING THROUGH TAPER (X)	MAX. CHANNELIZER SPACING THROUGH WORK AREA (Y)
0 TO 35	35'(2)	40'(2)
40 TO 45	40'(2)	80'(3)
50 TO 55	50'(3)	80'(3)
60 TO 70	60'(3)	120'

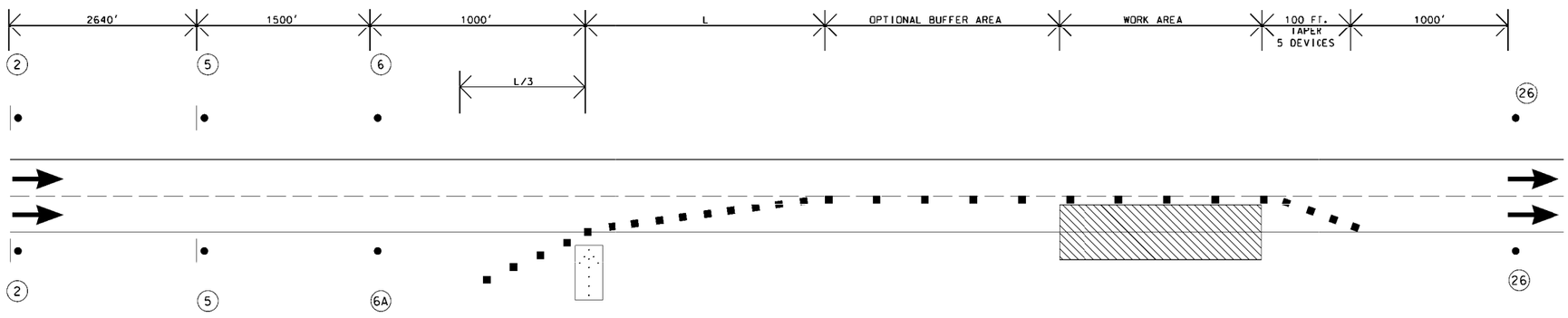
(1) CHANNELIZER SPACING MAY BE REDUCED TO DISCOURAGE TRAFFIC ENCROACHMENT.
(2) SPACING REDUCED $\frac{1}{2}$ AT INTERSECTIONS.
(3) SPACING MAY BE REDUCED TO $\frac{1}{2}$ AT INTERSECTIONS.

TAPER LENGTHS

L= W x P FOR 40 MPH OR MORE
L= $\frac{WP^2}{60}$ FOR 35 MPH OR LESS
L= TAPER LENGTH IN FEET
W= LATERAL SHIFT IN FEET
P= POSTED SPEED PRIOR TO CONSTRUCTION

BUFFER SPACE	
POSTED SPEED PRIOR TO CONSTRUCTION, MPH (P)	RECOMMENDED LENGTH OF LONGITUDINAL BUFFER
0 TO 35	280 FT
40 TO 45	400 FT
50 TO 55	560 FT
60 TO 70	840 FT

LANE CLOSURE



TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATIONS

STATE OF MISSOURI
JASON LAWRENCE C. JARQUIO
NUMBER PE-2021011939
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I-70	MO
DISTRICT	SHEET NO.
CD	3

COUNTY
BOONE

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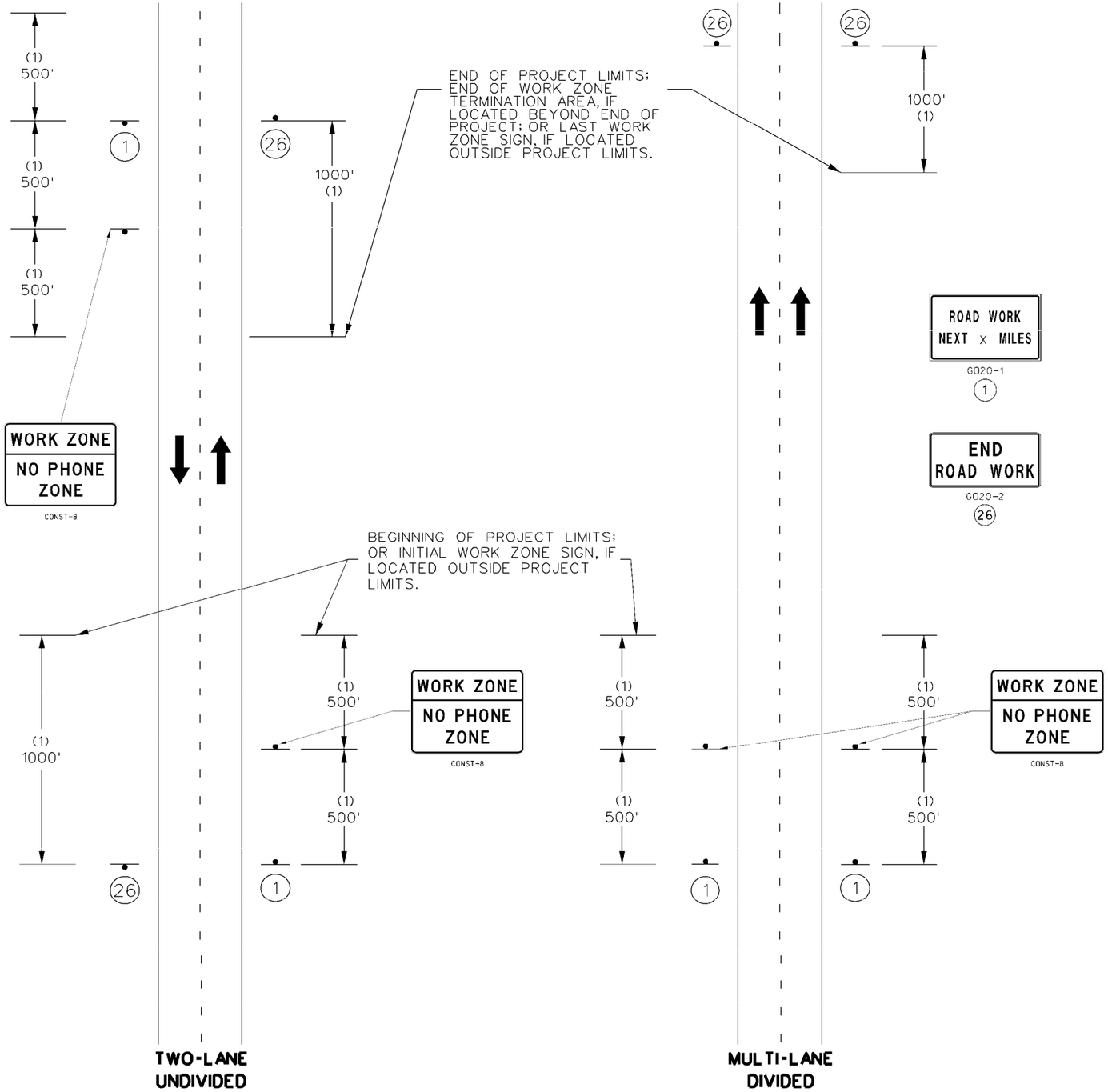
ARCHITECT 000212
PRO. LAND SURVEYOR 000059

JASON L. JARQUIO
PROFESSIONAL ENGINEER
PE-2021011939



NOTES:

SIGN (1) IS ONLY REQURED ON PROJECTS OF 2 MILES OR GREATER IN LENGTH.

SIGN (26) IS USED ON ALL PROJECTS WHERE SIGN 1 IS USED.

OTHER SIGNS SUCH AS DETOUR OR ALTERNATE ROUTE SIGNING MAY BE USED OUTSIDE THE PROJECT LIMITS.

ANY EXISTING SIGNING THAT CONFLICTS WITH THE TRAFFIC CONTROL SIGNING SHALL BE COMPLETELY COVERED OR REMOVED.

(1) DISTANCE MAY BE ADJUSTED ACCORDING TO FIELD CONDITIONS. WHERE TRAFFIC BACKUPS ARE EXPECTED BEYOND THE ADVANCE WARNING AREA, ADDITIONAL SIGNING MAY BE NEEDED.

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

BEGIN/END OF PROJECT SIGNING SHALL BE INSTALLED ALONG WB I-70.

STATE OF MISSOURI
JASON LAWRENCE C. JARQUIO
NUMBER PE-2021011939
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
8/12/2024

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
CD	4

COUNTY
BOONE

JOB NO.
JCDM0064

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A44492

DESCRIPTION	DATE

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

GBA
9801 Renner Blvd, Ste. 300
Lenexa, KS 66219
913.492.0400
GBAteam.com

GEORGE BUTLER ASSOCIATES, INC.
PRO. ENGINEER 000133
ARCHITECT 000212
PRO. LAND SURVEYOR 000059

JASON L. JARQUIO
PROFESSIONAL ENGINEER
PE-2021011939

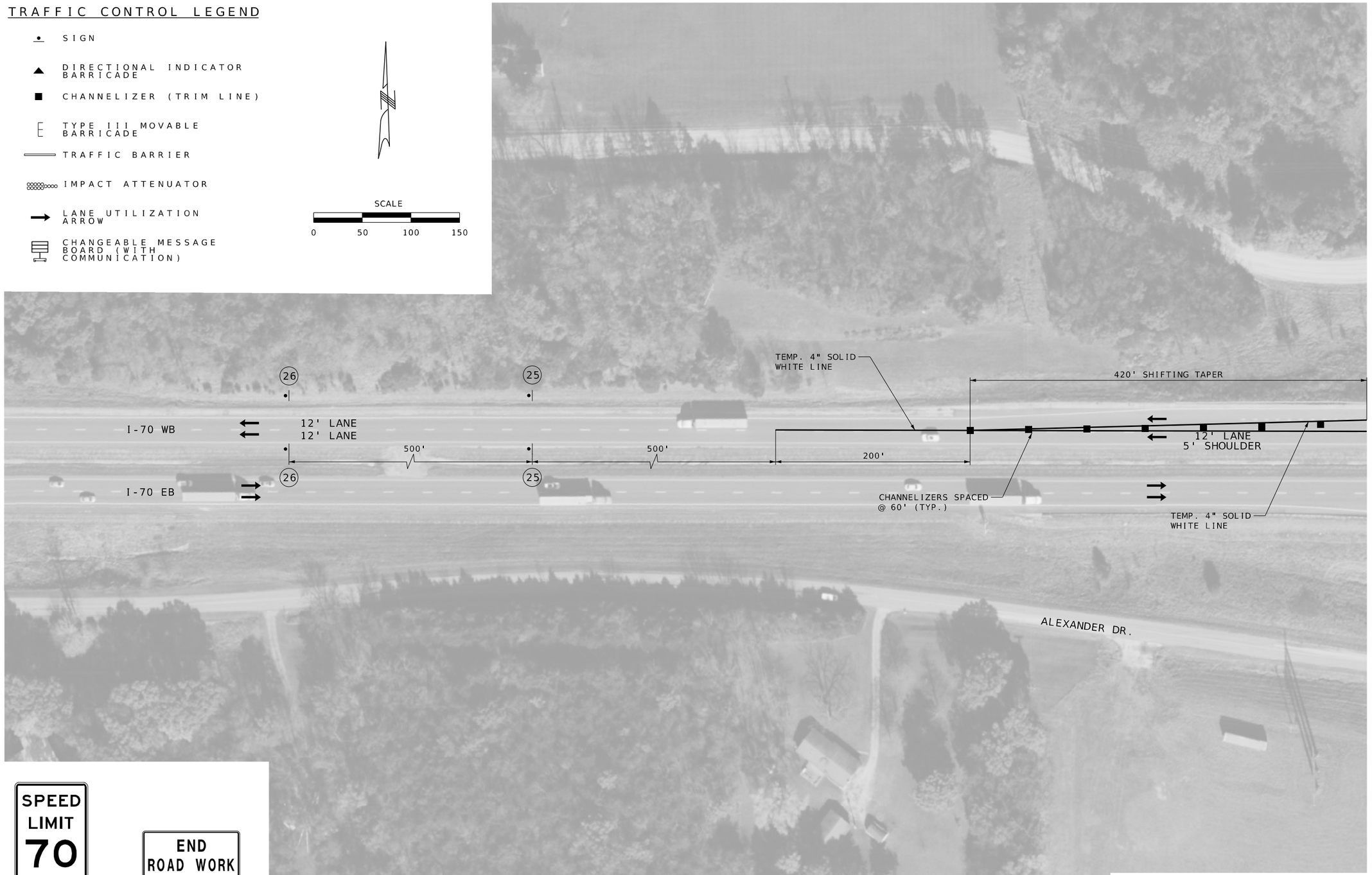
TEMPORARY TRAFFIC CONTROL BEGIN/END OF PROJECT SIGNING

TRAFFIC CONTROL LEGEND

- SIGN
- DIRECTIONAL INDICATOR BARRICADE
- CHANNELIZER (TRIM LINE)
- TYPE III MOVABLE BARRICADE
- TRAFFIC BARRIER
- IMPACT ATTENUATOR
- LANE UTILIZATION ARROW
- CHANGEABLE MESSAGE BOARD (WITH COMMUNICATION)

SCALE

0 50 100 150



SPEED LIMIT 70
R2-1
25

END ROAD WORK
GO20-2
26

TEMPORARY TRAFFIC CONTROL
I-70 OVER ROUTE J/
ROUTE O

STATE OF MISSOURI
JASON LAWRENCE C. JARQUIO
NUMBER PE-2021011939
PROFESSIONAL ENGINEER

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DATE PREPARED
8/12/2024

ROUTE	STATE
I-70	MO

DISTRICT	SHEET NO.
CD	5

COUNTY
BOONE

JOB NO.
JCDM0064

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A44492

DESCRIPTION	DATE

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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JASON L. JARQUIO
PROFESSIONAL ENGINEER
PE-2021011939

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TRAFFIC CONTROL LEGEND

- SIGN
- DIRECTIONAL INDICATOR BARRICADE
- CHANNELIZER (TRIM LINE)
- TYPE III MOVABLE BARRICADE
- TRAFFIC BARRIER
- IMPACT ATTENUATOR
- LANE UTILIZATION ARROW
- CHANGEABLE MESSAGE BOARD (WITH COMMUNICATION)

SCALE
0 50 100 150

ADVANCED SIGNAGE FOR SOUTHBOUND ROUTE J
DIMENSIONED NORTH FROM ROAD CLOSURE AT THE
OLD ROCHEPORT RD. AND ROUTE J INTERSECTION.

OLD ROCHEPORT RD.
PERM. SIGN COVER
TYPE III MOVABLE BARRICADE
ROUTE J
M1-5a M1-5a
M6-1L M6-1R
PERM. SIGN COVER
R1-1
PERM. SIGN COVER
IMPACT ATTENUATOR (50 MPH)
TEMP. TRAFFIC BARRIER
TEMP. 4" SOLID WHITE LINE
TEMP. 4" SOLID YELLOW LINE
TEMP. STRAIGHT ARROW
TEMP. TRAFFIC BARRIER
50' 75' 37.5
50' 75' 50'
TEMP. STRAIGHT ARROW
CHANNELIZERS SPACED @ 35' (TYP.)
I-70 WB ON RAMP
16' LANE
I-70 WB OFF RAMP
15' LANE
WORK AREA
BRIDGE A44492
TEMP. 4" SOLID WHITE LINE
CHANNELIZERS SPACED @ 60' (TYP.)
I-70 WB
12' LANE
5' SHOULDER
CHANNELIZERS SPACED @ 120' (TYP.)
TEMP. 4" SOLID WHITE LINE
737.5' TEMPORARY CONCRETE SAFETY BARRIER
12' LANE
5' SHOULDER
I-70 EB
TEMP. TRAFFIC BARRIER
WORK AREA
37.5
M1-5a
M6-3
PERM. SIGN COVER
I-70 FB ON RAMP
I-70 EB OFF RAMP
TYPE III MOVABLE BARRICADE
COVER THIS PORTION
M1-5a M1-5a
M6-1L M6-1R
PERM. SIGN COVER AS SHOWN
ROUTE O
500'
COVER THIS PORTION
GUIDE SIGN
PERM. SIGN
COVER AS SHOWN
ALEXANDER DR.
SONTAG DR.
TYPE III MOVABLE BARRICADE
CHANGEABLE MESSAGE BOARD SPACED 500' IN ADVANCE OF WO20-1 SIGN

BRIDGE WORK AHEAD
WO20-1
NOTE: INCLUDE ADVANCED WARNING RAIL SYSTEM ON ALL WO20-1 SIGNS.

EMERGENCY STOPPING ONLY
R8-7

ROAD CLOSED 500 FT
WO20-3

ROAD CLOSED AHEAD
WO20-3

ROAD CLOSED
R11-2

ROAD CLOSED TO THRU TRAFFIC
R11-4

STATE OF MISSOURI
JASON LAWRENCE C. JARQUIO NUMBER PE-2021011939
PROFESSIONAL ENGINEER

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DATE PREPARED
8/12/2024

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
CD	6

COUNTY
BOONE

JOB NO.
JCDM0064

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A44492

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

DESCRIPTION	DATE

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

GBA
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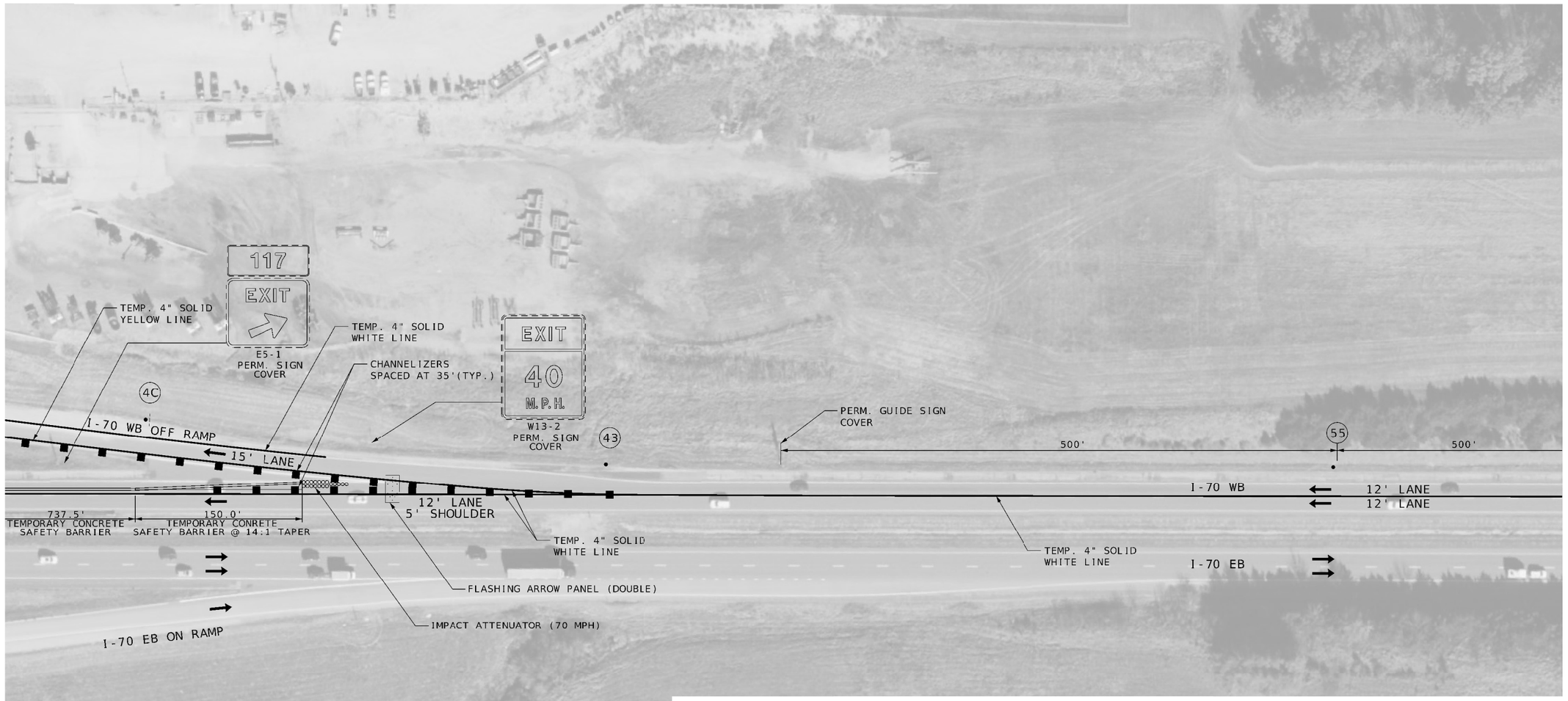
JASON L. JARQUIO
PROFESSIONAL ENGINEER
PE-2021011939

TEMPORARY TRAFFIC CONTROL I-70 OVER ROUTE J/ ROUTE O



TRAFFIC CONTROL LEGEND

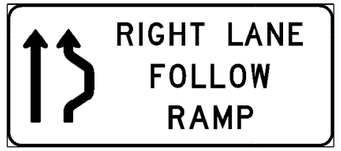
- SIGN
- DIRECTIONAL INDICATOR BARRICADE
- CHANNELIZER (TRIM LINE)
- TYPE 3 MOVABLE BARRICADE
- TRAFFIC BARRIER
- IMPACT ATTENUATOR
- LANE UTILIZATION ARROW
- CHANGEABLE MESSAGE BOARD (WITH COMMUNICATION)
- FLASHING ARROW PANEL (DOUBLE)

R2-1

4C

WO5-1

43



SP-1

55

SCALE

0 50 100 150

TEMPORARY TRAFFIC CONTROL
I-70 OVER ROUTE J/
ROUTE O

STATE OF MISSOURI
JASON LAWRENCE C. JARQUIO
NUMBER PE-2021011939
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8/12/2024

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
CD	7

COUNTY
BOONE

JOB NO.
JCDM0064

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A44492

DESCRIPTION	DATE

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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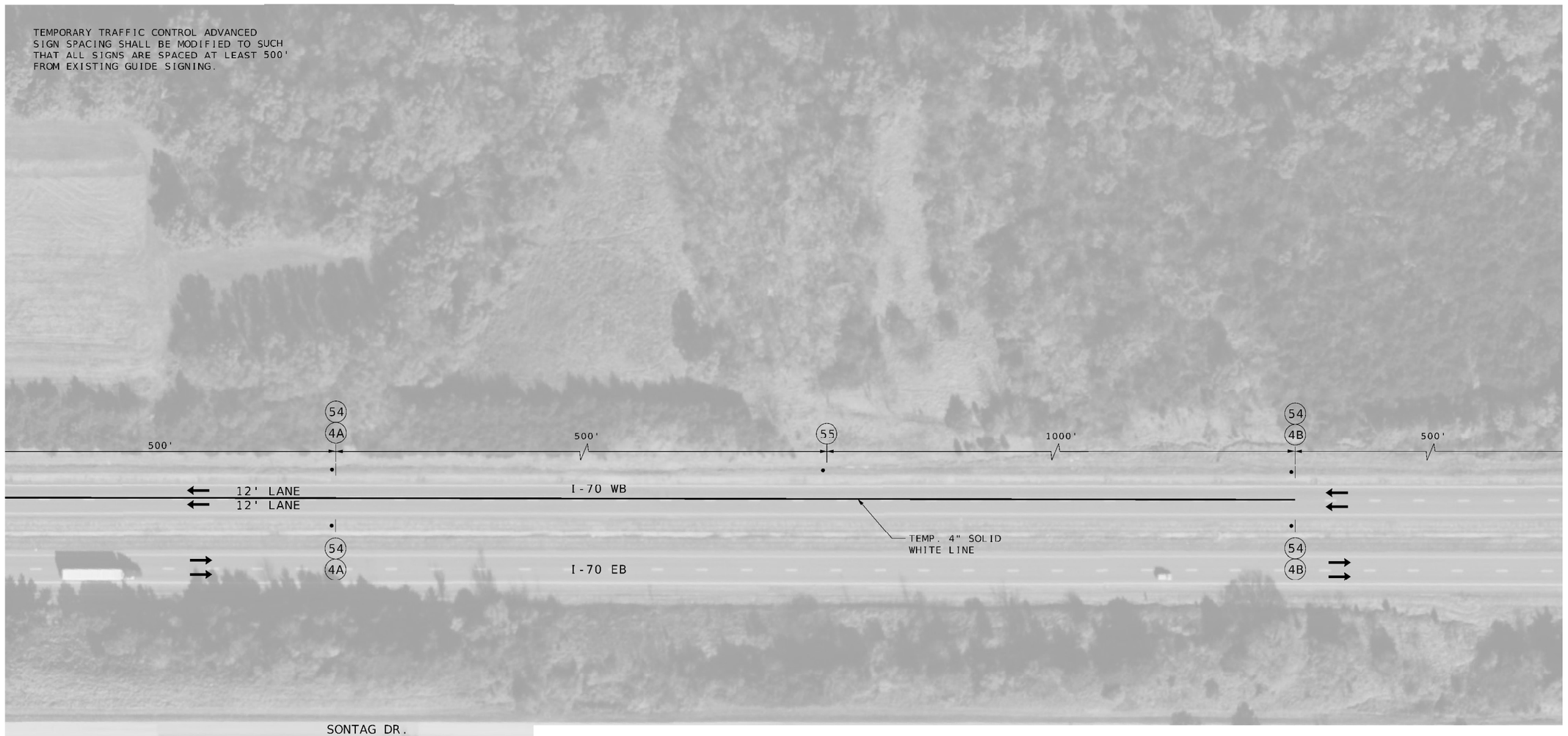
JASON L. JARQUIO
PROFESSIONAL ENGINEER
PE-2021011939

TEMPORARY TRAFFIC CONTROL ADVANCED SIGN SPACING SHALL BE MODIFIED TO SUCH THAT ALL SIGNS ARE SPACED AT LEAST 500' FROM EXISTING GUIDE SIGNING.



TRAFFIC CONTROL LEGEND

- SIGN
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- LANE UTILIZATION ARROW
- CHANGEABLE MESSAGE BOARD (WITH COMMUNICATION)
- FLASHING ARROW PANEL (DOUBLE)

R2-1

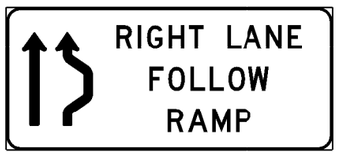
4A

R2-1

4B

G020-5aP

54



SP-1

55

TEMPORARY TRAFFIC CONTROL I-70 OVER ROUTE J/ ROUTE O

JASON LAWRENCE C. JARQUIO NUMBER PE-2021011939 PROFESSIONAL ENGINEER
STATE OF MISSOURI

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DATE PREPARED
8/12/2024

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
CD	8

COUNTY
BOONE

JOB NO.
JCDM0064

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A44492

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
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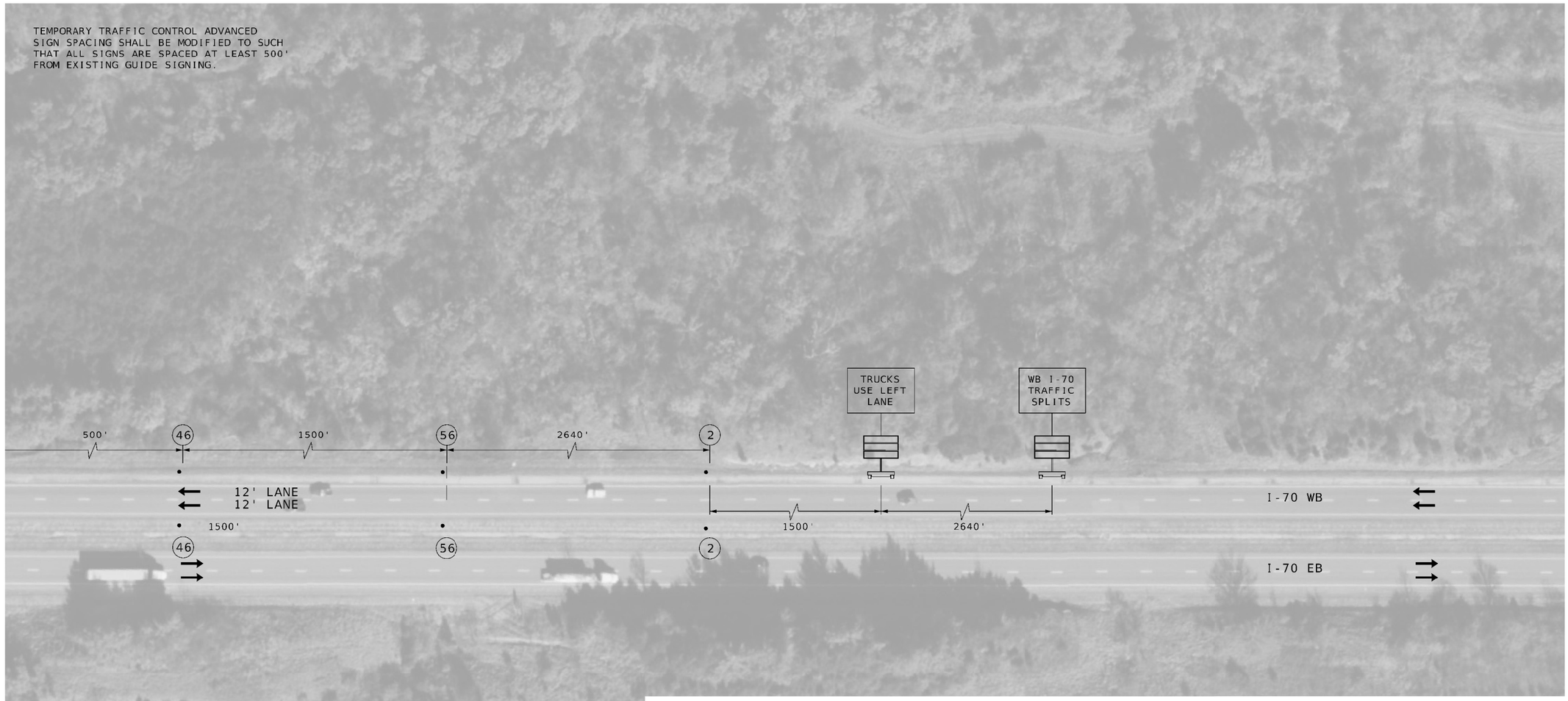
JASON L. JARQUIO
PROFESSIONAL ENGINEER
PE-2021011939

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

TEMPORARY TRAFFIC CONTROL ADVANCED SIGN SPACING SHALL BE MODIFIED TO SUCH THAT ALL SIGNS ARE SPACED AT LEAST 500' FROM EXISTING GUIDE SIGNING.



TRAFFIC CONTROL LEGEND

- SIGN
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- IMPACT ATTENUATOR
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- CHANGEABLE MESSAGE BOARD (WITH COMMUNICATION)
- FLASHING ARROW PANEL (DOUBLE)

NOTE: INCLUDE ADVANCED WARNING RAIL SYSTEM ON ALL W020-1 SIGNS.

W020-1
2

R4-1
46

SP-2
56

SCALE
0 50 100 150

TEMPORARY TRAFFIC CONTROL
I-70 OVER ROUTE J/
ROUTE O

STATE OF MISSOURI
JASON LAWRENCE C. JARQUIO
NUMBER PE-2021011939
PROFESSIONAL ENGINEER

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DATE PREPARED
8/12/2024

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
CD	9

COUNTY
BOONE

JOB NO.
JCDM0064

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A44492

DESCRIPTION	DATE

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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JASON L. JARQUIO
PROFESSIONAL ENGINEER
PE-2021011939

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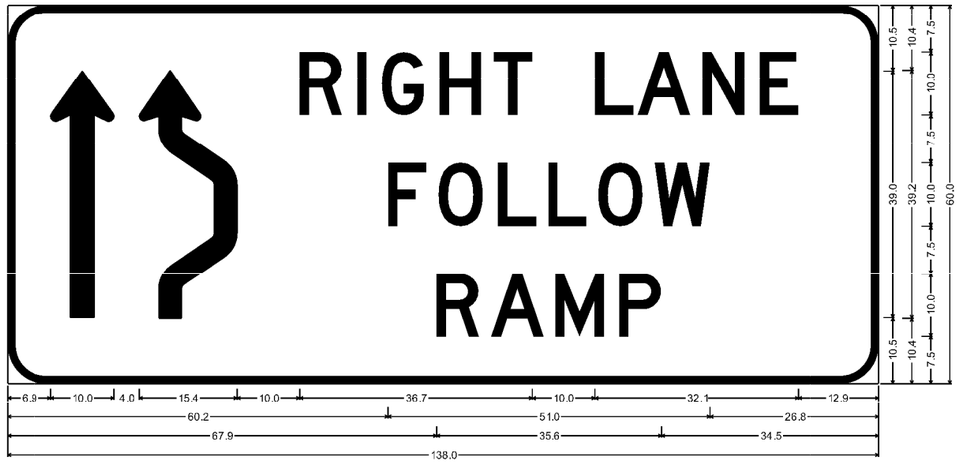
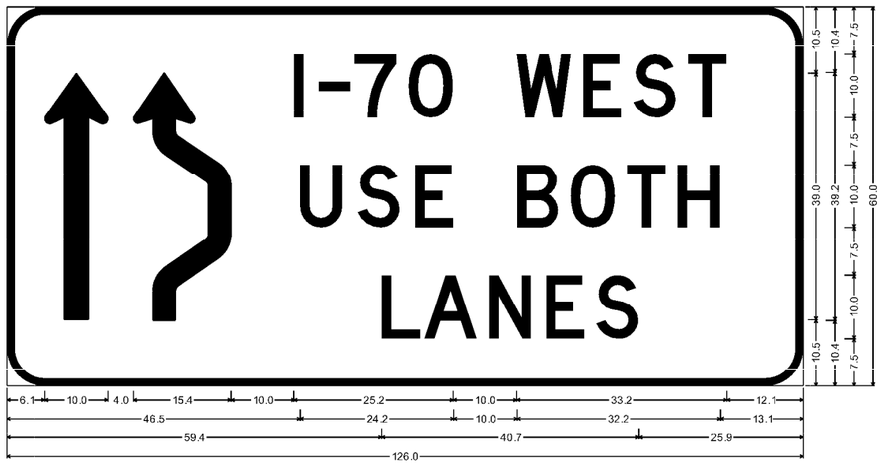


SIGN NO.	55
STATION	
ROADWAY	WB I-70

SP-1 (Detour Sign) ;
6.0" Radius, 1.3" Border, Black on Orange;
Arrow Custom - 39.0" 90°; Double Reverse Curve (1 Lane) Arrow; "RIGHT LANE", D; "FOLLOW", D; "RAMP", D;
Table of distances between letter and object lefts

6.9	I 14.0	R 25.4	I 9.1	G 3.9	H 9.0	T 8.6	L 16.1	A 6.7	N 10.3	E 9.0	6.1	12.9	
60.2	F 8.0	O 9.4	L 8.0	L 7.9	O 8.9	W 8.8	26.8						
67.9	R 8.6	A 10.2	M 10.1	P 6.7	34.5								



SIGN NO.	56
STATION	
ROADWAY	WB I-70

SP-2 (Detour Sign) ;
6.0" Radius, 1.3" Border, Black on Orange;
Arrow Custom - 39.0" 90°; Double Reverse Curve (1 Lane) Arrow; "I-70 WEST", D; "USE BOTH", D; "LANES", D;
Table of distances between letter and object lefts

6.1	I 14.0	R 25.4	I 3.9	- 5.6	7 8.6	0 17.1	W 10.6	E 7.9	S 8.6	T 6.1	12.1		
46.5	U 9.1	S 9.0	E 16.1	B 8.6	O 8.9	T 8.0	H 6.7	13.1					
59.4	L 6.7	A 10.2	N 9.1	E 7.9	S 6.8	25.9							

TEMPORARY TRAFFIC CONTROL
SIGN DETAILS

STATE OF MISSOURI
JASON LAWRENCE C. JARQUIO
NUMBER PE-2021011939
PROFESSIONAL ENGINEER

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DATE PREPARED
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ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
CD	10

COUNTY
BOONE

JOB NO.
JCDM0064

CONTRACT ID.

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BRIDGE NO.
A44492

DESCRIPTION	DATE

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105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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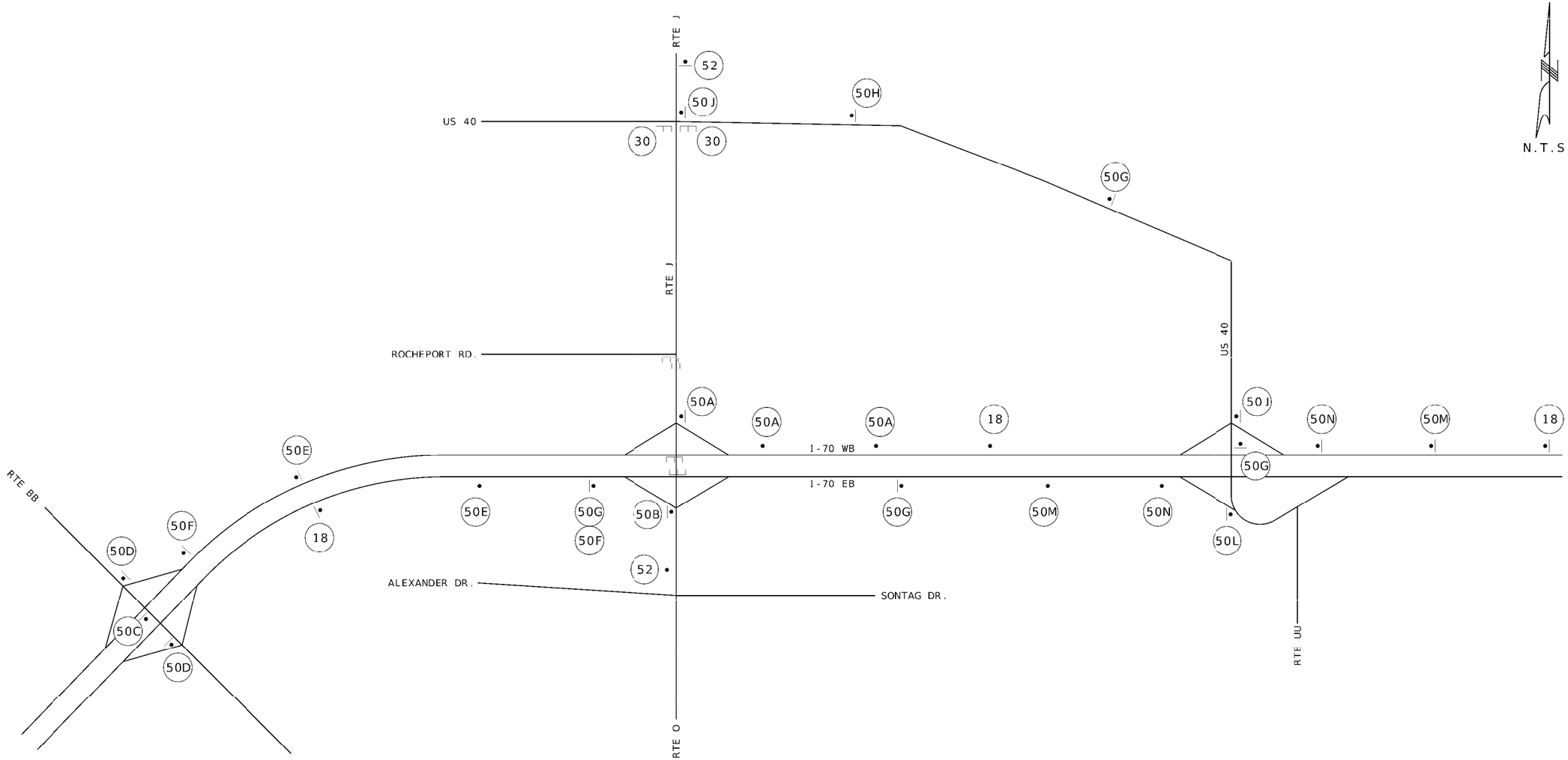
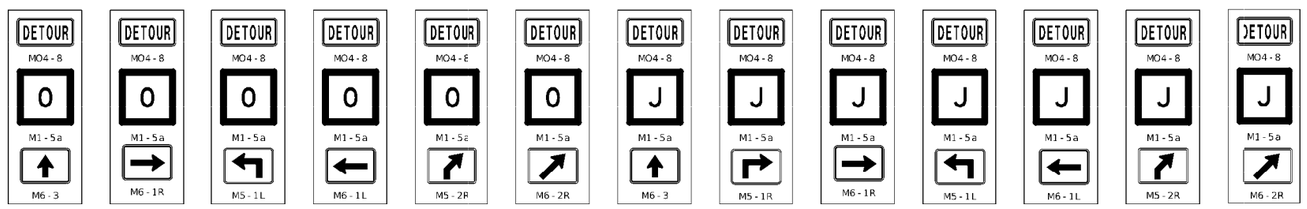


WO20-2
48" x 48"
18

R11-4
30

MO4-8a
52



50A 50B 50C 50D 50E 50F 50G 50H 50J 50K 50L 50M 50N

NOTE:
COVER OR REMOVE EXISTING ROUTE SIGNING AS NEEDED WHEN THEY CONFLICT WITH TEMPORARY TRAFFIC CONTROL ITEMS SHOWN ON PLANS.

TEMPORARY TRAFFIC CONTROL ROUTE J/ROUTE O DETOURS

STATE OF MISSOURI
JASON LAWRENCE C. JARQUIO
NUMBER PE-2021011939
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DATE PREPARED
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ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
CD	11

COUNTY
BOONE

JOB NO.
JCDM0064

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
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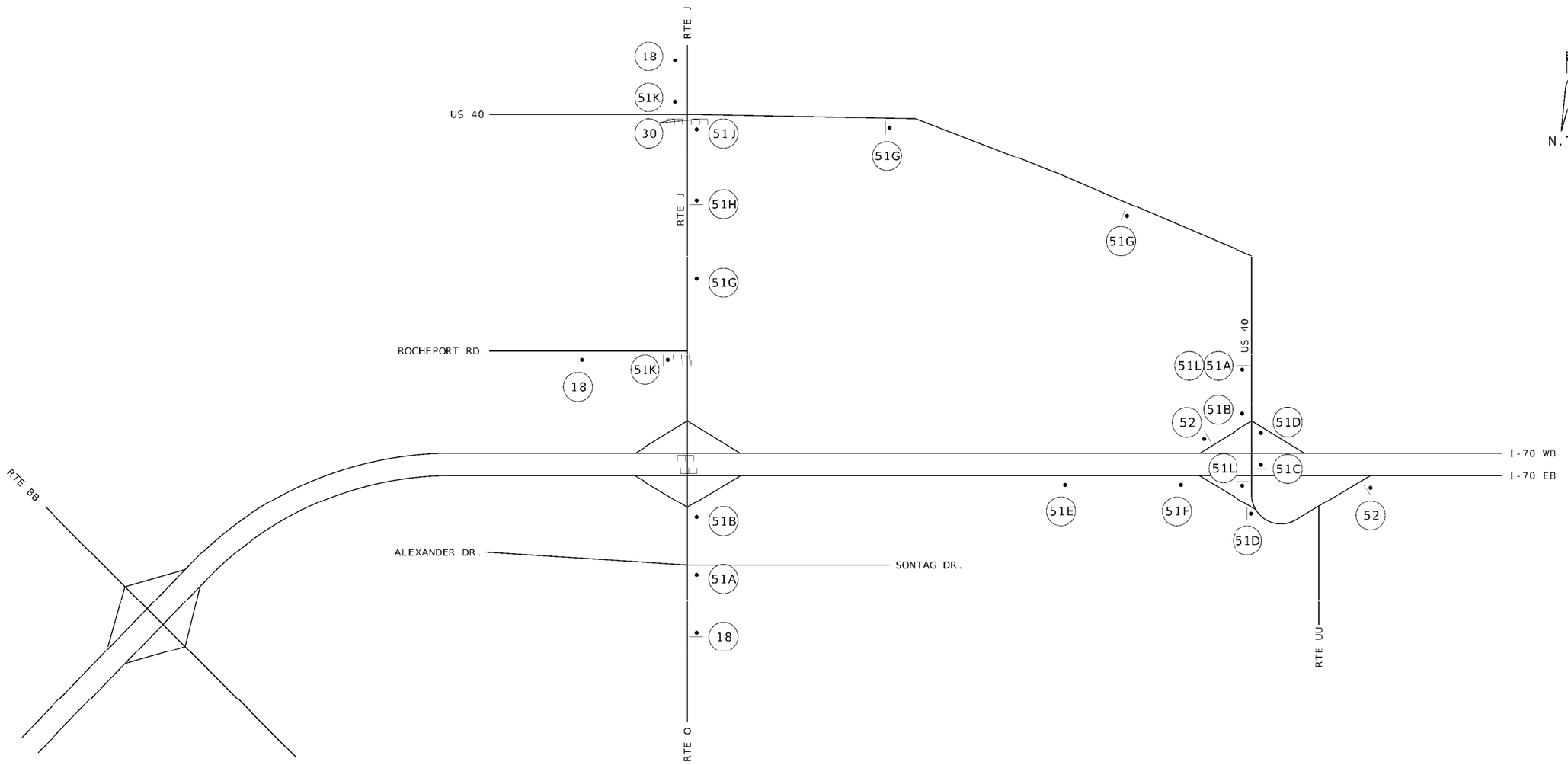

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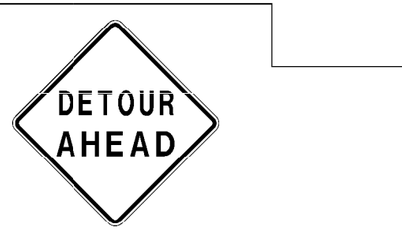
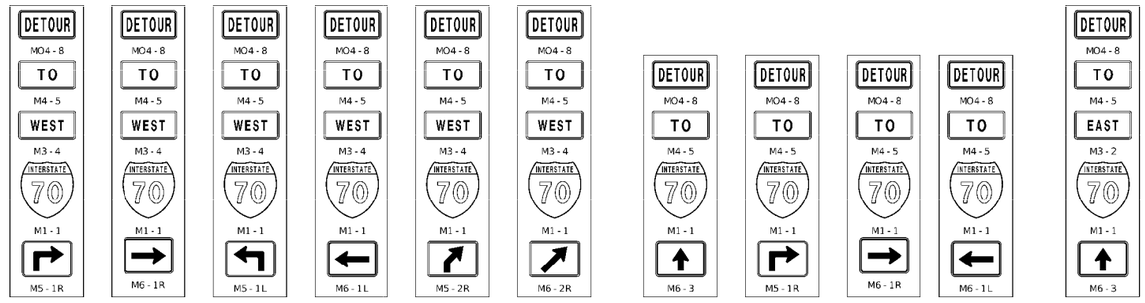


WO20-2
48" x 48"
18

R11-4
30

MO4-8a
52



51A 51B 51C 51D 51E 51F 51G 51H 51J 51K 51L

NOTE:
COVER OR REMOVE EXISTING ROUTE SIGNING AS NEEDED WHEN THEY CONFLICT WITH TEMPORARY TRAFFIC CONTROL ITEMS SHOWN ON PLANS.

TEMPORARY TRAFFIC CONTROL INTERSTATE 70 DETOURS

STATE OF MISSOURI
JASON LAWRENCE C. JARQUIO
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ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
CD	12

COUNTY
BOONE

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PROFESSIONAL ENGINEER
PE-2021011939

SEC/SUR 9/10 TWP 48N RGE 14W

U.I.P. AND REPAIR COLLISION DAMAGED (36'- 46'- 36') PRESTRESSED CONCRETE DOUBLE-TEE GIRDER SPANS (SKEW: 1°12')

General Notes:

Design Specifications:

2002 AASHTO (17th Ed.) Standard Specifications

Design Loading:

HS20-44 Modified (1984)(New Construction)
35 lb/sf Future Wearing Surface
Military 24,000 lb Tandem Axle (1984)(New Construction)
Earth - 120 lb/cf, Equivalent Fluid Pressure 30 lb/cf
Superstructure: Simply-supported, non-composite for dead load.
Continuous composite for live load.

Design Unit Stresses:

Class B-1 Concrete (Type B Barrier)	f'c = 4,000 psi
Class B-2 Concrete (Superstructure except Type B Barrier and Prestressed Girders)	f'c = 4,000 psi
Reinforcing Steel (Grade 60)	fy = 60,000 psi

For prestressed girder stresses, see Sheet No. 4.

Neoprene Pads:

Neoprene bearing pads shall be 60 durometer and shall be in accordance with Sec 716.

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.

MBS refers to mechanical bar splices. Mechanical bar splices shall be in accordance with Sec 706 or 710.

Traffic Handling:

Traffic to be maintained on structure during construction. See roadway plans for traffic control.

Miscellaneous:

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.

All dimensions are based on original design plans and are taken horizontal.

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

Contractor shall verify all dimensions in field before ordering new material and finalizing shop drawings.

Construction Notes:

The existing bridge and roadway plus appurtenances shall be inspected with the Owner's Representative, the Contractor's Representative, and any other interested parties' Representatives as approved by the Owner prior to starting work. Any deficiencies shall be noted and photographed as necessary and agreed upon prior to starting work. A follow-up inspection shall be performed with the same parties at the conclusion of the project.

The Contractor shall submit a work plan to the Engineer detailing all major operations of construction for approval prior to starting work. The work plan shall include schedule, sequence of construction, major equipment, methods of removal, methods of protecting existing structures, methods of protecting traffic below and proposed materials (mechanical bar splices, epoxy bonding agent, etc.).

The Contractor shall submit shop drawings for the replacement girders with new assigned mark numbers.

Any structure and roadway items to be preserved shall be protected from damage during the removal and/or storage process. Any remaining bridge structure, roadway or appurtenances damaged by the Contractor's operations shall be replaced by the Contractor as directed by the Engineer at no additional cost to the Owner.

All reinforcing steel indicated to be preserved that is damaged during the removal operation shall be repaired or replaced as required by the Engineer including coating cutoffs, and providing additional mechanical bar splices and reinforcing steel as needed.

Construction Notes (Cont'd):

The removal joint shall be blasted free of any concrete dust, dirt, or debris using high pressure sprayer(s) (not less than 1,200 psi) and maintained in a clean condition prior to placing the deck/diaphragm/barrier concrete. Any surface becoming contaminated shall be re-blasted as directed by the Engineer.

Care shall be taken during removal such that reinforcing steel to be preserved does not become unbonded. Any bars that become unbonded shall be carefully exposed by removing the concrete to provide a minimum of 1" clearance around the bar or as directed by the Engineer.

All mechanical bar splices shall be epoxy coated. The type and size of mechanical bar splices shall be as approved by the Engineer. Lengths of new reinforcing steel shown spliced to existing reinforcing are approximate and shall be adjusted to accommodate the type of mechanical bar splice used.

The face of concrete removal lines in the bridge deck shall be coated with an approved epoxy bonding agent prior to placing the bridge deck concrete. The epoxy bonding agent shall be applied in accordance with the Manufacturer's written directions. The epoxy bonding agent shall fully coat the surfaces to be bonded, remain tacky prior to placing concrete, and not allowed to pond or puddle on horizontal surfaces. The cost of the epoxy bonding agent shall be considered completely covered by the contract unit price for Partial Replacement of Slab on Concrete Adjacent Beam.

Any deck surface construction joints found to have visually opened up at 28 days following the completion of the cure shall be epoxy injected as directed by the Engineer. The cost of this work shall be considered completely covered by the contract unit price for Partial Replacement of Slab on Concrete Adjacent Beam.

All removals are the property of the Contractor and shall be disposed of as approved by the Engineer. The job site shall be left in a condition similar to that documented in the pre-construction walk-through and as approved by the Engineer.

Bridge deck surface may be finished with a vibratory screed.

Top of proposed concrete deck shall be tined to match the tining of the adjacent existing deck.

Estimated Quantities

Bridge A44492

Item		Total
Partial Removal of Existing Bridge Deck	sq. foot	776
Type B Barrier	linear foot	49
Partial Replacement of Slab on Concrete Adjacent Beam	sq. yard	79
Remove and Install Commission Furnished 30 in., Prestressed Concrete Double-Tee Girder	each	2
Mechanical Bar Splice	each	96
Remove and Install Commission Furnished Plain Neoprene Bearing Pad	each	8

All reinforcement in the intermediate bent concrete diaphragms is included in the Estimated Quantities for Partial Replacement of Slab on Concrete Adjacent Beam.

All concrete above the construction joint of the intermediate beam cap is included in the Estimated Quantities for Partial Replacement of Slab on Concrete Adjacent Beam.

All work required to remove the barrier, bridge deck, and intermediate concrete bent diaphragms shall be completely covered by the contract unit price for Partial Removal of Existing Bridge Deck.

All work required for the removal and replacement of Girders No. 1 & 2 in Span (2-3) shall be completely covered by the contract unit price for Remove and Install Commission Furnished 30 in., Prestressed Concrete Double-Tee Girder.

All work required for the removal and installation of the bearing pads for Girders No. 1 & 2 at Int. Bents No. 2 and No. 3 shall be completely covered by the contract unit price for Remove and Install Commission Furnished Plain Neoprene Bearing Pad.

Estimated Quantities for Partial Replacement of Slab on Concrete Adjacent Beam

Item		Total
Class B-2 Concrete	cu. yard	20
Reinforcing Steel (Epoxy Coated)	pound	3420

The table of Estimated Quantities for Partial Replacement of Slab on Concrete Adjacent Beam 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 as shown on the demolition plan. Payment for 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.

Type B Barrier quantities are not included in Estimated Quantities for Partial Replacement of Slab on Concrete Adjacent Beam.

STATE OF MISSOURI
MELANIE J. TOWNSEND
NUMBER PE-2000155363
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

DATE PREPARED 8/22/2024

ROUTE I-70 | STATE MO

DISTRICT BR | SHEET NO. 1

COUNTY BOONE

JOB NO. JCDM0064

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A44492

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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GEORGE BUTLER ASSOCIATES, INC.
PRO. ENGINEER 000133
ARCHITECT 000212
PRO. LAND SURVEYOR 000059

MELANIE J TOWNSEND
PROFESIONAL ENGINEER
PE-2000155363

REV.

REPAIRS TO BRIDGE:
ROUTE I-70 OVER ROUTE O/J

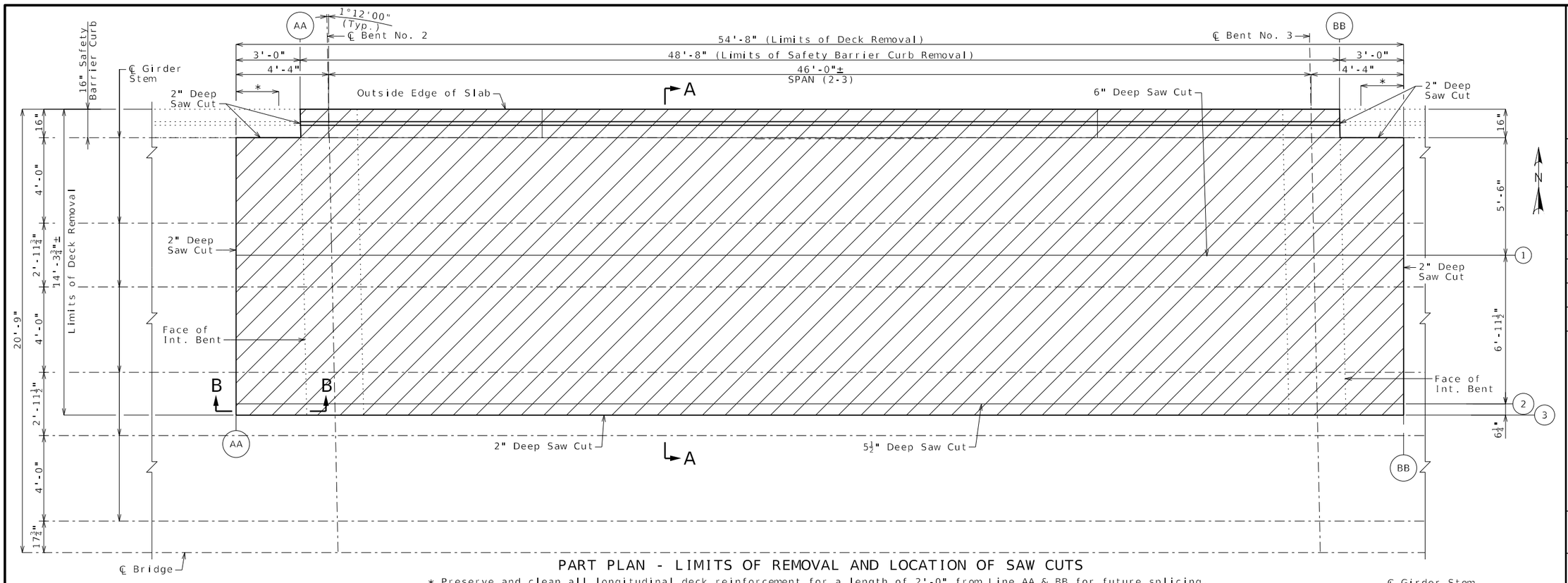
ROUTE I-70 FROM ROUTE BB TO ROUTE 40
ABOUT 2.2 MILES EAST OF ROUTE BB
BEG. STA. 148+12.20± (MATCH EXISTING)

Detailed July 2024
Checked Aug. 2024

GENERAL NOTES AND ESTIMATED QUANTITIES

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

B_A44492_001_JCDM0064_General_Notes_and_Quantites.dgn 3:55:40 PM 8/22/2024



PART PLAN - LIMITS OF REMOVAL AND LOCATION OF SAW CUTS

∗ Preserve and clean all longitudinal deck reinforcement for a length of 2'-0" from Line AA & BB for future splicing.

The existing slab for Bridge A4449 to be replaced was constructed as composite.

Any damage sustained to the remaining structure as a result of the Contractor's operations shall be repaired or the material replaced as approved by the Engineer at the Contractor's expense.

Removal Limits of Safety Barrier Curb & Concrete Deck

SUGGESTED SEQUENCE OF CONSTRUCTION

1. Mark layout lines on bridge deck as follows:
   a. Mark layout lines representing ℄ Bents No. 2 and No. 3. Mark transverse saw cut lines AA and BB at limits of removal near Bents No. 2 and No 3. See Part Plan - Limits of Removal and Location of Saw Cuts.
   b. Mark longitudinal saw cut lines 1, 2, and 3 as shown in Part Plan - Limits of Removal and Location of Saw Cuts.

2. Saw 2" deep cut on each face of safety barrier curb at AA and BB. Carefully remove barrier concrete from cut line to ℄ Pier, preserving longitudinal reinforcing steel for future use.

3. Saw cut bridge deck as follows and per Part Plan - Limits of Removal and Location of Saw Cuts:
   i. 2" deep saw cut in deck at transverse lines AA and BB.
   ii. 5 1/2" deep saw cut at longitudinal line 1.

4. Remove bridge deck from fascia to longitudinal 6" saw cut line 1. This will include the removal of concrete barrier. Use 35 lb. (max.) hammer for all slab removal.

5a. Saw cut bridge deck as follows and per Part Plan - Limits of Removal and Location of Saw Cuts:
   i. 5 1/2" deep saw cut at longitudinal line 2.
   ii. 2" deep saw cut at longitudinal line 3.

5b. Remove cast-in-place concrete deck between longitudinal lines 1 and 2 as shown in Part Plan - Limits of Removal and Location of Saw Cuts. Care shall be taken to not damage existing girders during removal process.

6. Carefully remove Bents No. 2 and No. 3 diaphragms to limits shown in Elevation and Sections A-A and B-B on Sheet No. 3. Care shall be taken to preserve the longitudinal deck reinforcing steel near Bents No. 2 and No. 3 for future splicing. When removing concrete between the ends of girders at Bents No. 2 and No. 3, care shall be taken so as to not damage the prestressing strands protruding from the ends of Girders No. 1 and No. 2, Span (1-2) and Girders No. 1 and No. 2 (Span 3-4). Care shall be taken to preserve the dowel bars between the pier cap and pier diaphragm and the longitudinal bars in the diaphragm between Girders No. 2 and No. 3.

7. Remove Girder No. 1, Span (2-3) and Girder No. 2, Span (2-3). Remove and dispose of existing bearing pads and joint filler at Bents No. 2 and No. 3.

8. Carefully remove concrete deck at Girder No. 3 to limits shown in Section A-A using lighweight handheld chipping hammers. Care shall be taken not to damage existing Girder No. 3.

9. Install bearing devices and joint filler at Bents No. 2 and No. 3.

10. Set replacement Girder No. 2.

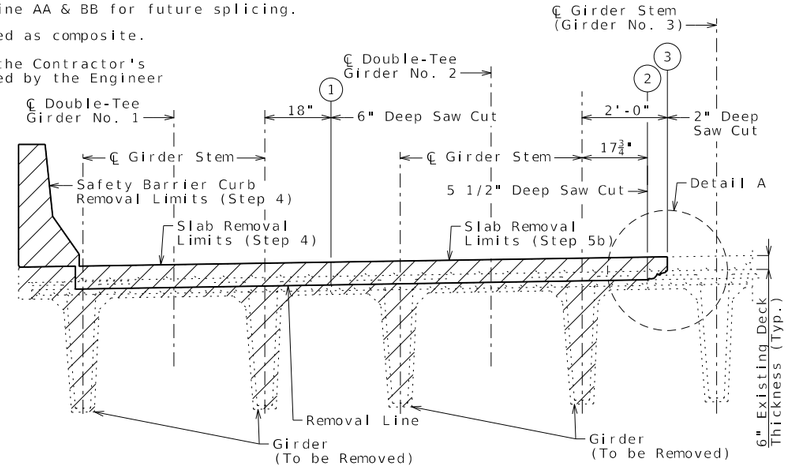
11. Set replacement Girder No. 1.

12. Form diaphragms. Install mechanical bar splices, deck reinforcing steel, and diaphragm reinforcing steel.

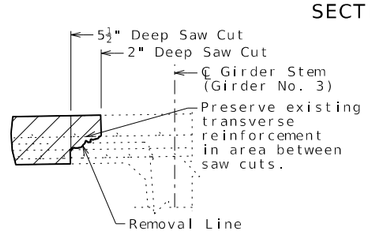
13. Place diaphragm and bridge deck concrete. Cure in accordance with Sec. 703.3.6.

14. Install barrier curb reinforcing steel. Place barrier curb concete.

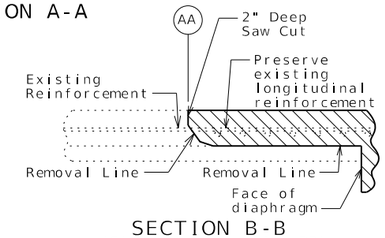
15. Install penetrating crack sealer and concrete crack filler per Sec. 1053.



SECTION A-A



DETAIL A



SECTION B-B
(Similar at cut line BB)

DEMOLITION PLAN

Detailed July 2024
Checked Aug. 2024

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

Sheet No. 2 of 8

STATE OF MISSOURI
MELANIE J. TOWNSEND
NUMBER PE-2000155363
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

DATE PREPARED
8/12/2024

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

COUNTY
BOONE

JOB NO.
JCDM0064

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A44492

DESCRIPTION

DATE

REV.

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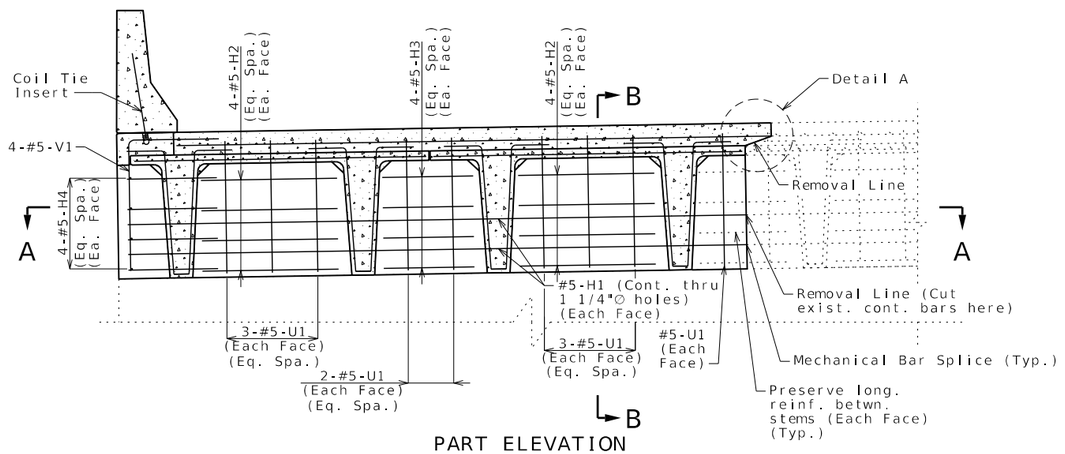
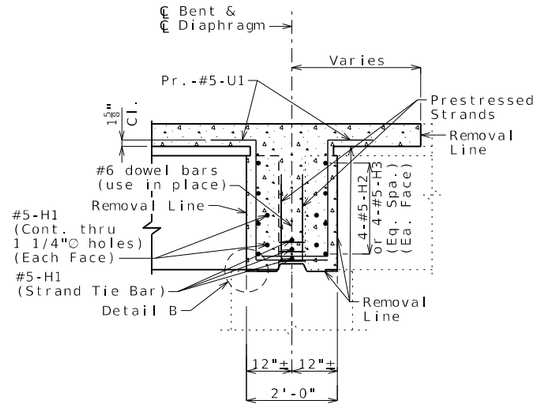
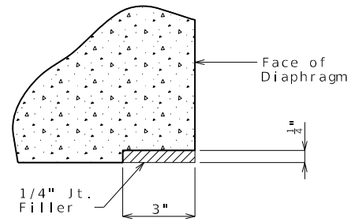


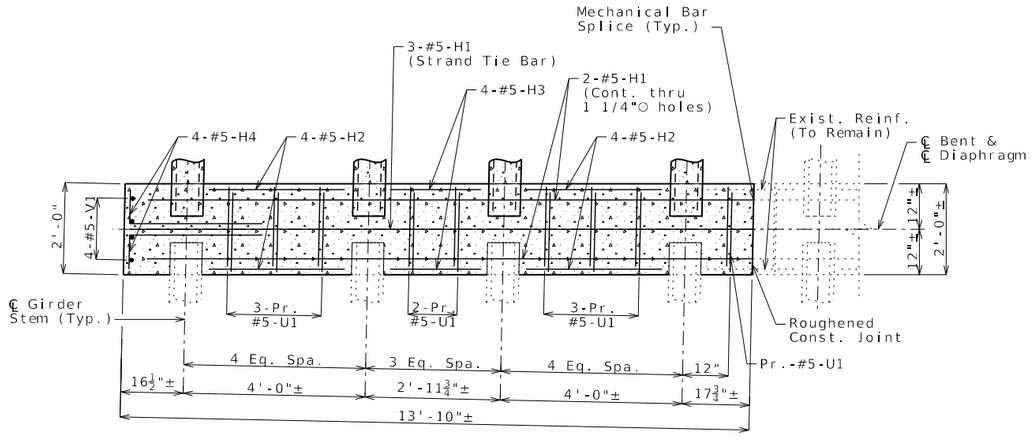
PART ELEVATION
(Bent 2 Shown, Bent 3 Similar)



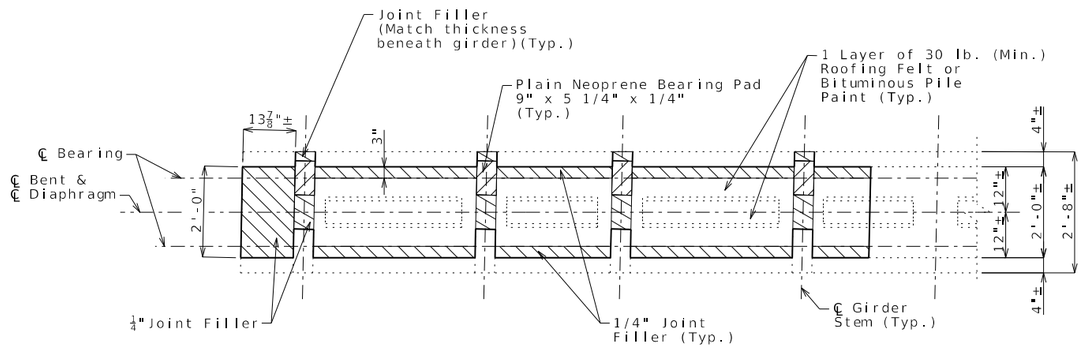
SECTION B-B



DETAIL B



SECTION A-A
(Bent No. 2 Shown, Bent No. 3 Similar)
(Key & dowels not shown for clarity)



PART PLAN - BENT CAP
(Bent No. 2 Shown, Bent No. 3 Similar)

Notes:

Diaphragms at intermediate bents shall be built vertical.

See Sheet No. 2 for Detail A.

For detials of Coil Tie Inserts, see Sheet No. 7.

INTERMEDIATE BENTS NO. 2 & 3 DIAPHRAGM DETAILS

Detailed July 2024
Checked Aug. 2024

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

Sheet No. 3 of 8

STATE OF MISSOURI
MELANIE J. TOWNSEND
NUMBER PE-2000155363
PROFESSIONAL ENGINEER

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DATE PREPARED
8/12/2024

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

COUNTY
BOONE

JOB NO.
JCDM0064

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A44492

DESCRIPTION

DATE

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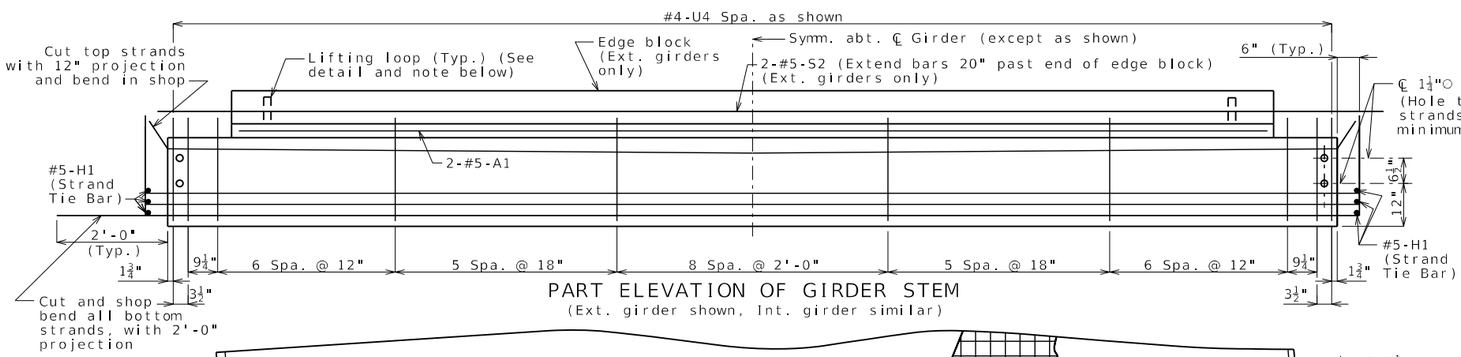
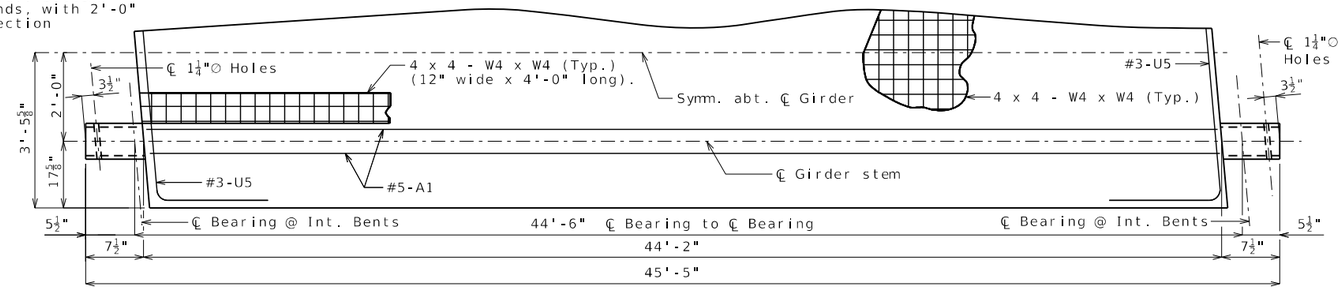
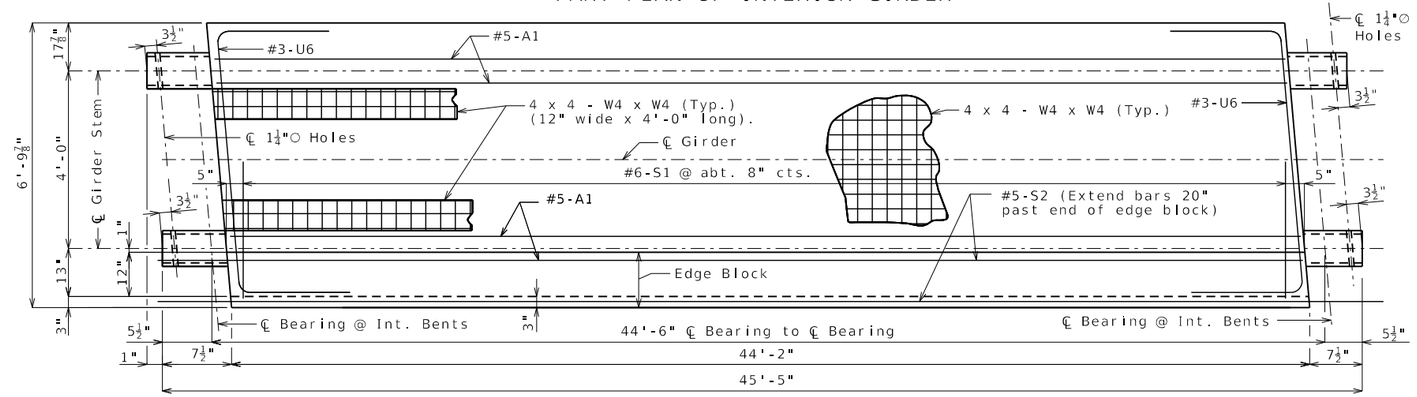


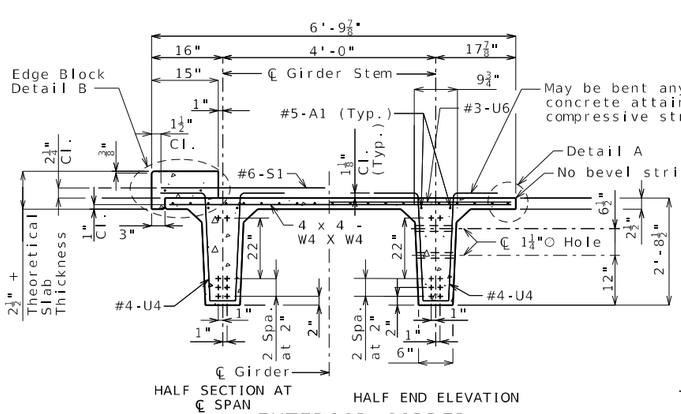
PART ELEVATION OF GIRDER STEM
(Ext. girder shown, Int. girder similar)



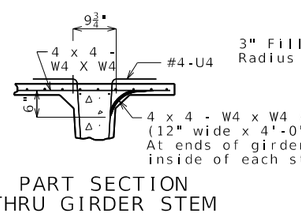
PART PLAN OF INTERIOR GIRDER



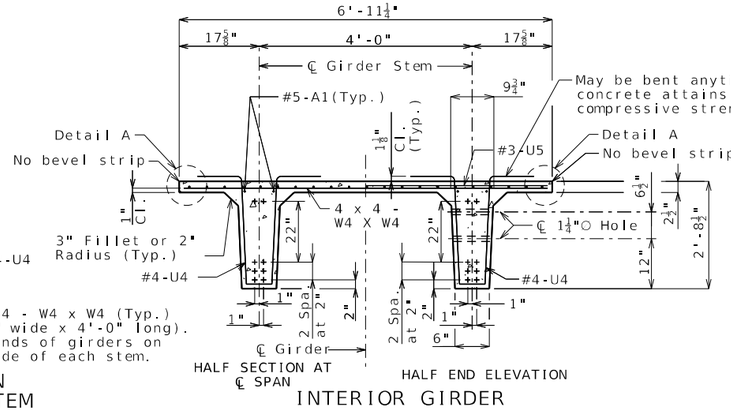
PLAN OF EXTERIOR GIRDER



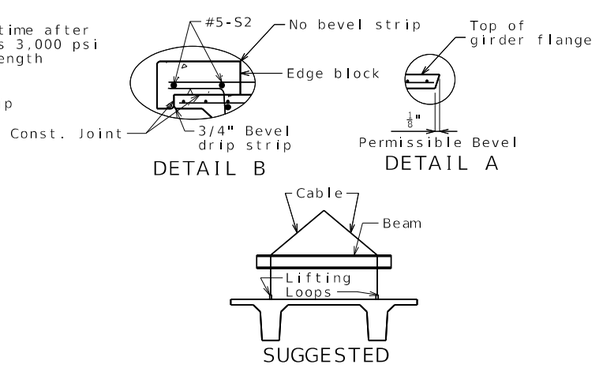
EXTERIOR GIRDER



PART SECTION THRU GIRDER STEM



INTERIOR GIRDER



PRESTRESSED CONCRETE DOUBLE-TEE GIRDERS

BILL OF REINFORCING STEEL (EACH GIRDER)

NO.	SIZE	MARK	ACTUAL LENGTH	NOTES	BENDING DIAGRAMS
Span (2-3)					U4 9¼" 3'-6½" 4" · U5 1⅝" 6'-8¼" 2'-6" · U6 2'-6" 3'-3⅜" 6'-1⅝" 1⅝" · Varies A1,S1 & S2
4	5	A1	43'-11"		
66	6	S1	3'-1"	Ext. Gdr. Only	
2	5	S2	47'-6"	Ext. Gdr. Only	
70	4	U4	7'-3"		
2	3	U5	11'-6"	Int. Gdr. Only	
2	3	U6	11'-2"	Ext. Gdr. Only	

All dimensions are out to out.
Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.
Actual lengths are measured along centerline of bar to the nearest inch.
Minimum clearance to reinforcing shall be 1", except for 4X4-W4 X W4.
All S and U reinforcing bars shall be epoxy coated.
All bar reinforcement shall be Grade 60.
Welded Wire Reinforcement (WWR) shall be in accordance with AASHTO M 221.

GENERAL NOTES:

Concrete for prestressed girders shall be Class A-1 with f'c = 6,000 psi and f'ci = 4,500 psi.

(+) Indicates prestressing strand.

Use 16 strands with an initial prestress force of 496 kips.

Prestressing tendons shall be uncoated, seven-wire, low-relaxation strands, 1/2" diameter in accordance with AASHTO M 203, Grade 270. Pretensioned members shall be in accordance with Sec 1029.

The 1 1/4"○ holes shall be cast in the stem. Drilling is not allowed.

Girders shall be handled and erected into position in a manner that will not impair the strength of the girder.

The vertical face of the exterior girder that will be in contact with the slab shall be roughened by sandblasting, or other approved methods, to provide suitable bond between girder and slab.

All exposed edges of concrete shall have a 1/2" radius or a 3/8" bevel, unless otherwise noted.

Provide lifting loops in each end of double-tee girder, located near center of stem, 2 feet from each end.

Adequate reinforcing other than the specified welded wire fabric may be used with the approval of the engineer.

For details and reinforcement of Type B Barrier including coil inserts in Edge Block, see Sheet No. 7.

Payment for edge block will be considered completely covered by the contract unit price for Remove and Install Commission Furnished 30 in., Prestressed Concrete Double-Tee Girder.

For Girder Camber Diagram and Theoretical Slab Thickness see Sheet No. 6.

Detailed July 2024
Checked Aug. 2024

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

STATE OF MISSOURI
MELANIE J. TOWNSEND
NUMBER PE-2000155363
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

DATE PREPARED 8/12/2024
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. 4
COUNTY BOONE
JOB NO. JCDM0064
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A44492

DESCRIPTION | DATE | REV.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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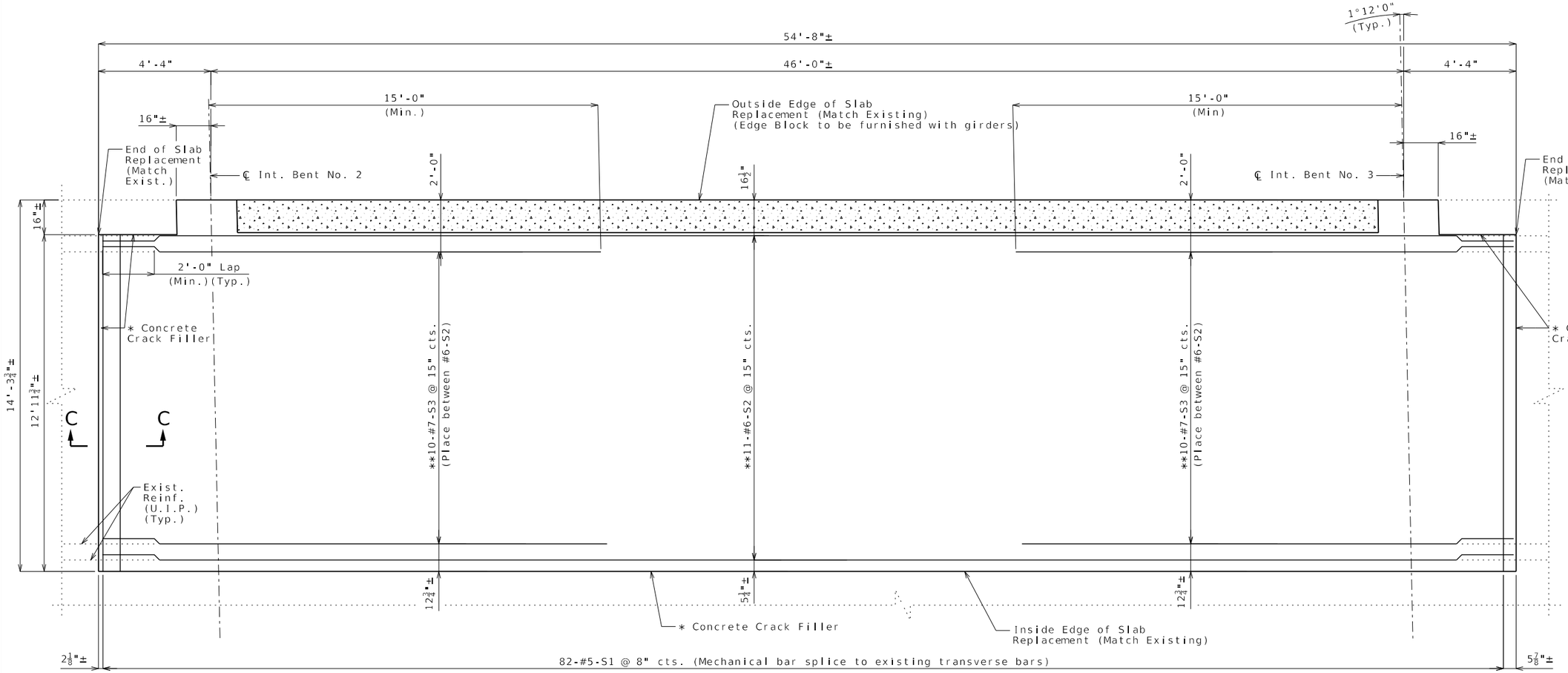
PE-2000155363



PART SLAB PLAN SHOWING REINFORCEMENT

(Mechanical bar splices not shown for clarity)

* Concrete Crack Filler shall be in accordance with Sec 704 and 1053 and shall be applied one day before or one day after the application of the Penetrating Concrete Sealer. The cost for Concrete Crack Filler will be considered completely covered by the contract unit price for Partial Replacement of Slab on Concrete Adjacent Beam.

** Lapped to existing bars. Contractor to verify bar lengths to account for coupling.

N

Notes:

Longitudinal slab dimensions are measured horizontally.

The contractor shall match the new edge of deck elevations to the existing.

See Sheet No. 6 for Section C-C.

U.I.P indicates Use in Place

PART SLAB PLAN

Detailed July 2024
Checked Aug. 2024

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

Sheet No. 5 of 8

STATE OF MISSOURI
MELANIE J. TOWNSEND
NUMBER PE-2000155363
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

DATE PREPARED
8/12/2024

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	5

COUNTY
BOONE

JOB NO.
JCDM0064

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A44492

REV.	DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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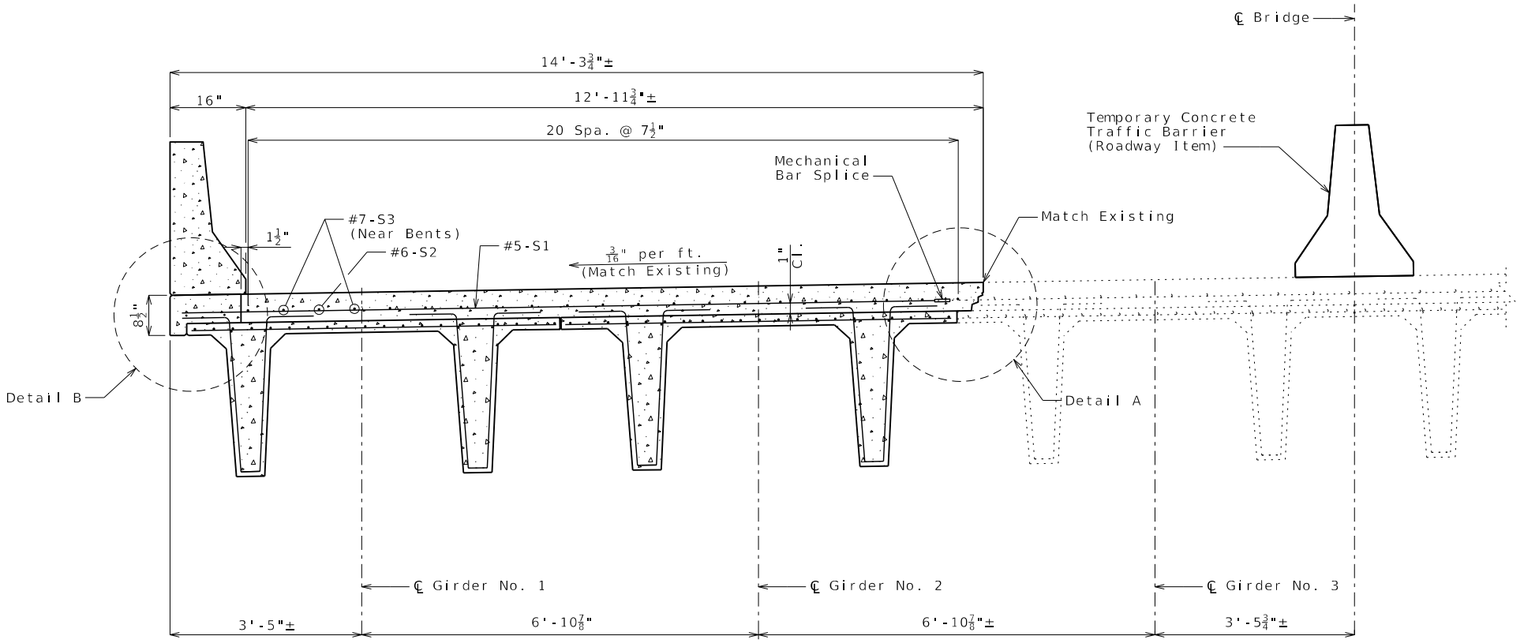
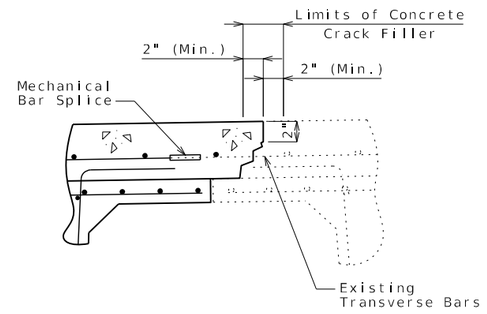
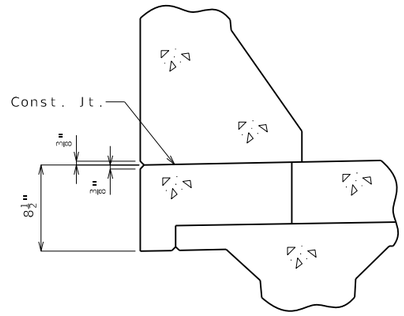


TYPICAL PART SECTION

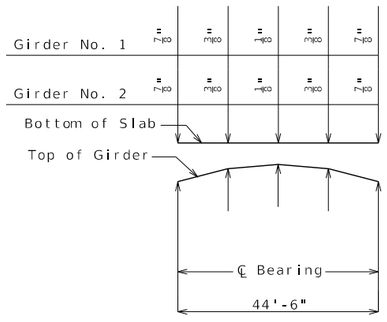
Temporary barrier shall not be attached to the bridge.



DETAIL A



DETAIL B

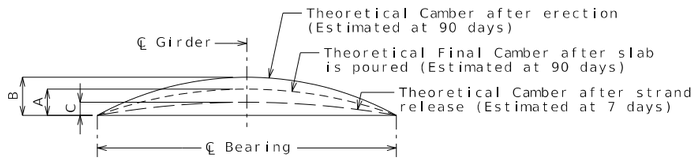


SPAN (2-3)

THEORETICAL SLAB HAUNCHING DIAGRAM

Haunch thickness shall be varied to provide required haunches and maintain 6" overall deck thickness. Use of constant joint filler thickness shall not be allowed.

In order to properly form the haunches for the replaced deck, the contractor shall survey the top of deck elevations above girder lines 1 & 2 prior to deck removal and survey elevations of the top of the replacement girder prior to new deck placement.

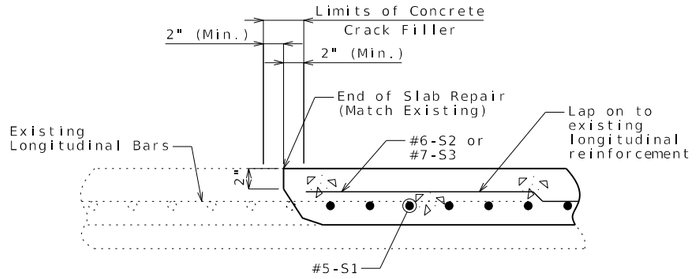


Girder	Span (2-3)		
	A	B	C
Exterior	¾"	⅞"	7/16"
Interior			

GIRDER CAMBER DIAGRAM

Conversion Factors for Beam Camber (Estimated at 90 days):

0.25 pt. = 0.7125 x 0.5 pt.



SECTION C-C

Notes:

Longitudinal slab dimensions are measured horizontally.

Concrete in the slab haunches is included in the Estimated Quantities for Partial Replacement of Slab on Concrete Adjacent Beam.

If the girder camber is different from that shown in the camber diagram, in order to maintain minimum slab thickness, adjustment of the slab haunches shall be necessary. No payment will be made for additional labor or materials required for variation in haunching.

The contractor shall pour and satisfactorily finish the roadway slab at a rate of not less than 25 cu. yd. per hour.

The concrete diaphragm at the intermediate bent shall be poured a minimum of 30 minutes and a maximum of 2 hours before the slab is poured.

The contractor shall match the new edge of deck elevations to the existing.

See Sheet No. 5 for location of Section C-C.

SLAB DETAILS

Detailed July 2024
Checked Aug. 2024

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

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ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	6

COUNTY BOONE

JOB NO. JCDM0064

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A44492

DESCRIPTION

DATE

REV.

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

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PRO. LAND SURVEYOR 000059

MELANIE J TOWNSEND
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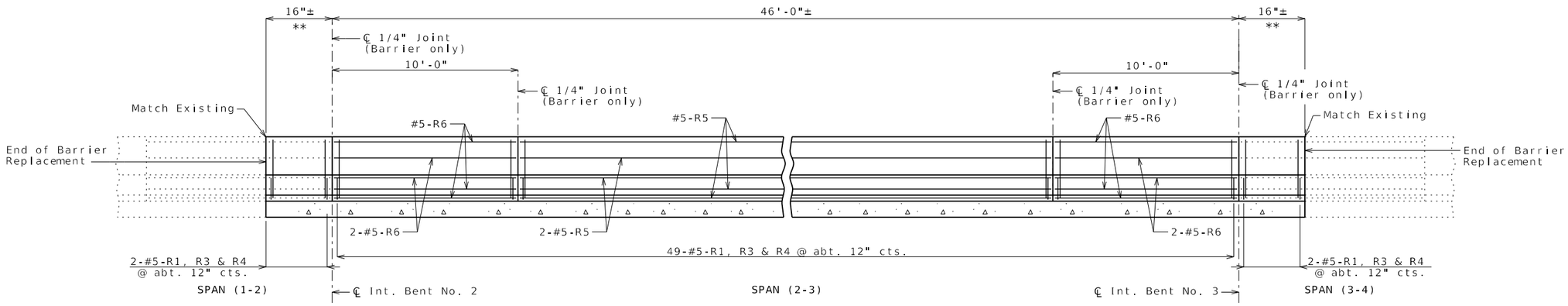
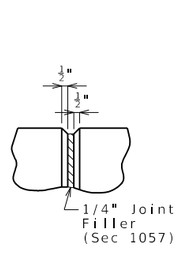


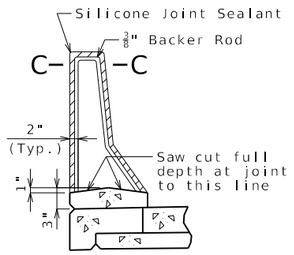
ELEVATION OF LEFT BARRIER

Longitudinal dimensions are horizontal.

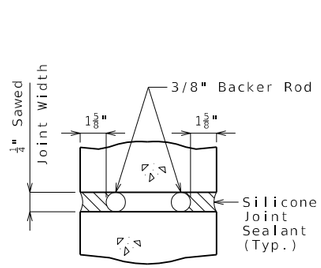
** Existing Longitudinal rebar in barrier to remain within these limits.



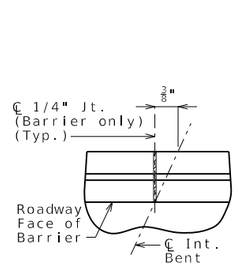
PART ELEVATION AT FORMED JOINT



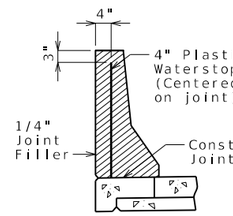
SECTION THRU SAW CUT JOINT



SECTION C-C



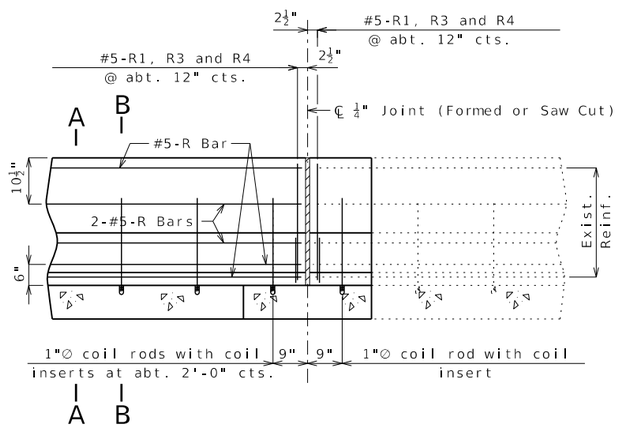
PART PLAN SHOWING JOINT LOCATION



WATERSTOP DETAIL

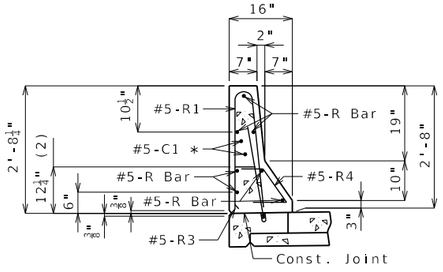
Plastic waterstop shall be placed in all formed joints, except structures with superelevation, use on lower joints only.

Cost of plastic waterstop, complete in place, will be considered completely covered by the contract unit price for Type B Barrier.



PART ELEVATION OF BARRIER

(1) Joint at CL Bent 3 shown; other joints similar

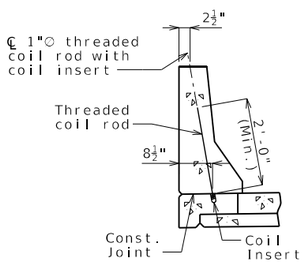


SECTION A-A

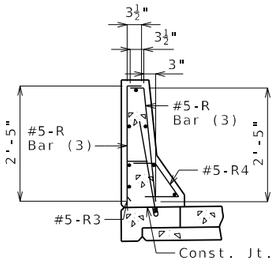
Use a minimum lap of 3'-1" for #5 horizontal barrier bars.

The cross-sectional area above the slab is 2.27 square feet.

(2) To top of bar



SECTION B-B



R-BAR PERMISSIBLE ALTERNATE SHAPE

(3) The R1 bar may be separated into two bars as shown, at the contractor's option. (All dimensions are out to out.)

General Notes:

Saw cut joints may be used.

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 considered completely covered by the contract unit price for Type B Barrier per linear foot.

Concrete in the barrier shall be Class B-1.

Measurement of barrier is to the nearest linear foot for each structure, measured along the gutter line within limits of removal.

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, one-way traffic shall have retroreflective sheeting on one side. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for Type B Barrier.

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

Plastic waterstop shall not be used with saw cut joints.

Coil inserts shall have a concrete ultimate pull-out strength of not less than 40,000 pounds in 5,000 psi concrete and an ultimate tensile strength of not less than 40,000 pounds.

Coil rods shall have an ultimate capacity of 36,000 pounds.

Payment for furnishing and installing coil inserts and threaded coil rods shall be fully covered by the contract unit price for Type B Barrier.

TYPE B BARRIER

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BR	7

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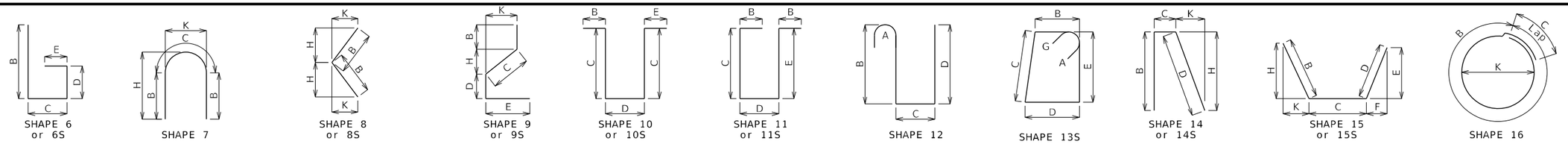
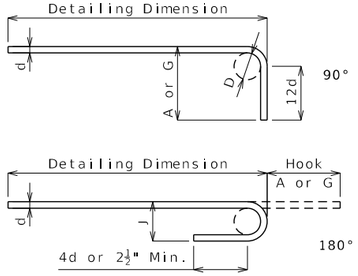


Finished Bend Diameters D and Hook Dimensions

Standard Pin Bend Shapes

Size	Case	D	A or G 90°	A or G 180°	J 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"	13¾"	10"
#9	1	9½"	19½"	15½"	11¾"
#10	1	10¾"	22"	17½"	13¼"
#11	1	12"	24½"	19½"	14⅞"
#14	1	18¾"	31¼"	27½"	21⅝"
#18	1	24"	41½"	36¼"	28½"

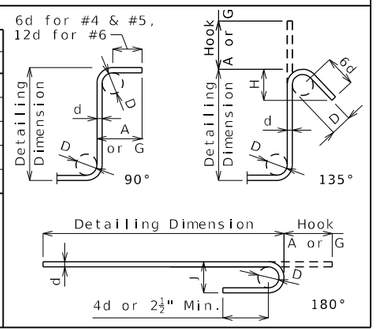


Stirrup Pin Bend Shapes (S)

Size	Case	D	A or G 90°	A or G 135°	A or G 180°	H 135°	J 180°
#4	2	2"	4½"	4½"	5"	2⅞"	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"	4⅝"	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.



BENDING DIAGRAMS

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.

All bars shall be Grade 60.

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.

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)

	Size	Substructure Plain	Substructure Epoxy	Superstructure Slab	Superstructure Barrier	Superstructure Slip Form	Entire Bridge Plain	Entire Bridge Epoxy
By Size	W5	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0
	5	0	0	1727	809	0	0	2536
	6	0	0	899	0	0	0	899
	7	0	0	797	0	0	0	797
By Type		0	0	3423	809	0	0	4232

All superstructure reinforcing steel shall be epoxy coated unless otherwise specified.

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
82	5 S1	SLAB	E	20		12 10.00							12 10	12 10	1098
11	6 S2	SLAB	E	20		54 5.00							54 5	54 5	899
20	7 S3	SLAB	E	20		19 6.00							19 6	19 6	797
14	5 H1	DIAPHRAGMS	E	20		13 8.00							13 8	13 8	200
32	5 H2	DIAPHRAGMS	E	20		3 0.00							3 0	3 0	100
16	5 H3	DIAPHRAGMS	E	20		2 0.00							2 0	2 0	33
16	5 H4	DIAPHRAGMS	E	19		9.00	2 11.00						3 8	3 7	60
36	5 U1	DIAPHRAGMS	E	28S			19.00	2 8.00	12.00				5 3	5 0	188
8	5 V1	DIAPHRAGMS	E	19S		2 11.00	2 11.00						5 10	5 9	48
53	5 R1	BARRIER	E	26S		2 5.00	4.00	1.75		4.00	2 3.25	3.00	5 4	5 3	290
53	5 R3	BARRIER	E	19S		10.75	5.75						1 4	1 3	69
53	5 R4	BARRIER	E	21S		5.75	12.50	12.00			10.25	7.25	2 6	2 2	120
7	5 R5	BARRIER	E	20		25 9.00							25 9	25 9	188
14	5 R6	BARRIER	E	20		9 9.00							9 9	9 9	142

BENDING DIAGRAMS AND REINFORCING STEEL TOTALS

Detailed July 2024
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